APPLICATION FOR CERTIFICATION

for the

ROSEVILLE ENERGY PARK

Roseville, California

VOLUME II: APPENDICES

Submitted to:

California Energy Commission
Sacramento, California

Submitted by:

Roseville Electric
Reliable Energy - Dependable Service

October 2003

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Application for Certification

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Parcel Map of the REP Site

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TOWNSHIP 11 NORTH, RANGE 5 EAST
SECTION 23
MOUNT DIABLO BASE AND MERIDIAN

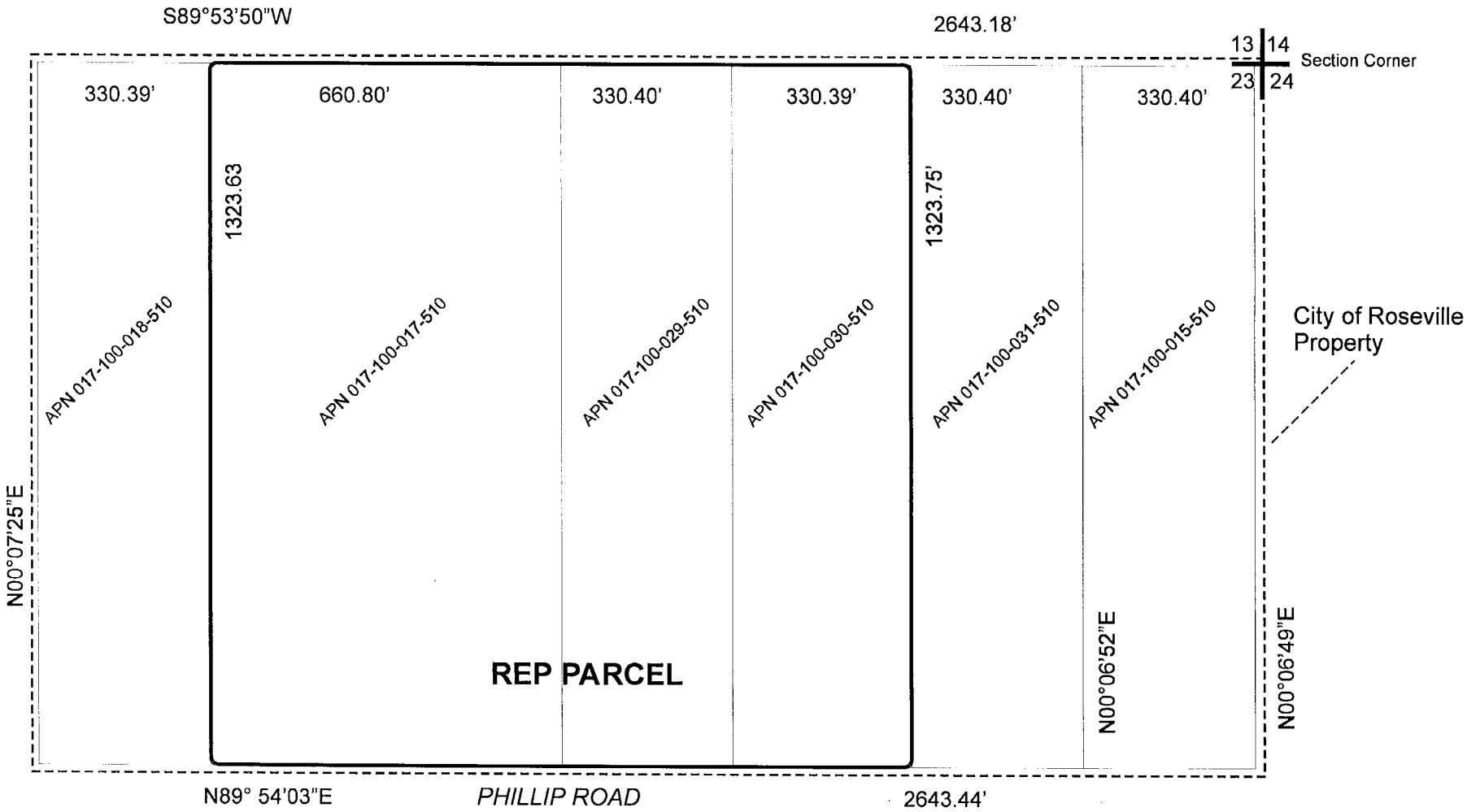

Figure 1.1-1A. REP parcel map

Roseville Energy Park

Appendix 1-B
Owners Adjacent to the Site and Linear Corridors

- ***Route A***
- ***Routes B & B1***
- ***Route C***

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Route A

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017 100 009 520
U C DAVIS FOUNDATION
1480 DREW AVE #130
DAVIS CA 95616

017 100 010 000
RUSS & JEAN LP;

017 100 014 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 100 015 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 017 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 018 510
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 100 021 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 100 027 510
ARCHIE L & WILLA OBRIEN
5480 PHILLIP RD
ROSEVILLE CA 95747

017 100 028 510
ARCHIE L & WILLA OBRIEN
5480 PHILLIP RD
ROSEVILLE CA 95747

017 100 029 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 030 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 031 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 032 000
WILLIAM C SR & Y P HARRIS
4900 PHILLIP RD
ROSEVILLE CA 95747

017 100 033 000
CHAU HSIUNG CHUANG
12351 CRAYSIDE LN
SARATOGA CA 95070

017 100 034 000
FTT
5400 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 035 000
FTT
5400 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 036 000
SA FTR
5400 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 038 000
BD PROPERTIES BENNETT ORIN
8568 PHEASANT HILL CT
ORANGEVALE CA 95662

017 100 042 000
PHILLIPS ROAD 160 INVESTORS MA
511 35TH ST
SACRAMENTO CA 95816

017 100 043 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 100 045 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 115 061 000
DAVID & DOLLY L FIDDYMENT
7136 FIREFLY GREEN LN
ROSEVILLE CA 95747

017 115 062 000
DAVID & DOLLY L FIDDYMENT
7136 FIREFLY GREEN LN
ROSEVILLE CA 95747

017 116 005 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 006 000
SUN CITY ROSEVILLE COMMUNITY A
7050 DEL WEBB BLVD
ROSEVILLE CA 95474

017 116 007 000
SUN CITY RSVL COMMUNITY ASSOC
7050 DEL WEBB BLVD
ROSEVILLE CA 95474

017 116 008 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 009 000
SUN CITY RSVL COMMUNITY ASSOC
7050 DEL WEBB BLVD
ROSEVILLE CA 95474

017 116 010 000
SUN CITY RSVL COMMUNITY ASSOC
7050 DEL WEBB BLVD
ROSEVILLE CA 95474

017 116 011 000
SUN CITY RSVL COMMUNITY ASSOC
7050 DEL WEBB BLVD
ROSEVILLE CA 95474

017 116 014 000
SUN CITY ROSEVILLE COMMUNITY A
7050 DEL WEBB BLVD
ROSEVILLE CA 95474

017 150 029 510
WEALTH PROPERTIES INC
1388 SUTTER ST #730
SAN FRANCISCO CA 94109

017 150 030 510
BAGLEY & ASSOCIATES
1437 BADOVINAC DR
ROSEVILLE CA 95747

017 150 031 510
COMPUTER DEDUCTIONS INC
2701 RATTLESNAKE RD
NEWCASTLE CA 95658

017 150 037 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 150 039 000
D F PROPERTIES
1551 VINEYARD RD
ROSEVILLE CA 95678

017 162 009 000
TERRACE L P SUTTER
1801 I ST #202
SACRAMENTO CA 95814

017 162 010 000
DEL WEBB CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 015 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

017 162 049 000
DEL WEBB CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 066 000
ELIZABETH A SIDNAM
1997 AMBER WAVES WAY
ROSEVILLE CA 95747

017 162 068 000
PETER P BOLLINGER INVESTMENT C
540 FULTON AVE
SACRAMENTO CA 95825

017 162 069 000
PETER P BOLLINGER INVESTMENT C
540 FULTON AVE
SACRAMENTO CA 95825

017 162 071 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 073 000
DRY CREEK JOINT ELEMENTARY SCH
9707 COOK RIOLO RD
ROSEVILLE CA 95747

017 162 075 000
ROMAN CATHOLIC BISHOP OF SACRA
2110 BROADWAY
SACRAMENTO CA 95818

017 162 077 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 078 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 085 000
PLEASANT GROVE COMMUNITY CHURC
1730 PLEASANT GROVE BLVD
ROSEVILLE CA 95747

023 220 054 000
TELEPHONE CO ROSEVILLE
8000 CROWDER LN
ROSEVILLE CA 00000

023 220 076 000
ROSEVILLE TELEPHONE COMPANY
8150 INDUSTRIAL AVE
ROSEVILLE CA 95678

023 220 084 000
RYAN C FONG
6230 GLORIA DR
SACRAMENTO CA 95831

023 220 085 000
K HOVNANIAN FORECAST HOMES INC
13 HIGHWAY 35
RED BANK NJ 07701

023 232 001 000
NELS E & PRISCILLA CHRISTENSEN
8038 BLACKWOOD LN
ROSEVILLE CA 95747

023 232 002 000
CRAIG B & LAURA L ADAMS
3682 KENWOOD WAY
ROSEVILLE CA 95747

023 232 003 000
KURT A LEATHERMAN
3722 KENWOOD WAY
ROSEVILLE CA 95747

023 232 004 000
CHARLES E FLACK
3762 KENWOOD WAY
ROSEVILLE CA 95747

023 232 005 000
ISRAEL LUNA
3802 KENWOOD WAY
ROSEVILLE CA 95747

023 232 006 000
ERNEST F RULLI
3842 KENWOOD WAY
ROSEVILLE CA 95747

023 232 007 000
HANS J & DAWN M HEEP
3882 KENWOOD WAY
ROSEVILLE CA 95747

023 232 008 000
RONALD L JR EVANS
3912 KENWOOD WAY
ROSEVILLE CA 95747

023 232 009 000
ANTHONY & SUSAN WRIGHT
3922 KENWOOD WAY
ROSEVILLE CA 95747

023 232 010 000
LOREN W & MARILYN J ROBINSON
3962 KENWOOD WAY
ROSEVILLE CA 95747

023 233 001 000
KENNETH W POLLOCK
4049 CANON AVE
OAKLAND CA 94602

023 233 002 000
ARTHUR G & JOANNE BAIRD
3843 KENWOOD WAY
ROSEVILLE CA 95747

023 233 003 000
EMILY & PAUL J KOSZALKA
3803 KENWOOD WAY
ROSEVILLE CA 95747

023 233 004 000
WILLIAM C & ALICE J TRATHEN
3763 KENWOOD WAY
ROSEVILLE CA 95747

023 233 005 000
JAMES F & MARY J BUSH
3723 KENWOOD WAY
ROSEVILLE CA 95747

023 233 006 000
JEFFREY L HOLLAND
3683 KENWOOD WAY
ROSEVILLE CA 95747

023 233 007 000
RAPHAEL E PEROWITZ
8110 BLACKWOOD LN
ROSEVILLE CA 95747

023 234 016 000
CAROL S LANGLEY & DONALD WAYNE MINARICH
8109 BLACKWOOD LN
ROSEVILLE CA 95747

023 234 017 000
KENNETH & SUSAN KELLOGG
8079 BLACKWOOD LN
ROSEVILLE CA 95747

023 234 018 000
DONATO & MARLENE DEMARCHI
700 PROMONTORY POINT LN #1107
FOSTER CITY CA 94404

023 234 019 000
ROBERT GRAY & TERESA L SCOTT
PO BOX 214129
SACRAMENTO CA 95821

023 271 001 000
FRED & JESSIE HENSON
3425 BASE LINE RD
ROSEVILLE CA 95747

023 271 003 000
PHILIP A KLINKENBORG
3429 CENTRAL AVE
ROSEVILLE CA 95747

023 271 007 000
LENA L LAMPEN
3411 CENTRAL AVE
ROSEVILLE CA 95747

023 271 014 000
FRED & JESSIE HENSON
3425 BASE LINE RD
ROSEVILLE CA 95747

023 271 015 000
MAX J & LAURA A WEIS
3453 CENTRAL AVE
ROSEVILLE CA 95747

023 272 003 000
JIMMY L NELSON
3211 BASE LINE RD
ROSEVILLE CA 95747

023 272 012 000
GORDON LYNN & ELIZABETH GAY RANEY
PO BOX 5
WILTON CA 95693

023 272 013 000
ELBERT A LAND
7570 HILL RD
GRANITE BAY CA 95746

023 272 014 000
RAYMOND SR CARRILLO
8056 COOK RIOLO RD
ROSEVILLE CA 95747

023 272 021 000
ALFRED & BARBARA J RAIA
PO BOX 1024
CARNELIAN BAY CA 96140

023 272 023 000
ROY E & SHIRLEY A BRUCE
8084 COOK RIOLO RD
ROSEVILLE CA 95747

023 272 031 000
RICHARD A & PATRICIA I BRUCE
8110 COOK RIOLO RD
ROSEVILLE CA 95747

023 272 041 000
THOMAS R & ELONA K ROCCO
3275 BASE LINE RD
ROSEVILLE CA 95747

023 272 044 000
THOMAS R & ELONA K ROCCO
3275 BASE LINE RD
ROSEVILLE CA 95747

023 272 045 000
WENDELL B BONNER
8055 CAROLYN CT
ROSEVILLE CA 95747

023 272 046 000
SILVA RICHARD A 1999 TRUST
8125 CAROLYN CT
ROSEVILLE CA 95747

023 272 047 000
HENRY B JR & RENA G PRUETT
8050 CAROLYN CT
ROSEVILLE CA 95747

023 272 048 000
FRED & GENA SILVERIA
8120 CAROLYN CT
ROSEVILLE CA 95747

023 272 050 000
JOHN R NICHOLSON II
7807 GALENA WAY
CITRUS HEIGHTS CA 95610

023 272 052 000
ABEL J & ELIZABETH A RIOS
3345 BASE LINE RD
ROSEVILLE CA 95747

023 272 053 000
MICHAEL E ROBERTSON
3460 CENTRAL AVE
ROSEVILLE CA 95747

023 272 058 000
THOMAS R & ELONA K ROCCO
3275 BASE LINE RD
ROSEVILLE CA 95747

023 272 059 000
THOMAS R & ELONA K ROCCO
3275 BASE LINE RD
ROSEVILLE CA 95747

023 272 060 000
THOMAS R & ELONA K ROCCO
3275 BASE LINE RD
ROSEVILLE CA 95747

474 010 003 000
JOHNSON JOHN/K 2003 TRUST
2915 BASE LINE RD
ROSEVILLE CA 95747

474 010 004 000
STEVEN D SPINDLER
2895 BASE LINE RD
ROSEVILLE CA 95747

474 010 006 000
MAXIM & DOMNITA NICULAI
2829 BASE LINE RD
ROSEVILLE CA 95747

474 010 007 000
RALPH S & ALICE M OKUMA
2811 BASE LINE RD
ROSEVILLE CA 95747

474 010 009 000
SALLY A ANDRESEN
2801 LIBERTY LN
ROSEVILLE CA 95747

474 010 012 000
TIMOTHY W & PRISCILLA N GIBSON
8125 COOK RIOLO RD
ROSEVILLE CA 95747

474 010 015 000
ROBERT LOUIS JR PAJER
2920 CENTRAL AVE
ROSEVILLE CA 95747

474 010 016 000
LEO JR & BONNIE J ROSKO
2880 CENTRAL AVE
ROSEVILLE CA 95747

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MICHAEL D & PATRICIA K KETCHUM
2860 CENTRAL AVE
ROSEVILLE CA 95747

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WILLIAM EARL & PAMELA ANN BENTON
2765 BASE LINE RD
ROSEVILLE CA 95747

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WILLIAM EARL & PAMELA ANN BENTON
2765 BASE LINE RD
ROSEVILLE CA 95747

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BRADLEY J & SHIRLEY M SANDERS
2695 BASE LINE RD
ROSEVILLE CA 95747

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CLIFFORD D & G BRANDON
2675 BASE LINE RD
ROSEVILLE CA 95747

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MICHAEL & SHANNON MANSCH
2655 BASE LINE RD
ROSEVILLE CA 95747

474 010 028 000
RONALD A & DONNA R; KAZMAN
8111 STICKLES LN
ROSEVILLE CA 95747

474 010 029 000
MICKEY R & LINDA D CLARK
8112 STICKLES LN
ROSEVILLE CA 95747

474 010 032 000
DONALD L & CHIN SUK EOFF
8010 OAK AVE
ROSEVILLE CA 95747

474 010 033 000
HILDEGARD ZACHARIAS
8020 OAK AVE
ROSEVILLE CA 95747

474 010 034 000
JAMES E & SHARON M MOE
8040 OAK AVE
ROSEVILLE CA 95747

474 010 035 000
KEVIN D WILSON
8070 OAK AVE
ROSEVILLE CA 95747

474 010 036 000
CLIFFORD & CLANCY BALL
8100 OAK AVE
ROSEVILLE CA 95747

474 010 042 000
RICHARD L & BECKY J BAKER
2865 BASE LINE RD
ROSEVILLE CA 95747

474 010 043 000
MCKIM
2875 BASE LINE RD
ROSEVILLE CA 95747

474 010 044 000
JOHN JR MARTIN
8075 COOK RIOLO RD
ROSEVILLE CA 95747

474 010 045 000
SERAFINA ANFUSO
2995 BASE LINE RD
ROSEVILLE CA 95747

474 010 046 000
L CARROLL & JENNIFER D GIBERSON
PO BOX 161
SHERIDAN CA 95681

474 010 049 000
DANIEL F & CAROL A GEHWEILER
2785 LIBERTY LN
ROSEVILLE CA 95747

474 010 051 000
ANTHONY J SIMON
2789 LIBERTY LN
ROSEVILLE CA 95747

474 010 052 000
RAYMOND C JR & BETTY M DAVIS
1295 HEMINGWAY DR
ROSEVILLE CA 95747

474 010 053 000
MICHAEL & TANYA MACK
2740 CENTRAL AVE
ROSEVILLE CA 95747

474 010 055 000
RODNEY & VIRGINIA BONNER
2700 CENTRAL AVE
ROSEVILLE CA 95747

474 020 001 000
C DWAIN SANDERS
8025 OAK AVE
ROSEVILLE CA 95747

474 020 002 000
C DWAIN SANDERS
8025 OAK AVE
ROSEVILLE CA 95747

474 020 003 000
ARNOLD W & SASITHORN PETERS
2485 BASE LINE RD
ROSEVILLE CA 95747

474 020 004 000
HAMID & ELISABETH HOSSEINI
1407 SPRINGFIELD DR
ROSEVILLE CA 95678

474 020 005 000
HAMID & ELISABETH HOSSEINI
1407 SPRINGFIELD DR
ROSEVILLE CA 95678

474 020 006 000
MARK C & KRISTINA E BUCHE
8055 OAK AVE
ROSEVILLE CA 95747

474 020 007 000
REVA G CUPLER
8081 OAK AVE
ROSEVILLE CA 95747

474 020 008 000
JAMES E & MARLYS D LUCAS
8109 OAK AVE
ROSEVILLE CA 95747

474 020 009 000
THOMAS C GERMANY
2440 CENTRAL AVE
ROSEVILLE CA 95747

474 020 011 000
THOMAS C GERMANY
2440 CENTRAL AVE
ROSEVILLE CA 95747

474 020 015 000
PACIFIC GAS & ELECTRIC CO
0 BASELINE RD
ROSEVILLE CA 00000

474 020 023 000
WALTER L & MICHAL ANN NAAKE
2300 CENTRAL AVE
ROSEVILLE CA 95747

474 020 024 000
ARTHUR C & PAMELA R BAUER
8080 MILNES AVE
ROSEVILLE CA 95747

474 020 025 000
MELINDA MORTIZ
8060 MILNES AVE
ROSEVILLE CA 95747

474 020 026 000
LUPE G CORONA
8040 MILNES AVE
ROSEVILLE CA 95747

474 020 027 000
STEVEN J OTAVKA
2345 BASE LINE RD
ROSEVILLE CA 95747

474 020 028 000
JACK A PACHECO
2431 BASE LINE RD
ROSEVILLE CA 95747

474 020 030 000
HENRY L VICTOR
2391 BASE LINE RD
ROSEVILLE CA 95747

474 020 031 000
DONALD E & LAVERNE A THOMPSON
4232 ECHO ROCK LN
ROSEVILLE CA 95747

476 270 021 000
MICHAEL & LYNN KEYS
1759 CHILTON DR
ROSEVILLE CA 95747

476 270 022 000
DAVID C & MARYDEAN RICHIE
1761 CHILTON DR
ROSEVILLE CA 95747

476 270 026 000
IVY F SHAW
2216 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 027 000
CURTIS W DAY
2017 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 001 000
TODD WILLIAM MOSACK
2214 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 002 000
CHARLES J & KIRSTEN A FAZZINO
2212 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 003 000
PAUL M SUMABON
2210 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 004 000
BRIAN ROTH
2208 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 005 000
LISA J FORRY
2206 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 006 000
JOHN DAVID & LINDA C SCHMITZ
1573 MILL RUN DR
ROSEVILLE CA 95747

476 280 007 000
JAMES B JR & CAMILLA J MCGEE
1571 MILL RUN DR
ROSEVILLE CA 95747

476 280 008 000
MICHAEL PUCCI
1569 MILL RUN DR
ROSEVILLE CA 95747

476 280 009 000
DEAN KENJI TOKUNAGA
1567 MILL RUN DR
ROSEVILLE CA 95747

476 280 010 000
JOANNA M HAWCK
1565 MILL RUN DR
ROSEVILLE CA 95747

476 280 011 000
DENNIS PATRICK BOGUE
1563 MILL RUN DR
ROSEVILLE CA 95747

476 280 012 000
MICHAEL & JESSICA MOULTON
1561 MILL RUN DR
ROSEVILLE CA 95747

476 280 013 000
JOHN HENRY JR & JOCELYN KAPPLER
2001 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 014 000
MATT & STACIE S WEBSTER
2003 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 015 000
SIGURD MEJDAL
346 DUNSMUIR TER #3
SUNNYVALE CA 94085

476 280 016 000
KELLEY A SILVA
2007 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 017 000
DANIEL C & TERRY M MURRELL
2009 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 018 000
PAUL A SOTO
2011 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 019 000
DONALD K & MAUREEN E SHEPHERD
2013 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 020 000
JAMES E & MARIA M HOLLOWAY
2015 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 021 000
CASEY HINKEY
505 MILL CREEK CT
ROSEVILLE CA 95747

476 280 022 000
RANDALL D MESA
2377 GOLD MEADOW WAY #100
GOLD RIVER CA 95670

476 280 023 000
GEORGE LOUIS RODRIGUEZ
2010 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 024 000
STEVEN R & KAREN M EASON
2006 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 025 000
TERRY STEPHEN & DANA LYNN
ZAHNISER
2002 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 026 000
ANNETTE M DIPIRRO
600 MILL RUN CT
ROSEVILLE CA 95747

476 280 027 000
BETH A CARRIGAN
602 MILL RUN CT
ROSEVILLE CA 95747

476 280 028 000
LARRY ROBERT & DONNIE JO WELCH
1550 MILL RUN DR
ROSEVILLE CA 95747

476 280 029 000
KATHLEEN KEEFE
1552 MILL RUN DR
ROSEVILLE CA 95747

476 280 030 000
MARK R & LYNNE M PEARCE
1554 MILL RUN DR
ROSEVILLE CA 95747

476 280 031 000
NESTOR & JOSEPHINE BUGAOISAN
1556 MILL RUN DR
ROSEVILLE CA 95747

476 280 032 000
DARRELL L & MARILYN R KAFF
1558 MILL RUN DR
ROSEVILLE CA 95747

476 280 033 000
LARRY R & COLLEEN M BERWICK
1560 MILL RUN DR
ROSEVILLE CA 95747

476 280 034 000
RICHARD B & KATHLEEN J ROCHON
1562 MILL RUN DR
ROSEVILLE CA 95747

476 280 035 000
ROBERT E & MARY A MORSE
1564 MILL RUN DR
ROSEVILLE CA 95747

476 280 036 000
JUDITH M YARNELL
1566 MILL RUN DR
ROSEVILLE CA 95747

476 280 037 000
TROY L & PAMELA J MOWRY
1568 MILL RUN DR
ROSEVILLE CA 95747

476 280 038 000
MICHAEL G & TERRI L SOBER
1570 MILL RUN DR
ROSEVILLE CA 95747

476 280 039 000
RADISA PETKOVIC
1572 MILL RUN DR
ROSEVILLE CA 95747

476 280 040 000
ROBERT & D J GONZALEZ
1574 MILL RUN DR
ROSEVILLE CA 95747

476 280 041 000
KARA M & CHAD A KAESTLE
2201 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 042 000
ALDEN
2203 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 043 000
ROBERT C; EGER
2205 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 044 000
KELLEY GETTEMY
2207 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 045 000
JAMES H & JOY ELISABETH WEBB
2209 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 046 000
CLAYTON LEE GREEN
2211 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 047 000
SHANE ONEILL
1760 CHILTON DR
ROSEVILLE CA 95747

476 280 048 000
PATRICK J & TONA LYNNE OBRIEN
2315 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 049 000
RONALD C BRETHERTON
2313 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 050 000
ROBERT S TALBOTT
2311 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 051 000
ROLAND C & CINDY D WRIGHT
2309 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 052 000
SOOK Y & KI S NAM
2307 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 053 000
MIRTA E ABEIJON
2305 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 054 000
GREGORY R & TERESA A FERGUSON
2303 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 055 000
DAVID W & ROSEMARIE HOWELL
2301 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 056 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 057 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 058 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 290 001 000
RICHARD LAWRENCE & KAREN L KELSO
2300 PROSPECT PARK DR
ROSEVILLE CA 95747

476 290 002 000
JEAN M NEILL
2302 PROSPECT POINT DR
ROSEVILLE CA 95747

476 290 003 000
MICHAEL G & CARMEN S PETERS
2304 PROSPECT POINT DR
ROSEVILLE CA 95747

476 290 004 000
MICHAEL REID & REBECCA MAE
ARNOLD
1751 EVERGREEN DR
ROSEVILLE CA 95747

476 290 005 000
SOLORIO
1749 EVERGREEN DR
ROSEVILLE CA 95747

476 290 006 000
TSAW S & YAYOUNG LIN
2026 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 007 000
DONALD P & JOYCE C ANDERSON
2024 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 008 000
MICHAEL & KARI ERICKSON
2022 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 009 000
WAYNE A & DONNA D EMERY
2020 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 077 000
SHARON L; CELIO
1748 EVERGREEN DR
ROSEVILLE CA 95747

476 290 078 000
VICTOR & NADEZHDA TIKHOMIROV
1750 EVERGREEN DR
ROSEVILLE CA 95747

476 290 079 000
JON A MARTIN
2316 PROSPECT POINT DR
ROSEVILLE CA 95747

476 360 019 000
ROLAND E GARNER
1409 LAZENBY WAY
ROSEVILLE CA 95747

476 360 020 000
ALEXANDER D LOPEZ
2107 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 021 000
CLAUDIO A SILVA
2109 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 045 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 370 008 000
BRAD A & MERRIANNE HALM
606 CHILCOTT CT
ROSEVILLE CA 95747

476 370 009 000
RONALD R LECROIX
608 CHILCOTT CT
ROSEVILLE CA 95747

476 370 010 000
GEORGE A JR & ELSA G BERRIOS
607 CHILCOTT CT
ROSEVILLE CA 95747

476 370 011 000
DAVID & JOYCE GOBER
605 CHILCOTT CT
ROSEVILLE CA 95747

476 370 017 000
BALWINDER SINGH
2119 CARGILL WAY
ROSEVILLE CA 95747

476 370 018 000
KEERAN & BINDYA NAGINDAS
2117 CARGILL WAY
ROSEVILLE CA 95747

476 370 019 000
WALTER A & WANDA V FORSTER
12955 SW BRIGHTWOOD ST
BEAVERTON OR 97005

476 370 020 000
VIOL BLAKENEY
2072 SHROPSHIRE ST
ROSEVILLE CA 95747

476 370 021 000
GUILLERMO J MIRANDA
703 ROWLEY CT
ROSEVILLE CA 95747

476 370 022 000
DENISE J MULHERNVINCENT
705 ROWLEY CT
ROSEVILLE CA 95747

476 370 023 000
KEVIN & DAWN R HEATH
707 ROWLEY CT
ROSEVILLE CA 95747

476 370 024 000
JOHN M & CHERYL M HAMILTON
709 ROWLEY CT
ROSEVILLE CA 95747

476 370 041 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 001 000
GEORGE R & BABETTE HATTEN
2115 CARGILL WAY
ROSEVILLE CA 95747

476 380 002 000
CHESTER E & CHERYL V CLEVELAND
2113 CARGILL WAY
ROSEVILLE CA 95747

476 380 003 000
CALVIN J & ARSENIA B ENGLAND
2111 CARGILL WAY
ROSEVILLE CA 95747

476 380 004 000
LINDA A COSTELLO
2109 CARGILL WAY
ROSEVILLE CA 95747

476 380 005 000
GARY E & CHRIS ANN KENYON
2107 CARGILL WAY
ROSEVILLE CA 95747

476 380 006 000
VICTOR J & ANITA PECORARO
2105 CARGILL WAY
ROSEVILLE CA 95747

476 380 007 000
PATRICK S & JENNY M SAXMAN
2103 CARGILL WAY
ROSEVILLE CA 95747

476 380 008 000
LOUIS F & ELEANOR JEAN GREGORINI
2101 CARGILL WAY
ROSEVILLE CA 95747

476 380 009 000
ARTURO JUAN
1435 LOCKHART WAY
ROSEVILLE CA 95747

476 380 010 000
STEPHEN M & BETTY J DORMAN
540 SOUTH RD
BELMONT CA 94002

476 380 011 000
GLENN L & LORI A HOUSTON
1431 LOCKHART WAY
ROSEVILLE CA 95747

476 380 012 000
MARTY WEBER
5340 DIVOT CIR
FAIR OAKS CA 95628

476 380 013 000
ALAN & JANE ELIZABETH BUZZURRO
1427 LOCKHART WAY
ROSEVILLE CA 95747

476 380 014 000
DONALD J & MARIANNA NORTH
2680 VOLK AVE
TURLOCK CA 95380

476 380 015 000
CHARLES & SUSANNE ELLIS II
1423 LOCKHART WAY
ROSEVILLE CA 95747

476 380 016 000
LINDA CORTEZ
1417 LOCKHART WAY
ROSEVILLE CA 95747

476 380 017 000
CATHERINE R DONOVAN
1419 LOCKHART WAY
ROSEVILLE CA 95747

476 380 018 000
DAVID J & MISTY L VIANI
1417 LOCKHART WAY
ROSEVILLE CA 95747

476 380 019 000
SANDRA L MARTINEZ
1415 LOCKHART WAY
ROSEVILLE CA 95747

476 380 020 000
MICHAEL H & PATRICIA RAMSEY
1413 LOCKHART WAY
ROSEVILLE CA 95747

476 380 021 000
PAUL MOCNY
1411 LOCKHART WAY
ROSEVILLE CA 95747

476 380 022 000
ERIK R & DEANNA L ALDRICH
1409 LOCKHART WAY
ROSEVILLE CA 95747

476 380 023 000
HENRY S YUN
101 GALSTON CT
ROSEVILLE CA 95747

476 380 024 000
STEVEN M & KAREN L HOLDERNESS
103 GALSTON CT
ROSEVILLE CA 95747

476 380 025 000
PATRICK G BACCARI
105 GALSTON CT
ROSEVILLE CA 95747

476 380 026 000
RICK W & PAMELA L BARTO
104 GALSTON CT
ROSEVILLE CA 95747

476 380 027 000
DANE D & DELLA P CABRAL
102 GALSTON CT
ROSEVILLE CA 95747

476 380 028 000
JACK SWEIGART
3434 MARCONI AVE #C
SACRAMENTO CA 95821

476 380 029 000
ROBIN MARIE LEONARD
201 EPWORTH CT
ROSEVILLE CA 95747

476 380 030 000
MARK J & JODI M TRUSCOTT
203 EPWORTH CT
ROSEVILLE CA 95747

476 380 031 000
AFTON L HARRINGTON
205 EPWORTH CT
ROSEVILLE CA 95747

476 380 032 000
KELLY D PECK
207 EPWORTH CT
ROSEVILLE CA 95747

476 380 033 000
DOUGLAS H & KATHY L FUNK
208 EPWORTH CT
ROSEVILLE CA 95747

476 380 034 000
DAWN WARRIOR
206 EPWORTH CT
ROSEVILLE CA 95747

476 380 035 000
VIRGINIA MARTINEZ
204 EPWORTH CT
ROSEVILLE CA 95747

476 380 036 000
ANH Q; PHAM
249 GREENDALE WAY #1
SAN JOSE CA 95129

476 380 037 000
JOHN & LISA MOLINEAUX
200 EPWORTH CT
ROSEVILLE CA 95747

476 380 038 000
JOSEPH A & JULIE R OLDHAM
2105 BECKENHAM WAY
ROSEVILLE CA 95747

476 380 039 000
MICHAEL J & SUZANNE E FUNK
302 CULLIGAN CT
ROSEVILLE CA 95747

476 380 040 000
JEROME M RYAN
306 CULLIGAN CT
ROSEVILLE CA 95747

476 380 041 000
JOHN JR VICENTE
308 CULLIGAN CT
ROSEVILLE CA 95747

476 380 042 000
J FELD DEFINED BENEFIT PLAN R
16666 BLUE OAK WAY
GRASS VALLEY CA 95949

476 380 043 000
RANDHER S & MANDIP K ATHWAL
307 CULLIGAN CT
ROSEVILLE CA 95747

476 380 044 000
PAUL J LEFRANCOIS
305 CULLIGAN CT
ROSEVILLE CA 95747

476 380 045 000
RAFAEL A MOLINA
303 CULLIGAN CT
ROSEVILLE CA 95747

476 380 046 000
JAMES ROBERT SEP IRA COURSHON
160 BOVET RD
SAN MATEO CA 94402

476 380 047 000
JEFFREY R & KATHLEEN M DUMONT
1410 LOCKHART WAY
ROSEVILLE CA 95747

476 380 048 000
WILLIAM KENT
1412 LOCKHART WAY
ROSEVILLE CA 95747

476 380 049 000
KENDRA K JUNK
1414 LOCKHART WAY
ROSEVILLE CA 95747

476 380 050 000
ANTONE G & PAULINE C CHRISTIE
1416 LOCKHART WAY
ROSEVILLE CA 95747

476 380 051 000
ERHARDT E KRAUSE
1418 LOCKHART WAY
ROSEVILLE CA 95747

476 380 052 000
JEFFERY A & WENDY D SPENCER
1420 LOCKHART WAY
ROSEVILLE CA 95747

476 380 053 000
ROY A & BEATRICE REMEDIOS
2617 COLDWATER CT
ROCKLIN CA 95765

476 380 054 000
PHILIP J & JOANNIE M HERZER
1424 LOCKHART WAY
ROSEVILLE CA 95747

476 380 055 000
RONALD T & JUNE Y LEE
15 BLUEBELL LN
HILLSBOROUGH CA 94010

476 380 056 000
ALEXANDER G & HEATHER A BROWN
1428 LOCKHART WAY
ROSEVILLE CA 95747

476 380 057 000
TEDDY R KERNAN
1430 LOCKHART WAY
ROSEVILLE CA 95747

476 380 058 000
DAVID J & MARY E HIGGINS
1432 LOCKHART WAY
ROSEVILLE CA 95747

476 380 059 000
SECRETARY OF VETERANS AFFAIRS
2106 CARGILL WAY
ROSEVILLE CA 95747

476 380 060 000
MICHAEL G & MONIQUE R BECKER
2108 CARGILL WAY
ROSEVILLE CA 95747

476 380 061 000
WILLIAM RON & KAREN RENEE CODY
2110 CARGILL WAY
ROSEVILLE CA 95747

476 380 062 000
RONALD ELMER & ELIZABETH HAGEN
603 BELHURST CT
ROSEVILLE CA 95747

476 380 063 000
JOHN J & LEANNE M PRICE
5098 FOOTHILLS BLVD #3-167
ROSEVILLE CA 95747

476 380 064 000
VANHUE & AGNES U SA
607 BELHURST CT
ROSEVILLE CA 95747

476 380 065 000
VALERIE VARZOS
609 BELHURST CT
ROSEVILLE CA 95747

476 380 066 000
MARIANNE MUIRHEAD
611 BELHURST CT
ROSEVILLE CA 95747

476 380 067 000
DANIEL LINSLEY
613 BELHURST CT
ROSEVILLE CA 95747

476 380 068 000
LYNDA L MULHOLLAND
615 BELHURST CT
ROSEVILLE CA 95747

476 380 069 000
LARRY W & GLADYS R GOINS
614 BELHURST CT
ROSEVILLE CA 95747

476 380 070 000
JACK P SR BISHOP
612 BELHURST CT
ROSEVILLE CA 95747

476 380 071 000
KIM BATCHELDER
610 BELHURST CT
ROSEVILLE CA 95747

476 380 072 000
STUART & JULIE BAILEY
608 BELHURST CT
ROSEVILLE CA 95747

476 380 073 000
DONNA MAYNARD
606 BELHURST CT
ROSEVILLE CA 95747

476 380 074 000
DOUGLAS S & JENNIFER R
HEADINGTON
604 BELHURST CT
ROSEVILLE CA 95747

476 380 075 000
KEVIN & MARYLISA A SMETHURST
602 BELHURST CT
ROSEVILLE CA 95747

476 380 076 000
STUART W & JULIE A BAILEY
608 BELHURST CT
ROSEVILLE CA 95747

476 380 077 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 078 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 079 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 080 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 440 021 000
RICARDO S & DIANA C PASCUAL III
1048 CASWELL DR
ROSEVILLE CA 95747

476 440 022 000
EARL JACK SHARP
1057 CASWELL DR
ROSEVILLE CA 95747

476 440 023 000
WILLIAM KENNETH & JUDY STANFILL
1065 CASWELL DR
ROSEVILLE CA 95747

476 440 024 000
JENNIFER L WHITWORTH
1566 FAULKNER DR
ROSEVILLE CA 95747

476 440 025 000
DARRIN A & JULIE KETELSEN LYNCH
1574 FAULKNER DR
ROSEVILLE CA 95747

476 440 026 000
SILVERIA HELEN E LIFE ESTATE
1582 FAULKNER DR
ROSEVILLE CA 95747

476 440 027 000
GREGORY T; SILVERIA
1582 FAULKNER DR
ROSEVILLE CA 95747

476 440 028 000
SHARON L DYE
1598 FAULKNER DR
ROSEVILLE CA 95747

476 450 001 000
JAMES E & HELEN R WEST
1040 CASWELL DR
ROSEVILLE CA 95747

476 450 002 000
GARY E & KIMBERLY B NIPPER
1032 CASWELL DR
ROSEVILLE CA 95747

476 450 003 000
STEVEN A & STACY D SCHWARTZ
1024 CASWELL DR
ROSEVILLE CA 95747

476 450 004 000
PETER C & SANDRA A AZEVEDO
1016 CASWELL DR
ROSEVILLE CA 95747

476 450 005 000
MAURICE D & JUDY J PERELLA
1008 CASWELL DR
ROSEVILLE CA 95747

476 450 006 000
ERIC J & MARY LAURSEN
540 TARRANT CT
ROSEVILLE CA 95747

476 450 007 000
RICHARD J H MORGAN
548 TARRANT CT
ROSEVILLE CA 95747

476 450 008 000
WILLIAM A CASTLE
556 TARRANT CT
ROSEVILLE CA 95747

476 450 009 000
PHILLIP C & LYNETTE A WILTON
564 TARRANT CT
ROSEVILLE CA 95747

476 450 010 000
ROBERT R & LINDA A FRIEND
572 TARRANT CT
ROSEVILLE CA 95747

476 450 011 000
ARIEL C & FE B MANIPULA
573 TARRANT CT
ROSEVILLE CA 95747

476 450 012 000
CRAIG & LAURA PLANTE
565 TARRANT CT
ROSEVILLE CA 95747

476 450 013 000
GEORGE HUNT
557 TARRANT CT
ROSEVILLE CA 95747

476 450 014 000
ALBERT & INA C SHENK
549 TARRANT CT
ROSEVILLE CA 95747

476 450 015 000
NEIL H & BETH SAUNDERS
541 TARRANT CT
ROSEVILLE CA 95747

476 450 016 000
BRENT G & ANDREA L FINK
533 TARRANT CT
ROSEVILLE CA 95747

476 450 017 000
DANIEL & ELAINE SCHITEA
525 TARRANT CT
ROSEVILLE CA 95747

476 450 018 000
MARY PAUWELS
517 TARRANT CT
ROSEVILLE CA 95747

476 450 019 000
BRENT K & JULIE BAIR
509 TARRANT CT
ROSEVILLE CA 95747

476 450 020 000
RANDALL & SONDRA DENNIS
501 TARRANT CT
ROSEVILLE CA 95747

476 450 021 000
BELL 1998 TRUST
401 KNOWLTON CT
ROSEVILLE CA 95747

476 450 022 000
BICKIE L & THERESA B BAZACOS
409 KNOWLTON CT
ROSEVILLE CA 95747

476 450 023 000
RICHARD G & JILL A VOGT
417 KNOWLTON CT
ROSEVILLE CA 95747

476 450 024 000
JOHN & AMY FREITAS
425 KNOWLTON CT
ROSEVILLE CA 95747

476 450 025 000
ROBERT P & JODI A CUELLAR
433 KNOWLTON CT
ROSEVILLE CA 95747

476 450 026 000
GURMEET S & JASVIR K GREWAL
441 KNOWLTON CT
ROSEVILLE CA 95747

476 450 027 000
WILLIAM J SWEENEY
449 KNOWLTON CT
ROSEVILLE CA 95747

476 450 028 000
RANA PARTAP
457 KNOWLTON CT
ROSEVILLE CA 95747

476 450 029 000
JOSE T & EVELYN E NAVOS
456 KNOWLTON CT
ROSEVILLE CA 95747

476 450 030 000
SAMUEL B & KAMI M NIEBANK
448 KNOWLTON CT
ROSEVILLE CA 95747

476 450 031 000
HENRY HARRIS
440 KNOWLTON CT
ROSEVILLE CA 95747

476 450 032 000
KENNETH D CRANSTON
432 KNOWLTON CT
ROSEVILLE CA 95747

476 450 033 000
RICHARD & CINDY TURK
424 KNOWLTON CT
ROSEVILLE CA 95747

476 450 034 000
MARGARET A FREITAS
416 KNOWLTON CT
ROSEVILLE CA 95747

476 450 035 000
STEVEN & STACEY GAVIS
408 KNOWLTON CT
ROSEVILLE CA 95747

476 450 036 000
RAJINDER S & JAGDISH DOSANJH
400 KNOWLTON CT
ROSEVILLE CA 95747

476 450 037 000
KATHERINE LILLIAN & MARK FRANKS
301 HADNALL CT
ROSEVILLE CA 95747

476 450 038 000
KIRK P & SHARON L GIPSON
309 HADNALL CT
ROSEVILLE CA 95747

476 450 039 000
JEFFERY M & MICHELLE D KAHLOR
317 HADNALL CT
ROSEVILLE CA 95747

476 450 040 000
SEAN N & EDDIE E MITCHELL
325 HADNALL CT
ROSEVILLE CA 95747

476 450 041 000
CHRIS JOHNSON
333 HADNALL CT
ROSEVILLE CA 95747

476 450 042 000
MICHAEL G & MONICA COLTHARP II
341 HADNALL CT
ROSEVILLE CA 95747

476 450 043 000
ROBERT J & JUDY L GETTY
340 HADNALL CT
ROSEVILLE CA 95747

476 450 044 000
STEPHEN & LAURIE PETERSON
332 HADNALL CT
ROSEVILLE CA 95747

476 450 045 000
JEFFREY O & LESLIE A WILSON
324 HADNALL CT
ROSEVILLE CA 95747

476 450 046 000
MICHAEL S & CHERYL D WARDELL
316 HADNALL CT
ROSEVILLE CA 95747

476 450 047 000
JOE G & KAREN A BAQUERA
308 HADNALL CT
ROSEVILLE CA 95747

476 450 048 000
EDWARD I & JILL A DAGHER
300 HADNALL CT
ROSEVILLE CA 95747

476 450 049 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 450 050 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

478 010 018 000
C FRED & IRENE BELCHER
6289 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 019 000
BAKOTICH
6281 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 020 000
PAUL J & CAROL J WRIGHT
6273 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 021 000
JAMES H & PHYLLIS I PAQUETTE
6265 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 022 000
FRED E & SHIRLEY J DUVAL
6257 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 023 000
EUGENE A & PATRICIA G BOESIGER
6249 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 024 000
NANCY J STURTEVANT
6241 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 025 000
ARMIN & SYLVIA GUTH
6233 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 026 000
M A & MARCELLA M ANASTASI
1033 HAMAN WAY
ROSEVILLE CA 95678

478 010 027 000
VIRGINIA ARLINE WOOD
6217 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 028 000
GRISWOLD
6209 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 029 000
SANDRA K RITACCO
6201 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 030 000
WARREN N & PATRICIA A LITTLEFIELD
6193 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 031 000
ROBERT D & SUZANNE BERNARD
6200 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 032 000
DAVID O & AUDREY J ANDREWS
6224 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 033 000
JEFF & DIANNA S MATTIMORE
500 PITCHER CT
ROSEVILLE CA 95747

478 010 034 000
WALTER A & LAURA M PROTNICK
508 PITCHER CT
ROSEVILLE CA 95747

478 010 035 000
JOHN W & BEVERLY A DAVIS
516 PITCHER CT
ROSEVILLE CA 95747

478 010 036 000
NADINE B CLAUSEN
517 PITCHER CT
ROSEVILLE CA 95747

478 010 037 000
PAUL J & LILA J FLANNERY
509 PITCHER CT
ROSEVILLE CA 95747

478 010 038 000
FREDRICKS 2003 TRUST
501 PITCHER CT
ROSEVILLE CA 95747

478 010 039 000
SALLY TATOSIAN
6165 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 040 000
ROBERT G CLARKE
PO BOX 1165
ROSEVILLE CA 95678

478 010 041 000
SALLIE W GRAY
6149 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 042 000
EDWARD P & JOAN E FUNCHEON
6141 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 043 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 020 012 000
ELSIE J FABIANO
6185 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 013 000
ROSALIE G GROW
6177 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 014 000
WANDA D DEATON
6169 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 015 000
CHRIS JR & GEORGIA A SPITZER
6161 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 016 000
ALBERT & ROSEMARY SANTORA
6153 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 017 000
SYLVIA M TILLEY
6145 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 018 000
HANSEN
6137 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 019 000
BETTY E WILLIBY
6129 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 020 000
ROBERT D & BETTY J KETELLE
6121 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 021 000
STECHMAN CHARLES W III & FRANC
6113 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 022 000
EDNA MCMORINE
6105 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 023 000
CLARA M DANIELS
6097 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 024 000
CAROLEE HAMILTON
6089 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 025 000
ELLIS J & BARBARA M TEEL
6081 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 026 000
WILLIAM B & ANTOINETTE M HUGHES
6056 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 027 000
VIRGINIA F HANSEN
6064 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 028 000
JOHN S & BONNIE M LUSTER
6072 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 029 000
RICHARD E & HELEN B SCHULTE
6080 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 030 000
BUTERA
7008 TIMBERROSE WAY
ROSEVILLE CA 95747

478 020 031 000
KAZUKO DOUPONCE
6096 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 032 000
MARIAN L CAMPBELL
6136 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 033 000
MILLICENT M YATES
6152 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 034 000
SHIRLEY MOE
6160 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 035 000
CAROL J MACADAMS
6176 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 036 000
DONALD E & MARGARET E WARD
6184 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 037 000
BILLY E & BETTY ANN WRIGHT
200 SWAZEY CT
ROSEVILLE CA 95747

478 020 038 000
RICHARD C & BETTY J CALETTI
208 SWAZEY CT
ROSEVILLE CA 95747

478 020 039 000
ROBERT & MARY L NEWMAN
216 SWAZEY CT
ROSEVILLE CA 95747

478 020 040 000
THOMAS E & YVONNE S HOGAN
224 SWAZEY CT
ROSEVILLE CA 95747

478 020 041 000
ROBERT B JR & BARBARA J MORRIS
232 SWAZEY CT
ROSEVILLE CA 95747

478 020 042 000
ARMAN & CAROLYN ARAKELIAN
225 SWAZEY CT
ROSEVILLE CA 95747

478 020 043 000
BEN & PAT PUGH
217 SWAZEY CT
ROSEVILLE CA 95747

478 020 044 000
BUCKMAN
209 SWAZEY CT
ROSEVILLE CA 95747

478 020 045 000
ELMER G JR & MARY E HASKIN
201 SWAZEY CT
ROSEVILLE CA 95747

478 020 053 000
ROBERT D & ARLENE J KEMIS
6057 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 054 000
SHEILA M KERINS
6065 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 055 000
PAULINE A BATTLE
6073 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 057 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 030 001 000
HARVEY LEE
5401 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 002 000
ERNEST J & DOROTHY L MOESSNER
PO BOX 1235
ROSEVILLE CA 95678

478 030 003 000
ROSS
5385 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 004 000
JOHN FRANCIS & SUE SPRATLEY
5377 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 005 000
BONNIE HOUSE
5369 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 006 000
ERLING W & MARINA LOKEN
5361 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 007 000
ELIZABETH A NITOPI
5353 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 008 000
GORDON & AUDLEY WALRATH
5345 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 009 000
JOHN A & MINAKO A KUMPULAINIEN
5337 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 010 000
ELAINE M RANDALL
5329 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 011 000
JAMES D & MARY ELLEN ROSZELL
5321 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 012 000
CELESTE M CALLISON
5313 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 013 000
ELISABETH W BROWN
5305 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 014 000
CURTIS A & HELEN M COX
5297 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 015 000
PEGGY ELIZABETH CLOUD
5289 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 016 000
LENI M & AILEEN J STENBACK
5281 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 017 000
LOUISE K BUMGARDNER
5273 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 018 000
JOHN A ZAFFERANO
7516 PAIUTE POINT RD
ROSEVILLE CA 95747

478 030 019 000
NORBERT & LEA ROTENBERG
5257 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 020 000
PATRICIA S BUTLER
5249 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 021 000
CARL D & JOY Y SAVAGE
5241 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 022 000
JOHN K SR & FAYE HOLIHAN
5233 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 023 000
NORMAN C & KATHRYN HAGENBUCH
5225 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 024 000
MOZELLE BURLESON
5217 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 025 000
BETTY C TOMPKINS
5209 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 026 000
LEON J & GAIL E RAGLEN
5201 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 027 000
JACQUES J & BERTA N BRUNNER
5123 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 028 000
THOMAS C & MARTHA OWENS
5115 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 029 000
DOLORES M KLEINKE
5107 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 030 000
ROBERT V RODGERS
5099 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 031 000
AGUILERA
5091 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 032 000
BLAINE A & GERALDINE R EISENBEIS
5083 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 033 000
LINDY E & MELBA O WILLIAMS
5075 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 034 000
ROBERT W & THEONIE S MURCH
5208 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 035 000
ALFRED L & HELEN I LUNA
5224 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 036 000
MARY L YOUNGBLUTT
5232 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 037 000
DON R PATTERSON
5240 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 038 000
LANG
5258 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 039 000
KENNETH E & KAREN R HASEMANN
5304 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 040 000
MARGORIE B KJAR
5312 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 041 000
ROBERT E & MARYON R MORRIS
5320 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 042 000
SARA E JORDAN
5336 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 043 000
JOSEPHINE DOLORES POLLICK
219 VALLEY VIEW DR
OROVILLE CA 95966

478 030 044 000
FRANK L & ELAINE MELLIN
5352 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 045 000
ORTON W JR & LEAH M BENSON
500 WASHOE CT
ROSEVILLE CA 95747

478 030 046 000
JERRY & DRAHA HUBIK
508 WASHOE CT
ROSEVILLE CA 95747

478 030 047 000
ARTHUR C & ELEANOR I DITTRICH
516 WASHOE CT
ROSEVILLE CA 95747

478 030 048 000
RALPH A & MARJORIE C GONGWER
524 WASHOE CT
ROSEVILLE CA 95747

478 030 049 000
ROGER D & COLLEEN S TOVEY
533 WASHOE CT
ROSEVILLE CA 95747

478 030 050 000
ALLEN L & JOAN CAROL EVANS
525 WASHOE CT
ROSEVILLE CA 95747

478 030 051 000
JAMES A & MARILEE H DENIO
1551 VINEYARD RD
ROSEVILLE CA 95678

478 030 052 000
JOHN P & JOANNE E SANCHEZ
509 WASHOE CT
ROSEVILLE CA 95747

478 030 053 000
BRUCE H & MARY MACLEAN
501 WASHOE CT
ROSEVILLE CA 95747

478 030 054 000
POZAREK 1989 TRUST
5417 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 055 000
CURTIS C & SHIRLEY R MILLER
5425 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 090 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 040 015 000
BARBARA M MOUREAUX
5051 GOLDFIELD WAY
ROSEVILLE CA 95747

478 040 021 000
JOYCE R MCCLURE
5032 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 022 000
MARY DUFOUR
5040 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 023 000
ROBERT F & FLORENCE G WANGLER
5056 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 024 000
JEAN B COTTER
5064 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 025 000
PAMELA C REHM
5072 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 026 000
PHYLLIS A DECROIX
5224 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 027 000
PHYLLIS & C PROVOST
5232 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 028 000
ERNEST R & RUTH I SAVAGE
5240 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 029 000
MANUEL S & GLORIA J MACIAS
5248 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 030 000
CHARLES E & ANN H BROWN
5256 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 031 000
FLORINE M BROWER
5264 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 032 000
HENRY & KATRIN A LANDAUER
5272 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 033 000
BAUGHMAN
200 STAMOS CT
ROSEVILLE CA 95747

478 040 034 000
PETERSON
208 STAMOS CT
ROSEVILLE CA 95747

478 040 035 000
ANTHONY & MARILYN ARGENTINE
216 STAMOS CT
ROSEVILLE CA 95747

478 040 036 000
SHIRLEY A GAYE
224 STAMOS CT
ROSEVILLE CA 95747

478 040 037 000
EDWARD A MCCOOEY
225 STAMOS CT
ROSEVILLE CA 95747

478 040 038 000
HARRY E & RITA C GORDON
217 STAMOS CT
ROSEVILLE CA 95747

478 040 039 000
CHARLES G & JOAN R ESKIN
209 STAMOS CT
ROSEVILLE CA 95747

478 040 040 000
EDWARD & AUDREY
201 STAMOS CT
ROSEVILLE CA 95747

478 040 042 000
CAROL P MCDANIEL
5345 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 043 000
JAMES E & ROBERTA B BURCKLE
5337 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 044 000
SNYDER
5329 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 045 000
HELEN L TOBIASON
5321 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 046 000
DARWIN J & R ELLOUISE SUNDAY
5313 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 047 000
OLIVER M & IRENE M OBRIEN
5305 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 048 000
HILDA DEUS
5297 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 049 000
WILMA B BULL
5289 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 050 000
MYRON W MCINTYRE
3 SOMER RIDGE DR #193
ROSEVILLE CA 95661

478 040 051 000
SUSAN A MOODY
5273 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 052 000
MANN
5265 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 053 000
LENA P BROWN
5257 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 054 000
TERENCE & NORA AIRLIE
5249 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 055 000
WILLIAM DAVID GIGLIO
5241 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 056 000
MAIDA M HOUSTON
5233 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 057 000
THOMAS M & CAROL M COOK
5225 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 058 000
JEAN K DARRAGH
5217 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 059 000
DONALD & GERALYN GORSHING
5209 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 060 000
MERRILL E & SHIRLEY F BAXLEY
5201 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 061 000
FLOYD CORGILE
5089 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 062 000
ALVIN J & PATSY R JORGENSON
5081 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 063 000
EDWARD H & ADELAIDE M HAGEMAN
5073 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 064 000
GARY EDWARD BENVENUTI
2101 EVERGREEN ST
SACRAMENTO CA 95815

478 040 065 000
RICHARD O & FRANCES CASTRILLON
5057 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 066 000
JEAN M SMITH
5049 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 067 000
BEVERLY J BETTENCOURT
5041 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 068 000
MALCOLM M & PAULINE SEGAL
5033 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 081 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 050 001 000
ROBERT L SMITH
7260 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 002 000
MATTHIAS MARY E 1998 TRUST
7444 GOOSE MEADOWS WAY
ROSEVILLE CA 95747

478 050 003 000
MARGARET B BOLSTAD
7276 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 004 000
ANN CARTER
7284 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 005 000
EARL R & MARY E SMITH
7292 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 006 000
FAY SEARS
7300 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 001 000
FRANK R & BETTE M GEORGE
7163 DREAM INN LN
ROSEVILLE CA 95747

478 060 002 000
JOAN W COBABE
7171 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 003 000
BOB L FORKEY
7179 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 004 000
DAVID & DOLLY L FIDDYMENT
7136 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 005 000
DORIS J MOORE
7195 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 006 000
JOHN & MARGAR GOMES
7203 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 007 000
CAROLYN K PARKINSON
7211 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 008 000
JACQUELINE SHAW
7219 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 009 000
RAYMOND L MOORE
7227 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 010 000
MANUEL S & GLORIA J MACIAS
7235 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 011 000
ROBERT L MYERS
7243 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 012 000
FRANK W & MARY JANE BOHN
30 EL CERRO CT
DANVILLE CA 94526

478 060 018 000
THOMAS J & ALICE J CORDRAY III
7112 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 019 000
POLLY E SINCLAIR
7438 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 020 000
ROSE IVES
7136 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 021 000
KARFIOL
7156 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 022 000
GLENN A & BARBARA BECKER
7180 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 023 000
WILLIAM L & HELEN P STRUBING
7188 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 024 000
VILMA M ALLEN
7204 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 025 000
SANDOR HORVATH
16775 SADDLEBACK DR
MORGAN HILL CA 95037

478 060 026 000
DANIEL F & DONNA L KYGAR
7185 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 027 000
THOMAS P & BARBARA A RYAN
7177 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 028 000
ROBERT H & CHARLOTTE F SWARTZ
408 BARUSCH CT
ROSEVILLE CA 95747

478 060 029 000
EDWARD A & M ARLENE SCALLET
416 BARUSCH CT
ROSEVILLE CA 95747

478 060 030 000
NORMAN M & LOIS B GRABAR
8049 GILLELAND DR
ROSEVILLE CA 95747

478 060 031 000
MARILYN M MOORE
409 BARUSCH CT
ROSEVILLE CA 95747

478 060 032 000
CLEGG
401 BARUSCH CT
ROSEVILLE CA 95747

478 060 033 000
JOHN FREDERICK & EULA MAE
SULLIVAN
300 COMSTOCK CT
ROSEVILLE CA 95747

478 060 034 000
RUSSELL W HEFFELFINGER
308 COMSTOCK CT
ROSEVILLE CA 95747

478 060 048 000
MEL & KATHY G ZIKES
7176 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 049 000
KATHRYN G ZIKES
7184 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 050 000
LEONARD & ALBERTA M RAWLINSON
7192 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 051 000
WILLIAM & BETTY STAHLBERGER
7236 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 052 000
TED A & MARY C SMITH
7244 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 053 000
RALPH V & OLGA LOMELE
7252 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 054 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 070 021 000
CALVIN A & GALE G SMITH
7027 DREAM INN LN
ROSEVILLE CA 95747

478 070 022 000
MERRILL G & MARCIA JOAN SMITH
7035 DREAM INN LN
ROSEVILLE CA 95747

478 070 023 000
EDITH F GOODSON
7043 DREAM INN LN
ROSEVILLE CA 95747

478 070 024 000
ELAINE A MURRILL
7051 DREAM INN LN
ROSEVILLE CA 95747

478 070 025 000
HOWARD J & DIANA L VONBERGEN
7059 DREAM INN LN
ROSEVILLE CA 95747

478 070 026 000
JAMES G & JEAN E PEARSE
7067 DREAM INN LN
ROSEVILLE CA 95747

478 070 027 000
LOREN D & BEVERLY J PROHASKA
7075 DREAM INN CT
ROSEVILLE CA 95747

478 070 028 000
FRANCIS H & ELEANOR J PAPINEAU
7083 DREAM INN CT
ROSEVILLE CA 95747

478 070 029 000
PAULA J LAVIN
7091 DREAM INN LN
ROSEVILLE CA 95747

478 070 030 000
WARREN L & JACQUELINE C VANDIVER
7099 DREAM INN LN
ROSEVILLE CA 95747

478 070 031 000
LOUIS & ELVA BOSCO
7107 DREAM INN LN
ROSEVILLE CA 95747

478 070 032 000
SHERILL E PARKER
14978 PAMMY WAY
GRASS VALLEY CA 95949

478 070 033 000
JAMES M & PATRICIA W JOHNSON
7123 DREAM INN LN
ROSEVILLE CA 95747

478 070 034 000
WALLACE MERBLER
7131 DREAM INN LN
ROSEVILLE CA 95747

478 070 035 000
AGATHA M HUDDLESTON
7139 DREAM INN LN
ROSEVILLE CA 95747

478 070 036 000
LOY E & SHARON E BATES
7147 DREAM INN LN
ROSEVILLE CA 95747

478 070 037 000
MAURICE L & PATRICIA A SWEATT
7155 DREAM INN LN
ROSEVILLE CA 95747

478 070 038 000
THOMAS F & BARBARA J STATTI
7154 DREAM INN LN
ROSEVILLE CA 95747

478 070 039 000
RAYMOND W GOODE
7146 DREAM INN LN
ROSEVILLE CA 95747

478 070 040 000
ARLIE D & YVONNE M SKELTON
7130 DREAM INN LN
ROSEVILLE CA 95747

478 070 041 000
CAMELIA MCNAUGHT
7122 DREAM INN LN
ROSEVILLE CA 95747

478 070 042 000
FREDERICK W & M ERIN FESTERSEN
7106 DREAM INN LN
ROSEVILLE CA 95747

478 070 043 000
ELLEN L MEEHAN
7098 DREAM INN LN
ROSEVILLE CA 95747

478 070 044 000
MAURICE B QUILLEN
7082 DREAM INN LN
ROSEVILLE CA 95747

478 070 045 000
A RUDY & LILA J GUERRERO
7066 DREAM INN LN
ROSEVILLE CA 95747

478 070 046 000
SHERRARD
7050 DREAM INN LN
ROSEVILLE CA 95747

478 070 047 000
PETER J & LESLIE V ROBERTS
7042 DREAM INN LN
ROSEVILLE CA 95747

478 070 048 000
DAVID W & MARY LOU HESS
7034 DREAM INN LN
ROSEVILLE CA 95747

478 070 049 000
ARNOLD E & RUTH D LASHER
7026 DREAM INN LN
ROSEVILLE CA 95747

478 070 052 000
ANTHONY & BEVERLY D CERVONE
7140 KINGBIRD LN
ROSEVILLE CA 95747

478 070 053 000
BARBARA H BLIM
7132 KINGBIRD LN
ROSEVILLE CA 95747

478 070 054 000
WALLACE H & NELLIE F CARROLL
7124 KINGBIRD LN
ROSEVILLE CA 95747

478 070 055 000
PASCHAL
7116 KINGBIRD LN
ROSEVILLE CA 95747

478 070 056 000
CORWIN HY & PHYLLIS MARTINDALE
7108 KINGBIRD LN
ROSEVILLE CA 95747

478 070 057 000
GEORGE A & MARGARET K LAROCHE
7100 KINGBIRD LN
ROSEVILLE CA 95747

478 070 058 000
ALBERT A & ROSEMARY ERKEL
501 COLD STREAM CT
ROSEVILLE CA 95747

478 070 059 000
PATRICIA M MEYERS
509 COLD STREAM CT
ROSEVILLE CA 95747

478 070 060 000
DONALD F & LOIS G HUG
517 COLD STREAM CT
ROSEVILLE CA 95747

478 070 061 000
JOHN H & ALICE M GUCKEEN
525 COLD STREAM CT
ROSEVILLE CA 95747

478 070 062 000
EDGAR J & DORIS S BURGER
533 COLD STREAM CT
ROSEVILLE CA 95747

478 070 063 000
HAROLD R & MARY H OHLENDORF
532 COLD STREAM CT
ROSEVILLE CA 95747

478 070 064 000
RICHARD B & BARBARA J REINGOLD
524 COLD STREAM CT
ROSEVILLE CA 95747

478 070 065 000
JOSEPH A SR & SHARON STEELE
5631 CONISTON WAY
SAN JOSE CA 95118

478 070 066 000
BARBARA J DAULTON
508 COLD STREAM CT
ROSEVILLE CA 95747

478 070 067 000
DONALD J & BEVERLY J PIETRO
500 COLD STREAM CT
ROSEVILLE CA 95747

478 070 068 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 220 006 000
DOROTHY W ERICKSON
5096 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 007 000
DONALD & IRENE ELSON
5112 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 008 000
CARL J & MARGAR BERGESCH
5120 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 009 000
FRED W & DORIS J MAPLE
5128 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 010 000
ROCCO M JR & DOROTHY E GIORDANO
5136 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 011 000
WILLIAM DOUGLAS & KAREN Y BARR
9009 UPPER VALLEY RD
AUBURN CA 95602

478 220 012 000
GOLDON L SELFRIDGE
5152 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 013 000
BARBARA L RAMSEY
5160 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 014 000
JAMES C PHELAN
5193 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 015 000
JAY A & DEBORAH A GRIGGS
5185 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 016 000
DAVID J INGOLS
606 WREN CT
ROSEVILLE CA 95661

478 220 017 000
WILBERT A & DELORIS A HAUCK
5169 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 018 000
GARY L LEE
5153 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 019 000
PHILIP G & DANA N DAMASK
19680 EXPLORER DR
PENN VALLEY CA 95946

478 220 020 000
E W NEWBERRY
552 CRESTFIELD CIR
ROSEVILLE CA 95678

478 220 021 000
CAROL S WALLACE
5129 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 022 000
OATHER L & SHIRLEY A GENTRY
5121 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 023 000
AUGUSTIN J VILA
4929 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 024 000
MORRIS E EASLEY
7131 LOST LAKE LN
ROSEVILLE CA 95747

478 220 025 000
JAMES C & LAURA J FORRISTALL
4913 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 026 000
JOHN M & ERLINDA R VAN SICKEL
4905 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 027 000
ANDRE
317 COPE RIDGE CT
ROSEVILLE CA 95747

478 220 028 000
CARL & MARY YACONELLI
4889 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 029 000
HERMAN E & JOSEPHINE MAY
4881 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 030 000
LOIS E KOWITZ
4873 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 031 000
JO BELLE SCHRILLO
4865 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 032 000
SONJA R MNICH
4857 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 033 000
JAMES W & LUCILLE J MCCARTY
4849 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 034 000
EDNA HART
4841 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 047 000
HILARY WALL & HAYLEY GANS III
4850 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 048 000
NANCY MANSFIELD
4858 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 049 000
JANE F PULEO
100 SIGGENS CT
ROSEVILLE CA 95747

478 220 050 000
CARL M & MEREDYTH A HENTSCHKE
108 SIGGENS CT
ROSEVILLE CA 95747

478 220 056 000
EVERETT D & PATRICIA J CASTER
109 SIGGENS CT
ROSEVILLE CA 95747

478 220 057 000
MARY M DIAL
101 SIGGENS CT
ROSEVILLE CA 95747

478 220 058 000
DEBORAH A HATFIELD
5113 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 059 000
KAY M & CHARLENE MICHAEL
5097 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 069 000
CITY OF ROSEVILLE
311 VERNON ST
ROSEVILLE CA 95678

478 220 070 000
CITY OF ROSEVILLE
311 VERNON ST
ROSEVILLE CA 95678

479 060 016 000
THOMAS LEE & AILEEN BEVERLEY
BARDET
7388 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 017 000
IRWIN A & ILENE C HERMAN
7372 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 018 000
SAM M & ZEPHYR KALUNIAN
7356 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 019 000
FRANCIS POLLY E SINCLAIR
7348 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 020 000
LUCILLE WESTWOOD
7340 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 021 000
RICHARD G & SHARON N JOHNSON
7324 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 022 000
WAYNE E & EVELYN I DACK
7316 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 023 000
R BRUCE & GAIL KURRE
7308 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 024 000
JOYCE A DOTZAUER
7309 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 025 000
J WARREN GARDNER
7317 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 026 000
JOHN C & PATRICIA M SHOOK
7325 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 027 000
GARY BENVENUTI
2101 EVERGREEN ST
SACRAMENTO CA 95815

479 060 028 000
STEVE D & STEPHANIE L SNIDER
7101 CLEARVIEW WAY
ROSEVILLE CA 95747

479 060 029 000
IVAN C & SANDRA V LUTZ
7109 CLEARVIEW WAY
ROSEVILLE CA 95747

479 060 030 000
ALEX J & ANNA M FLOWERS
7349 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 031 000
THERA M BURLESON
5217 ANGELROCK LOOP
ROSEVILLE CA 95747

479 060 032 000
GEORGE S IRWIN
4426 WANDERLUST LOOP
ROSEVILLE CA 95747

479 060 033 000
LINA Z SCHLUER
7373 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 034 000
JOSEPH E & YOSHIKO NEUHAUSER
7381 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 035 000
BILL H & DOROTHY K MANNING
7389 TIMBERROSE WAY
ROSEVILLE CA 95747

479 060 036 000
RICHARD T & SHIRLEY A CONZELMANN
7397 TIMBERROSE WAY
ROSEVILLE CA 95747

479 090 001 000
DEAN F & CAROLEE J GLEAVES
7117 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 002 000
BARBARA G SCHUTZ
7125 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 003 000
PAUL G & SANDRA L GARCIA
7133 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 004 000
LUIGI V CASTAGNA
7141 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 005 000
BUD & SHARON LEE
7149 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 006 000
WINTERS
7157 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 007 000
KATHRYN B LEWIS
7165 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 008 000
NESTER
7173 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 009 000
PAUL A BERMAN
7181 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 010 000
DENA J NELSON
7189 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 011 000
BARBARA R SWAN
7197 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 012 000
CALVIN S & VIRGINIA M TREML
7205 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 013 000
EDWARD J & ELAINE E CARDOZA
7213 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 014 000
EARNEST HEGGINS
7221 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 015 000
BARBARA ANNE KELLY
7229 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 016 000
LILLIAN E BENDER
7237 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 017 000
NANCY H HODAPP
7245 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 018 000
JAMES C & NORAH K BORK
7253 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 019 000
WILLIAM NICHOLS & CAROL JEAN
TOLLIS
7261 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 020 000
LOUIS J SALVO
7269 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 021 000
CORNELIA M GRENIER
7277 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 022 000
FRANK RALPH & DORIS STELLA MOORE
7285 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 023 000
CLARENCE G WINSTEDT
7293 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 024 000
JIMMIE HOWARD & MARY JANE
MUSGRAVE
7301 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 025 000
MATTHEW L & VIRGINIA M SANDS
7276 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 026 000
DOROTHY C SKARSTEN
7236 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 027 000
ROMAN N & ELNORA M LEMMER
7228 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 028 000
JAMES W & KATHLEEN B MCMILLEN
7220 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 029 000
RICHARD & NANCY WOLF
7212 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 030 000
THERA M BURLESON
101 HEAVENLY CT
ROSEVILLE CA 95747

479 090 031 000
BARBARA CASSIDYRIKER
109 HEAVENLY CT
ROSEVILLE CA 95747

479 090 032 000
LASZLO & GIZELLA PUTZ
117 HEAVENLY CT
ROSEVILLE CA 95747

479 090 033 000
KENNETH S & SHIRLEY R ROSS
124 HEAVENLY CT
ROSEVILLE CA 95747

479 090 034 000
ROBERT SHARKEY
116 HEAVENLY CT
ROSEVILLE CA 95747

479 090 035 000
LOIS VANDEVELDE
108 HEAVENLY CT
ROSEVILLE CA 95747

479 090 036 000
EDWARD H & JANE C CARMAN
100 HEAVENLY CT
ROSEVILLE CA 95747

479 090 037 000
MANFRED K & ALFRIEDA M RICHTER
7156 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 038 000
BARRY G & JUNE A BATES
7148 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 039 000
NANCY M LONG
7140 CLEARVIEW WAY
ROSEVILLE CA 95747

479 090 040 000
JACQUELIN H ASCHOW
7209 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 090 041 000
CLAUDE F & MABEL MARIE JENKINS
7217 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 090 042 000
PAUL & LORRAINE MARLOWE
PO BOX 7110
STATELINE NV 89449

479 090 043 000
JAMES A & WILMA J KEENER
7233 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 090 044 000
RICHARD L & LAURA E LAWRENCE
7241 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 090 045 000
THOMAS F & EVELYN L MORRISSEY
7249 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 090 046 000
GARY D & DIANA F HAUF
2184 HERITAGE DR
ROSEVILLE CA 95678

479 090 047 000
JAMES P & KARLENE MCKONE
7265 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 090 048 000
SUN CITY ROSEVILLE COMMUNITY A
198 CIRBY WAY #155
ROSEVILLE CA 95678

479 100 001 000
WERNER K & PEGGY L STENGEL
201 CLEARVIEW CT
ROSEVILLE CA 95747

479 100 002 000
GEORGE & LUCILE RILEY
209 CLEARVIEW CT
ROSEVILLE CA 95747

479 100 012 000
SIDNEY R & DONNA J EDWARDS
216 CLEARVIEW CT
ROSEVILLE CA 95747

479 100 013 000
DONALD D PHILLIPS
208 CLEARVIEW CT
ROSEVILLE CA 95747

479 100 014 000
DANIEL MORENO
200 CLEARVIEW CT
ROSEVILLE CA 95747

479 100 015 000
JOHN Z & ADA GRABEKLIS
7240 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 100 016 000
JANE JOSSELYN
7224 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 100 017 000
DARWIN G & DORIS S MCCLINTOCK
7216 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 100 018 000
MILTON L & CORRINE M KINGSBURY
7208 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 290 001 000
BOBBIE L SLEDGE
100 FULL MOON CT
ROSEVILLE CA 95747

479 290 002 000
BORN DEUEL W 1992 TRUST
108 FULL MOON CT
ROSEVILLE CA 95747

479 290 003 000
RICHARD MALLON
116 FULL MOON CT
ROSEVILLE CA 95747

479 290 004 000
MICHAEL & SHEILA KOUMELIS
124 FULL MOON CT
ROSEVILLE CA 95747

479 290 005 000
JOHN A & MARY B FERRARIS
132 FULL MOON CT
ROSEVILLE CA 95747

479 290 006 000
FRANCIS BOREN
140 FULL MOON CT
ROSEVILLE CA 95747

479 290 007 000
JUDY A WHITE
133 FULL MOON CT
ROSEVILLE CA 95747

479 290 008 000
ELEANOR JANET STAFFORD DULFER
117 FULL MOON CT
ROSEVILLE CA 95747

479 290 009 000
ROY E & DARLENE A MCAFEE
109 FULL MOON CT
ROSEVILLE CA 95747

479 290 010 000
AULD
101 FULL MOON CT
ROSEVILLE CA 95747

479 290 011 000
RAYMUND W & CAROL H ZWEMER
7388 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 012 000
JAMES W & DORIS N BERKOVEC
7396 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 013 000
JOHN W SR PENNINGTON
7404 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 014 000
DWIGHT I BROWN
7420 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 015 000
DOROTHY G PALMER
7436 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 016 000
CHARLES E & ANNA C HAGEN
7476 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 017 000
KARLHEINZ & RUTH B STAMMNITZ
7484 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 018 000
BARBARA SHANDERA
1646 CANNA LN
SAN JOSE CA 95124

479 290 019 000
SIBYLLE DE SUZANNET ARIES
7500 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 020 000
WALLACE 1991 TRUST
7508 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 021 000
GAYLE E HOLT
7516 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 030 000
CHARLOTTE M TIPPETS
7525 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 031 000
STANLEY G & JUDITH A WARD
7517 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 032 000
MARY E KYLE
7509 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 033 000
NICK D & DONNA L FORD
7501 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 034 000
JOHN M & CAMILLA M JENSEN
7493 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 035 000
ALBE MAE OWEN
7485 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 036 000
DENA DAVILLA
7477 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 037 000
DORIS E SALINAS
7469 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 038 000
ROBERT A HALL
7461 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 039 000
PENELOPE F YABE
7453 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 040 000
EUGENE A & JOYCE MARTINEAU
7445 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 041 000
CHARLES A KRAJNIAK
7437 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 042 000
SARAH A JEDRZYNSKI
7429 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 043 000
DOROTHY E DONAGAL
7421 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 044 000
LOLA D TAYLOR
7413 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 045 000
BERNARD S & MILDRED COHEN
7405 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 046 000
BARBARA BOOKER PREECE
7397 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 047 000
VERONICA KEEFE
7389 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 048 000
RALPH & NANCY HUDDLESTON
7381 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 049 000
SUSAN M MAY
7373 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 050 000
WILLARD A & ELVA W LILLROTH
7365 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 051 000
QUILLA J & NORMA D ROUNTREE
7357 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 052 000
MARION J KNIGHT
7349 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 053 000
RICHARD THORSON
7341 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 054 000
MARJORIE M WHISENHUNT
7333 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 055 000
CAROLE WALTON PETERSON
7325 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 056 000
DALE F & MARIAN R APPLEGATE
7317 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 290 057 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

479 300 001 000
PRESTON L & THERESA L HAMLIN
7290 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 300 002 000
JAMES E & ELLEN L CHAMBERLAIN
7298 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 300 003 000
D R & ABBIE GROVE TREICHLER
7306 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 300 004 000
JOHN E & GWENDOLYN M CURRY
7314 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 310 038 000
RICHARD E & PATRICIA A WILKERSON
7345 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 310 039 000
JAMES L & EVELYN M SHARP
7337 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 310 040 000
JOSEPH E & LUCILLE L VATTIMO
7329 SCHOOL HOUSE LN
ROSEVILLE CA 95747

479 310 041 000
ETHEL M VINSON
7309 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

479 310 042 000
JACK L & SARA L WANDER
7301 APPLE HOLLOW LOOP
ROSEVILLE CA 95747

480 010 062 000
CAROL BAIN
1036 VANSTON WAY
ROSEVILLE CA 95747

480 010 063 000
JOHN RAY & TIFFANY ANN BARNHART
1603 BLANCHARD DR
ROSEVILLE CA 95747

480 010 064 000
ALOISIA BOWSER
1605 BLANCHARD DR
ROSEVILLE CA 95747

480 010 065 000
WAYNE & SUSAN CONWELL
1607 BLANCHARD DR
ROSEVILLE CA 95747

480 010 066 000
ERIC J & KIMBERLY A MORROW
1609 BLANCHARD DR
ROSEVILLE CA 95747

480 010 067 000
F H WANDELL
1611 BLANCHARD DR
ROSEVILLE CA 95747

480 010 068 000
LOLA B MOORE
PO BOX 2163
GRANITE BAY CA 95746

480 020 004 000
KELLY J FLEMING
1118 CORFIELD DR
ROSEVILLE CA 95747

480 020 005 000
SEAN M ALDERS
1251 VINTAGE WAY
AUBURN CA 95603

480 020 006 000
RANDALL J & SONJA MCMANAMY
1114 CORFIELD DR
ROSEVILLE CA 95747

480 020 007 000
RICARDO C GUTIERREZ
1112 CORFIELD DR
ROSEVILLE CA 95747

480 020 008 000
STEPHEN D & CAROLYN J RODGERS
1110 CORFIELD DR
ROSEVILLE CA 95747

480 020 009 000
MATTHEW & LISA DWILLIS
1108 CORFIELD DR
ROSEVILLE CA 95747

480 020 010 000
RONALD JOEL ELKAN
6104 SHADOW LN
CITRUS HEIGHTS CA 95621

480 020 011 000
CHARLES J & JOYCE M SATHRE
1100 CORFIELD DR
ROSEVILLE CA 95747

480 020 012 000
CHRISTINE CAMPAGNA
1003 VANSTON WAY
ROSEVILLE CA 95747

480 020 013 000
ARTHUR & PAMELA CAROL MCDONALD
1005 VANSTON WAY
ROSEVILLE CA 95747

480 020 014 000
LAWRENCE JOSEPH BRENIER
7370 CRESTON RD
PASO ROBLES CA 93446

480 020 015 000
ALFONSO & PAMELA A GUERRERO
1009 VANSTON WAY
ROSEVILLE CA 95747

480 020 016 000
DANIEL GUSTAVO & DAWN DELENE GIGENA
1011 VANSTON WAY
ROSEVILLE CA 95747

480 020 017 000
JEFFREY M & DARYA EVANS
1013 VANSTON WAY
ROSEVILLE CA 95747

480 020 018 000
RALPH B & COLETTE M SCHANTZ
1015 VANSTON WAY
ROSEVILLE CA 95747

480 020 019 000
ROBERT G & MARY V FOOTE
101 PENNELL CT
ROSEVILLE CA 95747

480 020 020 000
CHRIS & KERI KIRST
103 PENNELL CT
ROSEVILLE CA 95747

480 020 021 000
WILLIAM R & ELEANORE C MARTIN
105 PENNELL CT
ROSEVILLE CA 95747

480 020 022 000
SUSAN E TURNER
107 PENNELL CT
ROSEVILLE CA 95747

480 020 023 000
EGIDIO & NINA D BRIUOLO
109 PENNELL CT
ROSEVILLE CA 95747

480 020 024 000
CHARLES A SMITH
111 PENNELL CT
ROSEVILLE CA 95747

480 020 025 000
CHRISTOPHER A MANN
113 PENNELL CT
ROSEVILLE CA 95747

480 020 026 000
MAURICE P NEGUELOUA
112 PENNELL CT
ROSEVILLE CA 95747

480 020 027 000
EDWARD W WINSTON
110 PENNELL CT
ROSEVILLE CA 95747

480 020 028 000
RICH JR & DAWN BAKANEC
108 PENNELL CT
ROSEVILLE CA 95747

480 020 029 000
GREGORY P & TONYA L KALVASS
106 PENNELL CT
ROSEVILLE CA 95747

480 020 030 000
DAWN M GRIFFIN
104 PENNELL CT
ROSEVILLE CA 95747

480 020 031 000
ALAN D & GAYLE E VANATTA
102 PENNELL CT
ROSEVILLE CA 95747

480 020 032 000
DARIN & LISA DIMARIA
100 PENNELL CT
ROSEVILLE CA 95747

480 020 033 000
JAMES L & VANESSA R MROZINSKI
1034 VANSTON WAY
ROSEVILLE CA 95747

480 020 034 000
TODD L & KELLY A CAMERON
1032 VANSTON WAY
ROSEVILLE CA 95747

480 020 035 000
DAVID M & JODY R SNIDER
1030 VANSTON WAY
ROSEVILLE CA 95747

480 020 036 000
JAMES W & ROBERTA C WAGNER
17371 AILEEN WAY
GRASS VALLEY CA 95949

480 020 037 000
JOSE H & GUADALUPE LICEA
1026 VANSTON WAY
ROSEVILLE CA 95747

480 020 038 000
RONALD DEE JR SMITH
1024 VANSTON WAY
ROSEVILLE CA 95747

480 020 039 000
CORY & GRETCHEN BOTTS
1022 VANSTON WAY
ROSEVILLE CA 95747

480 020 040 000
WANDA OLMSTEAD
1020 VANSTON WAY
ROSEVILLE CA 95747

480 020 041 000
THOMAS E WHITE
1018 VANSTON WAY
ROSEVILLE CA 95747

480 020 042 000
WAYNE K & SHARON MARSHALL
1016 VANSTON WAY
ROSEVILLE CA 95747

480 020 043 000
TERESA A MICHAUD
1014 VANSTON WAY
ROSEVILLE CA 95747

480 020 044 000
WESLEY A & HEATHER M WILLIAMS
1012 VANSTON WAY
ROSEVILLE CA 95747

480 020 045 000
PATRICK MCDONOUGH
1010 VANSTON WAY
ROSEVILLE CA 95747

480 020 046 000
DAVID & CINDY CAUDLE
1008 VANSTON WAY
ROSEVILLE CA 95747

480 020 047 000
DENNIS J & CAROL A HENDRICKS
1006 VANSTON WAY
ROSEVILLE CA 95747

480 020 048 000
RANDAL B & MARY PETERSON
1004 VANSTON WAY
ROSEVILLE CA 95747

480 020 049 000
MARGARITA MCCOWN
1002 VANSTON WAY
ROSEVILLE CA 95747

480 020 050 000
CHRISTOPHER ENEA
718 OLIVER AVE
SAN DIEGO CA 92109

480 020 051 000
MAURICE P LYNCH
3701 45TH AVE
SACRAMENTO CA 95824

480 020 052 000
DONALD M JR & STACYLEE M ADAMS
204 RYLAND CT
ROSEVILLE CA 95747

480 020 053 000
MICHAEL A YEE
1610 SHIRLEY DR
SACRAMENTO CA 95822

480 020 054 000
WILLIAM & BETHANN SPURGEON
203 RYLAND CT
ROSEVILLE CA 95747

480 020 055 000
EDWARD R & ELIZABETH B STONE
201 RYLAND CT
ROSEVILLE CA 95747

480 020 056 000
JOSEPH W & JANET L MCGRATH
1101 CORFIELD DR
ROSEVILLE CA 95747

480 020 057 000
M JACOBSON LLC TIMOTHY
1103 CORFIELD DR
ROSEVILLE CA 95747

480 020 058 000
MARTI SOUTHWELL
1105 CORFIELD DR
ROSEVILLE CA 95747

480 020 059 000
ERIC A & TANYA B MOROYOQUI
1107 CORFIELD DR
ROSEVILLE CA 95747

480 020 060 000
MARIANA HARDEN
1109 CORFIELD DR
ROSEVILLE CA 95747

480 020 061 000
ROBERT W & MELISSA M HOLBROOK
1111 CORFIELD DR
ROSEVILLE CA 95747

480 020 062 000
CHAD & KATHRYN RIOLO
1113 CORFIELD DR
ROSEVILLE CA 95747

480 020 063 000
JUDY LYNN BAKER
1115 CORFIELD DR
ROSEVILLE CA 95747

480 020 064 000
KEITH H & ELIZABETH G HALLSTEN
804 MACHADO LN
ROSEVILLE CA 95678

480 020 066 000
SEAN & LISA MCCUISTION
1123 CORFIELD DR
ROSEVILLE CA 95747

480 080 001 000
DARLENE A NEUMANN
1658 ROGART WAY
ROSEVILLE CA 95747

480 080 002 000
JUDEE SMYERS
1100 FORMBY WAY
ROSEVILLE CA 95747

480 080 003 000
SANDRA V SIDEBOTTOM
1101 FORMBY WAY
ROSEVILLE CA 95747

480 080 006 000
ANTHONY W & LINDA BARKVE
1698 ROGART WAY
ROSEVILLE CA 95747

480 080 010 000
EDWARD C & MAXINE M FRANKLIN
1073 RUDGWICK DR
ROSEVILLE CA 95747

480 080 011 000
EUN LEE
1065 RUDGWICK DR
ROSEVILLE CA 95747

480 080 012 000
HEINZ K & MARIANNE SCHEIBE
1057 RUDGWICK DR
ROSEVILLE CA 95747

480 080 013 000
STEPHANIE J PARSONS
1049 RUDGWICK DR
ROSEVILLE CA 95747

480 080 014 000
SHANE & DANA WAGGONER
1041 RUDGWICK DR
ROSEVILLE CA 95747

480 080 015 000
PIETER A & GAYLINDA E ZACK
1033 RUDGWICK DR
ROSEVILLE CA 95747

480 080 016 000
RAMIREZ
5238 MAKATI CIR
SAN JOSE CA 95123

480 080 017 000
STEVE M HOISINGTON
1650 LUTON DR
ROSEVILLE CA 95747

480 080 020 000
HONG N DANG
364 HATTON CT
ROSEVILLE CA 95747

480 080 021 000
BARRY S & MARCIA E NORIAN
1589 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 022 000
PHILLIP RESTIVO
5948 VISTA LOOP
SAN JOSE CA 95124

480 080 023 000
MICHAEL D & AMY BAKER BELLOWE
1573 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 024 000
MORGAN A & RACHEL E SCHILHAB
1565 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 025 000
MURRAY A & ELIZABETH A MARTY
1557 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 026 000
GREG J & PATTI B CLAWSON
1549 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 027 000
CONSTANCE CONTINELLI
6020 BAYVILLE CT
GRANITE BAY CA 95746

480 080 028 000
SCHRIVER RICHARD & STEPHANIE
39 NEPENTHE DR
SANTA CRUZ CA 95060

480 080 029 000
ERIC M & TERESA G CHAUVET
1525 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 030 000
GORDON L & MICHELLE A MCCARTY
1517 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 031 000
SURINDER MANN
1659 ROGART WAY
ROSEVILLE CA 95747

480 080 032 000
CHANDRAMOULI S KAVALIPATI
1675 ROGART WAY
ROSEVILLE CA 95747

480 080 035 000
DAVID ARMPRIEST
1500 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 037 000
BEATRIZ NEVAREZ
1524 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 042 000
RONALD D RIISAGER
1032 RUDGWICK DR
ROSEVILLE CA 95747

480 080 045 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

480 080 046 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

480 080 047 000
CHRISTINE MARTIN
1690 ROGART WAY
ROSEVILLE CA 95747

480 080 051 000
VERNETTA KINYON
1072 RUDGWICK DR
ROSEVILLE CA 95747

480 080 053 000
LISA HYSON
1001 RUDGWICK DR
ROSEVILLE CA 95747

480 080 055 000
PATRICIA A MAIN
1501 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 057 000
DARRICK BARNES
1715 ROGART WAY
ROSEVILLE CA 95747

480 080 060 000
JUNE EVELYN THOMAS
1572 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 062 000
KRISTEN E KUNKEL
1596 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 064 000
PAMELA SULME
1682 ROGART WAY
ROSEVILLE CA 95747

480 080 065 000
BURTON L & DEBORAH L RIISAGER
1064 RUDGWICK DR
ROSEVILLE CA 95747

480 080 066 000
RONALD E & PAMELA RIISAGER
75 CARUTHERS LN
CHICO CA 95973

480 080 067 000
LINDA A BALESTRERI
1659 LUTON DR
ROSEVILLE CA 95747

480 080 068 000
PATRICIA VILLARICA
1683 ROGART WAY
ROSEVILLE CA 95747

480 080 069 000
CAROLYN VICTOR
1707 ROGART WAY
ROSEVILLE CA 95747

480 080 070 000
DEBORAH J BOST
1040 RUDGWICK DR
ROSEVILLE CA 95747

480 080 071 000
LARA E DEEN
1532 ARNCLIFFE WAY
ROSEVILLE CA 95747

480 080 072 000
CARRIE L ARCHBOLD
1024 RUDGWICK DR
ROSEVILLE CA 95747

480 090 037 000
BRIAN & GWEN TORRES
1080 RUDGWICK DR
ROSEVILLE CA 95747

480 090 050 000
EDWINA SUPNET
1081 RUDGWICK DR
ROSEVILLE CA 95747

480 150 001 000
WILLIAM & JACKIE STOCKS
1998 SHIBLEY RD
CHADWICK IL 61014

480 150 002 000
SCOTT & CHRISTINE COVERICK
1730 STEBBING DR
ROSEVILLE CA 95747

480 150 003 000
ZENAIDA R ALMANZOR
1722 STEBBING DR
ROSEVILLE CA 95747

480 150 025 000
ADAM & AMY FELDMAN
1715 STEBBING DR
ROSEVILLE CA 95747

480 150 026 000
ADAM S & RENEE L MEYER
1731 STEBBING DR
ROSEVILLE CA 95747

480 150 027 000
ELLEN J WRIGHT
1739 STEBBING DR
ROSEVILLE CA 95747

480 150 028 000
KIM GREGERSEN
1732 TEVERSHAM DR
ROSEVILLE CA 95747

480 150 029 000
DONNA M EDSTROM
1708 TEVERSHAM DR
ROSEVILLE CA 95747

480 150 030 000
FRANCES MAE BADGLEY
209 FREMANTLE CT
ROSEVILLE CA 95747

480 150 031 000
KENT M CROSSMAN
217 FREMANTLE CT
ROSEVILLE CA 95747

480 150 032 000
TROY D & CONCHA I BENNETT
225 FREMANTLE CT
ROSEVILLE CA 95747

480 150 033 000
BOBBY L & JUDITH M CRAWFORD
232 FREMANTLE CT
ROSEVILLE CA 95747

480 150 034 000
GIAO DOAN
224 FREMANTLE CT
ROSEVILLE CA 95747

480 150 035 000
ADRIAN G & MICHELLE P ALBRIGHT
216 FREMANTLE CT
ROSEVILLE CA 95747

480 150 036 000
ROBERT I & CATHERINE L FELTS
208 FREMANTLE CT
ROSEVILLE CA 95747

480 160 001 000
JEWELL L LEASURE
1667 LUTON DR
ROSEVILLE CA 95747

480 160 002 000
KAM W KOK
1675 LUTON DR
ROSEVILLE CA 95747

480 160 003 000
KIMIYE BUSTAMANTE
1683 LUTON DR
ROSEVILLE CA 95747

480 160 004 000
JOSE LUIS & KRISTINA MARTINEZ
1691 LUTON DR
ROSEVILLE CA 95747

480 160 005 000
RICHARD F NURSE
1699 LUTON DR
ROSEVILLE CA 95747

480 160 006 000
PAUL & DEBBIE RANSOM
1707 LUTON DR
ROSEVILLE CA 95747

480 160 007 000
CYNTHIA HODGES
1731 LUTON DR
ROSEVILLE CA 95747

480 160 008 000
SANDRA R CRANDALL
109 TULLOCH CT
ROSEVILLE CA 95747

480 160 009 000
RICHARD L JR BROWN
117 TULLOCH CT
ROSEVILLE CA 95747

480 160 010 000
DEREK & KRISTY FRITZ
108 TULLOCH CT
ROSEVILLE CA 95747

480 160 011 000
OSCAR & NIDIA LAZO
100 TULLOCH CT
ROSEVILLE CA 95747

480 160 012 000
LAKHBIR HIRA
1794 STEBBING DR
ROSEVILLE CA 95747

480 160 013 000
LINDA A CLESI
PO BOX 2329
WOODLAND CA 95776

480 160 014 000
PAUL J & MARY L GRIMES
1778 STEBBING DR
ROSEVILLE CA 95747

480 160 015 000
ROY T & SARAH L HARRIS III
1770 STEBBING DR
ROSEVILLE CA 95747

480 160 016 000
SHYAM & DAWN BAGIAM NAMBIAR
1762 STEBBING DR
ROSEVILLE CA 95747

480 160 017 000
RACHEL WILLIAMS
1754 STEBBING DR
ROSEVILLE CA 95747

480 160 018 000
DANNY J OWENS
1746 STEBBING DR
ROSEVILLE CA 95747

480 160 019 000
MARTIN W & HOLLY D BUELL
200 FREMANTLE CT
ROSEVILLE CA 95747

480 160 020 000
SANTOKH HIRA
1050 FREMANTLE WAY
ROSEVILLE CA 95747

480 160 021 000
ROBERT W & LINDA K ALLEN
1042 FREMANTLE WAY
ROSEVILLE CA 95747

480 160 022 000
REZA QORBANZADEH
1034 FREMANTLE WAY
ROSEVILLE CA 95747

480 160 023 000
HARBANS S & GURJIT K RANU
6804 RANCH HOUSE WAY
CITRUS HEIGHTS CA 95621

480 160 024 000
STEPHEN E & DEBBRA A ELIAS
1018 FREMANTLE WAY
ROSEVILLE CA 95747

480 160 025 000
TIMOTHY D MCGOWEN
1674 LUTON DR
ROSEVILLE CA 95747

480 160 026 000
RICHARD R & DOLORES CLEGG
1214 ZINFANDEL DR
ROSEVILLE CA 95747

480 160 027 000
TIFFINY N ALLISON
1706 LUTON DR
ROSEVILLE CA 95747

480 160 028 000
SANDRA L BEANE
1714 LUTON DR
ROSEVILLE CA 95747

480 160 029 000
PAUL LUCAS
1 WEATHERLY DR #401
MILL VALLEY CA 94941

480 160 030 000
DANIEL P WELZ
1730 LUTON DR
ROSEVILLE CA 95747

480 160 031 000
MICHAEL J YANG
5159 CAMDEN RD
ROCKLIN CA 95765

480 160 032 000
JUSTINA JOHNSON
1763 STEBBING DR
ROSEVILLE CA 95747

480 160 033 000
STEVEN K & DIANA C KENNEDY
1733 TEVERSHAM DR
ROSEVILLE CA 95747

480 160 034 000
RAUL E JR & ELISA A MARTIN
1725 TEVERSHAM DR
ROSEVILLE CA 95747

480 160 035 000
ANGELA RAGONESE
1717 TEVERSHAM DR
ROSEVILLE CA 95747

480 160 036 000
GRACE R DOVER
1035 FREMANTLE WAY
ROSEVILLE CA 95747

480 160 037 000
GRACE R DOVER
1035 FREMANTLE WAY
ROSEVILLE CA 95747

480 160 038 000
CITY OF ROSEVILLE
311 VERNON ST
ROSEVILLE CA 95678

483 120 008 000
BRIAN & LATRISHIA MCADAMS
1708 WESTLAKE DR
ROSEVILLE CA 95747

483 120 009 000
KAREN GOODY
1716 WESTLAKE DR
ROSEVILLE CA 95747

483 120 010 000
VERA SUTHERLAND
1724 WESTLAKE DR
ROSEVILLE CA 95747

483 120 011 000
GEORGE A & MICHELLE S PENROD
1732 WESTLAKE DR
ROSEVILLE CA 95747

483 120 012 000
ERIC & MELISSA SORIA
1740 WESTLAKE DR
ROSEVILLE CA 95747

483 120 013 000
DANIEL M & EVELYN K WALLACH
116 SOLEDAD CT
ROSEVILLE CA 95747

483 120 014 000
LLOYD & MELISSA WEDBLAD
117 SOLEDAD CT
ROSEVILLE CA 95747

483 120 015 000
CHARLES & CAROLYN RAMOS
109 SOLEDAD CT
ROSEVILLE CA 95747

483 120 016 000
HOMES HOLDINGS CORP BEAZER
3009 DOUGLAS BLVD #150
ROSEVILLE CA 95661

483 120 017 000
TIM DRAKE
1601 SOLEDAD DR
ROSEVILLE CA 95747

483 120 018 000
JOHN TRYHUBCZAK
1609 SOLEDAD DR
ROSEVILLE CA 95747

483 120 019 000
JASON & DEBRA JEFFERY
1617 SOLEDAD DR
ROSEVILLE CA 95747

483 120 020 000
SAWAN; SINGH
1625 SOLEDAD DR
ROSEVILLE CA 95747

483 120 021 000
STEPHEN J VINSON
1633 SOLEDAD DR
ROSEVILLE CA 95747

483 120 022 000
HOMES HOLDINGS CORP BEAZER
3009 DOUGLAS BLVD #150
ROSEVILLE CA 95661

483 120 023 000
ENRIQUE & LYDIA ALMANZA
1649 SOLEDAD DR
ROSEVILLE CA 95747

483 120 024 000
LESLIE S & CHARMAINE A RAMOS
1640 SOLEDAD DR
ROSEVILLE CA 95747

483 120 025 000
LEO L & MARY C COYLE
1632 SOLEDAD DR
ROSEVILLE CA 95747

483 120 026 000
TIMOTHY & REI-HSIU BOWEN
1624 SOLEDAD DR
ROSEVILLE CA 95747

483 120 027 000
ALEXANDRA D HEATH
1616 SOLEDAD DR
ROSEVILLE CA 95747

483 120 028 000
GEORGE A MOGANNAM
1608 SOLEDAD DR
ROSEVILLE CA 95747

483 120 029 000
JOSEPH D & ANN M NAVARRO
1600 SOLEDAD DR
ROSEVILLE CA 95747

483 120 030 000
CORP SONOCA
16161 VENTURA BLVD #729
ENCINO CA 91436

483 120 031 000
CELESTINA RINGOR
1708 SANTA INES ST
ROSEVILLE CA 95747

483 120 032 000
MARTIN J; CAIN
1716 SANTA INES ST
ROSEVILLE CA 95747

483 120 033 000
LAURIE BETH & DOUGLAS WARREN
BROWN
1724 SANTA INES ST
ROSEVILLE CA 95747

483 120 034 000
JOHN & JOSIE C WRIGHT
1732 SANTA INES ST
ROSEVILLE CA 95747

483 120 035 000
SCOTT M & ANTOINETTE DUTRO
1740 SANTA INES ST
ROSEVILLE CA 95747

483 120 036 000
LISA KOSMAK
1600 SAN ANTONIO LN
ROSEVILLE CA 95747

483 120 037 000
THOMAS E & AMY A OWENS
1608 SAN ANTONIO LN
ROSEVILLE CA 95747

483 120 038 000
JEFFREY E DENNISON
1616 SAN ANTONIO LN
ROSEVILLE CA 95747

483 120 039 000
DAVID S & JENNIFER L DOMINGUEZ
1624 SAN ANTONIO LN
ROSEVILLE CA 95747

483 120 040 000
MARK M HIBBARD
1632 SAN ANTONIO LN
ROSEVILLE CA 95747

483 120 042 000
ALLAN & DIANA SANCHEZ
1633 SAN ANTONIO LN
ROSEVILLE CA 95747

483 120 043 000
WILSON
1625 SAN ANTONIO LN
ROSEVILLE CA 95747

483 120 044 000
CHARLES & AILEEN LOGAN
1733 SANTA INES ST
ROSEVILLE CA 95747

483 120 045 000
NEVA M FRESQUEZ
1741 SANTA INES ST
ROSEVILLE CA 95747

483 120 046 000
ANTONIO TONSO
200 SAN JUAN BAUTISTA CT
ROSEVILLE CA 95747

483 120 047 000
JONATHAN B & KRISTIN M ROWLETTE
208 SAN JUAN BAUTISTA CT
ROSEVILLE CA 95747

483 120 048 000
TIMOTHY EVAN JENKINS
216 SAN JUAN BAUTISTA CT
ROSEVILLE CA 95747

483 120 059 000
ROSEVILLE CITY OF EXEMPT FROM
300 VERNON ST
ROSEVILLE CA 95678

483 130 001 000
KATHRYN A RITCHIE
1657 SOLEDAD DR
ROSEVILLE CA 95747

483 130 002 000
KENNETH S ANDREWS
1665 SOLEDAD DR #IDR
ROSEVILLE CA 95747

483 130 003 000
MHARLOWE B & SHANNON M ABUAN
1673 SOLEDAD DR
ROSEVILLE CA 95747

483 130 004 000
ROBIN R DELONG
1681 SOLEDAD DR
ROSEVILLE CA 95747

483 130 005 000
MICHAEL GERARD
1689 SOLEDAD DR
ROSEVILLE CA 95747

483 130 006 000
HOMES HOLDINGS CORP BEAZER
3009 DOUGLAS BLVD #150
ROSEVILLE CA 95661

483 130 007 000
ARTHUR W ENGWER
1701 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 008 000
JAMES & MELISSA TREMAINE
1709 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 009 000
JANET M STEINDORF
1725 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 010 000
SAMUEL PATRICK & LORI ANNE BELL
1733 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 011 000
AL & JAYE CREWS
5038 CHELSHIRE DOWNS RD
GRANITE BAY CA 95746

483 130 012 000
ALAN R & SOHEILA K GOLSHANI
1749 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 019 000
CHRISTOPHER T & VIVIAN C BRAMMER
1748 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 020 000
PATRICIA A SMALL
1740 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 021 000
LAWRENCE N & LISA A LOMELI
1732 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 022 000
BRUCE H SEIGEL
1724 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 023 000
STANLEY A & DEBRA A GERLICA
1716 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 024 000
MARK & DIANA AOKI
1708 SAN JOSE WAY
ROSEVILLE CA 95747

483 130 025 000
ROBERT L & RENAE R TARABETZ
1680 SOLEDAD DR
ROSEVILLE CA 95747

483 130 026 000
GLORIA L AGUILAR
1672 SOLEDAD DR
ROSEVILLE CA 95747

483 130 027 000
WILLIAM; STEVENS
1664 SOLEDAD DR
ROSEVILLE CA 95747

483 130 028 000
CHERYL A CARTER
1656 SOLEDAD DR
ROSEVILLE CA 95747

483 130 029 000
TERRANCE & SUSAN PEARMAN
1648 SOLEDAD DR
ROSEVILLE CA 95747

483 130 030 000
DOROTHY A KNAGGS
1640 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 031 000
DAVID L & IRMA MITCHELL
1648 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 032 000
JACK & JULIE ABRAMS
1656 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 033 000
JENNIFER R SLAYDAY
1664 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 034 000
MARY MARGARET & ERIC D LARSON
1672 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 035 000
RAYMOND E UMAMOTO
1680 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 036 000
STEVEN D & JULIE B FULTON
1688 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 037 000
MITCHELL A & KRISTA N DERR
1696 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 045 000
RICHARD & MELLIE DUBOIS
1697 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 046 000
GARY & ROBERTA K SCALORA
1689 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 047 000
HARJIWAN & AMY R CHATHA
1681 SAN ANTONIO LN
ROSEVILLE CA 95747

483 130 048 000
SEAN & SOMMER MCCORMICK
1641 SAN ANTONIO LN
ROSEVILLE CA 95747

483 150 003 000
ARTHUR; ENGLISH
1892 SANTA INES ST
ROSEVILLE CA 95747

483 150 004 000
ROMAN CATHOLIC BISHOP
1900 SANTA INES ST
ROSEVILLE CA 95747

483 150 005 000
ROBERT & SHELLEY WILLIAMS
1908 SANTA INES ST
ROSEVILLE CA 95747

483 150 006 000
ARMAND & JENNY V BARTOLOME
1916 SANTA INES ST
ROSEVILLE CA 95747

483 150 007 000
HOMES HOLDINGS CORP BEAZER
3009 DOUGLAS BLVD #150
ROSEVILLE CA 95661

483 150 008 000
ERIC & JENNIFER GRINAGER
1932 SANTA INES ST
ROSEVILLE CA 95747

483 150 009 000
DANIEL W & LAUREL K STOLFUS
1940 SANTA INES ST
ROSEVILLE CA 95747

483 150 010 000
V CAL
1948 SANTA INES ST
ROSEVILLE CA 95747

483 150 011 000
COOPER
1956 SANTA INES ST
ROSEVILLE CA 95747

483 150 012 000
GEORGE & KATHLEEN M HOCKER
1964 SANTA INES ST
ROSEVILLE CA 95747

483 150 013 000
JULIO S BALAOING
1972 SANTA ROSA ST
ROSEVILLE CA 95747

483 150 014 000
JOSE R & AUDRA TORRES
1980 SANTA INES ST
ROSEVILLE CA 95747

483 150 015 000
JASON S & KRISTA L SUTKUS
1992 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 016 000
RAMOS & VERONICA F STEMLER
1984 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 017 000
STEPHEN J & SALLY A FAGAN
1976 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 018 000
TOMISLAV & J KUZMAN
1968 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 019 000
RASHEDA SAMDJEE
1960 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 020 000
RICHELEW A & VERONICA G PARKER
1952 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 021 000
VERONA L FESKE
1944 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 022 000
KENT & CHARMAINE MORRISON
1936 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 023 000
HOMES HOLDINGS CORP BEAZER
3009 DOUGLAS BLVD #150
ROSEVILLE CA 95661

483 150 024 000
ANDREW & RODONNA CURTAN
1920 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 025 000
MICHELLE ROSENBERG
1929 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 026 000
ROBERT L & ERICA FISCHER
1849 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 027 000
SCOTT J & KATHRYN M NEWBY
1961 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 028 000
ALFRED L & VIRGINIA M HALL
1977 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 029 000
DANIEL & LINDA STROTHER
1985 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 030 000
HAROLD C KIPP
839 SIERRA VISTA CT
AUBURN CA 95603

483 150 031 000
JEFF & JENNIFER KOFOID
1912 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 032 000
HOMES HOLDINGS CORP BEAZER
3009 DOUGLAS BLVD #150
ROSEVILLE CA 95661

483 150 033 000
TROY V & KRISTIN P FERGUSON
1896 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 034 000
DEBORAH HUGHES
1888 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 035 000
RONALD C & BARBARA S RIDDELL
1880 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 036 000
ROBERT J; JIMENEZ
1872 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 037 000
BRENNAN
1864 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 038 000
HOMES HOLDINGS CORP BEAZER
3009 DOUGLAS BLVD #150
ROSEVILLE CA 95661

483 150 039 000
SHAWN ERVIN
1848 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 040 000
RUSSELL F & DEBRA D MAGINN
1840 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 041 000
STEPHEN D & MAUREEN A GILLIES
1832 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 042 000
GREGORY & PATRICIA GOTTLIEB
1824 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 043 000
JEFFREY A LABER
1816 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 044 000
MAHFOUZ & RANIA ZABANEH
1808 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 045 000
JEREMY S PURVIS
1800 SAN DIEGO CIR
ROSEVILLE CA 95747

483 150 046 000
SCOTT A & STACI J MCLAUGHLIN
1997 SANTA INES ST
ROSEVILLE CA 95747

483 150 047 000
DOUGLAS W & MARY J REID
1989 SANTA INES ST
ROSEVILLE CA 95747

483 150 048 000
JAN REEVES
1981 SANTA INES ST
ROSEVILLE CA 95747

483 150 049 000
TIMOTHY P & JILL A DUFFY
1965 SANTA INES ST
ROSEVILLE CA 95747

483 150 050 000
MICHAEL & MELISSA ROMERO
1957 SANTA INES ST
ROSEVILLE CA 95747

483 150 051 000
FRANKLIN R & KIMBERLY A FAITH
1949 SANTA INES ST
ROSEVILLE CA 95747

483 150 052 000
DAVID & KRISTEN WEISS
1941 SANTA INES ST
ROSEVILLE CA 95747

483 160 003 000
JASON D POWELL
1876 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 004 000
CAROLYN A LUND
1884 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 005 000
ROSEVILLE LLC LMD
5170 HILLSDALE CIR #B
EL DORADO HILLS CA 95762

483 160 006 000
MARK & TRACEY BENDEL
1900 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 007 000
CARMENCITA P RETUYA
1908 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 008 000
ROSEVILLE LLC LMD
5170 HILLSDALE CIR #B
EL DORADO HILLS CA 95762

483 160 009 000
JACK JR & KIM L DURAN
1924 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 010 000
DESTYN LETCHER
1932 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 011 000
JOSE S & TESSIE VASQUEZ
1940 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 012 000
ROSEVILLE LLC LMD
5170 HILLSDALE CIR #B
EL DORADO HILLS CA 95762

483 160 013 000
JOSEPH M F & CLAIRE I ALCISO
1956 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 014 000
CHRIS W & DIANA L PALOMARES
1964 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 015 000
MICHAEL P; MCDERMOTT
1972 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 016 000
BRUNO M GALATI
1980 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 017 000
GALE E & BEVERLY J JEFFERS
1988 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 018 000
LAWRENCE & MAUREEN K DUMAS
1996 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 019 000
BEN & MARILOU FERNANDEZ
2004 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 020 000
WALTER & ROBERTA M FLATT
2012 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 021 000
MICHAEL A MENDOZA
2020 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 022 000
ROBERT C SR & HEATHER M
RODRIGUEZ
1748 WINDRUSH LN
ROSEVILLE CA 95747

483 160 023 000
RASHPAL & GIAN UPPAL
1756 WINDRUSH LN
ROSEVILLE CA 95747

483 160 024 000
DAVID A & JENNIFER L LEIGHTON
1692 CRESSIDA ST
ROSEVILLE CA 95747

483 160 025 000
COSGRO
1691 CRESSIDA ST
ROSEVILLE CA 95747

483 160 026 000
ERIC V & CATHERINE L HOFFMAN
1683 CRESSIDA ST
ROSEVILLE CA 95747

483 160 027 000
SERGEY & YELENA GOLUBYATNIKOV
1675 CRESSIDA ST
ROSEVILLE CA 95747

483 160 028 000
LUCIANO & SUZANN PAOLINI
1667 CRESSIDA ST
ROSEVILLE CA 95747

483 160 030 000
CALVIN J ANDLOVEC
1651 CRESSIDA ST
ROSEVILLE CA 95747

483 160 031 000
MARK D & CARA HEISTER
1643 CRESSIDA ST
ROSEVILLE CA 95747

483 160 032 000
ROSEVILLE LLC LMD
5170 HILLSDALE CIR #B
EL DORADO HILLS CA 95762

483 160 033 000
TODD M LYNN
1627 CRESSIDA ST
ROSEVILLE CA 95747

483 160 034 000
DAVE L & JEANNINE R PORTUGAL
2013 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 035 000
MICHAEL J & KATHERINE DENNA
2005 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 036 000
CHARLES E & STEPHANIE M BUTLER II
1997 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 037 000
NAVDEEP SOHAL
1989 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 038 000
GABRIELA PLOSCARIU
1981 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 039 000
NATHANIEL S & STACY L GREEN
1973 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 040 000
MARIE E HORTON
1965 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 041 000
NEAL E & MARGARITA H TORRES
1957 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 042 000
MICHAEL T & SANDRA C MOLASH
1949 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 043 000
JEFFREY & JAMIE NEUMANN
1933 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 044 000
ROSEVILLE LLC LMD
5170 HILLSDALE CIR #B
EL DORADO HILLS CA 95762

483 160 045 000
CHARLES A & KARIN B REGAN
1893 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 046 000
JUNE C LINN
1885 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 160 047 000
RANDY & GAYLE KUNKEL
1877 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 170 001 000
ERIC G & KELLY BERGER
101 CASTERBRIDGE CT
ROSEVILLE CA 95747

483 170 002 000
STEVEN & LINDA J FLANDERS
109 CASTERBRIDGE CT
ROSEVILLE CA 95747

483 170 003 000
DOUGLAS L & BRENDA K HEISER
117 CASTERBRIDGE CT
ROSEVILLE CA 95747

483 170 013 000
SCOTT R & MELISSA C KASSAHN
1616 SNOW GOOSE WAY
ROSEVILLE CA 95747

483 170 018 000
CRAIG W & KIM FORCE
1625 SNOW GOOSE WAY
ROSEVILLE CA 95747

483 170 019 000
RICHARD O & JOYCE M BROCK
1617 SNOW GOOSE WAY
ROSEVILLE CA 95747

483 170 020 000
LEE ROY JR & SUSAN M LIGONS
1609 SNOW GOOSE WAY
ROSEVILLE CA 95747

483 170 021 000
GEORGE HLAING MYA
1601 SNOW GOOSE WAY
ROSEVILLE CA 95747

483 170 022 000
LANCE D & DENISE M DEECOQUE
1600 GOLDSTAR ST
ROSEVILLE CA 95747

483 170 023 000
CHOW
1608 GOLDSTAR ST
ROSEVILLE CA 95747

483 170 024 000
MICHAEL & TRACY STOCKTON
1616 GOLDSTAR ST
ROSEVILLE CA 95747

483 170 025 000
ERIK SVENSON
1624 GOLDSTAR ST
ROSEVILLE CA 95747

483 170 026 000
JOHN D & CHERYL L MOREY
1610 CRESSIDA ST
ROSEVILLE CA 95747

483 170 027 000
CRIS J & KATHRYN I MANJARREZ
1618 CRESSIDA ST
ROSEVILLE CA 95747

483 170 028 000
BEST
3590 ROUND BOTTOM RD
CINCINNATI OH 45244

483 170 029 000
KAREN L HADEN
1619 CRESSIDA ST
ROSEVILLE CA 95747

483 170 030 000
RAYMOND P & KATHLEEN A BRETT
1611 CRESSIDA ST
ROSEVILLE CA 95747

483 170 031 000
AURORA D & ELIGIO ARCEGA
2021 CASTERBRIDGE DR
ROSEVILLE CA 95747

483 190 025 000
KATHLEEN E RYAN
1701 BRAITHWAITE ST
ROSEVILLE CA 95747

483 190 026 000
CRAIG F CROZIER
1709 BRAITHWAITE ST
ROSEVILLE CA 95747

483 190 027 000
THOMAS F & LISA D MURPHY III
1717 BRAITHWAITE ST
ROSEVILLE CA 95747

483 190 028 000
ELISA H; ANDALES
1725 BRAITHWAITE ST
ROSEVILLE CA 95747

483 190 029 000
FRANCES SANDER
1733 BRAITHWAITE ST
ROSEVILLE CA 95747

483 190 030 000
TOM W WATWOOD
1741 BRAITHWAITE ST
ROSEVILLE CA 95747

483 190 031 000
KB HOME NORTH BAY INC
611 ORANGE DR
VACAVILLE CA 95687

483 190 032 000
DONALD G & DOROTHY A MROCHINSKI
1757 BRAITHWAITE ST
ROSEVILLE CA 95747

483 190 033 000
MARTIN & J VANAUTREVE
1756 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 034 000
KEITH HARVEL
700 VALLEJO AVE #49
ROSEVILLE CA 95678

483 190 035 000
JAMES S & SONYA L BENNETT
1740 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 036 000
VLADIMIR & NATALYA KUZMENKO
1732 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 037 000
MARK T & DEVRA A HAGGARD
1724 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 038 000
JON R ROSENBERG
1716 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 039 000
MICHAEL A & KATHY F MARTIN
1708 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 040 000
ERICH S & MEGAN S BRASHEARS
1700 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 041 000
CRAIG A & LISA SHERLE
1757 CANYON CREEK DR
ROSEVILLE CA 95747

483 190 042 000
KBONE INC
7204 GLEN FOREST DR #201
RICHMOND VA 23226

483 190 043 000
KBONE INC
7204 GLEN FOREST DR #201
RICHMOND VA 23226

483 190 044 000
KBONE INC
7204 GLEN FOREST DR #201
RICHMOND VA 23226

483 190 045 000
BRIAN & MICHELLE SILVA
224 LENADER CT
ROSEVILLE CA 95747

483 190 046 000
ALLEN & SUSAN PEARSON
216 LENADER CT
ROSEVILLE CA 95747

483 190 047 000
JERRY & KATHLEEN WERNLI
208 LENADER CT
ROSEVILLE CA 95747

483 190 048 000
JORGE & SARAH E FLORES
200 LENADER CT
ROSEVILLE CA 95747

483 190 049 000
WILLIAM C JR & BARBARA J CHAMPION
201 LENADER CT
ROSEVILLE CA 95747

483 190 050 000
DAMIEN & LAURIE KEEHN
209 LENADER CT
ROSEVILLE CA 95747

483 190 051 000
JOSEPH W & DEBRA A ROYER
217 LENADER CT
ROSEVILLE CA 95747

483 190 052 000
NELSON & PERTA BARTOLOME
225 LENADER CT
ROSEVILLE CA 95747

483 190 053 000
KURT E & DEBORAH A MEYERS
124 MARINETTE CT
ROSEVILLE CA 95747

483 190 054 000
LORENZO & WANDA BRIDGERS
116 MARINETTE CT
ROSEVILLE CA 95747

483 190 055 000
CRAIG & JONI CHRISTIANSEN
108 MARINETTE CT
ROSEVILLE CA 95747

483 190 056 000
JEFF & JAMIE BRACE
100 MARINETTE CT
ROSEVILLE CA 95747

483 190 057 000
ALAN MENDOZA
133 MARINETTE CT
ROSEVILLE CA 95747

483 190 058 000
TAMITHA; BRESHEARS
125 MARINETTE CT
ROSEVILLE CA 95747

483 190 059 000
ANDREY & LANA KOVALCHUK
117 MARINETTE CT
ROSEVILLE CA 95747

483 190 060 000
PATRICK & DENISE WEIS
109 MARINETTE CT
ROSEVILLE CA 95747

483 190 061 000
PAUL E & JACQUELYN L DEMUTH
101 MARINETTE CT
ROSEVILLE CA 95747

483 190 062 000
PATRICK S JR & CINDY L HART
1921 MARINETTE LN
ROSEVILLE CA 95747

483 190 063 000
JOHN D & THERESA K WHARFF
1913 MARINETTE LN
ROSEVILLE CA 95747

483 190 064 000
STEPHEN L & PAMELA S MERCHANT
1905 MARINETTE LN
ROSEVILLE CA 95747

483 190 065 000
SALVADOR HERRERA
1897 MARINETTE LN
ROSEVILLE CA 95747

483 190 072 000
ROSEVILLE CITY OF EXEMPT FROM
300 VERNON ST
ROSEVILLE CA 95678

483 190 073 000
ROSEVILLE CITY OF EXEMPT FROM
300 VERNON ST
ROSEVILLE CA 95678

483 280 001 000
ROBERT W & LISA A HOLMES
1832 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 002 000
JUDITH K NICHOLS
2117 BEL AIR LN
ROSEVILLE CA 95678

483 280 003 000
AYAKO WALKER
1848 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 004 000
CHAD M & MERRY J OLSON
1856 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 005 000
CHARITY ANDREW
1864 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 006 000
EDWIN D JR & KRISTEN E SANDERSON
1872 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 007 000
THOMAS S & JULIA A GUTIERREZ
1880 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 008 000
JOHN L IV & SAMANTHA S MOURIER
1888 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 009 000
STANLEY N & RENEE M AMBROZY
1896 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 010 000
DANIEL & RAMONA AGRIGOROAE
1904 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 011 000
KEVIN N & KAREN J MUNOZ
1912 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 012 000
REED HOUGHTON
1920 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 013 000
HAROLD & SRINUAL DAVIS
1928 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 014 000
CHRISTOPHER & STEPHANI GUERRERO
1936 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 015 000
ERIC L; EUBANKS
1944 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 016 000
MICHAEL & TRACY FOLDEN
1952 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 017 000
CYNTHIA; CANALITA
1960 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 018 000
ERICK & RACHEL PECK
1968 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 019 000
SCOTT C BAKER
1976 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 020 000
DAVID M JR & DEBBIE M STROSNIDER
1984 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 021 000
CRAIGE J & COANN L REMINGTON
1922 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 022 000
DANIEL M JR MUNOZ
2000 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 023 000
JAMES A WEBBER
2001 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 024 000
BRENT E & MIN J KINGSFORD
1993 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 025 000
MARKAM R & SUSAN E CRUZ
1985 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 026 000
CLAUDIA ARRIAGA
1977 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 027 000
ROBERT E & STEPHANIE L WESSELMAN
1969 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 028 000
LEO E; NILES
1961 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 029 000
NATHAN A & JESSICA R PORTER
1857 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 030 000
SHAREN B LAURSEN
1849 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 031 000
CHAVEZ
1851 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 032 000
CAL VET
1712 BLACKBIRD ST
ROSEVILLE CA 95747

483 280 033 000
IGNAZIO & ANNETTE NOTO
1825 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 034 000
KENNETH C & SUSAN A BOWER
1809 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 035 000
RANDY W & SHARON A UTZ
1801 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 038 000
ROBERT D & THERESA H PONNEQUIN
1816 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 039 000
THOMAS & KRISTEN EMBRY
1824 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 040 000
STEVEN L & JULIE M DENNIS
1832 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 041 000
MATTHEW E SHERWOOD
1840 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 042 000
TRACY L ROURKE
1848 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 043 000
EDWARD D LEE
1856 SAN GABRIEL ST
ROSEVILLE CA 95747

483 280 044 000
ARNOLD H JR LOPEZ
1873 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 045 000
BRAD & MICHELLE A ANDERSON
1865 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 046 000
ROBERT K & PATRICIA A SWITZER
1849 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 047 000
RONALD W & DEBORAH J DAVIS
1841 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 048 000
CHRISTINA CALCAGNO
1833 SAN CARLOS CIR
ROSEVILLE CA 95747

483 280 049 000
WILLIAM J & LIBBI E MCGREEVY
1825 SAN CARLOS CIR
ROSEVILLE CA 95747

PROJECT TECH FW, INC.
ATTN: DOUG DAVEY
3947 LENNANE DR, STE 200
SACRAMENTO CA 95843

Routes B & B1

October 2003

Roseville Energy Park
Application for Certification

017 100 009 520
U C DAVIS FOUNDATION
1480 DREW AVE #130
DAVIS CA 95616

017 100 014 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 100 015 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 017 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 028 510
ARCHIE L & WILLA OBRIEN
5480 PHILLIP RD
ROSEVILLE CA 95747

017 100 029 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 030 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 031 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 032 000
WILLIAM C SR & Y P HARRIS
4900 PHILLIP RD
ROSEVILLE CA 95747

017 100 033 000
CHAU HSIUNG CHUANG
12351 CRAYSIDE LN
SARATOGA CA 95070

017 100 034 000
FTT
5400 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 035 000
FTT
5400 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 038 000
BD PROPERTIES BENNETT ORIN
8568 PHEASANT HILL CT
ORANGEVALE CA 95662

017 100 040 530
CORIN FAMILY LIMITED PARTNERSH
4440 PHILLIP RD
ROSEVILLE CA 95747

017 100 040 540
JOHN & DANA CORIN
5820 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 042 000
PHILLIPS ROAD 160 INVESTORS MA
511 35TH ST
SACRAMENTO CA 95816

017 100 043 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 100 044 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 100 045 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 005 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 007 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 116 008 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 009 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 116 010 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 116 011 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 150 031 510
COMPUTER DEDUCTIONS INC
2701 RATTLESNAKE RD
NEWCASTLE CA 95658

017 150 037 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 162 001 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 162 009 000
TERRACE L P SUTTER
1801 I ST #202
SACRAMENTO CA 95814

017 162 010 000
DEL WEBB CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 014 000
WEBB DEL CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 049 000
DEL WEBB CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 067 000
ESKATON
5105 MANZANITA AVE
CARMICHAEL CA 95608

017 162 068 000
PETER P BOLLINGER INVESTMENT C
540 FULTON AVE
SACRAMENTO CA 95825

017 162 069 000
PETER P BOLLINGER INVESTMENT C
540 FULTON AVE
SACRAMENTO CA 95825

017 162 074 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 076 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 077 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 079 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 080 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 085 000
PLEASANT GROVE COMMUNITY CHURC
1730 PLEASANT GROVE BLVD
ROSEVILLE CA 95747

017 380 001 000
MICHAEL BAYARD
3615 HAMPSTEAD RD
LA CANADA CA 91011

017 380 002 000
DRY CREEK JOINT ELEMENTARY SCH
9707 COOK RIOLO RD
ROSEVILLE CA 95747

017 380 003 000
DRY CREEK JOINT ELEMENTARY SCH
9707 COOK RIOLO RD
ROSEVILLE CA 95747

017 390 003 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

474 010 026 000
CLIFFORD D & G BRANDON
2675 BASE LINE RD
ROSEVILLE CA 95747

474 010 027 000
MICHAEL & SHANNON MANSCH
2655 BASE LINE RD
ROSEVILLE CA 95747

474 010 032 000
DONALD L & CHIN SUK EOFF
8010 OAK AVE
ROSEVILLE CA 95747

474 010 033 000
HILDEGARD ZACHARIAS
8020 OAK AVE
ROSEVILLE CA 95747

474 010 034 000
JAMES E & SHARON M MOE
8040 OAK AVE
ROSEVILLE CA 95747

474 010 035 000
KEVIN D WILSON
8070 OAK AVE
ROSEVILLE CA 95747

474 010 036 000
CLIFFORD & CLANCY BALL
8100 OAK AVE
ROSEVILLE CA 95747

474 020 001 000
C DWAIN SANDERS
8025 OAK AVE
ROSEVILLE CA 95747

474 020 002 000
C DWAIN SANDERS
8025 OAK AVE
ROSEVILLE CA 95747

474 020 003 000
ARNOLD W & SASITHORN PETERS
2485 BASE LINE RD
ROSEVILLE CA 95747

474 020 004 000
HAMID & ELISABETH HOSSEINI
1407 SPRINGFIELD DR
ROSEVILLE CA 95678

474 020 005 000
HAMID & ELISABETH HOSSEINI
1407 SPRINGFIELD DR
ROSEVILLE CA 95678

474 020 006 000
MARK C & KRISTINA E BUCHE
8055 OAK AVE
ROSEVILLE CA 95747

474 020 007 000
REVA G CUPLER
8081 OAK AVE
ROSEVILLE CA 95747

474 020 008 000
JAMES E & MARLYS D LUCAS
8109 OAK AVE
ROSEVILLE CA 95747

474 020 009 000
THOMAS C GERMANY
2440 CENTRAL AVE
ROSEVILLE CA 95747

474 020 011 000
THOMAS C GERMANY
2440 CENTRAL AVE
ROSEVILLE CA 95747

474 020 015 000
PACIFIC GAS & ELECTRIC CO
0 BASELINE RD
ROSEVILLE CA 00000

474 020 023 000
WALTER L & MICHAL ANN NAAKE
2300 CENTRAL AVE
ROSEVILLE CA 95747

474 020 024 000
ARTHUR C & PAMELA R BAUER
8080 MILNES AVE
ROSEVILLE CA 95747

474 020 025 000
MELINDA MORTIZ
8060 MILNES AVE
ROSEVILLE CA 95747

474 020 026 000
LUPE G CORONA
8040 MILNES AVE
ROSEVILLE CA 95747

474 020 027 000
STEVEN J OTAVKA
2345 BASE LINE RD
ROSEVILLE CA 95747

474 020 028 000
JACK A PACHECO
2431 BASE LINE RD
ROSEVILLE CA 95747

474 020 030 000
HENRY L VICTOR
2391 BASE LINE RD
ROSEVILLE CA 95747

474 020 031 000
DONALD E & LAVERNE A THOMPSON
4232 ECHO ROCK LN
ROSEVILLE CA 95747

476 070 028 000
GEORGE R & OLLIE E RODRIGUES
1455 EVERETT WAY
ROSEVILLE CA 95747

476 070 029 000
SCOTT J & NANCY L PETERS
1457 EVERETT WAY
ROSEVILLE CA 95747

476 070 030 000
EDWARD H & SHEILA D ACKE
1460 BADOVINAC DR
ROSEVILLE CA 95747

476 070 031 000
GARRY D HOLLINGER
1458 BADOVINAC DR
ROSEVILLE CA 95747

476 080 006 000
DOUGLAS R & COLLEEN C SMITH
1509 CARBURY WAY
ROSEVILLE CA 95747

476 080 007 000
RONNIE J & EVA F HOTT
1511 CARBURY WAY
ROSEVILLE CA 95747

476 080 008 000
CAMILLERI SAVIOUR/JOYCE
2013 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 080 009 000
JEREMY & KIMBERLY S FEELEY
1515 CARBURY WAY
ROSEVILLE CA 95747

476 080 010 000
CHRISTOPHER J HILL
1517 CARBURY WAY
ROSEVILLE CA 95747

476 080 011 000
JOE LATHOUWERS
1519 CARBURY WAY
ROSEVILLE CA 95747

476 080 012 000
NORTON 2002 TRUST
3177 BIG BEAR DR
ROSEVILLE CA 95747

476 080 013 000
MICHAEL E & MARY ANN KOVALCHIK
1523 CARBURY WAY
ROSEVILLE CA 95747

476 080 014 000
MICHAEL GARY WILLIS
1525 CARBURY WAY
ROSEVILLE CA 95747

476 080 015 000
GREG MAUPIN
1527 CARBURY WAY
ROSEVILLE CA 95747

476 080 016 000
SAUL P TERVYDIS
1529 CARBURY WAY
ROSEVILLE CA 95747

476 080 017 000
HELEN E HOLCOMB
1531 CARBURY WAY
ROSEVILLE CA 95747

476 080 018 000
STEVEN W YIP
1401 ORWELL DR
ROSEVILLE CA 95747

476 080 019 000
BETTY F ERICKSON
1403 ORWELL DR
ROSEVILLE CA 95747

476 080 052 000
EUGENE A & AGNES E ELDRIDGE
1520 CARBURY WAY
ROSEVILLE CA 95747

476 080 053 000
DAYNA L EVANS
1522 CARBURY WAY
ROSEVILLE CA 95747

476 080 054 000
ROBERT JOHN JR & EVA GREINER
1524 CARBURY WAY
ROSEVILLE CA 95747

476 080 055 000
JOHN M & KELLY R NADEAU
1526 CARBURY WAY
ROSEVILLE CA 95747

476 150 001 000
MONICA L WADE
1434 LORIMER WAY
ROSEVILLE CA 95747

476 150 002 000
DONOVAN W & SHELLY HATLEBERG
1436 LORIMER WAY
ROSEVILLE CA 95747

476 150 003 000
JOHN BARNETT
1438 LORIMER WAY
ROSEVILLE CA 95747

476 150 004 000
TONY & BRIGITTE SLY
1440 LORIMER WAY
ROSEVILLE CA 95747

476 150 005 000
MICHAEL E & LYNNE R STILES
1442 LORIMER WAY
ROSEVILLE CA 95747

476 150 006 000
JEFFREY N & MARY JOAN DAHLSTROM
1444 LORIMER WAY
ROSEVILLE CA 95747

476 150 007 000
RICCI
1446 LORIMER WAY
ROSEVILLE CA 95747

476 150 008 000
KURT & DEBRA SUE HEPPLER
1448 LORIMER WAY
ROSEVILLE CA 95747

476 150 009 000
CASEY D COX
1450 LORIMER WAY
ROSEVILLE CA 95747

476 150 010 000
ARTHUR L & DONNA S KRUMMES
1452 LORIMER WAY
ROSEVILLE CA 95747

476 150 011 000
JOHN F ELLIOTT
1454 LORIMER WAY
ROSEVILLE CA 95747

476 150 012 000
EARLE AUBREY & LAURA M REYNOLDS
1456 LORIMER WAY
ROSEVILLE CA 95747

476 150 013 000
VALERIE J PRICE
1458 LORIMER WAY
ROSEVILLE CA 95747

476 150 014 000
DAVID A & ANN Q CUNNINGHAM
1457 LORIMER WAY
ROSEVILLE CA 95747

476 150 015 000
DONALD J & STEPHANIE A COLLIN
1455 LORIMER WAY
ROSEVILLE CA 95747

476 150 016 000
CARL & REBECCA ROMINE
1453 LORIMER WAY
ROSEVILLE CA 95747

476 150 017 000
JAMES IAN & TAMI ECCLES
1451 LORIMER WAY
ROSEVILLE CA 95747

476 150 018 000
BRIAN E BADO
1449 LORIMER WAY
ROSEVILLE CA 95747

476 150 019 000
SUDHAKAR R TALANKI
1498 DALLEN WAY
ROSEVILLE CA 95747

476 150 020 000
JOHN & MARY A BOGNACKI
1497 DALLEN WAY
ROSEVILLE CA 95747

476 150 021 000
MARY SIMPSON
1495 DALLEN WAY
ROSEVILLE CA 95747

476 150 022 000
JOACHIM R & AMEY L RASMIJN
1445 LORIMER WAY
ROSEVILLE CA 95747

476 150 023 000
RONALD J & CYNTHIA A SARTORI
1443 LORIMER WAY
ROSEVILLE CA 95747

476 150 024 000
MICHAEL J & DEBRA L BURFORD
1441 LORIMER WAY
ROSEVILLE CA 95747

476 150 025 000
ELMER & AUDREY VANDELL
504 BROMLEY CT
ROSEVILLE CA 95747

476 150 026 000
NORMAN A JR & JANET L PILLIARD
506 BROMLEY CT
ROSEVILLE CA 95747

476 150 027 000
FRED LEE
6132 DEL ORO RD
GRANITE BAY CA 95746

476 150 028 000
STEVEN C & LINN C LIGHT
505 BROMLEY CT
ROSEVILLE CA 95747

476 150 029 000
FE A CEPE
503 BROMLEY CT
ROSEVILLE CA 95747

476 150 030 000
STEVE S LOE
1437 LORIMER WAY
ROSEVILLE CA 95747

476 150 031 000
GARY E & VERONICA S SHAW
736 NACIONAL CT
SALINAS CA 93901

476 150 032 000
O ANN KANE
1433 LORIMER WAY
ROSEVILLE CA 95747

476 150 033 000
DEL VILLAR MARIO
1470 BADOVINAC DR
ROSEVILLE CA 95747

476 150 034 000
BARBARA A ROBINSON
1472 BADOVINAC DR
ROSEVILLE CA 95747

476 150 035 000
GREGORY M & KAREN S SIINO
1474 BADOVINAC DR
ROSEVILLE CA 95747

476 150 036 000
ANN E DELFINO
1476 BADOVINAC DR
ROSEVILLE CA 95747

476 150 037 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 150 038 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 160 003 000
CHRISTOPHER J & DORIS J SA
7735 DUTRA BEND DR
SACRAMENTO CA 95831

476 160 004 000
BRUCE SINGER
1424 LORIMER WAY
ROSEVILLE CA 95747

476 160 005 000
ANN REGINA BARNER
1426 LORIMER WAY
ROSEVILLE CA 95747

476 160 006 000
JAMES R JR & FLORIDA P OBRIEN
1428 LORIMER WAY
ROSEVILLE CA 95747

476 160 007 000
CHERIE STRAIN
1430 LORIMER WAY
ROSEVILLE CA 95747

476 160 008 000
HAROLD D & EVELYN M KING
1432 LORIMER WAY
ROSEVILLE CA 95747

476 160 009 000
GERALD A & PAULENE S COUTURE
1475 BADOVINAC DR
ROSEVILLE CA 95747

476 160 010 000
GREGORY T & JENNIFER L ADAMSON
1473 BADOVINAC DR
ROSEVILLE CA 95747

476 160 011 000
JOHN R & VALERIE J KLINEFELTER
4900 RIDGELINE LN
FAIR OAKS CA 95628

476 160 012 000
HOMAYOON GEORGE ALAI
1469 BADOVINAC DR
ROSEVILLE CA 95747

476 160 013 000
WILLIAM & HOLLY C MARRA
1467 BADOVINAC DR
ROSEVILLE CA 95747

476 160 014 000
SUDIE V PRIDGEN
1465 BADOVINAC DR
ROSEVILLE CA 95747

476 160 015 000
ANTHONY L & LOIS E ROSE
1429 LORIMER WAY
ROSEVILLE CA 95747

476 160 016 000
RONALD G & THERESA F STEWART
1427 LORIMER WAY
ROSEVILLE CA 95747

476 160 017 000
SCOTT L & TERRI L BARMANN
402 DONNELLY CT
ROSEVILLE CA 95747

476 160 018 000
JAMES K ABRAHAM
406 DONNELLY CT
ROSEVILLE CA 95747

476 160 019 000
KENNETH L & KIM M ROWEL
408 DONNELLY CT
ROSEVILLE CA 95747

476 160 020 000
STEVEN & JENNIFER L VIRGEN
410 DONNELLY CT
ROSEVILLE CA 95747

476 160 021 000
JAMIE J BRYLA
412 DONNELLY CT
ROSEVILLE CA 95747

476 160 022 000
KIMBERLEY D MILLS
415 DONNELLY CT
ROSEVILLE CA 95747

476 160 023 000
ROBERT D HAAVISTO
413 DONNELLY CT
ROSEVILLE CA 95747

476 160 024 000
JONATHON & SARAH LEE
411 DONNELLY CT
ROSEVILLE CA 95747

476 160 025 000
KATHAYOUN KAVIANAN
561 TARTER CT
SAN JOSE CA 95136

476 160 026 000
JUDITH C PETERS
407 DONNELLY CT
ROSEVILLE CA 95747

476 160 027 000
SHERRI JACKSON
405 DONNELLY CT
ROSEVILLE CA 95747

476 160 028 000
CAROL D GREENER
403 DONNELLY CT
ROSEVILLE CA 95747

476 160 029 000
VIVIENNE BUTLER BRETT
401 DONNELLY CT
ROSEVILLE CA 95747

476 160 030 000
JOHN W BANKS III
300 CASSIDY CT
ROSEVILLE CA 95747

476 160 031 000
VONDA L WALKER
302 CASSIDY CT
ROSEVILLE CA 95747

476 160 032 000
WELLS
304 CASSIDY CT
ROSEVILLE CA 95747

476 160 033 000
WILLIAM J ROBERTSON
306 CASSIDY CT
ROSEVILLE CA 95747

476 160 034 000
RAYMOND J & ELL F HANNAN
308 CASSIDY CT
ROSEVILLE CA 95747

476 160 035 000
GUY R & KAREN I HOWES
1540 DUNFORD WAY
ROSEVILLE CA 95747

476 160 036 000
CARL L & BARBARA J BOLENBAUGH
1542 DUNFORD WAY
ROSEVILLE CA 95747

476 160 037 000
KELLEY S & RACHEL ANN HUNT
1541 DUNFORD WAY
ROSEVILLE CA 95747

476 160 038 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 160 039 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 170 001 000
ELAINE O JOHNSON
1512 DUNFORD WAY
ROSEVILLE CA 95747

476 170 002 000
RANDALL J & TAMMY C LEAR
611 HAILEY CT
ROSEVILLE CA 95747

476 170 003 000
JONATHAN D & JOAN L HILL
1516 DUNFORD WAY
ROSEVILLE CA 95747

476 170 004 000
ROBERT S & KIMBERLY J BAUMANN
1518 DUNFORD WAY
ROSEVILLE CA 95747

476 170 005 000
TODD H & LISA A HOLVERSON
110 PADGETT CT
ROSEVILLE CA 95747

476 170 006 000
DAVID J & MARGARET I SANDRONI
112 PADGETT CT
ROSEVILLE CA 95747

476 170 007 000
JEFFREY T & FRAULEIN S NELSON
114 PADGETT CT
ROSEVILLE CA 95747

476 170 008 000
COLLIN L & GAIL J COOPER
116 PADGETT CT
ROSEVILLE CA 95747

476 170 009 000
STEVE WARREN ADCOCK
115 PADGETT CT
ROSEVILLE CA 95747

476 170 010 000
DAVID W & SANDY D BROWN
1524 DUNFORD WAY
ROSEVILLE CA 95747

476 170 011 000
VIRGINIA NEWTON
1526 DUNFORD WAY
ROSEVILLE CA 95747

476 170 012 000
TIM W & DIANNA J TURNER
1445 PENHURST WAY
ROSEVILLE CA 95747

476 170 013 000
YAMAOKA FAMILY TRUST
1443 PENHURST WAY
ROSEVILLE CA 95747

476 170 014 000
DAVID C & DONNA L JORGENSEN
1441 PENHURST WAY
ROSEVILLE CA 95747

476 170 015 000
RICHARD AUGUSTUS BOGGESS
1439 PENHURST WAY
ROSEVILLE CA 95747

476 170 016 000
DOUGLAS E & BETH A WILFORD
1437 PENHURST WAY
ROSEVILLE CA 95747

476 170 017 000
LARRY A & JUDI A MILLER
1435 PENHURST WAY
ROSEVILLE CA 95747

476 170 018 000
TODD MOKHTARI
2325 HARBOR AVE SW #C1
SEATTLE WA 98126

476 170 032 000
JODY A CORSON
309 CASSIDY CT
ROSEVILLE CA 95747

476 170 033 000
CHARLES PARENTI
307 CASSLAY CT
ROSEVILLE CA 95747

476 170 034 000
CATHY JO CHANDLER
305 CASSIDY CT
ROSEVILLE CA 95747

476 170 035 000
MCCORD
3003 CASSIDY CT
ROSEVILLE CA 95678

476 170 036 000
LOBOW JOWA
1415 LORIMER WAY
ROSEVILLE CA 95747

476 170 037 000
NORMA P SAMOY
1413 LORIMER WAY
ROSEVILLE CA 95747

476 170 038 000
MICHAEL B & CHRISTINA M LEAPLEY
1411 LORIMER WAY
ROSEVILLE CA 95747

476 170 039 000
TIM & NANCY NUNES
1434 PENHURST WAY
ROSEVILLE CA 95747

476 170 040 000
RAMON & LETICIA ARIAS
1436 PENHURST WAY
ROSEVILLE CA 95747

476 170 041 000
AMANDA L ALBERS
1438 PENHURST WAY
ROSEVILLE CA 95747

476 170 042 000
STEVEN W HOSKINSON
1440 PENHURST WAY
ROSEVILLE CA 95747

476 170 043 000
MICHAEL & TERESA MULVEY
1442 PENHURST WAY
ROSEVILLE CA 95747

476 170 044 000
RODNEY W & ROSALIE A BRAZZEL
1532 DUNFORD WAY
ROSEVILLE CA 95747

476 170 045 000
WILLIAM H HAFFEY
1534 DUNFORD WAY
ROSEVILLE CA 95747

476 170 046 000
TIMOTHY H & MICHELLE E SHELLEY
1536 DUNFORD WAY
ROSEVILLE CA 95747

476 170 047 000
JULIE L LEAVERTON
1538 DUNFORD WAY
ROSEVILLE CA 95747

476 170 048 000
JOSEPH ZAPATA
1539 DUNFORD WAY
ROSEVILLE CA 95747

476 170 049 000
LINDA STILES
1537 DUNFORD WAY
ROSEVILLE CA 95747

476 170 050 000
ROBERT E & WYNNIE M BELL
1448 PENHURST WAY
ROSEVILLE CA 95747

476 170 051 000
ROLAND F & CATHERINE E WACHTER
1450 PENHURST WAY
ROSEVILLE CA 95747

476 170 052 000
SHAWN & DONNA SILVA
1449 PENHURST WAY
ROSEVILLE CA 95747

476 170 053 000
NGUYEN THU TRAN
PO BOX 246
ROSEVILLE CA 95678

476 170 054 000
SASAN & MARYAM AGHABEIGI
1527 DUNFORD WAY
ROSEVILLE CA 95747

476 170 055 000
STEVEN G & TERESA S PHILLIPS
200 BOWDEN CT
ROSEVILLE CA 95747

476 170 056 000
DONALD G & LORNA M MOLT
202 BOWDEN CT
ROSEVILLE CA 95747

476 170 057 000
CLARK R & LINDA A OSBORNE
204 BOWDEN CT
ROSEVILLE CA 95747

476 170 058 000
CATHERINE BACKER
206 BOWDEN CT
ROSEVILLE CA 95747

476 170 059 000
ROBERT C & DEBRA J FLETCHER
205 BOWDEN CT
ROSEVILLE CA 95747

476 170 060 000
REBECCA J SNYDER
203 BOWDEN CT
ROSEVILLE CA 95747

476 170 061 000
MICHAEL D JOVOVICH
201 BOWDEN CT
ROSEVILLE CA 95747

476 170 062 000
ANN MARIE STADDAN
910 CONNELL CT
ROSEVILLE CA 95747

476 170 063 000
EDWARD JOSEPH & BETH ANN
RODRIGUEZ
912 CONNELL CT
ROSEVILLE CA 95747

476 170 064 000
KENNY & DARLENE DURHAM
914 CONNELL CT
ROSEVILLE CA 95747

476 170 065 000
DANIEL S DAILY
916 CONNELL CT
ROSEVILLE CA 95747

476 170 066 000
MICHAEL R & JANICE M LAKE
918 CONNELL CT
ROSEVILLE CA 95747

476 170 067 000
SCOTT J OLIN
920 CONNELL CT
ROSEVILLE CA 95747

476 170 068 000
DAVID A & BONITA D GAMBOA
919 CONNELL CT
ROSEVILLE CA 95747

476 170 069 000
JOSEPH R & MAILE E BARRON II
917 CONNELL CT
ROSEVILLE CA 95747

476 170 070 000
STEFANIE DINES
915 CONNELL CT
ROSEVILLE CA 95747

476 170 071 000
BETTY M BUSELLINI
913 CONNELL CT
ROSEVILLE CA 95747

476 170 072 000
SELEWICZ
610 WHITEHALL WAY
SACRAMENTO CA 95864

476 170 073 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 170 074 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 180 001 000
GARY & JOHANNA BLEILE
1414 HURLSTON WAY
ROSEVILLE CA 95747

476 180 002 000
JOHN B & TERESITA P GUERRERO
1416 HURLSTON WAY
ROSEVILLE CA 95747

476 180 003 000
DONALD J JR & SHIRLEY A SHINGARA
1418 HURLSTON WAY
ROSEVILLE CA 95747

476 180 004 000
TOM E & MARGARET A SHERMAN
1420 HURLSTON WAY
ROSEVILLE CA 95747

476 180 005 000
USSERY
1422 HURLSTON WAY
ROSEVILLE CA 95747

476 180 006 000
ROBERT LEDOUX
1424 HURLSTON WAY
ROSEVILLE CA 95747

476 180 007 000
DANIEL R & BONNIE L HART
1426 HURLSTON WAY
ROSEVILLE CA 95747

476 180 008 000
LAVOY JOSEPH/L 2002 TRUST
810 LANETT CT
ROSEVILLE CA 95747

476 180 009 000
ROBERT J & LAURA J TURNER
812 LANETT CT
ROSEVILLE CA 95747

476 180 010 000
JACOB & MACKENZIE N BRUCKLER
814 LANETT CT
ROSEVILLE CA 95747

476 180 011 000
ANTHONY ADAMS
816 LANETT CT
ROSEVILLE CA 95747

476 180 012 000
MICHAELE D DAVES
815 LANETT CT
ROSEVILLE CA 95747

476 180 013 000
KENNETH C & DOROTHY LOU HALX
813 LANETT CT
ROSEVILLE CA 95747

476 180 014 000
SUSAN CANTWELL
1421 HURLSTON WAY
ROSEVILLE CA 95747

476 180 015 000
LISA K MORGAN
1419 HURLSTON WAY
ROSEVILLE CA 95747

476 180 016 000
WILLIAM A KLEINHANS
1417 HURLSTON WAY
ROSEVILLE CA 95747

476 180 017 000
THOMAS P & DIANA M DIPIETRO
1507 DUNFORD WAY
ROSEVILLE CA 95747

476 180 018 000
MARK N & LAURIE J VANWINKLE
1505 DUNFORD WAY
ROSEVILLE CA 95747

476 180 019 000
JOHN E & SABRINA K LERSETH
1503 DUNFORD WAY
ROSEVILLE CA 95747

476 180 020 000
JAMES SETTLE
1501 DUNFORD WAY
ROSEVILLE CA 95747

476 180 021 000
RYAN N & STEPHANI L SMITH
1500 DUNFORD WAY
ROSEVILLE CA 95747

476 180 022 000
MARK AARON & JACQUELINE DIANA SMITH
1502 DUNFORD WAY
ROSEVILLE CA 95747

476 180 023 000
ANTHONY & PIPER ROBERTS
1411 HURLSTON WAY
ROSEVILLE CA 95747

476 220 001 000
WALLACE C JONES
3000 ACTON WAY
ROSEVILLE CA 95747

476 220 002 000
GREG & HARRIET L PLATZ
3002 ACTON WAY
ROSEVILLE CA 95747

476 220 003 000
CAROLE P KOWALIK
3004 ACTON WAY
ROSEVILLE CA 95747

476 220 004 000
CHARLES B & MARY L SWAN
21915 RODEO CT
COLFAX CA 95713

476 220 005 000
MKB METCALFE FAMILY ENTERPRISE
1267 VINTAGE WAY
AUBURN CA 95603

476 220 006 000
BRIAN & KIMBERLEY ASTLE
3010 ACTON WAY
ROSEVILLE CA 95747

476 220 007 000
DANILO P & C DELEON
2295 PHEASANT DR
HERCULES CA 94547

476 220 008 000
KEVIN L & KRISTI M EDMONDSON
1414 FUHRMAN CT
ROSEVILLE CA 95747

476 220 009 000
MITCHELL CARRIE L 2002 TRUST
1416 FUHRMAN CT
ROSEVILLE CA 95747

476 220 010 000
DANIELLE M YOUNG
1418 FUHRMAN CT
ROSEVILLE CA 95747

476 220 011 000
WILLIS KAY JR & SANDRA K HOPKINS
1417 FUHRMAN CT
ROSEVILLE CA 95747

476 220 012 000
MARILYN BUTTS
1415 FUHRMAN CT
ROSEVILLE CA 95747

476 220 013 000
KEVIN G WARD
1413 FUHRMAN CT
ROSEVILLE CA 95747

476 220 014 000
JOYCE H GOMEZ
1411 FUHRMAN CT
ROSEVILLE CA 95747

476 220 015 000
FRY
3260 CUESTA DR
SAN JOSE CA 95148

476 220 016 000
CHRISTOPHER A MARCONI
1407 FUHRMAN CT
ROSEVILLE CA 95747

476 220 017 000
JAMES C & JENNY L FAHEY
1405 FUHRMAN CT
ROSEVILLE CA 95747

476 220 018 000
STEPHEN F LINTON
1403 FUHRMAN CT
ROSEVILLE CA 95747

476 220 019 000
EDWARD B & VALARIE S BELDING
3100 ACTON WAY
ROSEVILLE CA 95747

476 220 020 000
JAMES D & JENIFER K WILSON
3102 ACTON WAY
ROSEVILLE CA 95747

476 220 021 000
CAROL J YANDELL
3104 ACTON WAY
ROSEVILLE CA 95747

476 220 022 000
DAVID UNTERHOLZNER
500 COWAN CT
ROSEVILLE CA 95747

476 220 023 000
ELLEN BLANCHE WOODHOUSE
7409 ACORN GLEN LOOP
ROSEVILLE CA 95747

476 220 024 000
ERIC J & AMBER L ZEHRUNG
504 COWAN CT
ROSEVILLE CA 95747

476 220 048 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 250 001 000
GUY & TAMARA NAKANO
3101 ACTON WAY
ROSEVILLE CA 95747

476 250 002 000
RICARDO S & JULIET R SEGURITAN
3103 ACTON WAY
ROSEVILLE CA 95747

476 250 003 000
EUGENE E & ESTHER E EDEN
50 HAZELWOOD AVE
SAN FRANCISCO CA 94112

476 250 004 000
ELIZABETH PAVICH
3107 ACTON WAY
ROSEVILLE CA 95747

476 250 039 000
DENNIS E HARVEY
606 RIGBY CT
ROSEVILLE CA 95747

476 250 040 000
ROBERT E RATCLIFFE
604 RIGBY CT
ROSEVILLE CA 95747

476 250 041 000
JAMES M & KIM LAMAR
602 RIGBY CT
ROSEVILLE CA 95747

476 250 042 000
SHERRY L KIRKPATRICK
600 RIGBY CT
ROSEVILLE CA 95747

476 250 043 000
SCOTT DAVEY
1301 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 044 000
JAMES S & SHARON M WOODWARD
1303 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 045 000
RAYMOND T & JAMIE M JENNINGS
1305 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 046 000
ALLISON D & THOMAS J PERKINS
1302 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 047 000
WILLIAM E IV CRUM
1306 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 048 000
RUSSEL R JR YOUNG
1308 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 049 000
NICOLE TENNANT
3005 ACTON WAY
ROSEVILLE CA 95747

476 250 050 000
GEORGE D DEESE
3003 ACTON WAY
ROSEVILLE CA 95747

476 250 051 000
JOSEPH MARQUEZ
3001 ACTON WAY
ROSEVILLE CA 95747

476 250 052 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 250 053 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 270 002 000
DEREK EDWARD & MARCIA LAGE BROCK
1815 DISCOVERY DR
ROSEVILLE CA 95747

476 270 003 000
ROY D & LAURA L CRAVER
1819 DISCOVERY DR
ROSEVILLE CA 95747

476 270 004 000
GREGORY J & PEGGY E MELIN
1825 DISCOVERY DR
ROSEVILLE CA 95747

476 270 005 000
WILLIAM R & TRICIA L FITCH
1827 DISCOVERY DR
ROSEVILLE CA 95747

476 270 006 000
DENNIS D & MARY F KRUEGER
1829 DISCOVERY DR
ROSEVILLE CA 95747

476 270 007 000
BOBBY V & NETTIE E SHORT
1831 DISCOVERY DR
ROSEVILLE CA 95747

476 270 008 000
DAVID S & MARIEA K KIRKMAN
1837 DISCOVERY DR
ROSEVILLE CA 95747

476 270 009 000
THOMAS E & PATRICIA KERRIGAN
1839 DISCOVERY DR
ROSEVILLE CA 95747

476 270 023 000
TODD C & SUZANNE R ANDERSON
2222 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 024 000
MARK A & EMBER R SHURTZ
2220 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 025 000
THOMAS H ATKINSON II
2218 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 026 000
IVY F SHAW
2216 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 027 000
CURTIS W DAY
2017 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 028 000
ROSEMARY C KRAUSE
2019 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 029 000
MICHAEL ALLAN WALBORN
2021 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 030 000
WESLEY S NYGARD
2023 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 031 000
ROGELIO & DELIA ANGUIANO
3529 BARNACLE CT
UNION CITY CA 94587

476 270 032 000
MIKE GLAZEBROOK
1836 DISCOVERY DR
ROSEVILLE CA 95747

476 270 033 000
NANCY VAUGHN
1834 DISCOVERY DR
ROSEVILLE CA 95747

476 270 034 000
CLAUDIA J DUNN
1832 DISCOVERY DR
ROSEVILLE CA 95747

476 270 035 000
KOCH
500 MILL CREEK CT
ROSEVILLE CA 95747

476 270 036 000
WILLIAM SHAWN & KATHLEEN ANNA HASSELL
502 MILL CREEK CT
ROSEVILLE CA 95747

476 270 037 000
MICHAEL L & KATHY S TRAPP
504 MILL CREEK CT
ROSEVILLE CA 95747

476 270 038 000
ROGER N RANSFORD
506 MILL CREEK CT
ROSEVILLE CA 95747

476 270 041 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 270 042 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 001 000
TODD WILLIAM MOSACK
2214 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 002 000
CHARLES J & KIRSTEN A FAZZINO
2212 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 003 000
PAUL M SUMABON
2210 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 004 000
BRIAN ROTH
2208 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 005 000
LISA J FORRY
2206 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 006 000
JOHN DAVID & LINDA C SCHMITZ
1573 MILL RUN DR
ROSEVILLE CA 95747

476 280 007 000
JAMES B JR & CAMILLA J MCGEE
1571 MILL RUN DR
ROSEVILLE CA 95747

476 280 008 000
MICHAEL PUCCI
1569 MILL RUN DR
ROSEVILLE CA 95747

476 280 009 000
DEAN KENJI TOKUNAGA
1567 MILL RUN DR
ROSEVILLE CA 95747

476 280 010 000
JOANNA M HAWCK
1565 MILL RUN DR
ROSEVILLE CA 95747

476 280 011 000
DENNIS PATRICK BOGUE
1563 MILL RUN DR
ROSEVILLE CA 95747

476 280 012 000
MICHAEL & JESSICA MOULTON
1561 MILL RUN DR
ROSEVILLE CA 95747

476 280 013 000
JOHN HENRY JR & JOCELYN KAPPLER
2001 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 014 000
MATT & STACIE S WEBSTER
2003 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 015 000
SIGURD MEJDAL
346 DUNSMUIR TER #3
SUNNYVALE CA 94085

476 280 016 000
KELLEY A SILVA
2007 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 017 000
DANIEL C & TERRY M MURRELL
2009 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 018 000
PAUL A SOTO
2011 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 019 000
DONALD K & MAUREEN E SHEPHERD
2013 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 020 000
JAMES E & MARIA M HOLLOWAY
2015 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 021 000
CASEY HINKEY
505 MILL CREEK CT
ROSEVILLE CA 95747

476 280 022 000
RANDALL D MESA
2377 GOLD MEADOW WAY #100
GOLD RIVER CA 95670

476 280 023 000
GEORGE LOUIS RODRIGUEZ
2010 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 024 000
STEVEN R & KAREN M EASON
2006 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 025 000
TERRY STEPHEN & DANA LYNN
ZAHNISER
2002 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 026 000
ANNETTE M DIPIRRO
600 MILL RUN CT
ROSEVILLE CA 95747

476 280 027 000
BETH A CARRIGAN
602 MILL RUN CT
ROSEVILLE CA 95747

476 280 028 000
LARRY ROBERT & DONNIE JO WELCH
1550 MILL RUN DR
ROSEVILLE CA 95747

476 280 029 000
KATHLEEN KEEFE
1552 MILL RUN DR
ROSEVILLE CA 95747

476 280 030 000
MARK R & LYNNE M PEARCE
1554 MILL RUN DR
ROSEVILLE CA 95747

476 280 031 000
NESTOR & JOSEPHINE BUGAOISAN
1556 MILL RUN DR
ROSEVILLE CA 95747

476 280 032 000
DARRELL L & MARILYN R KAFF
1558 MILL RUN DR
ROSEVILLE CA 95747

476 280 033 000
LARRY R & COLLEEN M BERWICK
1560 MILL RUN DR
ROSEVILLE CA 95747

476 280 034 000
RICHARD B & KATHLEEN J ROCHON
1562 MILL RUN DR
ROSEVILLE CA 95747

476 280 035 000
ROBERT E & MARY A MORSE
1564 MILL RUN DR
ROSEVILLE CA 95747

476 280 036 000
JUDITH M YARNELL
1566 MILL RUN DR
ROSEVILLE CA 95747

476 280 037 000
TROY L & PAMELA J MOWRY
1568 MILL RUN DR
ROSEVILLE CA 95747

476 280 038 000
MICHAEL G & TERRI L SOBER
1570 MILL RUN DR
ROSEVILLE CA 95747

476 280 039 000
RADISA PETKOVIC
1572 MILL RUN DR
ROSEVILLE CA 95747

476 280 040 000
ROBERT & D J GONZALEZ
1574 MILL RUN DR
ROSEVILLE CA 95747

476 280 041 000
KARA M & CHAD A KAESTLE
2201 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 042 000
ALDEN
2203 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 043 000
ROBERT C; EGER
2205 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 044 000
KELLEY GETTEMY
2207 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 045 000
JAMES H & JOY ELISABETH WEBB
2209 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 046 000
CLAYTON LEE GREEN
2211 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 047 000
SHANE ONEILL
1760 CHILTON DR
ROSEVILLE CA 95747

476 280 048 000
PATRICK J & TONA LYNNE OBRIEN
2315 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 049 000
RONALD C BRETHERTON
2313 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 050 000
ROBERT S TALBOTT
2311 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 051 000
ROLAND C & CINDY D WRIGHT
2309 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 052 000
SOOK Y & KI S NAM
2307 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 053 000
MIRTA E ABEIJON
2305 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 054 000
GREGORY R & TERESA A FERGUSON
2303 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 055 000
DAVID W & ROSEMARIE HOWELL
2301 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 056 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 057 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 058 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 290 001 000
RICHARD LAWRENCE & KAREN L KELSO
2300 PROSPECT PARK DR
ROSEVILLE CA 95747

476 290 002 000
JEAN M NEILL
2302 PROSPECT POINT DR
ROSEVILLE CA 95747

476 290 003 000
MICHAEL G & CARMEN S PETERS
2304 PROSPECT POINT DR
ROSEVILLE CA 95747

476 290 004 000
MICHAEL REID & REBECCA MAE
ARNOLD
1751 EVERGREEN DR
ROSEVILLE CA 95747

476 290 005 000
SOLORIO
1749 EVERGREEN DR
ROSEVILLE CA 95747

476 290 006 000
TSAW S & YAYOUNG LIN
2026 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 007 000
DONALD P & JOYCE C ANDERSON
2024 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 008 000
MICHAEL & KARI ERICKSON
2022 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 009 000
WAYNE A & DONNA D EMERY
2020 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 077 000
SHARON L; CELIO
1748 EVERGREEN DR
ROSEVILLE CA 95747

476 290 078 000
VICTOR & NADEZHDA TIKHOMIROV
1750 EVERGREEN DR
ROSEVILLE CA 95747

476 300 001 000
DWIGHT ALLEN
1018 WAILEA WAY
ROSEVILLE CA 95747

476 300 002 000
WILBUR & NORMA REIMER
1016 WAILEA WAY
ROSEVILLE CA 95747

476 300 003 000
SEAN E & KATHLEEN G GOETZGER
1014 WAILEA WAY
ROSEVILLE CA 95747

476 300 004 000
STEPHEN G WAYMAN
1012 WAILEA WAY
ROSEVILLE CA 95747

476 300 005 000
HERMAN H & SUSAN J REDLICH
1010 WAILEA WAY
ROSEVILLE CA 95747

476 300 006 000
STEVEN DOUGLAS & DEBORAH ANEAS BUEHLER
1008 WAILEA WAY
ROSEVILLE CA 95747

476 300 007 000
AGNES LEE
1004 WAILEA WAY
ROSEVILLE CA 95747

476 300 008 000
MARY A STANTON
1000 WAILEA WAY
ROSEVILLE CA 95747

476 300 009 000
JASON J & VENUS A CARDA
804 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 010 000
FERNANDO & STEPHANIE CABRERA
806 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 011 000
ALFONSO J & KAREN L PEREZ
808 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 012 000
MICHAEL E & REBECCA L PARRE
809 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 013 000
ALEXANDER & PATRICE G FECANIN
807 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 014 000
BRIAN M & KRISTIN M SAWCHUK
805 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 015 000
THOMAS LEE & LAURA ANNE BUSTABADE
803 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 016 000
JOHN E & CHRISTY B BOUNDS
801 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 017 000
WAYNE ALBERT & LAURINE LEE LEWIS
1001 SHENENCOCK WAY
ROSEVILLE CA 95747

476 300 018 000
GAYLE CABLE
1003 SHENENCOCK WAY
ROSEVILLE CA 95747

476 300 019 000
DENNIS G MURANY
1005 SHENENCOCK WAY
ROSEVILLE CA 95747

476 300 031 000
LEO J JR & KATHY L MARIN
708 TROON CT
ROSEVILLE CA 95747

476 300 032 000
BRADON & TRACY D BRESNAHAN
706 TROON CT
ROSEVILLE CA 95747

476 300 033 000
STEVEN L DINESEN
704 TROON CT
ROSEVILLE CA 95747

476 300 034 000
JAMES A & CHRIS C GINTY
702 TROON CT
ROSEVILLE CA 95747

476 300 035 000
KEVIN D & MICHELLE CARTER PENNER
700 TROON CT
ROSEVILLE CA 95747

476 300 036 000
DARRELL L & MARILYN R KAFF
2340 HURLEY WAY #25
SACRAMENTO CA 95825

476 300 037 000
JOSHUA D RAUB
1003 WAILEA WAY
ROSEVILLE CA 95747

476 300 038 000
NADINE ANN CASSELLA
1005 WAILEA WAY
ROSEVILLE CA 95747

476 300 039 000
DANNY P & SUZANNE L NUNEZ
1007 WAILEA WAY
ROSEVILLE CA 95747

476 300 040 000
JAMES COOPER & SUSAN MAY ROBERTS
1009 WAILEA WAY
ROSEVILLE CA 95747

476 300 041 000
REBECCA M HARMAN
1011 WAILEA WAY
ROSEVILLE CA 95747

476 300 042 000
DEBORAH HOLLIS
1017 WAILEA WAY
ROSEVILLE CA 95747

476 300 044 000
KAUFMAN & BROAD OF SACRAMENTO
3300 DOUGLAS BLVD #300
ROSEVILLE CA 95661

476 310 001 000
DAVID & SABRINA BIRLEM
1028 WAILEA WAY
ROSEVILLE CA 95747

476 310 002 000
TRENT ERIK & KATHLEEN MARGAR JOHNSON
1026 WAILEA WAY
ROSEVILLE CA 95747

476 310 003 000
MILDRED C & ROBINSON B NUEVO
1024 WAILEA WAY
ROSEVILLE CA 95747

476 310 004 000
NOEL D & SUSAN J SHRUM
1022 WAILEA WAY
ROSEVILLE CA 95747

476 310 005 000
JOHN W GOODWIN
1020 WAILEA WAY
ROSEVILLE CA 95747

476 310 006 000
TODD S CRAWFORD
1019 WAILEA WAY
ROSEVILLE CA 95747

476 310 007 000
LINDSEY LEONARD
1021 WAILEA WAY
ROSEVILLE CA 95747

476 310 008 000
SHERRY L; EDGAR
1023 WAILEA WAY
ROSEVILLE CA 95747

476 310 009 000
NICHOLAS J & MERLE M GIBSON
1025 WAILEA WAY
ROSEVILLE CA 95747

476 310 010 000
TIMOTHY P & DEBRA M THRIFT
1405 LEGENDS WAY
ROSEVILLE CA 95747

476 310 011 000
EDWIN A & LEVY D SAGUCIO
201 WAILEA CT
ROSEVILLE CA 95747

476 310 012 000
ADRIENNE M SMITH
203 WAILEA CT
ROSEVILLE CA 95747

476 310 013 000
NORMA C GALLEGOS
205 WAILEA CT
ROSEVILLE CA 95747

476 310 014 000
EDWARD B BECKER
207 WAILEA CT
ROSEVILLE CA 95747

476 310 015 000
DANNY E & PAMELA L KEEN
209 WAILEA CT
ROSEVILLE CA 95747

476 310 016 000
CRISPIN A & NEJA M ASUNCION
211 WAILEA CT
ROSEVILLE CA 95747

476 310 017 000
L KENNETH & KATHLEEN E NEUTZ
213 WAILEA CT
ROSEVILLE CA 95747

476 310 018 000
SANGYONG PARK
212 WAILEA CT
ROSEVILLE CA 95747

476 310 019 000
GLENN R & COURTNEY YATES
210 WAILEA CT
ROSEVILLE CA 95747

476 310 020 000
FRANK & LEIGHANN JORDAN
208 WAILEA CT
ROSEVILLE CA 95747

476 310 021 000
HARVEY B PORTER III
206 WAILEA CT
ROSEVILLE CA 95747

476 310 022 000
LUKE B BURROUGHS
202 WAILEA CT
ROSEVILLE CA 95747

476 310 023 000
KAUFMAN & BROAD OF SACRAMENTO
3300 DOUGLAS BLVD #300
ROSEVILLE CA 95661

476 310 024 000
KAUFMAN & BROAD OF SACRAMENTO
3300 DOUGLAS BLVD #300
ROSEVILLE CA 95661

476 320 007 000
SUHAIR MELEHANI
1127 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 008 000
FRANCISCO RODRIGUEZ-RIVERA
1129 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 009 000
CHRIS MAROVICH
1131 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 010 000
MICHAEL & ERIN LOWE
700 GIBSON DR #623
ROSEVILLE CA 95678

476 320 011 000
TIMOTHY W & LISA M HEARL
1135 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 012 000
THOMAS E WARE
12540 CANYON WIND RD
RIVERSIDE CA 92503

476 320 013 000
STEVEN J & LYNDA L FIORAVANTI
1136 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 014 000
TIMOTHY JOHN WALSH
1134 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 015 000
JASON A MARTINEZ
1132 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 016 000
WILLARD A & DONNA M TODD
1130 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 017 000
EDWARD ROLDAN
1128 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 018 000
EDWARD & JULIA FARDOS
1126 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 019 000
GARY E & DONNA E ROSE
1124 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 020 000
GILBERT & CHARLOTTE LONZO
1122 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 021 000
COLLEEN G EDSON
1120 BROOKLINE CIR
ROSEVILLE CA 95747

476 340 001 000
SEWELL L KEETER
1407 LEGENDS WAY
ROSEVILLE CA 95747

476 340 002 000
TIMOTHY KENT & JULIA ANN HELMER
1409 LEGENDS WAY
ROSEVILLE CA 95747

476 340 003 000
TORE FINNEMYHR
402 PINE HEARST CT
ROSEVILLE CA 95747

476 340 004 000
BOYD R & JAN P WHITMAN
404 PINE HEARST CT
ROSEVILLE CA 95747

476 340 005 000
WILLIAM & AMY ADAM
406 PINE HEARST CT
ROSEVILLE CA 95747

476 340 006 000
JOHN D & PATRICIA M SNELL
408 PINE HEARST CT
ROSEVILLE CA 95747

476 340 007 000
SARAH M LAWSON
2581 CENTRAL AVE
ROSEVILLE CA 95747

476 340 008 000
TIMOTHY DEAN & TRACY ELIZABETH WILLIAMS
405 PINE HEARST CT
ROSEVILLE CA 95747

476 340 009 000
STEPHEN MATHAIS NEUMANN
403 PINE HEARST CT
ROSEVILLE CA 95747

476 340 010 000
MARY G & ALLEN J HOLLAND
401 PINE HEARST CT
ROSEVILLE CA 95747

476 340 045 000
TECHAU BRETT M
1139 BROOKLINE CIR
ROSEVILLE CA 95747

476 340 046 000
SARAH MARTINEZ
1138 BROOKLINE CIR
ROSEVILLE CA 95747

476 360 011 000
KEVIN V & THERESA L SMITH
506 FELTON CT
ROSEVILLE CA 95747

476 360 012 000
LINDA A ALLEN
505 FELTON CT
ROSEVILLE CA 95747

476 360 013 000
ERIC T & NICOLE HOWELLS
503 FELTON CT
ROSEVILLE CA 95747

476 360 014 000
CHARLES GREGORY & JULINDA K FOLAND
501 FELTON CT
ROSEVILLE CA 95747

476 360 015 000
MARK A & MARIANN C NELSON
1401 LAZENBY WAY
ROSEVILLE CA 95747

476 360 016 000
BRADLEY A & CHANA R BURCH
1403 LAZENBY WAY
ROSEVILLE CA 95747

476 360 017 000
MARK D & KRISTY R ROESE
1405 LAZENBY WAY
ROSEVILLE CA 95747

476 360 018 000
ELIZABETH Y & FRANK H JANOWITZ
1407 LAZENBY WAY
ROSEVILLE CA 95747

476 360 019 000
ROLAND E GARNER
1409 LAZENBY WAY
ROSEVILLE CA 95747

476 360 020 000
ALEXANDER D LOPEZ
2107 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 021 000
CLAUDIO A SILVA
2109 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 022 000
BONNIE G MEYER
56 MIDWAY ST
CAMPBELL CA 95008

476 360 023 000
GARY & TERESA P HYNES
2113 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 024 000
EMILY ELAINE ROTH
1234 CHENIN BLANC CIR
ROSEVILLE CA 95747

476 360 044 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 360 045 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 360 046 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 017 000
CATHERINE R DONOVAN
1419 LOCKHART WAY
ROSEVILLE CA 95747

476 380 018 000
DAVID J & MISTY L VIANI
1417 LOCKHART WAY
ROSEVILLE CA 95747

476 380 019 000
SANDRA L MARTINEZ
1415 LOCKHART WAY
ROSEVILLE CA 95747

476 380 020 000
MICHAEL H & PATRICIA RAMSEY
1413 LOCKHART WAY
ROSEVILLE CA 95747

476 380 021 000
PAUL MOCNY
1411 LOCKHART WAY
ROSEVILLE CA 95747

476 380 022 000
ERIK R & DEANNA L ALDRICH
1409 LOCKHART WAY
ROSEVILLE CA 95747

476 380 023 000
HENRY S YUN
101 GALSTON CT
ROSEVILLE CA 95747

476 380 024 000
STEVEN M & KAREN L HOLDERNESS
103 GALSTON CT
ROSEVILLE CA 95747

476 380 025 000
PATRICK G BACCARI
105 GALSTON CT
ROSEVILLE CA 95747

476 380 026 000
RICK W & PAMELA L BARTO
104 GALSTON CT
ROSEVILLE CA 95747

476 380 027 000
DANE D & DELLA P CABRAL
102 GALSTON CT
ROSEVILLE CA 95747

476 380 028 000
JACK SWEIGART
3434 MARCONI AVE #C
SACRAMENTO CA 95821

476 380 029 000
ROBIN MARIE LEONARD
201 EPWORTH CT
ROSEVILLE CA 95747

476 380 030 000
MARK J & JODI M TRUSCOTT
203 EPWORTH CT
ROSEVILLE CA 95747

476 380 031 000
AFTON L HARRINGTON
205 EPWORTH CT
ROSEVILLE CA 95747

476 380 032 000
KELLY D PECK
207 EPWORTH CT
ROSEVILLE CA 95747

476 380 033 000
DOUGLAS H & KATHY L FUNK
208 EPWORTH CT
ROSEVILLE CA 95747

476 380 034 000
DAWN WARRIOR
206 EPWORTH CT
ROSEVILLE CA 95747

476 380 035 000
VIRGINIA MARTINEZ
204 EPWORTH CT
ROSEVILLE CA 95747

476 380 036 000
ANH Q; PHAM
249 GREENDALE WAY #1
SAN JOSE CA 95129

476 380 037 000
JOHN & LISA MOLINEAUX
200 EPWORTH CT
ROSEVILLE CA 95747

476 380 038 000
JOSEPH A & JULIE R OLDHAM
2105 BECKENHAM WAY
ROSEVILLE CA 95747

476 380 039 000
MICHAEL J & SUZANNE E FUNK
302 CULLIGAN CT
ROSEVILLE CA 95747

476 380 040 000
JEROME M RYAN
306 CULLIGAN CT
ROSEVILLE CA 95747

476 380 041 000
JOHN JR VICENTE
308 CULLIGAN CT
ROSEVILLE CA 95747

476 380 042 000
J FELD DEFINED BENEFIT PLAN R
16666 BLUE OAK WAY
GRASS VALLEY CA 95949

476 380 043 000
RANDHER S & MANDIP K ATHWAL
307 CULLIGAN CT
ROSEVILLE CA 95747

476 380 044 000
PAUL J LEFRANCOIS
305 CULLIGAN CT
ROSEVILLE CA 95747

476 380 045 000
RAFAEL A MOLINA
303 CULLIGAN CT
ROSEVILLE CA 95747

476 380 046 000
JAMES ROBERT SEP IRA COURSHON
160 BOVET RD
SAN MATEO CA 94402

476 380 047 000
JEFFREY R & KATHLEEN M DUMONT
1410 LOCKHART WAY
ROSEVILLE CA 95747

476 380 048 000
WILLIAM KENT
1412 LOCKHART WAY
ROSEVILLE CA 95747

476 380 049 000
KENDRA K JUNK
1414 LOCKHART WAY
ROSEVILLE CA 95747

476 380 050 000
ANTONE G & PAULINE C CHRISTIE
1416 LOCKHART WAY
ROSEVILLE CA 95747

476 380 051 000
ERHARDT E KRAUSE
1418 LOCKHART WAY
ROSEVILLE CA 95747

476 380 078 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 079 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 430 001 000
DARCI PACKER
1400 RAEBURN WAY
ROSEVILLE CA 95747

476 430 002 000
RUTH A MOORE-TINER
2102 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 003 000
STEPHEN HODSON
2104 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 004 000
JAMES & MAUREEN ELIZABETH
PAGONIS
2106 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 005 000
DARREN M & KELLI L MCINTYRE
2108 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 006 000
NOBLE & TAMMMY BARTON III
2110 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 007 000
DENNIS & KAMELIA MCDERMIT
2112 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 008 000
LUIS A JR & DANYAIL L SOTOMAYOR
2114 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 009 000
BRENT CHARLES & HEIDI LYN MASSEY
2116 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 010 000
BRUCE FANCHER
103 STOFFELS CT
ROSEVILLE CA 95747

476 430 011 000
SEAN L BROEDER
1243 HENDERSON AVE #E
SUNNYVALE CA 94086

476 430 012 000
PAUL E MOCNY
2105 STOFFELS WAY
ROSEVILLE CA 95747

476 430 013 000
MICHAEL E HARPER
2103 STOFFELS WAY
ROSEVILLE CA 95747

476 430 014 000
MICHAEL R EDWARDS
2101STOFFELS WAY
ROSEVILLE CA 95747

476 430 015 000
JOHN T IKEDA
2102 STOFFELS WAY
ROSEVILLE CA 95747

476 430 016 000
GLEN E & JANICE L WILLIAMSON
2104 STOFFELS WAY
ROSEVILLE CA 95747

476 430 017 000
MARK & TAMMY HATCH
3105 ACTON WAY
ROSEVILLE CA 95747

476 430 018 000
GERALD W JR & MICHELLE J WILSON
2107 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 019 000
JEFFREY A & JENNIFER L MARTIN
2105 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 020 000
JOSEPH & JULIE RAPOSA
2103 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 021 000
CHRIS M & DEBORA G LUTHER
2101 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 022 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 460 001 000
DONALD L ROBINSON
1453 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 002 000
RANDHIR S & KAMALJIT DHANJAL
1449 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 003 000
JAY M & KRISTEN L DESIMONE
1445 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 004 000
KRIZ
1437 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 005 000
LAURA L GONDEK
1421 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 006 000
KEVIN P & PAMELA LONG
1417 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 007 000
STEVEN W & SANDRA L KING
1413 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 008 000
FRANK & BRENDA D TENEDORA
104 CORRIGAN CT
ROSEVILLE CA 95747

476 460 009 000
DAVID B & PHYLLIS A LEMAY
108 CORRIGAN CT
ROSEVILLE CA 95747

476 460 010 000
THOMAS P & GIDG MAGGIANO
112 CORRIGAN CT
ROSEVILLE CA 95747

476 460 011 000
SCOTT A & THERESA A MILLSPAUGH
113 CORRIGAN CT
ROSEVILLE CA 95747

476 460 012 000
TIMOTHY & LISA PARKER
109 CORRIGAN CT
ROSEVILLE CA 95747

476 460 013 000
JOHN THOMAS CONNEALLY
105 CORRIGAN CT
ROSEVILLE CA 95747

476 460 014 000
BARBARA N PAXSON
101 CORRIGAN CT
ROSEVILLE CA 95747

476 460 015 000
CHRIS J & WENDY R MONIZ
1400 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 016 000
SHERYL A LEE
1404 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 017 000
PETER J RADER
1408 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 018 000
JOSEPH A & JODI J KURTZ
1412 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 019 000
KIMIKO LESLEY KIDO
1416 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 020 000
MAUREEN D BROI
1420 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 021 000
JOHN K & DIANE C NOEL
1424 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 022 000
VIANEY O & BARBARA L SANTIBANEZ
1428 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 023 000
HAROLD A & JENNIFER L MICHAUD
1432 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 024 000
JEFFREY K LINEGAR
1436 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 025 000
ROGER & KAREN A MOORE
1440 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 026 000
COLLEEN L SUTHERLIN
1444 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 027 000
FERNANDO F & CHERYL A HUIZAR
1448 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 028 000
JOE A STONE
1452 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 029 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

476 460 030 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

476 460 031 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

476 460 032 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

477 100 007 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 100 009 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 100 016 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 110 004 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 110 005 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 110 006 000
WOODCREEK ROSEVILLE LTD
3007 DOUGLAS BLVD #170
ROSEVILLE CA 95661

477 110 009 000
RALPHS GROCERY COMPANY
1100 W ARTESIA BLVD
COMPTON CA 90220

477 110 010 000
WOODCREEK LLC BLE
660 COMMERCE DR #A
ROSEVILLE CA 95678

477 110 011 000
WOODCREEK LLC BLE
660 COMMERCE DR #A
ROSEVILLE CA 95678

477 110 012 000
WOODCREEK LLC BLE
660 COMMERCE DR #A
ROSEVILLE CA 95678

477 141 001 000
MERLE R & MARGARET S SHIELDS
5313 NAVIGATION CT
FAIR OAKS CA 95628

477 141 002 000
THOMAS & MARGARET C MCCLEARY
1005 DANIELLE DR
ROSEVILLE CA 95747

477 141 003 000
DOUG & CHERYL ANDERSON
201 TRAVIS CT
ROSEVILLE CA 95747

477 141 004 000
CATHRYN M ROMMEL
205 TRAVIS CT
ROSEVILLE CA 95747

477 141 005 000
MICHAEL T & MICHELLE L ANDERSON
204 TRAVIS CT
ROSEVILLE CA 95747

477 141 006 000
JOHN C & MARTHA J VOSS
1013 DANIELLE DR
ROSEVILLE CA 95747

477 141 007 000
ERIC M & REGINE K BEHR
1017 DANIELLE DR
ROSEVILLE CA 95747

477 141 008 000
SCOTT H & APRIL M EDWARDS
1021 DANIELLE DR
ROSEVILLE CA 95747

477 141 009 000
MICHAEL D & JAN J FRANKS
1025 DANIELLE DR
ROSEVILLE CA 95747

477 141 010 000
KYLE & ARLENE JOHNSON
405 JOSHUA CT
ROSEVILLE CA 95747

477 141 011 000
ROBERT & KRISTIN MCCARTHY
407 JOSHUA CT
ROSEVILLE CA 95747

477 141 012 000
JAMES & DENISE B LOUDAROS
409 JOSHUA CT
ROSEVILLE CA 95747

477 141 013 000
LYLE D & KANDYCE D SCHNEIDER
404 JOSHUA CT
ROSEVILLE CA 95747

477 141 014 000
JOHN & RUDINA LOUDAROS
1029 DANIELLE DR
ROSEVILLE CA 95747

477 141 015 000
PRADEEP K & VRUSHALI TAPADIYA
1033 DANIELLE DR
ROSEVILLE CA 95747

477 141 016 000
RODNEY W LEE
1037 DANIELLE DR
ROSEVILLE CA 95747

477 141 017 000
ANNETTE R MORAN
1041 DANIELLE DR
ROSEVILLE CA 95747

477 141 018 000
DAVID C & DONNA J MESSER
1032 DANIELLE DR
ROSEVILLE CA 95747

477 141 019 000
STEVEN D & SUSAN F HALL
1028 DANIELLE DR
ROSEVILLE CA 95747

477 141 020 000
DANIEL HERNANDEZ
505 DANIELLE CT
ROSEVILLE CA 95747

477 141 021 000
SILVER
509 DANIELLE CT
ROSEVILLE CA 95747

477 141 022 000
JOAN E ENGLISH
504 DANIELLE CT
ROSEVILLE CA 95747

477 141 023 000
GEORGE A JR & JOSEPHINE M VALINE
500 DANIELLE CT
ROSEVILLE CA 95747

477 141 024 000
FRANKLIN D FLETCHER
301 DILLON CT
ROSEVILLE CA 95747

477 141 025 000
DOUGLAS & ALICIA NODA
305 DILLON CT
ROSEVILLE CA 95747

477 141 026 000
STERLING D & TAMRA L RAGER
304 DILLON CT
ROSEVILLE CA 95747

477 141 027 000
MARY ELLEN MATTHIAS
7444 GOOSE MEADOWS WAY
ROSEVILLE CA 95747

477 141 028 000
BILLY K & VIRGINIA KNIGHT
101 ZACHARY CT
ROSEVILLE CA 95747

477 141 029 000
MICHAEL & KELLY THOMPSON
105 ZACHARY CT
ROSEVILLE CA 95747

477 141 030 000
RICHARD K FOGARTY
112 ZACHARY CT
ROSEVILLE CA 95747

477 141 031 000
JONES
108 ZACHARY CT
ROSEVILLE CA 95747

477 141 032 000
JAMES J & JENNIFER S DEMARIA
104 ZACHARY CT
ROSEVILLE CA 95747

477 141 033 000
JERRY C & BRENDA C JUST
100 ZACHARY CT
ROSEVILLE CA 95747

477 141 034 000
DAVID B & KATHERINE R JONES
1004 DANIELLE DR
ROSEVILLE CA 95747

477 141 035 000
RICKY P & CAROLYN L BROWN
1000 DANIELLE DR
ROSEVILLE CA 95747

477 141 036 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 141 037 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 141 038 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 151 001 000
EUNICE M PRESCOTT
1045 DANIELLE DR
ROSEVILLE CA 95747

477 151 002 000
MARK T & LINDA A JOHNSON
1049 DANIELLE DR
ROSEVILLE CA 95747

477 151 003 000
HARRY F JR & DEBORAH J BRANDT
1053 DANIELLE DR
ROSEVILLE CA 95747

477 151 004 000
GENEVIEVE M VALLENARI
1057 DANIELLE DR
ROSEVILLE CA 95747

477 151 005 000
RONALD R & JANET A ROBINETTE
1061 DANIELLE DR
ROSEVILLE CA 95747

477 151 016 000
ALAN V & MARISA C PARAS
1260 MERCEDES DR
ROSEVILLE CA 95747

477 151 017 000
JOAN I HOLMBERG
1256 MERCEDES DR
ROSEVILLE CA 95747

477 151 018 000
PETER O & JAYNE L TINOCO
1252 MERCEDES DR
ROSEVILLE CA 95747

477 151 019 000
ROBERT DAY
1248 MERCEDES DR
ROSEVILLE CA 95747

477 151 020 000
ELLIOTT MAX/C 1990 TRUST
1244 MERCEDES DR
ROSEVILLE CA 95747

477 151 021 000
MARVIN G & LULA M BROWN
1240 MERCEDES DR
ROSEVILLE CA 95747

477 151 022 000
LORRAINE GAJSEK
1236 MERCEDES DR
ROSEVILLE CA 95747

477 151 023 000
GREGORY S & SANDRA A NEWLAND
1232 MERCEDES DR
ROSEVILLE CA 95747

477 151 024 000
MARCIA A SUMPTER
1228 MERCEDES DR
ROSEVILLE CA 95747

477 151 025 000
JOHN G & LAURA L OREILLY II
1224 MERCEDES DR
ROSEVILLE CA 95747

477 151 026 000
JAMES E SUTTON
21722 SALUDA CIR
HUNTINGTON BEACH CA 92646

477 151 027 000
WILLIAM L JR & KAREN L CLEMENTS
1216 MERCEDES DR
ROSEVILLE CA 95747

477 151 028 000
DIETRICH & DIANE BUSING
1212 MERCEDES DR
ROSEVILLE CA 95747

477 151 029 000
WILLIAM P & MARGARET M WALSH
1208 MERCEDES DR
ROSEVILLE CA 95747

477 151 030 000
MARY L STUART SEIGENFELD
1300 RETREAT WAY
ROSEVILLE CA 95747

477 151 031 000
TOM & LEISA HOOD
1304 RETREAT WAY
ROSEVILLE CA 95747

477 151 032 000
ANTON J & GLORIA A HOLICEK
1201 MERCEDES DR
ROSEVILLE CA 95747

477 151 033 000
JAMES W & JOYCE ANN DAVIS
1205 MERCEDES DR
ROSEVILLE CA 95747

477 151 034 000
BRIAN D & KRISTIN S EISENLAUER
1209 MERCEDES DR
ROSEVILLE CA 95747

477 151 035 000
EDWARD K & KWANG J JANG
1217 MERCEDES DR
ROSEVILLE CA 95747

477 151 036 000
FREDERICK & CAMILLA SAHLBERG
1221 MERCEDES DR
ROSEVILLE CA 95747

477 151 037 000
JEFFREY M & JACQUELINE H TAUBMAN
1225 MERCEDES DR
ROSEVILLE CA 95747

477 151 038 000
CHAROLETTE A LONG
1237 MERCEDES DR
ROSEVILLE CA 95747

477 151 039 000
MARIO D & TERESA L SOLORIO
1249 MERCEDES DR
ROSEVILLE CA 95747

477 151 040 000
CHARLES E DENONN
1253 MERCEDES DR
ROSEVILLE CA 95747

477 151 041 000
JIWEI HUANG
5480 SHATTUCK AVE
FREMONT CA 94555

477 151 042 000
HARRY B & ELLEN A RAUCH
1092 DANIELLE DR
ROSEVILLE CA 95747

477 151 043 000
BRIAN A & KRISTINA SJOSTRAND
1088 DANIELLE DR
ROSEVILLE CA 95747

477 151 044 000
ROBERT H & DRENA A KOZLOWSKI
PO BOX 1244
ROSEVILLE CA 95678

477 151 045 000
TONI M & DAVID S FERRELL
705 DEAN CT
ROSEVILLE CA 95747

477 151 046 000
ROBERT L & VALERIE L BOUGHNER
709 DEAN CT
ROSEVILLE CA 95747

477 151 047 000
KRISHAN & PAO CHAUHAN
708 DEAN CT
ROSEVILLE CA 95747

477 151 048 000
ERIC S & CYNTHIA S RICHARDS
704 DEAN CT
ROSEVILLE CA 95747

477 151 049 000
DENNIS W & BEVERLY J BERG
700 DEAN CT
ROSEVILLE CA 95747

477 151 050 000
VASILE & MARGAR CINDEA
1320 RETREAT WAY
ROSEVILLE CA 95747

477 151 051 000
GREGORY L & KIMBERLY A KEIGHLEY
1316 RETREAT WAY
ROSEVILLE CA 95747

477 151 052 000
CRAIG J CASTAGNALI
1312 RETREAT WAY
ROSEVILLE CA 95747

477 151 053 000
MATT M & DONNA FAUBERT
1301 RETREAT WAY
ROSEVILLE CA 95747

477 151 054 000
CLEVELAND
1305 RETREAT WAY
ROSEVILLE CA 95747

477 151 055 000
RODNEY & TERRY FUNKE
605 MERCEDES CT
ROSEVILLE CA 95747

477 151 056 000
FRANCES C ECKOWITZ
609 MERCEDES CT
ROSEVILLE CA 95747

477 151 057 000
JOHN L & JANE M HOGG
608 MERCEDES CT
ROSEVILLE CA 95747

477 151 058 000
ORA B KING
604 MERCEDES CT
ROSEVILLE CA 95747

477 151 059 000
JEROLD L & DEBORAH L DOUGAL
1309 RETREAT WAY
ROSEVILLE CA 95747

477 151 060 000
JEANNIE D NOLL
1313 RETREAT WAY
ROSEVILLE CA 95747

477 151 061 000
GARY A & CATHERINE PORS
1056 DANIELLE DR
ROSEVILLE CA 95747

477 151 062 000
MARK A & JEAN A LACHER
1052 DANIELLE DR
ROSEVILLE CA 95747

477 151 063 000
DANIEL J TUBRIDY
1048 DANIELLE DR
ROSEVILLE CA 95747

477 151 064 000
STEPHEN W & DEBRA WILCOXSCHIMK
SCHIMKE
1044 DANIELLE DR
ROSEVILLE CA 95747

477 151 065 000
MICHAEL P & LAURA A BERNAUER
1036 DANIELLE DR
ROSEVILLE CA 95747

477 151 066 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 151 067 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 151 068 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 180 007 000
GAIL LYNN LANTRIP
1618 STEINBECK DR
ROSEVILLE CA 95747

477 180 008 000
IRENE M LEWIS
1616 STEINBECK DR
ROSEVILLE CA 95747

477 180 009 000
DEAN D & ROCHELLE M LAROCCA
1614 STEINBECK DR
ROSEVILLE CA 95747

477 180 010 000
DENIS STEELE
1564 STEINBECK DR
ROSEVILLE CA 95747

477 180 011 000
SCOTT W & SHARON M NICHOLSON
1562 STEINBECK DR
ROSEVILLE CA 95747

477 180 012 000
PHILIP & PAMELA D MARCHESE
1560 STEINBECK DR
ROSEVILLE CA 95747

477 180 046 000
MARTHA GOEPFERT
1508 DICKINSON DR
ROSEVILLE CA 95747

477 180 047 000
ROBIE P & MARIA A FEARN
1506 DICKINSON DR
ROSEVILLE CA 95747

477 180 048 000
JOHN & EUGENIA KRULJAC
1504 DICKINSON DR
ROSEVILLE CA 95747

477 180 049 000
ERIC OVERSTEG
1502 DICKINSON DR
ROSEVILLE CA 95747

477 180 051 000
ROBERT J & CAROL F WINKLER
1559 STEINBECK DR
ROSEVILLE CA 95747

477 180 052 000
LAWRENCE W BEAN
1561 STEINBECK DR
ROSEVILLE CA 95747

477 180 053 000
STEVEN T & PAMELA M POWELL
1563 STEINBECK DR
ROSEVILLE CA 95747

477 180 054 000
THO HUYNH
307 TARKINGTON CT
ROSEVILLE CA 95747

477 180 055 000
RONALD D HAWTHRONE
309 TARKINGTON CT
ROSEVILLE CA 95747

477 180 056 000
JOHNNY V & JACQUELINE A RAMIREZ
308 TARKINGTON CT
ROSEVILLE CA 95747

477 180 057 000
RICHARD D JR & LYNN M WILKIE
1511 MICHENER DR
ROSEVILLE CA 95747

477 180 058 000
KATHIE L WELDY
1513 MICHENER DR
ROSEVILLE CA 95747

477 180 059 000
NOAH P & KIMBERLY N SCHMITZ
3617 SAN SONITA PL
SANTA ROSA CA 95403

477 180 060 000
NATHAN M & PENNY S SNELL
1517 MICHENER DR
ROSEVILLE CA 95747

477 180 070 000
LYNDA M RISUCCI
1534 MICHENER DR
ROSEVILLE CA 95747

477 180 071 000
KATHY A BARSOTTI
1532 MICHENER DR
ROSEVILLE CA 95747

477 180 072 000
JOE HALLER
1530 MICHENER DR
ROSEVILLE CA 95747

477 180 073 000
STEPHEN F & JENNIFER BAKER
1528 MICHENER DR
ROSEVILLE CA 95747

477 180 074 000
GARY & LYNETTE HARRIMAN
1526 MICHENER DR
ROSEVILLE CA 95747

477 180 075 000
MAURICE T & BARBARA MAHAN III
1524 MICHENER DR
ROSEVILLE CA 95747

477 180 076 000
KEVIN J & JULIE A BREAULT
401 SHIVELEY CT
ROSEVILLE CA 95747

477 180 078 000
MICHAEL & TANYA GIANOTTI
407 SHIVELEY CT
ROSEVILLE CA 95747

477 180 079 000
MICHAEL MILLER
409 SHIVELEY CT
ROSEVILLE CA 95747

477 180 080 000
GARY HAMILTON
411 SHIVELEY CT
ROSEVILLE CA 95747

477 180 081 000
ANTHONY MARC & LISA U FERRARA
413 SHIVELEY CT
ROSEVILLE CA 95747

477 180 082 000
DANNY E & GRACE M VINCENT
1613 STEINBECK DR
ROSEVILLE CA 95747

477 180 083 000
DEAN D & ROCHELLE M LAROCCA
1615 STEINBECK DR
ROSEVILLE CA 95747

477 180 084 000
KEVIN J & JULIE A BREAULT
401 SHIVELEY CT
ROSEVILLE CA 95747

477 180 085 000
RONNIE R MASCIOVECCHIO
405 SHIVELEY CT
ROSEVILLE CA 95747

477 190 001 000
BRADLEY J & CARRIE L VINCENT
1612 STEINBECK DR
ROSEVILLE CA 95747

477 190 002 000
VIVIAN MARGULEAS
110 PARK RD #403
BURLINGAME CA 94010

477 190 003 000
KEVIN E STEVENS
1608 STEINBECK DR
ROSEVILLE CA 95747

477 190 004 000
RONALD G & VICKIE C LEATHERS
201 CRANE CT
ROSEVILLE CA 95747

477 190 005 000
LARRY S & KARLA D MORLAN
203 CRANE CT
ROSEVILLE CA 95747

477 190 006 000
ROBERT M & TANJA M BITTLE
202 CRANE CT
ROSEVILLE CA 95747

477 190 007 000
JOHN T & BETH J MCKINNEY
1606 STEINBECK DR
ROSEVILLE CA 95747

477 190 008 000
SAUL & KIM M LUNA
1604 STEINBECK DR
ROSEVILLE CA 95747

477 190 009 000
ANTHONY J LOPEZ
1602 STEINBECK DR
ROSEVILLE CA 95747

477 190 010 000
TODD A & ALESIA K WOLF
1600 STEINBECK DR
ROSEVILLE CA 95747

477 190 011 000
BRIAN C & JAIME PHILLIPS
1598 STEINBECK DR
ROSEVILLE CA 95747

477 190 012 000
DANNY J JACOBO
1596 STEINBECK DR
ROSEVILLE CA 95747

477 190 013 000
ZACHARY BENNETT
1594 STEINBECK DR
ROSEVILLE CA 95747

477 190 014 000
DEAN C CANADA
1592 STEINBECK DR
ROSEVILLE CA 95747

477 190 015 000
SVETLANA MKHITARIAN
1590 STEINBECK DR
ROSEVILLE CA 95747

477 190 016 000
GARY L & JEANETTE PATBURG
8785 LOS LAGOS CIR S
GRANITE BAY CA 95746

477 190 017 000
JAMES SARMENTO
415 MOANA WAY
PACIFICA CA 94044

477 190 018 000
JACQUELINE S KAUFMAN
1584 STEINBECK DR
ROSEVILLE CA 95747

477 190 019 000
DERON R & DONNA; YOUNG
1582 STEINBECK DR
ROSEVILLE CA 95747

477 190 020 000
DANNY & STEPHANIE GARCIA
1580 STEINBECK DR
ROSEVILLE CA 95747

477 190 021 000
GAIL A CHANDLER
1578 STEINBECK DR
ROSEVILLE CA 95747

477 190 022 000
MICHAEL L & LYNN RODRIAN
1576 STEINBECK DR
ROSEVILLE CA 95747

477 190 023 000
JAMES S & MAUREEN S RING
1574 STEINBECK DR
ROSEVILLE CA 95747

477 190 024 000
LARRY G WILLIAMS
101 DU MAURIER CT
ROSEVILLE CA 95747

477 190 025 000
ERIC C & JILL K HOLM
103 DU MAURIER CT
ROSEVILLE CA 95747

477 190 026 000
BRIAN M & AIMEE L GLYNN
102 DU MAURIER CT
ROSEVILLE CA 95747

477 190 027 000
DAVID A JOLLEY
1572 STEINBECK DR
ROSEVILLE CA 95747

477 190 028 000
JAMES D & CINDY D PERRY
1570 STEINBECK DR
ROSEVILLE CA 95747

477 190 029 000
KENNETH D & RENE A PERKETT
1568 STEINBECK DR
ROSEVILLE CA 95747

477 190 030 000
PETER J HUBIK
1566 STEINBECK DR
ROSEVILLE CA 95747

477 190 031 000
FERNANDO & SHELLEY L ALVAREZ
1565 STEINBECK DR
ROSEVILLE CA 95747

477 190 032 000
THEODORE A & DIANE K CONRAD
1567 STEINBECK DR
ROSEVILLE CA 95747

477 190 033 000
HARRISON HONGSHE & SHEILA SHIN WANG
1569 STEINBECK DR
ROSEVILLE CA 95747

477 190 034 000
CRAIG & JENNIFER COX
1573 STEINBECK DR
ROSEVILLE CA 95747

477 190 035 000
FOREST JAMES JR & JEAN M TRACY
1577 STEINBECK DR
ROSEVILLE CA 95747

477 190 036 000
KENNETH MATSUMOTO
303 TARKINGTON CT
ROSEVILLE CA 95747

477 190 037 000
DARLENE A ANGANES
305 TARKINGTON CT
ROSEVILLE CA 95747

477 190 038 000
RICHARD D & JULIE A POON
306 TARKINGTON CT
ROSEVILLE CA 95747

477 190 039 000
PETER K MARTIN
304 TARKINGTON CT
ROSEVILLE CA 95747

477 190 040 000
MARGARET L GROSELY
302 TARKINGTON CT
ROSEVILLE CA 95747

477 190 041 000
LINDA ROSE ALLMENDINGER
1581 STEINBECK DR
ROSEVILLE CA 95747

477 190 042 000
KENNETH C & PATRICIA D GERMAN
1583 STEINBECK DR
ROSEVILLE CA 95747

477 190 043 000
CHRISTOPHER S & DARCIE A PANKRATZ
1585 STEINBECK DR
ROSEVILLE CA 95747

477 190 044 000
MANUEL & MARYANNE MANITTA
1505 MICHENER DR
ROSEVILLE CA 95747

477 190 045 000
GERALD M & PATRICIA M KEELTY
1507 MICHENER DR
ROSEVILLE CA 95747

477 190 046 000
THEODORE E & DEBRA ANN KEITH
1509 MICHENER DR
ROSEVILLE CA 95747

477 190 047 000
ROLF M & CARRIE L HOEHENRIEDER
414 SHIVELEY CT
ROSEVILLE CA 95747

477 190 048 000
KENNETH A & JOANNE GORDON
412 SHIVELEY CT
ROSEVILLE CA 95747

477 190 049 000
JAMES M & RONDI M ANDERSON
410 SHIVELEY CT
ROSEVILLE CA 95747

477 190 050 000
PATRICK J & SUSAN D OBRIEN
408 SHIVELEY CT
ROSEVILLE CA 95747

477 190 051 000
DAVID C KRUGLE
406 SHIVELEY CT
ROSEVILLE CA 95747

477 190 052 000
DON & DENISE ZEBRAK
404 SHIVELEY CT
ROSEVILLE CA 95747

477 190 053 000
THOMAS J & SANDRA L DUVALL
402 SHIVELEY CT
ROSEVILLE CA 95747

477 190 054 000
DEVON & SUZANNE GIBBONS
400 SHIVELEY CT
ROSEVILLE CA 95747

477 190 055 000
JOHN A & ANGELA M LUJAN
1506 MICHENER DR
ROSEVILLE CA 95747

477 190 056 000
JOSH & RONDA LEUTY
1587 STEINBECK DR
ROSEVILLE CA 95747

477 190 057 000
DONNA BURNETT
1511 VERBENA WAY
ROSEVILLE CA 95747

477 190 058 000
ERNESTINE L ZIMMERLY
1591 STEINBECK DR
ROSEVILLE CA 95747

477 190 059 000
DANIEL & MIYUKI SCHMOOCK
1593 STEINBECK DR
ROSEVILLE CA 95747

477 190 060 000
RUSSELL H & ADA A PHILLIPS
1595 STEINBECK DR
ROSEVILLE CA 95747

477 190 061 000
RICHARD C & JULIE A GOULAS
1597 STEINBECK DR
ROSEVILLE CA 95747

477 190 062 000
MICHAEL J & JOY M NORGARD
340 S 20TH ST
SAN JOSE CA 95116

477 190 063 000
MICHAEL A PAGE
1601 STEINBECK DR
ROSEVILLE CA 95747

477 190 064 000
ANDRES BERRIOS
1605 STEINBECK DR
ROSEVILLE CA 95747

477 190 065 000
PETER B AMES
1607 STEINBECK DR
ROSEVILLE CA 95747

477 190 066 000
WILLIAM D & JANA S LEDOUX
1609 STEINBECK DR
ROSEVILLE CA 95747

477 190 067 000
JAMES L & SANDI R FRANCIS
1611 STEINBECK DR
ROSEVILLE CA 95747

477 190 068 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 190 069 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 350 004 000
KENNETH L & KARI J TAGGARD
901 SPILLANE CT
ROSEVILLE CA 95747

477 350 005 000
RICHARD T & ELIZABETH J MAU
903 SPILLANE CT
ROSEVILLE CA 95747

477 350 006 000
MARGIT M TIELMAN
905 SPILLANE CT
ROSEVILLE CA 95747

477 350 007 000
ELIZABETH CERVANTES
904 SPILLANE CT
ROSEVILLE CA 95747

477 350 008 000
KEVIN J DEES
PO BOX 311
MENDHAM NJ 07945

477 350 009 000
CHRIS D & MICHELLE L KEIM
900 SPILLANE CT
ROSEVILLE CA 95747

477 350 010 000
MICHAEL J & DIANNE GOMEZ
801 MITCHELL CT
ROSEVILLE CA 95747

477 350 011 000
MICHAEL S ABBOTT
805 MITCHELL CT
ROSEVILLE CA 95747

477 350 012 000
MARSHALL D & VALARIE A BLISS
804 MITCHELL CT
ROSEVILLE CA 95747

477 350 013 000
SUSAN MARY MCLANAHAN
802 MITCHELL CT
ROSEVILLE CA 95747

477 350 014 000
SCOTT B & RONDA OTSUKA
800 MITCHELL CT
ROSEVILLE CA 95747

477 550 001 000
ROBERT A & RONILYN HARTLEY
425 SUNNINGDALE CT
ROSEVILLE CA 95747

477 550 002 000
MITCHELL D & LESLIE K KINDRED
1512 EUREKA RD #120
ROSEVILLE CA 95661

477 550 003 000
MARK Y & KARI L UMEDA
424 SUNNINGDALE CT
ROSEVILLE CA 95747

477 550 004 000
GREGG E & DIANE M SWEARINGEN
416 SUNNINGDALE CT
ROSEVILLE CA 95747

477 550 005 000
JASPAL & PARAMJIT K DHANOTA
1650 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 006 000
JAY J & ROBIN ANDERSON
1658 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 007 000
TOM S & LORI S BARIL
1760 AINSDALE DR
ROSEVILLE CA 95747

477 550 008 000
MEI LIN LIU
1752 AINSDALE DR
ROSEVILLE CA 95747

477 550 009 000
DOUGLAS W & JACQUELIN A BURRIS
1744 AINSDALE DR
ROSEVILLE CA 95747

477 550 010 000
LANDIS C & REIKO GARMAN II
1736 AINSDALE DR
ROSEVILLE CA 95747

477 550 011 000
JOE & FRANCESCA WILLIAMS
1737 AINSDALE DR
ROSEVILLE CA 95747

477 550 012 000
FRANCIS HUCK
1745 AINSDALE DR
ROSEVILLE CA 95747

477 550 013 000
MICHAEL & LINDA CHU
1753 AINSDALE DR
ROSEVILLE CA 95747

477 550 014 000
WILLIAM C & LEAH M BRUMFIELD
1761 AINSDALE DR
ROSEVILLE CA 95747

477 550 015 000
DONALD MARTIN & MARGARET E KUNDLE
1769 AINSDALE DR
ROSEVILLE CA 95747

477 550 016 000
JAMES & GENEVIVE FARRELL
301 AINSDALE CT
ROSEVILLE CA 95747

477 550 017 000
BRAD J & DARLENE L HELM
309 AINSDALE CT
ROSEVILLE CA 95747

477 550 018 000
MARK EDWARD & JANEL MARIE COX
317 AINSDALE CT
ROSEVILLE CA 95747

477 550 019 000
JAMES E & KATHY A CALDWELL
325 AINSDALE CT
ROSEVILLE CA 95747

477 550 020 000
SCOTT C & MECCA SMITH
333 AINSDALE CT
ROSEVILLE CA 95747

477 550 021 000
ROBIN N & CATHERINE F HALL
341 AINSDALE CT
ROSEVILLE CA 95747

477 550 022 000
JILL MARIE WALDVOGEL
348 AINSDALE CT
ROSEVILLE CA 95747

477 550 023 000
FELIPE A & JOSEPHINE R RAFAEL
340 AINSDALE CT
ROSEVILLE CA 95747

477 550 024 000
DANIEL K & SHARON K GOETZMAN
332 AINSDALE CT
ROSEVILLE CA 95747

477 550 025 000
WILLIAM D & CINDY L HORNER
324 AINSDALE CT
ROSEVILLE CA 95747

477 550 026 000
ROBERT & JANA GOIN
316 AINSDALE CT
ROSEVILLE CA 95747

477 550 027 000
ALEXANDER P & LARISA MIKITYUK
308 AINSDALE CT
ROSEVILLE CA 95747

477 550 028 000
JAMES SCOTT UREN
300 AINSDALE CT
ROSEVILLE CA 95747

477 550 029 000
STEVEN & KITTY VOIGT
1674 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 030 000
JEFFREY L NIMMO
1659 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 031 000
PHILIP D RITTENHOUSE
1667 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 032 000
GREGGORY RANDALL & VIVIAN HUFFMAN
1675 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 033 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 550 034 000
WINNCREST HOMES II HOMEOWNERS

477 560 001 000
ADAM B & RENEE A PILOT
1729 AINSDALE DR
ROSEVILLE CA 95747

477 560 002 000
ROGER A & JULIE K JOHNSON
200 IRONSTONE CT
ROSEVILLE CA 95747

477 560 003 000
BLANCHE ERNEST
208 IRONSTONE CT
ROSEVILLE CA 95747

477 560 004 000
ANDRES & CATHERINE L LANGER
209 IRONSTONE CT
ROSEVILLE CA 95747

477 560 005 000
STEPHEN E; HORVATH
1705 AINSDALE DR
ROSEVILLE CA 95747

477 560 006 000
MARC T & JOANNE N HIGGINS
1689 AINSDALE DR
ROSEVILLE CA 95747

477 560 007 000
LAWRENCE ANTHONY & LESLIE OHER RUGH
1673 AINSDALE DR
ROSEVILLE CA 95747

477 560 008 000
DAVID R & SUSAN E MAGGI
1657 AINSDALE DR
ROSEVILLE CA 95747

477 560 009 000
BRIAN L & MARSHA HAFSTROM BENSON
100 HESKETH CT
ROSEVILLE CA 95747

477 560 010 000
MATTHEW P & DEBRA S HARRIS
108 HESKETH CT
ROSEVILLE CA 95747

477 560 011 000
ROBERT D FREDERICK
116 HESKETH CT
ROSEVILLE CA 95747

477 560 012 000
BRION F DANIELS
125 HESKETH CT
ROSEVILLE CA 95747

477 560 013 000
MABEL R ESTEVESVELAZQUEZ
117 HESKETH CT
ROSEVILLE CA 95747

477 560 014 000
JOHN A & AMY E HALTOM
109 HESKETH CT
ROSEVILLE CA 95747

477 560 015 000
OLIVIA & MALCOM WILLIAMSON
101 HESKETH CT
ROSEVILLE CA 95747

477 560 016 000
THERON & ESTHER R CALDIE
1600 AINSDALE DR
ROSEVILLE CA 95747

477 560 017 000
MICHAEL J & LAURA L PIANA
1608 AINSDALE DR
ROSEVILLE CA 95747

477 560 018 000
GALE D & NANCY L PATRICK
1616 AINSDALE DR
ROSEVILLE CA 95747

477 560 019 000
JAMES MARTIN & LAURA P BOYLE
1624 AINSDALE DR
ROSEVILLE CA 95747

477 560 020 000
LYNN M HEBERT
1632 AINSDALE DR
ROSEVILLE CA 95747

477 560 021 000
RICHARD & MARY M WURSTER
1640 AINSDALE DR
ROSEVILLE CA 95747

477 560 022 000
ROBERT D & LINDA C WHITEHOUSE
1648 AINSDALE DR
ROSEVILLE CA 95747

477 560 023 000
JEFFREY R & LISA B FRANKLIN
1656 AINSDALE DR
ROSEVILLE CA 95747

477 560 024 000
RON & JANEAN KELLING
1664 AINSDALE DR
ROSEVILLE CA 95747

477 560 025 000
DAVID IAN SMITH
1672 AINSDALE DR
ROSEVILLE CA 95747

477 560 026 000
PETER M & CHRISTINE M HUGENROTH
1680 AINSDALE DR
ROSEVILLE CA 95747

477 560 027 000
HARRISON J & CAROLYN E DEVERE
1688 AINSDALE DR
ROSEVILLE CA 95747

477 560 028 000
ALLAN S & KAREN M OKICICH
1696 AINSDALE DR
ROSEVILLE CA 95747

477 560 029 000
BRYANT 1999 TRUST
1704 AINSDALE DR
ROSEVILLE CA 95747

477 560 030 000
KATHY MONTGOMERY
1712 AINSDALE DR
ROSEVILLE CA 95747

477 560 031 000
CARLA M & ERIC L LAYTON
449 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 032 000
GEORGE L & ETHEL B STEVENS
441 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 033 000
MANINDER SINGH & RITU ATWAL
433 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 034 000
DEREK & NANCY PORTER
432 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 035 000
SHARON L EUBANK
440 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 036 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 560 037 000
WOODCREEK OAKS COM ASSOC
205 KANE CT
ROSEVILLE CA 95747

477 560 038 000
WOODCREEK OAKS COM ASSOC
205 KANE CT
ROSEVILLE CA 95747

477 590 001 000
DEREK T & MICHELLE A RASINA
501 RYE CT
ROSEVILLE CA 95747

477 590 002 000
MATTHEW E & JULIE M BUTLER
509 RYE CT
ROSEVILLE CA 95747

477 590 003 000
GILBERTO F CHAVEZ
517 RYE CT
ROSEVILLE CA 95747

477 590 004 000
SCOTT & DANI ECKMAN
525 RYE CT
ROSEVILLE CA 95747

477 590 005 000
WILLIAM J; PAGANO
533 RYE CT
ROSEVILLE CA 95747

477 590 006 000
TIMOTHY & DANIENE TRENT
532 RYE CT
ROSEVILLE CA 95747

477 590 007 000
KEVIN LEE & JULIE RANDLES
524 RYE CT
ROSEVILLE CA 95747

477 590 008 000
NOLAND & SUZANA WILLIAMS
516 RYE CT
ROSEVILLE CA 95747

477 590 009 000
PRABIR MUKHERJEE
500 RYE CT
ROSEVILLE CA 95747

477 590 016 000
RICHARD L & GAIL O HUMPHRIES
1683 SUNNINGDALE DR
ROSEVILLE CA 95747

477 590 017 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

478 010 018 000
C FRED & IRENE BELCHER
6289 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 019 000
BAKOTICH
6281 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 020 000
PAUL J & CAROL J WRIGHT
6273 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 021 000
JAMES H & PHYLLIS I PAQUETTE
6265 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 022 000
FRED E & SHIRLEY J DUVAL
6257 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 023 000
EUGENE A & PATRICIA G BOESIGER
6249 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 024 000
NANCY J STURTEVANT
6241 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 025 000
ARMIN & SYLVIA GUTH
6233 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 026 000
M A & MARCELLA M ANASTASI
1033 HAMAN WAY
ROSEVILLE CA 95678

478 010 027 000
VIRGINIA ARLINE WOOD
6217 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 028 000
GRISWOLD
6209 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 029 000
SANDRA K RITACCO
6201 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 030 000
WARREN N & PATRICIA A LITTLEFIELD
6193 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 031 000
ROBERT D & SUZANNE BERNARD
6200 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 032 000
DAVID O & AUDREY J ANDREWS
6224 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 033 000
JEFF & DIANNA S MATTIMORE
500 PITCHER CT
ROSEVILLE CA 95747

478 010 034 000
WALTER A & LAURA M PROTNICK
508 PITCHER CT
ROSEVILLE CA 95747

478 010 035 000
JOHN W & BEVERLY A DAVIS
516 PITCHER CT
ROSEVILLE CA 95747

478 010 036 000
NADINE B CLAUSEN
517 PITCHER CT
ROSEVILLE CA 95747

478 010 037 000
PAUL J & LILA J FLANNERY
509 PITCHER CT
ROSEVILLE CA 95747

478 010 038 000
FREDRICKS 2003 TRUST
501 PITCHER CT
ROSEVILLE CA 95747

478 010 039 000
SALLY TATOSIAN
6165 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 040 000
ROBERT G CLARKE
PO BOX 1165
ROSEVILLE CA 95678

478 010 041 000
SALLIE W GRAY
6149 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 042 000
EDWARD P & JOAN E FUNCHEON
6141 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 043 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 020 012 000
ELSIE J FABIANO
6185 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 013 000
ROSALIE G GROW
6177 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 014 000
WANDA D DEATON
6169 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 015 000
CHRIS JR & GEORGIA A SPITZER
6161 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 016 000
ALBERT & ROSEMARY SANTORA
6153 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 017 000
SYLVIA M TILLEY
6145 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 018 000
HANSEN
6137 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 019 000
BETTY E WILLIBY
6129 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 020 000
ROBERT D & BETTY J KETELLE
6121 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 021 000
STECHMAN CHARLES W III & FRANC
6113 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 022 000
EDNA MCMORINE
6105 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 023 000
CLARA M DANIELS
6097 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 024 000
CAROLEE HAMILTON
6089 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 025 000
ELLIS J & BARBARA M TEEL
6081 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 026 000
WILLIAM B & ANTOINETTE M HUGHES
6056 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 027 000
VIRGINIA F HANSEN
6064 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 028 000
JOHN S & BONNIE M LUSTER
6072 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 029 000
RICHARD E & HELEN B SCHULTE
6080 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 030 000
BUTERA
7008 TIMBERROSE WAY
ROSEVILLE CA 95747

478 020 031 000
KAZUKO DOUPONCE
6096 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 032 000
MARIAN L CAMPBELL
6136 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 033 000
MILLICENT M YATES
6152 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 034 000
SHIRLEY MOE
6160 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 035 000
CAROL J MACADAMS
6176 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 036 000
DONALD E & MARGARET E WARD
6184 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 037 000
BILLY E & BETTY ANN WRIGHT
200 SWAZEY CT
ROSEVILLE CA 95747

478 020 038 000
RICHARD C & BETTY J CALETTI
208 SWAZEY CT
ROSEVILLE CA 95747

478 020 039 000
ROBERT & MARY L NEWMAN
216 SWAZEY CT
ROSEVILLE CA 95747

478 020 040 000
THOMAS E & YVONNE S HOGAN
224 SWAZEY CT
ROSEVILLE CA 95747

478 020 041 000
ROBERT B JR & BARBARA J MORRIS
232 SWAZEY CT
ROSEVILLE CA 95747

478 020 042 000
ARMAN & CAROLYN ARAKELIAN
225 SWAZEY CT
ROSEVILLE CA 95747

478 020 043 000
BEN & PAT PUGH
217 SWAZEY CT
ROSEVILLE CA 95747

478 020 044 000
BUCKMAN
209 SWAZEY CT
ROSEVILLE CA 95747

478 020 045 000
ELMER G JR & MARY E HASKIN
201 SWAZEY CT
ROSEVILLE CA 95747

478 020 057 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 030 001 000
HARVEY LEE
5401 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 002 000
ERNEST J & DOROTHY L MOESSNER
PO BOX 1235
ROSEVILLE CA 95678

478 030 003 000
ROSS
5385 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 004 000
JOHN FRANCIS & SUE SPRATLEY
5377 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 005 000
BONNIE HOUSE
5369 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 006 000
ERLING W & MARINA LOKEN
5361 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 007 000
ELIZABETH A NITOPI
5353 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 008 000
GORDON & AUDLEY WALRATH
5345 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 009 000
JOHN A & MINAKO A KUMPULAINIEN
5337 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 010 000
ELAINE M RANDALL
5329 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 011 000
JAMES D & MARY ELLEN ROSZELL
5321 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 012 000
CELESTE M CALLISON
5313 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 013 000
ELISABETH W BROWN
5305 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 014 000
CURTIS A & HELEN M COX
5297 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 015 000
PEGGY ELIZABETH CLOUD
5289 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 016 000
LENI M & AILEEN J STENBACK
5281 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 017 000
LOUISE K BUMGARDNER
5273 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 018 000
JOHN A ZAFFERANO
7516 PAIUTE POINT RD
ROSEVILLE CA 95747

478 030 019 000
NORBERT & LEA ROTENBERG
5257 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 020 000
PATRICIA S BUTLER
5249 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 021 000
CARL D & JOY Y SAVAGE
5241 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 022 000
JOHN K SR & FAYE HOLIHAN
5233 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 023 000
NORMAN C & KATHRYN HAGENBUCH
5225 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 024 000
MOZELLE BURLESON
5217 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 025 000
BETTY C TOMPKINS
5209 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 026 000
LEON J & GAIL E RAGLEN
5201 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 027 000
JACQUES J & BERTA N BRUNNER
5123 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 028 000
THOMAS C & MARTHA OWENS
5115 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 029 000
DOLORES M KLEINKE
5107 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 030 000
ROBERT V RODGERS
5099 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 031 000
AGUILERA
5091 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 032 000
BLAINE A & GERALDINE R EISENBEIS
5083 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 033 000
LINDY E & MELBA O WILLIAMS
5075 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 034 000
ROBERT W & THEONIE S MURCH
5208 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 035 000
ALFRED L & HELEN I LUNA
5224 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 036 000
MARY L YOUNGBLUTT
5232 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 037 000
DON R PATTERSON
5240 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 038 000
LANG
5258 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 039 000
KENNETH E & KAREN R HASEMANN
5304 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 040 000
MARGORIE B KJAR
5312 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 041 000
ROBERT E & MARYON R MORRIS
5320 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 042 000
SARA E JORDAN
5336 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 043 000
JOSEPHINE DOLORES POLLICK
219 VALLEY VIEW DR
OROVILLE CA 95966

478 030 044 000
FRANK L & ELAINE MELLIN
5352 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 045 000
ORTON W JR & LEAH M BENSON
500 WASHOE CT
ROSEVILLE CA 95747

478 030 046 000
JERRY & DRAHA HUBIK
508 WASHOE CT
ROSEVILLE CA 95747

478 030 047 000
ARTHUR C & ELEANOR I DITTRICH
516 WASHOE CT
ROSEVILLE CA 95747

478 030 048 000
RALPH A & MARJORIE C GONGWER
524 WASHOE CT
ROSEVILLE CA 95747

478 030 049 000
ROGER D & COLLEEN S TOVEY
533 WASHOE CT
ROSEVILLE CA 95747

478 030 050 000
ALLEN L & JOAN CAROL EVANS
525 WASHOE CT
ROSEVILLE CA 95747

478 030 051 000
JAMES A & MARILEE H DENIO
1551 VINEYARD RD
ROSEVILLE CA 95678

478 030 052 000
JOHN P & JOANNE E SANCHEZ
509 WASHOE CT
ROSEVILLE CA 95747

478 030 053 000
BRUCE H & MARY MACLEAN
501 WASHOE CT
ROSEVILLE CA 95747

478 030 054 000
POZAREK 1989 TRUST
5417 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 055 000
CURTIS C & SHIRLEY R MILLER
5425 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 090 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 040 020 000
M JOANN BROOKS
5018 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 021 000
JOYCE R MCCLURE
5032 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 022 000
MARY DUFOUR
5040 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 023 000
ROBERT F & FLORENCE G WANGLER
5056 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 024 000
JEAN B COTTER
5064 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 025 000
PAMELA C REHM
5072 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 026 000
PHYLLIS A DECROIX
5224 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 027 000
PHYLLIS & C PROVOST
5232 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 028 000
ERNEST R & RUTH I SAVAGE
5240 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 029 000
MANUEL S & GLORIA J MACIAS
5248 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 030 000
CHARLES E & ANN H BROWN
5256 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 031 000
FLORINE M BROWER
5264 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 032 000
HENRY & KATRIN A LANDAUER
5272 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 033 000
BAUGHMAN
200 STAMOS CT
ROSEVILLE CA 95747

478 040 034 000
PETERSON
208 STAMOS CT
ROSEVILLE CA 95747

478 040 035 000
ANTHONY & MARILYN ARGENTINE
216 STAMOS CT
ROSEVILLE CA 95747

478 040 036 000
SHIRLEY A GAYE
224 STAMOS CT
ROSEVILLE CA 95747

478 040 037 000
EDWARD A MCCOOEY
225 STAMOS CT
ROSEVILLE CA 95747

478 040 038 000
HARRY E & RITA C GORDON
217 STAMOS CT
ROSEVILLE CA 95747

478 040 039 000
CHARLES G & JOAN R ESKIN
209 STAMOS CT
ROSEVILLE CA 95747

478 040 040 000
EDWARD & AUDREY
201 STAMOS CT
ROSEVILLE CA 95747

478 040 041 000
ROBERT H & DIANE M WAGNER
PO BOX 362
MILL VALLEY CA 94942

478 040 042 000
CAROL P MCDANIEL
5345 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 043 000
JAMES E & ROBERTA B BURCKLE
5337 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 044 000
SNYDER
5329 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 045 000
HELEN L TOBIASON
5321 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 046 000
DARWIN J & R ELLOUISE SUNDAY
5313 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 047 000
OLIVER M & IRENE M OBRIEN
5305 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 048 000
HILDA DEUS
5297 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 049 000
WILMA B BULL
5289 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 050 000
MYRON W MCINTYRE
3 SOMER RIDGE DR #193
ROSEVILLE CA 95661

478 040 051 000
SUSAN A MOODY
5273 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 052 000
MANN
5265 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 053 000
LENA P BROWN
5257 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 054 000
TERENCE & NORA AIRLIE
5249 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 055 000
WILLIAM DAVID GIGLIO
5241 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 056 000
MAIDA M HOUSTON
5233 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 057 000
THOMAS M & CAROL M COOK
5225 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 058 000
JEAN K DARRAGH
5217 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 059 000
DONALD & GERALYN GORSHING
5209 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 060 000
MERRILL E & SHIRLEY F BAXLEY
5201 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 081 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 050 001 000
ROBERT L SMITH
7260 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 002 000
MATTHIAS MARY E 1998 TRUST
7444 GOOSE MEADOWS WAY
ROSEVILLE CA 95747

478 050 003 000
MARGARET B BOLSTAD
7276 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 004 000
ANN CARTER
7284 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 005 000
EARL R & MARY E SMITH
7292 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 006 000
FAY SEARS
7300 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 001 000
FRANK R & BETTE M GEORGE
7163 DREAM INN LN
ROSEVILLE CA 95747

478 060 002 000
JOAN W COBABE
7171 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 003 000
BOB L FORKEY
7179 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 004 000
DAVID & DOLLY L FIDDYMENT
7136 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 005 000
DORIS J MOORE
7195 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 006 000
JOHN & MARGAR GOMES
7203 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 007 000
CAROLYN K PARKINSON
7211 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 008 000
JACQUELINE SHAW
7219 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 009 000
RAYMOND L MOORE
7227 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 010 000
MANUEL S & GLORIA J MACIAS
7235 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 011 000
ROBERT L MYERS
7243 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 012 000
FRANK W & MARY JANE BOHN
30 EL CERRO CT
DANVILLE CA 94526

478 060 018 000
THOMAS J & ALICE J CORDRAY III
7112 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 019 000
POLLY E SINCLAIR
7438 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 020 000
ROSE IVES
7136 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 021 000
KARFIOL
7156 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 022 000
GLENN A & BARBARA BECKER
7180 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 023 000
WILLIAM L & HELEN P STRUBING
7188 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 024 000
VILMA M ALLEN
7204 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 025 000
SANDOR HORVATH
16775 SADDLEBACK DR
MORGAN HILL CA 95037

478 060 026 000
DANIEL F & DONNA L KYGAR
7185 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 027 000
THOMAS P & BARBARA A RYAN
7177 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 028 000
ROBERT H & CHARLOTTE F SWARTZ
408 BARUSCH CT
ROSEVILLE CA 95747

478 060 029 000
EDWARD A & M ARLENE SCALLET
416 BARUSCH CT
ROSEVILLE CA 95747

478 060 030 000
NORMAN M & LOIS B GRABAR
8049 GILLELAND DR
ROSEVILLE CA 95747

478 060 031 000
MARILYN M MOORE
409 BARUSCH CT
ROSEVILLE CA 95747

478 060 032 000
CLEGG
401 BARUSCH CT
ROSEVILLE CA 95747

478 060 048 000
MEL & KATHY G ZIKES
7176 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 049 000
KATHRYN G ZIKES
7184 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 050 000
LEONARD & ALBERTA M RAWLINSON
7192 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 051 000
WILLIAM & BETTY STAHLBERGER
7236 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 052 000
TED A & MARY C SMITH
7244 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 053 000
RALPH V & OLGA LOMELE
7252 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 054 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 070 021 000
CALVIN A & GALE G SMITH
7027 DREAM INN LN
ROSEVILLE CA 95747

478 070 022 000
MERRILL G & MARCIA JOAN SMITH
7035 DREAM INN LN
ROSEVILLE CA 95747

478 070 023 000
EDITH F GOODSON
7043 DREAM INN LN
ROSEVILLE CA 95747

478 070 024 000
ELAINE A MURRILL
7051 DREAM INN LN
ROSEVILLE CA 95747

478 070 025 000
HOWARD J & DIANA L VONBERGEN
7059 DREAM INN LN
ROSEVILLE CA 95747

478 070 026 000
JAMES G & JEAN E PEARSE
7067 DREAM INN LN
ROSEVILLE CA 95747

478 070 027 000
LOREN D & BEVERLY J PROHASKA
7075 DREAM INN CT
ROSEVILLE CA 95747

478 070 028 000
FRANCIS H & ELEANOR J PAPINEAU
7083 DREAM INN CT
ROSEVILLE CA 95747

478 070 029 000
PAULA J LAVIN
7091 DREAM INN LN
ROSEVILLE CA 95747

478 070 030 000
WARREN L & JACQUELINE C VANDIVER
7099 DREAM INN LN
ROSEVILLE CA 95747

478 070 031 000
LOUIS & ELVA BOSCO
7107 DREAM INN LN
ROSEVILLE CA 95747

478 070 032 000
SHERILL E PARKER
14978 PAMMY WAY
GRASS VALLEY CA 95949

478 070 033 000
JAMES M & PATRICIA W JOHNSON
7123 DREAM INN LN
ROSEVILLE CA 95747

478 070 034 000
WALLACE MERBLER
7131 DREAM INN LN
ROSEVILLE CA 95747

478 070 035 000
AGATHA M HUDDLESTON
7139 DREAM INN LN
ROSEVILLE CA 95747

478 070 036 000
LOY E & SHARON E BATES
7147 DREAM INN LN
ROSEVILLE CA 95747

478 070 037 000
MAURICE L & PATRICIA A SWEATT
7155 DREAM INN LN
ROSEVILLE CA 95747

478 070 038 000
THOMAS F & BARBARA J STATTI
7154 DREAM INN LN
ROSEVILLE CA 95747

478 070 039 000
RAYMOND W GOODE
7146 DREAM INN LN
ROSEVILLE CA 95747

478 070 040 000
ARLIE D & YVONNE M SKELTON
7130 DREAM INN LN
ROSEVILLE CA 95747

478 070 041 000
CAMELIA MCNAUGHT
7122 DREAM INN LN
ROSEVILLE CA 95747

478 070 042 000
FREDERICK W & M ERIN FESTERSEN
7106 DREAM INN LN
ROSEVILLE CA 95747

478 070 043 000
ELLEN L MEEHAN
7098 DREAM INN LN
ROSEVILLE CA 95747

478 070 044 000
MAURICE B QUILLEN
7082 DREAM INN LN
ROSEVILLE CA 95747

478 070 045 000
A RUDY & LILA J GUERRERO
7066 DREAM INN LN
ROSEVILLE CA 95747

478 070 046 000
SHERRARD
7050 DREAM INN LN
ROSEVILLE CA 95747

478 070 047 000
PETER J & LESLIE V ROBERTS
7042 DREAM INN LN
ROSEVILLE CA 95747

478 070 048 000
DAVID W & MARY LOU HESS
7034 DREAM INN LN
ROSEVILLE CA 95747

478 070 049 000
ARNOLD E & RUTH D LASHER
7026 DREAM INN LN
ROSEVILLE CA 95747

478 070 050 000
ARTHUR L & HELEN R POWERS
7010 DREAM INN LN
ROSEVILLE CA 95747

478 070 051 000
FAULKNER
7002 DREAM INN LN
ROSEVILLE CA 95747

478 070 052 000
ANTHONY & BEVERLY D CERVONE
7140 KINGBIRD LN
ROSEVILLE CA 95747

478 070 053 000
BARBARA H BLIM
7132 KINGBIRD LN
ROSEVILLE CA 95747

478 070 054 000
WALLACE H & NELLIE F CARROLL
7124 KINGBIRD LN
ROSEVILLE CA 95747

478 070 055 000
PASCHAL
7116 KINGBIRD LN
ROSEVILLE CA 95747

478 070 056 000
CORWIN HY & PHYLLIS MARTINDALE
7108 KINGBIRD LN
ROSEVILLE CA 95747

478 070 057 000
GEORGE A & MARGARET K LAROCHE
7100 KINGBIRD LN
ROSEVILLE CA 95747

478 070 058 000
ALBERT A & ROSEMARY ERKEL
501 COLD STREAM CT
ROSEVILLE CA 95747

478 070 059 000
PATRICIA M MEYERS
509 COLD STREAM CT
ROSEVILLE CA 95747

478 070 060 000
DONALD F & LOIS G HUG
517 COLD STREAM CT
ROSEVILLE CA 95747

478 070 061 000
JOHN H & ALICE M GUCKEEN
525 COLD STREAM CT
ROSEVILLE CA 95747

478 070 062 000
EDGAR J & DORIS S BURGER
533 COLD STREAM CT
ROSEVILLE CA 95747

478 070 063 000
HAROLD R & MARY H OHLENDORF
532 COLD STREAM CT
ROSEVILLE CA 95747

478 070 064 000
RICHARD B & BARBARA J REINGOLD
524 COLD STREAM CT
ROSEVILLE CA 95747

478 070 065 000
JOSEPH A SR & SHARON STEELE
5631 CONISTON WAY
SAN JOSE CA 95118

478 070 066 000
BARBARA J DAULTON
508 COLD STREAM CT
ROSEVILLE CA 95747

478 070 067 000
DONALD J & BEVERLY J PIETRO
500 COLD STREAM CT
ROSEVILLE CA 95747

478 070 068 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 091 001 000
LEROY V & MARGARET P CRAWFORD
4000 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 002 000
ANDREW M & MADELINE E CRACOLICE
4004 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 003 000
BARBARA J FALLTRICK
4012 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 004 000
ERLINDA R RAEL
4020 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 005 000
EDWARD J JR & LINDA G GRIFFIN
PO BOX 1393
COLFAX CA 95713

478 091 006 000
ELEANOR A MARTIN
4019 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 007 000
RAYMOND S & MARIA R CULTRERA
4011 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 008 000
JOSEPH J & JESSIE M COURTNEY
4016 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 009 000
EDWARD R & JUANITA K LICK
4024 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 010 000
WILLIAM A & MARIA U ELKUS
4043 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 011 000
GLADYS LISS
4035 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 012 000
PHYLLIS TRIBE
4027 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 013 000
NANCY L R CARLETON
4019 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 014 000
RENNE DELMONTE
4002 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 015 000
KENNETH D SR & MARTHA J
SCHLICHTING
4010 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 016 000
WILHELMINE M HANSEN
4018 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 017 000
GERALDINE KAPLAN
PO BOX 1146
ROSEVILLE CA 95678

478 091 018 000
JOSE V & MARIA V GARCIA
4034 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 019 000
RUTH I KAISER
732 JOHNNY FRY CT
ROSEVILLE CA 95747

478 091 020 000
JAMES R & CAROLE E RICHMOND
4025 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 021 000
GEORGE A & MARTHA M JOHNSON
4017 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 022 000
RICHARD R & CHERYL A MACDONALD
14 MOUNT EDEN PL
CLAYTON CA 94517

478 091 023 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

478 220 006 000
DOROTHY W ERICKSON
5096 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 007 000
DONALD & IRENE ELSON
5112 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 008 000
CARL J & MARGAR BERGESCH
5120 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 009 000
FRED W & DORIS J MAPLE
5128 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 010 000
ROCCO M JR & DOROTHY E GIORDANO
5136 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 011 000
WILLIAM DOUGLAS & KAREN Y BARR
9009 UPPER VALLEY RD
AUBURN CA 95602

478 220 012 000
GOLDON L SELFRIDGE
5152 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 013 000
BARBARA L RAMSEY
5160 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 014 000
JAMES C PHELAN
5193 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 015 000
JAY A & DEBORAH A GRIGGS
5185 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 016 000
DAVID J INGOLS
606 WREN CT
ROSEVILLE CA 95661

478 220 017 000
WILBERT A & DELORIS A HAUCK
5169 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 018 000
GARY L LEE
5153 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 019 000
PHILIP G & DANA N DAMASK
5145 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 020 000
E W NEWBERRY
552 CRESTFIELD CIR
ROSEVILLE CA 95678

478 220 021 000
CAROL S WALLACE
5129 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 022 000
OATHER L & SHIRLEY A GENTRY
5121 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 023 000
AUGUSTIN J VILA
4929 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 024 000
MORRIS E EASLEY
7131 LOST LAKE LN
ROSEVILLE CA 95747

478 220 025 000
JAMES C & LAURA J FORRISTALL
4913 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 026 000
JOHN M & ERLINDA R VAN SICKEL
4905 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 027 000
ANDRE
317 COPE RIDGE CT
ROSEVILLE CA 95747

478 220 028 000
CARL & MARY YACONELLI
4889 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 029 000
HERMAN E & JOSEPHINE MAY
4881 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 030 000
LOIS E KOWITZ
4873 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 031 000
JO BELLE SCHRILLO
4865 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 032 000
SONJA R MNICH
4857 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 033 000
JAMES W & LUCILLE J MCCARTY
4849 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 034 000
EDNA HART
4841 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 047 000
HILARY WALL & HAYLEY GANS III
4850 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 048 000
NANCY MANSFIELD
4858 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 049 000
JANE F PULEO
100 SIGGENS CT
ROSEVILLE CA 95747

478 220 050 000
CARL M & MEREDYTH A HENTSCHKE
108 SIGGENS CT
ROSEVILLE CA 95747

478 220 056 000
EVERETT D & PATRICIA J CASTER
109 SIGGENS CT
ROSEVILLE CA 95747

478 220 057 000
MARY M DIAL
101 SIGGENS CT
ROSEVILLE CA 95747

478 220 058 000
DEBORAH A HATFIELD
5113 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 059 000
KAY M & CHARLENE MICHAEL
5097 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 069 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

478 240 004 000
BETTY M RUBY
4781 COTTAGE LN
ROSEVILLE CA 95747

478 240 005 000
THOMPSON FAMILY TRUST
867 MAHOGANY DR
MINDEN NV 89423

478 240 006 000
EILEEN M MULLIGAN
4797 COTTAGE LN
ROSEVILLE CA 95747

478 240 007 000
PADAVONA JOHN/M 2002 TRUST
4796 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 008 000
ORTENCIA E FERRARI
4788 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 009 000
CASEY PAUL S 2003 TRUST
4780 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 010 000
ANNA LISA SMITH
4772 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 011 000
VALERA O PETRIE
4764 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 012 000
WILLIAM W & ELIANE WILSON
4756 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 024 000
THOMAS F HARPER
4805 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 025 000
ROBERTA TRAYNOR
4797 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 026 000
CHARLES G & DOROTHY M SNYDER
4789 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 027 000
KOPKO
4781 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 028 000
CLIFTON E & JOAN ROBINSON
4773 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 029 000
IAN A & LORRAINE HAMILTON
4765 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 030 000
BARBARA JEAN CHILTON
705 HILLCREST AVE
ROSEVILLE CA 95678

478 240 031 000
GEOFFREY & MILDRED LUCY TYSON
4749 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 032 000
ROBERT A & COLLEEN M BROOKS
4741 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 033 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

478 250 001 000
BERNIECE KATHERINE BUSHMAN
4523 WANDERLUST LOOP
ROSEVILLE CA 95747

478 250 004 000
EVELYN L SACKMAN
516 EMPIRE CT
ROSEVILLE CA 95747

478 250 005 000
JOSEPH F & DORIS H SOMMERS
524 EMPIRE CT
ROSEVILLE CA 95747

478 250 006 000
GORDON E & HELEN J PENNEY
533 EMPIRE CT
ROSEVILLE CA 95747

478 250 011 000
NANCY ARLYN DUFF
3405 SAPPHIRE DR
ROCKLIN CA 95677

478 250 035 000
ANTHONY M & BETTY J FRENN
4548 COACH LAMP LN
ROSEVILLE CA 95747

478 250 041 000
DONALD C & ALICE B GOLDSTEIN
4541 COACH LAMP LN
ROSEVILLE CA 95747

478 250 042 000
DONALD R SMITH
4549 COACH LAMP LN
ROSEVILLE CA 95747

478 260 001 000
LOIS J SCOTT
4733 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 260 002 000
RALPH & OPAL GOOD
4725 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 260 003 000
ROBERT G & JANICE G ALLEN
4717 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 260 004 000
FALZARANO
1004 MONTEREY CT
ROSEVILLE CA 95661

478 260 005 000
JULIA M BRITTO
608 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 006 000
JOSEPH M NUSSBAUM
616 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 007 000
CHRISTIAN H M & DONNA P THOLEN
624 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 008 000
FRANK JAMES SOUTHWICK
632 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 009 000
CAROL K WALTZ
640 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 010 000
RAYMOND G ALVARADO
657 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 011 000
MICHAEL C & KAREN K IDLER
649 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 012 000
YOSHIMI & HELEN S WATARI
641 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 013 000
JERRY L & SHIRLEY M HORN
633 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 014 000
DAVID B & VIVIAN I KANE
2206 FORTROSE PL
EL DORADO HILLS CA 95762

478 260 015 000
BARBARA B BLABON
617 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 016 000
DOROTHY L STOKKE
609 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 017 000
HOWARD G & FLOY FENNER
601 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 018 000
WILLIAM C TIEMANN
4586 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 019 000
JOAN CLAIRE THOMAS
4594 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 020 000
PAUL & PHYLLIS B ROSEN
4602 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 021 000
JEANETTE F HEADY FRANK
4610 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 022 000
SYLVIA E FITZPATRICK
4618 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 023 000
JOSEPH J DUB
4626 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 024 000
ROBERT G & SHIRLEY R STIERWALT
4634 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 025 000
LIONEL & AMY BETTENCOURT
BETTENCOURT
4642 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 026 000
ROBERT L IRONSIDE
4597 COACH LAMP LN
ROSEVILLE CA 95747

478 260 027 000
ROBERT E & SYLVIA S CONDON
4589 COACH LAMP LN
ROSEVILLE CA 95747

478 260 028 000
JEAN M MARUEJOULS
4581 COACH LAMP LN
ROSEVILLE CA 95747

478 260 029 000
JOANNE O MATTOON
4573 COACH LAMP LN
ROSEVILLE CA 95747

478 260 030 000
WILLIAM T SR & NANCY L HASTINGS
4565 COACH LAMP LN
ROSEVILLE CA 95747

478 260 031 000
JAMES R & PATRICIA L THOMSON
4635 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 032 000
RICHARD T & KAREN K OSTROWSKI
4571 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 033 000
RICHARD L & BETTY J BUNKER
4619 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 034 000
DAVID A CAPITO
4603 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 035 000
EDGAR G & PAMELYN UNDERWOOD
4587 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 036 000
DONNA V GRAHN
4579 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 037 000
ALLEN T & LINDA C TOKIFUJI
4571 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 038 000
ROBERT N & LOIS H CARSON
4563 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 039 000
ROBERT W & NANCY M GUIN
4555 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 040 000
JACK R & RITA A OPHEIM
4539 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 042 000
GEORGE J MERICK
4554 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 043 000
EDWARD CARTOTTO
4546 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 044 000
TRUST; OTLEY
4538 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 045 000
CLIFFORD M & MARY FRANCES KREBS
400 HELLER CT
ROSEVILLE CA 95747

478 260 046 000
JOSEPH F & JEAN E SCHOPP
408 HELLER CT
ROSEVILLE CA 95747

478 260 047 000
HUGH & MARY L LAMARCHE
416 HELLER CT
ROSEVILLE CA 95747

478 260 048 000
DONALD J & L GAIL DUGAN
424 HELLER CT
ROSEVILLE CA 95747

478 260 049 000
JOSEPH & PATRICIA CAMPAGNA
432 HELLER CT
ROSEVILLE CA 95747

478 260 050 000
RAYMOND T & PATRICIA A ANDERSEN
425 HELLER CT
ROSEVILLE CA 95747

478 260 051 000
DAVID L & EVAH R BIGLER
417 HELLER CT
ROSEVILLE CA 95747

478 260 052 000
GEORGE R & NORMA H KLEIN
409 HELLER CT
ROSEVILLE CA 95747

478 260 053 000
ALFRED & RUTH ZEITS
401 HELLER CT
ROSEVILLE CA 95747

478 260 054 000
RUTH C EELLS
4557 COACH LAMP LN
ROSEVILLE CA 95747

478 260 055 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

478 270 001 000
BEATRICE A SYLVA
4152 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 002 000
OSTRO HANS
4144 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 003 000
JAY & PAMELA KAY REID
4136 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 014 000
LYNNDA FAIR
4057 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 015 000
ABEL HAINES
4065 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 016 000
W JACKSON & ELAINE WILLOUGHBY
309 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 017 000
RICHARD W & BARBARA A GIBSON
317 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 018 000
JEAN AUMAN
325 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 019 000
CHARLES S CROWNOVER
332 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 020 000
BARNETT H & JANE M BLOAT
324 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 021 000
DUDLEY S & LYNN MOORE
316 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 022 000
BETTY A CHARLES
308 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 023 000
LEONARD R & BARBARA J SORBY
300 ROUNDHILL CT
ROSEVILLE CA 95747

478 270 024 000
SHIVELY THOMAS/J 2000 TRUST
4121 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 025 000
ROBERT E & SHARON LEE GERHART
4137 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 026 000
GERALD D & BETTY J SNYDER
4145 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 027 000
ARNESEN ROY 2002 TRUST
4153 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 028 000
LAURENCE E & LINDA S FLETCHER
4161 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 029 000
ESTELLE ELHAI
4169 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 030 000
LARRY & FLORENCE BROGAN
4160 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 031 000
HOWARD D RIES
PO BOX 1341
ROSEVILLE CA 95678

478 270 032 000
MARJORIE E SMITH
4176 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 033 000
WANDA M BERAN
4184 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 034 000
RICHARD T & KAREN K OSTROWSKI
4571 WANDERLUST LOOP
ROSEVILLE CA 95747

478 270 035 000
DAVID BLOOM
4200 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 036 000
MARLENE NAGLE
4208 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 037 000
RONALD E & MARIANNE R JONES
827 WARREN WAY
AUBURN CA 95603

478 270 038 000
ROBERT J KOVATS
4224 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 039 000
RICHARD J & HELEN D OLWELL
PO BOX 19149
SACRAMENTO CA 95819

478 270 040 000
KOCHER
4240 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 041 000
SAM O & NOBUKO MORISHIGE
4248 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 042 000
EUCLID D & HAZEL A SIMMONS
4256 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 043 000
ANTHONY & DOROTHY MARKUS
4264 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 044 000
DORIS LEE S COCHRAN
4272 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 045 000
DONALD R & RUTH H PECKHAM
4280 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 046 000
EDWARD LEE CHANNELL
4288 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 047 000
JAMES W & BEVERLY M EASTER
4296 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 048 000
VIRGINIA M ROBINSON
4217 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 049 000
EDWARD S & MARIA S ALAMEIDA
4225 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 050 000
EARL P & PEGGY J PARISI
4233 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 051 000
HAROLD C & ELIZABETH J THURM
4241 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 052 000
MARIAN V COSTA
4249 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 053 000
ELAINE N FAMBRINI
4257 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 054 000
ALBERT M & FRANCES V KNIGHT
4265 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 055 000
NORMAN R BILLS
PO BOX 1614
SPARKS NV 89432

478 270 056 000
JOHN G BEACH
4297 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 057 000
ROGER & MARY L PESSAGNO
4305 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 058 000
ROBERT HARLEY
201 STRONGBOX CT
ROSEVILLE CA 95747

478 270 059 000
ROBERT T; DESMOND
209 STRONGBOX CT
ROSEVILLE CA 95747

478 270 060 000
D LEROY & A IMOGENE SANDERS
216 STRONGBOX CT
ROSEVILLE CA 95747

478 270 061 000
BILLIE F JACKSON
208 STRONGBOX CT
ROSEVILLE CA 95747

478 270 062 000
EDITH PENTON
200 STRONGBOX CT
ROSEVILLE CA 95747

478 270 063 000
PATRICIA L MEIER
101 ENCHANTED CT
ROSEVILLE CA 95747

478 270 064 000
EUGENE J & WILMA MELLO
109 ENCHANTED CT
ROSEVILLE CA 95747

478 270 065 000
DEAN A; RICHARDSON
4403 WHITLAND CT
ROCKLIN CA 95677

478 270 066 000
SARAH E HEWETTE
124 ENCHANTED CT
ROSEVILLE CA 95747

478 270 067 000
ALBERT & DOROTHY ADAMS
116 ENCHANTED CT
ROSEVILLE CA 95747

478 270 068 000
CAROLYN L FOLSOM
108 ENCHANTED CT
ROSEVILLE CA 95747

478 270 069 000
ARTHUR B & ANITA M BRITTAIN
100 ENCHANTED CT
ROSEVILLE CA 95747

478 270 070 000
ALLEN R WILSON
4000 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 071 000
BERNARD J & SANDRA H ALLENDORF
4008 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 072 000
ROBERT K & CHRISTINE C HEFNER
4016 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 073 000
GLORIA L COOLEY
4024 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 074 000
DOLORES Y ARAGON
2572 BOOKSIN AVE
SAN JOSE CA 95125

478 270 075 000
GLORIA M DAVIS
4040 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 076 000
JOAN M JEFFREY
4048 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 078 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

PROJECT TECH FW, INC.
ATTN: DOUG DAVEY
3947 LENNANE DR, STE 200
SACRAMENTO CA 95843

Route C

October 2003

Roseville Energy Park
Application for Certification

017 100 009 520
U C DAVIS FOUNDATION
1480 DREW AVE #130
DAVIS CA 95616

017 100 014 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 100 015 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 017 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 018 510
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 100 021 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 100 027 510
ARCHIE L & WILLA OBRIEN
5480 PHILLIP RD
ROSEVILLE CA 95747

017 100 028 510
ARCHIE L & WILLA OBRIEN
5480 PHILLIP RD
ROSEVILLE CA 95747

017 100 029 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 030 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 031 510
ROSEVILLE CITY OF
316 VERNON ST #106
ROSEVILLE CA 95678

017 100 032 000
WILLIAM C SR & Y P HARRIS
4900 PHILLIP RD
ROSEVILLE CA 95747

017 100 033 000
CHAU HSIUNG CHUANG
12351 CRAYSIDE LN
SARATOGA CA 95070

017 100 034 000
FTT
5400 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 035 000
FTT
5400 FIDDYMENT RD
ROSEVILLE CA 95747

017 100 038 000
BD PROPERTIES BENNETT ORIN
8568 PHEASANT HILL CT
ORANGEVALE CA 95662

017 100 041 000
KENNETH J FRIEDMAN
529 BROOKLINE AVE
MILL VALLEY CA 94941

017 100 043 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 100 044 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 100 045 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 005 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 007 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 116 008 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #208
ROSEVILLE CA 95678

017 116 009 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 116 010 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 116 011 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 150 002 000
ROSEVILLE RICHLAND
4890 W KENNEDY BLVD #920
TAMPA FL 33609

017 150 003 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 150 012 510
FEDERICOTYLER FAMILY LIMITED P
2144 SHIELAH WAY
SACRAMENTO CA 95822

017 150 019 510
ROSEVILLE RICHLAND
4890 W KENNEDY BL #920
TAMPA FL 33609

017 150 020 510
FEDERICOTYLER FAMILY LIMITED P
2144 SHIELAH WAY
SACRAMENTO CA 95822

017 150 023 510
ROSEVILLE RICHLAND
4890 W KENNEDY BLVD #920
TAMPA FL 33609

017 150 024 510
FEDERICOTYLER FAMILY LIMITED P
2144 SHIELAH WAY
SACRAMENTO CA 95822

017 150 030 510
BAGLEY & ASSOCIATES
1437 BADOVINAC DR
ROSEVILLE CA 95747

017 150 031 510
COMPUTER DEDUCTIONS INC
2701 RATTLESNAKE RD
NEWCASTLE CA 95658

017 150 037 000
1600 PLACER INVESTORS L P
100 TUNNEL RD
BERKELEY CA 94705

017 162 001 000
SUN CITY RSVL COMMUNITY ASSOC
VALUE TO THE LOTS
NA 00000

017 162 009 000
TERRACE L P SUTTER
1801 I ST #202
SACRAMENTO CA 95814

017 162 010 000
DEL WEBB CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 014 000
WEBB DEL CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 049 000
DEL WEBB CALIFORNIA CORP
985 SUN CITY LN
LINCOLN CA 95648

017 162 067 000
ESKATON
5105 MANZANITA AVE
CARMICHAEL CA 95608

017 162 068 000
PETER P BOLLINGER INVESTMENT C
540 FULTON AVE
SACRAMENTO CA 95825

017 162 069 000
PETER P BOLLINGER INVESTMENT C
540 FULTON AVE
SACRAMENTO CA 95825

017 162 074 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 076 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 077 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 079 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 080 000
ROSEVILLE CITY OF EXEMPT FROM
2000 HILLTOP CIR
ROSEVILLE CA 95747

017 162 085 000
PLEASANT GROVE COMMUNITY CHURC
1730 PLEASANT GROVE BLVD
ROSEVILLE CA 95747

017 380 001 000
MICHAEL BAYARD
3615 HAMPSTEAD RD
LA CANADA CA 91011

017 380 002 000
DRY CREEK JOINT ELEMENTARY SCH
9707 COOK RIOLO RD
ROSEVILLE CA 95747

017 380 003 000
DRY CREEK JOINT ELEMENTARY SCH
9707 COOK RIOLO RD
ROSEVILLE CA 95747

017 390 003 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

474 010 026 000
CLIFFORD D & G BRANDON
2675 BASE LINE RD
ROSEVILLE CA 95747

474 010 027 000
MICHAEL & SHANNON MANSCH
2655 BASE LINE RD
ROSEVILLE CA 95747

474 010 032 000
DONALD L & CHIN SUK EOFF
8010 OAK AVE
ROSEVILLE CA 95747

474 010 033 000
HILDEGARD ZACHARIAS
8020 OAK AVE
ROSEVILLE CA 95747

474 010 034 000
JAMES E & SHARON M MOE
8040 OAK AVE
ROSEVILLE CA 95747

474 010 035 000
KEVIN D WILSON
8070 OAK AVE
ROSEVILLE CA 95747

474 010 036 000
CLIFFORD & CLANCY BALL
8100 OAK AVE
ROSEVILLE CA 95747

474 020 001 000
C DWAIN SANDERS
8025 OAK AVE
ROSEVILLE CA 95747

474 020 002 000
C DWAIN SANDERS
8025 OAK AVE
ROSEVILLE CA 95747

474 020 003 000
ARNOLD W & SASITHORN PETERS
2485 BASE LINE RD
ROSEVILLE CA 95747

474 020 004 000
HAMID & ELISABETH HOSSEINI
1407 SPRINGFIELD DR
ROSEVILLE CA 95678

474 020 005 000
HAMID & ELISABETH HOSSEINI
1407 SPRINGFIELD DR
ROSEVILLE CA 95678

474 020 006 000
MARK C & KRISTINA E BUCHE
8055 OAK AVE
ROSEVILLE CA 95747

474 020 007 000
REVA G CUPLER
8081 OAK AVE
ROSEVILLE CA 95747

474 020 008 000
JAMES E & MARLYS D LUCAS
8109 OAK AVE
ROSEVILLE CA 95747

474 020 009 000
THOMAS C GERMANY
2440 CENTRAL AVE
ROSEVILLE CA 95747

474 020 011 000
THOMAS C GERMANY
2440 CENTRAL AVE
ROSEVILLE CA 95747

474 020 015 000
PACIFIC GAS & ELECTRIC CO
0 BASELINE RD
ROSEVILLE CA 00000

474 020 023 000
WALTER L & MICHAL ANN NAAKE
2300 CENTRAL AVE
ROSEVILLE CA 95747

474 020 024 000
ARTHUR C & PAMELA R BAUER
8080 MILNES AVE
ROSEVILLE CA 95747

474 020 025 000
MELINDA MORTIZ
8060 MILNES AVE
ROSEVILLE CA 95747

474 020 026 000
LUPE G CORONA
8040 MILNES AVE
ROSEVILLE CA 95747

474 020 027 000
STEVEN J OTAVKA
2345 BASE LINE RD
ROSEVILLE CA 95747

474 020 028 000
JACK A PACHECO
2431 BASE LINE RD
ROSEVILLE CA 95747

474 020 030 000
HENRY L VICTOR
2391 BASE LINE RD
ROSEVILLE CA 95747

474 020 031 000
DONALD E & LAVERNE A THOMPSON
4232 ECHO ROCK LN
ROSEVILLE CA 95747

476 070 028 000
GEORGE R & OLLIE E RODRIGUES
1455 EVERETT WAY
ROSEVILLE CA 95747

476 070 029 000
SCOTT J & NANCY L PETERS
1457 EVERETT WAY
ROSEVILLE CA 95747

476 070 030 000
EDWARD H & SHEILA D ACKE
1460 BADOVINAC DR
ROSEVILLE CA 95747

476 070 031 000
GARRY D HOLLINGER
1458 BADOVINAC DR
ROSEVILLE CA 95747

476 080 006 000
DOUGLAS R & COLLEEN C SMITH
1509 CARBURY WAY
ROSEVILLE CA 95747

476 080 007 000
RONNIE J & EVA F HOTT
1511 CARBURY WAY
ROSEVILLE CA 95747

476 080 008 000
CAMILLERI SAVIOUR/JOYCE
2013 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 080 009 000
JEREMY & KIMBERLY S FEELEY
1515 CARBURY WAY
ROSEVILLE CA 95747

476 080 010 000
CHRISTOPHER J HILL
1517 CARBURY WAY
ROSEVILLE CA 95747

476 080 011 000
JOE LATHOUWERS
1519 CARBURY WAY
ROSEVILLE CA 95747

476 080 012 000
NORTON 2002 TRUST
3177 BIG BEAR DR
ROSEVILLE CA 95747

476 080 013 000
MICHAEL E & MARY ANN KOVALCHIK
1523 CARBURY WAY
ROSEVILLE CA 95747

476 080 014 000
MICHAEL GARY WILLIS
1525 CARBURY WAY
ROSEVILLE CA 95747

476 080 015 000
GREG MAUPIN
1527 CARBURY WAY
ROSEVILLE CA 95747

476 080 016 000
SAUL P TERVYDIS
1529 CARBURY WAY
ROSEVILLE CA 95747

476 080 017 000
HELEN E HOLCOMB
1531 CARBURY WAY
ROSEVILLE CA 95747

476 080 018 000
STEVEN W YIP
1401 ORWELL DR
ROSEVILLE CA 95747

476 080 019 000
BETTY F ERICKSON
1403 ORWELL DR
ROSEVILLE CA 95747

476 080 052 000
EUGENE A & AGNES E ELDRIDGE
1520 CARBURY WAY
ROSEVILLE CA 95747

476 080 053 000
DAYNA L EVANS
1522 CARBURY WAY
ROSEVILLE CA 95747

476 080 054 000
ROBERT JOHN JR & EVA GREINER
1524 CARBURY WAY
ROSEVILLE CA 95747

476 080 055 000
JOHN M & KELLY R NADEAU
1526 CARBURY WAY
ROSEVILLE CA 95747

476 150 001 000
MONICA L WADE
1434 LORIMER WAY
ROSEVILLE CA 95747

476 150 002 000
DONOVAN W & SHELLY HATLEBERG
1436 LORIMER WAY
ROSEVILLE CA 95747

476 150 003 000
JOHN BARNETT
1438 LORIMER WAY
ROSEVILLE CA 95747

476 150 004 000
TONY & BRIGITTE SLY
1440 LORIMER WAY
ROSEVILLE CA 95747

476 150 005 000
MICHAEL E & LYNNE R STILES
1442 LORIMER WAY
ROSEVILLE CA 95747

476 150 006 000
JEFFREY N & MARY JOAN DAHLSTROM
1444 LORIMER WAY
ROSEVILLE CA 95747

476 150 007 000
RICCI
1446 LORIMER WAY
ROSEVILLE CA 95747

476 150 008 000
KURT & DEBRA SUE HEPPLER
1448 LORIMER WAY
ROSEVILLE CA 95747

476 150 009 000
CASEY D COX
1450 LORIMER WAY
ROSEVILLE CA 95747

476 150 010 000
ARTHUR L & DONNA S KRUMMES
1452 LORIMER WAY
ROSEVILLE CA 95747

476 150 011 000
JOHN F ELLIOTT
1454 LORIMER WAY
ROSEVILLE CA 95747

476 150 012 000
EARLE AUBREY & LAURA M REYNOLDS
1456 LORIMER WAY
ROSEVILLE CA 95747

476 150 013 000
VALERIE J PRICE
1458 LORIMER WAY
ROSEVILLE CA 95747

476 150 014 000
DAVID A & ANN Q CUNNINGHAM
1457 LORIMER WAY
ROSEVILLE CA 95747

476 150 015 000
DONALD J & STEPHANIE A COLLIN
1455 LORIMER WAY
ROSEVILLE CA 95747

476 150 016 000
CARL & REBECCA ROMINE
1453 LORIMER WAY
ROSEVILLE CA 95747

476 150 017 000
JAMES IAN & TAMI ECCLES
1451 LORIMER WAY
ROSEVILLE CA 95747

476 150 018 000
BRIAN E BADO
1449 LORIMER WAY
ROSEVILLE CA 95747

476 150 019 000
SUDHAKAR R TALANKI
1498 DALLEN WAY
ROSEVILLE CA 95747

476 150 020 000
JOHN & MARY A BOGNACKI
1497 DALLEN WAY
ROSEVILLE CA 95747

476 150 021 000
MARY SIMPSON
1495 DALLEN WAY
ROSEVILLE CA 95747

476 150 022 000
JOACHIM R & AMEY L RASMIJN
1445 LORIMER WAY
ROSEVILLE CA 95747

476 150 023 000
RONALD J & CYNTHIA A SARTORI
1443 LORIMER WAY
ROSEVILLE CA 95747

476 150 024 000
MICHAEL J & DEBRA L BURFORD
1441 LORIMER WAY
ROSEVILLE CA 95747

476 150 025 000
ELMER & AUDREY VANDELL
504 BROMLEY CT
ROSEVILLE CA 95747

476 150 026 000
NORMAN A JR & JANET L PILLIARD
506 BROMLEY CT
ROSEVILLE CA 95747

476 150 027 000
FRED LEE
6132 DEL ORO RD
GRANITE BAY CA 95746

476 150 028 000
STEVEN C & LINN C LIGHT
505 BROMLEY CT
ROSEVILLE CA 95747

476 150 029 000
FE A CEPE
503 BROMLEY CT
ROSEVILLE CA 95747

476 150 030 000
STEVE S LOE
1437 LORIMER WAY
ROSEVILLE CA 95747

476 150 031 000
GARY E & VERONICA S SHAW
736 NACIONAL CT
SALINAS CA 93901

476 150 032 000
O ANN KANE
1433 LORIMER WAY
ROSEVILLE CA 95747

476 150 033 000
DEL VILLAR MARIO
1470 BADOVINAC DR
ROSEVILLE CA 95747

476 150 034 000
BARBARA A ROBINSON
1472 BADOVINAC DR
ROSEVILLE CA 95747

476 150 035 000
GREGORY M & KAREN S SIINO
1474 BADOVINAC DR
ROSEVILLE CA 95747

476 150 036 000
ANN E DELFINO
1476 BADOVINAC DR
ROSEVILLE CA 95747

476 150 037 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 150 038 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 160 003 000
CHRISTOPHER J & DORIS J SA
7735 DUTRA BEND DR
SACRAMENTO CA 95831

476 160 004 000
BRUCE SINGER
1424 LORIMER WAY
ROSEVILLE CA 95747

476 160 005 000
ANN REGINA BARNER
1426 LORIMER WAY
ROSEVILLE CA 95747

476 160 006 000
JAMES R JR & FLORIDA P OBRIEN
1428 LORIMER WAY
ROSEVILLE CA 95747

476 160 007 000
CHERIE STRAIN
1430 LORIMER WAY
ROSEVILLE CA 95747

476 160 008 000
HAROLD D & EVELYN M KING
1432 LORIMER WAY
ROSEVILLE CA 95747

476 160 009 000
GERALD A & PAULENE S COUTURE
1475 BADOVINAC DR
ROSEVILLE CA 95747

476 160 010 000
GREGORY T & JENNIFER L ADAMSON
1473 BADOVINAC DR
ROSEVILLE CA 95747

476 160 011 000
JOHN R & VALERIE J KLINEFELTER
4900 RIDGELINE LN
FAIR OAKS CA 95628

476 160 012 000
HOMAYOON GEORGE ALAI
1469 BADOVINAC DR
ROSEVILLE CA 95747

476 160 013 000
WILLIAM & HOLLY C MARRA
1467 BADOVINAC DR
ROSEVILLE CA 95747

476 160 014 000
SUDIE V PRIDGEN
1465 BADOVINAC DR
ROSEVILLE CA 95747

476 160 015 000
ANTHONY L & LOIS E ROSE
1429 LORIMER WAY
ROSEVILLE CA 95747

476 160 016 000
RONALD G & THERESA F STEWART
1427 LORIMER WAY
ROSEVILLE CA 95747

476 160 017 000
SCOTT L & TERRI L BARMANN
402 DONNELLY CT
ROSEVILLE CA 95747

476 160 018 000
JAMES K ABRAHAM
406 DONNELLY CT
ROSEVILLE CA 95747

476 160 019 000
KENNETH L & KIM M ROWEL
408 DONNELLY CT
ROSEVILLE CA 95747

476 160 020 000
STEVEN & JENNIFER L VIRGEN
410 DONNELLY CT
ROSEVILLE CA 95747

476 160 021 000
JAMIE J BRYLA
412 DONNELLY CT
ROSEVILLE CA 95747

476 160 022 000
KIMBERLEY D MILLS
415 DONNELLY CT
ROSEVILLE CA 95747

476 160 023 000
ROBERT D HAAVISTO
413 DONNELLY CT
ROSEVILLE CA 95747

476 160 024 000
JONATHON & SARAH LEE
411 DONNELLY CT
ROSEVILLE CA 95747

476 160 025 000
KATHAYOUN KAVIANAN
561 TARTER CT
SAN JOSE CA 95136

476 160 026 000
JUDITH C PETERS
407 DONNELLY CT
ROSEVILLE CA 95747

476 160 027 000
SHERRI JACKSON
405 DONNELLY CT
ROSEVILLE CA 95747

476 160 028 000
CAROL D GREENER
403 DONNELLY CT
ROSEVILLE CA 95747

476 160 029 000
VIVIENNE BUTLER BRETT
401 DONNELLY CT
ROSEVILLE CA 95747

476 160 030 000
JOHN W BANKS III
300 CASSIDY CT
ROSEVILLE CA 95747

476 160 031 000
VONDA L WALKER
302 CASSIDY CT
ROSEVILLE CA 95747

476 160 032 000
WELLS
304 CASSIDY CT
ROSEVILLE CA 95747

476 160 033 000
WILLIAM J ROBERTSON
306 CASSIDY CT
ROSEVILLE CA 95747

476 160 034 000
RAYMOND J & ELL F HANNAN
308 CASSIDY CT
ROSEVILLE CA 95747

476 160 035 000
GUY R & KAREN I HOWES
1540 DUNFORD WAY
ROSEVILLE CA 95747

476 160 036 000
CARL L & BARBARA J BOLENBAUGH
1542 DUNFORD WAY
ROSEVILLE CA 95747

476 160 037 000
KELLEY S & RACHEL ANN HUNT
1541 DUNFORD WAY
ROSEVILLE CA 95747

476 160 038 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 160 039 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 170 001 000
ELAINE O JOHNSON
1512 DUNFORD WAY
ROSEVILLE CA 95747

476 170 002 000
RANDALL J & TAMMY C LEAR
611 HAILEY CT
ROSEVILLE CA 95747

476 170 003 000
JONATHAN D & JOAN L HILL
1516 DUNFORD WAY
ROSEVILLE CA 95747

476 170 004 000
ROBERT S & KIMBERLY J BAUMANN
1518 DUNFORD WAY
ROSEVILLE CA 95747

476 170 005 000
TODD H & LISA A HOLVERSON
110 PADGETT CT
ROSEVILLE CA 95747

476 170 006 000
DAVID J & MARGARET I SANDRONI
112 PADGETT CT
ROSEVILLE CA 95747

476 170 007 000
JEFFREY T & FRAULEIN S NELSON
114 PADGETT CT
ROSEVILLE CA 95747

476 170 008 000
COLLIN L & GAIL J COOPER
116 PADGETT CT
ROSEVILLE CA 95747

476 170 009 000
STEVE WARREN ADCOCK
115 PADGETT CT
ROSEVILLE CA 95747

476 170 010 000
DAVID W & SANDY D BROWN
1524 DUNFORD WAY
ROSEVILLE CA 95747

476 170 011 000
VIRGINIA NEWTON
1526 DUNFORD WAY
ROSEVILLE CA 95747

476 170 012 000
TIM W & DIANNA J TURNER
1445 PENHURST WAY
ROSEVILLE CA 95747

476 170 013 000
YAMAOKA FAMILY TRUST
1443 PENHURST WAY
ROSEVILLE CA 95747

476 170 014 000
DAVID C & DONNA L JORGENSEN
1441 PENHURST WAY
ROSEVILLE CA 95747

476 170 015 000
RICHARD AUGUSTUS BOGGESS
1439 PENHURST WAY
ROSEVILLE CA 95747

476 170 016 000
DOUGLAS E & BETH A WILFORD
1437 PENHURST WAY
ROSEVILLE CA 95747

476 170 017 000
LARRY A & JUDI A MILLER
1435 PENHURST WAY
ROSEVILLE CA 95747

476 170 018 000
TODD MOKHTARI
2325 HARBOR AVE SW #C1
SEATTLE WA 98126

476 170 032 000
JODY A CORSON
309 CASSIDY CT
ROSEVILLE CA 95747

476 170 033 000
CHARLES PARENTI
307 CASSLAY CT
ROSEVILLE CA 95747

476 170 034 000
CATHY JO CHANDLER
305 CASSIDY CT
ROSEVILLE CA 95747

476 170 035 000
MCCORD
3003 CASSIDY CT
ROSEVILLE CA 95678

476 170 036 000
LOBOW JOWA
1415 LORIMER WAY
ROSEVILLE CA 95747

476 170 037 000
NORMA P SAMOY
1413 LORIMER WAY
ROSEVILLE CA 95747

476 170 038 000
MICHAEL B & CHRISTINA M LEAPLEY
1411 LORIMER WAY
ROSEVILLE CA 95747

476 170 039 000
TIM & NANCY NUNES
1434 PENHURST WAY
ROSEVILLE CA 95747

476 170 040 000
RAMON & LETICIA ARIAS
1436 PENHURST WAY
ROSEVILLE CA 95747

476 170 041 000
AMANDA L ALBERS
1438 PENHURST WAY
ROSEVILLE CA 95747

476 170 042 000
STEVEN W HOSKINSON
1440 PENHURST WAY
ROSEVILLE CA 95747

476 170 043 000
MICHAEL & TERESA MULVEY
1442 PENHURST WAY
ROSEVILLE CA 95747

476 170 044 000
RODNEY W & ROSALIE A BRAZZEL
1532 DUNFORD WAY
ROSEVILLE CA 95747

476 170 045 000
WILLIAM H HAFFEY
1534 DUNFORD WAY
ROSEVILLE CA 95747

476 170 046 000
TIMOTHY H & MICHELLE E SHELLEY
1536 DUNFORD WAY
ROSEVILLE CA 95747

476 170 047 000
JULIE L LEAVERTON
1538 DUNFORD WAY
ROSEVILLE CA 95747

476 170 048 000
JOSEPH ZAPATA
1539 DUNFORD WAY
ROSEVILLE CA 95747

476 170 049 000
LINDA STILES
1537 DUNFORD WAY
ROSEVILLE CA 95747

476 170 050 000
ROBERT E & WYNNIE M BELL
1448 PENHURST WAY
ROSEVILLE CA 95747

476 170 051 000
ROLAND F & CATHERINE E WACHTER
1450 PENHURST WAY
ROSEVILLE CA 95747

476 170 052 000
SHAWN & DONNA SILVA
1449 PENHURST WAY
ROSEVILLE CA 95747

476 170 053 000
NGUYEN THU TRAN
PO BOX 246
ROSEVILLE CA 95678

476 170 054 000
SASAN & MARYAM AGHABEIGI
1527 DUNFORD WAY
ROSEVILLE CA 95747

476 170 055 000
STEVEN G & TERESA S PHILLIPS
200 BOWDEN CT
ROSEVILLE CA 95747

476 170 056 000
DONALD G & LORNA M MOLT
202 BOWDEN CT
ROSEVILLE CA 95747

476 170 057 000
CLARK R & LINDA A OSBORNE
204 BOWDEN CT
ROSEVILLE CA 95747

476 170 058 000
CATHERINE BACKER
206 BOWDEN CT
ROSEVILLE CA 95747

476 170 059 000
ROBERT C & DEBRA J FLETCHER
205 BOWDEN CT
ROSEVILLE CA 95747

476 170 060 000
REBECCA J SNYDER
203 BOWDEN CT
ROSEVILLE CA 95747

476 170 061 000
MICHAEL D JOVOVICH
201 BOWDEN CT
ROSEVILLE CA 95747

476 170 062 000
ANN MARIE STADDAN
910 CONNELL CT
ROSEVILLE CA 95747

476 170 063 000
EDWARD JOSEPH & BETH ANN
RODRIGUEZ
912 CONNELL CT
ROSEVILLE CA 95747

476 170 064 000
KENNY & DARLENE DURHAM
914 CONNELL CT
ROSEVILLE CA 95747

476 170 065 000
DANIEL S DAILY
916 CONNELL CT
ROSEVILLE CA 95747

476 170 066 000
MICHAEL R & JANICE M LAKE
918 CONNELL CT
ROSEVILLE CA 95747

476 170 067 000
SCOTT J OLIN
920 CONNELL CT
ROSEVILLE CA 95747

476 170 068 000
DAVID A & BONITA D GAMBOA
919 CONNELL CT
ROSEVILLE CA 95747

476 170 069 000
JOSEPH R & MAILE E BARRON II
917 CONNELL CT
ROSEVILLE CA 95747

476 170 070 000
STEFANIE DINES
915 CONNELL CT
ROSEVILLE CA 95747

476 170 071 000
BETTY M BUSELLINI
913 CONNELL CT
ROSEVILLE CA 95747

476 170 072 000
SELEWICZ
610 WHITEHALL WAY
SACRAMENTO CA 95864

476 170 073 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 170 074 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 180 001 000
GARY & JOHANNA BLEILE
1414 HURLSTON WAY
ROSEVILLE CA 95747

476 180 002 000
JOHN B & TERESITA P GUERRERO
1416 HURLSTON WAY
ROSEVILLE CA 95747

476 180 003 000
DONALD J JR & SHIRLEY A SHINGARA
1418 HURLSTON WAY
ROSEVILLE CA 95747

476 180 004 000
TOM E & MARGARET A SHERMAN
1420 HURLSTON WAY
ROSEVILLE CA 95747

476 180 005 000
USSERY
1422 HURLSTON WAY
ROSEVILLE CA 95747

476 180 006 000
ROBERT LEDOUX
1424 HURLSTON WAY
ROSEVILLE CA 95747

476 180 007 000
DANIEL R & BONNIE L HART
1426 HURLSTON WAY
ROSEVILLE CA 95747

476 180 008 000
LAVOY JOSEPH/L 2002 TRUST
810 LANETT CT
ROSEVILLE CA 95747

476 180 009 000
ROBERT J & LAURA J TURNER
812 LANETT CT
ROSEVILLE CA 95747

476 180 010 000
JACOB & MACKENZIE N BRUCKLER
814 LANETT CT
ROSEVILLE CA 95747

476 180 011 000
ANTHONY ADAMS
816 LANETT CT
ROSEVILLE CA 95747

476 180 012 000
MICHAELE D DAVES
815 LANETT CT
ROSEVILLE CA 95747

476 180 013 000
KENNETH C & DOROTHY LOU HALX
813 LANETT CT
ROSEVILLE CA 95747

476 180 014 000
SUSAN CANTWELL
1421 HURLSTON WAY
ROSEVILLE CA 95747

476 180 015 000
LISA K MORGAN
1419 HURLSTON WAY
ROSEVILLE CA 95747

476 180 016 000
WILLIAM A KLEINHANS
1417 HURLSTON WAY
ROSEVILLE CA 95747

476 180 017 000
THOMAS P & DIANA M DIPIETRO
1507 DUNFORD WAY
ROSEVILLE CA 95747

476 180 018 000
MARK N & LAURIE J VANWINKLE
1505 DUNFORD WAY
ROSEVILLE CA 95747

476 180 019 000
JOHN E & SABRINA K LERSETH
1503 DUNFORD WAY
ROSEVILLE CA 95747

476 180 020 000
JAMES SETTLE
1501 DUNFORD WAY
ROSEVILLE CA 95747

476 180 021 000
RYAN N & STEPHANI L SMITH
1500 DUNFORD WAY
ROSEVILLE CA 95747

476 180 022 000
MARK AARON & JACQUELINE DIANA SMITH
1502 DUNFORD WAY
ROSEVILLE CA 95747

476 180 023 000
ANTHONY & PIPER ROBERTS
1411 HURLSTON WAY
ROSEVILLE CA 95747

476 220 001 000
WALLACE C JONES
3000 ACTON WAY
ROSEVILLE CA 95747

476 220 002 000
GREG & HARRIET L PLATZ
3002 ACTON WAY
ROSEVILLE CA 95747

476 220 003 000
CAROLE P KOWALIK
3004 ACTON WAY
ROSEVILLE CA 95747

476 220 004 000
CHARLES B & MARY L SWAN
21915 RODEO CT
COLFAX CA 95713

476 220 005 000
MKB METCALFE FAMILY ENTERPRISE
1267 VINTAGE WAY
AUBURN CA 95603

476 220 006 000
BRIAN & KIMBERLEY ASTLE
3010 ACTON WAY
ROSEVILLE CA 95747

476 220 007 000
DANILO P & C DELEON
2295 PHEASANT DR
HERCULES CA 94547

476 220 008 000
KEVIN L & KRISTI M EDMONDSON
1414 FUHRMAN CT
ROSEVILLE CA 95747

476 220 009 000
MITCHELL CARRIE L 2002 TRUST
1416 FUHRMAN CT
ROSEVILLE CA 95747

476 220 010 000
DANIELLE M YOUNG
1418 FUHRMAN CT
ROSEVILLE CA 95747

476 220 011 000
WILLIS KAY JR & SANDRA K HOPKINS
1417 FUHRMAN CT
ROSEVILLE CA 95747

476 220 012 000
MARILYN BUTTS
1415 FUHRMAN CT
ROSEVILLE CA 95747

476 220 013 000
KEVIN G WARD
1413 FUHRMAN CT
ROSEVILLE CA 95747

476 220 014 000
JOYCE H GOMEZ
1411 FUHRMAN CT
ROSEVILLE CA 95747

476 220 015 000
FRY
3260 CUESTA DR
SAN JOSE CA 95148

476 220 016 000
CHRISTOPHER A MARCONI
1407 FUHRMAN CT
ROSEVILLE CA 95747

476 220 017 000
JAMES C & JENNY L FAHEY
1405 FUHRMAN CT
ROSEVILLE CA 95747

476 220 018 000
STEPHEN F LINTON
1403 FUHRMAN CT
ROSEVILLE CA 95747

476 220 019 000
EDWARD B & VALARIE S BELDING
3100 ACTON WAY
ROSEVILLE CA 95747

476 220 020 000
JAMES D & JENIFER K WILSON
3102 ACTON WAY
ROSEVILLE CA 95747

476 220 021 000
CAROL J YANDELL
3104 ACTON WAY
ROSEVILLE CA 95747

476 220 022 000
DAVID UNTERHOLZNER
500 COWAN CT
ROSEVILLE CA 95747

476 220 023 000
ELLEN BLANCHE WOODHOUSE
7409 ACORN GLEN LOOP
ROSEVILLE CA 95747

476 220 024 000
ERIC J & AMBER L ZEHRUNG
504 COWAN CT
ROSEVILLE CA 95747

476 220 048 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 250 001 000
GUY & TAMARA NAKANO
3101 ACTON WAY
ROSEVILLE CA 95747

476 250 002 000
RICARDO S & JULIET R SEGURITAN
3103 ACTON WAY
ROSEVILLE CA 95747

476 250 003 000
EUGENE E & ESTHER E EDEN
50 HAZELWOOD AVE
SAN FRANCISCO CA 94112

476 250 004 000
ELIZABETH PAVICH
3107 ACTON WAY
ROSEVILLE CA 95747

476 250 039 000
DENNIS E HARVEY
606 RIGBY CT
ROSEVILLE CA 95747

476 250 040 000
ROBERT E RATCLIFFE
604 RIGBY CT
ROSEVILLE CA 95747

476 250 041 000
JAMES M & KIM LAMAR
602 RIGBY CT
ROSEVILLE CA 95747

476 250 042 000
SHERRY L KIRKPATRICK
600 RIGBY CT
ROSEVILLE CA 95747

476 250 043 000
SCOTT DAVEY
1301 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 044 000
JAMES S & SHARON M WOODWARD
1303 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 045 000
RAYMOND T & JAMIE M JENNINGS
1305 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 046 000
ALLISON D & THOMAS J PERKINS
1302 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 047 000
WILLIAM E IV CRUM
1306 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 048 000
RUSSEL R JR YOUNG
1308 FUHRMAN WAY
ROSEVILLE CA 95747

476 250 049 000
NICOLE TENNANT
3005 ACTON WAY
ROSEVILLE CA 95747

476 250 050 000
GEORGE D DEESE
3003 ACTON WAY
ROSEVILLE CA 95747

476 250 051 000
JOSEPH MARQUEZ
3001 ACTON WAY
ROSEVILLE CA 95747

476 250 052 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 250 053 000
ELLIOT HOMES INC
2390 E BIDWELL ST
FOLSOM CA 95630

476 270 002 000
DEREK EDWARD & MARCIA LAGE BROCK
1815 DISCOVERY DR
ROSEVILLE CA 95747

476 270 003 000
ROY D & LAURA L CRAVER
1819 DISCOVERY DR
ROSEVILLE CA 95747

476 270 004 000
GREGORY J & PEGGY E MELIN
1825 DISCOVERY DR
ROSEVILLE CA 95747

476 270 005 000
WILLIAM R & TRICIA L FITCH
1827 DISCOVERY DR
ROSEVILLE CA 95747

476 270 006 000
DENNIS D & MARY F KRUEGER
1829 DISCOVERY DR
ROSEVILLE CA 95747

476 270 007 000
BOBBY V & NETTIE E SHORT
1831 DISCOVERY DR
ROSEVILLE CA 95747

476 270 008 000
DAVID S & MARIEA K KIRKMAN
1837 DISCOVERY DR
ROSEVILLE CA 95747

476 270 009 000
THOMAS E & PATRICIA KERRIGAN
1839 DISCOVERY DR
ROSEVILLE CA 95747

476 270 023 000
TODD C & SUZANNE R ANDERSON
2222 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 024 000
MARK A & EMBER R SHURTZ
2220 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 025 000
THOMAS H ATKINSON II
2218 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 026 000
IVY F SHAW
2216 SILVER CREEK LN
ROSEVILLE CA 95747

476 270 027 000
CURTIS W DAY
2017 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 028 000
ROSEMARY C KRAUSE
2019 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 029 000
MICHAEL ALLAN WALBORN
2021 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 030 000
WESLEY S NYGARD
2023 GOLD MINE WAY
ROSEVILLE CA 95747

476 270 031 000
ROGELIO & DELIA ANGUIANO
3529 BARNACLE CT
UNION CITY CA 94587

476 270 032 000
MIKE GLAZEBROOK
1836 DISCOVERY DR
ROSEVILLE CA 95747

476 270 033 000
NANCY VAUGHN
1834 DISCOVERY DR
ROSEVILLE CA 95747

476 270 034 000
CLAUDIA J DUNN
1832 DISCOVERY DR
ROSEVILLE CA 95747

476 270 035 000
KOCH
500 MILL CREEK CT
ROSEVILLE CA 95747

476 270 036 000
WILLIAM SHAWN & KATHLEEN ANNA HASSELL
502 MILL CREEK CT
ROSEVILLE CA 95747

476 270 037 000
MICHAEL L & KATHY S TRAPP
504 MILL CREEK CT
ROSEVILLE CA 95747

476 270 038 000
ROGER N RANSFORD
506 MILL CREEK CT
ROSEVILLE CA 95747

476 270 041 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 270 042 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 001 000
TODD WILLIAM MOSACK
2214 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 002 000
CHARLES J & KIRSTEN A FAZZINO
2212 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 003 000
PAUL M SUMABON
2210 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 004 000
BRIAN ROTH
2208 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 005 000
LISA J FORRY
2206 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 006 000
JOHN DAVID & LINDA C SCHMITZ
1573 MILL RUN DR
ROSEVILLE CA 95747

476 280 007 000
JAMES B JR & CAMILLA J MCGEE
1571 MILL RUN DR
ROSEVILLE CA 95747

476 280 008 000
MICHAEL PUCCI
1569 MILL RUN DR
ROSEVILLE CA 95747

476 280 009 000
DEAN KENJI TOKUNAGA
1567 MILL RUN DR
ROSEVILLE CA 95747

476 280 010 000
JOANNA M HAWCK
1565 MILL RUN DR
ROSEVILLE CA 95747

476 280 011 000
DENNIS PATRICK BOGUE
1563 MILL RUN DR
ROSEVILLE CA 95747

476 280 012 000
MICHAEL & JESSICA MOULTON
1561 MILL RUN DR
ROSEVILLE CA 95747

476 280 013 000
JOHN HENRY JR & JOCELYN KAPPLER
2001 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 014 000
MATT & STACIE S WEBSTER
2003 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 015 000
SIGURD MEJDAL
346 DUNSMUIR TER #3
SUNNYVALE CA 94085

476 280 016 000
KELLEY A SILVA
2007 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 017 000
DANIEL C & TERRY M MURRELL
2009 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 018 000
PAUL A SOTO
2011 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 019 000
DONALD K & MAUREEN E SHEPHERD
2013 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 020 000
JAMES E & MARIA M HOLLOWAY
2015 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 021 000
CASEY HINKEY
505 MILL CREEK CT
ROSEVILLE CA 95747

476 280 022 000
RANDALL D MESA
2377 GOLD MEADOW WAY #100
GOLD RIVER CA 95670

476 280 023 000
GEORGE LOUIS RODRIGUEZ
2010 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 024 000
STEVEN R & KAREN M EASON
2006 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 025 000
TERRY STEPHEN & DANA LYNN
ZAHNISER
2002 GOLD MINE WAY
ROSEVILLE CA 95747

476 280 026 000
ANNETTE M DIPIRRO
600 MILL RUN CT
ROSEVILLE CA 95747

476 280 027 000
BETH A CARRIGAN
602 MILL RUN CT
ROSEVILLE CA 95747

476 280 028 000
LARRY ROBERT & DONNIE JO WELCH
1550 MILL RUN DR
ROSEVILLE CA 95747

476 280 029 000
KATHLEEN KEEFE
1552 MILL RUN DR
ROSEVILLE CA 95747

476 280 030 000
MARK R & LYNNE M PEARCE
1554 MILL RUN DR
ROSEVILLE CA 95747

476 280 031 000
NESTOR & JOSEPHINE BUGAOISAN
1556 MILL RUN DR
ROSEVILLE CA 95747

476 280 032 000
DARRELL L & MARILYN R KAFF
1558 MILL RUN DR
ROSEVILLE CA 95747

476 280 033 000
LARRY R & COLLEEN M BERWICK
1560 MILL RUN DR
ROSEVILLE CA 95747

476 280 034 000
RICHARD B & KATHLEEN J ROCHON
1562 MILL RUN DR
ROSEVILLE CA 95747

476 280 035 000
ROBERT E & MARY A MORSE
1564 MILL RUN DR
ROSEVILLE CA 95747

476 280 036 000
JUDITH M YARNELL
1566 MILL RUN DR
ROSEVILLE CA 95747

476 280 037 000
TROY L & PAMELA J MOWRY
1568 MILL RUN DR
ROSEVILLE CA 95747

476 280 038 000
MICHAEL G & TERRI L SOBER
1570 MILL RUN DR
ROSEVILLE CA 95747

476 280 039 000
RADISA PETKOVIC
1572 MILL RUN DR
ROSEVILLE CA 95747

476 280 040 000
ROBERT & D J GONZALEZ
1574 MILL RUN DR
ROSEVILLE CA 95747

476 280 041 000
KARA M & CHAD A KAESTLE
2201 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 042 000
ALDEN
2203 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 043 000
ROBERT C; EGER
2205 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 044 000
KELLEY GETTEMY
2207 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 045 000
JAMES H & JOY ELISABETH WEBB
2209 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 046 000
CLAYTON LEE GREEN
2211 SILVER CREEK LN
ROSEVILLE CA 95747

476 280 047 000
SHANE ONEILL
1760 CHILTON DR
ROSEVILLE CA 95747

476 280 048 000
PATRICK J & TONA LYNNE OBRIEN
2315 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 049 000
RONALD C BRETHERTON
2313 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 050 000
ROBERT S TALBOTT
2311 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 051 000
ROLAND C & CINDY D WRIGHT
2309 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 052 000
SOOK Y & KI S NAM
2307 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 053 000
MIRTA E ABEIJON
2305 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 054 000
GREGORY R & TERESA A FERGUSON
2303 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 055 000
DAVID W & ROSEMARIE HOWELL
2301 PROSPECT POINT DR
ROSEVILLE CA 95747

476 280 056 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 057 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 280 058 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 290 001 000
RICHARD LAWRENCE & KAREN L KELSO
2300 PROSPECT PARK DR
ROSEVILLE CA 95747

476 290 002 000
JEAN M NEILL
2302 PROSPECT POINT DR
ROSEVILLE CA 95747

476 290 003 000
MICHAEL G & CARMEN S PETERS

476 290 004 000
MICHAEL REID & REBECCA MAE ARNOLD
1751 EVERGREEN DR
ROSEVILLE CA 95747

476 290 005 000
SOLORIO
1749 EVERGREEN DR
ROSEVILLE CA 95747

476 290 006 000
TSAW S & YAYOUNG LIN
2026 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 007 000
DONALD P & JOYCE C ANDERSON
2024 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 008 000
MICHAEL & KARI ERICKSON
2022 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 009 000
WAYNE A & DONNA D EMERY
2020 MINERAL SPRINGS DR
ROSEVILLE CA 95747

476 290 077 000
SHARON L; CELIO
1748 EVERGREEN DR
ROSEVILLE CA 95747

476 290 078 000
VICTOR & NADEZHDA TIKHOMIROV
1750 EVERGREEN DR
ROSEVILLE CA 95747

476 300 001 000
DWIGHT ALLEN
1018 WAILEA WAY
ROSEVILLE CA 95747

476 300 002 000
WILBUR & NORMA REIMER
1016 WAILEA WAY
ROSEVILLE CA 95747

476 300 003 000
SEAN E & KATHLEEN G GOETZGER
1014 WAILEA WAY
ROSEVILLE CA 95747

476 300 004 000
STEPHEN G WAYMAN
1012 WAILEA WAY
ROSEVILLE CA 95747

476 300 005 000
HERMAN H & SUSAN J REDLICH
1010 WAILEA WAY
ROSEVILLE CA 95747

476 300 006 000
STEVEN DOUGLAS & DEBORAH ANEAS BUEHLER
1008 WAILEA WAY
ROSEVILLE CA 95747

476 300 007 000
AGNES LEE
1004 WAILEA WAY
ROSEVILLE CA 95747

476 300 008 000
MARY A STANTON
1000 WAILEA WAY
ROSEVILLE CA 95747

476 300 009 000
JASON J & VENUS A CARDA
804 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 010 000
FERNANDO & STEPHANIE CABRERA
806 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 011 000
ALFONSO J & KAREN L PEREZ
808 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 012 000
MICHAEL E & REBECCA L PARRE
809 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 013 000
ALEXANDER & PATRICE G FECANIN
807 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 014 000
BRIAN M & KRISTIN M SAWCHUK
805 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 015 000
THOMAS LEE & LAURA ANNE BUSTABADE
803 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 016 000
JOHN E & CHRISTY B BOUNDS
801 SHENENCOCK CT
ROSEVILLE CA 95747

476 300 017 000
WAYNE ALBERT & LAURINE LEE LEWIS
1001 SHENENCOCK WAY
ROSEVILLE CA 95747

476 300 018 000
GAYLE CABLE
1003 SHENENCOCK WAY
ROSEVILLE CA 95747

476 300 019 000
DENNIS G MURANY
1005 SHENENCOCK WAY
ROSEVILLE CA 95747

476 300 031 000
LEO J JR & KATHY L MARIN
708 TROON CT
ROSEVILLE CA 95747

476 300 032 000
BRADON & TRACY D BRESNAHAN
706 TROON CT
ROSEVILLE CA 95747

476 300 033 000
STEVEN L DINESEN
704 TROON CT
ROSEVILLE CA 95747

476 300 034 000
JAMES A & CHRIS C GINTY
702 TROON CT
ROSEVILLE CA 95747

476 300 035 000
KEVIN D & MICHELLE CARTER PENNER
700 TROON CT
ROSEVILLE CA 95747

476 300 036 000
DARRELL L & MARILYN R KAFF
2340 HURLEY WAY #25
SACRAMENTO CA 95825

476 300 037 000
JOSHUA D RAUB
1003 WAILEA WAY
ROSEVILLE CA 95747

476 300 038 000
NADINE ANN CASSELLA
1005 WAILEA WAY
ROSEVILLE CA 95747

476 300 039 000
DANNY P & SUZANNE L NUNEZ
1007 WAILEA WAY
ROSEVILLE CA 95747

476 300 040 000
JAMES COOPER & SUSAN MAY
ROBERTS
1009 WAILEA WAY
ROSEVILLE CA 95747

476 300 041 000
REBECCA M HARMAN
1011 WAILEA WAY
ROSEVILLE CA 95747

476 300 042 000
DEBORAH HOLLIS
1017 WAILEA WAY
ROSEVILLE CA 95747

476 300 044 000
KAUFMAN & BROAD OF SACRAMENTO
3300 DOUGLAS BLVD #300
ROSEVILLE CA 95661

476 310 001 000
DAVID & SABRINA BIRLEM
1028 WAILEA WAY
ROSEVILLE CA 95747

476 310 002 000
TRENT ERIK & KATHLEEN MARGAR
JOHNSON
1026 WAILEA WAY
ROSEVILLE CA 95747

476 310 003 000
MILDRED C & ROBINSON B NUEVO
1024 WAILEA WAY
ROSEVILLE CA 95747

476 310 004 000
NOEL D & SUSAN J SHRUM
1022 WAILEA WAY
ROSEVILLE CA 95747

476 310 005 000
JOHN W GOODWIN
1020 WAILEA WAY
ROSEVILLE CA 95747

476 310 006 000
TODD S CRAWFORD
1019 WAILEA WAY
ROSEVILLE CA 95747

476 310 007 000
LINDSEY LEONARD
1021 WAILEA WAY
ROSEVILLE CA 95747

476 310 008 000
SHERRY L; EDGAR
1023 WAILEA WAY
ROSEVILLE CA 95747

476 310 009 000
NICHOLAS J & MERLE M GIBSON
1025 WAILEA WAY
ROSEVILLE CA 95747

476 310 010 000
TIMOTHY P & DEBRA M THRIFT
1405 LEGENDS WAY
ROSEVILLE CA 95747

476 310 011 000
EDWIN A & LEVY D SAGUCIO
201 WAILEA CT
ROSEVILLE CA 95747

476 310 012 000
ADRIENNE M SMITH
203 WAILEA CT
ROSEVILLE CA 95747

476 310 013 000
NORMA C GALLEGOS
205 WAILEA CT
ROSEVILLE CA 95747

476 310 014 000
EDWARD B BECKER
207 WAILEA CT
ROSEVILLE CA 95747

476 310 015 000
DANNY E & PAMELA L KEEN
209 WAILEA CT
ROSEVILLE CA 95747

476 310 016 000
CRISPIN A & NEJA M ASUNCION
211 WAILEA CT
ROSEVILLE CA 95747

476 310 017 000
L KENNETH & KATHLEEN E NEUTZ
213 WAILEA CT
ROSEVILLE CA 95747

476 310 018 000
SANGYONG PARK
212 WAILEA CT
ROSEVILLE CA 95747

476 310 019 000
GLENN R & COURTNEY YATES
210 WAILEA CT
ROSEVILLE CA 95747

476 310 020 000
FRANK & LEIGHANN JORDAN
208 WAILEA CT
ROSEVILLE CA 95747

476 310 021 000
HARVEY B PORTER III
206 WAILEA CT
ROSEVILLE CA 95747

476 310 022 000
LUKE B BURROUGHS
202 WAILEA CT
ROSEVILLE CA 95747

476 310 023 000
KAUFMAN & BROAD OF SACRAMENTO
3300 DOUGLAS BLVD #300
ROSEVILLE CA 95661

476 310 024 000
KAUFMAN & BROAD OF SACRAMENTO
3300 DOUGLAS BLVD #300
ROSEVILLE CA 95661

476 320 007 000
SUHAIR MELEHANI
1127 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 008 000
FRANCISCO RODRIGUEZ-RIVERA
1129 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 009 000
CHRIS MAROVICH
1131 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 010 000
MICHAEL & ERIN LOWE
700 GIBSON DR #623
ROSEVILLE CA 95678

476 320 011 000
TIMOTHY W & LISA M HEARL
1135 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 012 000
THOMAS E WARE
12540 CANYON WIND RD
RIVERSIDE CA 92503

476 320 013 000
STEVEN J & LYNDA L FIORAVANTI
1136 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 014 000
TIMOTHY JOHN WALSH
1134 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 015 000
JASON A MARTINEZ
1132 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 016 000
WILLARD A & DONNA M TODD
1130 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 017 000
EDWARD ROLDAN
1128 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 018 000
EDWARD & JULIA FARDOS
1126 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 019 000
GARY E & DONNA E ROSE
1124 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 020 000
GILBERT & CHARLOTTE LONZO
1122 BROOKLINE CIR
ROSEVILLE CA 95747

476 320 021 000
COLLEEN G EDSON
1120 BROOKLINE CIR
ROSEVILLE CA 95747

476 340 001 000
SEWELL L KEETER
1407 LEGENDS WAY
ROSEVILLE CA 95747

476 340 002 000
TIMOTHY KENT & JULIA ANN HELMER
1409 LEGENDS WAY
ROSEVILLE CA 95747

476 340 003 000
TORE FINNEMYHR
402 PINE HEARST CT
ROSEVILLE CA 95747

476 340 004 000
BOYD R & JAN P WHITMAN
404 PINE HEARST CT
ROSEVILLE CA 95747

476 340 005 000
WILLIAM & AMY ADAM
406 PINE HEARST CT
ROSEVILLE CA 95747

476 340 006 000
JOHN D & PATRICIA M SNELL
408 PINE HEARST CT
ROSEVILLE CA 95747

476 340 007 000
SARAH M LAWSON
2581 CENTRAL AVE
ROSEVILLE CA 95747

476 340 008 000
TIMOTHY DEAN & TRACY ELIZABETH
WILLIAMS
405 PINE HEARST CT
ROSEVILLE CA 95747

476 340 009 000
STEPHEN MATHAIS NEUMANN
403 PINE HEARST CT
ROSEVILLE CA 95747

476 340 010 000
MARY G & ALLEN J HOLLAND
401 PINE HEARST CT
ROSEVILLE CA 95747

476 340 045 000
TECHAU BRETT M
1139 BROOKLINE CIR
ROSEVILLE CA 95747

476 340 046 000
SARAH MARTINEZ
1138 BROOKLINE CIR
ROSEVILLE CA 95747

476 360 011 000
KEVIN V & THERESA L SMITH
506 FELTON CT
ROSEVILLE CA 95747

476 360 012 000
LINDA A ALLEN
505 FELTON CT
ROSEVILLE CA 95747

476 360 013 000
ERIC T & NICOLE HOWELLS
503 FELTON CT
ROSEVILLE CA 95747

476 360 014 000
CHARLES GREGORY & JULINDA K FOLAND
501 FELTON CT
ROSEVILLE CA 95747

476 360 015 000
MARK A & MARIANN C NELSON
1401 LAZENBY WAY
ROSEVILLE CA 95747

476 360 016 000
BRADLEY A & CHANA R BURCH
1403 LAZENBY WAY
ROSEVILLE CA 95747

476 360 017 000
MARK D & KRISTY R ROESE
1405 LAZENBY WAY
ROSEVILLE CA 95747

476 360 018 000
ELIZABETH Y & FRANK H JANOWITZ
1407 LAZENBY WAY
ROSEVILLE CA 95747

476 360 019 000
ROLAND E GARNER
1409 LAZENBY WAY
ROSEVILLE CA 95747

476 360 020 000
ALEXANDER D LOPEZ
2107 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 021 000
CLAUDIO A SILVA
2109 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 022 000
BONNIE G MEYER
56 MIDWAY ST
CAMPBELL CA 95008

476 360 023 000
GARY & TERESA P HYNES
2113 BECKENHAM WAY
ROSEVILLE CA 95747

476 360 024 000
EMILY ELAINE ROTH
1234 CHENIN BLANC CIR
ROSEVILLE CA 95747

476 360 044 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 360 045 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 360 046 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 017 000
CATHERINE R DONOVAN
1419 LOCKHART WAY
ROSEVILLE CA 95747

476 380 018 000
DAVID J & MISTY L VIANI
1417 LOCKHART WAY
ROSEVILLE CA 95747

476 380 019 000
SANDRA L MARTINEZ
1415 LOCKHART WAY
ROSEVILLE CA 95747

476 380 020 000
MICHAEL H & PATRICIA RAMSEY
1413 LOCKHART WAY
ROSEVILLE CA 95747

476 380 021 000
PAUL MOCNY
1411 LOCKHART WAY
ROSEVILLE CA 95747

476 380 022 000
ERIK R & DEANNA L ALDRICH
1409 LOCKHART WAY
ROSEVILLE CA 95747

476 380 023 000
HENRY S YUN
101 GALSTON CT
ROSEVILLE CA 95747

476 380 024 000
STEVEN M & KAREN L HOLDERNESS
103 GALSTON CT
ROSEVILLE CA 95747

476 380 025 000
PATRICK G BACCARI
105 GALSTON CT
ROSEVILLE CA 95747

476 380 026 000
RICK W & PAMELA L BARTO
104 GALSTON CT
ROSEVILLE CA 95747

476 380 027 000
DANE D & DELLA P CABRAL
102 GALSTON CT
ROSEVILLE CA 95747

476 380 028 000
JACK SWEIGART
3434 MARCONI AVE #C
SACRAMENTO CA 95821

476 380 029 000
ROBIN MARIE LEONARD
201 EPWORTH CT
ROSEVILLE CA 95747

476 380 030 000
MARK J & JODI M TRUSCOTT
203 EPWORTH CT
ROSEVILLE CA 95747

476 380 031 000
AFTON L HARRINGTON
205 EPWORTH CT
ROSEVILLE CA 95747

476 380 032 000
KELLY D PECK
207 EPWORTH CT
ROSEVILLE CA 95747

476 380 033 000
DOUGLAS H & KATHY L FUNK
208 EPWORTH CT
ROSEVILLE CA 95747

476 380 034 000
DAWN WARRIOR
206 EPWORTH CT
ROSEVILLE CA 95747

476 380 035 000
VIRGINIA MARTINEZ
204 EPWORTH CT
ROSEVILLE CA 95747

476 380 036 000
ANH Q; PHAM
249 GREENDALE WAY #1
SAN JOSE CA 95129

476 380 037 000
JOHN & LISA MOLINEAUX
200 EPWORTH CT
ROSEVILLE CA 95747

476 380 038 000
JOSEPH A & JULIE R OLDHAM
2105 BECKENHAM WAY
ROSEVILLE CA 95747

476 380 039 000
MICHAEL J & SUZANNE E FUNK
302 CULLIGAN CT
ROSEVILLE CA 95747

476 380 040 000
JEROME M RYAN
306 CULLIGAN CT
ROSEVILLE CA 95747

476 380 041 000
JOHN JR VICENTE
308 CULLIGAN CT
ROSEVILLE CA 95747

476 380 042 000
J FELD DEFINED BENEFIT PLAN R
16666 BLUE OAK WAY
GRASS VALLEY CA 95949

476 380 043 000
RANDHER S & MANDIP K ATHWAL
307 CULLIGAN CT
ROSEVILLE CA 95747

476 380 044 000
PAUL J LEFRANCOIS
305 CULLIGAN CT
ROSEVILLE CA 95747

476 380 045 000
RAFAEL A MOLINA
303 CULLIGAN CT
ROSEVILLE CA 95747

476 380 046 000
JAMES ROBERT SEP IRA COURSHON
160 BOVET RD
SAN MATEO CA 94402

476 380 047 000
JEFFREY R & KATHLEEN M DUMONT
1410 LOCKHART WAY
ROSEVILLE CA 95747

476 380 048 000
WILLIAM KENT
1412 LOCKHART WAY
ROSEVILLE CA 95747

476 380 049 000
KENDRA K JUNK
1414 LOCKHART WAY
ROSEVILLE CA 95747

476 380 050 000
ANTONE G & PAULINE C CHRISTIE
1416 LOCKHART WAY
ROSEVILLE CA 95747

476 380 051 000
ERHARDT E KRAUSE
1418 LOCKHART WAY
ROSEVILLE CA 95747

476 380 078 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 380 079 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 430 001 000
DARCI PACKER
1400 RAEBURN WAY
ROSEVILLE CA 95747

476 430 002 000
RUTH A MOORE-TINER
2102 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 003 000
STEPHEN HODSON
2104 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 004 000
JAMES & MAUREEN ELIZABETH
PAGONIS
2106 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 005 000
DARREN M & KELLI L MCINTYRE
2108 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 006 000
NOBLE & TAMMMY BARTON III
2110 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 007 000
DENNIS & KAMELIA MCDERMIT
2112 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 008 000
LUIS A JR & DANYAIL L SOTOMAYOR
2114 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 009 000
BRENT CHARLES & HEIDI LYN MASSEY
2116 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 010 000
BRUCE FANCHER
103 STOFFELS CT
ROSEVILLE CA 95747

476 430 011 000
SEAN L BROEDER
1243 HENDERSON AVE #E
SUNNYVALE CA 94086

476 430 012 000
PAUL E MOCNY
2105 STOFFELS WAY
ROSEVILLE CA 95747

476 430 013 000
MICHAEL E HARPER
2103 STOFFELS WAY
ROSEVILLE CA 95747

476 430 014 000
MICHAEL R EDWARDS
2101STOFFELS WAY
ROSEVILLE CA 95747

476 430 015 000
JOHN T IKEDA
2102 STOFFELS WAY
ROSEVILLE CA 95747

476 430 016 000
GLEN E & JANICE L WILLIAMSON
2104 STOFFELS WAY
ROSEVILLE CA 95747

476 430 017 000
MARK & TAMMY HATCH
3105 ACTON WAY
ROSEVILLE CA 95747

476 430 018 000
GERALD W JR & MICHELLE J WILSON
2107 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 019 000
JEFFREY A & JENNIFER L MARTIN
2105 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 020 000
JOSEPH & JULIE RAPOSA
2103 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 021 000
CHRIS M & DEBORA G LUTHER
2101 SEEBOLD WAY
ROSEVILLE CA 95747

476 430 022 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

476 460 001 000
DONALD L ROBINSON
1453 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 002 000
RANDHIR S & KAMALJIT DHANJAL
1449 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 003 000
JAY M & KRISTEN L DESIMONE
1445 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 004 000
KRIZ
1437 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 005 000
LAURA L GONDEK
1421 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 006 000
KEVIN P & PAMELA LONG
1417 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 007 000
STEVEN W & SANDRA L KING
1413 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 008 000
FRANK & BRENDA D TENEDORA
104 CORRIGAN CT
ROSEVILLE CA 95747

476 460 009 000
DAVID B & PHYLLIS A LEMAY
108 CORRIGAN CT
ROSEVILLE CA 95747

476 460 010 000
THOMAS P & GIDG MAGGIANO
112 CORRIGAN CT
ROSEVILLE CA 95747

476 460 011 000
SCOTT A & THERESA A MILLSPAUGH
113 CORRIGAN CT
ROSEVILLE CA 95747

476 460 012 000
TIMOTHY & LISA PARKER
109 CORRIGAN CT
ROSEVILLE CA 95747

476 460 013 000
JOHN THOMAS CONNEALLY
105 CORRIGAN CT
ROSEVILLE CA 95747

476 460 014 000
BARBARA N PAXSON
101 CORRIGAN CT
ROSEVILLE CA 95747

476 460 015 000
CHRIS J & WENDY R MONIZ
1400 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 016 000
SHERYL A LEE
1404 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 017 000
PETER J RADER
1408 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 018 000
JOSEPH A & JODI J KURTZ
1412 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 019 000
KIMIKO LESLEY KIDO
1416 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 020 000
MAUREEN D BROI
1420 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 021 000
JOHN K & DIANE C NOEL
1424 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 022 000
VIANEY O & BARBARA L SANTIBANEZ
1428 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 023 000
HAROLD A & JENNIFER L MICHAUD
1432 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 024 000
JEFFREY K LINEGAR
1436 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 025 000
ROGER & KAREN A MOORE
1440 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 026 000
COLLEEN L SUTHERLIN
1444 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 027 000
FERNANDO F & CHERYL A HUIZAR
1448 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 028 000
JOE A STONE
1452 MUSGRAVE DR
ROSEVILLE CA 95747

476 460 029 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

476 460 030 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

476 460 031 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

476 460 032 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 100 007 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 100 009 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 100 016 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 110 004 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 110 005 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 110 006 000
WOODCREEK ROSEVILLE LTD
3007 DOUGLAS BLVD #170
ROSEVILLE CA 95661

477 110 009 000
RALPHS GROCERY COMPANY
1100 W ARTESIA BLVD
COMPTON CA 90220

477 110 010 000
WOODCREEK LLC BLE
660 COMMERCE DR #A
ROSEVILLE CA 95678

477 110 011 000
WOODCREEK LLC BLE
660 COMMERCE DR #A
ROSEVILLE CA 95678

477 110 012 000
WOODCREEK LLC BLE
660 COMMERCE DR #A
ROSEVILLE CA 95678

477 141 001 000
MERLE R & MARGARET S SHIELDS
5313 NAVIGATION CT
FAIR OAKS CA 95628

477 141 002 000
THOMAS & MARGARET C MCCLEARY
1005 DANIELLE DR
ROSEVILLE CA 95747

477 141 003 000
DOUG & CHERYL ANDERSON
201 TRAVIS CT
ROSEVILLE CA 95747

477 141 004 000
CATHRYN M ROMMEL
205 TRAVIS CT
ROSEVILLE CA 95747

477 141 005 000
MICHAEL T & MICHELLE L ANDERSON
204 TRAVIS CT
ROSEVILLE CA 95747

477 141 006 000
JOHN C & MARTHA J VOSS
1013 DANIELLE DR
ROSEVILLE CA 95747

477 141 007 000
ERIC M & REGINE K BEHR
1017 DANIELLE DR
ROSEVILLE CA 95747

477 141 008 000
SCOTT H & APRIL M EDWARDS
1021 DANIELLE DR
ROSEVILLE CA 95747

477 141 009 000
MICHAEL D & JAN J FRANKS
1025 DANIELLE DR
ROSEVILLE CA 95747

477 141 010 000
KYLE & ARLENE JOHNSON
405 JOSHUA CT
ROSEVILLE CA 95747

477 141 011 000
ROBERT & KRISTIN MCCARTHY
407 JOSHUA CT
ROSEVILLE CA 95747

477 141 012 000
JAMES & DENISE B LOUDAROS
409 JOSHUA CT
ROSEVILLE CA 95747

477 141 013 000
LYLE D & KANDYCE D SCHNEIDER
404 JOSHUA CT
ROSEVILLE CA 95747

477 141 014 000
JOHN & RUDINA LOUDAROS
1029 DANIELLE DR
ROSEVILLE CA 95747

477 141 015 000
PRADEEP K & VRUSHALI TAPADIYA
1033 DANIELLE DR
ROSEVILLE CA 95747

477 141 016 000
RODNEY W LEE
1037 DANIELLE DR
ROSEVILLE CA 95747

477 141 017 000
ANNETTE R MORAN
1041 DANIELLE DR
ROSEVILLE CA 95747

477 141 018 000
DAVID C & DONNA J MESSER
1032 DANIELLE DR
ROSEVILLE CA 95747

477 141 019 000
STEVEN D & SUSAN F HALL
1028 DANIELLE DR
ROSEVILLE CA 95747

477 141 020 000
DANIEL HERNANDEZ
505 DANIELLE CT
ROSEVILLE CA 95747

477 141 021 000
SILVER
509 DANIELLE CT
ROSEVILLE CA 95747

477 141 022 000
JOAN E ENGLISH
504 DANIELLE CT
ROSEVILLE CA 95747

477 141 023 000
GEORGE A JR & JOSEPHINE M VALINE
500 DANIELLE CT
ROSEVILLE CA 95747

477 141 024 000
FRANKLIN D FLETCHER
301 DILLON CT
ROSEVILLE CA 95747

477 141 025 000
DOUGLAS & ALICIA NODA
305 DILLON CT
ROSEVILLE CA 95747

477 141 026 000
STERLING D & TAMRA L RAGER
304 DILLON CT
ROSEVILLE CA 95747

477 141 027 000
MARY ELLEN MATTHIAS
7444 GOOSE MEADOWS WAY
ROSEVILLE CA 95747

477 141 028 000
BILLY K & VIRGINIA KNIGHT
101 ZACHARY CT
ROSEVILLE CA 95747

477 141 029 000
MICHAEL & KELLY THOMPSON
105 ZACHARY CT
ROSEVILLE CA 95747

477 141 030 000
RICHARD K FOGARTY
112 ZACHARY CT
ROSEVILLE CA 95747

477 141 031 000
JONES
108 ZACHARY CT
ROSEVILLE CA 95747

477 141 032 000
JAMES J & JENNIFER S DEMARIA
104 ZACHARY CT
ROSEVILLE CA 95747

477 141 033 000
JERRY C & BRENDA C JUST
100 ZACHARY CT
ROSEVILLE CA 95747

477 141 034 000
DAVID B & KATHERINE R JONES
1004 DANIELLE DR
ROSEVILLE CA 95747

477 141 035 000
RICKY P & CAROLYN L BROWN
1000 DANIELLE DR
ROSEVILLE CA 95747

477 141 036 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 141 037 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 141 038 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 151 001 000
EUNICE M PRESCOTT
1045 DANIELLE DR
ROSEVILLE CA 95747

477 151 002 000
MARK T & LINDA A JOHNSON
1049 DANIELLE DR
ROSEVILLE CA 95747

477 151 003 000
HARRY F JR & DEBORAH J BRANDT
1053 DANIELLE DR
ROSEVILLE CA 95747

477 151 004 000
GENEVIEVE M VALLENARI
1057 DANIELLE DR
ROSEVILLE CA 95747

477 151 005 000
RONALD R & JANET A ROBINETTE
1061 DANIELLE DR
ROSEVILLE CA 95747

477 151 016 000
ALAN V & MARISA C PARAS
1260 MERCEDES DR
ROSEVILLE CA 95747

477 151 017 000
JOAN I HOLMBERG
1256 MERCEDES DR
ROSEVILLE CA 95747

477 151 018 000
PETER O & JAYNE L TINOCO
1252 MERCEDES DR
ROSEVILLE CA 95747

477 151 019 000
ROBERT DAY
1248 MERCEDES DR
ROSEVILLE CA 95747

477 151 020 000
ELLIOTT MAX/C 1990 TRUST
1244 MERCEDES DR
ROSEVILLE CA 95747

477 151 021 000
MARVIN G & LULA M BROWN
1240 MERCEDES DR
ROSEVILLE CA 95747

477 151 022 000
LORRAINE GAJSEK
1236 MERCEDES DR
ROSEVILLE CA 95747

477 151 023 000
GREGORY S & SANDRA A NEWLAND
1232 MERCEDES DR
ROSEVILLE CA 95747

477 151 024 000
MARCIA A SUMPTER
1228 MERCEDES DR
ROSEVILLE CA 95747

477 151 025 000
JOHN G & LAURA L OREILLY II
1224 MERCEDES DR
ROSEVILLE CA 95747

477 151 026 000
JAMES E SUTTON
21722 SALUDA CIR
HUNTINGTON BEACH CA 92646

477 151 027 000
WILLIAM L JR & KAREN L CLEMENTS
1216 MERCEDES DR
ROSEVILLE CA 95747

477 151 028 000
DIETRICH & DIANE BUSING
1212 MERCEDES DR
ROSEVILLE CA 95747

477 151 029 000
WILLIAM P & MARGARET M WALSH
1208 MERCEDES DR
ROSEVILLE CA 95747

477 151 030 000
MARY L STUART SEIGENFELD
1300 RETREAT WAY
ROSEVILLE CA 95747

477 151 031 000
TOM & LEISA HOOD
1304 RETREAT WAY
ROSEVILLE CA 95747

477 151 032 000
ANTON J & GLORIA A HOLICEK
1201 MERCEDES DR
ROSEVILLE CA 95747

477 151 033 000
JAMES W & JOYCE ANN DAVIS
1205 MERCEDES DR
ROSEVILLE CA 95747

477 151 034 000
BRIAN D & KRISTIN S EISENLAUER
1209 MERCEDES DR
ROSEVILLE CA 95747

477 151 035 000
EDWARD K & KWANG J JANG
1217 MERCEDES DR
ROSEVILLE CA 95747

477 151 036 000
FREDERICK & CAMILLA SAHLBERG
1221 MERCEDES DR
ROSEVILLE CA 95747

477 151 037 000
JEFFREY M & JACQUELINE H TAUBMAN
1225 MERCEDES DR
ROSEVILLE CA 95747

477 151 038 000
CHAROLETTE A LONG
1237 MERCEDES DR
ROSEVILLE CA 95747

477 151 039 000
MARIO D & TERESA L SOLORIO
1249 MERCEDES DR
ROSEVILLE CA 95747

477 151 040 000
CHARLES E DENONN
1253 MERCEDES DR
ROSEVILLE CA 95747

477 151 041 000
JIWEI HUANG
5480 SHATTUCK AVE
FREMONT CA 94555

477 151 042 000
HARRY B & ELLEN A RAUCH
1092 DANIELLE DR
ROSEVILLE CA 95747

477 151 043 000
BRIAN A & KRISTINA SJOSTRAND
1088 DANIELLE DR
ROSEVILLE CA 95747

477 151 044 000
ROBERT H & DRENA A KOZLOWSKI
PO BOX 1244
ROSEVILLE CA 95678

477 151 045 000
TONI M & DAVID S FERRELL
705 DEAN CT
ROSEVILLE CA 95747

477 151 046 000
ROBERT L & VALERIE L BOUGHNER
709 DEAN CT
ROSEVILLE CA 95747

477 151 047 000
KRISHAN & PAO CHAUHAN
708 DEAN CT
ROSEVILLE CA 95747

477 151 048 000
ERIC S & CYNTHIA S RICHARDS
704 DEAN CT
ROSEVILLE CA 95747

477 151 049 000
DENNIS W & BEVERLY J BERG
700 DEAN CT
ROSEVILLE CA 95747

477 151 050 000
VASILE & MARGAR CINDEA
1320 RETREAT WAY
ROSEVILLE CA 95747

477 151 051 000
GREGORY L & KIMBERLY A KEIGHLEY
1316 RETREAT WAY
ROSEVILLE CA 95747

477 151 052 000
CRAIG J CASTAGNALI
1312 RETREAT WAY
ROSEVILLE CA 95747

477 151 053 000
MATT M & DONNA FAUBERT
1301 RETREAT WAY
ROSEVILLE CA 95747

477 151 054 000
CLEVELAND
1305 RETREAT WAY
ROSEVILLE CA 95747

477 151 055 000
RODNEY & TERRY FUNKE
605 MERCEDES CT
ROSEVILLE CA 95747

477 151 056 000
FRANCES C ECKOWITZ
609 MERCEDES CT
ROSEVILLE CA 95747

477 151 057 000
JOHN L & JANE M HOGG
608 MERCEDES CT
ROSEVILLE CA 95747

477 151 058 000
ORA B KING
604 MERCEDES CT
ROSEVILLE CA 95747

477 151 059 000
JEROLD L & DEBORAH L DOUGAL
1309 RETREAT WAY
ROSEVILLE CA 95747

477 151 060 000
JEANNIE D NOLL
1313 RETREAT WAY
ROSEVILLE CA 95747

477 151 061 000
GARY A & CATHERINE PORS
1056 DANIELLE DR
ROSEVILLE CA 95747

477 151 062 000
MARK A & JEAN A LACHER
1052 DANIELLE DR
ROSEVILLE CA 95747

477 151 063 000
DANIEL J TUBRIDY
1048 DANIELLE DR
ROSEVILLE CA 95747

477 151 064 000
STEPHEN W & DEBRA WILCOXSCHIMK
SCHIMKE
1044 DANIELLE DR
ROSEVILLE CA 95747

477 151 065 000
MICHAEL P & LAURA A BERNAUER
1036 DANIELLE DR
ROSEVILLE CA 95747

477 151 066 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 151 067 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 151 068 000
J & L PROPERTIES COMMON AREA
NO ADDRESS ON RECORD

477 180 007 000
GAIL LYNN LANTRIP
1618 STEINBECK DR
ROSEVILLE CA 95747

477 180 008 000
IRENE M LEWIS
1616 STEINBECK DR
ROSEVILLE CA 95747

477 180 009 000
DEAN D & ROCHELLE M LAROCCA
1614 STEINBECK DR
ROSEVILLE CA 95747

477 180 010 000
DENIS STEELE
1564 STEINBECK DR
ROSEVILLE CA 95747

477 180 011 000
SCOTT W & SHARON M NICHOLSON
1562 STEINBECK DR
ROSEVILLE CA 95747

477 180 012 000
PHILIP & PAMELA D MARCHESE
1560 STEINBECK DR
ROSEVILLE CA 95747

477 180 046 000
MARTHA GOEPFERT
1508 DICKINSON DR
ROSEVILLE CA 95747

477 180 047 000
ROBIE P & MARIA A FEARN
1506 DICKINSON DR
ROSEVILLE CA 95747

477 180 048 000
JOHN & EUGENIA KRULJAC
1504 DICKINSON DR
ROSEVILLE CA 95747

477 180 049 000
ERIC OVERSTEG
1502 DICKINSON DR
ROSEVILLE CA 95747

477 180 051 000
ROBERT J & CAROL F WINKLER
1559 STEINBECK DR
ROSEVILLE CA 95747

477 180 052 000
LAWRENCE W BEAN
1561 STEINBECK DR
ROSEVILLE CA 95747

477 180 053 000
STEVEN T & PAMELA M POWELL
1563 STEINBECK DR
ROSEVILLE CA 95747

477 180 054 000
THO HUYNH
307 TARKINGTON CT
ROSEVILLE CA 95747

477 180 055 000
RONALD D HAWTHRONE
309 TARKINGTON CT
ROSEVILLE CA 95747

477 180 056 000
JOHNNY V & JACQUELINE A RAMIREZ
308 TARKINGTON CT
ROSEVILLE CA 95747

477 180 057 000
RICHARD D JR & LYNN M WILKIE
1511 MICHENER DR
ROSEVILLE CA 95747

477 180 058 000
KATHIE L WELDY
1513 MICHENER DR
ROSEVILLE CA 95747

477 180 059 000
NOAH P & KIMBERLY N SCHMITZ
3617 SAN SONITA PL
SANTA ROSA CA 95403

477 180 060 000
NATHAN M & PENNY S SNELL
1517 MICHENER DR
ROSEVILLE CA 95747

477 180 070 000
LYNDA M RISUCCI
1534 MICHENER DR
ROSEVILLE CA 95747

477 180 071 000
KATHY A BARSOTTI
1532 MICHENER DR
ROSEVILLE CA 95747

477 180 072 000
JOE HALLER
1530 MICHENER DR
ROSEVILLE CA 95747

477 180 073 000
STEPHEN F & JENNIFER BAKER
1528 MICHENER DR
ROSEVILLE CA 95747

477 180 074 000
GARY & LYNETTE HARRIMAN
1526 MICHENER DR
ROSEVILLE CA 95747

477 180 075 000
MAURICE T & BARBARA MAHAN III
1524 MICHENER DR
ROSEVILLE CA 95747

477 180 076 000
KEVIN J & JULIE A BREAULT
401 SHIVELEY CT
ROSEVILLE CA 95747

477 180 078 000
MICHAEL & TANYA GIANOTTI
407 SHIVELEY CT
ROSEVILLE CA 95747

477 180 079 000
MICHAEL MILLER
409 SHIVELEY CT
ROSEVILLE CA 95747

477 180 080 000
GARY HAMILTON
411 SHIVELEY CT
ROSEVILLE CA 95747

477 180 081 000
ANTHONY MARC & LISA U FERRARA
413 SHIVELEY CT
ROSEVILLE CA 95747

477 180 082 000
DANNY E & GRACE M VINCENT
1613 STEINBECK DR
ROSEVILLE CA 95747

477 180 083 000
DEAN D & ROCHELLE M LAROCCA
1615 STEINBECK DR
ROSEVILLE CA 95747

477 180 084 000
KEVIN J & JULIE A BREAULT
401 SHIVELEY CT
ROSEVILLE CA 95747

477 180 085 000
RONNIE R MASCIOVECCHIO
405 SHIVELEY CT
ROSEVILLE CA 95747

477 190 001 000
BRADLEY J & CARRIE L VINCENT
1612 STEINBECK DR
ROSEVILLE CA 95747

477 190 002 000
VIVIAN MARGULEAS
110 PARK RD #403
BURLINGAME CA 94010

477 190 003 000
KEVIN E STEVENS
1608 STEINBECK DR
ROSEVILLE CA 95747

477 190 004 000
RONALD G & VICKIE C LEATHERS
201 CRANE CT
ROSEVILLE CA 95747

477 190 005 000
LARRY S & KARLA D MORLAN
203 CRANE CT
ROSEVILLE CA 95747

477 190 006 000
ROBERT M & TANJA M BITTLE
202 CRANE CT
ROSEVILLE CA 95747

477 190 007 000
JOHN T & BETH J MCKINNEY
1606 STEINBECK DR
ROSEVILLE CA 95747

477 190 008 000
SAUL & KIM M LUNA
1604 STEINBECK DR
ROSEVILLE CA 95747

477 190 009 000
ANTHONY J LOPEZ
1602 STEINBECK DR
ROSEVILLE CA 95747

477 190 010 000
TODD A & ALESIA K WOLF
1600 STEINBECK DR
ROSEVILLE CA 95747

477 190 011 000
BRIAN C & JAIME PHILLIPS
1598 STEINBECK DR
ROSEVILLE CA 95747

477 190 012 000
DANNY J JACOBO
1596 STEINBECK DR
ROSEVILLE CA 95747

477 190 013 000
ZACHARY BENNETT
1594 STEINBECK DR
ROSEVILLE CA 95747

477 190 014 000
DEAN C CANADA
1592 STEINBECK DR
ROSEVILLE CA 95747

477 190 015 000
SVETLANA MKHITARIAN
1590 STEINBECK DR
ROSEVILLE CA 95747

477 190 016 000
GARY L & JEANETTE PATBURG
8785 LOS LAGOS CIR S
GRANITE BAY CA 95746

477 190 017 000
JAMES SARMENTO
415 MOANA WAY
PACIFICA CA 94044

477 190 018 000
JACQUELINE S KAUFMAN
1584 STEINBECK DR
ROSEVILLE CA 95747

477 190 019 000
DERON R & DONNA; YOUNG
1582 STEINBECK DR
ROSEVILLE CA 95747

477 190 020 000
DANNY & STEPHANIE GARCIA
1580 STEINBECK DR
ROSEVILLE CA 95747

477 190 021 000
GAIL A CHANDLER
1578 STEINBECK DR
ROSEVILLE CA 95747

477 190 022 000
MICHAEL L & LYNN RODRIAN
1576 STEINBECK DR
ROSEVILLE CA 95747

477 190 023 000
JAMES S & MAUREEN S RING
1574 STEINBECK DR
ROSEVILLE CA 95747

477 190 024 000
LARRY G WILLIAMS
101 DU MAURIER CT
ROSEVILLE CA 95747

477 190 025 000
ERIC C & JILL K HOLM
103 DU MAURIER CT
ROSEVILLE CA 95747

477 190 026 000
BRIAN M & AIMEE L GLYNN
102 DU MAURIER CT
ROSEVILLE CA 95747

477 190 027 000
DAVID A JOLLEY
1572 STEINBECK DR
ROSEVILLE CA 95747

477 190 028 000
JAMES D & CINDY D PERRY
1570 STEINBECK DR
ROSEVILLE CA 95747

477 190 029 000
KENNETH D & RENE A PERKETT
1568 STEINBECK DR
ROSEVILLE CA 95747

477 190 030 000
PETER J HUBIK
1566 STEINBECK DR
ROSEVILLE CA 95747

477 190 031 000
FERNANDO & SHELLEY L ALVAREZ
1565 STEINBECK DR
ROSEVILLE CA 95747

477 190 032 000
THEODORE A & DIANE K CONRAD
1567 STEINBECK DR
ROSEVILLE CA 95747

477 190 033 000
HARRISON HONGSHE & SHEILA SHIN WANG
1569 STEINBECK DR
ROSEVILLE CA 95747

477 190 034 000
CRAIG & JENNIFER COX
1573 STEINBECK DR
ROSEVILLE CA 95747

477 190 035 000
FOREST JAMES JR & JEAN M TRACY
1577 STEINBECK DR
ROSEVILLE CA 95747

477 190 036 000
KENNETH MATSUMOTO
303 TARKINGTON CT
ROSEVILLE CA 95747

477 190 037 000
DARLENE A ANGANES
305 TARKINGTON CT
ROSEVILLE CA 95747

477 190 038 000
RICHARD D & JULIE A POON
306 TARKINGTON CT
ROSEVILLE CA 95747

477 190 039 000
PETER K MARTIN
304 TARKINGTON CT
ROSEVILLE CA 95747

477 190 040 000
MARGARET L GROSELY
302 TARKINGTON CT
ROSEVILLE CA 95747

477 190 041 000
LINDA ROSE ALLMENDINGER
1581 STEINBECK DR
ROSEVILLE CA 95747

477 190 042 000
KENNETH C & PATRICIA D GERMAN
1583 STEINBECK DR
ROSEVILLE CA 95747

477 190 043 000
CHRISTOPHER S & DARCIE A PANKRATZ
1585 STEINBECK DR
ROSEVILLE CA 95747

477 190 044 000
MANUEL & MARYANNE MANITTA
1505 MICHENER DR
ROSEVILLE CA 95747

477 190 045 000
GERALD M & PATRICIA M KEELTY
1507 MICHENER DR
ROSEVILLE CA 95747

477 190 046 000
THEODORE E & DEBRA ANN KEITH
1509 MICHENER DR
ROSEVILLE CA 95747

477 190 047 000
ROLF M & CARRIE L HOEHENRIEDER
414 SHIVELEY CT
ROSEVILLE CA 95747

477 190 048 000
KENNETH A & JOANNE GORDON
412 SHIVELEY CT
ROSEVILLE CA 95747

477 190 049 000
JAMES M & RONDI M ANDERSON
410 SHIVELEY CT
ROSEVILLE CA 95747

477 190 050 000
PATRICK J & SUSAN D OBRIEN
408 SHIVELEY CT
ROSEVILLE CA 95747

477 190 051 000
DAVID C KRUGLE
406 SHIVELEY CT
ROSEVILLE CA 95747

477 190 052 000
DON & DENISE ZEBRAK
04 SHIVELEY CT
ROSEVILLE CA 95747

477 190 053 000
THOMAS J & SANDRA L DUVALL
402 SHIVELEY CT
ROSEVILLE CA 95747

477 190 054 000
DEVON & SUZANNE GIBBONS
400 SHIVELEY CT
ROSEVILLE CA 95747

477 190 055 000
JOHN A & ANGELA M LUJAN
1506 MICHENER DR
ROSEVILLE CA 95747

477 190 056 000
JOSH & RONDA LEUTY
1587 STEINBECK DR
ROSEVILLE CA 95747

477 190 057 000
DONNA BURNETT
1511 VERBENA WAY
ROSEVILLE CA 95747

477 190 058 000
ERNESTINE L ZIMMERLY
1591 STEINBECK DR
ROSEVILLE CA 95747

477 190 059 000
DANIEL & MIYUKI SCHMOOCK
1593 STEINBECK DR
ROSEVILLE CA 95747

477 190 060 000
RUSSELL H & ADA A PHILLIPS
1595 STEINBECK DR
ROSEVILLE CA 95747

477 190 061 000
RICHARD C & JULIE A GOULAS
1597 STEINBECK DR
ROSEVILLE CA 95747

477 190 062 000
MICHAEL J & JOY M NORGARD
340 S 20TH ST
SAN JOSE CA 95116

477 190 063 000
MICHAEL A PAGE
1601 STEINBECK DR
ROSEVILLE CA 95747

477 190 064 000
ANDRES BERRIOS
1605 STEINBECK DR
ROSEVILLE CA 95747

477 190 065 000
PETER B AMES
1607 STEINBECK DR
ROSEVILLE CA 95747

477 190 066 000
WILLIAM D & JANA S LEDOUX
1609 STEINBECK DR
ROSEVILLE CA 95747

477 190 067 000
JAMES L & SANDI R FRANCIS
1611 STEINBECK DR
ROSEVILLE CA 95747

477 190 068 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 190 069 000
ROSEVILLE CITY OF
311 VERNON ST #200
ROSEVILLE CA 95678

477 350 004 000
KENNETH L & KARI J TAGGARD
901 SPILLANE CT
ROSEVILLE CA 95747

477 350 005 000
RICHARD T & ELIZABETH J MAU
903 SPILLANE CT
ROSEVILLE CA 95747

477 350 006 000
MARGIT M TIELMAN
905 SPILLANE CT
ROSEVILLE CA 95747

477 350 007 000
ELIZABETH CERVANTES
904 SPILLANE CT
ROSEVILLE CA 95747

477 350 008 000
KEVIN J DEES
PO BOX 311
MENDHAM NJ 07945

477 350 009 000
CHRIS D & MICHELLE L KEIM
900 SPILLANE CT
ROSEVILLE CA 95747

477 350 010 000
MICHAEL J & DIANNE GOMEZ
801 MITCHELL CT
ROSEVILLE CA 95747

477 350 011 000
MICHAEL S ABBOTT
805 MITCHELL CT
ROSEVILLE CA 95747

477 350 012 000
MARSHALL D & VALARIE A BLISS
804 MITCHELL CT
ROSEVILLE CA 95747

477 350 013 000
SUSAN MARY MCLANAHAN
802 MITCHELL CT
ROSEVILLE CA 95747

477 350 014 000
SCOTT B & RONDA OTSUKA
800 MITCHELL CT
ROSEVILLE CA 95747

477 550 001 000
ROBERT A & RONILYN HARTLEY
425 SUNNINGDALE CT
ROSEVILLE CA 95747

477 550 002 000
MITCHELL D & LESLIE K KINDRED
1512 EUREKA RD #120
ROSEVILLE CA 95661

477 550 003 000
MARK Y & KARI L UMEDA
424 SUNNINGDALE CT
ROSEVILLE CA 95747

477 550 004 000
GREGG E & DIANE M SWEARINGEN
416 SUNNINGDALE CT
ROSEVILLE CA 95747

477 550 005 000
JASPAL & PARAMJIT K DHANOTA
1650 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 006 000
JAY J & ROBIN ANDERSON
1658 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 007 000
TOM S & LORI S BARIL
1760 AINSDALE DR
ROSEVILLE CA 95747

477 550 008 000
MEI LIN LIU
1752 AINSDALE DR
ROSEVILLE CA 95747

477 550 009 000
DOUGLAS W & JACQUELIN A BURRIS
1744 AINSDALE DR
ROSEVILLE CA 95747

477 550 010 000
LANDIS C & REIKO GARMAN II
1736 AINSDALE DR
ROSEVILLE CA 95747

477 550 011 000
JOE & FRANCESCA WILLIAMS
1737 AINSDALE DR
ROSEVILLE CA 95747

477 550 012 000
FRANCIS HUCK
1745 AINSDALE DR
ROSEVILLE CA 95747

477 550 013 000
MICHAEL & LINDA CHU
1753 AINSDALE DR
ROSEVILLE CA 95747

477 550 014 000
WILLIAM C & LEAH M BRUMFIELD
1761 AINSDALE DR
ROSEVILLE CA 95747

477 550 015 000
DONALD MARTIN & MARGARET E KUNDLE
1769 AINSDALE DR
ROSEVILLE CA 95747

477 550 016 000
JAMES & GENEVIVE FARRELL
301 AINSDALE CT
ROSEVILLE CA 95747

477 550 017 000
BRAD J & DARLENE L HELM
309 AINSDALE CT
ROSEVILLE CA 95747

477 550 018 000
MARK EDWARD & JANEL MARIE COX
317 AINSDALE CT
ROSEVILLE CA 95747

477 550 019 000
JAMES E & KATHY A CALDWELL
325 AINSDALE CT
ROSEVILLE CA 95747

477 550 020 000
SCOTT C & MECCA SMITH
333 AINSDALE CT
ROSEVILLE CA 95747

477 550 021 000
ROBIN N & CATHERINE F HALL
341 AINSDALE CT
ROSEVILLE CA 95747

477 550 022 000
JILL MARIE WALDVOGEL
348 AINSDALE CT
ROSEVILLE CA 95747

477 550 023 000
FELIPE A & JOSEPHINE R RAFAEL
340 AINSDALE CT
ROSEVILLE CA 95747

477 550 024 000
DANIEL K & SHARON K GOETZMAN
332 AINSDALE CT
ROSEVILLE CA 95747

477 550 025 000
WILLIAM D & CINDY L HORNER
324 AINSDALE CT
ROSEVILLE CA 95747

477 550 026 000
ROBERT & JANA GOIN
316 AINSDALE CT
ROSEVILLE CA 95747

477 550 027 000
ALEXANDER P & LARISA MIKITYUK
308 AINSDALE CT
ROSEVILLE CA 95747

477 550 028 000
JAMES SCOTT UREN
300 AINSDALE CT
ROSEVILLE CA 95747

477 550 029 000
STEVEN & KITTY VOIGT
1674 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 030 000
JEFFREY L NIMMO
1659 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 031 000
PHILIP D RITTENHOUSE
1667 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 032 000
GREGGORY RANDALL & VIVIAN HUFFMAN
1675 SUNNINGDALE DR
ROSEVILLE CA 95747

477 550 033 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 550 034 000
WINNCREST HOMES II HOMEOWNERS
NO ADDRESS ON RECORD

477 560 001 000
ADAM B & RENEE A PILOT
1729 AINSDALE DR
ROSEVILLE CA 95747

477 560 002 000
ROGER A & JULIE K JOHNSON
200 IRONSTONE CT
ROSEVILLE CA 95747

477 560 003 000
BLANCHE ERNEST
208 IRONSTONE CT
ROSEVILLE CA 95747

477 560 004 000
ANDRES & CATHERINE L LANGER
209 IRONSTONE CT
ROSEVILLE CA 95747

477 560 005 000
STEPHEN E; HORVATH
1705 AINSDALE DR
ROSEVILLE CA 95747

477 560 006 000
MARC T & JOANNE N HIGGINS
1689 AINSDALE DR
ROSEVILLE CA 95747

477 560 007 000
LAWRENCE ANTHONY & LESLIE OHER RUGH
1673 AINSDALE DR
ROSEVILLE CA 95747

477 560 008 000
DAVID R & SUSAN E MAGGI
1657 AINSDALE DR
ROSEVILLE CA 95747

477 560 009 000
BRIAN L & MARSHA HAFSTROM BENSON
100 HESKETH CT
ROSEVILLE CA 95747

477 560 010 000
MATTHEW P & DEBRA S HARRIS
108 HESKETH CT
ROSEVILLE CA 95747

477 560 011 000
ROBERT D FREDERICK
116 HESKETH CT
ROSEVILLE CA 95747

477 560 012 000
BRION F DANIELS
125 HESKETH CT
ROSEVILLE CA 95747

477 560 013 000
MABEL R ESTEVESVELAZQUEZ
117 HESKETH CT
ROSEVILLE CA 95747

477 560 014 000
JOHN A & AMY E HALTOM
109 HESKETH CT
ROSEVILLE CA 95747

477 560 015 000
OLIVIA & MALCOM WILLIAMSON
101 HESKETH CT
ROSEVILLE CA 95747

477 560 016 000
THERON & ESTHER R CALDIE
1600 AINSDALE DR
ROSEVILLE CA 95747

477 560 017 000
MICHAEL J & LAURA L PIANA
1608 AINSDALE DR
ROSEVILLE CA 95747

477 560 018 000
GALE D & NANCY L PATRICK
1616 AINSDALE DR
ROSEVILLE CA 95747

477 560 019 000
JAMES MARTIN & LAURA P BOYLE
1624 AINSDALE DR
ROSEVILLE CA 95747

477 560 020 000
LYNN M HEBERT
1632 AINSDALE DR
ROSEVILLE CA 95747

477 560 021 000
RICHARD & MARY M WURSTER
1640 AINSDALE DR
ROSEVILLE CA 95747

477 560 022 000
ROBERT D & LINDA C WHITEHOUSE
1648 AINSDALE DR
ROSEVILLE CA 95747

477 560 023 000
JEFFREY R & LISA B FRANKLIN
1656 AINSDALE DR
ROSEVILLE CA 95747

477 560 024 000
RON & JANEAN KELLING
1664 AINSDALE DR
ROSEVILLE CA 95747

477 560 025 000
DAVID IAN SMITH
1672 AINSDALE DR
ROSEVILLE CA 95747

477 560 026 000
PETER M & CHRISTINE M HUGENROTH
1680 AINSDALE DR
ROSEVILLE CA 95747

477 560 027 000
HARRISON J & CAROLYN E DEVERE
1688 AINSDALE DR
ROSEVILLE CA 95747

477 560 028 000
ALLAN S & KAREN M OKICICH
1696 AINSDALE DR
ROSEVILLE CA 95747

477 560 029 000
BRYANT 1999 TRUST
1704 AINSDALE DR
ROSEVILLE CA 95747

477 560 030 000
KATHY MONTGOMERY
1712 AINSDALE DR
ROSEVILLE CA 95747

477 560 031 000
CARLA M & ERIC L LAYTON
449 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 032 000
GEORGE L & ETHEL B STEVENS
441 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 033 000
MANINDER SINGH & RITU ATWAL
433 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 034 000
DEREK & NANCY PORTER
432 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 035 000
SHARON L EUBANK
440 SUNNINGDALE CT
ROSEVILLE CA 95747

477 560 036 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

477 560 037 000
WOODCREEK OAKS COM ASSOC
205 KANE CT
ROSEVILLE CA 95747

477 560 038 000
WOODCREEK OAKS COM ASSOC
205 KANE CT
ROSEVILLE CA 95747

477 590 001 000
DEREK T & MICHELLE A RASINA
501 RYE CT
ROSEVILLE CA 95747

477 590 002 000
MATTHEW E & JULIE M BUTLER
509 RYE CT
ROSEVILLE CA 95747

477 590 003 000
GILBERTO F CHAVEZ
517 RYE CT
ROSEVILLE CA 95747

477 590 004 000
SCOTT & DANI ECKMAN
525 RYE CT
ROSEVILLE CA 95747

477 590 005 000
WILLIAM J; PAGANO
533 RYE CT
ROSEVILLE CA 95747

477 590 006 000
TIMOTHY & DANIENE TRENT
532 RYE CT
ROSEVILLE CA 95747

477 590 007 000
KEVIN LEE & JULIE RANDLES
524 RYE CT
ROSEVILLE CA 95747

477 590 008 000
NOLAND & SUZANA WILLIAMS
516 RYE CT
ROSEVILLE CA 95747

477 590 009 000
PRABIR MUKHERJEE
500 RYE CT
ROSEVILLE CA 95747

477 590 016 000
RICHARD L & GAIL O HUMPHRIES
1683 SUNNINGDALE DR
ROSEVILLE CA 95747

477 590 017 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

478 010 018 000
C FRED & IRENE BELCHER
6289 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 019 000
BAKOTICH
6281 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 020 000
PAUL J & CAROL J WRIGHT
6273 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 021 000
JAMES H & PHYLLIS I PAQUETTE
6265 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 022 000
FRED E & SHIRLEY J DUVAL
6257 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 023 000
EUGENE A & PATRICIA G BOESIGER
6249 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 024 000
NANCY J STURTEVANT
6241 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 025 000
ARMIN & SYLVIA GUTH
6233 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 026 000
M A & MARCELLA M ANASTASI
1033 HAMAN WAY
ROSEVILLE CA 95678

478 010 027 000
VIRGINIA ARLINE WOOD
6217 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 028 000
GRISWOLD
6209 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 029 000
SANDRA K RITACCO
6201 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 030 000
WARREN N & PATRICIA A LITTLEFIELD
6193 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 031 000
ROBERT D & SUZANNE BERNARD
6200 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 032 000
DAVID O & AUDREY J ANDREWS
6224 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 010 033 000
JEFF & DIANNA S MATTIMORE
500 PITCHER CT
ROSEVILLE CA 95747

478 010 034 000
WALTER A & LAURA M PROTNICK
508 PITCHER CT
ROSEVILLE CA 95747

478 010 035 000
JOHN W & BEVERLY A DAVIS
516 PITCHER CT
ROSEVILLE CA 95747

478 010 036 000
NADINE B CLAUSEN
517 PITCHER CT
ROSEVILLE CA 95747

478 010 037 000
PAUL J & LILA J FLANNERY
509 PITCHER CT
ROSEVILLE CA 95747

478 010 038 000
FREDRICKS 2003 TRUST
501 PITCHER CT
ROSEVILLE CA 95747

478 010 039 000
SALLY TATOSIAN
6165 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 040 000
ROBERT G CLARKE
PO BOX 1165
ROSEVILLE CA 95678

478 010 041 000
SALLIE W GRAY
6149 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 042 000
EDWARD P & JOAN E FUNCHEON
6141 GRANITE FLAT LN
ROSEVILLE CA 95747

478 010 043 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 020 012 000
ELSIE J FABIANO
6185 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 013 000
ROSALIE G GROW
6177 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 014 000
WANDA D DEATON
6169 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 015 000
CHRIS JR & GEORGIA A SPITZER
6161 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 016 000
ALBERT & ROSEMARY SANTORA
6153 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 017 000
SYLVIA M TILLEY
6145 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 018 000
HANSEN
6137 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 019 000
BETTY E WILLIBY
6129 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 020 000
ROBERT D & BETTY J KETELLE
6121 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 021 000
STECHMAN CHARLES W III & FRANC
6113 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 022 000
EDNA MCMORINE
6105 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 023 000
CLARA M DANIELS
6097 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 024 000
CAROLEE HAMILTON
6089 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 025 000
ELLIS J & BARBARA M TEEL
6081 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 026 000
WILLIAM B & ANTOINETTE M HUGHES
6056 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 027 000
VIRGINIA F HANSEN
6064 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 028 000
JOHN S & BONNIE M LUSTER
6072 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 029 000
RICHARD E & HELEN B SCHULTE
6080 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 030 000
BUTERA
7008 TIMBERROSE WAY
ROSEVILLE CA 95747

478 020 031 000
KAZUKO DOUPONCE
6096 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 032 000
MARIAN L CAMPBELL
6136 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 033 000
MILLICENT M YATES
6152 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 034 000
SHIRLEY MOE
6160 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 035 000
CAROL J MACADAMS
6176 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 036 000
DONALD E & MARGARET E WARD
6184 BURNT CEDAR WAY
ROSEVILLE CA 95747

478 020 037 000
BILLY E & BETTY ANN WRIGHT
200 SWAZEY CT
ROSEVILLE CA 95747

478 020 038 000
RICHARD C & BETTY J CALETTI
208 SWAZEY CT
ROSEVILLE CA 95747

478 020 039 000
ROBERT & MARY L NEWMAN
216 SWAZEY CT
ROSEVILLE CA 95747

478 020 040 000
THOMAS E & YVONNE S HOGAN
224 SWAZEY CT
ROSEVILLE CA 95747

478 020 041 000
ROBERT B JR & BARBARA J MORRIS
232 SWAZEY CT
ROSEVILLE CA 95747

478 020 042 000
ARMAN & CAROLYN ARAKELIAN
225 SWAZEY CT
ROSEVILLE CA 95747

478 020 043 000
BEN & PAT PUGH
217 SWAZEY CT
ROSEVILLE CA 95747

478 020 044 000
BUCKMAN
209 SWAZEY CT
ROSEVILLE CA 95747

478 020 045 000
ELMER G JR & MARY E HASKIN
201 SWAZEY CT
ROSEVILLE CA 95747

478 020 057 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 030 001 000
HARVEY LEE
5401 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 002 000
ERNEST J & DOROTHY L MOESSNER
PO BOX 1235
ROSEVILLE CA 95678

478 030 003 000
ROSS
5385 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 004 000
JOHN FRANCIS & SUE SPRATLEY
5377 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 005 000
BONNIE HOUSE
5369 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 006 000
ERLING W & MARINA LOKEN
5361 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 007 000
ELIZABETH A NITOPI
5353 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 008 000
GORDON & AUDLEY WALRATH
5345 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 009 000
JOHN A & MINAKO A KUMPULAINIEN
5337 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 010 000
ELAINE M RANDALL
5329 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 011 000
JAMES D & MARY ELLEN ROSZELL
5321 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 012 000
CELESTE M CALLISON
5313 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 013 000
ELISABETH W BROWN
5305 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 014 000
CURTIS A & HELEN M COX
5297 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 015 000
PEGGY ELIZABETH CLOUD
5289 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 016 000
LENI M & AILEEN J STENBACK
5281 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 017 000
LOUISE K BUMGARDNER
5273 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 018 000
JOHN A ZAFFERANO
7516 PAIUTE POINT RD
ROSEVILLE CA 95747

478 030 019 000
NORBERT & LEA ROTENBERG
5257 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 020 000
PATRICIA S BUTLER
5249 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 021 000
CARL D & JOY Y SAVAGE
5241 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 022 000
JOHN K SR & FAYE HOLIHAN
5233 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 023 000
NORMAN C & KATHRYN HAGENBUCH
5225 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 024 000
MOZELLE BURLESON
5217 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 025 000
BETTY C TOMPKINS
5209 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 026 000
LEON J & GAIL E RAGLEN
5201 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 027 000
JACQUES J & BERTA N BRUNNER
5123 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 028 000
THOMAS C & MARTHA OWENS
5115 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 029 000
DOLORES M KLEINKE
5107 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 030 000
ROBERT V RODGERS
5099 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 031 000
AGUILERA
5091 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 032 000
BLAINE A & GERALDINE R EISENBEIS
5083 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 033 000
LINDY E & MELBA O WILLIAMS
5075 GOLDFIELD WAY
ROSEVILLE CA 95747

478 030 034 000
ROBERT W & THEONIE S MURCH
5208 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 035 000
ALFRED L & HELEN I LUNA
5224 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 036 000
MARY L YOUNGBLUTT
5232 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 037 000
DON R PATTERSON
5240 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 038 000
LANG
5258 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 039 000
KENNETH E & KAREN R HASEMANN
5304 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 040 000
MARGORIE B KJAR
5312 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 041 000
ROBERT E & MARYON R MORRIS
5320 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 042 000
SARA E JORDAN
5336 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 043 000
JOSEPHINE DOLORES POLLICK
219 VALLEY VIEW DR
OROVILLE CA 95966

478 030 044 000
FRANK L & ELAINE MELLIN
5352 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 045 000
ORTON W JR & LEAH M BENSON
500 WASHOE CT
ROSEVILLE CA 95747

478 030 046 000
JERRY & DRAHA HUBIK
508 WASHOE CT
ROSEVILLE CA 95747

478 030 047 000
ARTHUR C & ELEANOR I DITTRICH
516 WASHOE CT
ROSEVILLE CA 95747

478 030 048 000
RALPH A & MARJORIE C GONGWER
524 WASHOE CT
ROSEVILLE CA 95747

478 030 049 000
ROGER D & COLLEEN S TOVEY
533 WASHOE CT
ROSEVILLE CA 95747

478 030 050 000
ALLEN L & JOAN CAROL EVANS
525 WASHOE CT
ROSEVILLE CA 95747

478 030 051 000
JAMES A & MARILEE H DENIO
1551 VINEYARD RD
ROSEVILLE CA 95678

478 030 052 000
JOHN P & JOANNE E SANCHEZ

478 030 053 000
BRUCE H & MARY MACLEAN
501 WASHOE CT
ROSEVILLE CA 95747

478 030 054 000
POZAREK 1989 TRUST
5417 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 055 000
CURTIS C & SHIRLEY R MILLER
5425 ANGELROCK LOOP
ROSEVILLE CA 95747

478 030 090 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 040 020 000
M JOANN BROOKS
5018 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 021 000
JOYCE R MCCLURE
5032 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 022 000
MARY DUFOUR
5040 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 023 000
ROBERT F & FLORENCE G WANGLER
5056 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 024 000
JEAN B COTTER
5064 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 025 000
PAMELA C REHM
5072 WHITECLOVER LN
ROSEVILLE CA 95747

478 040 026 000
PHYLLIS A DECROIX
5224 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 027 000
PHYLLIS & C PROVOST
5232 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 028 000
ERNEST R & RUTH I SAVAGE
5240 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 029 000
MANUEL S & GLORIA J MACIAS
5248 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 030 000
CHARLES E & ANN H BROWN
5256 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 031 000
FLORINE M BROWER
5264 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 032 000
HENRY & KATRIN A LANDAUER
5272 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 033 000
BAUGHMAN
200 STAMOS CT
ROSEVILLE CA 95747

478 040 034 000
PETERSON
208 STAMOS CT
ROSEVILLE CA 95747

478 040 035 000
ANTHONY & MARILYN ARGENTINE
216 STAMOS CT
ROSEVILLE CA 95747

478 040 036 000
SHIRLEY A GAYE
224 STAMOS CT
ROSEVILLE CA 95747

478 040 037 000
EDWARD A MCCOOEY
225 STAMOS CT
ROSEVILLE CA 95747

478 040 038 000
HARRY E & RITA C GORDON
217 STAMOS CT
ROSEVILLE CA 95747

478 040 039 000
CHARLES G & JOAN R ESKIN
209 STAMOS CT
ROSEVILLE CA 95747

478 040 040 000
EDWARD & AUDREY
201 STAMOS CT
ROSEVILLE CA 95747

478 040 041 000
ROBERT H & DIANE M WAGNER
PO BOX 362
MILL VALLEY CA 94942

478 040 042 000
CAROL P MCDANIEL
5345 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 043 000
JAMES E & ROBERTA B BURCKLE
5337 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 044 000
SNYDER
5329 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 045 000
HELEN L TOBIASON
5321 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 046 000
DARWIN J & R ELLOUISE SUNDAY
5313 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 047 000
OLIVER M & IRENE M OBRIEN
5305 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 048 000
HILDA DEUS
5297 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 049 000
WILMA B BULL
5289 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 050 000
MYRON W MCINTYRE
3 SOMER RIDGE DR #193
ROSEVILLE CA 95661

478 040 051 000
SUSAN A MOODY
5273 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 052 000
MANN
5265 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 053 000
LENA P BROWN
5257 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 054 000
TERENCE & NORA AIRLIE
5249 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 055 000
WILLIAM DAVID GIGLIO
5241 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 056 000
MAIDA M HOUSTON
5233 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 057 000
THOMAS M & CAROL M COOK
5225 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 058 000
JEAN K DARRAGH
5217 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 059 000
DONALD & GERALYN GORSHING
5209 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 060 000
MERRILL E & SHIRLEY F BAXLEY
5201 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 040 081 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 050 001 000
ROBERT L SMITH
7260 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 002 000
MATTHIAS MARY E 1998 TRUST
7444 GOOSE MEADOWS WAY
ROSEVILLE CA 95747

478 050 003 000
MARGARET B BOLSTAD
7276 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 004 000
ANN CARTER
7284 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 005 000
EARL R & MARY E SMITH
7292 TIMBERROSE WAY
ROSEVILLE CA 95747

478 050 006 000
FAY SEARS
7300 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 001 000
FRANK R & BETTE M GEORGE
7163 DREAM INN LN
ROSEVILLE CA 95747

478 060 002 000
JOAN W COBABE
7171 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 003 000
BOB L FORKEY
7179 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 004 000
DAVID & DOLLY L FIDDYMENT
7136 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 005 000
DORIS J MOORE
7195 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 006 000
JOHN & MARGAR GOMES
7203 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 007 000
CAROLYN K PARKINSON
7211 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 008 000
JACQUELINE SHAW
7219 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 009 000
RAYMOND L MOORE
7227 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 010 000
MANUEL S & GLORIA J MACIAS
7235 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 011 000
ROBERT L MYERS
7243 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 012 000
FRANK W & MARY JANE BOHN
30 EL CERRO CT
DANVILLE CA 94526

478 060 018 000
THOMAS J & ALICE J CORDRAY III
7112 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 019 000
POLLY E SINCLAIR
7438 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 020 000
ROSE IVES
7136 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 021 000
KARFIOL
7156 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 022 000
GLENN A & BARBARA BECKER
7180 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 023 000
WILLIAM L & HELEN P STRUBING
7188 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 024 000
VILMA M ALLEN
7204 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 025 000
SANDOR HORVATH
16775 SADDLEBACK DR
MORGAN HILL CA 95037

478 060 026 000
DANIEL F & DONNA L KYGAR
7185 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 027 000
THOMAS P & BARBARA A RYAN
7177 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 028 000
ROBERT H & CHARLOTTE F SWARTZ
408 BARUSCH CT
ROSEVILLE CA 95747

478 060 029 000
EDWARD A & M ARLENE SCALLET
416 BARUSCH CT
ROSEVILLE CA 95747

478 060 030 000
NORMAN M & LOIS B GRABAR
8049 GILLELAND DR
ROSEVILLE CA 95747

478 060 031 000
MARILYN M MOORE
409 BARUSCH CT
ROSEVILLE CA 95747

478 060 032 000
CLEGG
401 BARUSCH CT
ROSEVILLE CA 95747

478 060 048 000
MEL & KATHY G ZIKES
7176 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 049 000
KATHRYN G ZIKES
7184 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 050 000
LEONARD & ALBERTA M RAWLINSON
7192 FIREFLY GREEN LN
ROSEVILLE CA 95747

478 060 051 000
WILLIAM & BETTY STAHLBERGER
7236 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 052 000
TED A & MARY C SMITH
7244 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 053 000
RALPH V & OLGA LOMELE
7252 TIMBERROSE WAY
ROSEVILLE CA 95747

478 060 054 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 070 021 000
CALVIN A & GALE G SMITH
7027 DREAM INN LN
ROSEVILLE CA 95747

478 070 022 000
MERRILL G & MARCIA JOAN SMITH
7035 DREAM INN LN
ROSEVILLE CA 95747

478 070 023 000
EDITH F GOODSON
7043 DREAM INN LN
ROSEVILLE CA 95747

478 070 024 000
ELAINE A MURRILL
7051 DREAM INN LN
ROSEVILLE CA 95747

478 070 025 000
HOWARD J & DIANA L VONBERGEN
7059 DREAM INN LN
ROSEVILLE CA 95747

478 070 026 000
JAMES G & JEAN E PEARSE
7067 DREAM INN LN
ROSEVILLE CA 95747

478 070 027 000
LOREN D & BEVERLY J PROHASKA
7075 DREAM INN CT
ROSEVILLE CA 95747

478 070 028 000
FRANCIS H & ELEANOR J PAPINEAU
7083 DREAM INN CT
ROSEVILLE CA 95747

478 070 029 000
PAULA J LAVIN
7091 DREAM INN LN
ROSEVILLE CA 95747

478 070 030 000
WARREN L & JACQUELINE C VANDIVER
7099 DREAM INN LN
ROSEVILLE CA 95747

478 070 031 000
LOUIS & ELVA BOSCO
7107 DREAM INN LN
ROSEVILLE CA 95747

478 070 032 000
SHERILL E PARKER
14978 PAMMY WAY
GRASS VALLEY CA 95949

478 070 033 000
JAMES M & PATRICIA W JOHNSON
7123 DREAM INN LN
ROSEVILLE CA 95747

478 070 034 000
WALLACE MERBLER
7131 DREAM INN LN
ROSEVILLE CA 95747

478 070 035 000
AGATHA M HUDDLESTON
7139 DREAM INN LN
ROSEVILLE CA 95747

478 070 036 000
LOY E & SHARON E BATES
7147 DREAM INN LN
ROSEVILLE CA 95747

478 070 037 000
MAURICE L & PATRICIA A SWEATT
7155 DREAM INN LN
ROSEVILLE CA 95747

478 070 038 000
THOMAS F & BARBARA J STATTI
7154 DREAM INN LN
ROSEVILLE CA 95747

478 070 039 000
RAYMOND W GOODE
7146 DREAM INN LN
ROSEVILLE CA 95747

478 070 040 000
ARLIE D & YVONNE M SKELTON
7130 DREAM INN LN
ROSEVILLE CA 95747

478 070 041 000
CAMELIA MCNAUGHT
7122 DREAM INN LN
ROSEVILLE CA 95747

478 070 042 000
FREDERICK W & M ERIN FESTERSEN
7106 DREAM INN LN
ROSEVILLE CA 95747

478 070 043 000
ELLEN L MEEHAN
7098 DREAM INN LN
ROSEVILLE CA 95747

478 070 044 000
MAURICE B QUILLEN
7082 DREAM INN LN
ROSEVILLE CA 95747

478 070 045 000
A RUDY & LILA J GUERRERO
7066 DREAM INN LN
ROSEVILLE CA 95747

478 070 046 000
SHERRARD
7050 DREAM INN LN
ROSEVILLE CA 95747

478 070 047 000
PETER J & LESLIE V ROBERTS
7042 DREAM INN LN
ROSEVILLE CA 95747

478 070 048 000
DAVID W & MARY LOU HESS
7034 DREAM INN LN
ROSEVILLE CA 95747

478 070 049 000
ARNOLD E & RUTH D LASHER
7026 DREAM INN LN
ROSEVILLE CA 95747

478 070 050 000
ARTHUR L & HELEN R POWERS
7010 DREAM INN LN
ROSEVILLE CA 95747

478 070 051 000
FAULKNER
7002 DREAM INN LN
ROSEVILLE CA 95747

478 070 052 000
ANTHONY & BEVERLY D CERVONE
7140 KINGBIRD LN
ROSEVILLE CA 95747

478 070 053 000
BARBARA H BLIM
7132 KINGBIRD LN
ROSEVILLE CA 95747

478 070 054 000
WALLACE H & NELLIE F CARROLL
7124 KINGBIRD LN
ROSEVILLE CA 95747

478 070 055 000
PASCHAL
7116 KINGBIRD LN
ROSEVILLE CA 95747

478 070 056 000
CORWIN HY & PHYLLIS MARTINDALE
7108 KINGBIRD LN
ROSEVILLE CA 95747

478 070 057 000
GEORGE A & MARGARET K LAROCHE
7100 KINGBIRD LN
ROSEVILLE CA 95747

478 070 058 000
ALBERT A & ROSEMARY ERKEL
501 COLD STREAM CT
ROSEVILLE CA 95747

478 070 059 000
PATRICIA M MEYERS
509 COLD STREAM CT
ROSEVILLE CA 95747

478 070 060 000
DONALD F & LOIS G HUG
517 COLD STREAM CT
ROSEVILLE CA 95747

478 070 061 000
JOHN H & ALICE M GUCKEEN
525 COLD STREAM CT
ROSEVILLE CA 95747

478 070 062 000
EDGAR J & DORIS S BURGER
533 COLD STREAM CT
ROSEVILLE CA 95747

478 070 063 000
HAROLD R & MARY H OHLENDORF
532 COLD STREAM CT
ROSEVILLE CA 95747

478 070 064 000
RICHARD B & BARBARA J REINGOLD
524 COLD STREAM CT
ROSEVILLE CA 95747

478 070 065 000
JOSEPH A SR & SHARON STEELE
5631 CONISTON WAY
SAN JOSE CA 95118

478 070 066 000
BARBARA J DAULTON
508 COLD STREAM CT
ROSEVILLE CA 95747

478 070 067 000
DONALD J & BEVERLY J PIETRO
500 COLD STREAM CT
ROSEVILLE CA 95747

478 070 068 000
SUN CITY RSVL COMMUNITY ASSOC
198 CIRBY WAY #155
ROSEVILLE CA 95678

478 091 001 000
LEROY V & MARGARET P CRAWFORD
4000 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 002 000
ANDREW M & MADELINE E CRACOLICE
4004 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 003 000
BARBARA J FALLTRICK
4012 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 004 000
ERLINDA R RAEL
4020 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 005 000
EDWARD J JR & LINDA G GRIFFIN
PO BOX 1393
COLFAX CA 95713

478 091 006 000
ELEANOR A MARTIN
4019 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 007 000
RAYMOND S & MARIA R CULTRERA
4011 PINE CABIN WAY
ROSEVILLE CA 95747

478 091 008 000
JOSEPH J & JESSIE M COURTNEY
4016 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 009 000
EDWARD R & JUANITA K LICK
4024 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 010 000
WILLIAM A & MARIA U ELKUS
4043 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 011 000
GLADYS LISS
4035 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 012 000
PHYLLIS TRIBE
4027 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 013 000
NANCY L R CARLETON
4019 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 014 000
RENNE DELMONTE
4002 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 015 000
KENNETH D SR & MARTHA J
SCHLICHTING
4010 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 016 000
WILHELMINE M HANSEN
4018 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 017 000
GERALDINE KAPLAN
PO BOX 1146
ROSEVILLE CA 95678

478 091 018 000
JOSE V & MARIA V GARCIA
4034 SYLVAN GLEN LN
ROSEVILLE CA 95747

478 091 019 000
RUTH I KAISER
732 JOHNNY FRY CT
ROSEVILLE CA 95747

478 091 020 000
JAMES R & CAROLE E RICHMOND
4025 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 021 000
GEORGE A & MARTHA M JOHNSON
4017 ROSE CREEK RD
ROSEVILLE CA 95747

478 091 022 000
RICHARD R & CHERYL A MACDONALD
14 MOUNT EDEN PL
CLAYTON CA 94517

478 091 023 000
ROSEVILLE CITY OF EXEMPT FROM
311 VERNON ST #200
ROSEVILLE CA 95678

478 220 006 000
DOROTHY W ERICKSON
5096 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 007 000
DONALD & IRENE ELSON
5112 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 008 000
CARL J & MARGAR BERGESCH
5120 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 009 000
FRED W & DORIS J MAPLE
5128 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 010 000
ROCCO M JR & DOROTHY E GIORDANO
5136 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 011 000
WILLIAM DOUGLAS & KAREN Y BARR
9009 UPPER VALLEY RD
AUBURN CA 95602

478 220 012 000
GOLDON L SELFRIDGE
5152 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 013 000
BARBARA L RAMSEY
5160 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 014 000
JAMES C PHELAN
5193 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 015 000
JAY A & DEBORAH A GRIGGS
5185 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 016 000
DAVID J INGOLS
606 WREN CT
ROSEVILLE CA 95661

478 220 017 000
WILBERT A & DELORIS A HAUCK
5169 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 018 000
GARY L LEE
5153 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 019 000
PHILIP G & DANA N DAMASK
5145 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 020 000
E W NEWBERRY
552 CRESTFIELD CIR
ROSEVILLE CA 95678

478 220 021 000
CAROL S WALLACE
5129 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 022 000
OATHER L & SHIRLEY A GENTRY
5121 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 023 000
AUGUSTIN J VILA
4929 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 024 000
MORRIS E EASLEY
7131 LOST LAKE LN
ROSEVILLE CA 95747

478 220 025 000
JAMES C & LAURA J FORRISTALL
4913 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 026 000
JOHN M & ERLINDA R VAN SICKEL
4905 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 027 000
ANDRE
317 COPE RIDGE CT
ROSEVILLE CA 95747

478 220 028 000
CARL & MARY YACONELLI
4889 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 029 000
HERMAN E & JOSEPHINE MAY
4881 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 030 000
LOIS E KOWITZ
4873 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 031 000
JO BELLE SCHRILLO
4865 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 032 000
SONJA R MNICH
4857 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 033 000
JAMES W & LUCILLE J MCCARTY
4849 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 034 000
EDNA HART
4841 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 047 000
HILARY WALL & HAYLEY GANS III
4850 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 048 000
NANCY MANSFIELD
4858 WINTER HAVEN WAY
ROSEVILLE CA 95747

478 220 049 000
JANE F PULEO
100 SIGGENS CT
ROSEVILLE CA 95747

478 220 050 000
CARL M & MEREDYTH A HENTSCHKE
108 SIGGENS CT
ROSEVILLE CA 95747

478 220 056 000
EVERETT D & PATRICIA J CASTER
109 SIGGENS CT
ROSEVILLE CA 95747

478 220 057 000
MARY M DIAL
101 SIGGENS CT
ROSEVILLE CA 95747

478 220 058 000
DEBORAH A HATFIELD
5113 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 059 000
KAY M & CHARLENE MICHAEL
5097 DREAMGARDEN LOOP
ROSEVILLE CA 95747

478 220 069 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

478 240 004 000
BETTY M RUBY
4781 COTTAGE LN
ROSEVILLE CA 95747

478 240 005 000
THOMPSON FAMILY TRUST
867 MAHOGANY DR
MINDEN NV 89423

478 240 006 000
EILEEN M MULLIGAN
4797 COTTAGE LN
ROSEVILLE CA 95747

478 240 007 000
PADAVONA JOHN/M 2002 TRUST
4796 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 008 000
ORTENCIA E FERRARI
4788 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 009 000
CASEY PAUL S 2003 TRUST
4780 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 010 000
ANNA LISA SMITH
4772 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 011 000
VALERA O PETRIE
4764 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 012 000
WILLIAM W & ELIANE WILSON
4756 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 024 000
THOMAS F HARPER
4805 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 025 000
ROBERTA TRAYNOR
4797 MOUNT ROSE WAY
ROSEVILLE CA 95747

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CHARLES G & DOROTHY M SNYDER
4789 MOUNT ROSE WAY
ROSEVILLE CA 95747

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KOPKO
4781 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 028 000
CLIFTON E & JOAN ROBINSON
4773 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 029 000
IAN A & LORRAINE HAMILTON
4765 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 030 000
BARBARA JEAN CHILTON
705 HILLCREST AVE
ROSEVILLE CA 95678

478 240 031 000
GEOFFREY & MILDRED LUCY TYSON
4749 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 032 000
ROBERT A & COLLEEN M BROOKS
4741 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 240 033 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

478 250 001 000
BERNIECE KATHERINE BUSHMAN
4523 WANDERLUST LOOP
ROSEVILLE CA 95747

478 250 004 000
EVELYN L SACKMAN
516 EMPIRE CT
ROSEVILLE CA 95747

478 250 005 000
JOSEPH F & DORIS H SOMMERS
524 EMPIRE CT
ROSEVILLE CA 95747

478 250 006 000
GORDON E & HELEN J PENNEY
533 EMPIRE CT
ROSEVILLE CA 95747

478 250 011 000
NANCY ARLYN DUFF
3405 SAPPHIRE DR
ROCKLIN CA 95677

478 250 035 000
ANTHONY M & BETTY J FRENN
4548 COACH LAMP LN
ROSEVILLE CA 95747

478 250 041 000
DONALD C & ALICE B GOLDSTEIN
4541 COACH LAMP LN
ROSEVILLE CA 95747

478 250 042 000
DONALD R SMITH
4549 COACH LAMP LN
ROSEVILLE CA 95747

478 260 001 000
LOIS J SCOTT
4733 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 260 002 000
RALPH & OPAL GOOD
4725 MOUNT ROSE WAY
ROSEVILLE CA 95747

478 260 003 000
ROBERT G & JANICE G ALLEN
4717 MOUNT ROSE WAY
ROSEVILLE CA 95747

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FALZARANO
1004 MONTEREY CT
ROSEVILLE CA 95661

478 260 005 000
JULIA M BRITTO
608 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 006 000
JOSEPH M NUSSBAUM
616 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 007 000
CHRISTIAN H M & DONNA P THOLEN
624 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 008 000
FRANK JAMES SOUTHWICK
632 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 009 000
CAROL K WALTZ
640 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 010 000
RAYMOND G ALVARADO
657 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 011 000
MICHAEL C & KAREN K IDLER
649 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 012 000
YOSHIMI & HELEN S WATARI
641 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 013 000
JERRY L & SHIRLEY M HORN
633 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 014 000
DAVID B & VIVIAN I KANE
2206 FORTROSE PL
EL DORADO HILLS CA 95762

478 260 015 000
BARBARA B BLABON
617 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 016 000
DOROTHY L STOKKE
609 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 017 000
HOWARD G & FLOY FENNER
601 BLACKSTONE CT
ROSEVILLE CA 95747

478 260 018 000
WILLIAM C TIEMANN
4586 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 019 000
JOAN CLAIRE THOMAS
4594 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 020 000
PAUL & PHYLLIS B ROSEN
4602 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 021 000
JEANETTE F HEADY FRANK
4610 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 022 000
SYLVIA E FITZPATRICK
4618 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 023 000
JOSEPH J DUB
4626 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 024 000
ROBERT G & SHIRLEY R STIERWALT
4634 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 025 000
LIONEL & AMY BETTENCOURT
BETTENCOURT
4642 WANDERLUST LOOP
ROSEVILLE CA 95747

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ROBERT L IRONSIDE
4597 COACH LAMP LN
ROSEVILLE CA 95747

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ROBERT E & SYLVIA S CONDON
4589 COACH LAMP LN
ROSEVILLE CA 957474587
WANDERLUST LOOP
ROSEVILLE CA 95747

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JEAN M MARUEJOULS
4581 COACH LAMP LN
ROSEVILLE CA 95747

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JOANNE O MATTOON
4573 COACH LAMP LN
ROSEVILLE CA 95747

478 260 030 000
WILLIAM T SR & NANCY L HASTINGS
4565 COACH LAMP LN
ROSEVILLE CA 95747

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JAMES R & PATRICIA L THOMSON
4635 WANDERLUST LOOP
ROSEVILLE CA 95747

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RICHARD T & KAREN K OSTROWSKI
4571 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 033 000
RICHARD L & BETTY J BUNKER
4619 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 034 000
DAVID A CAPITO
4603 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 035 000
EDGAR G & PAMELYN UNDERWOOD
4587 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 036 000
DONNA V GRAHN
4579 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 037 000
ALLEN T & LINDA C TOKIFUJI
4571 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 038 000
ROBERT N & LOIS H CARSON
4563 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 039 000
ROBERT W & NANCY M GUIN
4555 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 040 000
JACK R & RITA A OPHEIM
4539 WANDERLUST LOOP
ROSEVILLE CA 95747

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GEORGE J MERICK
4554 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 043 000
EDWARD CARTOTTO
4546 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 044 000
TRUST; OTLEY
4538 WANDERLUST LOOP
ROSEVILLE CA 95747

478 260 045 000
CLIFFORD M & MARY FRANCES KREBS
400 HELLER CT
ROSEVILLE CA 95747

478 260 046 000
JOSEPH F & JEAN E SCHOPP
408 HELLER CT
ROSEVILLE CA 95747

478 260 047 000
HUGH & MARY L LAMARCHE
416 HELLER CT
ROSEVILLE CA 95747

478 260 048 000
DONALD J & L GAIL DUGAN
424 HELLER CT
ROSEVILLE CA 95747

478 260 049 000
JOSEPH & PATRICIA CAMPAGNA
432 HELLER CT
ROSEVILLE CA 95747

478 260 050 000
RAYMOND T & PATRICIA A ANDERSEN
425 HELLER CT
ROSEVILLE CA 95747

478 260 051 000
DAVID L & EVAH R BIGLER
417 HELLER CT
ROSEVILLE CA 95747

478 260 052 000
GEORGE R & NORMA H KLEIN
409 HELLER CT
ROSEVILLE CA 95747

478 260 053 000
ALFRED & RUTH ZEITS
401 HELLER CT
ROSEVILLE CA 95747

478 260 054 000
RUTH C EELLS
4557 COACH LAMP LN
ROSEVILLE CA 95747

478 260 055 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

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BEATRICE A SYLVA
4152 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 002 000
OSTRO HANS
4144 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 003 000
JAY & PAMELA KAY REID
4136 ENCHANTED CIR
ROSEVILLE CA 95747

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LYNNDA FAIR
4057 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 015 000
ABEL HAINES
4065 ENCHANTED CIR
ROSEVILLE CA 95747

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W JACKSON & ELAINE WILLOUGHBY
309 ROUNDHILL CT
ROSEVILLE CA 95747

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RICHARD W & BARBARA A GIBSON
317 ROUNDHILL CT
ROSEVILLE CA 95747

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JEAN AUMAN
325 ROUNDHILL CT
ROSEVILLE CA 95747

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CHARLES S CROWNOVER
332 ROUNDHILL CT
ROSEVILLE CA 95747

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BARNETT H & JANE M BLOAT
324 ROUNDHILL CT
ROSEVILLE CA 95747

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DUDLEY S & LYNN MOORE
316 ROUNDHILL CT
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BETTY A CHARLES
308 ROUNDHILL CT
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LEONARD R & BARBARA J SORBY
300 ROUNDHILL CT
ROSEVILLE CA 95747

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SHIVELY THOMAS/J 2000 TRUST
4121 ENCHANTED CIR
ROSEVILLE CA 95747

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ROBERT E & SHARON LEE GERHART
4137 ENCHANTED CIR
ROSEVILLE CA 95747

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GERALD D & BETTY J SNYDER
4145 ENCHANTED CIR
ROSEVILLE CA 95747

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ARNESEN ROY 2002 TRUST
4153 ENCHANTED CIR
ROSEVILLE CA 95747

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LAURENCE E & LINDA S FLETCHER
4161 ENCHANTED CIR
ROSEVILLE CA 95747

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ESTELLE ELHAI
4169 ENCHANTED CIR
ROSEVILLE CA 95747

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LARRY & FLORENCE BROGAN
4160 ENCHANTED CIR
ROSEVILLE CA 95747

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HOWARD D RIES
PO BOX 1341
ROSEVILLE CA 95678

478 270 032 000
MARJORIE E SMITH
4176 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 033 000
WANDA M BERAN
4184 ENCHANTED CIR
ROSEVILLE CA 95747

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RICHARD T & KAREN K OSTROWSKI
4571 WANDERLUST LOOP
ROSEVILLE CA 95747

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DAVID BLOOM
4200 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 036 000
MARLENE NAGLE
4208 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 037 000
RONALD E & MARIANNE R JONES
827 WARREN WAY
AUBURN CA 95603

478 270 038 000
ROBERT J KOVATS
4224 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 039 000
RICHARD J & HELEN D OLWELL
PO BOX 19149
SACRAMENTO CA 95819

478 270 040 000
KOCHER
4240 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 041 000
SAM O & NOBUKO MORISHIGE
4248 ENCHANTED CIR
ROSEVILLE CA 95747

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EUCLID D & HAZEL A SIMMONS
4256 ENCHANTED CIR
ROSEVILLE CA 95747

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ANTHONY & DOROTHY MARKUS
4264 ENCHANTED CIR
ROSEVILLE CA 95747

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DORIS LEE S COCHRAN
4272 ENCHANTED CIR
ROSEVILLE CA 95747

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DONALD R & RUTH H PECKHAM
4280 ENCHANTED CIR
ROSEVILLE CA 95747

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EDWARD LEE CHANNELL
4288 ENCHANTED CIR
ROSEVILLE CA 95747

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JAMES W & BEVERLY M EASTER
4296 ENCHANTED CIR
ROSEVILLE CA 95747

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VIRGINIA M ROBINSON
4217 ENCHANTED CIR
ROSEVILLE CA 95747

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EDWARD S & MARIA S ALAMEIDA
4225 ENCHANTED CIR
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EARL P & PEGGY J PARISI
4233 ENCHANTED CIR
ROSEVILLE CA 95747

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HAROLD C & ELIZABETH J THURM
4241 ENCHANTED CIR
ROSEVILLE CA 95747

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MARIAN V COSTA
4249 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 053 000
ELAINE N FAMBRINI
4257 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 054 000
ALBERT M & FRANCES V KNIGHT
4265 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 055 000
NORMAN R BILLS
PO BOX 1614
SPARKS NV 89432

478 270 056 000
JOHN G BEACH
4297 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 057 000
ROGER & MARY L PESSAGNO
4305 ENCHANTED CIR
ROSEVILLE CA 95747

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ROBERT HARLEY
201 STRONGBOX CT
ROSEVILLE CA 95747

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ROBERT T; DESMOND
209 STRONGBOX CT
ROSEVILLE CA 95747

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D LEROY & A IMOGENE SANDERS
216 STRONGBOX CT
ROSEVILLE CA 95747

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BILLIE F JACKSON
208 STRONGBOX CT
ROSEVILLE CA 95747

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EDITH PENTON
200 STRONGBOX CT
ROSEVILLE CA 95747

478 270 063 000
PATRICIA L MEIER
101 ENCHANTED CT
ROSEVILLE CA 95747

478 270 064 000
EUGENE J & WILMA MELLO
109 ENCHANTED CT
ROSEVILLE CA 95747

478 270 065 000
DEAN A; RICHARDSON
4403 WHITLAND CT
ROCKLIN CA 95677

478 270 066 000
SARAH E HEWETTE
124 ENCHANTED CT
ROSEVILLE CA 95747

478 270 067 000
ALBERT & DOROTHY ADAMS
116 ENCHANTED CT
ROSEVILLE CA 95747

478 270 068 000
CAROLYN L FOLSOM
108 ENCHANTED CT
ROSEVILLE CA 95747

478 270 069 000
ARTHUR B & ANITA M BRITTAIN
100 ENCHANTED CT
ROSEVILLE CA 95747

478 270 070 000
ALLEN R WILSON
4000 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 071 000
BERNARD J & SANDRA H ALLENDORF
4008 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 072 000
ROBERT K & CHRISTINE C HEFNER
4016 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 073 000
GLORIA L COOLEY
4024 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 074 000
DOLORES Y ARAGON
2572 BOOKSIN AVE
SAN JOSE CA 95125

478 270 075 000
GLORIA M DAVIS
4040 ENCHANTED CIR
ROSEVILLE CA 95747

478 270 076 000
JOAN M JEFFREY
4048 ENCHANTED CIR
ROSEVILLE CA 95747

017 100 014 000
ROSEVILLE CITY OF
311 VERNON ST #208
ROSEVILLE CA 95678

PROJECT TECH FW, INC.
ATTN: DOUG DAVEY
3947 LENNANE DR, STE 200
SACRAMENTO CA 95843

Roseville Energy Park

Appendix 1-C
Persons Who Prepared the AFC

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 1C
LIST OF CONTRIBUTORS

Affiliation	Name	Responsibility
City of Roseville	Tom Habashi	Director of Utility
	Bob Hren	REP Project Manager
	Russ Nichols	Electronics Superintendent
	Tom Green	Power Supply Manager
	Patty Dunn	Community Development Director/Assistant City Manager
	Mark Morse	Environmental Coordinator
	Bernie Fargen	Public Relations
	Kathy Pease	Planner
Grattan & Galati	Scott A. Galati	Legal Counsel
Grenier &Associates	Andrea Grenier	Environmental Permitting Manager
Calpine Power Services	Steve Clark, PE	Engineering Project Manager
	Jim McLucas	Technical Director
	Bob Anders	Construction Engineering
	Bob Moen, PE	Water Specialist
	Steve Blue	Electrical Engineer
	Gary Pratt	Mechanical Engineer
Tetra Tech FW, Inc.	Douglas M. Davy, Ph.D.	Project Manager
	Douglas Urry	Assistant Project Manager, Hazardous Materials Handling, Waste Management
	Thomas Adams, INCE	Noise
	Lida Moussavian	Air Quality
	Suzanne Burnell	Water Resources
	Karen Cantillon	Technical Editor
	Monica Caravati	Public Health
	David Dirkin	Geological Hazards and Resources,
	Jenna Farrell	Cultural Resources
	Aileen Giovanello	Socioeconomics, Land Use
	Brett Hartman	Biological Resources
	Eric Htain	Biological Resources
	Amanda Johnson	Soils and Agriculture
	Dwight Mudry, Ph.D.	Technical Review
	Scott Muller, LLA	Visual Resources
	Chris Niemcek	CAD, GIS
	Andrea Slusser	Traffic and Transportation
	Thomas Stewart, Ph.D.	Paleontology
	Connie Stark	Document Production

APPENDIX 1C
LIST OF CONTRIBUTORS (continued)

Affiliation	Name	Responsibility
Atmospheric Dynamics	Gregory S. Darvin	Air modeling
Mark O. Turner	Mark Turner	Emission Reduction Credits
3Dscape	Timothy Zack	Visual simulation

Roseville Energy Park

Appendix 6-A
Western Area Power Administration
System Impact Study

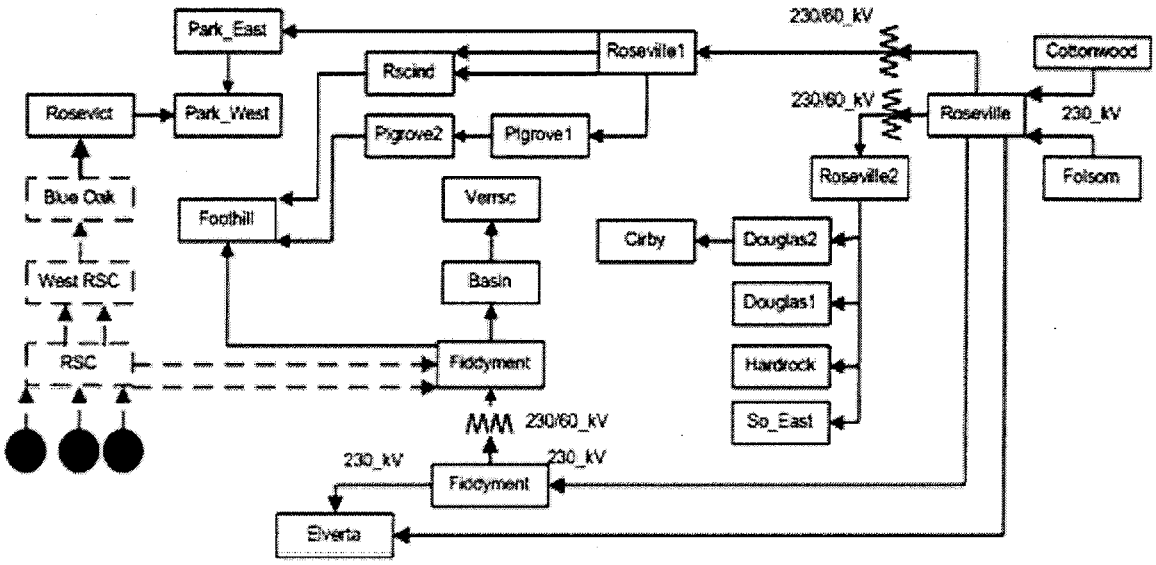
October 2003

Roseville Energy Park
Application for Certification

ROSEVILLE ENERGY PARK

POWER GENERATION FACILITY

SCREENING STUDY



PREPARED BY

WESTERN AREA POWER ADMINISTRATION
SIERRA NEVADA REGION

June 24, 2003

Executive Summary

This report summarizes the results of Western Area Power Administration's feasibility studies, performed in response to the City of Roseville's (City) request to assess the impact of adding 150 MW of generation. The City asked Western to study and evaluate the benefit of such a plant prior to proceeding with the engineering and construction of the second transformer at Fiddyment. The proposed power generation facility (Roseville Energy Park) is to be located on a 40-acre site adjacent to the new Pleasant Grove Wastewater Treatment Plant, about one mile northwest of the City's existing limits. This site is located approximately four miles north of Fiddyment Substation. The generation facility will have the capability to generate 150 megawatts.

This study included two interconnection configurations. First: the proposed project connected to the City's 60-kV transmission near the proposed plant site. Second: a direct interconnection at Fiddyment Substation with the Western's 230-kV transmission system. Three alternatives were devised for each the 60 & 230-kV systems:

Alternative I	Consists of adding the 150 MW of generation with a double circuit connection to the Fiddyment 60-kV Substation, a double circuit connection to a new West Roseville Substation, and West Roseville Substation to a new Blue Oaks Substation. See Figures 3 and 4.
Alternative II	Same as Alternative I plus a new H.P. West Substation connected to the new West Roseville Substation, Fiddyment, and Foothills Substations. See Figure 5.
Alternative III	Same as Alternative II plus a second 150MVA, 230/60-kV transformer at Fiddyment Substation. See Figure 6.

The alternatives for the 230-kV studies are labeled 230-kV Alternative Ia, IIa, and IIIa, with the same configuration as the 60-kV studies, except that the 150 MW of generation is connected to the Fiddyment 230-kV Substation with a single circuit 230-kV transmission line.

See attached drawings.

Summary of Findings:

Prior to adding the new generation, voltages at several busses within The City system dropped below 0.95 p.u. After adding 150MW of generation, voltages remain within acceptable limits.

There are 35 overloaded elements under N-1 conditions before modeling the new generation. Of these 35 elements, 33 will improve. The loss of one of the O'Banion-Elverta lines causes the second line to overload 174%. Even though the overload is high, it is marginally less with the generation, but does not eliminate the need for RAS.

The study results indicate that the second 230/60-kV transformer at Fiddyment Substation may be deferred to a later date if the new generation is added to the City's 60-kV system.

Table I compares the system losses when the generation is added to Western's 230-kV system versus The City's 60-kV system, using the forecasted load for 2006 of 320 MW.

Table I

	No Generation Added	Generation added to Roseville's 60-kV System		Generation added to Western's 230-kV System	
SYSTEM LINE & XFM LOSSES	**Ploss (MW)**	**Ploss (MW)**	**Difference (MW)**	**Ploss (MW)**	**Difference (MW)**
Roseville's 60-kV System	1.14	1.91	0.77	0.89	(0.25)
Western's System	67.81	63.92	(3.89)	64.08	(3.73)
SMUD's System	31.55	32.07	0.52	31.22	(0.33)

Base Case Study Assumptions

The study focuses on the anticipated summer peak load condition for the 2006 summer season. The base case load assumption is one in ten load forecast for the Sacramento area, and PG&E's Area 5 (Sierra), and is temperature adjusted load forecast for the surrounding areas.

The following is a summary of the 2006 heavy summer base case with heavy load conditions in the greater Sacramento valley region:

2006 SUMMER PEAK NORTH-TO-SOUTH CASE	
Study Path	**Flow (MW)**
PACI + COTP	4,313 (N-S)
Planning Area Load	**MW**
Sacramento Area	3,171 (SMUD), 320 (Roseville),
Generation	**MW**
Sutter Energy Center	525 MW
SMUD Hydro & Thermal Generation	1,591 MW
CVP Hydro generation	1,130 MW

The City's forecasted load for 2006 is 320 MW and for 2010 the forecast is 375 MW. Studies were performed for both load levels.

The only overloaded element (no outage taken) in the base case before adding generation is the O'Banion-Elverta 230-kV lines, loaded at 100.4%. After adding generation, the lines are loaded at 97.4%.

Before adding generation, the loss of the Fiddyment 230/60-kV transformer causes the voltage at several busses within The City's system to drop below 0.95 p.u. (ranging from .891 p.u. to .965 p.u). Voltages

remain within acceptable limits after adding 150 MW of generation to the 60-kV side of Fiddyment Substation.

Contingency Analysis with Generation on the City's 60-kV System

There are 35 overloaded elements under N-1 conditions in the base case (using the 2010 forecast of 375 MW) before modeling the new generation. Of these 35 elements, 33 will improve. The loss of one of the O'Banion-Elverta lines causes the remaining line to overload 174%. This condition exists without the added generation and a RAS scheme is in place to relieve the overload.

The ElvertaW-ElvertaS outage causes the ElvertaW-HurleyS lines to overload and the overloads increases (9%) with the additional generation. The following table shows the comparison in the loading of transmission lines and transformers before and after adding 150MW of generation. The study case that was used, without the new generation on-line, has the Roseville CTs on and generating 50 megawatts. Studies were performed using the 2006 load forecast of 320 MW and the 2010 forecast of 375 MW.

Table II

Overloaded Elements with and without 150 MW of Generation on Roseville's 60kV System

	OVERLOADED ELEMENTS					NCPA CTs 50 MW		NCPA CTs 0 MW			
Outage	From	kV	To	kV	Ckt	% Loading without RSC Generation (2006)	% Loading without RSC Generation (2010)	% Loading with RSC Generation (2006)	% Loading with RSC Generation (2010)	Change in % Loading (2006)	Change in % Loading (2010)
West Roseville-Blue Oak 60kV	FIDDYMNT	60	FTHILL	60	1	n/a	n/a	94.6	101.75		
O'Banion-Elverta #1	OBANION	230	ELVERTAW	230	2	176	177.94	172.2	174.05	-3.8	-3.89
O'Banion-Elverta #2	OBANION	230	ELVERTAW	230	1	176	177.94	172.2	174.05	-3.8	-3.89
Fiddyment 230/60kV #1	FIDDYMNT	60	FTHILL	60	1	172	209.18	46	39.2	-126	-169.98
Fiddyment 230/60kV #1	FTHILL	60	RSCIND	60	1	142	171.68	16.8	31.6	-125.2	-140.08
ElvertaS-ElvertaW	ELVERTAW	230	HURLEY S	230	2	140.6	134.52	150	144.14	9.4	9.62
ElvertaS-ElvertaW	ELVERTAW	230	HURLEY S	230	1	135.8	130	145	139.3	9.2	9.3
Fiddyment 230/60kV #1	PLGROVE1	60	ROSEVLL1	60	1	117.7	141.93	31.6	45.8	-86.1	-96.13
ElvertaS-ElvertaW	HURLEY S	230	NATOMAS	230	1	114	113	114.3	113.76	0.3	0.76
Camino-Lake 230kV	ORANGEVL	230	WHITEROK	230	1	112.3	113.79	110.7	111.3	-1.6	-2.49
Cottonwood-Roseville	OBANION	230	ELVERTAW	230	2	103.8	105.04	101.6	102.71	-2.2	-2.33
Cottonwood-Roseville	OBANION	230	ELVERTAW	230	1	103.8	105.04	101.6	102.71	-2.2	-2.33
Roseville 230/60kV #1	ROSEVILL	230	ROSEVLL2	60	2	103	123.55	87	107.72	-16	-15.83
Fiddyment 230/60kV #1	PLGROVE2	60	PLGROVE1	60	1	102	123.6	17.2	28.7	-84.8	-94.9
Tracy-Hurley #2	OBANION	230	ELVERTAW	230	2	102	103.29	99.6	100.82	-2.4	-2.47
Tracy-Hurley #2	OBANION	230	ELVERTAW	230	1	102	103.29	99.6	100.82	-2.4	-2.47
Tracy-Hurley #1	OBANION	230	ELVERTAW	230	2	102	103.12	99.2	100.67	-2.8	-2.45
Tracy-Hurley #1	OBANION	230	ELVERTAW	230	1	102	103.12	99.2	100.67	-2.8	-2.45
Roseville 230/60kV #2	ROSEVILL	230	ROSEVLL1	60	1	101.7	122.23	86	106.37	-15.7	-15.86
Elk Grove-Rancho Seco 230kV	OBANION	230	ELVERTAW	230	2	99.7	100.76	97.6	98.58	-2.1	-2.18
Elk Grove-Rancho Seco 230kV	OBANION	230	ELVERTAW	230	1	99.7	100.76	97.6	98.58	-2.1	-2.18
SRWTP-Pocket 69kV	OBANION	230	ELVERTAW	230	2	99.7	100.73	97.6	98.62	-2.1	-2.11
SRWTP-Pocket 69kV	OBANION	230	ELVERTAW	230	1	99.7	100.73	97.6	98.62	-2.1	-2.11

Table II (continued)

Overloaded Elements with and without 150 MW of Generation on Roseville's 60kV System											
	OVERLOADED ELEMENTS					NCPA CTs 50 MW		NCPA CTs 0 MW			
Outage	From	kV	To	kV	Ckt	% Loading without RSC Generation (2006)	% Loading without RSC Generation (2010)	% Loading with RSC Generation (2006)	% Loading with RSC Generation (2010)	Change in % Loading (2006)	Change in % Loading (2010)
Olinda-Keswick	OBANION	230	ELVERTAW	230	2	99.5	100.55	97.5	98.52	-2	-2.03
Olinda-Keswick	OBANION	230	ELVERTAW	230	1	99.5	100.55	97.5	98.52	-2	-2.03
Orangevale-Whiterock 230kV	OBANION	230	ELVERTAW	230	2	99.2	100.28	97.1	98.1	-2.1	-2.18
Orangevale-Whiterock 230kV	OBANION	230	ELVERTAW	230	1	99.2	100.28	97.1	98.1	-2.1	-2.18
Hedge-Rancho Seco 230kV	OBANION	230	ELVERTAW	230	2	99.1	100.24	97.1	98.1	-2	-2.14
Hedge-Rancho Seco 230kV	OBANION	230	ELVERTAW	230	1	99.1	100.24	97.1	98.1	-2	-2.14
Fiddyment 230/60kV #1	ROSEVILL	230	ROSEVLL2	60	2	99	120.4	59.1	74.8	-39.9	-45.6
Keswick-Airport 230kV	OBANION	230	ELVERTAW	230	2	99	100.09	97.1	98.05	-1.9	-2.04
Keswick-Airport 230kV	OBANION	230	ELVERTAW	230	1	99	100.09	97.1	98.05	-1.9	-2.04
Fiddyment 230/60kV #1	RSCIND	60	ROSEVLL1	60	2	97	117.36	19.5	36.8	-77.5	-80.56
Fiddyment 230/60kV #1	ROSEVILL	230	ROSEVLL1	60	1	95	115.53	56.5	74.8	-38.5	-40.73
Fiddyment 230/60kV #1	PLGROVE2	60	FTHILL	60	1	86	105.24	7.3	13.7	-78.7	-91.54
Roseville 230/60kV #1	FIDDYMNT	230	FIDDYMNT	60	1	85.6	104.45	38.1	52.8	-47.5	-51.65

Table III shows the overloaded elements before adding the City's 150 MW of generation compared to the level of only when the generation is on under N-2 conditions. Thirteen elements overloaded under N-2 conditions without the additional generation modeled. With the new generation on-line, the loading on ElvertaW-ElvertaS breaker and ElvertaS-Natomas line increases with the double outage of Elverta-Hurley lines. The loading of the remaining overloaded elements on the 230kV system decrease and the overloads on the 60kV system no longer exists.

Table III

N-2 Overloaded Elements with and without 150 MW of Generation on Roseville's 60-kV System

	OVERLOADED ELEMENTS					NCPA CTs 50 MW		NCPA CTs 0 MW			
Outage	From	kV	To	kV	Ckt	% Loading without RSC Generation (2006)	% Loading without RSC Generation (2010)	% Loading with RSC Generation (2006)	% Loading with RSC Generation (2010)	Change in % Loading (2006)	Change in % Loading (2010)
Fiddyment-Elverta & Fiddyment-Roseville	FIDDYMNT	60	FTHILL	60	1	173	211.8	45.7	34.47	-127.3	-177.33
Fiddyment-Elverta & Fiddyment-Roseville	FTHILL	60	RSCIND	60	1	142.6	173.7	16.6	30.79	-126	-142.91
Fiddyment-Elverta & Fiddyment-Roseville	PLGROVE1	60	ROSEVLL1	60	1	118.2	143.6	31.6	46.03	-86.6	-97.57
Fiddyment-Elverta & Fiddyment-Roseville	PLGROVE2	60	PLGROVE1	60	1	102.7	125.1	17.1	28.48	-85.6	-96.62
Fiddyment-Elverta & Fiddyment-Roseville	ROSEVILL	230	ROSEVLL2	60	2	98.7	120.7	59.1	78.59	-39.6	-42.11
Fiddyment-Elverta & Fiddyment-Roseville	RSCIND	60	ROSEVLL1	60	1	97.7	118.7	25.1	28.7	-72.6	-90
Fiddyment-Elverta & Fiddyment-Roseville	ROSEVILL	230	ROSEVLL1	60	1	94.7	115.8	19.5	75.17	-75.2	-40.63
O'Banion-ElvertaW 1 & 2	TRCY PMP	230	HURLEY S	230	2	111	115.7	104.3	108.55	-6.7	-7.15
O'Banion-ElvertaW 1 & 2	TRCY PMP	230	HURLEY S	230	1	109	112.9	101.9	106.05	-7.1	-6.85
ElvertaW-Hurley S 1 & 2	ELVERTAS	230	ELVERTAW	230	1	114	109.9	122	117.31	8	7.41
Trcy Pmp-Hurley S 1&2	OBANION	230	ELVERTAW	230	2	107.8	109.4	104.8	106.29	-3	-3.11
Trcy Pmp-Hurley S 1&2	OBANION	230	ELVERTAW	230	1	107.8	109.4	104.8	106.29	-3	-3.11
ElvertaW-Hurley S 1 & 2	ELVERTAS	230	NATOMAS	230	1	114	107.5	125	118.36	11	10.86

Table IV shows the elements which overload under N-2 conditions with the new generation modeled.

Table IV

Overloaded Elements with and without 150 MW of Generation on Roseville's 60-kV System											
	OVERLOADED ELEMENTS					NCPA CTs 50 MW		NCPA CTs 0 MW			
Outage	From	kV	To	kV	Ckt	% Loading without RSC Generation (2006)	% Loading without RSC Generation (2010)	% Loading with RSC Generation (2006)	% Loading with RSC Generation (2010)	Change in % Loading (2006)	Change in % Loading (2010)
Rsc 60-Fiddyment 60kV	ROSEVLCT	60	BLUE OAK	60	1	n/a	n/a	143.7	130.6		
Rsc 60-Fiddyment 60kV	ROSEVLCT	60	PARKWEST	60	1	n/a	n/a	143.6	130.6		
Rsc 60-West Rsc 1&2	ROSEVLL1	60	PARKEAST	60	1	n/a	n/a	136.9	163.3		
Rsc 60-West Rsc 1&2	FIDDYMNT	60	FTHILL	60	1	n/a	n/a	121	132.62		
Rsc 60-Fiddyment 60kV	PARKEAST	60	PARKWEST	60	1	n/a	n/a	117.5	101.3		
Rsc 60-West Rsc 1&2	PARKWEST	60	PARKEAST	60	1	n/a	n/a	109.8	131.05		
Rsc 60-Fiddyment 60kV	WEST RSC	60	BLUE OAK	60	1	n/a	n/a	106.3	100.7		
O'Banion-ElvertaW 1 & 2	OBANION	230	OLINDAW	230	1	97.3	97.7	96.6	102.39	-0.7	4.69
Roseville 230/60kV xfm 1&2	PARKEAST	60	PARKWEST	60	1	n/a	n/a	95.9	120.29		
Roseville 230/60kV xfm 1&2	WEST RSC	60	BLUE OAK	60	1	n/a	n/a	94.1	119.39		
Roseville 230/60kV xfm 1&2	FTHILL	60	RSCIND	60	1	n/a	n/a	92.6	124.61		

Generation added to the 230-kV Transmission System

Table V shows the overloads with the generation connected to the 230-kV side of Fiddyment Substation. Again, an outage of the Elverta Bus Tie Breaker causes an increase in the loading on the Elverta-Hurley lines. 16 elements were overloaded in N-1 conditions without the additional generation, 8 of the overloaded elements improve with the additional generation.

Table V

Overloaded Elements with and without 150 MW of Generation on Western's 230kV System											
	OVERLOAD ELEMENTS					NCPA CTs 50 MW		NCPA CTs 0 MW			
Outage	From	kV	To	kV	Ckt	% Loading without RSC Generation (2006)	% Loading without RSC Generation (2010)	% Loading with RSC Generation (2006)	% Loading with RSC Generation (2010)	Change in % Loading (2006)	Change in % Loading (2010)
O'Banion-Elverta #2	OBANION	230	ELVERTAW	230	#1	175.9	177.9	172.1	173.96	-3.8	-3.94
O'Banion-Elverta #1	OBANION	230	ELVERTAW	230	#2	175.9	177.9	172.1	173.96	-3.8	-3.94
ElvertaS-ElvertaW	ELVERTAW	230	HURLEY S	230	#2	140.5	134.3	150.6	144.25	10.1	9.95
ElvertaS-ElvertaW	ELVERTAW	230	HURLEY S	230	#1	135.7	129.8	145.6	139.41	9.9	9.61
ElvertaS-ElvertaW	HURLEY S	230	NATOMAS	230	#1	113.8	113	114.4	113.73	0.6	0.73
Roseville 230/60kV Xfm #1	ROSEVILL	230	ROSEVLL2	60	#2	106.8	127.2	122.7	144.04	15.9	16.84
Roseville 230/60kV Xfm #2	ROSEVILL	230	ROSEVLL1	60	#1	106	125.6	122	142.33	16	16.73
Cottonwood-Roseville	OBANION	230	ELVERTAW	230	#2	103.8	105	101.6	102.7	-2.2	-2.3
Cottonwood-Roseville	OBANION	230	ELVERTAW	230	#1	103.8	105	101.6	102.7	-2.2	-2.3
Tracy-Hurley #2	OBANION	230	ELVERTAW	230	#2	101.9	104.5	99.6	100.76	-2.3	-3.74
Tracy-Hurley #2	OBANION	230	ELVERTAW	230	#1	101.9	104.5	99.6	100.76	-2.3	-3.74
Tracy-Hurley #1	OBANION	230	ELVERTAW	230	#2	101.9	104.31	99	100.62	-2.9	-3.69
Tracy-Hurley #1	OBANION	230	ELVERTAW	230	#1	101.9	104.31	99	100.62	-2.9	-3.69
Fiddyment 230/60kV Xfm	ROSEVILL	230	ROSEVLL2	60	#2	96	116.9	116.8	138.6	20.8	21.7
Fiddyment 230/60kV Xfm	ROSEVILL	230	ROSEVLL1	60	#1	92.1	112.2	112.1	133.11	20	20.91
Roseville 230/60kV Xfm #2	FIDDYMNT	230	FIDDYMNT	60	#1	82	100.2	102.5	123.05	20.5	22.85
Roseville 230/60kV Xfm #1	FIDDYMNT	230	FIDDYMNT	60	#1	80.7	98.5	101.9	121.04	21.2	22.54
Fiddyment 230/60kV Xfm	ROSEVLL1	60	PARKEAST	60	#1	76	99.9	134.5	160.63	58.5	60.73
Fiddyment 230/60kV Xfm	FTHILL	60	RSCIND	60	#1	74.6	92.1	94.4	112.88	19.8	20.78
Fiddyment 230/60kV Xfm	ROSEVLL1	60	PLGROVE1	60	#1	72.1	88	86.1	102.88	14	14.88
Roseville-Park East 60kV	FIDDYMNT	230	FIDDYMNT	60	#1	66.8	82.8	93.7	111.25	26.9	28.45
Park East-Park West 60kV	FIDDYMNT	230	FIDDYMNT	60	#1	61.2	76.2	87.1	103.29	25.9	27.09
Fiddyment 230/60kV Xfm	FIDDYMNT	60	FTHILL	60	#1	61.1	78	91.7	110.07	30.6	32.07
Fiddyment 230/60kV Xfm	PARKEAST	60	PARKWEST	60	#1	50.4	69	107.3	128.33	56.9	59.33
RSC PP - Fiddyment 230kV	OBANION	230	ELVERTAW	230	#2	n/a	n/a	99.3	100.42		
RSC PP - Fiddyment 230kV	OBANION	230	ELVERTAW	230	#1	n/a	n/a	99.3	100.42		

The attached drawings show The City's 60-kV system before generation is added, Figures 1 and 2. Figures 3 through 9 are the three alternatives with generation on the 60-kV system and 230-kV system. The single worst contingency, the Elverta Bus Tie Breaker is shown in Figure 10 and the flows on The City's system with the Fiddyment transformer out of service are shown in Figure 11.

Figure 1 - No generation added, 2006 load forecast

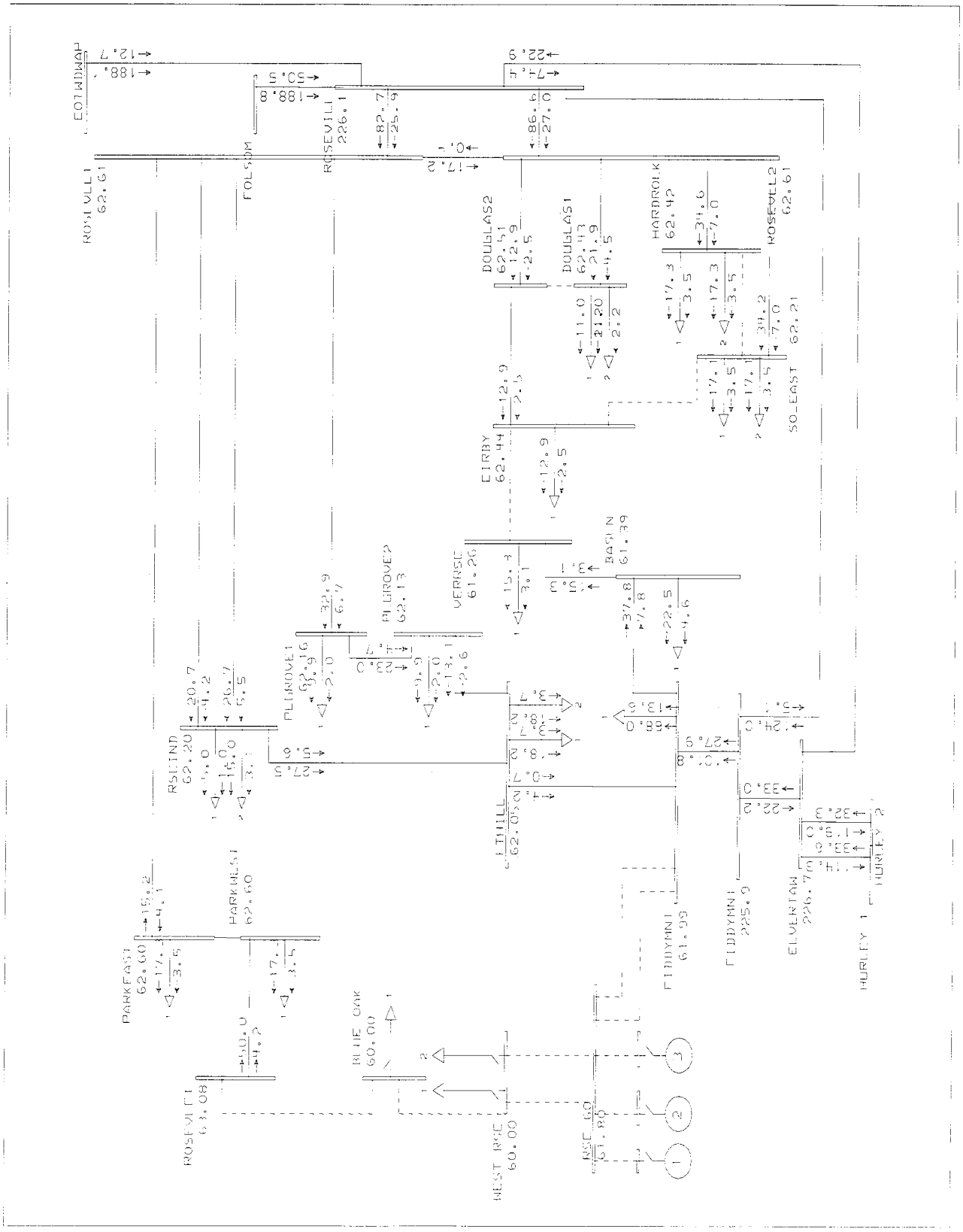


Figure 2 - No generation added, 2010 load forecast

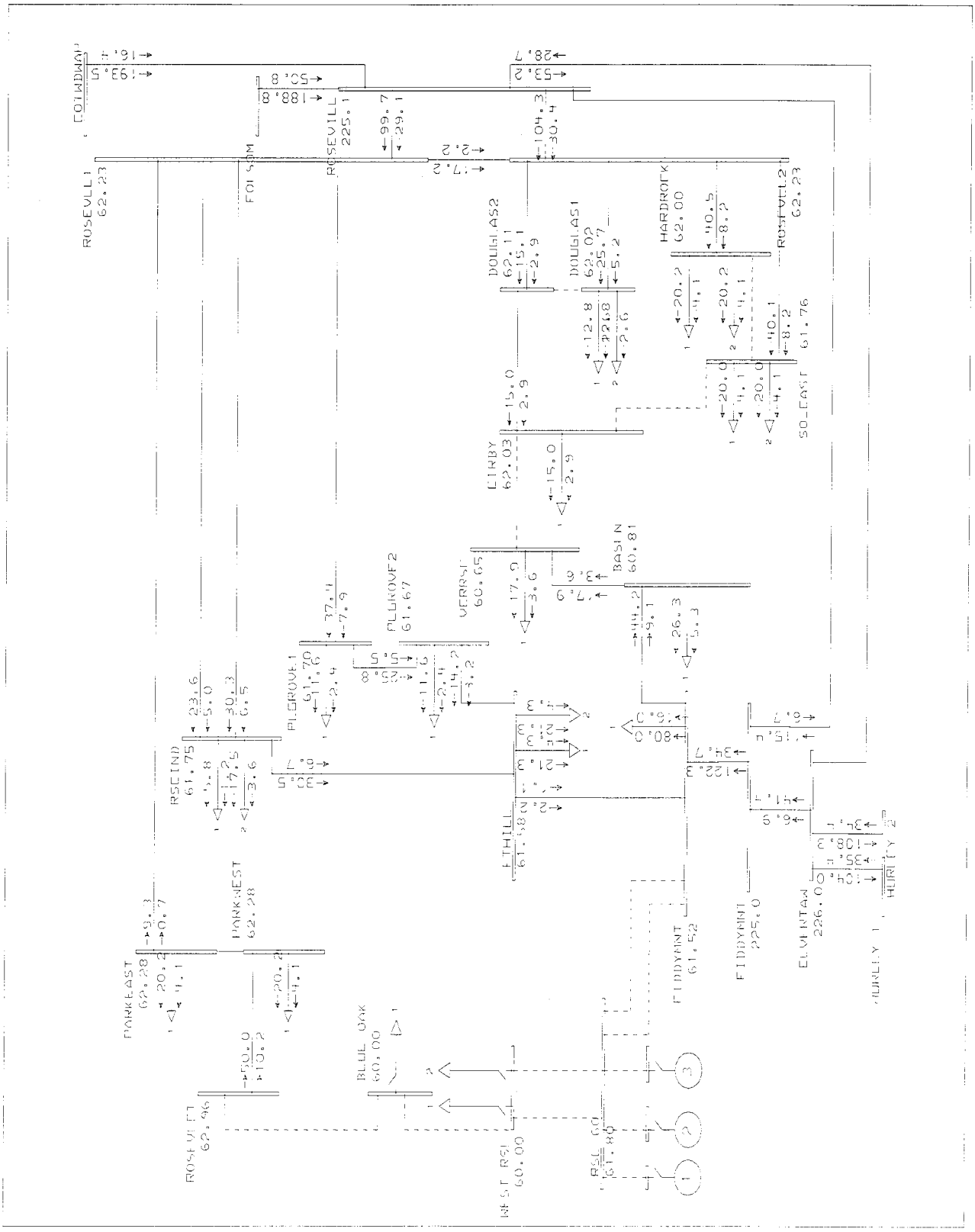


Figure 3 - 60kV Alternative I (2006 load) - 150 mw added to Roseville's 60kV system. two connections from Fiddyment 60kV to Roseville PP, two connections from Roseville PP to West Roseville, connection from West Roseville to Blue Oaks.

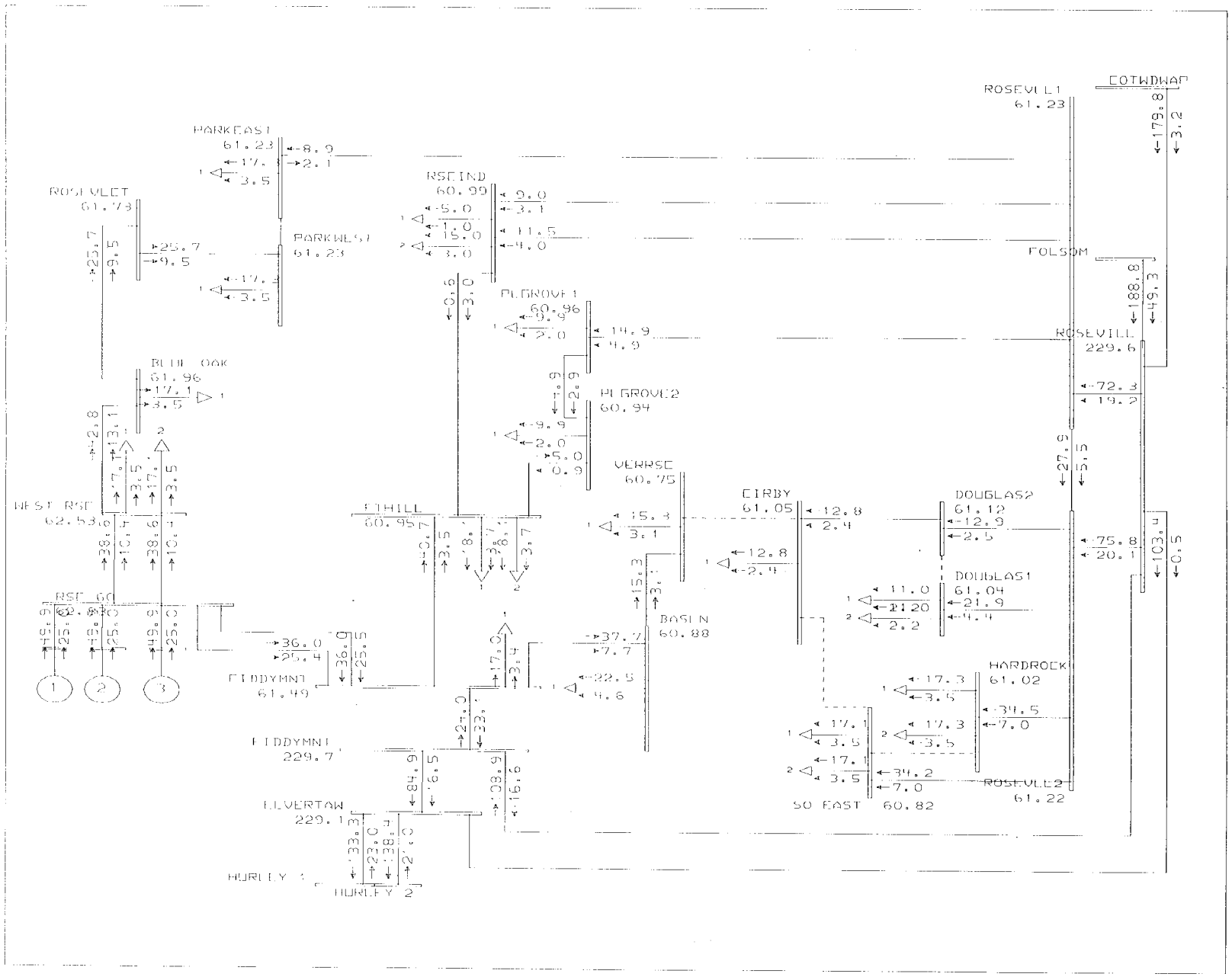


Figure 4 - 60kV Alternative I (2010 load) - 150 mw added to Roseville's 60kV system. two connections from Fiddyment 60kV to Roseville PP, two connections from Roseville PP to West Roseville, connection from West Roseville to Blue Oaks.

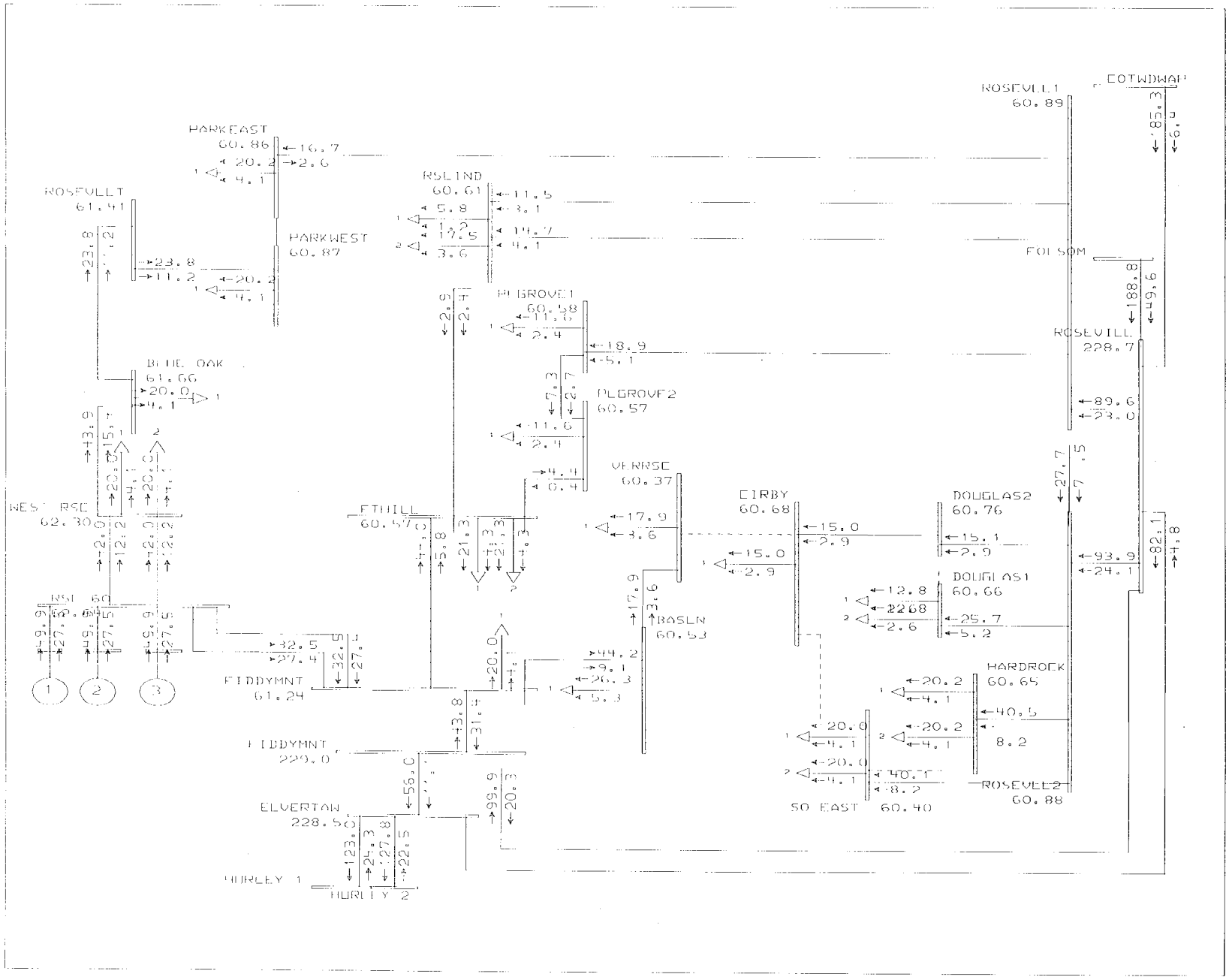


Figure 5- 60kV - Alternative II: Alternative I plus H.P. West Sub connected to West Roseville, Foothills, and Fiddyment.

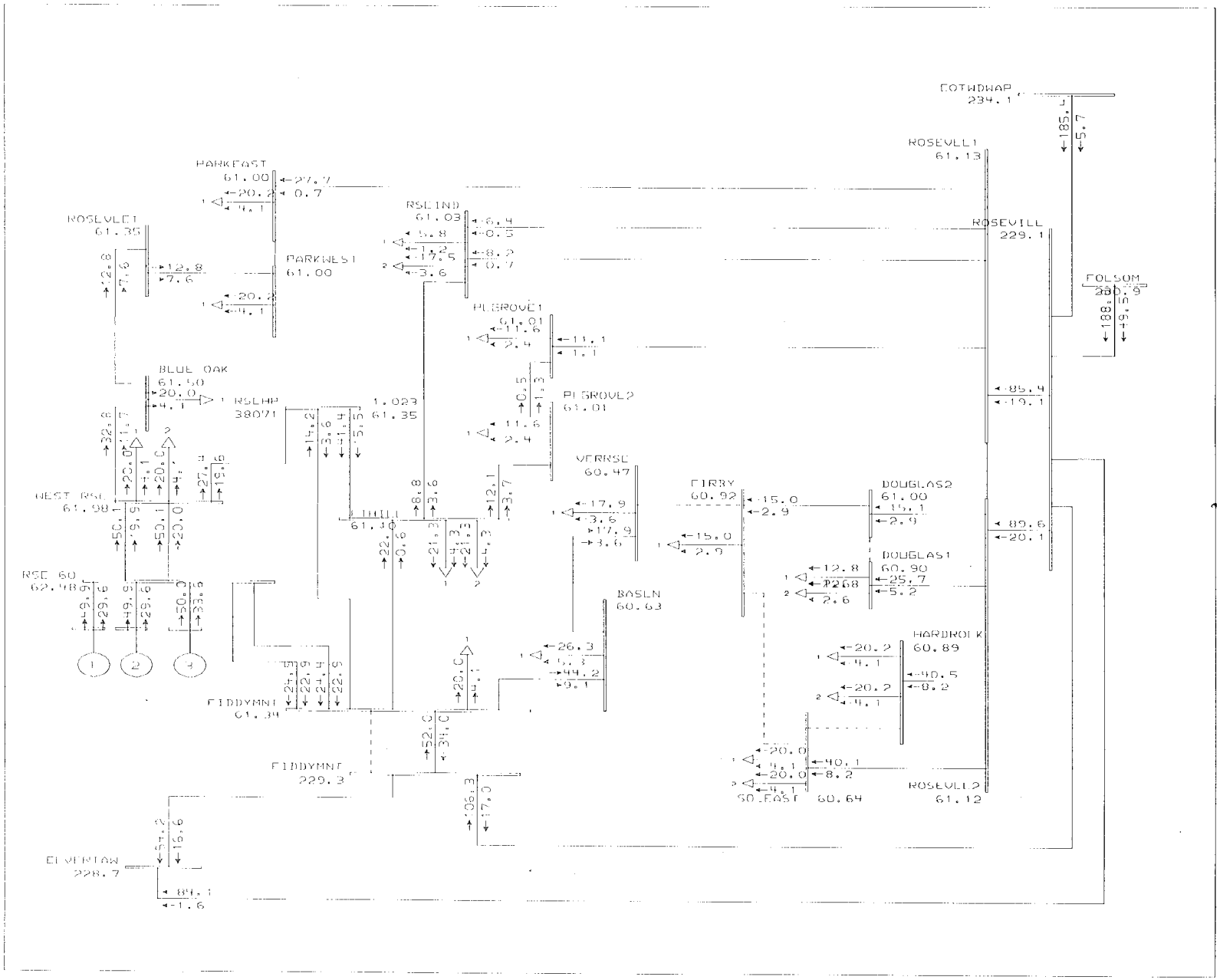


Figure 6 - 60kV Alternative III: Alternative I, II, and second transformer at Fiddyment.

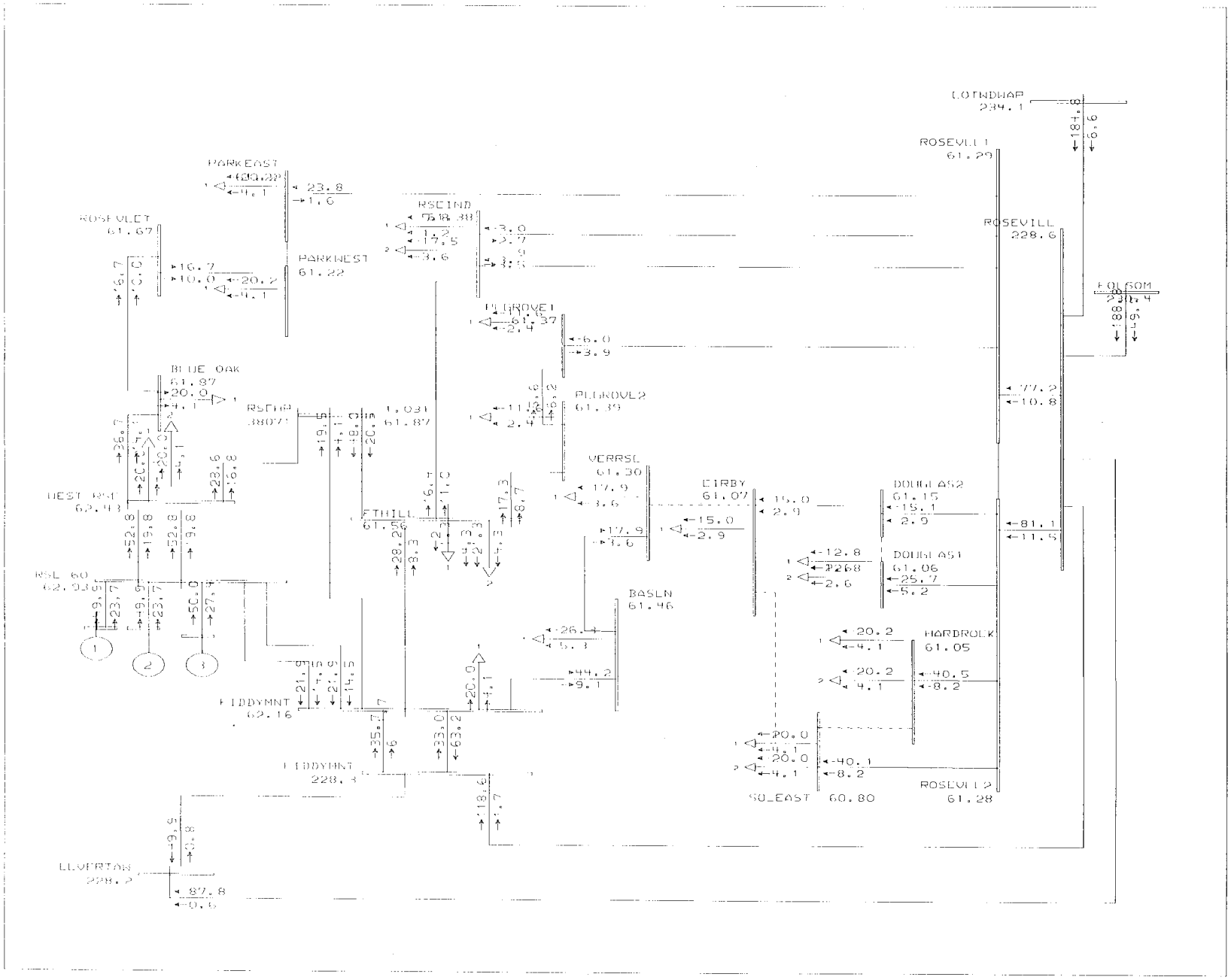


Figure 7 - 230kV Alternative Ia - 150 mw added to 230kV system, two connections from Fiddyment 60kV to West Roseville, and one connection from West Roseville to Blue Oaks.

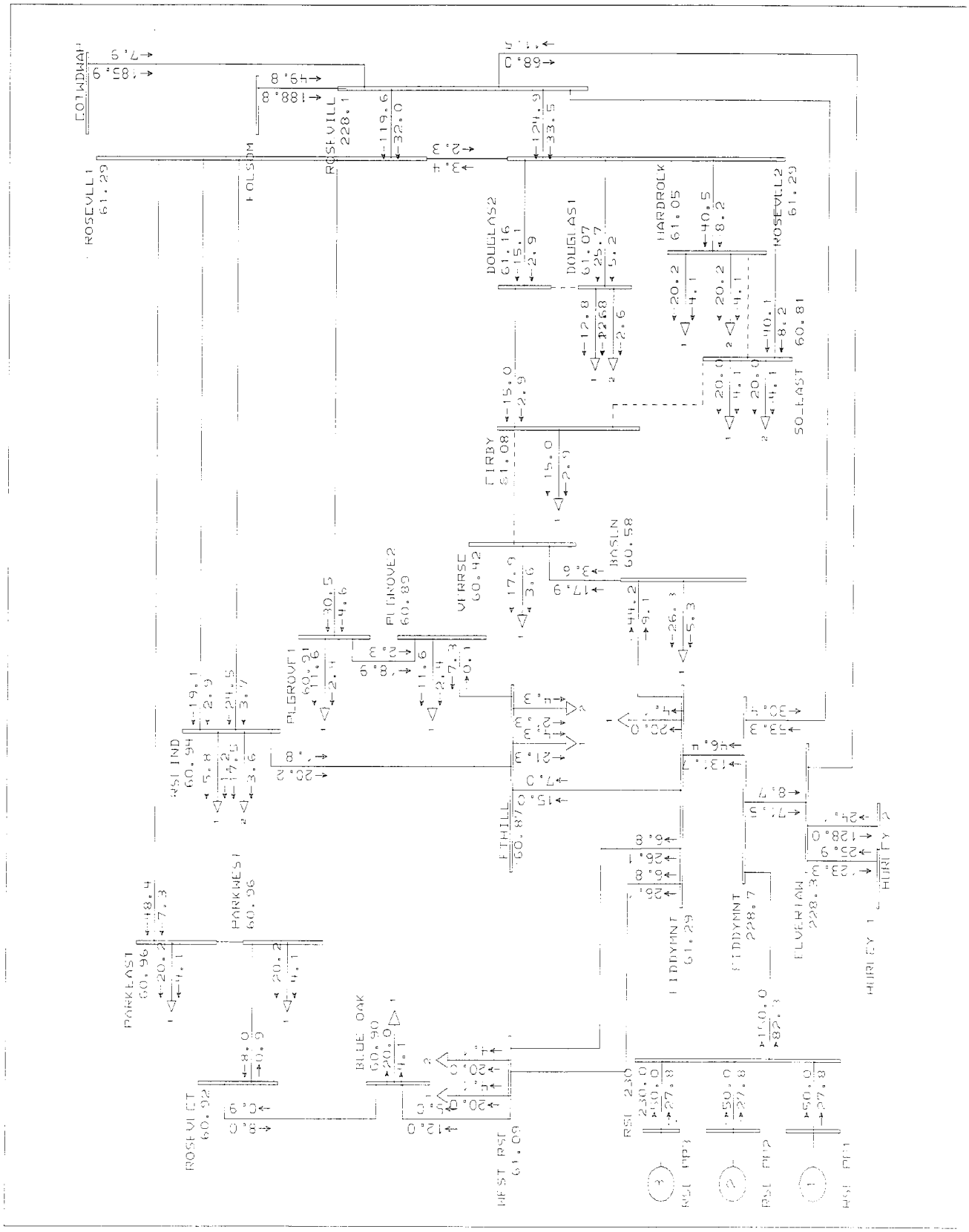


Figure 8 - 230kV Alternative 1Ia: Alternative I plus H.P. West Sub connected to West Roseville, Foothills, and Fiddyment.

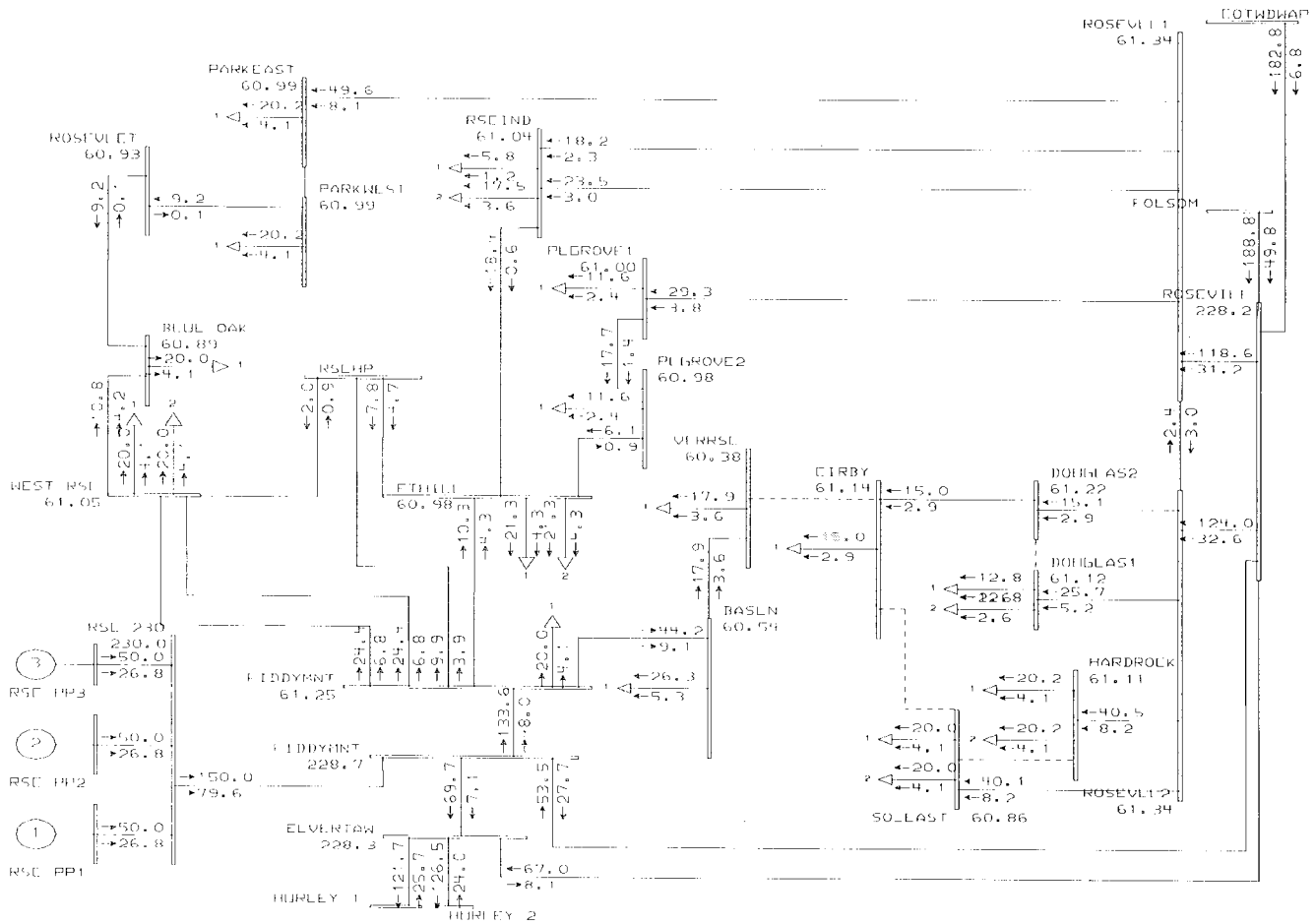


Figure 9 - 230kV Alternative IIIa: Alternative I ,II, and second transformer at Fiddyment.

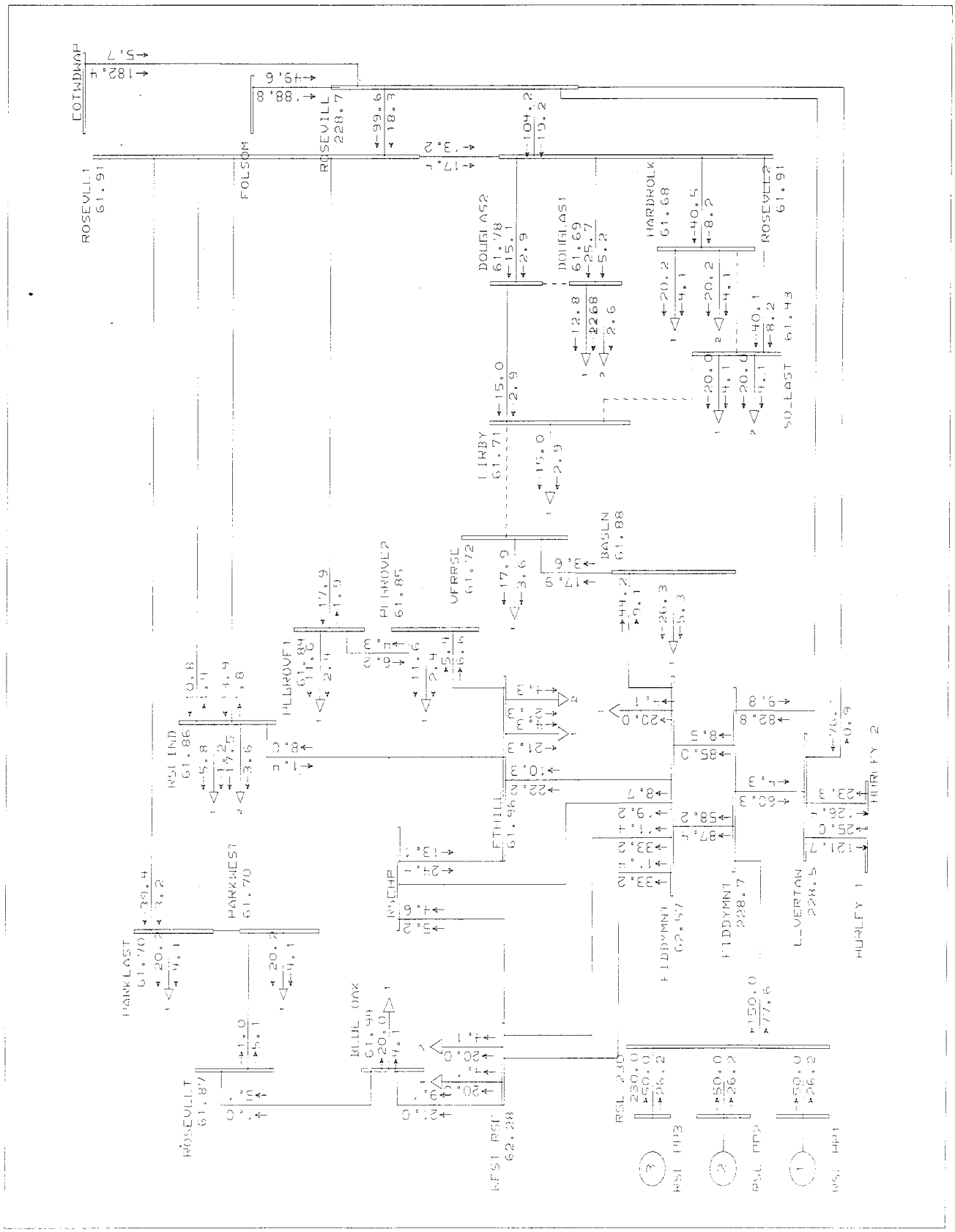


Figure 10 - Single worse contingency, Elverta Breaker Out

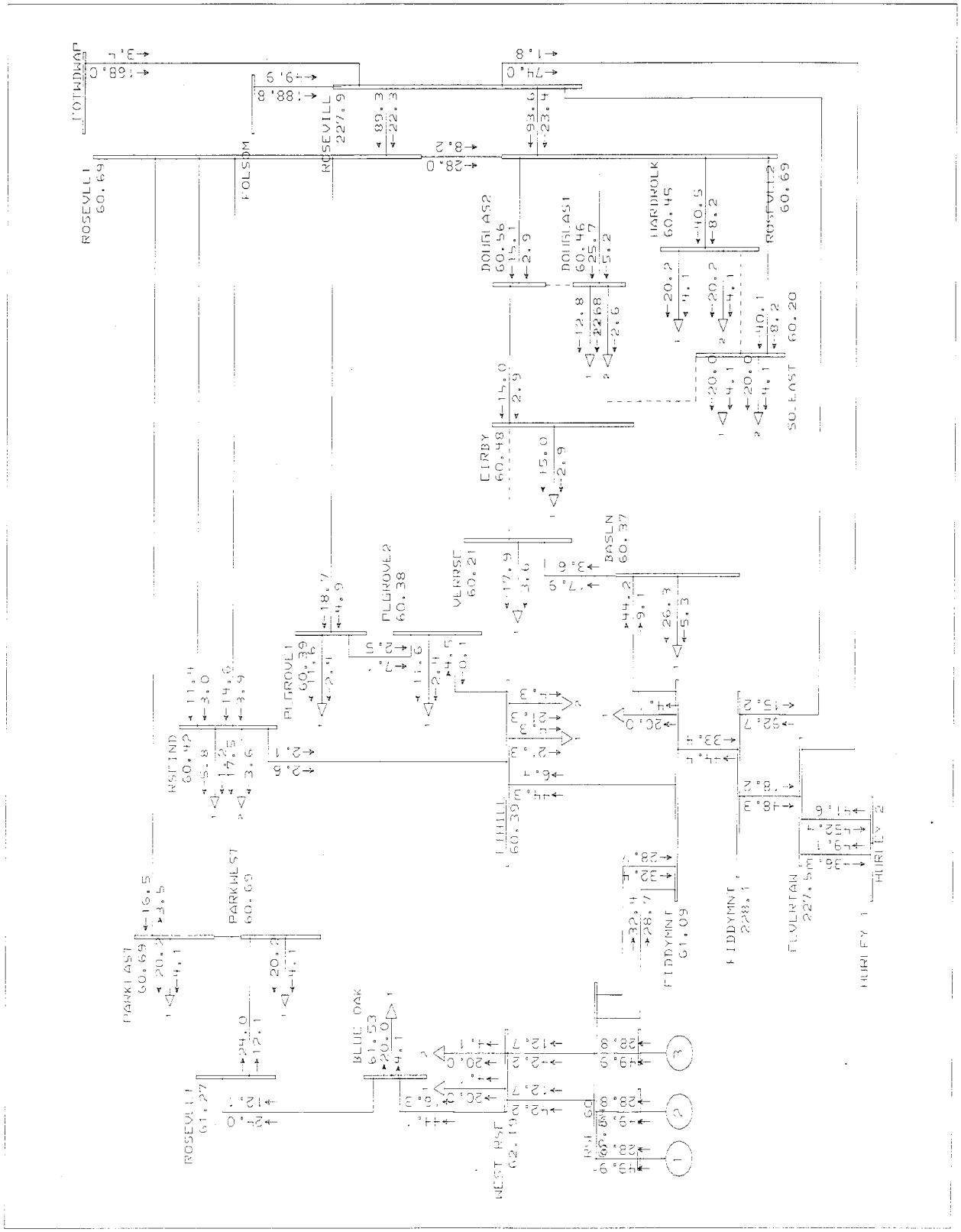
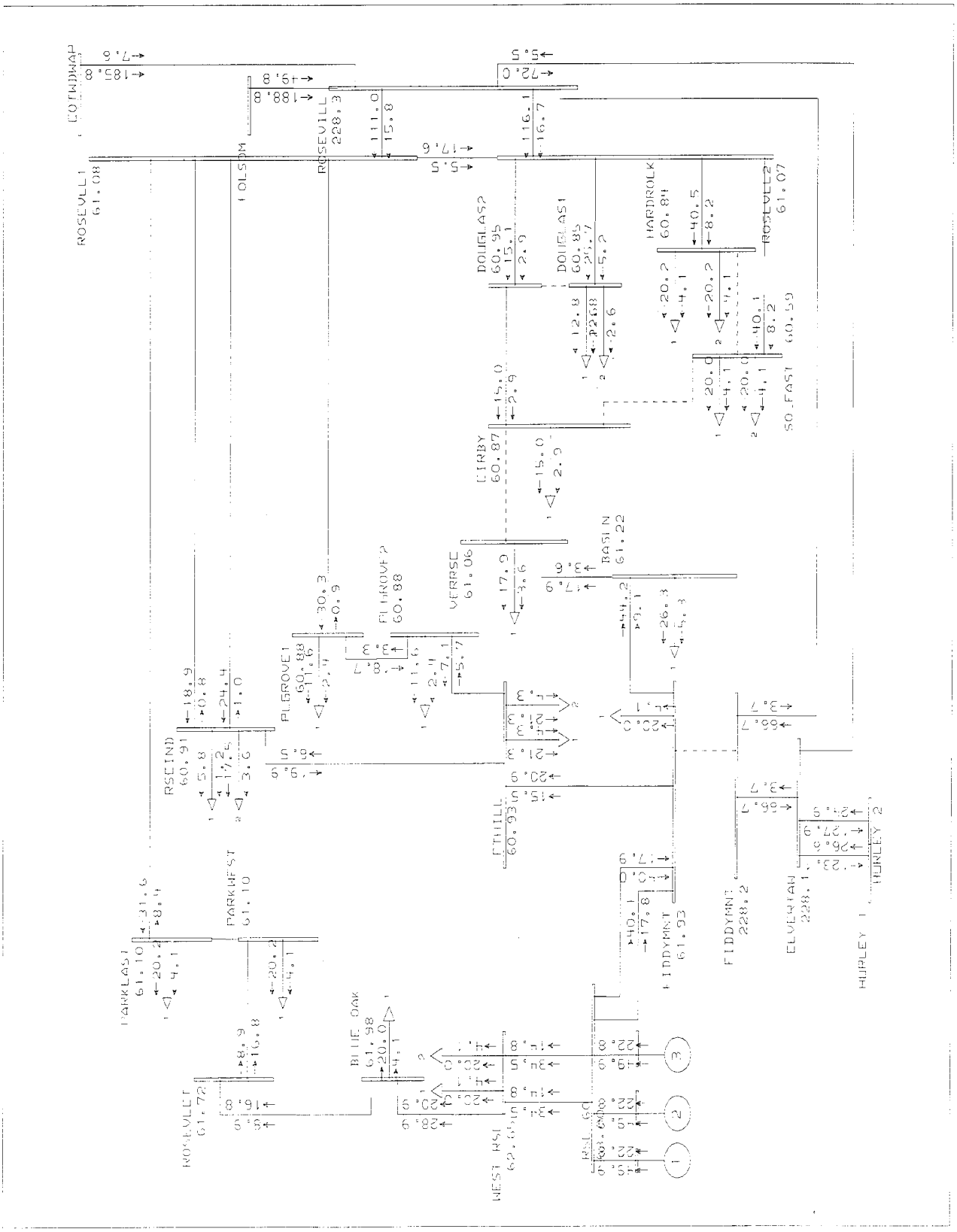


Figure 11 - Fiddyment Transformer Out



Roseville Energy Park

Appendix 7-A
Water Resources Will-Serve Letter

October 2003

Roseville Energy Park
Application for Certification

CITY OF
ROSEVILLE
TRADITION • PRIDE • PROGRESS

Environmental Utilities
2005 Hilltop Circle
Roseville, California 95747-9704

Date: 10/01/03

Mr. Robert Hren, Project Manager
Roseville Electric
Roseville Energy Project
2090 Hilltop Circle
Roseville, CA 95747

Re: "Will-Serve" Letter for Recycled Water

Dear Mr. Hren,

We understand that Roseville Electric will be constructing the Roseville Energy Project (REP), a 160 MW nominally rated combined cycle power plant to be located immediately adjacent to the newly constructed Pleasant Grove Wastewater Treatment Plant (PGWWTP). The estimated date for commercial operation of REP is approximately May 1, 2006. The PGWWTP has a design peak capacity of 12.0 mgd, and by the year 2005 is expected to produce 6.2 mgd of recycled water. Thereafter, the expected recycled water production will increase as the service area of the plant experiences growth. We also understand that the REP requests delivery of recycled water from the PGWWTP to serve its power plant cooling needs.

Please accept this "Will-Serve" letter for recycled water as the City of Roseville's commitment to provide the REP recycled water at a 24 hour average rate of up to 1008 gpm (1.45 mgd). Recycled water deliveries have been incorporated into our plans and will not result in a significant impact to the City's recycled water program. It should also be noted that we do not anticipate taking any return flow from the REP, except domestic wastewater.

If you have any questions, please give me a call.

Respectfully,

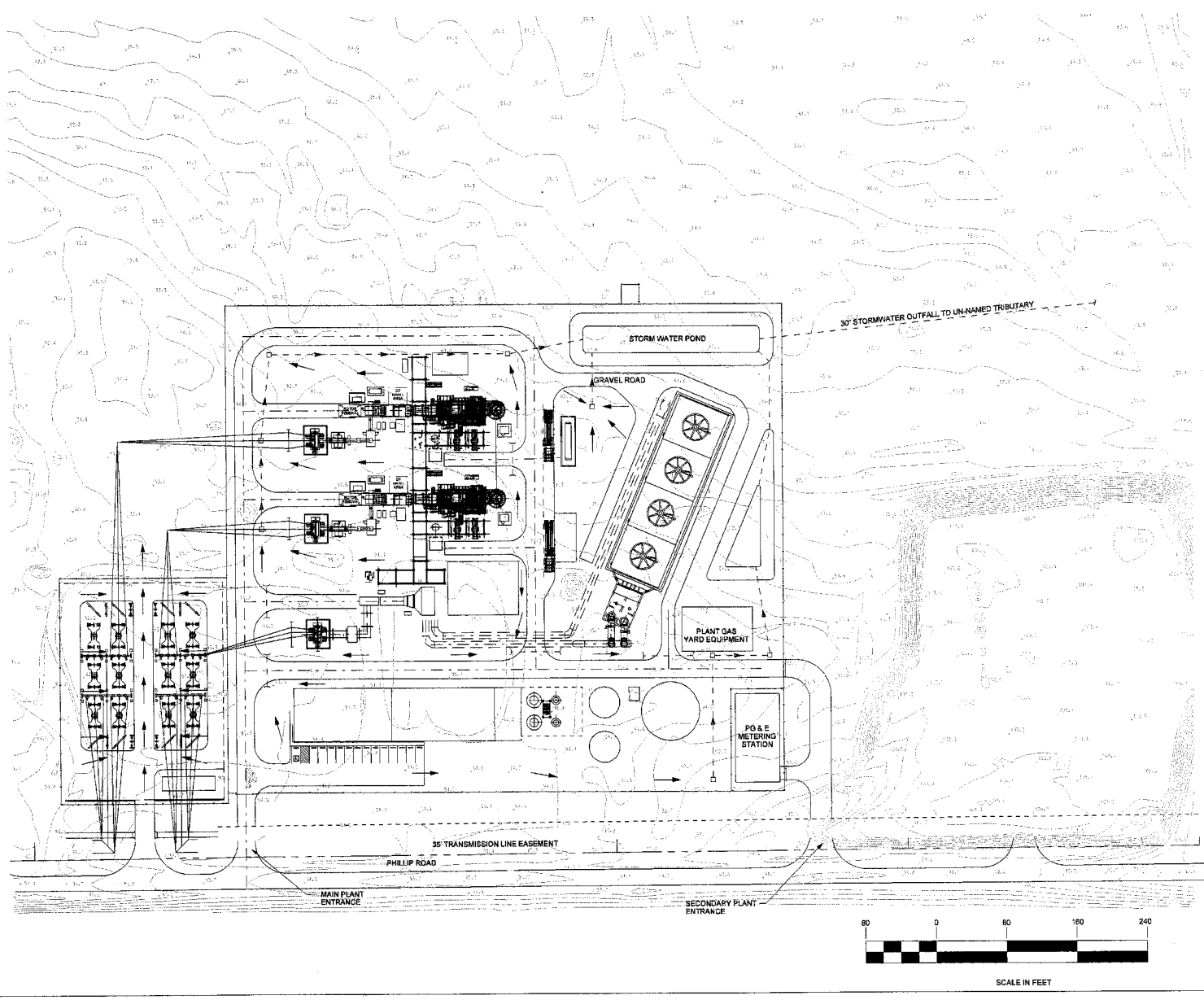
Derrick Whitehead, PE
Environmental Utilities Director

Roseville Energy Park

Appendix 7-B
Site Layout Drainage Plan and Erosion Control & BMP Plan

October 2003

Roseville Energy Park
Application for Certification



NOTES

1. HIGH POINT OF POWER BLOCK CONCRETE FOUNDATION IS ELEVATION 94'-6".
2. HIGH POINT OF CONCRETE PAVING IS ELEVATION 94'-0".
3. ADMIN/WAREHOUSE FINISH FLOOR ELEVATION IS 95'-0".

LEGEND

- ROAD CULVERT
- UNDERGROUND DRAIN PIPE
- CATCH BASIN
- SURFACE DRAINAGE

REV	DATE	DESCRIPTION	DRAWN	CHECKED	ENGINEER	PROJECT ENGINEER	PROJECT MANAGER

DRAWN BY	DATE
CHECKED BY	DATE
ENGINEER	DATE
PROJECT ENGINEERING MANAGER	DATE
PROJECT MANAGER	DATE

Figure 7-B1

CALPINE Power Services

PROJECT NO.

ROSEVILLE ELECTRIC
ROSEVILLE ENERGY PARK
SITE LAYOUT
DRAINAGE PLAN

SCALE 1" = 50'-0"

DWG. NO. RE-S-1005

REVISION B

17-OCT-2003

24x36

Roseville Energy Park

Appendix 7-C
Storm Water Pond Sizing Criteria
Preliminary Drainage Calculations

October 2003

Roseville Energy Park
Application for Certification

Storm Water Pond Sizing Criteria

The City of Roseville, and Placer County have a detailed program for Stormwater management. This is outlined in the Placer County Flood Control and Water Conservation District "Stormwater Management Manual". The program does not specifically address the need for "Detention" of storm events, and therefore the City of Roseville was consulted directly for detention requirements.

Per Mr. Garth Gaylord, the City of Roseville Sr. Public Works Engineer for Stormwater Management, due to the location of the plant in relation to the regional hydrology, detention of storm events is not necessary or desired. Mr. Gaylord explained that, although storm detention was not required, the City of Roseville is going through the process of adopting all or a portion of the requirements of the California Stormwater BMP Requirements, and therefore the storm pond could be constructed as a BMP facility.

The pond is sized based on the California Stormwater BMP Handbook, Volume-Based BMP Design. The intent of the pond is to have an outlet elevation at a minimum of 2'-0" above the bottom of the pond. For the purpose of volumetric treatment, the entire volume of the pond will not be calculated, only the volume below the elevation of the outlet.

The basis of the volumetric approach is to determine the 80th percentile average annual runoff volume and use this to determine the treatment volume of the pond. This value has not been determined at the project site location; however, Mr. Gaylord stated that this value is about 0.25 inches for Roseville. Using this figure, and a runoff coefficient of 1.0 (somewhat conservative) yields the following:

$$Q = C*I*A$$

Where Q = Volume
C = runoff coefficient (per BMP handbook, many California sites have composite coefficients of 0.50 – 0.95, use 1.0)
I = Rain intensity = 0.25 inches = .021 feet
A = Area = 358,400 sf

$$Q = (1.0)(0.021 \text{ feet})(358{,}400 \text{ sf})$$
$$= 7{,}530 \text{ cf}$$

Therefore, at 2 feet in depth, the bottom of the pond will need to be a minimum of 3,765 sf. The ponds depicted in the current arrangement are currently shown at approximately 6,000 sf, indicating an adequate area has been allotted for the ponds.

Roseville Energy Park
Preliminary Drainage Calculations
September, 2003

Total Acreage:

Site total 640' x 560' =	258,400 sf
Less Transformers (3x30x25) =	(2,250)
Less Ammonia Storage (20x50) =	(1,000)
Less Cooling Tower (65x210) =	(13,650)
Less Pump Intake (50x35) =	(1,750)
Less Cooling Tower Chem (22x50) =	(1,250)
TOTAL	338,590 = 7.8 acres

Using this total acreage before and after will yield a slightly greater delta in the pre and post flow analysis. This is because the lower acreage before will yield a lower runoff, and the lower acreage is acceptable post construction because those areas deducted above will not contribute any runoff.

The analysis is a preliminary estimate of runoff volumes before and after construction. The method used is outlined in Section 10, "Drainage" of the City of Roseville's "Department of Public Works — IMPROVEMENT STANDARDS". The design runoff methodology within this document is based on the Placer County Flood Control and Water Conservation District's "Stormwater Management Manual".

PRE-DEVELOPMENT:

$Qp = qA$ (Equation 10-1)

Where:

Qp = peak discharge (cfs)
q = unit peak discharge (cfs/acre)
A = Acres

$=qA-ApFi$

$A = 7.8$ acres
$Ap = 7.8$ acres

Where Ap = Previous Area

Unit Peak Discharge:

$q = cotr^{C_1}$

Where q = Peak Unit Discharge (CFS/Acre)

tr = tro + trc = Response Time (Minutes)

Co_1 C_1 = Coefficient from Table 10-3

Infiltration Factor:

$F_i = 1.7\ I$

I = Infiltration Rate (Inches/Hour, Table 10-4)

= 0.07 For soils "0" Fair Open Space

= 0.119

$q = Cotr^{C_1}$

10 Year

$$tro = \frac{0.355 \quad (nL)^{0.6}}{S}$$

Where: tro = Overload Response Time

n = Mannings Roughness Coef. (Table 10-2)

L = Flow Length (feet)

S = Slope of Surface (ft/ft)

For Our Case: n = 0.40 (Poor grass on moderately rough surface)

L = 600' (Across site)

S = 9'/600' = 0.015

10 Year Continued

$$tro = \frac{.355\,(nL)^{.6}}{S^{.3}}$$

$$= \frac{(.355)\,[(.4)(600)]^{0.6}}{(.015)^{.3}}$$

$$= \frac{(.355)(26.8)}{.284}$$

$$= 33.5 \text{ Minutes}$$

$$tr = tro + trc = 33.5 + 0 = 33.5$$

$trc = 0$, No current flow

With $tr = 33.5$ $\quad Co = 17.8$, $C_1 = -0.87$ $>$ Table 10.3

$$\therefore \quad q = Cotr^{C_1}$$

$$= (17.8)(33.5)^{-.87}$$

$$= (17.8)(0.047)$$

$$= .84 \text{ cfs}$$

$$Q_{10} = (0.84)(7.8) - (7.8)(.119)$$

$$(q)(A) - (A_p)(F_i)$$

$$\underline{\underline{= 5.63 \text{ cfs}}}$$

100 YEAR (PRE)

tro = 33.5 Minutes

However — "These times should be reduced to 0.70 in the 100 year event".

= (33.5)(.7) = 23.5 Minutes

This is still >than 20 minutes, so for 100 YR

Co = 28.48 > Table 10-3

C_1 = -0.87

$q = Cotr^{C_1}$

$= (28.48)(23.5)^{-.87}$

= (28.48)(.064)

= 1.83

Q_{100} = (1.83)(7.8) – (7.8)(.119)

= 13.35 cfs

Post Construction

The site has a high point ridge that divides the site into 2 flow paths. These flow paths drain to the 2 storm water ponds. The slope of each drainage area is 0.01 = 1%.

Using the same methodology as before

S= 1%

N = 0.15 (Gravel/grass swales ⇒ Use low n value)

Area 1: l = 580' , A = 3.58 acres

Area 2: l = 720' , A = 4.22 acres

10 Year

Area 1) $tro = \frac{(.355)[(.15)(580)]^{.6}}{(0.01)^{.3}}$

$= \frac{5.17}{.251}$

$= 20.6$

$\therefore$ $Co = 17.8$, $C_1 = -.87$ $>$ Table 10-3

$\Rightarrow$ $q = Cotr^{C_1}$

$= (17.8)(20.6)^{-.87}$

$= 1.28$

$Fi = (1.7)(.03)$

$= 0.051$

0.03 = Gravel in soil Group "D"

$Q_{10} = q\ A\text{-}ApFi$

$= (1.28)(3.58) - (3.58)(.7)(.051)$

$= 4.45$ cfs

Area 2) $tro = \frac{(.3555)[(.15)(720)]^{.6}}{.251}$

$= 23.5$

$\therefore$ $Co = 17.8$, $C_1 = -.87$ $>$ Table 10-3

$q = (17.8)(23.5)^{-.87}$

$Q_{10} = (1.14)(4.22) - (4.22)(.7)(.051)$

$= 4.66$ cfs

Q_{10} Total = Q_{10} area 1 = Q_{10} area 2

$= 4.45 = 4.66$

$= 9.11$ cfs

For 100 Year

tro for Area 1 = (20.6)(.7) = 14.42

tro for Area 2 = (23.5)(.7) = 16.45

$\therefore$ Co = 9.28 $>$ Table 10-3

C_1 = -.50

$q_1 = (9.28)(14.42)^{-.5}$

$= 2.44$

$Q_1 = (2.44)(3.58) - (3.58)(.7)(.051)$

$= 8.61$ cfs

$q_2 = (9.28)(16.45^{)-0.5}$

$= 2.29$

$Q_2 = (2.29)(4.22) - (4.22)(.7)(.051)$

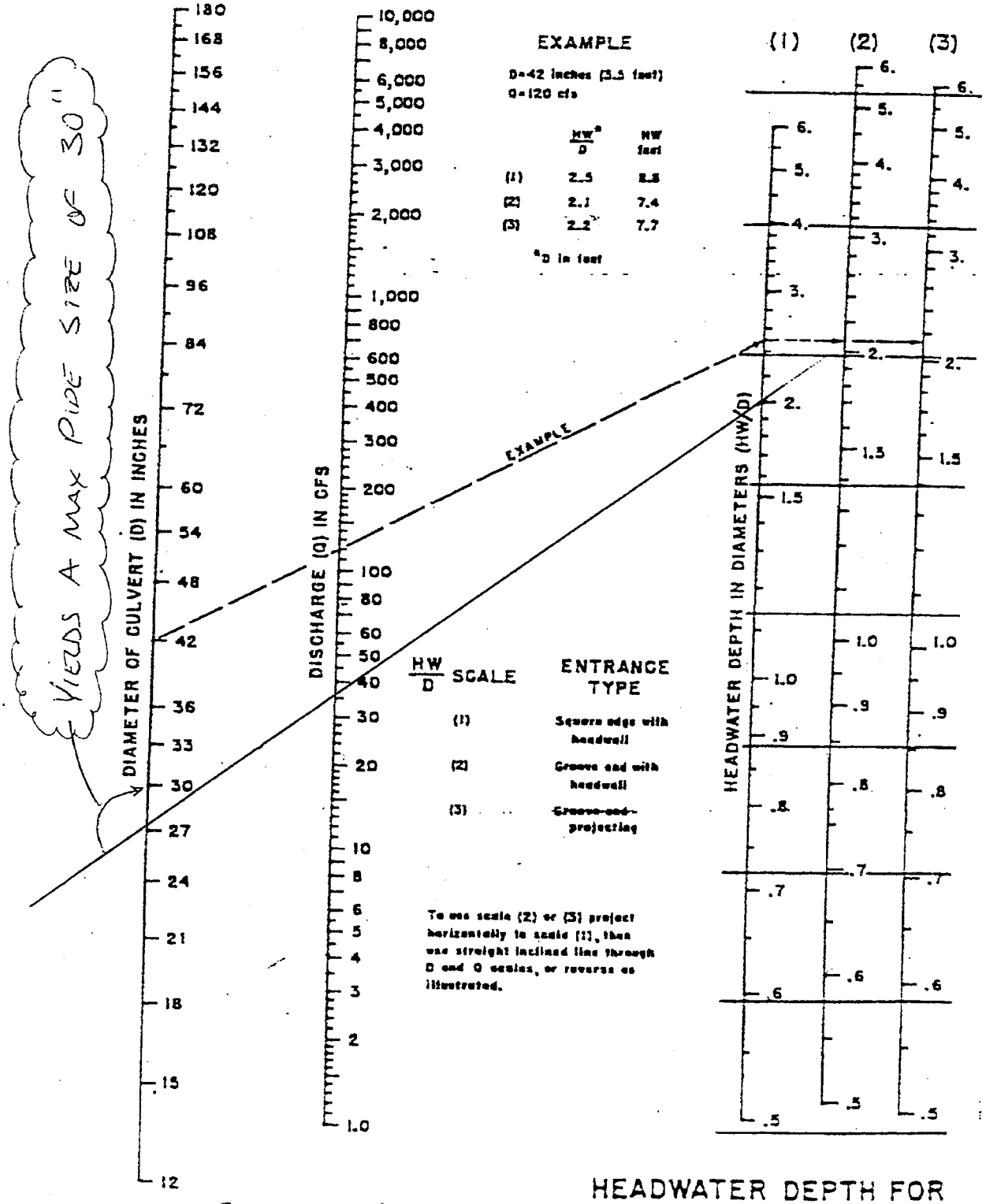
$= 9.51$ cfs

Total = 18.12

THIS PRELIMINARY ANALYSIS YIELDS THE FOLLOWING:

	10 Year	**100 Year**
PRE	5.63	13.35
POST	9.11	18.12

(All Values in cfs)



FHWA

TAKE MAX FLOW @ 18CFS AND ADD 100% FOR F.S. & ADDED FLOWS POSSIBLE FOR ROSEVILLE LAND BETWEEN THE PLANT SITE & OUTFALL USE 2' OF HEADWATER DEPTH

HEADWATER DEPTH FOR CONCRETE PIPE CULVERTS WITH INLET CONTROL

Roseville Energy Park

Appendix 8.1-A
Combustion Turbine Emissions and Performance Data for General Electric LM6000 PC SPRINT and Alstom GTX100

October 2003

Roseville Energy Park
Application for Certification

Roseville Energy Park
Expected HRSG Stack Emissions - General Electric LM6000 PC SPRINT

		Operating Conditions								
		Hot			Average			Cold		
Case		Peak	Base	Min	Peak	Base	Min	Peak	Base	Min
Ambient Dry Bulb Temp.	deg. F	99.0	99.0	99.0	62.0	62.0	62.0	34.0	34.0	34.0
Ambient Wet Bulb Temp.	deg. F	70.0	70.0	70.0	53.0	53.0	53.0	32.0	32.0	32.0
Combustion Turbines Operating		2	2	1	2	2	1	2	2	1
Combustion Turbine Load	%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Duct Firing? (Yes/No)		Yes	No	No	Yes	No	No	Yes	No	No
Evaporative Cooling? (Yes/No)		Yes	Yes	No	Yes	Yes	No	No	No	No
Evaporative Cooling Effectiveness	%	85%	85%	0%	85%	85%	0%	0%	0%	0%
Water Injection (NO_x control &/or SPRINT)? (Yes/No)		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fuel Input (each turbine)										
GT Fuel (LHV)	MMBtu/hr	376.1	376.1	187.8	403.2	403.2	241.8	426.4	426.4	257.9
HRSG Fuel (LHV)	MMBtu/hr	230.1	0.0	0.0	195.5	0.0	0.0	195.5	0.0	0.0
Total Fuel (LHV)	MMBtu/hr	606.2	376.1	187.8	598.7	403.2	241.8	621.9	426.4	257.9
HHV/LHV =	1.1082									
GT Fuel (HHV)	MMBtu/hr	416.7	416.7	208.1	446.8	446.8	268.0	472.5	472.5	285.8
HRSG Fuel (HHV)	MMBtu/hr	255.0	0.0	0.0	216.6	0.0	0.0	216.6	0.0	0.0
Total Fuel (HHV)	MMBtu/hr	671.7	416.7	208.1	663.4	446.8	268.0	689.2	472.5	285.8
GT Fuel	lb/hr	18,282	18,282	9,130	19,600	19,600	11,756	20,730	20,730	12,538
HRSG Fuel	lb/hr	11,187	0	0	9,505	0	0	9,505	0	0
Total Fuel	lb/hr	29,469	18,282	9,130	29,105	19,600	11,756	30,235	20,730	12,538
Inlet Air (each turbine)										
Inlet Air Flow	lb/hr	951,012	951,012	642,192	999,868	999,868	780,850	1,048,513	1,048,513	847,302
Dry Bulb Temperature	deg. F	74.4	74.4	99.0	55.0	55.0	62.0	34.0	34.0	34.0
Moisture Content	lb H_2O/lb air	0.0149	0.0149	0.0092	0.0081	0.0081	0.0065	0.0034	0.0034	0.0034
N_2	mole %	76.22%	76.22%	76.91%	77.03%	77.03%	77.23%	77.62%	77.62%	77.62%
O_2	mole %	20.50%	20.50%	20.68%	20.72%	20.72%	20.77%	20.88%	20.88%	20.88%
CO_2	mole %	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
H_2O	mole %	2.34%	2.34%	1.45%	1.29%	1.29%	1.04%	0.54%	0.54%	0.54%
Ar	mole %	0.92%	0.92%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Molecular Weight		28.71	28.71	28.81	28.83	28.83	28.85	28.91	28.91	28.91
Total Water Injection (each turbine)										
Water Injection Flow	lb/hr	23,392	23,392	8,508	24,110	24,110	9,621	24,281	24,281	10,442
Combustion Turbine Exhaust (each turbine)										
Total Exhaust Flow	lb/hr	992,686	992,686	659,830	1,043,578	1,043,578	802,227	1,093,524	1,093,524	870,282
N_2	mole %	71.11%	71.11%	73.57%	71.86%	71.86%	73.87%	72.48%	72.48%	74.28%
O_2	mole %	12.99%	12.99%	15.12%	13.05%	13.05%	14.92%	13.14%	13.14%	15.10%
CO_2	mole %	3.16%	3.16%	2.41%	3.23%	3.23%	2.55%	3.27%	3.27%	2.52%
H_2O	mole %	11.88%	11.88%	8.02%	11.00%	11.00%	7.77%	10.24%	10.24%	7.21%
Ar	mole %	0.86%	0.86%	0.89%	0.87%	0.87%	0.89%	0.87%	0.87%	0.89%

Roseville Energy Park

Expected HRSG Stack Emissions - General Electric LM6000 PC SPRINT

		Operating Conditions								
		Hot			Average			Cold		
Case		Peak	Base	Min	Peak	Base	Min	Peak	Base	Min
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Molecular Weight		27.95	27.95	28.31	28.05	28.05	28.35	28.14	28.14	28.40
Combustion Turbine Emissions (each turbine) - Expected										
NO_x, @ 15% O_2	ppmvd	25	25	25	25	25	25	25	25	25
CO, @15% O_2	ppmvd	14	14	10	25	25	20	39	39	37
VOC, @15% O_2	ppmvd	2	2	2	3	3	2	4	4	4
NO_x, as NO_2	lb/hr	37.6	37.6	18.7	40.3	40.3	24.0	42.6	42.6	25.6
CO	lb/hr	12.8	12.8	4.5	24.5	24.5	11.7	40.5	40.5	23.1
VOC, as CH_4	lb/hr	1.1	1.0	0.5	1.7	1.7	0.7	2.4	2.4	1.4
PM_{10}	lb/hr	2.8	2.8	1.4	3.0	3.0	1.8	3.2	3.2	1.9
SO_2	lb/hr	0.6	0.6	0.3	0.6	0.6	0.4	0.7	0.7	0.4
Duct Burner Emissions (each HRSG)										
NO_x, as NO_2	lb/hr	20.4	0.0	0.0	17.3	0.0	0.0	17.3	0.0	0.0
CO	lb/hr	51.0	0.0	0.0	43.3	0.0	0.0	43.3	0.0	0.0
VOC, as CH_4	lb/hr	12.7	0.0	0.0	10.8	0.0	0.0	10.8	0.0	0.0
PM_{10}	lb/hr	3.8	0.0	0.0	3.2	0.0	0.0	3.2	0.0	0.0
SO_2	lb/hr	0.4	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0
Total Emissions Upstream of Catalyst (each HRSG)										
NO_x, as NO_2	lb/hr	58.0	37.6	18.7	57.6	40.3	24.0	59.9	42.6	25.6
CO	lb/hr	63.8	12.8	4.5	67.9	24.5	11.7	83.8	40.5	23.1
VOC, as CH_4	lb/hr	13.9	1.0	0.5	12.5	1.7	0.7	13.2	2.4	1.4
PM_{10}	lb/hr	6.6	2.8	1.4	6.2	3.0	1.8	6.4	3.2	1.9
SO_2	lb/hr	0.9	0.6	0.3	0.9	0.6	0.4	1.0	0.7	0.4
CO Catalyst Performance (each HRSG)										
Required CO Reduction	lb/hr	57.9	9.1	2.7	62.0	20.6	9.4	77.7	36.3	20.6
Required CO Reduction (mass basis)	%	91%	71%	60%	91%	84%	80%	93%	90%	89%
Required VOC Reduction	lb/hr	12.2	0.0	0.0	10.8	0.6	0.0	11.5	1.2	0.7
Required VOC Reduction (mass basis)	%	88%	0%	0%	87%	33%	0%	87%	50%	50%
NO_x Catalyst Performance (each HRSG, Annual Average)										
Required NO_x Reduction, as NO_2	lb/hr	53.1	34.6	17.2	52.8	37.1	22.1	54.9	39.2	23.6
Required NO_x Reduction (mass basis)	%	92%	92%	92%	92%	92%	92%	92%	92%	92%
NH_3 Slip	lb/hr	9.0	5.6	2.8	8.9	6.0	3.6	9.2	6.3	3.8
NH_3 Reacted	lb/hr	20.6	13.4	6.7	20.5	14.4	8.6	21.4	15.2	9.2
Total NH_3 Added	lb/hr	29.7	19.0	9.4	29.4	20.4	12.2	30.6	21.5	13.0
HRSG Stack Exhaust Analysis (each HRSG)										
Total	lb/hr	1,003,956	992,686	659,830	1,053,153	1,043,578	802,227	1,103,099	1,093,524	870,282

Roseville Energy Park
Expected HRSG Stack Emissions - General Electric LM6000 PC SPRINT

		Operating Conditions								
		Hot			Average			Cold		
Case		Peak	Base	Min	Peak	Base	Min	Peak	Base	Min
N_2	mole%	69.8%	71.1%	73.6%	70.8%	71.9%	73.9%	71.4%	72.5%	74.3%
O_2	mole%	9.1%	13.0%	15.1%	9.9%	13.0%	14.9%	10.1%	13.1%	15.1%
CO_2	mole%	5.0%	3.2%	2.4%	4.7%	3.2%	2.6%	4.7%	3.3%	2.5%
H_2O	mole%	15.3%	11.9%	8.0%	13.8%	11.0%	7.8%	12.9%	10.2%	7.2%
Ar	mole%	0.8%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Total	mole%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Molecular Weight		27.74	27.95	28.31	27.88	28.05	28.35	27.98	28.14	28.40
Stack Temperature	deg. F	160	207	184	156	204	198	156	207	212
Stack Velocity	ft/sec	48.0	50.8	32.1	49.8	52.9	39.9	52.0	55.5	44.1
HRSG Stack Emissions (each HRSG)										
NO_x, @ 15% O_2, Annual Ave.	ppmvd	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NO_x, @ 15% O_2, Maximum	ppmvd	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CO, @ 15% O_2	ppmvd	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
VOC, as CH_4 @ 15% O_2	ppmvd	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NH_3 Slip, @ 15% O_2	ppmvd	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
NO_x, as NO_2, Annual Ave.	lb/hr	4.9	3.0	1.5	4.8	3.2	1.9	5.0	3.4	2.1
NO_x, as NO_2, Maximum	lb/hr	4.9	3.0	1.5	4.8	3.2	1.9	5.0	3.4	2.1
CO	lb/hr	5.9	3.7	1.8	5.9	3.9	2.3	6.1	4.2	2.5
VOC, as CH_4	lb/hr	1.7	1.0	0.5	1.7	1.1	0.7	1.7	1.2	0.7
Total PM_{10}	lb/hr	4.5	2.8	1.4	4.4	3.0	1.8	4.6	3.2	1.9
NH_3	lb/hr	9.0	5.6	2.8	8.9	6.0	3.6	9.2	6.3	3.8
SO_2	lb/hr	0.9	0.6	0.3	0.9	0.6	0.4	1.0	0.7	0.4

Roseville Energy Park
Expected HRSG Stack Emissions - Alstom GTX100

		Operating Conditions								
		Hot			Average			Cold		
Case		Peak	Base	Min	Peak	Base	Min	Peak	Base	Min
Ambient Dry Bulb Temp.	deg. F	99.0	99.0	99.0	62.0	62.0	62.0	34.0	34.0	34.0
Ambient Wet Bulb Temp.	deg. F	70.0	70.0	70.0	53.0	53.0	53.0	32.0	32.0	32.0
Combustion Turbines Operating		2	2	1	2	2	1	2	2	1
Combustion Turbine Load	%	100%	100%	50%	100%	100%	50%	100%	100%	50%
Duct Firing? (Yes/No)		Yes	No	No	Yes	No	No	Yes	No	No
Evaporative Cooling? (Yes/No)		Yes	Yes	No	Yes	Yes	No	No	No	No
Evaporative Cooling Effectiveness	%	85%	85%	0%	85%	85%	0%	0%	0%	0%
Water Injection (NO_x control &/or SPRINT)? (Yes/No)		No	No	No	No	No	No	No	No	No
Fuel Input (each turbine)										
GT Fuel (LHV)	MMBtu/hr	394.2	394.2	230.6	412.7	412.7	271.1	433.9	433.9	288.5
HRSG Fuel (LHV)	MMBtu/hr	202.6	0.0	0.0	202.6	0.0	0.0	202.6	0.0	0.0
Total Fuel (LHV)	MMBtu/hr	596.8	394.2	230.6	615.3	412.7	271.1	636.5	433.9	288.5
HHV/LHV =	1.1082									
GT Fuel (HHV)	MMBtu/hr	436.8	436.8	255.5	457.3	457.3	300.4	480.8	480.8	319.7
HRSG Fuel (HHV)	MMBtu/hr	224.5	0.0	0.0	224.5	0.0	0.0	224.5	0.0	0.0
Total Fuel (HHV)	MMBtu/hr	661.4	436.8	255.5	681.8	457.3	300.4	705.3	480.8	319.7
GT Fuel	lb/hr	19,165	19,165	11,211	20,062	20,062	13,180	21,095	21,095	14,026
HRSG Fuel	lb/hr	9,850	0	0	9,850	0	0	9,850	0	0
Total Fuel	lb/hr	29,015	19,165	11,211	29,912	20,062	13,180	30,945	21,095	14,026
Inlet Air (each turbine)										
Inlet Air Flow	lb/hr	968,078	968,078	670,505	1,009,782	1,009,782	783,523	1,042,235	1,042,235	818,388
Dry Bulb Temperature	deg. F	74.4	74.4	99.0	55.0	55.0	62.0	34.0	34.0	34.0
Moisture Content	lb H_2O/lb air	0.0149	0.0149	0.0092	0.0081	0.0081	0.0065	0.0034	0.0034	0.0034
N_2	mole %	76.22%	76.22%	76.91%	77.03%	77.03%	77.23%	77.62%	77.62%	77.62%
O_2	mole %	20.50%	20.50%	20.68%	20.72%	20.72%	20.77%	20.88%	20.88%	20.88%
CO_2	mole %	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
H_2O	mole %	2.34%	2.34%	1.45%	1.29%	1.29%	1.04%	0.54%	0.54%	0.54%
Ar	mole %	0.92%	0.92%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%	0.93%
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Molecular Weight		28.71	28.71	28.81	28.83	28.83	28.85	28.91	28.91	28.91
Total Water Injection (each turbine)										
Water Injection Flow	lb/hr	0	0	0	0	0	0	0	0	0
Combustion Turbine Exhaust (each turbine)										
Total Exhaust Flow	lb/hr	987,243	987,243	681,716	1,029,844	1,029,844	796,703	1,063,330	1,063,330	832,414
N_2	mole %	73.74%	73.74%	74.78%	74.51%	74.51%	75.07%	75.03%	75.03%	75.41%
O_2	mole %	13.28%	13.28%	14.53%	13.44%	13.44%	14.57%	13.44%	13.44%	14.55%
CO_2	mole %	3.37%	3.37%	2.87%	3.39%	3.39%	2.90%	3.46%	3.46%	2.95%
H_2O	mole %	8.72%	8.72%	6.92%	7.76%	7.76%	6.56%	7.16%	7.16%	6.18%
Ar	mole %	0.89%	0.89%	0.90%	0.90%	0.90%	0.90%	0.90%	0.90%	0.91%

Roseville Energy Park
Expected HRSG Stack Emissions - Alstom GTX100

		Operating Conditions								
		Hot			Average			Cold		
Case		Peak	Base	Min	Peak	Base	Min	Peak	Base	Min
Total		100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Molecular Weight		28.32	28.32	28.47	28.42	28.42	28.51	28.49	28.49	28.56
Combustion Turbine Emissions (each turbine) - Expected										
NO_x, @ 15% O_2	ppmvd	15	15	15	15	15	15	15	15	15
CO, @15% O_2	ppmvd	5	5	5	5	5	5	5	5	5
VOC, @15% O_2	ppmvd	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
NO_x, as NO_2	lb/hr	23.6	23.6	13.8	24.7	24.7	16.2	26.0	26.0	17.3
CO	lb/hr	4.8	4.8	2.8	5.0	5.0	3.3	5.3	5.3	3.5
VOC, as CH_4	lb/hr	0.7	0.7	0.4	0.7	0.7	0.5	0.7	0.7	0.5
PM_{10}	lb/hr	2.9	2.9	1.7	3.1	3.1	2.0	3.2	3.2	2.1
SO_2	lb/hr	0.6	0.6	0.4	0.6	0.6	0.4	0.7	0.7	0.4
Duct Burner Emissions (each HRSG)										
NO_x, as NO_2	lb/hr	18.0	0.0	0.0	18.0	0.0	0.0	18.0	0.0	0.0
CO	lb/hr	22.5	0.0	0.0	22.5	0.0	0.0	22.5	0.0	0.0
VOC, as CH_4	lb/hr	4.5	0.0	0.0	4.5	0.0	0.0	4.5	0.0	0.0
PM_{10}	lb/hr	3.4	0.0	0.0	3.4	0.0	0.0	3.4	0.0	0.0
SO_2	lb/hr	0.3	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0
Total Emissions Upstream of Catalyst (each HRSG)										
NO_x, as NO_2	lb/hr	41.6	23.6	13.8	42.7	24.7	16.2	44.0	26.0	17.3
CO	lb/hr	27.2	4.8	2.8	27.5	5.0	3.3	27.7	5.3	3.5
VOC, as CH_4	lb/hr	5.2	0.7	0.4	5.2	0.7	0.5	5.2	0.7	0.5
PM_{10}	lb/hr	6.3	2.9	1.7	6.4	3.1	2.0	6.6	3.2	2.1
SO_2	lb/hr	0.9	0.6	0.4	0.9	0.6	0.4	1.0	0.7	0.4
CO Catalyst Performance (each HRSG)										
Required CO Reduction	lb/hr	21.4	1.0	0.6	21.5	1.0	0.7	21.5	1.1	0.7
Required CO Reduction (mass basis)	%	79%	20%	20%	78%	20%	20%	78%	20%	20%
Required VOC Reduction	lb/hr	3.5	0.0	0.0	3.5	0.0	0.0	3.4	0.0	0.0
Required VOC Reduction (mass basis)	%	68%	0%	0%	67%	0%	0%	66%	0%	0%
NO_x Catalyst Performance (each HRSG, Annual Average)										
Required NO_x Reduction, as NO_2	lb/hr	36.8	20.5	11.9	37.8	21.4	14.0	38.9	22.5	15.0
Required NO_x Reduction (mass basis)	%	88%	87%	87%	88%	87%	87%	88%	87%	87%
NH_3 Slip	lb/hr	8.9	5.8	3.4	9.1	6.1	4.0	9.5	6.4	4.3
NH_3 Reacted	lb/hr	14.3	8.0	4.6	14.7	8.3	5.5	15.1	8.8	5.8
Total NH_3 Added	lb/hr	23.2	13.8	8.0	23.8	14.4	9.5	24.6	15.2	10.1
HRSG Stack Exhaust Analysis (each HRSG)										
Total	lb/hr	997,166	987,243	681,716	1,039,767	1,029,844	796,703	1,073,253	1,063,330	832,414

Roseville Energy Park
Expected HRSG Stack Emissions - Alstom GTX100

		Operating Conditions								
		Hot			Average			Cold		
Case		Peak	Base	Min	Peak	Base	Min	Peak	Base	Min
N_2	mole%	72.5%	73.7%	74.8%	73.3%	74.5%	75.1%	73.9%	75.0%	75.4%
O_2	mole%	9.8%	13.3%	14.5%	10.0%	13.4%	14.6%	10.1%	13.4%	14.5%
CO_2	mole%	5.0%	3.4%	2.9%	5.0%	3.4%	2.9%	5.0%	3.5%	3.0%
H_2O	mole%	11.8%	8.7%	6.9%	10.8%	7.8%	6.6%	10.1%	7.2%	6.2%
Ar	mole%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%	0.9%
Total	mole%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Molecular Weight		28.12	28.32	28.47	28.24	28.42	28.51	28.31	28.49	28.56
Stack Temperature	deg. F	157	178	156	156	174	154	155	169	154
Stack Velocity	ft/sec	46.9	47.6	31.6	48.6	49.2	36.7	49.9	50.3	38.3
HRSG Stack Emissions (each HRSG)										
NO_x, @ 15% O_2	ppmvd	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CO, @ 15% O_2	ppmvd	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
VOC, as CH_4 @ 15% O_2	ppmvd	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
NH_3 Slip, @ 15% O_2	ppmvd	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
NO_x, as NO_2	lb/hr	4.8	3.2	1.8	4.9	3.3	2.2	5.1	3.5	2.3
CO	lb/hr	5.8	3.8	2.2	6.0	4.0	2.6	6.2	4.2	2.8
VOC, as CH_4	lb/hr	1.7	0.7	0.4	1.7	0.7	0.5	1.8	0.7	0.5
Total PM_{10}	lb/hr	4.4	2.9	1.7	4.6	3.1	2.0	4.7	3.2	2.1
NH_3	lb/hr	8.9	5.8	3.4	9.1	6.1	4.0	9.5	6.4	4.3
SO_2	lb/hr	0.9	0.6	0.4	0.9	0.6	0.4	1.0	0.7	0.4

Roseville Energy Park

Appendix 8.1-B
Cooling Tower Performance and Emission Data

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Roseville Energy Park

Cooling Tower - General Electric LM6000 PC SPRINT

		Operating Conditions					
		Hot		Average		Cold	
Case		Peak	Base	Peak	Base	Peak	Base
Ambient Dry Bulb Temp.	deg. F	99.0	99.0	62.0	62.0	34.0	34.0
Ambient Wet Bulb Temp.	deg. F	70.0	70.0	53.0	53.0	32.0	32.0
Combustion Turbines Operating		2	2	2	2	2	2
Combustion Turbine Load	%	100%	100%	100%	100%	100%	100%
Duct Firing?	Yes/No	Yes	No	Yes	No	Yes	No
Cooling Tower Performance							
Cooling Tower Inlet Wet Bulb Temperature	deg. F	72.0	72.0	55.0	55.0	32.0	32.0
Total Circulating Water Flow	gpm	54,414	54,414	54,414	54,414	54,414	54,414
Heat Rejected from Circulating Water	MMBtu/hr	538	242	500	250	503	253
Number of Cells		4	4	4	4	4	4
Number of Fans Operating		4	4	4	4	4	2
Total Leaving Air Flow	cfm	5,236,000	5,236,000	5,236,000	5,236,000	5,236,000	2,618,000
Fan Stack Diameter	ft	31.62	31.62	31.62	31.62	31.62	31.62
Stack Velocity	ft/sec	27.8	27.8	27.8	27.8	27.8	27.8
Temperature of Leaving Air	deg. F	94.3	83.1	82.5	70.4	70.0	70.2
Density of Leaving Air	lbs/cf	0.0699	0.0718	0.0719	0.0739	0.0739	0.0739
Drift, percent of circulating water flow		0.0005%	0.0005%	0.0005%	0.0005%	0.0005%	0.0005%
Drift	gpm	0.27	0.27	0.27	0.27	0.27	0.27
Circulating Water TDS	mg/l	5,000	5,000	5,000	5,000	5,000	5,000
% PM_{10} Emissions	% of total	100%	100%	100%	100%	100%	100%
PM_{10} Emissions	lbs/hr	0.68	0.68	0.68	0.68	0.68	0.68

Roseville Energy Park
Cooling Tower - Alstom GTX100

		Operating Conditions					
		Hot		Average		Cold	
Case		Peak	Base	Peak	Base	Peak	Base
Ambient Dry Bulb Temp.	deg. F	99.0	99.0	62.0	62.0	34.0	34.0
Ambient Wet Bulb Temp.	deg. F	70.0	70.0	53.0	53.0	32.0	32.0
Combustion Turbines Operating		2	2	2	2	2	2
Combustion Turbine Load	%	100%	100%	100%	100%	100%	100%
Duct Firing?	Yes/No	Yes	No	Yes	No	Yes	No
Cooling Tower Performance							
Cooling Tower Inlet Wet Bulb Temperature	deg. F	72.0	72.0	55.0	55.0	32.0	32.0
Total Circulating Water Flow	gpm	54,414	54,414	54,414	54,414	54,414	54,414
Heat Rejected from Circulating Water	MMBtu/hr	566	310	566	310	566	324
Number of Cells		4	4	4	4	4	4
Number of Fans Operating		4	4	4	4	4	3
Total Leaving Air Flow	cfm	5,236,000	5,236,000	5,236,000	5,236,000	5,236,000	3,927,000
Fan Stack Diameter	ft	31.62	31.62	31.62	31.62	31.62	31.62
Stack Velocity	ft/sec	27.8	27.8	27.8	27.8	27.8	27.8
Temperature of Leaving Air	deg. F	95.2	85.9	85.3	73.5	73.4	65.8
Density of Leaving Air	lbs/cf	0.0697	0.0713	0.0714	0.0733	0.0734	0.0746
Drift, percent of circulating water flow		0.0005%	0.0005%	0.0005%	0.0005%	0.0005%	0.0005%
Drift	gpm	0.27	0.27	0.27	0.27	0.27	0.27
Circulating Water TDS	mg/l	5,000	5,000	5,000	5,000	5,000	5,000
% PM_{10} Emissions	% of total	100%	100%	100%	100%	100%	100%
PM_{10} Emissions	lbs/hr	0.68	0.68	0.68	0.68	0.68	0.68

Roseville Energy Park

Appendix 8.1-C
Emergency Generator, Fire Pump, and Auxiliary Performance Data

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Roseville Energy Park
Expected Fire Pump Engine Emissions

Engine		
Manufacturer		Clarke
Model		JW6H-UF40
Useable Horsepower	hp	300
Speed	rpm	2,350
Fuel		No. 2 fuel oil
Fuel Specific Gravity		0.825
Fuel Sulfur Content	mass %	0.05%
Fuel Consumption	gph	14.5
Exhaust Flow	cfm	2,058
Exhaust Temperature	deg. F	738
Exhaust Pipe Diameter	in	6
Exhaust Stack Height	ft	15
Emissions		
Exhaust Velocity	ft/sec	174.7
NO_x	g/hp-hr	5.2
CO	g/hp-hr	0.27
HC	g/hp-hr	0.15
Particulates	g/hp-hr	0.09
SO_2	g/hp-hr	0.15
NO_x	lb/hr	3.439
CO	lb/hr	0.179
HC	lb/hr	0.099
Particulates	lb/hr	0.060
SO_2	lb/hr	0.099

Roseville Energy Park
Expected Standby Generator Emissions

Engine		
Manufacturer		Caterpillar
Model		3412C TA
Capacity (w/ fan)	kW	750
Brake Horsepower	bhp	1,133
Speed	rpm	1,800
Fuel		Diesel
Specific Gravity		0.825
Fuel Sulfur Content	mass %	0.05%
Fuel Consumption	gal/hr	54.8
Exhaust Temperature	deg. F	958
Exhaust Flow	cfm	6,459
Exhaust Pipe Diameter	in	10
Number of Exhaust Pipes		1
Exhaust Stack Height	ft	10
Emissions		
Exhaust Velocity	ft/sec	197
NO_x	g/bhp-hr	7.17
CO	g/bhp-hr	1.34
VOC	g/bhp-hr	0.25
PM_{10}	g/bhp-hr	0.22
NO_x	lb/hr	17.91
CO	lb/hr	3.35
VOC	lb/hr	0.62
PM_{10}	lb/hr	0.54
SO_2	lb/hr	0.38

Roseville Energy Park
Expected Auxiliary Boiler Emissions

Operating Conditions		
Boiler Rating	lb/hr	40,000
Saturated Steam Pressure	psig	600
Steam Enthalpy	Btu/lb	1,203.4
Makeup Water Enthalpy	Btu/lb	149.4
Thermal Efficiency	%	80%
Fuel Input		
Fuel Input (LHV)	MMBtu/hr	53
Fuel Input (HHV)	MMBtu/hr	58
Fuel Input	lb/hr	2,562
Air Required for Combustion		
Excess Air	%	15.0%
Oxygen	lb/hr	11,220
Nitrogen	lb/hr	36,519
Stack Exhaust Analysis		
Oxygen	lb/hr	1,463
Nitrogen	lb/hr	36,576
Carbon Dioxide	lb/hr	6,854
Water	lb/hr	5,427
Total	lb/hr	50,321
Oxygen	mole %	2.53%
Nitrogen	mole %	72.20%
Carbon Dioxide	mole %	8.61%
Water	mole %	16.66%
Total	mole %	100.00%
Molecular Weight		26.45
Stack Velocity	ft/sec	39.4
Stack Emissions		
NO_x, @ 3% O_2	ppmv	9
CO, @ 3% O_2	ppmv	50
VOC, as CH_4 @ 3% O_2	ppmv	10
PM_{10}	lbs/MMBtu (HHV)	0.010
NO_x, as NO_2	lb/hr	0.7
CO	lb/hr	2.2
VOC, as CH_4	lb/hr	0.3
PM_{10}	lb/hr	0.6
SO_2	lb/hr	0.08

Roseville Energy Park

Appendix 8.1-D
Fuel Gas Analysis

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Roseville Energy Park
Design Fuel Gas Analysis

		Fuel Gas Composition (mole %)	Mole % x Molecular Weight	Fuel Gas Composition (mass %)	Molecular Weight	Density (lbs/scf)	Specific Gravity	Heat of Combustion Btu/lb Gross	Heat of Combustion Btu/lb Net
Methane	CH_4	94.005%	15.081	88.2916%	16.043	0.0422	0.5558	23,879	21,520
Ethane	C_2H_6	3.515%	1.057	6.1886%	30.070	0.0792	1.0418	22,320	20,432
Propane	C_3H_8	0.188%	0.083	0.4851%	44.097	0.1161	1.5277	21,661	19,944
n-Butane	C_4H_{10}	0.032%	0.019	0.1093%	58.124	0.1530	2.0137	21,308	19,680
Isobutane	C_4H_{10}	0.026%	0.015	0.0889%	58.124	0.1530	2.0137	21,257	19,629
n-Pentane	C_5H_{12}	0.111%	0.080	0.4700%	72.151	0.1900	2.4997	21,091	19,517
Isopentane	C_5H_{12}	0.080%	0.058	0.3398%	72.151	0.1900	2.4997	21,052	19,478
Neopentane	C_5H_{12}	0.000%	0.000	0.0000%	72.151	0.1900	2.4997	20,970	19,396
n-Hexane	C_6H_{14}	0.011%	0.009	0.0538%	86.178	0.2269	2.9856	20,940	19,403
Ethylene	C_2H_4	0.000%	0.000	0.0000%	28.054	0.0739	0.9719	21,644	20,295
Propylene	C_3H_6	0.000%	0.000	0.0000%	42.081	0.1108	1.4579	21,041	19,691
n-Butene	C_4H_8	0.000%	0.000	0.0000%	56.108	0.1477	1.9439	20,840	19,496
Isobutene	C_4H_8	0.000%	0.000	0.0000%	56.108	0.1477	1.9439	20,730	19,382
n-Pentene	C_5H_{10}	0.000%	0.000	0.0000%	70.135	0.1847	2.4298	20,712	19,363
Benzene	C_6H_6	0.000%	0.000	0.0000%	78.115	0.2057	2.7063	18,210	17,480
Toluene	C_7H_8	0.000%	0.000	0.0000%	92.142	0.2426	3.1922	18,440	17,620
Xylene	C_8H_{10}	0.000%	0.000	0.0000%	106.169	0.2795	3.6782	18,650	17,760
Acetylene	C_2H_2	0.000%	0.000	0.0000%	26.038	0.0686	0.9021	21,500	20,776
Napthalene	$C_{10}H_8$	0.000%	0.000	0.0000%	128.175	0.3375	4.4406	17,298	16,708
Methly alcohol	CH_3OH	0.000%	0.000	0.0000%	32.042	0.0844	1.1101	10,259	9,078
Ethyl alcohol	C_2H_5OH	0.000%	0.000	0.0000%	46.070	0.1213	1.5961	13,161	11,929
Ammonia	NH_3	0.000%	0.000	0.0000%	17.031	0.0448	0.5900	9,668	8,001
Hydrogen	H_2	0.000%	0.000	0.0000%	2.016	0.0053	0.0698	61,100	51,623
Nitrogen	N_2	1.346%	0.377	2.2074%	28.013	0.0738	0.9712	0	0
Carbon Dioxide	CO_2	0.685%	0.302	1.7654%	44.010	0.1159	1.5247	0	0
Total		100.0%		100.0%	17.081	0.0450	0.5922	22,794	20,569
Sulfur Compounds									
Sulfur	S	0.50 grains/100scf							

Roseville Energy Park

Appendix 8.1-E
Emission Calculations

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Application for Certification

APPENDIX 8.1E
CALCULATION OF STARTUP, MAXIMUM HOURLY, DAILY, QUARTERLY, AND ANNUAL EMISSIONS

Table 8.1-E1 shows the quarterly startup schedule, which is based on the data presented in Section 8.1, Table 8.1-10.

Table 8.1-E2 shows the emissions of pollutants for each quarter associated with hot start, warm start and cold starts using the startup schedule from Table 8.1-10 and the emissions-for-each-event data from Table 8.1-14.

Total quarterly and annual emissions for each pollutant associated with startups are summarized and shown in Table 8.1-E3. Table 8.1-E4 shows the baseload and peak load quarterly emissions for each quarter for each turbine.

Tables 8.1-E5 through 8.1-E9 show the total quarterly emissions for each turbine, including startups, based load, and peak load operations. Also, the tables summarize total new emissions, including turbines, fire pump, emergency generator, auxiliary boiler and cooling tower for each pollutant.

Calculation of Maximum Hourly Emissions

a. Turbines/HRSGs

As hourly NO_x, CO and VOC emissions from the turbines are higher during startup than during peak load operation, highest hourly emissions occur while both turbines are in startup mode for the Alstom GTX100 and during peak load operation for the GE LM6000. Except for startup, maximum hourly emissions from the turbines occur while operating at peak load and 34°F with duct firing. Emissions under this operating mode are higher than under part load or high temperature operations. Emissions under peak and base, and minimum load conditions at 99°F, 62°F, and 34°F temperature conditions are shown in Appendix 8.1-A.

Both turbines may be started up within the same 1-hour timeframe. Therefore highest hourly emissions from the turbines will occur when both turbines are starting up within the same 1-hour timeframe.

b. Auxiliary Boiler

Auxiliary boiler will operate in all four quarters.

c. Standby Generator and Fire Pump

Standby generator set and fire pump testing will not occur during turbine startups, nor will the standby generator and fire pump be tested on the same day. Each test takes 30 minutes. The standby generator will operate at not more than 50 percent load during testing. The fire pump will operate at 100 percent load during testing.

d. Cooling Tower

Maximum hourly emissions occur while the cooling tower is operating at full capacity.

Calculation of Maximum Daily Emissions

a. Turbines/HRSGs

As discussed above for the hourly emissions calculations, hourly NO_x, CO and VOC emissions are highest during startup. The operating conditions having the next highest hourly emissions are peak load operation at 34°F with duct firing. Therefore maximum daily turbine emissions will occur on a day when each turbine has one hot and one cold start, and operates at full load with duct firing. Again, both turbines can be in startup mode at the same time.

b. Auxiliary Boiler

Auxiliary boiler will operate in all four quarters.

c. Standby Generator and Fire Pump

Standby generator set and fire pump testing will not occur during turbine startups nor will the standby generator and fire pump be tested on the same day. Each test takes 30 minutes. The standby generator will operate at 50 percent load during testing. The fire pump will operate at up to 100 percent load during testing.

d. Cooling Tower

Maximum daily cooling tower emissions will occur while the cooling tower is in operation for 24 hours.

Maximum Annual Emissions

a. Turbines/HRSGs

Maximum annual emissions are calculated based on the dispatch schedule of Table 8.1-10.

b. Auxiliary Boiler

Auxiliary boiler will operate in all four quarters.

c. Standby Generator and Fire Pump

Standby generator and fire pump will operate up to 50 hours per year.

Maximum Quarterly Emissions

a. Turbines/HRSGs

Quarterly turbine emission rates are calculated based on the proposed plant dispatch schedule for each quarter.

b. Auxiliary Boiler

Auxiliary boiler will operate in all four quarters.

c. Standby Generator and Fire Pump

It is assumed that these units will operate for up to 12.5 hours per quarter.

Table 8.1-E1. Quarterly startup schedule.[1]

	1st	2nd	3rd	4th
Number of hot starts	25	71	29	42
Hours of hot starts[1]	25	71	29	42
Number of warm starts	8	25	1	1
Hours of warm start[3]	16	50	2	2
Number of cold starts	1	2	1	1
Hours of cold starts[4]	3	6	3	3

1 – Based on AFC Table 8.1-10.
2 – Hot start takes 1 hour.
3 – Warm start takes 2 hours.
4 – Cold start takes 3 hours.

Table 8.1-E2. Quarterly startup emissions (both turbines).[1]

	NO_X	CO	VOC	PM_{10}	SO_2
Quarter 1					
GE LM6000 PC SPRINT					
Hot start emissions lbs/qtr	397.5	407.5	57.5	157.5	10
Warm start emission lbs/qtr	233.6	220.8	36	101.6	3.2
Cold start emission lbs/qtr	49.7	42.2	6.6	19.0	0.4
Total Quarter 1	**680.8**	**670.5**	**100.1**	**278.1**	**13.6**
Alstom GTX100					
Hot start emissions lbs/qtr	920	8,687.5	5780	160	10
Warm start emission lbs/qtr	699.2	3,929.6	2,313.6	103.2	3.2
Cold start emission lbs/qtr	124.1	737.4	402.4	19.3	0.4
Total Quarter 1	**1,743.3**	**13,354.5**	**8,496**	**282.5**	**13.6**
Quarter 2					
GE LM6000 PC SPRINT					
Hot start emissions lbs/qtr	1,128.9	1,157.3	163.3	447.3	28.4
Warm start emission lbs/qtr	730	690	112.5	317.5	10
Cold start emission lbs/qtr	99.4	84.4	13.2	38	0.8
Total Quarter 2	**1,958.3**	**1,931.7**	**289**	**802.8**	**39.2**
Alstom GTX100					
Hot start emissions lbs/qtr	2,612.8	24,672.5	16,415.2	454.4	28.4
Warm start emission lbs/qtr	2,185	12,280	7,230	322.5	10
Cold start emission lbs/qtr	248.2	1,474.8	804.8	38.6	0.8
Total Quarter 2	**5,046**	**38,427.3**	**24,450**	**815.5**	**39.2**
Quarter 3					
GE LM6000 PC SPRINT					
Hot start emissions lbs/qtr	461.1	472.7	66.7	182.7	11.6
Warm start emission lbs/qtr	29.2	27.6	4.5	12.7	0.4
Cold start emission lbs/qtr	49.7	42.2	6.6	19.0	0.4
Total Quarter 3	**540**	**542.5**	**77.8**	**214.4**	**12.4**
Alstom GTX100					
Hot start emissions lbs/qtr	1,067.2	10,077.5	6,704.8	185.6	11.6
Warm start emission lbs/qtr	87.4	491.2	289.2	12.9	0.4
Cold start emission lbs/qtr	124.1	737.4	402.4	19.3	0.4
Total Quarter 3	**1,278.7**	**11,306.1**	**7,396.4**	**217.8**	**12.4**
Quarter 4					
GE LM6000 PC SPRINT					
Hot start emissions lbs/qtr	667.8	684.6	96.6	264.6	16.8
Warm start emission lbs/qtr	29.2	27.6	4.5	12.7	0.4
Cold start emission lbs/qtr	49.7	42.2	6.6	19.0	0.4
Total Quarter 4	**746.7**	**754.4**	**107.7**	**296.3**	**17.6**
Alstom GTX100					
Hot start emissions lbs/qtr	1,545.6	14,595.5	9,710.4	268.8	16.8
Warm start emission lbs/qtr	87.4	491.2	289.2	12.9	0.4
Cold start emission lbs/qtr	124.1	737.4	402.4	19.3	0.4
Total Quarter 4	**1,757.1**	**15,823.6**	**10,402**	**301**	**17.6**

1 – Emissions are calculated from the number of events shown in Table 8.1-10 and the emission rates shown in Table 8.1-14.

Table 8.1-E3. Summary total quarterly and annual startup emissions for two turbines combined (pounds).[1]

	Turbine	Q1	Q2	Q3	Q4	Total
NO_X	GE LM6000	680.8	1,958.3	540	746.7	3,925.8
	Alstom GTX 100	1,743.3	5046	1,278.7	1,757.1	9,825.1
CO	GE LM6000	670.5	1931.7	542.5	754.4	3899.1
	Alstom GTX 100	13,354.5	38,427.3	11,306.1	15,823.6	78,911.5
VOC	GE LM6000	100.1	289	77.8	107.7	574.6
	Alstom GTX 100	8,496	24,450	7,396.4	10,402	50,744.4
PM_{10}	GE LM6000	278.1	802.8	214.4	296.3	1,591.6
	Alstom GTX 100	282.5	815.5	217.8	301	1,616.8
SO_2	GE LM6000	13.6	39.2	12.4	17.6	82.8
	Alstom GTX 100	13.6	39.2	12.4	17.6	82.8

1 – This table summarizes the emissions shown in Table 8.1-E2.

Table 8.1-E4. Base load and peak load emissions per quarter and annual, not including startups (per turbine).

Pollutant	Turbine	Q1 Base Load Hrs.[1]	Q1 Peak Load Hrs.[1]	Q2 Base Load Hrs.[1]	Q2 Peak Load Hrs.[1]	Q3 Base Load Hrs.[1]	Q3 Peak Load Hrs.[1]	Q4 Base Load Hrs.[1]	Q4 Peak Load Hrs.[1]	Total Pounds per year	Total Tons per year
		1,123	929	1,188	559	751	1,347	852	1,246		
NO_x[2]	LM 6000 PC SPRINT	3,818.20	4,645.00	4,039.20	2,795.00	2,553.40	6,735.00	2,896.80	6,230.00	33,712.60	16.86
(lbs)	Alstom GTX 100	3,930.50	4,737.90	4,158.00	2,850.90	2,628.50	6,869.70	2,982.00	6,354.60	34,512.10	17.26
CO[2]	LM 6000 PC SPRINT	4,716.60	5,666.90	4,989.60	3,409.90	3,154.20	8,216.70	3,578.40	7,600.60	41,332.90	20.67
(lbs)	Alstom GTX 100	4,716.60	5,759.80	4,989.60	3,465.80	3,154.20	8,351.40	3,578.40	7,725.20	41,741.00	20.87
VOC[2]	LM 6000 PC SPRINT	1,347.60	1,579.30	1,425.60	950.30	901.20	2,289.90	1,022.40	2,118.20	11,634.50	5.82
(lbs)	Alstom GTX 100	786.10	1,672.20	831.60	1,006.20	525.70	2,424.60	596.40	2,242.80	10,085.60	5.04
PM_{10}[2]	LM 6000 PC SPRINT	3,593.60	4,273.40	3,801.60	2,571.40	2,403.20	6,196.20	2,726.40	5,731.60	31,297.40	15.65
(lbs)	Alstom GTX 100	3,593.60	4,366.30	3,801.60	2,627.30	2,403.20	6,330.90	2,726.40	5,856.20	31,705.50	15.85
SO_2[2]	LM 6000 PC SPRINT	786.10	929.00	831.60	559.00	525.70	1,347.00	596.40	1,246.00	6,820.80	3.41
(lbs)	Alstom GTX 100	786.10	929.00	831.60	559.00	525.70	1,347.00	596.40	1,246.00	6,820.80	3.41
NH_3[2]	LM 6000 PC SPRINT	7,074.90	8,546.80	7,484.40	5,142.80	4,731.30	12,392.40	5,367.60	11,463.20	62,203.40	31.10
(lbs)	Alstom GTX 100	7,187.20	8,825.50	7,603.20	5,310.50	4,806.40	12,796.50	5,452.80	11,837.00	63,819.10	31.91

1 - The operating hours under base load and peak load conditions are taken from AFC Table 8.1-10.

2 - The emissions are calculated from the emission rates shown in Table 8.1-12, and the hours corresponding to each load condition for each quarter.

Table 8.1-E5. NO_X emission calculations.

	Q1		Q2		Q3		Q4		Total Annual LM 6000	Total Annual Alstom
	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom		
Start Up Emissions for Two Turbines	680.80	1,743.30	1,958.30	5,046.00	540.00	1,278.70	746.70	1,757.10		
Base Load Emissions Per Turbine	3,818.20	3,930.50	4,039.20	4,158.00	2,553.40	2,628.50	2,896.80	2,982.00		
Base Load Emissions Two Turbine	7,636.40	7,861.00	8,078.40	8,316.00	5,106.80	5,257.00	5,793.60	5,964.00		
Peak Load Emissions Per Turbine	4,645.00	4,737.90	2,795.00	2,850.90	6,735.00	6,869.70	6,230.00	6,354.60		
Peak Load Emissions Two Turbine	9,290.00	9,475.80	5,590.00	5,701.80	13,470.00	13,739.40	12,460.00	12,709.20		
Turbine Total Pounds	17,607.20	19,080.10	15,626.70	19,063.80	19,116.80	20,275.10	19,000.30	20,430.30		
Turbine Total Tons	8.80	9.54	7.81	9.53	9.56	10.14	9.50	10.22		
Fire Pump Emission Rate(pound/test)	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72		
test/Quarter fire pump	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Fire Pump Emission	43.00	43.00	43.00	43.00	43.00	43.00	43.00	43.00		
Emergency Generator Emission Rate (lb/test)	4.48	4.48	4.48	4.48	4.48	4.48	4.48	4.48		
test/Quarter Emergency Generator	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Emergency Generator Emission	112.00	112.00	112.00	112.00	112.00	112.00	112.00	112.00		
Cooling Tower (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Hrs/Quarter Cooling Tower	2,160.00	2,160.00	2,184.00	2,184.00	2,208.00	2,208.00	2,208.00	2,208.00		
Cooling Tower Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Auxiliary Boiler (lb/hr)	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70		
Hrs/Quarter Auxiliary Boiler	140.00	140.00	568.00	568.00	143.00	143.00	143.00	143.00		
Auxiliary Boiler Emissions	98.00	98.00	397.60	397.60	100.10	100.10	100.10	100.10		
Turbine Total Pounds	17,607.20	19,080.10	15,626.70	19,063.80	19,116.80	20,275.10	19,000.30	20,430.30		
Total Pounds	17,860.20	19,333.10	16,179.30	19,616.40	19,371.90	20,530.20	19,255.40	20,685.40	**72,666.80**	**80,165.10**
Total Tons	8.93	9.67	8.09	9.81	9.69	10.27	9.63	10.34	**36.33**	**40.08**

Table 8.1-E6. CO emission calculations.

	Q1		Q2		Q3		Q4		Total Annual LM 6000	Total Annual Alstom
	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom		
Start Up Emissions for Two Turbines	670.50	13,354.50	1,931.70	38,427.30	542.50	11,306.10	754.40	15,823.60		
Base Load Emissions Per Turbine	4,716.60	4,716.60	4,989.60	4,989.60	3,154.20	3,154.20	3,578.40	3,578.40		
Base Load Emissions Two Turbine	9,433.20	9,433.20	9,979.20	9,979.20	6,308.40	6,308.40	7,156.80	7,156.80		
Peak Load Emissions Per Turbine	5,666.90	5,759.80	3,409.90	3,465.80	8,216.70	8,351.40	7,600.60	7,725.20		
Peak Load Emissions Two Turbine	11,333.80	11,519.60	6,819.80	6,931.60	16,433.40	16,702.80	15,201.20	15,450.40		
Turbine Total Pounds	21,437.50	34,307.30	18,730.70	55,338.10	23,284.30	34,317.30	23,112.40	38,430.80		
Turbine Total Tons	10.72	17.15	9.37	27.67	11.64	17.16	11.56	19.22		
Fire Pump Emission Rate(pound/test)	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		
test/Quarter fire pump	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Fire Pump Emission	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25		
Emergency Generator Emission Rate (lb/test)	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84		
test/Quarter Emergency Generator	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Emergency Generator Emission	21.00	21.00	21.00	21.00	21.00	21.00	21.00	21.00		
Cooling Tower (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Hrs/Quarter Cooling Tower	2,160.00	2,160.00	2,184.00	2,184.00	2,208.00	2,208.00	2,208.00	2,208.00		
Cooling Tower Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Auxiliary Boiler Emission Rate(pound/hr)	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20		
Hrs/Quarter Auxiliary Boiler	140.00	140.00	568.00	568.00	143.00	143.00	143.00	143.00		
Auxiliary Boiler Emission	308.00	308.00	1,249.60	1,249.60	314.60	314.60	314.60	314.60		
Turbine Total Pounds	21,437.50	34,307.30	18,730.70	55,338.10	23,284.30	34,317.30	23,112.40	38,430.80		
Total Pounds	21,768.75	34,638.55	20,003.55	56,610.95	23,622.15	34,655.15	23,450.25	38,768.65	**88,844.70**	**164,673.30**
Total Tons	10.88	17.32	10.00	28.31	11.81	17.33	11.73	19.38	**44.42**	**82.34**

Table 8.1-E7. VOC emission calculations.

	Q1		Q2		Q3		Q4		Total Annual LM 6000	Total Annual Alstom
	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom		
Start Up Emissions for Two Turbines	100.10	8,496.00	289.00	24,450.00	77.80	7,396.40	107.70	10,402.00		
Base Load Emissions Per Turbine	1,347.60	786.10	1,425.60	831.60	901.20	525.70	1,022.40	596.40		
Base Load Emissions Two Turbine	2,695.20	1,572.20	2,851.20	1,663.20	1,802.40	1,051.40	2,044.80	1,192.80		
Peak Load Emissions Per Turbine	1,579.30	1,672.20	450.30	1,006.20	2,289.90	2,424.60	2,118.20	2,242.80		
Peak Load Emissions Two Turbine	3,158.60	3,344.40	900.60	2,012.40	4,579.80	4,849.20	4,236.40	4,485.60		
Turbine Total Pounds	5,953.90	13,412.60	4,040.80	28,125.60	6,460.00	13,297.00	6,388.90	16,080.40		
Turbine Total Tons	2.98	6.71	2.02	14.06	3.23	6.65	3.19	8.04		
Fire Pump Emission Rate(pound/test)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
test/Quarter fire pump	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Fire Pump Emission	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		
Emergency Generator Emission Rate (lb/test)	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16		
test/Quarter Emergency Generator	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Emergency Generator Emission	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00		
Cooling Tower (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Hrs/Quarter Cooling Tower	2,160.00	2,160.00	2,184.00	2,184.00	2,208.00	2,208.00	2,208.00	2,208.00		
Cooling Tower Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Auxiliary Boiler Emission Rate(lb/hr)	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30		
Hrs/Quarter Auxiliary Boiler	140.00	140.00	568.00	568.00	143.00	143.00	143.00	143.00		
Auxiliary Boiler Emissions	42.00	42.00	170.40	170.40	42.90	42.90	42.90	42.90		
Turbine Total Pounds	5,953.90	13,412.60	4,040.80	28,125.60	6,460.00	13,297.00	6,388.90	16,080.40		
Total Pounds	6,001.15	13,459.85	4,216.45	28,301.25	6,508.15	13,345.15	6,437.05	16,128.55	**23,162.80**	**71,234.80**
Total Tons	3.00	6.73	2.11	14.15	3.25	6.67	3.22	8.06	**11.58**	**35.62**

Table 8.1-E8. PM_{10} emission calculations.

	Q1		Q2		Q3		Q4		Total Annual LM 6000	Total Annual Alstom
	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom		
Start Up Emissions for Two Turbines	278.10	282.50	802.80	815.50	214.40	217.80	296.30	301.00		
Base Load Emissions Per Turbine	3,593.60	3,593.60	3,801.60	3,801.60	2,403.20	2,403.20	2,726.40	2,726.40		
Base Load Emissions Two Turbine	7,187.20	7,187.20	7,603.20	7,603.20	4,806.40	4,806.40	5,452.80	5,452.80		
Peak Load Emissions Per Turbine	4,273.40	4,366.30	2,571.40	2,627.30	6,196.20	6,330.90	5,731.60	5,856.20		
Peak Load Emissions Two Turbine	8,546.80	8,732.60	5,142.80	5,254.60	12,392.40	12,661.80	11,463.20	11,712.40		
Turbine Total Pounds	16,012.10	16,202.30	13,548.80	13,673.30	17,413.20	17,686.00	17,212.30	17,466.20		
Turbine Total Tons	8.01	8.10	6.77	6.84	8.71	8.84	8.61	8.73		
Fire Pump Emission Rate(pound/test)	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03		
test/Quarter fire pump	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Fire Pump Emission	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75		
Emergency Generator Emission Rate (test/hr)	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14		
test/Quarter Emergency Generator	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Emergency Generator Emission	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50		
Cooling Tower (lb/hr)	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70		
Hrs/Quarter Cooling Tower	2,160.00	2,160.00	2,184.00	2,184.00	2,208.00	2,208.00	2,208.00	2,208.00		
Cooling Tower Emissions	1,512.00	1,512.00	1,528.80	1,528.80	1,545.60	1,545.60	1,545.60	1,545.60		
Auxiliary Boiler Emission Rate(pound/hr)	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90		
Hrs/Quarter Auxiliary Boiler	140.00	140.00	568.00	568.00	143.00	143.00	143.00	143.00		
Auxiliary Boiler Emission	126.00	126.00	511.20	511.20	128.70	128.70	128.70	128.70		
Turbine Total Pounds	16,012.10	16,202.30	13,548.80	13,673.30	17,413.20	17,686.00	17,212.30	17,466.20		
Total Pounds	17,654.35	17,844.55	15,593.05	15,717.55	19,091.75	19,364.55	18,890.85	19,144.75	**71,230.00**	**72,071.40**
Total Tons	8.83	8.92	7.80	7.86	9.55	9.68	9.45	9.57	**35.62**	**36.04**

Table 8.1-E9. SO_2 emission calculations.

	Q1		Q2		Q3		Q4		Total Annual LM 6000	Total Annual Alstom
	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom	LM 6000	Alstom		
Start Up Emissions for Two Turbines	13.60	13.60	39.20	39.20	12.40	12.40	17.60	17.60		
Base Load Emissions Per Turbine	786.10	786.10	831.60	831.60	525.70	525.70	596.40	596.40		
Base Load Emissions Two Turbine	1,572.20	1,572.20	1,663.20	1,663.20	1,051.40	1,051.40	1,192.80	1,192.80		
Peak Load Emissions Per Turbine	929.00	929.00	559.00	559.00	1,347.00	1,347.00	1,246.00	1,246.00		
Peak Load Emissions Two Turbine	1,858.00	1,858.00	1,118.00	1,118.00	2,694.00	2,694.00	2,492.00	2,492.00		
Turbine Total Pounds	3,443.80	3,443.80	2,820.40	2,820.40	3,757.80	3,757.80	3,702.40	3,702.40		
Turbine Total Tons	1.72	1.72	1.41	1.41	1.88	1.88	1.85	1.85		
Fire Pump Emission Rate(pound/test)	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
Test/Quarter fire pump	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Fire Pump Emission	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		
Emergency Generator Emission Rate (lb/test)	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		
test/Quarter Emergency Generator	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00		
Emergency Generator Emission	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35		
Cooling Tower (lb/hr)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Hrs/Quarter Cooling Tower	2,160.00	2,160.00	2,184.00	2,184.00	2,208.00	2,208.00	2,208.00	2,208.00		
Cooling Tower Emissions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Auxiliary Boiler Emission Rate (lb/hr)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08		
Hrs/Quarter Auxiliary Boiler	140.00	140.00	568.00	568.00	143.00	143.00	143.00	143.00		
Auxiliary Boiler Emissions	11.20	11.20	45.44	45.44	11.44	11.44	11.44	11.44		
Turbine Total Pounds	3,443.80	3,443.80	2,820.40	2,820.40	3,757.80	3,757.80	3,702.40	3,702.40		
Total Pounds	3,458.60	3,458.60	2,869.44	2,869.44	3,772.84	3,772.84	3,717.44	3,717.44	**13,818.32**	**13,818.32**
Total Tons	1.73	1.73	1.43	1.43	1.89	1.89	1.86	1.86	**6.91**	**6.91**

Table 8.1-E10. Maximum hourly emissions, lb/hr[1].

	NO_X		SO_2[2]		CO		VOC		PM_{10}	
	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100
2 combustion turbines/peak	9.99	10.23	2	2	12.16	12.45	3.48	3.57	9.23	9.45
2 combustion turbine/startup	38.66	74.73	0.8	0.8	28.67	711.61	2.9	398.65	6.33	6.44
Auxiliary Boiler	0.7	0.7	0.08	0.08	2.2	2.2	0.3	0.3	0.6	0.6
Highest	39.32	75.39	2.08	2.08	30.89	713.83	3.73	398.90	9.81	10.03
Standby generator[3]	4.48		0.094		0.84		0.16		0.14	
Fire pump[4]	1.72		0.05		0.09		0.05		0.03	
Cooling tower	--		--		--		--		0.7	
Auxiliary Boiler	0.7		0.08		2.2		0.3		0.6	
Subtotal	5.14		0.22		3.06		0.41		1.39	
Maximum hourly emissions	43.5	79.9	2.22	2.22	31.7	714.7	3.9	399.1	10.6	10.8

1 – Standby generator and fire pump testing do not occur during CTG startups. Therefore, the maximum hourly emissions correspond to startup conditions for all pollutants except for SO_2.
2 – Maximum hourly SO_2 emissions correspond to peak load operation for the turbines and other equipment running at the same time.
3 –Standby generator is only tested for 30 minutes, operating at 50% load.
4 – The fire pump testing is for 30 minutes at 100% load.

Table 8.1-E11. Maximum daily emissions, lb/day

	NO_X		SO_2		CO		VOC		PM_{10}	
	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100
2 startup (cold)	49.7	124.1	0.8	0.8	42.2	737.4	6.6	402.4	19.0	19.3
2 startups (warm)	29.2	87.4	0.8	0.8	27.6	491.2	4.5	289.2	12.7	12.9
2 peak operating 19 hrs	190	193.8	38	38	231.8	235.6	64.6	68.4	174.8	178.6
Subtotal	268.9	405.3	39.6	39.6	301.6	1,464.2	75.7	760	206.5	210.8
2 combustion turbine peak	240	244.8	48	48	292.8	297.6	81.6	86.4	220.8	225.6
Highest	268.9	405.3	48	48	301.6	1,464.2	81.6	760	220.8	225.6
Cooling tower									16.8	16.8
Standby generator(1)	4.48		0.094		0.84		0.16		0.14	
Fire pump(1)	1.72		0.05		0.09		0.05		0.03	
Auxiliary Boiler	16.8		1.92		52.8		7.2		14.4	
Maximum daily emissions(2)	285.7	422.1	49.92	49.92	354.4	1,517.0	88.8	767.2	235.2	240

1 – 30-minute operation for each testing period. They do not run during startup.
2 – The highest daily emissions assumes 2 cold startups, 2 warm startups, and 19 hours of peak load operation at 34°F. It is assumed that the auxiliary boiler is also operating during that day.

Table 8.1-E12. Maximum total quarterly and annual emissions (pounds)

	NO_X		SO_2		CO		VOC		PM_{10}	
	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100	LM6000	GTX100
Quarterly[1]	19,371.9	20,685.4	3,772.84	3,772.84	23,622.15	56,610.96	6,508.14	28,301.25	19,091.75	19,364.655
Annual	72,666.8	80,165.1	13,818.32	13,818.32	88,844.7	164,673.3	23,162.8	71,234.8	71,230	72,071.4

1 – Values are taken from the highest total quarterly values shown in Tables 8.1-E5 through 8.1-E9.

Roseville Energy Park

Appendix 8.1-F
Construction Emissions and Impact Analysis

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APPENDIX 8.1-F
CONSTRUCTION EMISSIONS AND IMPACT ANALYSIS

Construction Phases

Construction of the REP is expected to last approximately 20 months. Construction will occur in the following four main phases:

- Site preparation
- Foundation work
- Construction/installation of major structures
- Installation of major equipment

Site preparation includes clearing, grading, excavation of footings and foundations, and backfilling operations. After site preparation is finished, construction of the foundations and structures begins, followed by installation and assembly of the mechanical and electrical equipment:

Fugitive dust emissions from the construction of the REP will result from:

- Dust entrained during site preparation and grading/excavation at the construction site
- Dust entrained during onsite travel on paved and unpaved surfaces
- Dust entrained during aggregate and soil loading and unloading operations
- Wind erosion of areas disturbed during construction activities

Combustion emissions during construction will result from:

- Exhaust from the diesel construction equipment used for site preparation, grading, excavation, and construction of onsite structures
- Exhaust from water trucks used to control construction dust emissions
- Exhaust from diesel-powered welding machines, electric generators, air compressors, and water pumps
- Exhaust from pickup trucks and diesel trucks used to transport workers and materials around the construction site
- Exhaust from diesel trucks used to deliver concrete, fuel, and construction supplies to the construction site
- Exhaust from locomotives used to deliver mechanical equipment to the project area
- Exhaust from automobiles used by workers to commute to the construction site

To determine the potential worst-case daily construction impacts, exhaust and dust emission rates have been evaluated for each source of emissions. Worst-case daily dust emissions are expected to occur during the first one to two months of construction when site preparation occurs. The worst-case daily exhaust emissions are expected to occur during the middle of the construction schedule during the installation of the major mechanical equipment. Annual emissions are based on the average equipment mix during the 20-month construction period.

Available Mitigation Measures

The following mitigation measures are proposed to control exhaust emissions from the Diesel heavy equipment used during construction of REP:

- Operational measures, such as limiting time spent with the engine idling by shutting down equipment when not in use
- Regular preventive maintenance to prevent emission increases due to engine problems
- Use of low sulfur and low aromatic fuel meeting California standards for motor vehicle Diesel fuel
- Use of low-emitting gas and diesel engines meeting state and federal emissions standards for construction equipment, including, but not limited to catalytic converter systems and particulate filter systems

The following mitigation measures are proposed to control fugitive dust emissions during construction of the project:

- Use either water application or chemical dust suppressant application to control dust emissions from on-site unpaved road travel and unpaved parking areas
- Use vacuum sweeping and/or water flushing of paved road surface to remove buildup of loose material to control dust emissions from travel on the paved access road (including adjacent public streets impacted by construction activities) and paved parking areas
- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard
- Install sandbags or other erosion control measures to prevent silt runoff to roadways
- Replant vegetation in disturbed areas as quickly as possible
- Use wheel washers or wash off tires of all trucks exiting construction site
- Mitigate fugitive dust emissions from wind erosion of areas disturbed from construction activities (including storage piles) by application of either water or chemical dust suppressant

Estimation of Emissions with Mitigation Measures

Tables 8.1-F1 through 8.1-F3 show the estimated maximum daily and annual heavy equipment exhaust and fugitive dust emissions with recommended mitigation measures.

Table 8.1-F1. Maximum daily emissions during construction (fugitive dust), pounds per day.

	NO_x	CO	VOC	SO_x	PM_{10}
Onsite					
Construction Fugitive Dust	0	0	0	0	3.86
Offsite					
Worker Travel, Truck/Rail Deliveries	0	0	0	0	0.66
Total	**0**	**0**	**0**	**0**	**4.52**

Table 8.1-F2. Maximum daily emissions during construction (exhaust emissions), pounds per day.

	NO_x	CO	VOC	SO_x	PM_{10}
Onsite and Offsite					
Construction Equipment, Worker Travel, Truck/Rail Deliveries	291.2	360.7	52.2	23.9	17.0
Total	**291.2**	**360.7**	**52.2**	**23.9**	**17.0**

Table 8.1-F3. Annual emissions during construction, tons per year.

	NO_x	CO	VOC	SO_x	PM_{10}
Onsite and Offsite					
Construction Equipment, Fugitive Dust, Worker Travel, Truck/Rail Deliveries	10.8	35.7	4.4	0.6	1.0
Total	**10.8**	**35.7**	**4.4**	**0.6**	**1.0**
Construction Period Total Emissions	18.0	59.5	7.3	1.0	1.65
Total Construction Period	**18.0**	**59.5**	**7.3**	**1.0**	**1.65**

Analysis of Ambient Impacts from Facility Construction

Ambient air quality impacts from emissions during the construction of the REP were estimated using an air quality dispersion modeling analysis. The modeling analysis considers the construction site location, the surrounding topography, and the sources of emissions during construction, including vehicle and equipment exhaust emissions and fugitive dust.

Existing Ambient Levels

As with the modeling analysis of project operating impacts, monitoring stations delineated were used to establish the ambient background levels for the construction impact modeling analysis. Section 8.1, Tables 8.1-3 through 8.1-6 show the maximum concentrations of NO_x, SO_2, CO and PM_{10} recorded for 2000 through 2002 at those monitoring stations.

Dispersion Model

As in the analysis of project operating impacts, the USEPA-approved Industrial Source Complex Short Term (ISCST3) model was used to estimate ambient impacts from construction activities. A detailed discussion of the ISCST3 dispersion model is included in Section 8.1.

The emission sources for the construction site were grouped into two categories: exhaust emissions and dust emissions. An effective emission plume height (stack height plus plume rise) of 7.32 meters was used for all exhaust emissions. For construction dust emissions, an effective plume height of 0.5 meters was used in the modeling analysis. The exhaust and dust emissions were modeled as a single area source that covered the total area of the construction site. The construction impacts modeling analysis used the same receptor locations as used for the project operating impact analysis (see Section 8.9, Public Health).

To determine the construction impacts on short-term ambient standards (24 hours and less), the worst-case daily onsite construction emission levels shown in Tables 8.1-F1 and 8.1-F2 were used. For pollutants with annual average ambient standards, the annual onsite emission levels shown in Table 8.1-

F3 were used. As with the project operating impact analysis, the meteorological data set used for the construction emission impacts analysis is data collected from the McClellan Air Force Base met station for 1992-1996.

Modeling Results

Based on the emission rates of NO_x, SO_2, CO, and PM_{10} and the meteorological data, the ISCST3 model calculates hourly and annual ambient impacts for each pollutant. As mentioned above, the modeled 1-hour, 3-hour 8-hour, and 24-hour ambient impacts are based on the worst-case daily emission rates of NO_x, SO_2, CO, and PM_{10}. The annual impacts are based on the annual emission rates of these pollutants.

The one-hour and annual average concentrations of NO_2 were computed following the revised USEPA guidance for computing these concentrations (August 9, 1995 Federal Register, 60 FR 40465). The one-hour average was adjusted using the Ozone Limiting Method. The annual average was calculated using the ambient ratio method (ARM) with the national default value of 0.75 for the annual average NO_2/NO_x ratio.

The modeling analysis results are shown in Table 8.1-F4. Also included in the table are the maximum background levels that have occurred in the last three years and the resulting total ambient impacts. As shown in Table 8.1-F4, construction impacts for all modeled pollutants except PM_{10} are expected to be at or below the most stringent state and national standards. However, the state 24-hour average PM_{10} standard is exceeded even in the absence of the construction impacts for the REP.

Table 8.1-F4. Modeled maximum construction impacts.

Pollutant	Averaging Time	Maximum Construction Impacts (μg/m³)	Background (μg/m³)	Total Impact (μg/m³)	State Standard (μg/m³)	Federal Standard (μg/m³)
NO_2[1]	1-hour	243	162	405	470	N/A
	Annual	8	32	40	N/A	100
SO_2	1-hour	161	50	211	655	N/A
	3-hour	94	31	125	N/A	1300
	24-hour	34	29	63	105	365
	Annual	0.9	5	5.9	N/A	80
CO	1-hour	769	5270	6038	23000	40000
	8-hour	420	3551	3971	10000	10000
PM_{10}	24-hour	42	93	135	50	150
	Annual[2]	5	25	30	30	50
	Annual[3]					

Notes:
[1]Ozone limiting method applied for 1-hour average, using maximum background O_3 and NO_2 level during the period from 2001. ARM applied for annual average, using national default 0.75 ratio.
[2]Annual Arithmetic Mean.
[3]Annual Geometric Mean.

The ISCST3 model over-predicts construction emission impacts due to the cold plume (i.e., ambient temperature) effect of dust emissions. Most of the plume dispersion characteristics in the ISCST3 model are derived from observations of hot plumes associated with typical smoke stacks. The ISCST3 model does compensate for plume temperature; however, for ambient temperature plumes the model assumes negligible buoyancy and dispersion. Consequently, the ambient concentrations in cold plumes remain high even at significant distances from a source. REP construction site impacts are not unusual in comparison to most construction sites; construction sites that use good dust suppression techniques and

low-emitting vehicles typically do not cause violations of air quality standards. The input and output modeling files are being provided electronically.

Roseville Energy Park

Appendix 8.1-G
Screening Health Risk Assessment and Hazardous Air Pollutants Emissions

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APPENDIX 8.1-G
SCREENING HEALTH RISK ASSESSMENT

The screening health risk assessment was conducted in accordance with the procedures developed by the California Air Pollution Control Officers' Association (CAPCOA) in the Air Toxics "Hot Spots" Program: Revised 1992 Risk Assessment Guidelines, CAPCOA, 1993).

The screening health risk assessment was carried out in three steps. First, emissions of toxic air pollutants from the project were calculated. These calculations are shown in Tables 8.1-G1 and 8.1-G4 (attached at the end of this appendix). Next, the ISCST3 model was used to predict the maximum concentration at each receptor due to the facility. This was done first for the coarse grid of receptors, and the locations of maximum risk were determined. Fine grids were set up around the locations of maximum modeled risk and impacts were reevaluated using ISCST3. Finally, the ARB/OEHHA Health Risk Assessment (HRA) Program (September 1996, with 3-4-02 updated database) was used to evaluate acute, chronic and cancer risks through inhalation and non-inhalation pathways based upon the maximum predicted concentration at each receptor.

Based upon the water quality data, chromium (in any form other than Cr3) is not expected to be found in the cooling tower drift.

The other assumptions used in running the HRA program were as follows:

- Emission rates for non-criteria pollutants are taken from Section 8.1
- Number of residents affected is based upon the 2000 population data for those census tracts or portions of census tracts that lie within a 1-mile radius of the proposed facility
- Number of workers affected is based upon the county average percentage of non-farm workers as compared to the total county population in 2000. This average was applied to all affected census tracts
- Deposition velocity is taken to be 0.02 m/s and 0.05 m/s, as recommended by ARB for controlled and uncontrolled sources respectfully
- Fraction of residents with gardens is taken to be 0.25, which is conservatively high the project area
- Fraction of produce grown at home is taken to be 0.05, which is also conservatively high

The HRA program is a single-source model, using the emissions from a single source and the relationship between emissions and ambient concentration to calculate modeled concentration and then to determine modeled risk. The HRA input files use emission rates for each toxic pollutant, in grams per second, and a value of χ/Q, in $\mu g/m^3$ per gram per second. Since REP has multiple sources, the actual maximum modeled concentration of each toxic substance was used in place of the emission rate and χ/Q was taken as 1 to allow the model to evaluate total risk from all sources. Additionally, since the REP is being proposed using two different gas turbines, a risk assessment for each set of turbines plus the cooling tower was performed. The maximum-modeled annual concentrations from all sources did not occur at the same location. For purposes of the HRA, it was assumed that all maximum concentrations did occur at the maximum impact receptor (MIR), which results in a conservative estimate of risk and health effects at the MIR.

The receptor grids used for these modeling analyses are similar to those used for the refined modeling, with the addition of discrete receptors located at schools, hospitals, day care centers, elder care facilities, retirement homes, and nursing homes. Residences nearest the proposed facility were also included as discrete receptors. A list of the sensitive receptors within 6 miles of the project is included in Section 8.9, Table 8.9-1 (see also Table 8.1-G12, at the end of this section)

The HRA program results for acute and chronic inhalation and chronic non-inhalation exposures, and individual cancer risk for the cooling tower and the combustion sources are attached. Separate calculations are shown for each type of exposure and risk, and the results of the calculations are summarized below.

The modeling results show that the maximum calculated cancer risk from REP (turbines, duct burners, auxillary boiler, and cooling tower) is expected to be 0.0743 in one million (70-year risk plus 44-year risk from mother's milk). This risk is well below the ten in one-million significance level currently used by the District and CEC. The acute and chronic non-cancer hazard indices are <0.468 and <0.0108, respectively. Both are well below the significant impact level of 1.0. Detailed calculations and results for each significant receptor are included in the modeling results, which are being submitted electronically. Tables 8.1-G1 through 8.1-G4 show the input data used in the HRA model (all tables are included at the end of the appendix). Table 8.1-G1displays the fuel use rate. Table 8.1-G2a and 8.1-G2b show the calculations of noncriteria pollutant emissions for the LM6000 and GTX100 combustion turbines, respectively. Table 8.1-G3 shows the calculation of noncriteria pollutant emissions from the cooling tower. Table 8.1-G4 shows the calculation of non-criteria pollutant emissions for the auxiliary boiler.

Tables 8.1-G5 through 8.1-G8 show the specific results of the HRA. Values in the tables represent the highest value of the two separate HRA analyses, i.e., LM6000 turbines plus the cooling tower, or the GTX100 turbines plus the cooling tower. Table 8.1-G9 shows the comparison of risk assessment values for the two turbine options.

Construction Emissions

In addition, an HRA was performed for the construction emissions (construction equipment diesel PM exhaust emissions). The results are as follows:

- Cancer Risk = 5.26 in one million
- Chronic Inhalation Hazard Index = 0.1224

These values are also well below the established significance levels.

Other Health Risk Studies Conducted in the Project Region

Identification of available health studies concerning the potentially affected populations within the project region are as follows:

1. *The 2001 California Almanac of Emissions and Air Quality,* California Air Resources Board, Planning and Technical Support Division, 2001.

The California Air Resources Board (CARB) presents a wide variety of air toxics data in the 2001 Almanac acquired from the statewide monitoring network. Data from the network is generally given for the years 1990-1999 for the top ten air toxics: acetaldehyde, benzene, 1-3 butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter. A summary of this data is presented in Table 8.1-G10. This data is not

specifically targeted for the proposed power plant site, but rather to the project region. CARB currently monitors approximately 63 toxic substances in the statewide network.

2. *Screening Health Risk Assessment for the Rio Linda/Elverta Power Project*, RLEP-AFC, Section 5.15, Foster Wheeler Environmental Corp., January 2001.

A conservative health risk assessment was prepared for the Rio Linda/Elverta Power Project (RLEP) located approximately 10 miles west-southwest of the REP project. The RLEP project was designed as a 560 MW natural gas-fired, combined cycle facility. Estimated health risks associated from this facility are shown in Table 8.1-G11 for comparison with the REP.

Table 8.1-G1. Fuel use rate MMBTU (HHV) and MMSCF.

	Peak Load	Base Load	Startup
LM 6000 PC SPRINT (MMBTU/HR)	689.2	472.5	285.5
LM 6000 PC SPRINT (MMSCF/HR)	0.677013752	0.464145383	0.280452
Max. LM 6000 PC SPRINT (MMSCF/HR)	**0.677013752**		
LM 6000 (HRS per year Each Load)	4081	3914	252
LM 6000 PC SPRINT (MMSCF/YR Each Load)	2762.893124	1816.665029	70.67387
LM 6000 PC SPRINT Total (MMSCF/YR)	4650.232024		
Alstom GTX 100 (MMBTU/HR)	705.3	480.8	319.7
Alstom GTX 100 (MMSCF/HR)	0.692829077	0.472298625	0.314047
Max. Alstom GTX 100 (MMSCF/HR)	**0.692829077**		
Alstom GTX 100 (HRS Per Year Each Load)	4081	3914	252
Alstom GTX 100 (MMSCF/YR Each Load)	2827.435462	1848.576817	79.13988
Alstom Total (MMSCF/YR)	4755.152161		

Table 8.1-G2a. Calculation of noncriteria pollutant emissions for Roseville LM 6000 turbines/duct burners.

	Calculation of Noncriteria Pollutant Emissions from Gas Turbines (each turbine)				Emission Rates for Modeling (g/s each turbine)		Modeled Impacts ug/m3 (6)	
Compound	Emission Factor, lb/MMscf (1)	Maximum Hourly Emissions, lb/hr/tur (2)	Maximum Daily Emissions, lb/day/tur	Annual Emissions, ton/yr/tur (3)	One-hour g/s/turbine	Annual g/s/turbine	One-hour ug/m3	Annual ug/m3
Acetaldehyde	4.08E-02	2.76E-02	6.63E-01	9.49E-02	3.48E-03	2.73E-03	1.82E-01	2.01E-03
Acrolein	3.69E-03	2.50E-03	6.00E-02	8.58E-03	3.15E-04	2.47E-04	1.64E-02	1.82E-04
Ammonia	(4)	9.20E+00	2.21E+02	3.68E+01	1.159	1.06E+00	5.46E+01	6.28E-01
Benzene	3.33E-03	2.25E-03	5.41E-02	7.74E-03	2.84E-04	2.23E-04	1.48E-02	1.64E-04
1,3-Butadiene	1.27E-04	8.60E-05	2.06E-03	2.95E-04	1.08E-05	8.49E-06	5.66E-04	6.25E-06
Ethylbenzene	1.79E-02	1.21E-02	2.91E-01	4.16E-02	1.53E-03	1.20E-03	7.97E-02	8.81E-04
Formaldehyde	1.10E-01	7.45E-02	1.79E+00	2.56E-01	9.38E-03	7.36E-03	4.90E-01	5.41E-03
Hexane	2.59E-01	1.75E-01	4.21E+00	6.02E-01	2.21E-02	1.73E-02	1.15E+00	1.27E-02
Naphthalene	1.33E-03	9.00E-04	2.16E-02	3.09E-03	1.13E-04	8.90E-05	5.92E-03	6.54E-05
PAHs (5)	1.65E-04	1.12E-04	2.68E-03	3.83E-04	1.41E-05	1.10E-05	7.34E-04	8.11E-06
Propylene	7.70E-01	5.21E-01	1.25E+01	1.79E+00	6.57E-02	5.15E-02	3.43E+00	3.79E-02
Propylene oxide	2.96E-02	2.00E-02	4.81E-01	6.88E-02	2.52E-03	1.98E-03	1.32E-01	1.46E-03
Toluene	7.10E-02	4.81E-02	1.15E+00	1.65E-01	6.06E-03	4.75E-03	3.16E-01	3.49E-03
Xylene	2.61E-02	1.77E-02	4.24E-01	6.07E-02	2.23E-03	1.75E-03	1.16E-01	1.28E-03

Notes:

(1) Provided by Ventura County APCD and CATEF databases.

(2) Based on maximum hourly turbine fuel use of 689.2 MMBtu/hr/turbine (with duct burner)
and fuel HHV of 1018 Btu/scf gives 0.6770 MMscf/hr/turbine.

(3) Based on annual turbine fuel use, as calculated in Table 8.1-G1.
4650.2320 MMscf/yr/turbine.

(4) Based on 10 ppm ammonia slip from SCR system.

(5) Polycyclic aromatic hydrocarbons, excluding naphthalene (treated separately).

(6) Modeled impacts: 52.22044 ug/m3 per g/s/turbine (2 turbines @ 1 g/s/turbine), 1-hour average
0.73570 ug/m3 per g/s/turbine (2 turbines @ 1 g/s/turbine), annual average
except ammonia modeled at actual emission rates (includes cooling tower)

Table 8.1-G2b Calculation of noncriteria pollutant emissions for Roseville Alstom GTX 100 Turbines/Duct Burners

	Calculation of Noncriteria Pollutant Emissions from Gas Turbines (each turbine)				Emission Rates for Modeling (g/s each turbine)		Modeled Impacts ug/m3 (6)	
Compound	Emission Factor, lb/MMscf (1)	Maximum Hourly Emissions, lb/hr/tur (2)	Maximum Daily Emissions, lb/day/tur	Annual Emissions, ton/yr/tur (3)	One-hour g/s/turbine	Annual g/s/turbine	One-hour ug/m3	Annual ug/m3
Acetaldehyde	4.08E-02	2.83E-02	6.78E-01	9.70E-02	3.56E-03	2.79E-03	1.86E-01	2.05E-03
Acrolein	3.69E-03	2.56E-03	6.14E-02	8.77E-03	3.22E-04	2.52E-04	1.68E-02	1.86E-04
Ammonia	(4)	9.50E+00	2.28E+02	3.80E+01	1.197	1.09E+00	5.46E+01	6.28E-01
Benzene	3.33E-03	2.31E-03	5.54E-02	7.92E-03	2.91E-04	2.28E-04	1.52E-02	1.68E-04
1,3-Butadiene	1.27E-04	8.80E-05	2.11E-03	3.02E-04	1.11E-05	8.69E-06	5.79E-04	6.39E-06
Ethylbenzene	1.79E-02	1.24E-02	2.98E-01	4.26E-02	1.56E-03	1.22E-03	8.16E-02	9.01E-04
Formaldehyde	1.10E-01	7.62E-02	1.83E+00	2.62E-01	9.60E-03	7.52E-03	5.01E-01	5.54E-03
Hexane	2.59E-01	1.79E-01	4.31E+00	6.16E-01	2.26E-02	1.77E-02	1.18E+00	1.30E-02
Naphthalene	1.33E-03	9.21E-04	2.21E-02	3.16E-03	1.16E-04	9.10E-05	6.06E-03	6.69E-05
PAHs (5)	1.65E-04	1.14E-04	2.74E-03	3.92E-04	1.44E-05	1.13E-05	7.51E-04	8.29E-06
Propylene	7.70E-01	5.33E-01	1.28E+01	1.83E+00	6.72E-02	5.27E-02	3.51E+00	3.87E-02
Propylene oxide	2.96E-02	2.05E-02	4.92E-01	7.04E-02	2.58E-03	2.02E-03	1.35E-01	1.49E-03
Toluene	7.10E-02	4.92E-02	1.18E+00	1.69E-01	6.20E-03	4.86E-03	3.24E-01	3.57E-03
Xylene	2.61E-02	1.81E-02	4.34E-01	6.21E-02	2.28E-03	1.79E-03	1.19E-01	1.31E-03

Notes:

(1) Provided by Ventura County APCD and CATEF databases.

(2) Based on maximum hourly turbine fuel use of 705.3 MMBtu/hr/turbine (with duct burner)
and fuel HHV of 1018 Btu/scf gives 0.6928 MMscf/hr/turbine.

(3) Based on annual turbine fuel use, as calculated in Table 8.1-G1.
4755.1522 MMscf/yr/turbine.

(4) Based on 10 ppm ammonia slip from SCR system.

(5) Polycyclic aromatic hydrocarbons, excluding naphthalene (treated separately).

(6) Modeled impacts: 52.22044 ug/m3 per g/s/turbine (2 turbines @ 1 g/s/turbine), 1-hour average
0.73570 ug/m3 per g/s/turbine (2 turbines @ 1 g/s/turbine), annual average
except ammonia modeled at actual emission rates (includes cooling tower)

Table 8.1-G3. Calculation of noncriteria pollutant emissions from REP cooling tower [1].

	Calculation of Noncriteria Pollutant Emissions from Cooling Tower (all cells)					Emission Rates for Modeling (g/s each cell)		Modeled Impacts ug/m3 (2)	
Constituent	Concentration in Cooling Tower Return Water *		Maximum Hourly Emissions, lb/hr	Maximum Daily Emissions, lb/day	Annual Emissions, ton/yr	One-hour g/s/cell	Annual g/s/cell	One-hour ug/m3	Annual ug/m3
Arsenic	0.025	ppm	1.75E-08	4.20E-07	7.67E-08	5.51E-10	5.51E-10	1.54E-07	1.84E-08
Cadmium	0.001	ppm	7.00E-10	1.68E-08	3.07E-09	2.21E-11	2.21E-11	6.15E-09	7.34E-10
Chromium	0.006	ppm	4.20E-09	1.01E-07	1.84E-08	1.32E-10	1.32E-10	3.69E-08	4.41E-09
Copper	0.0245	ppm	1.72E-08	4.12E-07	7.51E-08	5.40E-10	5.40E-10	1.51E-07	1.80E-08
Lead	0.005	ppm	3.50E-09	8.40E-08	1.53E-08	1.10E-10	1.10E-10	3.08E-08	3.67E-09
Mercury	0	ppm	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nickel	0.0115	ppm	8.05E-09	1.93E-07	3.53E-08	2.54E-10	2.54E-10	7.07E-08	8.44E-09
Silver	0.00007	ppm	4.90E-11	1.18E-09	2.15E-10	1.54E-12	1.54E-12	4.31E-10	5.14E-11
Zinc	0.23	ppm	1.61E-07	3.86E-06	7.05E-07	5.07E-09	5.07E-09	1.41E-06	1.69E-07

Notes:
(1) Emissions calculated from maximum total drift rate of 0.70 lb/hr for 4 cells
(2) Modeled impacts: 279.00970 ug/m3 per g/s/cell (1 g/s/cell), 1-hour average
33.30345 ug/m3 per g/s/cell (1 g/s/cell), annual average

* Based on water quality parameters in Section 8.15 of the AFC and 5 cycles

Table 8.1-G4. Calculation of noncriteria pollutant emissions for auxiliary boiler

Calculation of Noncriteria Pollutant Emissions from Auxiliary Boiler					Emission Rates for Modeling (g/s)	
Compound	Emission Factor, lb/MMscf (1)	Maximum Hourly Emissions, lb/hr(2)	Maximum Daily Emissions, lb/day	Annual Emissions, ton/yr (3)	One-hour g/s	Annual g/s
Acetaldehyde	4.08E-02	2.32E-03	5.58E-02	1.16E-03	2.93E-04	3.33E-05
Acrolein	3.69E-03	2.10E-04	5.05E-03	1.05E-04	2.65E-05	3.01E-06
Benzene	3.33E-03	1.90E-04	4.55E-03	9.44E-05	2.39E-05	2.72E-06
1,3-Butadiene	1.27E-04	7.24E-06	1.74E-04	3.60E-06	9.12E-07	1.04E-07
Ethylbenzene	1.79E-02	1.02E-03	2.45E-02	5.08E-04	1.29E-04	1.46E-05
Formaldehyde	1.10E-01	6.27E-03	1.50E-01	3.12E-03	7.90E-04	8.97E-05
Hexane	2.59E-01	1.48E-02	3.54E-01	7.34E-03	1.86E-03	2.11E-04
Naphthalene	1.33E-03	7.58E-05	1.82E-03	3.77E-05	9.55E-06	1.08E-06
PAHs (4)	1.65E-04	9.39E-06	2.25E-04	4.67E-06	1.18E-06	1.34E-07
Propylene	7.70E-01	4.39E-02	1.05E+00	2.18E-02	5.53E-03	6.28E-04
Propylene oxide	2.96E-02	1.69E-03	4.05E-02	8.39E-04	2.12E-04	2.41E-05
Toluene	7.10E-02	4.05E-03	9.71E-02	2.01E-03	5.10E-04	5.79E-05
Xylene	2.61E-02	1.49E-03	3.57E-02	7.40E-04	1.87E-04	2.13E-05

Notes:

(1) Provided by Ventura County APCD and CATEF databases.

(2) Based on maximum hourly fuel use of 58 MMBtu/hr
and fuel HHV of 1018 Btu/scf gives 0.0570 MMscf/hr

(3) Based on annual operating schedule for the auxiliary boiler.
56.7150 MMscf/yr

(4) Polycyclic aromatic hydrocarbons, excluding naphthalene (treated separately).

Table 8.1G-5. Summary of excess lifetime cancer risks for the Maximum Impact Receptor.

	Increased Lifetime Cancer Risk by Exposure Pathway				
Emission Source	**Inhalation of Ambient Air**	**Soil Ingestion**	**Dermal Contact with Soil**	**Ingestion of Garden Fruits and Vegetables**	**Infant Ingestion of Mother's Milk[b]**
Total Pathway Risk (Combustion Sources[a] and Cooling Tower)	2.80E-08	8.12E-09	5.16E-09	1.97E-08	1.34E-08
Total Risk	0.0743 in one million (70-year exposure)				

Note: [a]Combustion sources include turbines and duct burners.
[b]Mother's milk risk derived from 44-year exposure scenario.

Table 8.1-G6. Summary of chronic non-cancer hazard quotients (inhalation exposure pathway) for the Maximum Impact Receptor.

	Target Organ[a]							
Emission Source	**Resp**	**CV/BL**	**CNS**	**Skin**	**Repro**	**Kidn**	**GI/LV**	**Immun**
Combustion Sources[b] and Cooling Tower	0.006	<0.0001	<0.0001	0.0043	<0.0001	<0.0001	<0.0001	-
Total, All Pathways	<0.0108	-	-	-	-	-	-	-

[a]Resp = respiratory
[b]Combustion sources include turbines and duct burners
CV/BL = cardiovascular/blood, CNS = central nervous system, Repro = reproductive system, Kidn = renal system, GI/LV = gastrointestinal/liver, Immun = immunological system

Table 8.1G-7. Summary of chronic non-cancer hazard quotients (non-inhalation exposure pathway) for the Maximum Impact Receptor.

Chemical	**Total dose (mg/kg-d) Combustion Sources and Cooling Tower**	**REL[a] (mg/kg-d)**	**Hazard Quotient (Total Dose/REL)**
Naphthalene	2.36E-08	-	-
PAH (as BaP)	2.75E-09	-	-
Arsenic	2.15E-12	3.00E-04	7.17E-09
Cadmium	1.04E-13	5.00E-04	2.08E-10
Lead	4.32E-13	-	-
Chromium 6	5.99E-13	2.00E-02	2.99E-11

[a]REL - non-cancer Reference Exposure Level

Table 8.1G-8. Summary of acute noncancer hazard quotients for the Maximum Impact Receptor.

	Target Organ[a]							
Emission Source	**Resp**	**CV/BL**	**CNS**	**Eye**	**Repro**	**Kidn**	**GI/LV**	**Immun**
Combustion Sources[b] and Cooling Tower	0.2334	<0.0001	<0.0001	0.2334	0.0001	-	-	0.0013
Total Acute Hazard Quotient	<0.4684	-	-	-	-	-	-	-

[a]Resp = respiratory
[b]Combustion sources include turbines and HRSG duct burner
CV/BL = cardiovascular/blood, CNS = central nervous system, Repro = reproductive system, Kidn = renal system
GI/LV = gastrointestinal/liver, Immun = immunological system

Table 8.1G-9. Risk assessment comparison for two turbine options.

Risk Parameter	LM6000 Turbines w/Cooling Tower	GTX100 Turbines w/Cooling Tower
Acute Inhalation Hazard Index	0.468	0.4684
Chronic Inhalation Hazard Index	0.0105	0.0108
Cancer Rate per Million	0.0713	0.0743

Table 8.1-G10. Regional air toxics data[1]

Toxic Pollutant	Emissions Tons/yr	Average Annual Concentration	Health Risk Range per Million
Acetaldehyde	95	0.25-0.96 ppb	1-5
Benzene	269	0.44-0.91 ppb	40-84
1-3 Butadiene	50	0.11-0.19 ppb	40-73
Carbon Tetrachloride	0	0.08-0.10 ppb	20-26
Hex Chromium	0.0073	0.10-0.19 ng/m^3	15-29
Para-Dichlorobenzene	9	0.10-0.28 ppb	7-19
Formaldehyde	230	1.71-2.52 ppb	13-19
Methylene Chloride	61	0.50-0.82 ppb	2-3
Perchloroethylene	103	0.05-0.07 ppb	2-3
Diesel PM	166	ND ug/m^3	ND

[1] Data is for the portion of Placer County within the Sacramento Valley Air Basin

Table 8.1-G11. HRA screening results from the Rio Linda/Elverta Power Project.

HRA Screening Category	HRA Screening Result
Cancer Risk	0.345 per million
Cancer Burden	ND
Acute Inhalation Hazard Index	0.209
Chronic Inhalation Hazard Index	0.0278
Chronic Non-Inhalation Hazard Index	ND

Table 8.1-G12. Sensitive receptors within six miles of the Roseville Energy Park.

Facility	Address	City	Mi. to REP
Senior Centers			
Sun City Roseville	7050 Del Webb Boulevard	Roseville	2.2
Cordia Senior Residence	5161 Foothills Drive	Roseville	4.6
Day Care/Preschool			
Adventure Clubs	1250 Canevari Drive	Roseville	3.0
Heritage Park Pre-School	1098 Woodcreek Oaks, Blvd #201	Roseville	3.5
Childtime Children's Center	1267 Pleasant Grove Boulevard	Roseville	3.7
Merryhill Country Schools	1370 Baseline Road	Roseville	4.4
Roseville Adventure Clubs	2271 Americana Drive	Roseville	4.5
Antelope Preschool	8725 Watt Avenue	Antelope	4.5

Table 8.1-G12. Sensitive receptors within six miles of the Roseville Energy Park.

Facility	Address	City	Mi. to REP
Kinder Care Learning Center	5141 Foothills Boulevard	Roseville	4.5
Adventure Clubs	250 Trestle Road	Roseville	4.7
Sunrise Kids Club Oakhill	3909 N Loop Blvd	Antelope	5.0
Adventure Clubs	1040 Main Street	Roseville	5.0
Antelope Meadows Sunrise Kids	8343 Palmerson Drive	Antelope	5.1
Street John's Christian School	1090 Main Street	Roseville	5.2
Adventure Clubs	2955 PFE Road	Roseville	5.2
Happy Hearts Home Daycare	907 Lawtone Ave	Roseville	5.2
Adventure Clubs	1071 Trehowell Drive	Roseville	5.3
Arthur Dudley Child Devel.Center	8000 Aztec Way	Antelope	5.3
Roseville Community Pre-school	50 Corporation Yard Road	Roseville	5.4
Phoenix Schools	1071 Trehowell Drive	Roseville	5.4
Phoenix Schools	4110 Skyland Court	Antelope	5.5
Adventure Clubs	515 Niles Avenue	Roseville	5.6
Adventure Clubs	699 Shasta Street	Roseville	5.8
Head Start	201 N Grant Street	Roseville	5.8
Cyril Spinelli Child Devel. Center	3401 Scotland Drive	Antelope	5.9
North Country Child Devel. Ctr	3901 Little Rock Drive	Antelope	5.9
Elementary Schools			
Coyote Ridge Elementary School	1751 Morningstar Drive	Roseville	2.7
Quail Glen Elementary School	1250 Canevari Drive	Roseville	3.0
Antelope View Charter School	8725 Watt Avenue	Antelope	4.4
Heritage Oak Elementary School	2271 Americana Drive	Roseville	4.5
Antelope Meadows Elementary	8343 Palmerson Drive	Antelope	4.6
Brown Grammar School	250 Trestle Road	Roseville	4.7
Dry Creek Elementary School	2955 PFE Road	Roseville	5.0
Oak Hill Elementary School	3909 N Loop Road	Antelope	5.1
Street John's Christian School	1090 Main Street	Roseville	5.2
Kaseberg Elementary School	1040 Main Street	Roseville	5.2
Dudley Elementary School	8000 Aztec Way	Antelope	5.3
Rock Creek Elementary School	2140 Collet Quarry Drive	Rocklin	5.4
Cathryn Gates School	1051 Trehowell Drive	Roseville	5.5
Woodbridge Elementary School	515 Niles Avenue	Roseville	5.6
Roseville Community School	800 All America City Blvd	Roseville	5.6
Spanger School	699 Shasta Street	Roseville	5.8
Olive Grove Elementary School	7926 Firestone Way	Antelope	5.9
Spinelli Elementary School	3401 Scotland Drive	Antelope	5.9
North Country Elementary School	3901 Little Rock Drive	Antelope	5.9
Middle Schools			
Cooley Middle School	9300 Prairie Woods Way	Roseville	2.7

Table 8.1-G12. Sensitive receptors within six miles of the Roseville Energy Park.

Facility	Address	City	Mi. to REP
Silverado Middle School	2525 Country Club Drive	Roseville	3.9
Buljan School	100 Hallissey Drive	Roseville	4.4
Center Junior High School	3243 Center Court Lane	Antelope	4.8
Antelope Crossing Middle School	9200 Palmerson Drive	Antelope	5.6
Alpha Intermediate School	8920 Elwyn Avenue	Elverta	6.3
High Schools			
Woodcreek High School	2551 Woodcreek Oaks Boulevard	Roseville	3.5
Mc Clellan High School	8725 Watt Avenue	Antelope	4.6
Center High School	3111 Center Court Lane	Antelope	4.9
Other			
BIP Program	1263 Pleasant Grove Blvd #100	Roseville	3.6

Roseville Energy Park

Appendix 8.1-H
Air Quality Impact Analysis

October 2003

Roseville Energy Park
Application for Certification

October 27, 2003

Mr. John Finnell
Placer County Air Pollution Control District
11464 B Avenue
Auburn, CA 95603

Subject: Modeling Protocol for the Roseville Energy Park

Dear Mr. Finnell:

In October of this year, the City of Roseville will apply to the Placer County air Pollution Control District (APCD) for an Authority to Construct and a Determination of Compliance for a nominal 160 MW power generating facility to be sited on property owned by the City of Roseville, located just north of Phillip Road in Placer County. The project, called the Roseville Energy Park, will be a major new source as defined by the District's Siting Regulations, and will be subject to District requirements for air quality modeling analyses for toxics. The proposed project will not be subject to PSD. Attached for your review and approval is a description of the analytical approach that will be used to comply with District modeling requirements for the project. We intend to file the application with the District in October 2003.

We look forward to working with you. If you have any questions, please do not hesitate to call me at (805) 569-6555. Thank you for your attention in this matter.

Sincerely,
ATMOSHPERIC DYNAMICS

Gregory Darvin

cc:

Joe Loyer, CEC
Doug Davy, TTFW

Roseville Energy Park
Modeling Protocol

The City of Roseville, through its municipal electrical department, intends to develop, construct, and operate a base load power plant near Phillips Road in Placer County. The proposed project, called the Roseville Energy Park, will consist of two (2) natural gas-fired combustion turbine-generators (CTs) with supplementary-fired heat recovery steam generators (HRSGs) and one steam turbine-generator (STG), with a total nominal net generating capacity of 160 MW. The combustion turbines are expected to be either GE LM6000 PC Sprint machines or Alstom GTX100. A four-cell wet cooling tower will also be installed to provide cooling water for the steam turbine condenser. Additionally, auxiliary equipment such as one auxiliary boiler, one diesel emergency generator, and one diesel engine-driven fire pump will be installed at the site.

The proposed project will be a minor new source under the Placer County APCD regulations (Rule 502).

The applicant will submit air quality impact analyses to both the Placer County APCD and the California Energy Commission (CEC). The modeling analysis will include impact evaluations for those pollutants shown in Table 1 and the CEC requirements for evaluation of project air quality impacts. The purpose of this document is to establish the procedure for meeting the Placer County APCD and CEC air quality modeling requirements for the proposed project.

Table 1
Placer County APCD Major Source Significant Emissions Thresholds

Pollutant	Cumulative Increase (tons/yr)
NO_x	50
ROC	50
CO	100
PM_{10}	100

The project is expected to result in emissions that will not exceed the Placer County APCD major source significance thresholds for oxides of nitrogen (NO_x), reactive organic compounds (VOC), carbon monoxide (CO), and fine particulate matter (PM_{10}). Furthermore, emissions of sulfur dioxide (SO_2) are expected to be below the significance levels. The project will trigger CEC modeling requirements for cumulative and construction-based impacts.

The project will trigger the Placer County offset requirements for NO_x, ROC, and PM_{10} as emissions of other criteria pollutants are below the offset trigger levels or will be below modeled significance levels. As part of the minor source permit application, an air quality, toxics, and cumulative impacts analysis is required. Modeled ambient impacts are expected to be below the levels at which preconstruction monitoring is required. The results of these analyses will be presented in detail in the AFC and the application for a Determination of Compliance.

This modeling protocol outlines the proposed use of air dispersion modeling techniques that will be used to assess impacts from the proposed source, and has been prepared by Atmospheric Dynamics on behalf of REP. This protocol also follows modeling guidance provided by the U.S. Environmental Protection Agency (USEPA) in its "*Guideline on Air Quality Models*" (including supplements), the National Park Service's "*Permit Application Guidance for New Air Pollution Sources*" (Bunyak, 1993), the Federal Land Managers' "*Air Quality Related Values Workgroup (FLAG) Draft Phase I Report*" (October 1999), and the "*Interagency Workgroup on Air Quality Modeling (IWAQM) Phase II Recommendations*" (1998), as well as Placer County APCD modeling guidance.

Project Location

The proposed project site is located on property adjacent to Phillips Road in Placer County. The UTM coordinates of the site are 640496.9 meters easting, 4294857.2 meters northing. The nominal site elevation is approximately 85 feet above mean sea level. See Figure 1.

PROPOSED EMISSION SOURCES

The primary emission sources at REP will be two (2) natural gas-fired turbine electric generators, each equipped with a supplementary-fired HRSG that will have the potential to fire up to ~689 MMBtu/hour. The project will also consist of one 4-cell cooling tower. The turbines, and HRSG duct burners will be fired with pipeline quality natural gas only. The turbines/HRSGs will utilize advanced combustion designs and emission controls to limit emissions of NO_x to 2.0 ppmvd (1-hour average), VOC emissions will be limited to 2.0 ppm (3-hour average), and CO will be limited to 4 ppmvd (3-hour average). Emissions of PM_{10} and SO_2 will be kept to a minimum through the exclusive use of natural gas. Additionally, high-efficiency drift eliminators (0.0005%) will minimize emissions of PM_{10} from the cooling tower.

EXISTING METEOROLOGICAL AND AIR QUALITY DATA

Meteorological data to be used in the air quality impacts assessment was derived from the McClellan Air Force Base for the following years: 1992-1996. This data has been approved for use by the Placer County APCD for a larger project located at the same site.

Several SLAMS/NAMS air quality monitoring stations exist in the regional vicinity of the proposed facility site. Data from these stations, as follows, will be used to establish background air quality levels for the proposed project:

Name	Data Length	Pollutants Monitored
North Highlands	2000-2002	Ozone, CO, NO_2, SO_2, PM_{10}
Roseville	2000-2002	Ozone, CO, NO_2, PM_{10}
Rocklin	2000-2002	Ozone, PM_{10}

Terrain in the vicinity of the project site is as follows.

- Within several miles of the project site the terrain is essentially flat with elevations ranging from sea level to 300 ft. amsl.
- Significant terrain features (above stack height) occurs towards the east and southeast at distances starting at six miles

All terrain data will be derived from USGS 7.5 min topographic and Digital Elevation Model (DEM) maps.

Air flow patterns in the region can be characterized by season as follows.

Spring (March through May) – Flow across the proposed site is from the south-southeast.

Summer (June through August) – Flow across the site and this portion of the Sacramento Valley is from the south-southeast.

Fall (September through November) – Flow across the site and this portion of the Sacramento Valley is from the southeast with similar occurrences of winds from the north-northwest.

Winter (December through February) – Flow across the site is predominantly southeasterly.

Figure 2 delineates the wind flow regime data on an annual basis for the years 1992-1996.

Preliminary background air quality data for the project site is delineated in Tables 3 through 7.

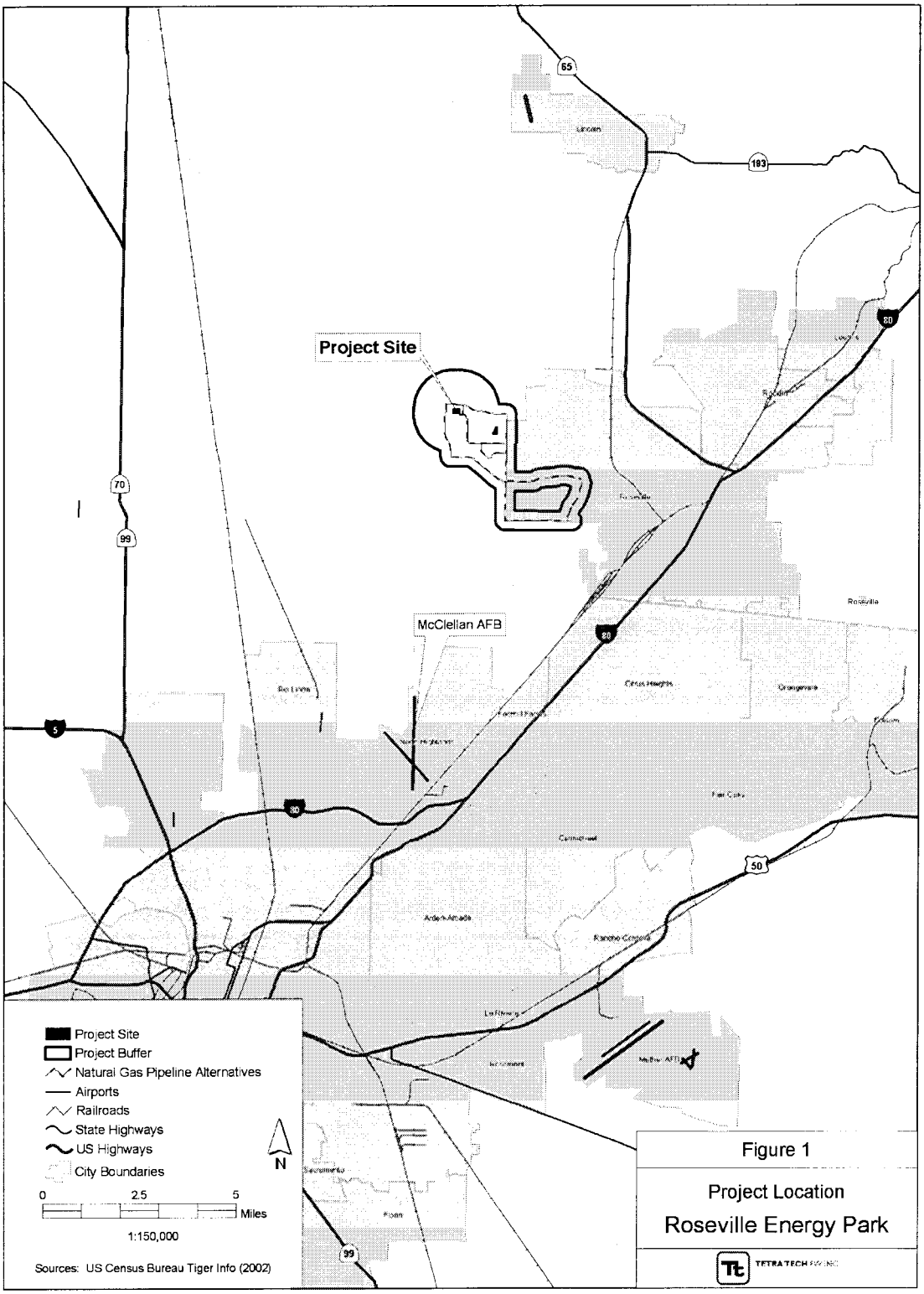
Project Site
McClellan AFB
Roseville
Project Site
Project Buffer
Natural Gas Pipeline Alternatives
Airports
Railroads
State Highways
US Highways
City Boundaries
N
0
2.5
5
Miles
1:150,000
Sources: US Census Bureau Tiger Info (2002)
Figure 1
Project Location
Roseville Energy Park
TETRA TECH

Figure 2
McClellan Air Force Base
Annual Wind Rose (1992-1996)

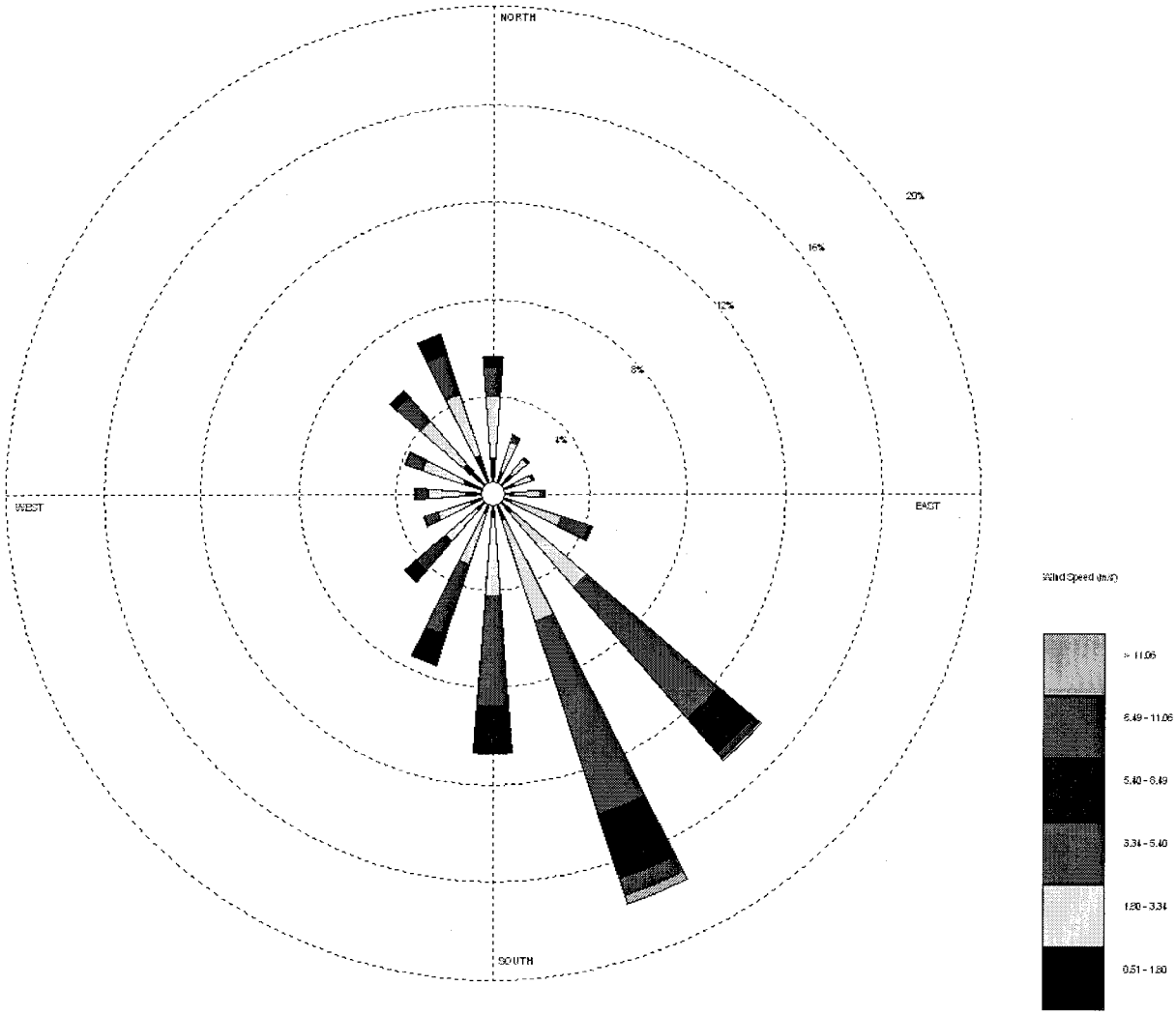

Table 3 Ambient ozone levels: 2000-2002 (ppm)

	North Highlands Air Monitoring Station			Roseville Air Monitoring Station			Rocklin Air Monitoring Station		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
Maximum 1-hour average (ppm)	0.12	0.132	0.123	0.128	0.122	0.131	0.118	0.128	0.135
Maximum 8-hour average	0.100	0.094	0.101	0.1	0.102	0.105	0.098	0.097	0.111

1 – The California 1-hour O_3 ambient air quality standard is 0.09 ppm.
2 – The Federal 1-hour O_3 ambient air quality standard is 0.12 ppm.
ppm = parts per million.

Table 4 Ambient nitrogen dioxide levels: 2000-2002 (ppm)

	North Highlands Air Monitoring Station			Roseville Air Monitoring Station			Rocklin Air Monitoring Station		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
Maximum 1-hour average	0.085	0.075	0.067	0.097	0.093	0.082	NA	NA	NA
Annual average	0.014	0.014	0.015	0.017	0.015	0.016	NA	NA	NA

1 – All hourly and annual average concentrations are below the state and federal NO_2 ambient air quality standards.
ppm = parts per million.
ND = no data availablefor this pollutant.

Table 5 Ambient carbon monoxide levels: 2000-2002 (ppm)

	North Highlands Air Monitoring Station			Roseville Air Monitoring Station			Rocklin Air Monitoring Station		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
Maximum 1-hour average[1]	4.1	4.4	3.7	3.2	3.1	4.6	NA	NA	NA
Maximum 8-hour average[2]	3.1	3.1	3.1	2.4	1.9	2.8	NA	NA	NA

1 – All 1-hour concentrations are below the California CO ambient air quality standard of 20 ppm and the federal CO ambient air quality standard of 35 ppm.
2 – All 8-hour concentrations are below the California and federal CO ambient air quality standards of 9.0 ppm.
ppm = parts per million.
NA = no data available for this pollutant.

Table 6 Ambient sulfur dioxide levels: 2000-2002 (ppm)

	North Highlands Air Monitoring Station			Roseville Air Monitoring Station			Rocklin Air Monitoring Station		
	2000	2001	2002	2000	2001	2002	2000	2001	2002
Maximum 1-hour average[1]	0.013	0.014	0.019	NA	NA	NA	NA	NA	NA
Maximum 3-hour Average[2]	0.008	0.012	0.011	NA	NA	NA	NA	NA	NA
Maximum 24-hour average[3]	0.005	0.011	0.009	NA	NA	NA	NA	NA	NA
Annual average[4]	0.002	0.002	0.002	NA	NA	NA	NA	NA	NA

1 – All 1-hour average concentrations are below the California SO_2 ambient air quality standard of 0.25 ppm.
3 – All 24-hr concentrations are below the California SO_2 ambient air quality standard of 0.04 ppm and the federal ambient air quality standard of 0.14 ppm.
2 – All 3-hour average concentrations are below the federal SO_2 ambient air quality standard of 0.5 ppm.
4 – All annual arithmetic mean concentrations are below the federal SO_2 ambient air quality standard of 0.03 ppm (80 $\mu g/m^3$).
ppm = parts per million.
ND = no data for this pollutant.

Table 7 Ambient particulate (<10 μm) levels: 2000-2002 (μg/m³)

	North Highlands Air Monitoring Station			Roseville Air Monitoring Station			Rocklin Air Monitoring Station		
	2000	**2001**	**2002**	**2000**	**2001**	**2002**	**2000**	**2001**	**2002**
Maximum 24-hour average	82	64	3	58	59	58	46	57	93
Annual mean[3]	23	23	25	24	24	25	21	21	22

1 – All 24-hour concentrations are below the federal PM_{10} ambient air quality standard of 150 μg/m³.

2 – All annual mean concentrations should be compared to the federal PM_{10} ambient air quality standard of 50 μg/m³.

μg/m³ = micrograms per cubic meter.

SITE REPRESENTATION

USEPA defines the term "on-site data" to mean data that would be representative of atmospheric dispersion conditions at the source and at locations where the source may have a significant impact on air quality. Specifically, the meteorological data requirement originates in the Clean Air Act at section 165(e)(1). Section 165(e)(1) defines on-site meteorology as the collection "of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under [the Act] which will be emitted from such facility."

This definition and USEPA's guidance on the use of on-site monitoring data are also outlined in the "*On-Site Meteorological Program Guidance for Regulatory Modeling Applications*" (1987). The representativeness of the data is dependent upon (a) the proximity of the meteorological monitoring site to the area under consideration, (b) the complexity of the topography of the area, (c) the exposure of the meteorological sensors, and (d) the period of time during which the data are collected. As discussed below, we believe the meteorological data from McClellan Air Force Base satisfy the definition of on-site data.

The annual average distribution of wind speed and direction near the site of the proposed REP project is shown in Figure 2. The wind rose is based on meteorological data collected during the period from 1992 to 1996 at McClellan Air Force Base (AFB) in Sacramento. The overall predominant wind patterns for this portion of the Sacramento Valley is consistent with the wind patterns shown in the data for McClellan AFB.

Prevailing winds in the local region are south to southeasterly (except during November when the prevailing winds are from the north-northwest). Steep air pressure gradients occasionally form to the north, resulting in air flow to the south. As the air descends higher-altitude mountains to the north of the valley, the air warms. The warm, drying northerly winds can result in some of the hottest weather extremes of the summer. These winds occur infrequently. If the wind pattern occurs during the winter season, it usually brings comparatively warm, drying winds. The

unstable conditions that lead to these winds typically are followed within a few days by the normal south-southeasterly flows (Ruffner, 1977).

During the winter months the passage of frontal storm systems will sometimes bring high wind speed conditions. With the exception of November, the prevailing wind direction is predominantly from the south and south-southeast.

The attached windrose (Figure 2) for McClellan AFB indicates a good level of consistency of southerly winds as well as reinforcing the general seasonal wind patterns discussed earlier. Thus, use of the McClellan AFB to represent the project site wind speed, wind direction, and temperature would be considered representative with respect to the calculation of potential impacts from the project.

The area surrounding the project site can be characterized as rural. Areas within three (3) kilometers of the project site are predominately undeveloped agricultural areas. In accordance with the Auer land use classification methodology (USEPA's "*Guideline on Air Quality Models*"), land use within the area circumscribed by a three km radius around the modified facility is greater than 50 percent rural. Therefore, in the modeling analyses supporting the permitting of the facility, rural coefficients will be assigned.

Representativeness has also been defined in the "*Workshop on the Representativeness of Meteorological Observations*" (Nappo et. al., 1982) as "the extent to which a set of measurements taken in a space-time domain reflects the actual conditions in the same or different space-time domain taken on a scale appropriate for a specific application." Judgments of representativeness should be made only when sites are climatologically similar, as the project site and McClellan AFB clearly are. Representativeness has also been defined in the PSD Monitoring Guideline as data that characterize the air quality for the general area in which the proposed project would construct and operate. The same large-scale topographic features that influence McClellan AFB monitoring station also influence the proposed project site in the same manner.

In determining the representativeness of McClellan AFB relative to the project site, the following considerations were addressed.

Aspect ratio of terrain, which is the ratio of height to width of hill at base - There are no major terrain features either near the proposed project site or McClellan AFB that would modify (influence) the prevailing wind pattern that is characteristic of this region of the Valley. The elevations of the project site and McClellan AFB are essentially the same.

Slope of terrain - Terrain in the immediate vicinity of the project site and McClellan AFB are relatively flat.

Ratio of terrain height to stack/plume height –Terrain above the stack height is located at least 7.5 miles or more from the project site towards the east and southeast.

Final plume height (stack height plus plume rise) was calculated for D stability and a wind speed of 5 meter/second (m/s) to be about 210 meters. While complex and/or intermediate terrain occurs at significant distances from the project site, impacts in these areas are expected to be minimal. Based upon the flat terrain surrounding the project site, along with most maximum impact(s) being driven by downwash, terrain will not drive the final modeling results. Thus, it is expected that no impacts in complex or intermediate terrain will be identified.

Correlation of terrain features to prevailing meteorological conditions - As discussed earlier, the orientation and aspect of terrain in the project area correlates well with the prevailing wind fields as identified by the McClellan AFB windrose, with little to no apparent influence by local terrain perturbations (such as small land outcroppings). Wind flow at McClellan AFB would therefore be nearly identical to the project site.

Thus, it is our assessment that the meteorological data collected at McClellan AFB are identical to the dispersion conditions at the project site and to the regional area. The windroses do not indicate any overwhelming effects on the potential dispersion of pollutants from the project site on a regional scale from influences other than the general influence of the large-scale valley orientation. Because of the distances to the complex terrain features, it is likely that all short-term and annual impacts will occur in the immediate vicinity of the project site. Thus, the data set would satisfy the definition of on-site data, as defined in the PSD Monitoring Guidelines (1990) and the On-site Meteorological Program Guidance for Regulatory Modeling Applications (1987).

The five (5) years of meteorological data for McClellan AFB were obtained from the Placer County APCD for the years 1992-1996. The data set includes all the necessary parameters required for the ISCST3 dispersion modeling analyses (i.e., wind speed and direction, temperature, stability, and mixing height). The data will not be modified in anyway.

As described above, recent maximum air quality data from the surrounding SLAMS/NAMS monitoring stations will be used to represent ambient concentrations of O_3, NO_x, NO_2, CO, SO_2, PM_{10}, and sulfates. These data are expected to be conservative for estimating baseline concentrations in the project vicinity, since they are taken from locations closer to emission sources than is the project site. For state and federal attainment pollutants with maximum modeled ground-level impacts greater than USEPA-defined significance levels, modeled

concentrations will be added to these representative maximum background concentrations to determine compliance with the CAAQS and NAAQS.

AIR QUALITY DISPERSION MODELS

Overview

Several USEPA dispersion models are proposed for use to quantify pollutant impacts on the surrounding environment based on the emission sources operating parameters and their locations. The models proposed for use are Building Profile Input Program (BPIP, current version 95086), Industrial Source Complex - Short Term (ISCST3, current version 02035), ISC-PRIME (Plume Rise Model Enhancements, version 98069), and SCREEN3. These models, along with options for their use and how they are used, are discussed below. These models will be used for the following:

- Comparison of impacts to significant impact levels;
- Comparison of impacts to monitoring significance thresholds;
- Compliance with AAQS;
- Cumulative impacts analysis; and

Simple, Complex, and Intermediate Terrain Impacts

For modeling the project in simple, complex, and intermediate terrain, the ISCST3 model will be used with five (5) years of hourly meteorological data from McClellan AFB for 1992-1996. The ISCST3 model is a steady-state, multiple-source, Gaussian dispersion model designed for use with stack emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources. The ISCST3 model requires hourly meteorological data consisting of wind vector, wind speed, temperature, stability class, and mixing height. The model assumes that there is no variability in meteorological parameters over a 1-hour time period, hence the term steady-state. The ISCST3 model allows input of multiple sources and source groupings, eliminating the need for multiple model runs. Complex phenomena such as building-induced plume downwash are treated in the ISCST3 model.

The ISCST3 model was selected due in part to the flat terrain surrounding the project site, and is one of several models that are recommended by the USEPA for such evaluations. The ISCST3 model is capable of calculating pollutant concentrations in intermediate terrain. Intermediate terrain is defined as terrain between stack top and final plume height. In calculating pollutant concentrations in intermediate terrain, the model will select the higher of the simple and complex terrain calculations on an hour-by-hour, source-by-source, and receptor-by-receptor basis. As discussed earlier, intermediate and complex terrain features are present but at distances that range from 8-12 miles from the project site. In addition, the ISCST3 model is preferred for this

application because it incorporates algorithms for the simulation of aerodynamic downwash induced by buildings. These effects are of importance because many of the emission points may be below Good Engineering Practice (GEP) stack height.

Technical options selected for the ISCST3 model are listed below. Use of these options follows the USEPA's (1986, 1987, 1990, and 1994) modeling guidance, Placer County APCD guidance, and/or sound scientific practice. An explanation of these options and the rationale for their selection is provided below.

- Gradual plume rise
- Stack tip downwash
- Default option for temperature gradients, wind profile exponents, and calm processing
- Anemometer height = 7 m;
- Rural dispersion parameters; and
- Elevated receptor terrain heights option.

Final plume rise option does not consider the possible effects of gradual plume rise on ambient concentrations during the rising phase of the plume downwind transport. Gradual plume rise is recommended by USEPA (1986, 1987, 1990, 1994) when downwash effects are to be considered. Buoyancy-induced dispersion, which accounts for the buoyant growth of a plume caused by entrainment of ambient air, will be included because of the relatively warm exit temperature and subsequent buoyant nature of the exhaust plumes. Stack-tip downwash, which adjusts the effective stack height downward following the methods of Briggs (1972) for cases where the stack exit velocity is less than 1.5 times the wind speed at stack top, will be selected per USEPA guidance.

As previously mentioned, based on the land use classification procedure of Auer (1978), land use within the area circumscribed by a three-km radius around the modified facility is greater than 50 percent rural. Therefore, in the modeling analyses supporting the permitting of the facility, rural coefficients will be assigned.

The calm processing option allows the user to direct the program to exclude hours with persistent calm winds in the calculation of concentrations for each averaging period. This option is generally recommended by the USEPA (1986, 1987, 1990, 1994) for regulatory applications. The ISCST3 model recognizes a calm wind condition as a wind speed less than or equal to 1 meter per second and a wind direction equal to that of the previous hour (a wind speed of 0 m/sec is used in the ASCII meteorological data file). The calm processing option in the ISCST3 model will then exclude these hours from the calculation of concentrations.

PRIME Dispersion Model

EPRI sponsored a study to develop and evaluate new, improved plume rise and building downwash algorithms. The downwash algorithms in the existing ISC3 model, currently recommended for regulatory application, were largely developed with data that represented neutral stability, moderate to high wind speeds, winds perpendicular to the building face, and non-buoyant or low buoyancy plumes. Some of the limitations of the ISC3 downwash algorithms are: (1) the location of the stack is not considered; (2) streamline deflection is not considered; (3) there is no linkage between plume material captured by the near wake and far wake concentrations; and (4) large concentrations predicted by ISC3 during light wind speed, stable conditions are not supported by observations. Proper treatment of all of the above factors is considered essential for an improved building downwash model.

The central approach used in ISC-PRIME is to explicitly treat the trajectory of the plume near the building, and to use the position of the stack and plume relative to the building to calculate interactions with the building wake. ISC-PRIME calculates the local slope of the mean streamlines as a function of projected building shape, and coupled with a numerical plume rise model, determines the change in plume centerline location with downwind distance. This incorporates the descent of the air containing the plume material, and rise of the plume relative to the streamlines due to buoyancy or momentum effects. The ISC-PRIME plume rise is computed using a numerical solution of the mass, energy and momentum conservation laws. A key feature of the plume rise calculation is the ability to include vertical wind shear effects, which are important for many buoyant releases from short stacks. Additionally, the wind speed deficit induced by the building is modified as a function of downwind distance from the building. The deficit also leads to increased plume rise from short stacks.

ISC-PRIME calculates enhanced turbulence intensity and velocity deficit values within the wake region. These values are a maximum at the lee wall of the building and decay with the two-thirds power downwind through the wake. Ambient turbulence intensity is inferred from the Briggs dispersion coefficient formulas for rural and urban locations. If the plume is released upwind of the wake, the plume initially grows at the ambient rate, and then plume dispersion in the wake and near field is determined using the enhanced turbulence and velocity deficits. As observed in wind-tunnels, both the horizontal and vertical dispersion coefficients are enhanced in the building wake (this virtually eliminates the suspiciously large predictions by ISC3 during light wind speed, stable conditions which are caused by only enhancing the vertical dispersion coefficient when the stack height is more than 20% higher than the building height). When the turbulence intensity within the wake has decayed to the ambient rate, a virtual source technique is used to transition to the ISC3 dispersion curves.

An additional limitation of ISCST3 is that the model is only valid for the far wake (defined in ISCST3 as the area beyond the lesser of three building heights or building widths). A separate EPA model, SCREEN3, is recommended by EPA for near wake concentrations. However, ISC-

PRIME predicts concentrations in both the near and far wakes. The fraction of the plume captured by the near wake is well-mixed within the near wake. That plume mass is then re-emitted to the far wake as a volume source and added to the uncaptured primary plume. A transition zone between the near and far wakes is used to represent the unsteadiness of the near wake/far wake interface.

ISC-PRIME is proposed for the calculation of impacts that may exceed CAAQS when these exceedances are caused by downwash effects. The advantage in using ISC-PRIME in this situation is that ISC-PRIME explicitly treats the trajectory of the plume near the building and uses the position of the stack and plume relative to the building to calculate interactions with the building wake.

Ambient Ratio Method and Ozone Limiting Method

Annual NO_2 concentrations will be calculated using the Ambient Ratio Method (ARM), adopted in Supplement C to the Guideline on Air Quality Models (USEPA, 1994). The Guideline allows a nationwide default conversion rate of 75% for annual NO_2/NO_x ratios.

Should NO_2 concentrations need to be examined in a more rigorous manner, the Ozone Limiting Method (OLM) will be used. Hourly ozone data collected at the north highlands monitoring station during 2001 are proposed for use in the Ozone Limiting Method to calculate hourly NO_2 concentrations from hourly NO_x concentrations. This year were chosen since it represents the year with the maximum ozone values and would be considered conservative. The Ozone Limiting Method involves an initial comparison of the estimated maximum NO_x concentration and the ambient O_3 concentration to determine which is the limiting factor to NO_2 formation. If the O_3 concentration is greater than the maximum NO_x concentration, total conversion is assumed. If the NO_x concentration is greater than the O_3 concentration, the formation of NO_2 is limited by the ambient O_3 concentration. In this case, the NO_2 concentration is set equal to the O_3 concentration plus a correction factor that accounts for in-stack and near-stack thermal conversion.

EPA's ISC-OLM model will be used to calculate the NO_2 concentration based upon the OLM method. ISC-OLM will be implemented on a plume-by-plume basis (i.e., individual plume). However, for some receptors, a demonstration of plume merging may be made to allow use of the combined source analysis. Plume merging will be demonstrated as follows. The horizontal dispersion of each individual plume, as a function of downwind distance, will be identified using EPA's SCREEN3 dispersion model at the distance to the receptor of interest, under the appropriate meteorology. This value will be compared with half the distance between sources proposed for plume merging. If the horizontal dispersion at the distance to the receptor exceeds half the distance between the sources proposed for merging, then the plumes are assumed to have merged by the time they are transported to the receptor of interest.

Fumigation

The SCREEN3 model will be used to evaluate inversion breakup for all short-term averaging periods (24 hours or less). The methodology outlined in EPA 454/R-92-019 (Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised) will be followed for this analysis.

GOOD ENGINEERING PRACTICE STACK HEIGHT AND DOWNWASH

ISCST3 can account for building downwash effects. Stack locations and heights and building locations and dimensions will be input to BPIP. The first part of BPIP determines and reports on whether a stack is being subjected to wake effects from a structure or structures. The second part calculates direction-dependent "equivalent building dimensions" if a stack is being influenced by structure wake effects. The BPIP output is formatted for use in ISCST3 input files. For ISC-PRIME, the BPIPPRIME input program will be used.

RECEPTOR SELECTION

Receptor and source base elevations will be determined from USGS Digital Elevation Model (DEM) data using the most recent 7½-minute format (i.e., 30-meter spacing between grid nodes). At this time, no 10 meter data exists for this region. All coordinates will be referenced to UTM North American Datum 1927 (NAD27), zone 10. The ISC receptors from the DEM files will be placed exactly on the DEM nodes. Every effort will be made to maintain receptor spacing across DEM file boundaries.

Cartesian coordinate receptor grids will be used to provide adequate spatial coverage surrounding the project area for assessing ground-level pollution concentrations, to identify the extent of significant impacts, and to identify maximum impact locations. A 180-meter resolution coarse receptor grid will be developed and will extend outwards at least 10 km (or more as necessary to calculate the significant impact area). The maximum extent of the significant impact isopleth for any pollutant that triggers PSD review will be used to represent the impact radius.

For the full impact analyses, a nested grid will be developed to fully represent the significance area(s) and maximum impact area(s). This grid will have 30-meter resolution along the facility fenceline and out to one (1) km from the fenceline and 180 meter resolution outwards to 10 kilometers from the site. When maximum or maximum second-highest impacts occur in the 180 meter spaced area, additional refined receptor grids with 30-meter resolution will be placed around the maximum coarse grid impacts and extended out 1,000 meters in all directions. Concentrations within the facility fenceline will not be calculated.

MODELING SCENARIOS

Pollutant emissions to the atmosphere from the proposed facility will occur from combustion of natural gas in each of two (2) identical combustion turbines/HRSGs. Emission rates will be provided by REP and are based on vendor data and additional conservative assumptions of turbine and HRSG performance. REP is considering two different turbine manufacturers and turbine models; GE LM6000 and Alstom GTX100. Both turbine manufacturers will be included in the modeling analysis. Once the final turbine manufacturer has been selected, the APCD will be notified prior to commencement of construction.
Turbine/HRSG emissions and stack parameters, such as flow rate and exit temperature, exhibit some variation with ambient temperature and operating load. In order to calculate the worst-case air quality impacts, a screening analysis will be performed to evaluate each operating scenario (based on operating load with and without HRSG firing and atmospheric conditions) to predict the worst-case facility configuration on a pollutant-specific basis.

In the modeling analysis, maximum impacts will be predicted for maximum (100%) and reduced load conditions. In addition, different ambient temperatures will be evaluated for each load condition. Each of these conditions has unique performance characteristics that affect plume dispersion and thus predicted impacts. This analysis is most relevant to analyses for short-term impacts. Annual impacts will be evaluated based on expected turbine performance at an ambient temperature representative of the project site. The temperatures and humidity levels selected for the short-term screening analyses will closely reflect the range of possible site characteristics. The results of this screening analysis will be used to select the worst-case operational scenarios for the modeling analyses in order to provide maximum operating flexibility. Refined modeling for the permit application will be based on these worst-case scenarios.

The screening modeling will use one complete year of meteorological data and the nested receptor grid described above to determine the worst-case source configuration (i.e., configuration that produces maximum facility impacts). This worst-case source configuration will then be executed with all five (5) years of meteorological data and, if necessary, coarse grid impacts will be refined with fine grid receptors spaced 30 meters apart.

Ambient Air Quality Impact Analyses

In evaluating the impacts of the proposed project on ambient air quality, REP will model the ambient impacts of the project, add those impacts to background concentrations, and compare the results to the state and federal ambient standards for SO_2, NO_2, PM_{10}, and CO.

In accordance with EPA guidance (40 CFR part 51, Appendix W, Sections 11.2.3.2 and 11.2.3.3), the highest modeled concentration will be used to demonstrate compliance with annual

standards, while the highest second-highest modeled concentrations will be used to demonstrate compliance with standards based on averaging periods of 24 hours or less.

Additional Impacts Analysis

For those pollutants emitted in significant amounts, the applicant will prepare additional impacts analysis for growth, soils and vegetation, and visibility.

Impacts on Class I Areas

As the proposed project is a minor source under the Placer County APCD rules, the applicant does not have to prepare an analysis to determine whether the proposed project will result in emissions that would have an adverse impact on air quality related values, including visibility, acidic deposition, and regional haze, in Class I areas.

Additional Analyses Required by the CEC

Additional analyses that are required by the CEC are a cumulative air quality impacts analysis and an analysis of construction impacts. The procedures to be used in evaluating construction impacts are discussed below.

Cumulative Impacts – Pursuant to discussions with CEC staff, a cumulative impacts analysis will be required and must consider the additional impacts of the following sources located within 8 miles of the project site.

- Sources with impacts on existing air quality that are not reflected in the ambient air quality data used to establish background. These sources are generally those which have received permits authorizing construction but are not yet in operation and sources which have commenced operations subsequent to the data used to establish background air quality levels. Data derived from the Placer County APCD, CARB, and the EPA AIRS data system indicates that air quality data for the project region is available up to the end of year 2002. As such the cumulative analysis will concentrate on the above types of sources permitted or becoming operational after January 1, 2002.

Construction Impacts Analysis - The potential ambient impacts from air pollutant emissions during the construction of the proposed project will be evaluated by air quality modeling that will account for the construction site location and the surrounding topography; the sources of emissions during construction, including vehicle and equipment exhaust emissions; and fugitive dust.

Site Description - The dispersion modeling analyses will include a description of the physical setting of the facility and surrounding terrain. A map showing the plant location, fence lines, and model receptors will be included, as well as a plot plan of the plant site indicating heights of nearby structures above a common reference point.

Types of Emission Sources - Construction of the proposed project will be divided into three main construction phases: (1) site preparation; (2) construction of foundations; and (3) installation and assembly of mechanical and electrical equipment. The construction impacts analysis will include a schedule for construction operation activities. Site preparation is expected to include site excavation, excavation of footings and foundations, and backfilling operations. After site preparation is finished, the construction of the foundations will begin. Once the foundations are finished, the installation and assembly of the mechanical and electrical equipment will begin.

Fugitive dust emissions from the construction of the project result from (1) dust entrained during excavation and grading at the construction site; (2) dust entrained during onsite travel on paved and unpaved roads and across the unpaved construction site; (3) dust entrained during aggregate and soil loading and unloading operations; (4) dust entrained from raw material transfer to and from material stockpiles; and (5) wind erosion of areas disturbed during construction activities. Heavy equipment exhaust emissions result from (1) exhaust from the heavy equipment used for excavation, grading, and construction of onsite structures; (2) exhaust from a water truck used to control construction dust emissions; (3) exhaust from Diesel welding machines, gasoline-powered generators, air compressors, and water pumps; and (4) exhaust from gasoline-powered pickup trucks and Diesel flatbed trucks used onsite to transport workers and materials around the construction site. Diesel and gasoline truck exhaust emissions will result from transport of mechanical and electrical equipment to the project site and transport of rubble and debris from the site to an appropriate landfill. Diesel exhaust emissions may also result from transport of raw materials to and from stockpiles.

Emissions from a worst-case day will be calculated for each of the three main construction phases and only the phase with the highest emissions will be modeled. As the construction impacts are expected to occur for a relatively short time compared with the lifetime of the project, only short-term averaging periods (24 hours or less) will be included in the construction modeling analysis.

Existing Ambient Levels - Ambient NO_2, SO_2, CO, and PM_{10} concentrations are monitored at several locations in the vicinity of the proposed site: North Highlands, Roseville, and Rocklin. These sites are believed to be representative of the site and are being proposed for use in the analysis.

Model Type - The EPA-approved ISCST3 model will be used to estimate ambient impacts from construction emissions. The modeling options and meteorological data described above will be used for the modeling analysis.

The construction site will be represented as an area source in the modeling analysis. Emissions will be divided into two categories: exhaust emissions and dust emissions. For exhaust emissions, a plume height of 4.6 meters (15 feet) will be used. Plume height refers to the distance measured from ground level to the centerline of the emissions plume. For dust emissions, a release height of two meters will be used due to the ambient plume temperatures and negligible plume velocities.

For the construction modeling analysis, the receptor grid will begin at the property boundary and will extend approximately one kilometer in all directions. Receptor spacing will be 30 meters.

FINAL MODELING SUBMITTAL

In accordance with Placer County APCD permit guidance, the final modeling analyses will also include the following materials:

- US Geological Survey (USGS) 7½-minute (1:24,000) map(s) showing the facility
- Modeling summaries of maximum impacts for each air quality model showing meteorological conditions and receptor location and elevation;
- All modeling outputs (including BPIP and meteorological files) on diskette, together with a description of all filenames;
- Plot plan showing emission points, nearby buildings (including dimensions), cross-section lines, property lines, fencelines, roads, and UTM coordinates; and
- Table showing the building identifiers in the BPIP run(s) and plot plan.

REFERENCES

Briggs, G.A., 1972. Discussion on Chimney Plumes in Neutral and Stable Surroundings. Atmos. Environ. 6:507-510.

Bunyak, John. 1993. Permit Application Guidance for New Air Pollution Sources. Natural Resources Report NPS/NRAQD/NRR-93/09, US Dept. of the Interior, National Park Service.

California Air Resources Board, Aerometric Data Division, Aerometric Projects and Laboratory Branch, Meteorological Section, June 1984. California Surface Wind Climatology.

National Climatic Data Center (NCDC), 2000. Local Climatological Data (LCD) - Annual Summary with Comparative Data for Salem [McNary Airport] for 1999.

U.S. Environmental Protection Agency (USEPA), 1985. Guideline for Determination of Good Engineering Practice Stack Height (Technical Support Document for the Stack Height Regulations) - Revised. EPA-450/4-80-023R.

USEPA, 1986. Guideline on Air Quality Models (Revised), U.S. EPA-45/2-78-027R, Office of Air Quality Planning and Standards, Research Triangle Park, NC.

USEPA, 1987. Supplement A to the Guideline on Air Quality Models (Revised). Office of Air Quality Planning and Standards, Research Triangle Park, NC.

USEPA, 1988. Workbook for Plume Visual Impact Screening and Analysis. Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA-450/4-88-015 (Including October 1992 Revisions).

USEPA, 1990. Supplement B to the Guideline on Air Quality Models (Revised). Office of Air Quality Planning and Standards, Research Triangle Park, NC.

USEPA, 1990. New Source Review Workshop Manual — Draft. Office of Air Quality Planning and Standards, Research Triangle Park, NC.

USEPA, 1992. Procedures for Substituting Values for Missing NWS Meteorological Data for Use in Regulatory Air Quality Models. Dennis Atkinson and Russell F. Lee, Office of Air Quality Planning and Standards, Research Triangle Park, NC. July 7, 1992.

USEPA, 1995. Supplement C to the Guideline on Air Quality Models (revised).

Office of Air Quality Planning and Standards, Research Triangle Park, NC.

USEPA, 1998. Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long-Range Transport Impacts. Air Quality Modeling Group (MD-14), Research Triangle Park. National Park Service - Air Resource Division, Denver, Colorado. USDA Forest Service - Air Quality Program, Fort Collins, Colorado. US Fish and Wildlife Service Air Quality Branch, Denver, Colorado.

USDA Forest Service Air Quality Program, National Park Service Air Resource Division, US Fish and Wildlife Service — Air Quality Branch. 1999. Federal Land Managers' Air Quality Related Values Workgroup (FLAG) Draft Phase I Report. October 1999.

Figure 8.1H-1
Buildings and Structures Used In BPIP

Table 8.1-H1. Roseville Energy Park equipment dimensions (GE LM600).

Feature	Height (feet)	Width (feet)	Length (feet)	Diameter (feet)
HRSG Units:				
HRSG casings	53'	15'	93'	N/A
To platform	60'	N/A	N/A	N/A
To top of highest drums	65'	N/A	N/A	N/A
To top of the top-works support steel	80.5'	N/A	N/A	N/A
To top of relief valves and vent silencers	88'	N/A	N/A	N/A
HRSG stacks	120'	N/A	N/A	11'
Gas Combustion Turbine Generators:				
Gas combustion turbines & generators	16'	14'	57'	N/A
Inlet air filters (located above CT)	35'	34'	34'	N/A
Steam Turbine Generator:				
STG enclosure (mounted on pedestal)	30'	N/A'	N/A	N/A
STG pedestal	15'	N/A	N/A	N/A
Condenser	32'	15'	32'	N/A
Auxilliary Boiler:				
Boiler	18'	25'	40'	N/A
Stack	30'	N/A	N/A	3'
Pipe Rack:				
Rack	32'	15'	255'	N/A
Platform tower	48'	20'	20'	N/A
Cooling Tower (4 cells):	see below	49'	193'	32'
To top of deck	30'	N/A	N/A	N/A
To top of fan shrouds (cones)	44'	N/A	N/A	N/A
Ammonia storage tank	15'	N/A	55'	13.5'
Cooling Tower Chemical Feed Shelter	18'	25'	55'	N/A
Zero Liquid Discharge System:				
Brine concentrators	80'	N/A	N/A	17'/10'
Crystallizers	70'	N/A	N/A	12'/8
Vapor compressors	8'	15'	10'	N/A
Filter press	18'	30'	15'	N/A
Tanks:	15	80	85	N/A
Service/firewater tank	40'	N/A	N/A	66'
Demineralized water storage tank	24'	N/A	N/A	35'
Cooling tower blowdown storage tank	32'	N/A	N/A	35'
Administration Building	16'	61'	112'	N/A
Warehouse/Maintenance Building	26'	61'	115'	
Water Treatment Building	22'	61'	30'	
Plant Electrical Building	16'	60'	80'	N/A
Fire Pump House	10'	16'	13'	N/A
Switchyard:				
Switchyard bus structures	20'	2'	14'	N/A
Conductor take-off structures	50	N/A	N/A	2'
Switchyard control building	16'	60'	12'	N/A
Storm Water Retention Ponds:	Depth to 10'	N/A	N/A	N/A
Gas Compressor Station	12'	50'	80'	N/A
Gas Metering Station	10'	50'	100'	N/A

REP FUMIGATION IMPACTS		LM6000 Fumigation Location	GTX-100 Fumigation Location
Unitized Impacts			
LM6000		3.640	#N/A
GTX-100		#N/A	3.751
Aux.Boiler		27.94	28.61
Em.Gen.		30.56	31.33
Firepump		32.28	33.12
Dist(m)		7301	7141
NOx Impacts	Emissions (g/s)		
LM6000	1.260	4.6	
GTX-100	1.286		4.8
Aux.Boiler	0.088	2.5	2.5
Em.Gen.	0.564	17.2	17.7
Firepump	#N/A		
TOTAL		24.3	25.0
SOx Impacts	Emissions (g/s)		
LM6000	0.252	0.92	
GTX-100	0.252		0.95
Aux.Boiler	0.010	0.28	0.29
Em.Gen.	#N/A		
Firepump	0.0063	0.20	0.21
TOTAL		1.40	1.45
CO Impacts	Emissions (g/s)		
LM6000	1.538	5.6	
GTX-100	1.562		5.9
Aux.Boiler	0.277	7.7	7.9
Em.Gen.	0.105	3.2	3.3
Firepump	#N/A		
TOTAL		16.5	17.1

Table 8.1H-6
Emission Rates and Stack Parameters for Modeling, Alstom GTX100

				Emission Rates, g/s							Emission Rates, lb/hr			
	Stack Diam, m	Temp, deg K	Exhaust Velocity, m/s	NOx	SO2	CO	PM10	Stack Diam, ft	Exh Temp, Deg F	Exhaust Velocity, ft/s	NOx	SO2	CO	PM10
Averaging Period: One hour														
Turbine 1/HRSG	3.3528	341.58	15.22	0.643	0.126	0.781	n/a	11	155.18	49.94	5.1	1	6.2	4.7
Turbine 2/HRSG	3.3528	341.58	15.22	0.643	0.126	0.781	n/a	11	155.18	49.94	5.1	1	6.2	4.7
Aux Boiler	0.9144	399.82	12.01	0.088	0.010	0.277	n/a	3	260	39.40	0.7	0.08	2.2	n/a
Em Generator	0.2540	787.59	60.05	0.564	(1)	0.105	n/a	0.83	958	197.00	4.477	(1)	0.837	n/a
Fire Pump	0.1524	665.37	53.25	(1)	0.0063	(1)	n/a	0.50	738	174.70	(1)	0.0499	(1)	(1)
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	n/a	31.62	70.4	27.80	n/a	n/a	n/a	n/a
Averaging Period: Three hours														
Turbine 1/HRSG	3.3528	341.58	15.22	n/a	0.126	n/a	n/a	11	155.18	49.94	n/a	1	n/a	n/a
Turbine 2/HRSG	3.3528	341.58	15.22	n/a	0.126	n/a	n/a	11	155.18	49.94	n/a	1	n/a	n/a
Aux Boiler	0.9144	399.82	12.01	n/a	0.010	n/a	n/a	3	260	39.40	n/a	0.08	n/a	n/a
Em Generator	0.2540	787.59	60.05	n/a	(1)	n/a	n/a	0.83	958	197.00	n/a	(1)	n/a	n/a
Fire Pump	0.1524	665.37	53.25	n/a	2.096E-03	n/a	n/a	0.50	738	174.70	n/a	0.017	n/a	n/a
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	n/a	31.62	70.4	27.80	n/a	n/a	n/a	n/a
Averaging Period: Eight hours														
Turbine 1/HRSG	3.3528	341.58	15.22	n/a	n/a	17.100	n/a	11	155.18	49.94	n/a	n/a	135.71	n/a
Turbine 2/HRSG	3.3528	341.58	15.22	n/a	n/a	17.100	n/a	11	155.18	49.94	n/a	n/a	135.71	n/a
Aux Boiler	0.9144	399.82	12.01	n/a	n/a	0.277	n/a	3	260	39.40	n/a	n/a	2.2	n/a
Em Generator	0.2540	787.59	60.05	n/a	n/a	1.318E-02	n/a	0.83	958	197.00	n/a	n/a	1.05E-01	n/a
Fire Pump	0.1524	665.37	53.25	n/a	n/a	(1)	n/a	0.50	738	174.70	n/a	n/a	(1)	n/a
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	n/a	31.62	70.4	27.80	n/a	n/a	n/a	n/a
Averaging Period: 24 hours														
Turbine 1/HRSG	3.3528	342.80	14.28	n/a	0.126	n/a	0.592	11	157.37	46.85	n/a	1	n/a	4.7
Turbine 2/HRSG	3.3528	342.80	14.28	n/a	0.126	n/a	0.592	11	157.37	46.85	n/a	1	n/a	4.7
Aux Boiler	0.9144	399.82	12.01	n/a	0.010	n/a	0.074	3	260	39.40	n/a	0.08	n/a	0.584
Em Generator	0.2540	787.59	60.05	n/a	4.951E-04	n/a	7.193E-04	0.83	958	197.00	n/a	3.93E-03	n/a	5.71E-03
Fire Pump	0.1524	665.37	53.25	n/a	(1)	n/a	(1)	0.50	738	174.70	n/a	(1)	n/a	(1)
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	2.205E-02	31.62	70.4	27.80	n/a	n/a	n/a	0.1750
Averaging Period: Annual														
Turbine 1/HRSG	3.3528	342.36	14.81	0.568	0.099	n/a	0.468	11	156.58	48.59	4.51	0.7834	n/a	3.712
Turbine 2/HRSG	3.3528	342.36	14.81	0.568	0.099	n/a	0.468	11	156.58	48.59	4.51	0.7834	n/a	3.712
Aux Boiler	0.9144	399.82	12.01	0.010	0.001	n/a	0.008	3	260	39.40	0.080	0.009	n/a	0.066
Em Generator	0.2540	787.59	60.05	6.440E-03	1.356E-04	n/a	1.971E-04	0.83	958	197.00	5.11E-02	1.08E-03	n/a	1.56E-03
Fire Pump	0.1524	665.37	53.25	2.474E-03	7.177E-05	n/a	4.281E-05	0.50	738	174.70	1.96E-02	5.70E-04	n/a	3.40E-04
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	2.076E-02	31.62	70.4	27.80	n/a	n/a	n/a	0.1648

Note: 1. Emergency generator and fire pump will not operate during the same 24-hour period.
Higher concentration from screening assessement used for each pollutant and averaging period.

Table 8.1H-5
Emission Rates and Stack Parameters for Modeling, GE LM6000

				Emission Rates, g/s							Emission Rates, lb/hr			
	Stack Diam, m	Temp, deg K	Exhaust Velocity, m/s	NOx	SO2	CO	PM10	Stack Diam, ft	Exh Temp, Deg F	Exhaust Velocity, ft/s	NOx	SO2	CO	PM10
Averaging Period: One hour														
Turbine 1/HRSG	3.3528	342.04	15.85	0.630	0.126	0.769	n/a	11	156	52.00	5	1	6.1	4.6
Turbine 2/HRSG	3.3528	342.04	15.85	0.630	0.126	0.769	n/a	11	156	52.00	5	1	6.1	4.6
Aux Boiler	0.9144	399.82	12.01	0.088	0.010	0.277	n/a	3	260	39.40	0.7	0.08	2.2	n/a
Em Generator	0.2540	787.59	60.05	0.564	(1)	0.105	n/a	0.83	958	197.00	4.477	(1)	0.837	n/a
Fire Pump	0.1524	665.37	53.25	(1)	0.0063	(1)	n/a	0.50	738	174.70	(1)	0.0499	(1)	(1)
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	n/a	31.62	70.4	27.80	n/a	n/a	n/a	n/a
Averaging Period: Three hours														
Turbine 1/HRSG	3.3528	344.15	14.63	n/a	0.126	n/a	n/a	11	159.8	48.00	n/a	1	n/a	n/a
Turbine 2/HRSG	3.3528	344.15	14.63	n/a	0.126	n/a	n/a	11	159.8	48.00	n/a	1	n/a	n/a
Aux Boiler	0.9144	399.82	12.01	n/a	0.010	n/a	n/a	3	260	39.40	n/a	0.08	n/a	n/a
Em Generator	0.2540	787.59	60.05	n/a	(1)	n/a	n/a	0.83	958	197.00	n/a	(1)	n/a	n/a
Fire Pump	0.1524	665.37	53.25	n/a	2.096E-03	n/a	n/a	0.50	738	174.70	n/a	0.017	n/a	n/a
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	n/a	31.62	70.4	27.80	n/a	n/a	n/a	n/a
Averaging Period: Eight hours														
Turbine 1/HRSG	3.3528	344.15	14.63	n/a	n/a	0.964	n/a	11	159.8	48.00	n/a	n/a	7.65	n/a
Turbine 2/HRSG	3.3528	344.15	14.63	n/a	n/a	0.964	n/a	11	159.8	48.00	n/a	n/a	7.65	n/a
Aux Boiler	0.9144	399.82	12.01	n/a	n/a	0.277	n/a	3	260	39.40	n/a	n/a	2.2	n/a
Em Generator	0.2540	787.59	60.05	n/a	n/a	1.318E-02	n/a	0.83	958	197.00	n/a	n/a	1.05E-01	n/a
Fire Pump	0.1524	665.37	53.25	n/a	n/a	(1)	n/a	0.50	738	174.70	n/a	n/a	(1)	n/a
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	n/a	31.62	70.4	27.80	n/a	n/a	n/a	n/a
Averaging Period: 24 hours														
Turbine 1/HRSG	3.3528	344.15	14.63	n/a	0.126	n/a	0.580	11	159.8	48.00	n/a	1	n/a	4.6
Turbine 2/HRSG	3.3528	344.15	14.63	n/a	0.126	n/a	0.580	11	159.8	48.00	n/a	1	n/a	4.6
Aux Boiler	0.9144	399.82	12.01	n/a	0.010	n/a	0.0736	3	260	39.40	n/a	0.08	n/a	0.584
Em Generator	0.2540	787.59	60.05	n/a	4.951E-04	n/a	7.193E-04	0.83	958	197.00	n/a	3.93E-03	n/a	5.71E-03
Fire Pump	0.1524	665.37	53.25	n/a	(1)	n/a	(1)	0.50	738	174.70	n/a	(1)	n/a	(1)
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	2.205E-02	31.62	70.4	27.80	n/a	n/a	n/a	0.1750
Averaging Period: Annual														
Turbine 1/HRSG	3.3528	342.15	15.19	0.513	0.099	n/a	0.462	11	156.2	49.83	4.073	0.7833	n/a	3.664
Turbine 2/HRSG	3.3528	342.15	15.19	0.513	0.099	n/a	0.462	11	156.2	49.83	4.073	0.7833	n/a	3.664
Aux Boiler	0.9144	399.82	12.01	0.010	0.001	n/a	0.0084	3	260	39.40	0.080	0.009	n/a	0.066
Em Generator	0.2540	787.59	60.05	6.440E-03	1.356E-04	n/a	1.971E-04	0.83	958	197.00	5.11E-02	1.08E-03	n/a	1.56E-03
Fire Pump	0.1524	665.37	53.25	2.474E-03	7.177E-05	n/a	4.281E-05	0.50	738	174.70	1.96E-02	5.70E-04	n/a	3.40E-04
Cooling Tower (each cell)	9.6378	294.48	8.47	n/a	n/a	n/a	2.076E-02	31.62	70.4	27.80	n/a	n/a	n/a	0.1648

Note: 1. Emergency generator and fire pump will not operate during the same 24-hour period.
Higher concentration from screening assessement used for each pollutant and averaging period.

Emissions, Modeling Characteristics, and Screening Results for Emergency Generator and Fire Pump Engine

Emergency Generator	NOx	SOx (1)	CO	PM10			
Emissions g/bhp-hr(2)	7.17	n/a	1.34	0.22	Testing at:	Manufacturer	Caterpillar
lb/hr(4)	4.477	0.0943	0.837	0.137	50% load (4)	Model	3412C TA
g/s (1-hour)	0.564	0.0119	0.105	0.017	30 min/hr (4)	Output (Bhp) (nominal)	1,133
g/s (3-hour)		0.00396			Testing 24 hrs/day	Output (Bhp) (testing)	567
g/s (8-hour)			0.01318			Fuel cons, gals/hr (nominal)	55
g/s (24-hour) (5)		0.00049		0.00072		Fuel cons, gals/hr (testing)	14
tpy (3)	0.224	0.0047	0.042	0.0069	100 tests/yr (3)		
g/s (annual) (5)	0.0064	0.00014		0.00020	453.6 g/lb	Unitized Impacts (for 1 g/s/source)	
Impacts (ug/m3)						(ug/m3)	
1-hour	***1726***	***36.3***	***322.6***	***53.0***		3059.82300	
3-hour		7.20				1817.75700	
8-hour			***11.32***			858.85500	
24-hour		***0.217***		***0.317***		439.45730	
Annual	#N/A	#N/A		#N/A		#N/A	
Stack height	10 feet		3.048 m				
Exhaust temp	958 deg F		787.6 deg K				
Stack diam.	10 in		0.254 m				
Exhaust flow	6446.8 cfm		3.043 m3/s				
Exhaust velocity	197 ft/sec		60.046 m/s				

Fire Pump Engine	NOx	SOx (1)	CO	PM10			
Emissions g/bhp-hr(2)	5.2	n/a	0.27	0.09	Testing at:	Manufacturer	Clarke
lb/hr	1.720	0.0499	0.089	0.029762	100% load (4)	Model	JW6H-UF40
g/s (1-hour)	0.217	6.29E-03	0.0113	0.0038	30 min/hr (4)	Output (Bhp) (nominal)	300
g/s (3-hour)		2.10E-03			Testing 24 hrs/day	Output (Bhp) (testing)	300
g/s (8-hour)			0.00141			Fuel cons, gals/hr (nominal)	14.5
g/s (24-hour) (5)		2.62E-04		0.00016		Fuel cons, gals/hr (testing)	7.3
tpy (3)	0.086	0.002	0.004	0.001	100 tests/yr (3)		
g/s (annual) (5)	0.0025	7.18E-05	0.00013	0.00004		Unitized Impacts (for 1 g/s/source)	
Impacts (ug/m3)						(ug/m3)	
1-hour	1716	***49.8***	89.1	29.7		7917.94800	
3-hour		***9.30***				4437.20560	
8-hour			2.34			1663.55200	
24-hour		0.166		0.099		633.14050	
Annual	#N/A	#N/A		#N/A		#N/A	
Stack height	15 feet		4.572 m				
Exhaust temp	738 deg F		665.4 deg K				
Stack diam.	6 in		0.152 m				
Exh flow	2058.1 cfm		0.97 m3/s				
Exh velocity	175 fps		53.249 m/s				

Notes:

(1) Based on Diesel: 0.05% sulfur 0.825 Spec.Grav.

(2) Emission factors based on vendor information.

(3) Based on 200 tests of 30 minutes each (100 hrs/year).

(4) lb/hr emissions reduced by 50% (since each test is 30 minutes) except for fire pump which is 100% load for 15 minut and additional 50% for emergency generator since load during testing is 50%.

(5) Since operations not limited for daily (24-hr) periods, modeled average g/s emissions for these two periods NOT multiplied by 3 to compensate for 8 am - 4 pm testing.

Gas Turbines Parameters for Screening Modeling, GE LM6000

Case	Ambient Temp (°F)	Load, %	Stack Height (m)	Exhaust Temp (Kelvins)	Exhaust Vel (m/s)	Stack Diam (m)	NOx (g/s/tur)	SO2 (g/s/tur)	CO (g/s/tur)	PM10 (g/s/tur)
1	99	99 deg F Full Load w/ EVAP and DB	36.576	344.150	14.640	3.353	0.614	0.118	0.747	0.567
2	99	99 deg F Full Load w/ EVAP and no DB	36.576	370.590	15.470	3.353	0.379	0.073	0.461	0.352
3	99	99 deg F Min Load at 50%	36.576	357.430	9.800	3.353	0.188	0.036	0.229	0.176
4	62	62 deg F Full Load w/ EVAP and DB	36.576	342.150	15.190	3.353	0.606	0.116	0.738	0.560
5	62	62 deg F Full Load w/ EVAP and no DB	36.576	368.710	16.120	3.353	0.406	0.078	0.494	0.377
6	62	62 deg F Min Load at 50%	36.576	365.370	12.160	3.353	0.242	0.047	0.295	0.226
7	34	34 deg F Full Load w/ DB and no EVAP	36.576	342.040	15.860	3.353	0.629	0.121	0.766	0.582
8	34	34 deg F Full Load no EVAP and no DB	36.576	370.590	16.930	3.353	0.429	0.083	0.523	0.399
9	34	34 deg F Min Load at 50%	36.576	373.260	13.440	3.353	0.258	0.050	0.315	0.241

Normalized ISCST3 Results for Screening Modeling (i.e., ug/m^3 at 1 g/s/tur) with RURAL Dispersion, LM6000

Case	Ambient Temp (°F)	Load, %		1-Hour	3-Hour	8-Hour	24-Hour	Annual
1	99	99 deg F Full Load w/ EVAP and DB		12.82600	10.47600	7.06400	5.32800	na
2	99	99 deg F Full Load w/ EVAP and no DB		10.04600	8.05400	5.83800	4.22200	na
3	99	99 deg F Min Load at 50%		12.31700	7.03100	4.83300	3.80100	na
4	62	62 deg F Full Load w/ EVAP and DB		12.56400	10.22800	6.89400	5.16400	na
5	62	62 deg F Full Load w/ EVAP and no DB		9.69600	7.71800	5.62600	4.03120	na
6	62	62 deg F Min Load at 50%		7.66300	5.48900	3.82500	2.92500	na
7	34	34 deg F Full Load w/ DB and no EVAP		12.54600	9.72600	6.60000	4.88800	na
8	34	34 deg F Full Load no EVAP and no DB		9.04400	7.13000	5.27200	3.73220	na
9	34	34 deg F Min Load at 50%		5.77800	4.70500	3.33700	2.49900	na

Final ISCST3 Screening Results for Criteria Pollutants (ug/m^3) with RURAL Dispersion-GE LM6000

Case	Ambient Temp (°F)	Load, %	1-Hour NO_x	Annual NO_x	1-Hour SO_2	3-Hour SO_2	24-Hour SO_2	Annual SO_2	1-Hour CO	8-Hour CO	24-Hour PM10	Annual PM10
1	**99**	**99 deg F Full Load w/ EVAP and DB**	7.8726	na	1.5109	**1.2341**	**0.6276**	na	9.5862	**5.2796**	**3.0215**	na
2	99	99 deg F Full Load w/ EVAP and no DB	3.8034	na	0.7344	0.5887	0.3086	na	4.6312	2.6913	1.4853	na
3	99	99 deg F Min Load at 50%	2.3168	na	0.4496	0.2566	0.1387	na	2.8206	1.1068	0.6678	na
4	62	62 deg F Full Load w/ EVAP and DB	7.6113	na	1.4612	1.1895	0.6006	na	9.2685	5.0857	2.8918	na
5	62	62 deg F Full Load w/ EVAP and no DB	3.9366	na	0.7592	0.6043	0.3156	na	4.7937	2.7815	1.5206	na
6	62	62 deg F Min Load at 50%	1.8575	na	0.3602	0.2580	0.1375	na	2.2621	1.1291	0.6616	na
7	**34**	**34 deg F Full Load w/ DB and no EVAP**	**7.8952**	na	**1.5156**	1.1749	0.5905	na	**9.6127**	5.0569	2.8438	na
8	34	34 deg F Full Load no EVAP and no DB	3.8835	na	0.7488	0.5904	0.3090	na	4.7291	2.7567	1.4888	na
9	34	34 deg F Min Load at 50%	1.4930	na	0.2895	0.2357	0.1252	na	1.8183	1.0502	0.6030	na

Gas Turbines Parameters for Screening Modeling, Alstom GTX100

Case	Ambient Temp (°F)	Load, %	Stack Height (m)	Exhaust Temp (Kelvins)	Exhaust Vel (m/s)	Stack Diam (m)	NOx (g/s/tur)	SO2 (g/s/tur)	CO (g/s/tur)	PM10 (g/s/tur)
1	99	99 deg F Full Load w/ EVAP and DB	36.576	342.650	14.280	3.353	0.604	0.116	0.736	0.558
2	99	99 deg F Full Load w/ EVAP and no DB	36.576	354.210	14.520	3.353	0.397	0.077	0.484	0.369
3	99	99 deg F Min Load at 50%	36.576	342.210	9.630	3.353	0.232	0.045	0.282	0.216
4	62	62 deg F Full Load w/ EVAP and DB	36.576	342.210	14.810	3.353	0.623	0.120	0.758	0.576
5	62	62 deg F Full Load w/ EVAP and no DB	36.576	352.150	15.000	3.353	0.416	0.080	0.506	0.386
6	62	62 deg F Min Load at 50%	36.576	340.820	11.200	3.353	0.272	0.053	0.332	0.254
7	34	34 deg F Full Load w/ DB and no EVAP	36.576	341.430	15.220	3.353	0.644	0.124	0.784	0.595
8	34	34 deg F Full Load no EVAP and no DB	36.576	349.370	15.330	3.353	0.437	0.084	0.532	0.406
9	34	34 deg F Min Load at 50%	36.576	340.930	11.680	3.353	0.290	0.056	0.353	0.270

Normalized ISCST3 Results for Screening Modeling (i.e., ug/m^3 at 1 g/s/tur) with RURAL Dispersion. Alstom GTX100

Case	Ambient Temp (°F)	Load, %		1-Hour	3-Hour	8-Hour	24-Hour	Annual
1	99	99 deg F Full Load w/ EVAP and DB		13.35200	10.92200	7.29800	5.55212	na
2	99	99 deg F Full Load w/ EVAP and no DB		11.94600	9.73600	6.73800	5.03400	na
3	99	99 deg F Min Load at 50%		12.26200	7.90000	5.28400	4.20500	na
4	62	62 deg F Full Load w/ EVAP and DB		12.88400	10.52600	7.06600	5.32800	na
5	62	62 deg F Full Load w/ EVAP and no DB		11.72000	9.51800	6.59000	4.89400	na
6	62	62 deg F Min Load at 50%		12.29200	7.05200	4.69400	3.68100	na
7	34	34 deg F Full Load w/ DB and no EVAP		12.61200	10.27600	6.91200	5.17942	na
8	34	34 deg F Full Load no EVAP and no DB		11.70800	9.48600	6.54400	4.84600	na
9	34	34 deg F Min Load at 50%		12.30400	6.78600	4.51600	3.52480	na

Final ISCST3 Screening Results for Criteria Pollutants (ug/m^3) with RURAL Dispersion, Alstom GTX100

Case	Ambient Temp (°F)	Load, %	1-Hour NO_x	Annual NO_x	1-Hour SO_2	3-Hour SO_2	24-Hour SO_2	Annual SO_2	1-Hour CO	8-Hour CO	24-Hour PM10	Annual PM10
1	**99**	**99 deg F Full Load w/ EVAP and DB**	8.0673	na	1.5475	1.2659	***0.6435***	na	9.8231	5.3691	**3.0997**	na
2	99	99 deg F Full Load w/ EVAP and no DB	4.7438	na	0.9151	0.7458	0.3856	na	5.7759	3.2578	1.8565	na
3	99	99 deg F Min Load at 50%	2.8399	na	0.5493	0.3539	0.1884	na	3.4591	1.4906	0.9070	na
4	62	62 deg F Full Load w/ EVAP and DB	8.0229	na	1.5396	1.2579	0.6367	na	9.7699	5.3581	3.0668	na
5	62	62 deg F Full Load w/ EVAP and no DB	4.8708	na	0.9399	0.7633	0.3925	na	5.9315	3.3352	1.8891	na
6	62	62 deg F Min Load at 50%	3.3471	na	0.6478	0.3716	0.1940	na	4.0760	1.5565	0.9335	na
7	**34**	**34 deg F Full Load w/ DB and no EVAP**	**8.1247**	na	**1.5588**	**1.2701**	0.6402	na	**9.8941**	**5.4225**	3.0843	na
8	34	34 deg F Full Load no EVAP and no DB	5.1176	na	0.9870	0.7997	0.4085	na	6.2322	3.4834	1.9670	na
9	34	34 deg F Min Load at 50%	3.5669	na	0.6890	0.3800	0.1974	na	4.3433	1.5941	0.9513	na

Roseville Energy Park

Appendix 8.1-I
Emission Reduction Credits

(Filed separately under a request for confidentiality)

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 8.1-I
Air Quality

The Emission Reduction Credits have been submitted to the CEC under separate cover with a request for confidentiality.

Roseville Energy Park

Appendix 8.2-A
Results of the California Natural Diversity/ Rarefind Data Base Search

October 2003

Roseville Energy Park
Application for Certification

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 29 **Map Index:** 33250 **EO Index:** 2571

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: MARTINE, A. & B. HELM 1994 (OBS)

Dates Last Seen
Element: 1994-12-28
Site: 1994-12-28

Record Last Updated: 1996-02-23

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.86173° / -121.29715°
UTM: Zone-10 N4302810 E647744
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 27 **Qtr:** NW
Meridian: M
Elevation: 140 ft

Location: EAST SIDE OF HWY 65, 0.4 MILE SOUTH OF THE LINCOLN RODEO GROUNDS, 2 MILES SOUTH OF LINCOLN.
Location Detail:
Ecological: HABITAT CONSISTS OF VERNAL POOLS IN ROLLING GRASSLAND.
Threat: THREATENED BY PROPOSED DEVELOPMENT.
General: MANY SHRIMP OBSERVED/COLLECTED (DEPOSITED AT CAS) ON 28 DECEMBER 1994.
Owner/Manager: PVT

Sources

MAR94F04 MARTINE, ANDREA AND BRENT HELM (JSA). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1994-12-28.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 30 **Map Index:** 33251 **EO Index:** 2570

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: MARTINE, A. & B. HELM 1994 (OBS)

Dates Last Seen
Element: 1994-12-28
Site: 1994-12-28

Record Last Updated: 1995-06-30

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.84669° / -121.26971°
UTM: Zone-10 N4301186 E650156
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 35 **Qtr:** NE
Meridian: M
Elevation: 195 ft

Location: 2 MILES SE OF THE LINCOLN RODEO GROUNDS, ~3 MILES SSE OF LINCOLN.
Location Detail:
Ecological: HABITAT CONSISTS OF VERNAL POOLS WITHIN ROLLING GRASSLAND.
Threat: THREATENED BY PROPOSED DEVELOPMENT.
General: MANY SHRIMP OBSERVED/COLLECTED (DEPOSITED AT CAS) ON 28 DECEMBER 1994.
Owner/Manager: PVT

Sources

MAR94F05 MARTINE, ANDREA AND BRENT HELM (JSA). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1994-12-28.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 41 **Map Index:** 32449 **EO Index:** 1022

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1995 (LIT)

Dates Last Seen
Element: 2002-01-04
Site: 2002-01-04

Record Last Updated: 2002-07-31

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.78926° / -121.29294°
UTM: Zone-10 N4294775 E648259
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 12.9 ac

Township: 11N
Range: 06E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 150 ft

Location: 0.8 KM E OF HWY 65; 1.5 MILES SSW OF INTERSECTION PLEASANT GROVE CREEK AND PLACER BLVD/SUNSET BLVD; N OF ROSEVILLE.

Location Detail: HIGHLAND RESERVE SOUTH; POOL NUMBERS N10, N42, N8, NA AND NB. THE ECORP 2000 SURVEY LAT/LONG GIVEN ARE NOT AT THE LOCATION THEY MAPPED; REPORT HAS TEMP, DEPTH, & SURFACE AREA OF POOLS.

Ecological: CONSTRUCTED AND HISTORIC VERNAL POOLS WITHIN A NON-NATIVE ANNUAL GRASSLAND; WETLAND COMPENSATION/MITIGATION PRESERVE. 2/6/95: POOL HAD SURFACE AREA OF 94 SQUARE METERS & DEPTH OF 17 CM. SURROUNDING AREA COMPRISED OF URBAN/DEVELOPMENT.

Threat:

General: POOL #NB: 50+ ADULTS OBS IN 1995; 1 ADULT COLLECTED & DEPOSITED IN CAS. 10'S OBS IN 2000, VERNAL POOL #VPN10; LINDERIELLA OCCIDENTALIS ALSO OBS IN 2 POOLS NOT IDENTIFIED IN THE PRESEVE. 100'S OBS IN POOLS NA, N8 & N42 ON 4 JAN 2002.

Owner/Manager: PVT-ROSEVILLE PROPERTIES

Sources

ECO00F01 ECORP CONSULTING, INC. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI (VERNAL POOL FAIRY SHRIMP). 2000-02-25.

ECO00R02 ECORP CONSULTING, INC. ANNULA REPORT OF FINDINGS REGARDING BRANCHIOPODS ASSESSMENT SURVEY HIGHLAND RESERVE SOUTH OPEN SPACE AREAS. 2000-06-28.

ECO02R05 ECORP CONSULTING, INC. ANNUAL REPORT OF FINDINGS REGARDING BRANCHIOPOD ASSESSMENT SURVEY HIGHLAND RESERVE SOUTH OPEN SPACE AREAS. 2002-03-25.

SUG95R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT #PRT-795933. (2 BINDERS). 1995-06-XX.

SUG95R02 SUGNET & ASSOCIATES. CORRECTIONS TO ANNUAL REPORT TO THE U.S. FISH AND WILDLIFE SERVICE REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933, 1994-95. 1995-10-30.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 42 **Map Index:** 11713 **EO Index:** 17819

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1995 (LIT)

Dates Last Seen
Element: 2001-02-16
Site: 2001-02-16

Record Last Updated: 2001-05-24

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.76982° / -121.27800°
UTM: Zone-10 N4292642 E649597
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area: 77.8 ac

Township: 11N
Range: 06E
Section: 26 **Qtr:** SW
Meridian: M
Elevation: 150 ft

Location: HIGHLAND RESERVE SOUTH OPEN SPACE JUST N & E OF DIAMOND OAKS MUNICIPAL GOLF COURSE, ROSEVILLE

Location Detail: HIGHLAND RESERVE SOUTH. BOTH NATURAL AND MANMADE VERNAL POOLS PRESENT.

Ecological: HABITAT CONSISTS OF HARDPAN VERNAL POOLS IN ANNUAL GRASSLAND; WETLAND COMPENSATION/MITIGATION PRESERVE. ON 1/31/95 THE SURFACE AREA WAS 59 (U22) & 94 (U26) SQUARE METERS & THE DEPTH WAS 35 (U22) & 14 (U26) CM.

Threat:

General: POOLS #U22 & U26: 50+ ADULTS OBSERVED IN EACH; 2 ADULTS COLLECTED AND DEPOSITED IN CAS. IN THE MANMADE VERNAL POOLS SUGNET OBSERVED B. LYNCHI IN 5 OF 32 FEATURES INSPECTED, 2/11/93 (#92). UNKNOWN NUMBER OBSERVED IN POOL #U-22, 16 FEB 2001.

Owner/Manager: PVT-ROSEVILLE PROPERTIES

Sources

RAM01F01 RAMONES, SUSAN (ECORP CONSULTING). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2001-02-16.

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

SUG95R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT #PRT-795933. (2 BINDERS). 1995-06-XX.

SUG95R02 SUGNET & ASSOCIATES. CORRECTIONS TO ANNUAL REPORT TO THE U.S. FISH AND WILDLIFE SERVICE REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933, 1994-95. 1995-10-30.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 44 **Map Index:** 32456 **EO Index:** 1903

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1996 (LIT)

Dates Last Seen
Element: 1995-03-XX
Site: 1996-03-11

Record Last Updated: 1996-07-17

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.76045° / -121.34114°
UTM: Zone-10 N4291500 E644131
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 59.3 ac

Township: 11N
Range: 06E
Section: XX **Qtr:** XX
Meridian: M
Elevation: 145 ft

Location: NORTHWEST OF ROSEVILLE; BETWEEN FIDDYMENT ROAD & HWY 65, SOUTH OF PLEASANT GROVE CREEK.

Location Detail: 1995: 15 TOTAL WETLANDS SAMPLED BTW PARCELS 32 & 72. 1996: 10 TOTAL WETLANDS SAMPLED ON SILVERADO OAKS URBAN RESERVE MITIGATION SITE; POOLS IN URBAN RESERVE ARE MUTUALLY EXCLUSIVE FROM PARCEL 72 (1995), BUT SHARE THE SAME GEOGRAPHIC SPACE.

Ecological: CONSTRUCTED AND SEASONAL HARDPAN VERNAL POOLS WITH NON-NATIVE ANNUAL GRASSLAND.

Threat:

General: 1995: POOLS #47 & 71: 50+ ADULTS OBSERVED IN EACH POOL, POOLS #47 & 71 ARE NOT ON MAP, MAPPED ACCORDING TO DATA FORMS; VISUAL OBSERVATION ONLY. 1996: NO B. LYNCHI OBSERVED, BUT LINDERIELLA OCCIDENTALIS PRESENT.

Owner/Manager: PVT-ELLIOTT HOMES

Sources

FRE96U01 FREEMAN, H. (SUGNET & ASSOCIATES). REPORT OF TELEPHONE CONVERSATION REGARDING ANNUAL REPORT TO USFWS FOR LISTED CRUSTACEA SURVEYS FROM 1995 AND 1996 (SUG95R01 & SUG96R01). 1996-07-17.

SUG95R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT #PRT-795933. (2 BINDERS). 1995-06-XX.

SUG96R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED BRACHIOPODS-CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933. 1996-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 45 **Map Index:** 32457 **EO Index:** 1899

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1995 (LIT)

Dates Last Seen
Element: 1995-03-14
Site: 1995-03-14

Record Last Updated: 1995-10-11

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.76950° / -121.32354°
UTM: Zone-10 N4292533 E645642
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 11N
Range: 06E
Section: 29 **Qtr:** SE
Meridian: M
Elevation: 130 ft

Location: BETWEEN KASEBERG CREEK AND SOUTH BRANCH PLEASANT GROVE CREEK; 1.8 KM WEST OF SOUTHERN PACIFIC RR X HWY 65.

Location Detail: WOODCREEK OAKS MITIGATION SITES. 14 WATER BODIES WERE SAMPLED ON FEB 9, 10, 27 & MARCH 14, 1995. B. LYNCHI FOUND IN ONLY 1 POOL & ONLY ON 3/14/95.

Ecological: HARDPAN VERNAL POOL IN ANNUAL NON-NATIVE GRASSLAND. ON 3/14 THE SURFACE AREA WAS 129 SQ METERS & THE DEPTH WAS 18 CM. WETLAND COMPENSATION/MITIGATION PRESERVE.

Threat:

General: POOL #C2: 50+ ADULTS OBSERVED; 1 ADULT COLLECTED & DEPOSITED IN CAS. THE INFORMATION PROVIDED BY THE CONSULTANT HAS CONFLICTING DATA ON THE LOCATION OF THIS POOL; THIS SITE WAS MAPPED ACCORDING TO THE MAP THEY PROVIDED, NOT THE T-R-S GIVEN.

Owner/Manager: PVT-SARES REGIS GROUP

Sources

SUG95R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT #PRT-795933. (2 BINDERS). 1995-06-XX.

SUG95R02 SUGNET & ASSOCIATES. CORRECTIONS TO ANNUAL REPORT TO THE U.S. FISH AND WILDLIFE SERVICE REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933, 1994-95. 1995-10-30.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 46 **Map Index:** 32458 **EO Index:** 9535

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1996 (LIT)

Dates Last Seen
Element: 1996-01-29
Site: 1996-01-29

Record Last Updated: 1996-09-06

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.85840° / -121.31539°
UTM: Zone-10 N4302411 E646168
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 19.0 ac

Township: 12N
Range: 06E
Section: 28 **Qtr:** SW
Meridian: M
Elevation: 130 ft

Location: INGRAM SLOUGH; 3.2 KM ESE OF MOORE ROAD X FIDDYMENT ROAD; SSW OF LINCOLN.

Location Detail: LINCOLN CROSSING MITIGATION SITE. 1995: 10 TOTAL WETLANDS SAMPLED, THE INFORMATION FROM CONSULTANT HAD DISCREPANCIES BETWEEN FIELD SURVEY FORMS & MAP - MAPPED ACCORDING TO THEIR MAP. 1996: 42 TOTAL WATERBODIES WERE SURVEYED.

Ecological: CONSTRUCTED HARDPAN VERNAL POOL IN ANNUAL NON-NATIVE GRASSLAND. WETLAND COMPENSATION/MITIGATION PRESERVE.

Threat:

General: 1995: <50 ADULTS OBSERVED IN POOL #211. 1996: <50 ADULTS OBSERVED IN 5 POOLS (101, 204, 206, 216 & 220). LINDERIELLA OCCIDENTALIS ALSO PRESENT IN MOST OF SITE DURING 1995 & 1996.

Owner/Manager: PVT-STERLING PACIFIC ASSETS

Sources

SUG95R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT #PRT-795933. (2 BINDERS). 1995-06-XX.

SUG95R02 SUGNET & ASSOCIATES. CORRECTIONS TO ANNUAL REPORT TO THE U.S. FISH AND WILDLIFE SERVICE REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933, 1994-95. 1995-10-30.

SUG96R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED BRACHIOPODS-CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933. 1996-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 91 **Map Index:** 32516 **EO Index:** 1892

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: GIBSON, J. 1996 (LIT)

Dates Last Seen
Element: 1998-02-04
Site: 1998-02-04

Record Last Updated: 1998-09-29

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.86505° / -121.29394°
UTM: Zone-10 N4303184 E648015
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area: 108.2 ac

Township: 12N
Range: 06E
Section: 27 **Qtr:** NW
Meridian: M
Elevation: 140 ft

Location: EASTRIDGE SOUTHERN WETLAND PRESERVE, JUST EAST OF HWY 65 (AT THE LINCOLN RODEO
Location Detail: GROUNDS), 0.5 MILE SE OF LINCOLN

Ecological: NORTHERN HARDPAN VERNAL POOL HABITAT WITH CONSTRUCTED VERNAL POOLS (3.95 ACRES), CONSTRUCTED SEASONAL WETLANDS (1.95 ACRES), AND REFERENCE VERNAL POOLS IN ANNUAL GRASSLAND.

Threat: FUTURE RESIDENTIAL DEVELOPMENT PLANNED IN ADJACENT AREA; DIRT ROADS BISECT PRESERVE; GRAZING; RODEO GROUNDS TO THE NW.

General: 1995 (SECOND MONITORING YEAR): OBS IN 7 REFERENCE VERNAL POOLS, IN 17 CONSTRUCTED VERNAL POOLS, IN 2 1996 (THIRD YEAR): OBS IN 21 OF 45 CONSTRUCTED POOLS, 6 OF 10 REFERENCE POOLS. PRESENT ON-SITE IN 1997 AND 1998.

Owner/Manager: PVT-PLACER HOLDINGS

Sources

GIB94F01 GIBSON, JIM AND TOM SKORDAL. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1994-12-28.

GIB95F02 GIBSON, JIM AND TOM SKORDAL. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1995-03-16.

GIB95R03 GIBSON & SKORDAL WETLAND CONSULTANTS. MITIGATION MONITORING REPORT-EASTRIDGE PROJECT SECOND GROWING SEASON-BRANCHINECTA LYNCHI. 1995-08-XX.

GIB96F01 GIBSON & SKORDAL, WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI AT EASTRIDGE PROJECT SITE. 1996-01-11.

GIB96F02 GIBSON & SKORDAL, WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI AT EASTRIDGE PROJECT SITE. 1996-02-09.

GIB96F03 GIBSON & SKORDAL, WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI AT EASTRIDGE PROJECT SITE. 1996-03-13.

GIB96R03 GIBSON & SKORDAL, WETLAND CONSULTANTS. MITIGATION MONITORING REPORT--EASTRIDGE PROJECT THIRD GROWING SEASON. 1996-08-27.

GIB97F04 GIBSON & SKORDAL WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1997-01-08.

GIB97F05 GIBSON & SKORDAL WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1997-02-11.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Sources

GIB98F01 GIBSON AND SKORDAL WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1998-01-13.

GIB98F02 GIBSON AND SKORDAL WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1998-02-04.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 137 **Map Index:** 34810 **EO Index:** 2496

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1996 (LIT)

Dates Last Seen
Element: 1999-02-25
Site: 1999-02-25

Record Last Updated: 2002-03-20

Quad Summary: PLEASANT GROVE (3812174/528C)
County Summary: PLACER

Lat/Long: 38.78337° / -121.44842°
UTM: Zone-10 N4293880 E634766
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 59.8 ac

Township: 11N
Range: 05E
Section: 20 **Qtr:** SW
Meridian: M
Elevation: 60 ft

Location: 0.25 MILE NORTHEAST OF BREWER ROAD & CURRY CREEK, ~3 MILES SOUTHEAST OF PLEASANT GROVE.

Location Detail: BASELINE BREWER MITIGATION SITE; A TOTAL OF 46 WATERBODIES WERE SURVEYED IN FEBRUARY/MARCH 1996. PROPERTY MGR: EVERGREEN MANAGMENT

Ecological: CONSTRUCTED AND EXISTING SEASONAL WATERBODIES WITHIN NON-NATIVE ANNUAL GRASSLAND. LASTHENIA FREMONTII, NAVARRETIA LEUCOCEPHALA, & ELOCHARIS MACROSTACHYA DOMINANT. LINDERIELLA OCCIDENTALIS ALSO PRESENT IN MITIGATION SITE.

Threat:

General: 1996: B. LYNCHI OBS IN 7 POOLS (#105, 122, 140 & 143 HAD >50 SHRIMP; POOLS #131, 133 & 148 HAD <50 SHRIMP). 1998: 100'S OBS IN VP# 121, 142 & 143; 1000'S OBS IN VP# 122. 1999: 100'S OBS IN MANY POOLS WITHIN MONITORED AREA.

Owner/Manager: PVT-ROSEVILLE 150 PARTNERSHIP

Sources

SUG96R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED BRACHIOPODS-CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933. 1996-XX-XX.

SUG98R02 SUGNET AND ASSOCIATES. FINAL "90-DAY" REPORT RE FEDERALLY-LISTED CRUSTACEA: BASELINE BREWER, BROADSTONE UNIT 2, CLAY STATION, FOOTHILL BUS. PARK, HERITAGE AT D. OAKS, JOHNSON RANCH E., LINCOLN CROSSING. 1998-09-XX.

WHI99F03 WHITNEY, KENNETH. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI (VERNAL POOL FAIRY SHRIMP). 1999-02-25.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 139 **Map Index:** 34813 **EO Index:** 1874

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1996 (LIT)

Dates Last Seen
Element: 1996-01-30
Site: 1996-03-11

Record Last Updated: 2002-03-22

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.80312° / -121.30397°
UTM: Zone-10 N4296295 E647273
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 33.4 ac

Township: 11N
Range: 06E
Section: 16 **Qtr:** NE
Meridian: M
Elevation: 105 ft

Location: NORTH OF ROSEVILLE; BETWEEN HWY 65 AND INDUSTRIAL AVENUE; 0.3 KM WSW OF HWY 65 X PLEASANT GROVE CREEK.

Location Detail: FOOTHILL BUSINESS PARK MITIGATION SITE, PARCEL 1. 1995: 12 WATERBODIES SURVEYED. 1996: 14 WATERBODIES SURVEYED. 1997: 29 WATERBODIES SURVEYED.

Ecological: CONSTRUCTED VERNAL POOLS WITHIN NON-NATIVE ANNUAL GRASSLAND. POOL #VP32-1995: SURFACE AREA WAS 0, DEPTH WAS 39.0 CM; 1996: SURFACE AREA WAS 461 SQ METERS, DEPTH WAS 19.0 CM.

Threat:

General: 1/14/1997: 10'S SEEN IN 2 POOLS (VP12 & 29). 1/30/1996: >50 FAIRY SHRIMP OBSERVED IN POOL #VP32; LINDERIELLA OCCIDENTALIS ALSO PRESENT.

Owner/Manager: PVT-STANFORD RANCH

Sources

SUG95R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT #PRT-795933. (2 BINDERS). 1995-06-XX.

SUG96R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED BRACHIOPODS-CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933. 1996-XX-XX.

SUG97R01 SUGNET & ASSOCIATES. 1997 ANNUAL REPORT TO THE U.S. FISH AND WILDLIFE SERVICE REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933. 1997-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 141 **Map Index:** 34819 **EO Index:** 17500

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1996 (LIT)

Dates Last Seen
Element: 1996-01-30
Site: 1996-01-30

Record Last Updated: 1996-07-17

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.86474° / -121.30580°
UTM: Zone-10 N4303130 E646987
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 28 **Qtr:** NE
Meridian: M
Elevation: 140 ft

Location: NNW OF ROSEVILLE IN INGRAM SLOUGH; 0.4 KM WEST OF HWY 65 X INDUSTRIAL BLVD.

Location Detail: LICOLN CROSSING MITIGATION SITE. 1996: 42 TOTAL WATERBODIES SURVEYED.

Ecological: CONSTRUCTED HARDPAN VERNAL POOL WITHIN NON-NATIVE ANNUAL GRASSLAND. WETLAND COMPENSATION/MITIGATION PRESERVE.

Threat:

General: 1996: <50 ADULTS OBSERVED IN POOL #222; SURFACE AREA=574 SQ METERS, WATER DEPTH=32.0 CM, TEMPERATURE= 11.5 DEGREES C, CONDUCTIVITY=75.80, TURBIDITY WAS LOW. LINDERIELLA ALSO PRESENT IN POOL AND IN SURROUNDING AREAS.

Owner/Manager: PVT-STERLING PACIFIC ASSETS

Sources

SUG96R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED BRACHIOPODS-CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933. 1996-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 154 **Map Index:** 33672 **EO Index:** 30807

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1993 (PERS)

Dates Last Seen
Element: 1993-01-27
Site: 1993-01-27

Record Last Updated: 1997-03-05

Quad Summary: ROSEVILLE (3812173/528D), PLEASANT GROVE (3812174/528C)
County Summary: PLACER

Lat/Long: 38.80255° / -121.36784°
UTM: Zone-10 N4296131 E641727
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area: 1,932.4 ac

Township: 11N
Range: 05E
Section: 13 **Qtr:** XX
Meridian: M
Elevation: 95 ft

Location: NORTH OF PHILLIP ROAD IN THE VICINITY OF PLEASANT GROVE CREEK. NORTHWEST OF ROSEVILLE.

Location Detail: VERNAL POOLS ARE FOUND IN T11N, R05E, SECTIONS 13 & 14 AND IN T11N, R06E, SECTION 18.

Ecological: NATURAL VERNAL POOLS.

Threat:

General: 1/27/93: B. LYNCHI OBSERVED IN 16 OF 52 FEATURES INSPECTED IN SECTION 13, & IN 4 OF 9 FEATURES INSPECTED IN SECTION 14. 1/16/93: OBSERVED IN 3 INSPECTED FEATURES IN SECTION 18. NO LEPIDURUS PACKARDI OBSERVED. SUGNET RECORD #'S 87, 88 & 91.

Owner/Manager: UNKNOWN

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 155 **Map Index:** 33674 **EO Index:** 30808

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1993 (PERS)

Dates Last Seen
Element: 1993-01-27
Site: 1993-01-27

Record Last Updated: 1997-04-07

Quad Summary: ROSEVILLE (3812173/528D), PLEASANT GROVE (3812174/528C)
County Summary: PLACER

Lat/Long: 38.77345° / -121.36795°
UTM: Zone-10 N4292901 E641775
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 11N
Range: 05E
Section: 25 **Qtr:** XX
Meridian: M
Elevation: 110 ft

Location: SOUTH OF PHILLIP ROAD AND WEST OF FIDDYMENT ROAD. WNW OF ROSEVILLE.

Location Detail: VERNAL POOLS LOCATED SOMEWHERE IN SECTION 25.

Ecological: NATURAL VERNAL POOLS.

Threat:

General: B. LYNCHI OBSERVED IN 5 OF 31 FEATURES INSPECTED. NO LEPIDURUS PACKARDI OBSERVED. SUGNET RECORD NUMBER 89.

Owner/Manager: UNKNOWN

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 156 **Map Index:** 33673 **EO Index:** 30806

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1993 (PERS)

Dates Last Seen
Element: 1993-02-18
Site: 1993-02-18

Record Last Updated: 1997-04-07

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.80298° / -121.31236°
UTM: Zone-10 N4296266 E646544
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 11N
Range: 06E
Section: 16 **Qtr:** XX
Meridian: M
Elevation: 100 ft

Location: WEST OF HWY 65 & NORTH OF SCOW ROAD. NNW OF ROSEVILLE.
Location Detail: VERNAL POOLS LOCATED SOMEWHERE IN SECTION 16.
Ecological: NATURAL VERNAL POOLS.
Threat:
General: B. LYNCHI WAS FOUND IN 5 OF 54 FEATURES INSPECTED. NO LEPIDURUS PACKARDI OBSERVED. SUGNET RECORD #90.
Owner/Manager: UNKNOWN

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 157 **Map Index:** 33676 **EO Index:** 30431

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1993 (PERS)

Dates Last Seen
Element: 1993-01-18
Site: 1993-01-18

Record Last Updated: 1997-03-12

Quad Summary: ROSEVILLE (3812173/528D), LINCOLN (3812183/528A)
County Summary: PLACER

Lat/Long: 38.87538° / -121.29395°
UTM: Zone-10 N4304331 E647993
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 12N
Range: 06E
Section: 22 **Qtr:** XX
Meridian: M
Elevation: 150 ft

Location: SOUTH OF AUBURN RAVINE, ON BOTH SIDES OF HWY 65, SOUTH OF LINCOLN.

Location Detail: VERNAL POOLS LOCATED SOMEWHERE IN SECTION 22.

Ecological: NATURAL VERNAL POOLS.

Threat:

General: B. LYNCHI OBSERVED IN 2 OF 5 FEATURES INSPECTED. NO LEPIDURUS PACKARDI OBSERVED. SUGNET RECORD #95.

Owner/Manager: UNKNOWN

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 175 **Map Index:** 33707 **EO Index:** 30604

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1993 (PERS)

Dates Last Seen
Element: 1993-03-12
Site: 1993-03-12

Record Last Updated: 1997-03-11

Quad Summary: PLEASANT GROVE (3812174/528C), VERONA (3812175/529D)
County Summary: SUTTER

Lat/Long: 38.77305° / -121.49794°
UTM: Zone-10 N4292663 E630483
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 11N
Range: 04E
Section: 26 **Qtr:** XX
Meridian: M
Elevation: 35 ft

Location: SOUTHWEST OF THE INTERSECTION OF PLEASANT GROVE ROAD AND SANKEY ROAD.

Location Detail: ROADSIDE DITCHES SOMEWHERE IN SECTION 26.

Ecological: MANMADE ROADSIDE DITCHES.

Threat:

General: B. LYNCHI OBSERVED IN THE ONE FEATURE INSPECTED. SUGNET RECORD #86. LEPIDURUS PACKARDI ALSO OBSERVED.

Owner/Manager: UNKNOWN

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status

Federal: Threatened
State: None

NDDB Element Ranks

Global: G2G3
State: S2S3

Other Lists

CDFG Status:

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 191 **Map Index:** 36947 **EO Index:** 31944

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: GIBSON, J. & T. SKORDAL 1997 (OBS)

Dates Last Seen
Element: 1997-01-17
Site: 1997-01-17

Record Last Updated: 1997-09-30

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.84424° / -121.31478°
UTM: Zone-10 N4300841 E646250
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 12N
Range: 06E
Section: 33 **Qtr:** SW
Meridian: M
Elevation: 115 ft

Location: ORCHARD CREEK AREA, 0.25 MILE NORTH OF ATHENS AVENUE (PLEASANT GROVE BLVD) AND WEST OF SPRR TRACKS, NORTH OF ROSEVILLE.

Location Detail: SITE IS LOCATED ON A 632-ACRE MITIGATION BANK PRESERVE. THIS UNDEVELOPED PASTURELAND IS BEING ESTABLISHED AS A MITIGATION BANK.

Ecological: HABITAT CONSISTS OF NORTHERN HARDPAN VERNAL POOLS.

Threat:

General: AN UNSPECIFIED NUMBER OF FAIRY SHRIMP WERE OBSERVED ON 17 JAN 1997.

Owner/Manager: PVT-WILDLANDS INC

Sources

GIB97F06 GIBSON & SKORDAL, WETLAND CONSULTANTS. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1997-01-17.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 195 **Map Index:** 38256 **EO Index:** 33263

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: GIBSON, J. & T. SKORDAL 1997 (OBS)

Dates Last Seen
Element: 1997-01-16
Site: 1997-01-16

Record Last Updated: 1998-03-02

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.78083° / -121.34926°
UTM: Zone-10 N4293749 E643384
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area: 1,183.4 ac

Township: 11N
Range: 06E
Section: 30 **Qtr:** XX
Meridian: M
Elevation: 120 ft

Location: EAST OF FIDDYMENT ROAD, WEST OF FOOTHILLS BLVD, AND NORTH OF BASELINE ROAD, NW OF ROSEVILLE.
Location Detail:

Ecological: HABITAT CONSISTS OF SEASONAL WETLANDS, REFERENCE VERNAL POOLS, AND CONSTRUCTED VERNAL POOLS WITHIN A DESIGNATED WETLAND MITIGATION AREA. SURROUNDING UPLAND CONSISTS OF NON-NATIVE ANNUAL GRASSLAND/MIXED OAK WOODLAND.

Threat: THREATENED BY SURROUNDING DEVELOPMENT (GOLF COURSES AND RESIDENTIAL DEVELOPMENT).

General: VERNAL POOL FAIRY SHRIMP WERE IDENTIFIED WITHIN 71 CONSTRUCTED VERNAL POOLS AND SEASONAL WETLANDS. LINDERIELLA OCCIDENTALIS ALSO OBSERVED.

Owner/Manager: PVT

Sources

GIB97F07 GIBSON & SKORDAL, WETLAND CONSULTANTS. FIELD SURVEY FORMS FOR BRANCHINECTA LYNCHI AND LINDERIELLA OCCIDENTALIS. 1997-01-16.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 196 **Map Index:** 38629 **EO Index:** 33636

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1997 (OBS)

Dates Last Seen
Element: 1997-11-06
Site: 1997-11-06

Record Last Updated: 1998-04-20

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.85775° / -121.37303°
UTM: Zone-10 N4302249 E641167
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 05E
Section: 25 **Qtr:** SW
Meridian: M
Elevation: 100 ft

Location: MOORE RANCH PROPERTY, 0.8 MILE NORTH OF PLEASANT VALLEY ROAD, SOUTH OF AUBURN RAVINE, 7 MILES NNW OF ROSEVILLE.
Location Detail:

Ecological: HABITAT CONSISTS OF A VERNAL POOL IN GRAZED ANNUAL GRASSLAND.
Threat:
General: SITE WAS HISTORICALLY (SINCE AT LEAST 1937) DISCED; HAS ONLY BEEN GRAZED OVER THE PAST SEVERAL YEARS. 6 CYSTS FOUND IN POOL #3 (PRESUMED TO BE BRANCHINESTA LYNCHI, SINCE THAT IS THE ONLY MEMBER OF THAT GENUS KNOWN TO OCCUR IN THIS AREA).

Owner/Manager: UNKNOWN

Sources

SUG97F01 SUGNET & ASSOCIATES. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 1997-11-06.

SUG98R01 SUGNET & ASSOCIATES. "90-DAY/ANNUAL REPORT - DRY SEASON CYST SURVEY OF THE MOORE RANCH PROPERTY, PLACER COUNTY". 1998-02-09.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 235 **Map Index:** 42745 **EO Index:** 42745

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: GIBSON & SKORDAL 1997 (LIT)

Dates Last Seen
Element: 1997-01-17
Site: 1997-01-17

Record Last Updated: 2000-04-12

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.84578° / -121.30899°
UTM: Zone-10 N4301021 E646749
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 33 **Qtr:** SE
Meridian: M
Elevation: 120 ft

Location: 0.5 MILE N OF PLEASANT GROVE RD & SP RR, 1.7 MILES ESE OF ORCHARD CREEK & INGRAM SLOUGH CONFLUENCE, NNW OF ROSEVILLE.

Location Detail: FOUND IN THE SOUTHEAST PORTION OF THE ORCHARD CREEK MIDIGATION BANK. MAJORITY OF VERNAL POOLS ARE ON SAN JOAQUIN SANDY LOAM AND ALAMO-FIDDYMENT COMPLEX SOILS.

Ecological: VERNAL POOLS ENDEMIC VEGETATION: RANUNCULUS ALVEOLATUS, ERYNGIUM VASEYI, PLAGIOBOTHRYS STIPITAUS, PSILICARPHUS ZIZYPHOROIDES, DESCHAMPSIA DAMTHONIOIDES, NAVARRETIA LEUCOCEPHALA

Threat:

General: OBSERVED SHRIMP IN 2 OF THE 170 SURVEY POOLS SAMPLED. THIS POOL WAS RATED AS LOW IN ABUNDANCE (LESS THAN ONE INDIVIDUAL PER PULL).

Owner/Manager: UNKNOWN

Sources

GIB97R01 GIBSON & SKORDAL (WETLAND CONSULTANTS). LISTED VERNAL POOL BRANCHIOPODS SURVEY WET SEASON SAMPLING. ORCHARD CREEK MITIGATION BANK. 1997-07-21.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 236 **Map Index:** 42746 **EO Index:** 42746

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: GIBSON & SKORDAL 1997 (LIT)

Dates Last Seen
Element: 1997-01-17
Site: 1997-01-17

Record Last Updated: 2000-04-12

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.84043° / -121.32009°
UTM: Zone-10 N4300410 E645796
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 33 **Qtr:** SW
Meridian: M
Elevation: 115 ft

Location: 0.7 MILE W OF PLEASANT GROVE RD & SP RR, 1.3 MILES SE OF ORCHARD CREEK & INGRAM SLOUGH CONFLUENCE, NNW OF ROSEVILLE.

Location Detail: FOUND IN THE SOUTHWEST PORTION OF THE ORCHARD CREEK MIDIGATION BANK. MAJORITY OF VERNAL POOLS ARE ON SAN JOAQUIN SANDY LOAM AND ALAMO-FIDDYMENT COMPLEX SOILS.

Ecological: VERNAL POOLS ENDEMIC VEGETATION: RANUNCULUS ALVEOLATUS, ERYNGIUM VASEYI, PLAGIOBOTHRYS STIPITAUS, PSILICARPHUS ZIZYPHOROIDES, DESCHAMPSIA DAMTHONIOIDES, NAVARRETIA LEUCOCEPHALA

Threat:

General: OBSERVED SHRIMP IN 2 OF THE 170 SURVEY POOLS SAMPLED. THIS POOL WAS RATED MEDIUM IN ABUNDANCE (1 TO 5 INDIVIDUALS PER PULL).

Owner/Manager: UNKNOWN

Sources

GIB97R01 GIBSON & SKORDAL (WETLAND CONSULTANTS). LISTED VERNAL POOL BRANCHIOPODS SURVEY WET SEASON SAMPLING. ORCHARD CREEK MITIGATION BANK. 1997-07-21.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 247 **Map Index:** 43395 **EO Index:** 43395

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: KWAN, K. & S. CAPELL 2000 (OBS)

Dates Last Seen
Element: 2001-03-08
Site: 2001-03-08

Record Last Updated: 2002-03-19

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.82818° / -121.29718°
UTM: Zone-10 N4299087 E647810
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 11N
Range: 06E
Section: 03 **Qtr:** SW
Meridian: M
Elevation: 150 ft

Location: STANFORD RANCH NORTH, 0.75 MILES NNE JCT OF SUNSET BLVD & HWY 65, 1.8 MILES WSW OF TELEGRAPH HILL, ~4 MILES N OF ROCKLIN

Location Detail: VERNAL POOL AT THIS SITE NUMBERED VP42, MAX SURFACE AREA ~10 METERS BY 13 METERS & 35 CM DEEP. MAPPED TO THE LAT/LONG GIVEN (38 49'42"/121 17'46") AND NOT THE PROJECT SITE (UNCERTAIN HOW LAT/LONG WERE ESTABLISHED SO MAPPED AS A 1/5 MILE)

Ecological: FALLOW FIELD THAT IS DISTURBED (NOT MENTIONED BY WHAT) YET UNGRAZED.

Threat: DISTURBED FIELD (SOURCE OF DISTURBANCE NOT GIVEN)

General: OBSERVED IN (AN ORDER OF MAGNITUDE) 10'S IN VERNAL POOL #VP42. 8 MAR 2001: 1 MALE OBSERVED WITHIN POOL #42.

Owner/Manager: PVT

Sources

KWA00F01 KWAN, KEITH & SUSAN CAPELL. U.S. FISH & WILDLIFE SERVICE FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI (VERNAL POOL FAIRY SHRIMP). 2000-01-11.

KWA01R01 KWAN, K., & S. STARR ET AL (ECORP). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2001-07-05.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 293 **Map Index:** 45435 **EO Index:** 45435

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: RAMONES, S. 2001 (OBS)

Dates Last Seen
Element: 2002-01-04
Site: 2002-01-04

Record Last Updated: 2002-07-31

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.77040° / -121.27237°
UTM: Zone-10 N4292715 E650085
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 13.3 ac

Township: 11N
Range: 06E
Section: 26 **Qtr:** SE
Meridian: M
Elevation: 185 ft

Location: HIGHLAND RESERVE SOUTH OPEN SPACE, ON THE WEST SIDE OF EAST ROSEVILLE PARKWAY, ROSEVILLE

Location Detail:

Ecological: HABITAT CONSISTS OF ANNUAL GRASSLAND INTERSPERSED WITH BOTH CONSTRUCTED AND HISTORIC VERNAL POOLS.

Threat:

General: >100 OBSERVED IN POOLS #8 AND #27 ON 16 FEB 2001. ONLY 2 FEMALES OBSERVED IN POOL #5 ON 4 JAN 2002

Owner/Manager: CITY OF ROSEVILLE

Sources

ECO02R05 ECORP CONSULTING, INC. ANNUAL REPORT OF FINDINGS REGARDING BRANCHIOPOD ASSESSMENT SURVEY HIGHLAND RESERVE SOUTH OPEN SPACE AREAS. 2002-03-25.

RAM01F01 RAMONES, SUSAN (ECORP CONSULTING). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2001-02-16.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 304 **Map Index:** 46034 **EO Index:** 46034

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: RAMONES, S. 2001 (OBS)

Dates Last Seen
Element: 2001-02-15
Site: 2001-02-15

Record Last Updated: 2001-10-03

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.76449° / -121.34970°
UTM: Zone-10 N4291935 E643379
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 11N
Range: 06E
Section: 31 **Qtr:** NW
Meridian: M
Elevation: 125 ft

Location: WOODCREEK WEST WETLAND COMPENSATION AREA. 2.7 MILES NW OF WEST EDGE OF ROSEVILLE.

Location Detail: 0.9 MILES NORTH OF THE INTERSECTION OF FIDDYMENT ROAD AND BASE LINE ROAD AND THEN NEAR 0.8 MILES DIRECTLY EAST.

Ecological: HABITAT CONSISTS OF ANNUAL GRASSLAND INTERSPERSED WITH CONSTRUCTED AND HISTORIC VERNAL POOLS.

Threat:

General: MORE THAN 10 ADULTS OBSERVED.

Owner/Manager: CITY OF ROSEVILLE

Sources

RAM01F03 RAMONES, SUSAN (ECORP). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2001-02-15.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 307 **Map Index:** 46096 **EO Index:** 46096

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: KWAN, K. 2001 (OBS)

Dates Last Seen
Element: 2001-03-09
Site: 2001-03-09

Record Last Updated: 2001-10-10

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.87145° / -121.32514°
UTM: Zone-10 N4303844 E645295
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 20 **Qtr:** SE
Meridian: M
Elevation: 120 ft

Location: SW OF LINCOLN; 0.15 MILES SOUTH OF MOORE ROAD AND 0.25 MILES NW OF INGRAM SLOUGH.
Location Detail:
Ecological: HABITAT CONSISTS OF LAND WHICH HAS BEEN DRY-FARMED (DISKED ETC.)
Threat: AGRICULTURE - DRY-FARMING.
General: 10'S OF ADULTS OBSERVED. 5 INDIVIDUALS COLLECTED TO BE DEPOSITED AT CAL ACADEMY OF SCIENCES.
Owner/Manager: UNKNOWN

Sources

KWA01F01 KWAN, KEITH (ECORP). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2001-03-09.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 308 **Map Index:** 46098 **EO Index:** 46098

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: KWAN, K. 2001 (OBS)

Dates Last Seen
Element: 2001-03-09
Site: 2001-03-09

Record Last Updated: 2001-10-10

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.85475° / -121.32838°
UTM: Zone-10 N4301986 E645048
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 29 **Qtr:** SE
Meridian: M
Elevation: 120 ft

Location: SW OF LINCOLN. 1.1 MILES EAST FIDDYMENT RD & 1.1 MILES NORTH PLEASANT GROVE RD BETWEEN INGRAM SLOUGH & ORCHARD CREEK.

Location Detail: 375 FT SOUTH OF POND.

Ecological: HABITAT CONSISTS OF GRAZED NON-NATIVE GRASSLAND. LINDERIELLA OCCIDENTALIS ALSO FOUND HERE.

Threat:

General: 10'S OF ADULTS OBSERVED. 6 COLLECTED TO BE DEPOSITED AT CAL ACADEMY OF SCIENCES.

Owner/Manager: UNKNOWN

Sources

KWA01F02 KWAN, KEITH (ECORP). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2001-03-09.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 309 **Map Index:** 46106 **EO Index:** 46106

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: RAMONES, S. 2001 (OBS)

Dates Last Seen
Element: 2001-03-07
Site: 2001-03-07

Record Last Updated: 2001-10-10

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.78947° / -121.33654°
UTM: Zone-10 N4294728 E644472
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area: 10.1 ac

Township: 11N
Range: 06E
Section: 20 **Qtr:** NW
Meridian: M
Elevation: 115 ft

Location: WOODCREEK NORTH COMPENSATION AREA. 1 MI SW INTERSECTION FIDDYMENT RD & PLEASANT GROVE CR; 500 FT SOUTH OF SOUTH BRANCH.

Location Detail: POOL #6.

Ecological: HABITAT CONSISTS OF ANNUAL GRASSLAND WITH CONSTRUCTED VERNAL POOLS SURROUNDED BY OAK WOODLAND. LINDERIELLA OCCIDENTALIS ALSO FOUND HERE.

Threat:

General: MORE THAN 100 INDIVIDUALS OBSERVED.

Owner/Manager: CITY OF ROSEVILLE

Sources

RAM01F02 RAMONES, SUSAN (ECORP CONSULTING). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI AND LINDERIELLA OCCIDENTALIS. 2001-03-07.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 315 **Map Index:** 47900 **EO Index:** 47900

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: ECORP CONSULTING 2002 (OBS)

Dates Last Seen
Element: 2002-01-14
Site: 2002-01-14

Record Last Updated: 2002-05-13

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.84806° / -121.35293°
UTM: Zone-10 N4301205 E642931
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 31 **Qtr:** NW
Meridian: M
Elevation: 100 ft

Location: 0.2 MILE NW OF THE INTERSECTION OF PLEASANT GROVE ROAD AND FIDDYMENT ROAD, 6 MILES NW OF ROSEVILLE

Location Detail: IDENTIFIED AS POOL #135.

Ecological: HABITAT CONSISTS OF A GRASSLAND/VERNAL POOL RESTORATION SITE. LINDERIELLA OCCIDENTALIS ALSO FOUND AT THIS SITE.

Threat:

General: ADULTS NUMBERING IN THE 10'S OBSERVED ON 14 JAN 2002.

Owner/Manager: MOORE RANCH CONSERVANCY

Sources

ECO02F01 ECORP CONSULTING INC. FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2002-01-14.

ECO02R01 ECORP CONSULTING INC. ANNUAL REPORT OF FINDINGS REGARDING FEDERALLY-LISTED BRANCHIOPODS FOR WOODCREEK WEST-MOORE RANCH PRESERVE (PLACER COUNTY, CA). 2002-05-09.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 316 **Map Index:** 47901 **EO Index:** 47901

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: ECORP CONSULTING 2002 (OBS)

Dates Last Seen
Element: 2002-01-14
Site: 2002-01-14

Record Last Updated: 2002-05-13

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.85163° / -121.35292°
UTM: Zone-10 N4301601 E642925
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 12N
Range: 06E
Section: 31 **Qtr:** NW
Meridian: M
Elevation: 100 ft

Location: 0.4 MILE NNW OF THE INTERSECTION OF PLEASANT GROVE ROAD AND FIDDYMENT ROAD, 6 MILES NW OF ROSEVILLE

Location Detail: POOL #49.

Ecological: HABITAT CONSISTS OF A GRASSLAND/VERNAL POOL RESTORATION SITE. LINDERIELLA OCCIDENTALIS ALSO FOUND AT THIS SITE.

Threat:

General: ADULTS NUMBERING IN THE 100'S OBSERVED ON 14 JAN 2002.

Owner/Manager: MOORE RANCH CONSERVANCY

Sources

ECO02R01 ECORP CONSULTING INC. ANNUAL REPORT OF FINDINGS REGARDING FEDERALLY-LISTED BRANCHIOPODS FOR WOODCREEK WEST-MOORE RANCH PRESERVE (PLACER COUNTY, CA). 2002-05-09.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 319 **Map Index:** 47287 **EO Index:** 48240

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: EHRHARDT, K. 2002 (OBS)

Dates Last Seen
Element: 2002-01-21
Site: 2002-01-21

Record Last Updated: 2002-07-12

Quad Summary: PLEASANT GROVE (3812174/528C)
County Summary: PLACER

Lat/Long: 38.85698° / -121.38635°
UTM: Zone-10 N4302143 E640013
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area: 325.8 ac

Township: 12N
Range: 05E
Section: 26 **Qtr:** XX
Meridian: M
Elevation: 90 ft

Location: AITKEN RANCH MITIGATION BANK. ALONG AUBURN RAVINE S OF MOORE RD, N OF PLEASANT GROVE BLVD
Location Detail: & WEST OF DOWD AVE.

Ecological: HABITAT CONSISTS OF LIGHTLY GRAZED ANNUAL GRASSLAND & VERNAL POOL LANDSCAPE. SWAINSON'S HAWK OBSERVED FORAGING (SPRING, SUMMER, FALL) IN VICINITY. SITE IS A CONSERVATION BANK. SURROUNDING LAND COMPRISED OF RICE FARMING & CATTLE GRAZING.

Threat:

General: 21 JAN 2002: POPULATION OF POOL ESTIMATED TO BE IN 100'S; 1 MALE AND 1 FEMALE COLLECTED.

Owner/Manager: WILDLANDS, INC

Sources

EHR02F03 EHRHARDT, KRISTIE (WILDLANDS, INC). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2002-01-21.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 320 **Map Index:** 48242 **EO Index:** 48242

Occ Rank: Excellent
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: EHRHARDT, K. 2002 (OBS)

Dates Last Seen
Element: 2002-01-10
Site: 2002-01-10

Record Last Updated: 2002-07-15

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.84871° / -121.31724°
UTM: Zone-10 N4301333 E646027
Mapping Precision: NON-SPECIFIC
Symbol Type: POLYGON
Area: 696.5 ac

Township: 12N
Range: 06E
Section: 33 **Qtr:** XX
Meridian: M
Elevation: 120 ft

Location: ORCHARD CREEK CONSERVATION SITE; 6 MILES NORTH OF ROSEVILLE.

Location Detail: 0.8 MILE SOUTH OF MOORE ROAD AND 1.2 MILES EAST OF FIDDYMENT ROAD. BORDERED TO THE SOUTH BY PLEASANT GROVE BLVD AND TO THE EAST BY RAILROAD TRACKS.

Ecological: HABITAT CONSISTS OF NATURALLY OCCURRING VERNAL POOLS, SEASONAL WET SWALES, EMERGENT MARSH, SEASONAL WETLANDS AND INTERMITTANT/SEASONAL STREAMS. MAJORITY OF VERNAL POOLS LOCATED ON SAN JOAQUIN SANDY LOAM AND ALAMO-FIDDYMENT COMPLEX SOILS.

Threat:

General: 100'S OF ADULTS OBSERVED WITHIN UNKNOWN NUMBER OF POOLS ON 10 JAN 2002. VERNAL POOLS CONCENTRATED THROUGHOUT THIS SITE.

Owner/Manager: WILDLANDS INC

Sources

EHR02F04 EHRHARDT, KRISTIE (WILDLANDS INC). FIELD SURVEY FORM FOR BRANCHINECTA LYNCHI. 2002-01-10.

GIB97R01 GIBSON & SKORDAL (WETLAND CONSULTANTS). LISTED VERNAL POOL BRANCHIOPODS SURVEY WET SEASON SAMPLING. ORCHARD CREEK MITIGATION BANK. 1997-07-21.

Branchinecta lynchi

vernal pool fairy shrimp

Element Code: ICBRA03030

Status	NDDB Element Ranks	Other Lists
Federal: Threatened	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: ENDEMIC TO THE GRASSLANDS OF THE CENTRAL VALLEY, CENTRAL COAST MTNS, AND SOUTH COAST MTNS, IN ASTATIC RAIN-FILLED POOLS.

Micro: INHABIT SMALL, CLEAR-WATER SANDSTONE-DEPRESSION POOLS AND GRASSED SWALE, EARTH SLUMP, OR BASALT-FLOW DEPRESSION POOLS.

Occurrence No. 329 **Map Index:** 48419 **EO Index:** 48419

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: ECORPS CONSULTING, INC. 2002 (LIT)

Dates Last Seen
Element: 2002-01-18
Site: 2002-01-18

Record Last Updated: 2002-07-31

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.76501° / -121.35644°
UTM: Zone-10 N4291982 E642792
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 11N
Range: 06E
Section: 31 **Qtr:** NW
Meridian: M
Elevation: 130 ft

Location: 3.5 MILES WNW OF ROSEVILLE; JUST NORTH OF POWER LINES, 0.1 MILE EAST OF FIDDYMENT ROAD.

Location Detail: WOODCREEK WEST WETLAND COMPENSATION AREA. POOL #17.

Ecological: HABITAT CONSISTS OF CONSTRUCTED AND HISTORIC VERNAL POOLS WITHIN AN ANNUAL GRASSLAND HABITAT; WETLAND COMPENSATION AREA. POOL DEPTH: 15CM. SURROUNDING LAND IS DEVELOPMENT.

Threat:

General: 10'S OBSERVED ON 18 JAN 2002 IN A POOL CONSTRUCTED IN 1990.

Owner/Manager: CITY OF ROSEVILLE

Sources

ECO02R04 ECORP CONSULTING, INC. ANNUAL REPORT OF FINDINGS REGARDING BRANCHIOPOD ASSESSMENT SURVEY WOODCREEK WEST WETLAND COMPENSATION AREA. 2002-04-15.

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status	NDDB Element Ranks	Other Lists
Federal: Species of Concern	**Global:** G5	**CDFG Status:**
State: Threatened	**State:** S2	

Habitat Associations

General: (NESTING) BREEDS IN STANDS WITH FEW TREES IN JUNIPER-SAGE FLATS, RIPARIAN AREAS AND IN OAK SAVANNAH.

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 791 **Map Index:** 42026 **EO Index:** 42026

Occ Rank: Fair
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: WILLIAMS, B. 1996 (OBS)

Dates Last Seen
Element: 1996-07-01
Site: 1997-XX-XX

Record Last Updated: 1999-12-14

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.77076° / -121.34480°
UTM: Zone-10 N4292639 E643792
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 11N
Range: 06E
Section: 30 **Qtr:** SE
Meridian: M
Elevation: 125 ft

Location: KASEBERG CREEK, 0.75 MILE EAST OF FIDDYMENT ROAD AND 0.25 MILE NORTH OF PLEASANT GROVE BOULEVARD, EAST SIDE OF ROSEVILLE

Location Detail: NEST TREE IS LOCATED IN WHAT IS NOW THE NORTH EDGE OF AN OPEN SPACE CORRIDOR.

Ecological: HABITAT CONSISTS OF A WOODLAND CORRIDOR ALONG THE CREEK DRAINAGE.

Threat: THREATENED BY THE CONSTRUCTION OF A SUBDIVISION AND GOLF COURSE.

General: NESTING WAS INITIATED IN 1996, DURING GRADING, BUT PRIOR TO CONSTRUCTION, OF HOUSING; 2 YOUNG PRODUCED IN 1996. NEST SITE WAS UNUSED IN 1997, ALTHOUGH NEST TREE IS WITHIN AN OPEN SPACE CORRIDOR.

Owner/Manager: UNKNOWN

Sources

WIL96F11 WILLIAMS, BRIAN. FIELD SURVEY FORM FOR BUTEO SWAINSONI (NEST SITE). 1996-07-01.

Buteo swainsoni

Swainson's hawk

Element Code: ABNKC19070

Status	NDDB Element Ranks	Other Lists
Federal: Species of Concern	**Global:** G5	**CDFG Status:**
State: Threatened	**State:** S2	

Habitat Associations

General: (NESTING) BREEDS IN STANDS WITH FEW TREES IN JUNIPER-SAGE FLATS, RIPARIAN AREAS AND IN OAK SAVANNAH.

Micro: REQUIRES ADJACENT SUITABLE FORAGING AREAS SUCH AS GRASSLANDS, OR ALFALFA OR GRAIN FIELDS SUPPORTING RODENT POPULATIONS.

Occurrence No. 952 **Map Index:** 46025 **EO Index:** 46025

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: WARENYCIA, D. & D. MCGRIFF 2001 (OBS)

Dates Last Seen
Element: 2001-06-XX
Site: 2001-06-27

Record Last Updated: 2001-10-03

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.79509° / -121.34800°
UTM: Zone-10 N4295334 E643465
Mapping Precision: SPECIFIC
Symbol Type: POINT
Radius: 80 meters

Township: 11N
Range: 06E
Section: 19 **Qtr:** N
Meridian: M
Elevation: 110 ft

Location: ALONG PLEASANT GROVE CREEK, BETWEEN FIDDYMENT ROAD AND BLUE OAKS BOULEVARD, WEST SIDE OF ROSEVILLE
Location Detail:

Ecological: HABITAT CONSISTS OF BLUE OAK WOODLAND GROWING ALONG PLEASANT GROVE CREEK.

Threat: THREATENED BY DEVELOPMENT JUST WEST OF THE NEST SITE.

General: DARK-PHASE ADULT SWHA OBSERVED ON 26 APR 2001; NO NEST FOUND. NEST FOUND BY THOMAS LEHMAN (ESA), AND HE REPORTED THAT AT LEAST 1 YOUNG HAD BEEN PRODUCED. BY 27 JUN 2001, WHEN WE RETURNED TO GPS THE NEST, THE YOUNG HAD FLEDGED.

Owner/Manager: UNKNOWN

Sources

WAR01F04 WARENYCIA, DEE & DARLENE MCGRIFF (DFG-CNDDB). FIELD SURVEY FORM FOR BUTEO SWAINSONI (NEST SITE). 2001-06-27.

Gratiola heterosepala

Boggs Lake hedge-hyssop

Element Code: PDSCR0R060

Status	NDDB Element Ranks	Other Lists
Federal: Species of Concern	**Global:** G3	**CNPS List:** 1B
State: Endangered	**State:** S3.1	**R-E-D Code:** 1-2-2

Habitat Associations

General: MARSHES AND SWAMPS (FRESHWATER), VERNAL POOLS.

Micro: CLAY SOILS; USUALLY IN VERNAL POOLS, SOMETIMES ON LAKE MARGINS. 5-2400M.

Occurrence No. 16 **Map Index:** 11749 **EO Index:** 7258

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: STROMBERG, L. 1987 (OBS)

Dates Last Seen
Element: 1987-04-22
Site: 1997-06-18

Record Last Updated: 1997-08-11

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.76720° / -121.26365°
UTM: Zone-10 N4292374 E650850
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 6.4 ac

Township: 11N
Range: 06E
Section: 25 **Qtr:** SW
Meridian: M
Elevation: 230 ft

Location: N OF ROSEVILLE, W OF ANTELOPE CREEK, WSW OF ROCKLIN.

Location Detail:

Ecological: NORTHERN HARDPAN VERNAL POOL ON EXCHEQUER VERY STONY LOAM SOIL. ASSOCIATED VEGETATION INCLUDES ERYNGIUM VASEYI, ALLOCARYA STIPATATA MICRANTHA AND GRATIOLA EBRACTEATA.

Threat: AREA GRAZED AND PROPOSED FOR REGIONAL SHOPPING CENTER.

General: OVER 40 PLANTS IN 2 SUBPOPULATIONS IN 1987. DEVELOPMENT IMMINENT IN 1997; ROSEVILLE BLVD EXPANSION HAS/WILL PROBABLY WIPE OUT MOST OF THIS OCCURRENCE UNLESS SET ASIDE.

Owner/Manager: PVT

Sources

NOS97F18 NOSAL, T. ET AL. FIELD SURVEY FORM FOR GRATIOLA HETEROSEPALA. 1997-06-18.

STR87F02 STROMBERG, L. FIELD SURVEY FORM FOR GRATIOLA HETEROSEPALA. 1987-04-22.

STR87F03 STROMBERG, L. FIELD SURVEY FORM FOR GRATIOLA HETEROSEPALA. 1987-04-06.

STR87F04 STROMBERG, L. FIELD SURVEY FORM FOR GRATIOLA HETEROSEPALA. 1987-04-06.

STR87F05 STROMBERG, L. FIELD SURVEY FORM FOR GRATIOLA HETEROSEPALA. 1987-04-06.

Lepidurus packardi

vernal pool tadpole shrimp

Element Code: ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: INHABITS VERNAL POOLS AND SWALES IN THE SACRAMENTO VALLEY CONTAINING CLEAR TO HIGHLY TURBID WATER.

Micro: POOLS COMMONLY FOUND IN GRASS BOTTOMED SWALES OF UNPLOWED GRASSLANDS. SOME POOLS ARE MUD-BOTTOMED & HIGHLY TURBID.

Occurrence No. 24 **Map Index:** 32457 **EO Index:** 1900

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1995 (LIT)

Dates Last Seen
Element: 1995-02-09
Site: 1995-02-09

Record Last Updated: 1997-03-04

Quad Summary: ROSEVILLE (3812173/528D)
County Summary: PLACER

Lat/Long: 38.76950° / -121.32354°
UTM: Zone-10 N4292533 E645642
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 1/5 mile

Township: 11N
Range: 06E
Section: 29 **Qtr:** SE
Meridian: M
Elevation: 130 ft

Location: BETWEEN KASEBERG CREEK AND SOUTH BRANCH PLEASANT GROVE CREEK; 1.8 KM WEST OF SOUTHERN PACIFIC RR X HWY 65.

Location Detail: WOODCREEK OAKS MITIGATION SITES. 14 WATER BODIES WERE SAMPLED ON FEB 9, 10, 27 & MARCH 14, 1995. LEPIDURUS PACKARDI FOUND IN ONLY 1 POOL & ONLY ON 2/9/95. SUGNET OBSERVED TADPOLE SHRIMP IN A MANMADE VERNAL POOL SOMEWHERE IN SEC 29 ON 2/4/93

Ecological: HARDPAN VERNAL POOL IN ANNUAL NON-NATIVE GRASSLAND. ON 2/9/95 THE SURFACE AREA WAS 129 SQ METERS & THE WATER DEPTH WAS 16 CM. WETLAND COMPENSATION/MITIGATION PRESERVE. ALSO, A MANMADE VERNAL POOL SOMEWHERE IN SEC 29.

Threat:

General: POOL #C2: 50+ ADULTS OBSERVED; 3 ADULTS COLLECTED & DEPOSITED IN CAS. THE INFORMATION PROVIDED BY THE CONSULTANT HAS CONFLICTING DATA ON THE LOCATION OF THIS POOL; THIS SITE WAS MAPPED ACCORDING TO THE MAP THEY PROVIDED, NOT THE T-R-S GIVEN

Owner/Manager: PVT-SARES REGIS GROUP

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

SUG95R01 SUGNET & ASSOCIATES. ANNUAL REPORT TO THE USFWS REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT #PRT-795933. (2 BINDERS). 1995-06-XX.

SUG95R02 SUGNET & ASSOCIATES. CORRECTIONS TO ANNUAL REPORT TO THE U.S. FISH AND WILDLIFE SERVICE REGARDING SURVEYS FOR LISTED CRUSTACEA CONDUCTED UNDER FEDERAL FISH AND WILDLIFE PERMIT NO. PRT-795933, 1994-95. 1995-10-30.

Lepidurus packardi

vernal pool tadpole shrimp

Element Code: ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: INHABITS VERNAL POOLS AND SWALES IN THE SACRAMENTO VALLEY CONTAINING CLEAR TO HIGHLY TURBID WATER.

Micro: POOLS COMMONLY FOUND IN GRASS BOTTOMED SWALES OF UNPLOWED GRASSLANDS. SOME POOLS ARE MUD-BOTTOMED & HIGHLY TURBID.

Occurrence No. 27 **Map Index:** 32503 **EO Index:** 30805

Occ Rank: Good
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: LACY, T. 1995 (LIT)

Dates Last Seen
Element: 1996-02-15
Site: 1996-02-15

Record Last Updated: 1997-03-27

Quad Summary: PLEASANT GROVE (3812174/528C)
County Summary: PLACER

Lat/Long: 38.87335° / -121.38786°
UTM: Zone-10 N4303957 E639850
Mapping Precision: SPECIFIC
Symbol Type: POLYGON
Area: 15.2 ac

Township: 12N
Range: 05E
Section: 23 **Qtr:** SW
Meridian: M
Elevation: 93 ft

Location: USAF LINCOLN COMMUNICATIONS FACILITY; 1.1 KM WNW OF MOORE ROAD X DOWD AVENUE.

Location Detail: FACILITY ~231 ACRES W/ABOUT 236 VERNAL POOLS. 36 POOLS SAMPLED IN 1995, 15 POOLS SAMPLED IN 1994 & 2 POOLS SAMPLED IN 1993. ONLY 1 LIVE TADPOLE SHRIMP FOUND IN 1 POOL DURING THESE 3 YEARS. IN 1996 100'S FOUND IN 4 POOLS IN NE CORNER OF SITE

Ecological: ANNUAL GRASSLAND & OAK SAVANNAH WITH VERNAL POOLS INTERSPERSED AMONG THESE HABITATS. TADPOLES, OSTRACODS, COPEPODS, FLATWORMS, BEETLES & INSECT LARVAE ALSO FOUND.

Threat: DISCING OF POOLS; POSSIBLE HERBICIDE RUNOFF FROM ANTENNA PADS; AGRICULTURE-CATTLE & SHEEP GRAZING, RICE FARMING NEARBY.

General: POOL #215: GRASS & ALGAE BOTTOM. POOL EST TO BE 180 X 20 FT, & 10 INCHES DEEP. 1 INDIVIDUAL FOUND 2/9/95, NONE FOUND 3/1 OR 3/15/95. ONLY DISSOLVED CARAPACES FOUND IN 1994. 100'S FOUND IN POOLS 180, 140, 141 & 143 ON 2/15/96.

Owner/Manager: DOD-LINCOLN COMMUNICATIONS FAC

Sources

LAC95F02 LACY, TIMOTHY (WESCO-RMI). FIELD SURVEY FORM FOR LEPIDURUS PACKARDI. 1995-02-09.

LAC95R01 LACY, TIMOTHY (WESCO-RMI). 1995 VERNAL POOL CRUSTACEAN SURVEY RESULTS-MCCLELLAN AFB AND LINCOLN & DAVIS COMMUNICATIONS FACILITIES; CONSERVATION PLAN INCLUDED. 1995-XX-XX.

LAC96F01 LACY, TIMOTHY (RMI). FIELD SURVEY FORM FOR LEPIDURUS PACKARDI. 1996-02-15.

Lepidurus packardi

vernal pool tadpole shrimp

Element Code: ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: INHABITS VERNAL POOLS AND SWALES IN THE SACRAMENTO VALLEY CONTAINING CLEAR TO HIGHLY TURBID WATER.

Micro: POOLS COMMONLY FOUND IN GRASS BOTTOMED SWALES OF UNPLOWED GRASSLANDS. SOME POOLS ARE MUD-BOTTOMED & HIGHLY TURBID.

Occurrence No. 103 **Map Index:** 33706 **EO Index:** 30603

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1993 (PERS)

Dates Last Seen
Element: 1993-03-12
Site: 1993-03-12

Record Last Updated: 1997-03-11

Quad Summary: PLEASANT GROVE (3812174/528C), VERONA (3812175/529D)
County Summary: SUTTER

Lat/Long: 38.81675° / -121.49758°
UTM: Zone-10 N4297513 E630435
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 11N
Range: 04E
Section: 11 **Qtr:** XX
Meridian: M
Elevation: 40 ft

Location: SOUTHWEST OF THE INTERSECTION OF PLEASANT GROVE ROAD AND HOWSLEY ROAD.
Location Detail: ROADSIDE DITCHES SOMEWHERE IN SECTION 11.
Ecological: MANMADE ROADSIDE DITCHES.
Threat:
General: LEPIDURUS PACKARDI OBSERVED IN THE 2 FEATURES INSPECTED. SUGNET RECORD #185. NO B. LYNCHI OBSERVED.
Owner/Manager: UNKNOWN

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

Lepidurus packardi

vernal pool tadpole shrimp

Element Code: ICBRA10010

Status	NDDB Element Ranks	Other Lists
Federal: Endangered	**Global:** G2G3	**CDFG Status:**
State: None	**State:** S2S3	

Habitat Associations

General: INHABITS VERNAL POOLS AND SWALES IN THE SACRAMENTO VALLEY CONTAINING CLEAR TO HIGHLY TURBID WATER.

Micro: POOLS COMMONLY FOUND IN GRASS BOTTOMED SWALES OF UNPLOWED GRASSLANDS. SOME POOLS ARE MUD-BOTTOMED & HIGHLY TURBID.

Occurrence No. 104 **Map Index:** 33707 **EO Index:** 30605

Occ Rank: Unknown
Origin: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Source: SUGNET & ASSOC. 1993 (PERS)

Dates Last Seen
Element: 1993-03-12
Site: 1993-03-12

Record Last Updated: 1997-03-11

Quad Summary: PLEASANT GROVE (3812174/528C), VERONA (3812175/529D)
County Summary: SUTTER

Lat/Long: 38.77305° / -121.49794°
UTM: Zone-10 N4292663 E630483
Mapping Precision: NON-SPECIFIC
Symbol Type: POINT
Radius: 3/5 mile

Township: 11N
Range: 04E
Section: 26 **Qtr:** XX
Meridian: M
Elevation: 35 ft

Location: SOUTHWEST OF THE INTERSECTION OF PLEASANT GROVE ROAD AND SANKEY ROAD.

Location Detail: ROADSIDE DITCHES SOMEWHERE IN SECTION 26.

Ecological: MANMADE ROADSIDE DITCHES.

Threat:

General: LEPIDURUS PACKARDI OBSERVED IN THE ONE FEATURE INSPECTED. SUGNET RECORD #186. B. LYNCHI ALSO OBSERVED.

Owner/Manager: UNKNOWN

Sources

SUG93U01 SUGNET & ASSOCIATES. PRINT-OUT OF LOCATIONS (T-R-S) OF FAIRY SHRIMP SAMPLING. (OBTAINED FROM THE US FISH AND WILDLIFE SERVICE). 1993-XX-XX.

Roseville Energy Park

Appendix 8.2-B
U.S. Fish and Wildlife Service (USFWS) Letter Regarding Special Status Species in the Project Vicinity

October 2003

Roseville Energy Park
Application for Certification

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W2605
Sacramento, California 95825

IN REPLY REFER TO:
1-1-03-SP-2568

JUL 29 2003

Mr. Brett Hartman
Ecologist
Tetra Tech FW, Inc.
3947 Lennane Drive, Suite 200
Sacramento, California 95834

Subject: Species List for Roseville Energy Park (REP)

Dear Mr. Hartman:

We are sending the enclosed list in response to your request for information about endangered and threatened species (Enclosure A). The list covers the U.S. Geological Survey 7.5 minute quad(s) where your project is planned.

Please read Important Information About Your Species List (Enclosure B). It explains how we made the list and describes your responsibilities under the Endangered Species Act. Contact Justin Ly at (916) 414-6645, if you have any questions about the attached list or your responsibilities under the Endangered Species Act.

For the fastest response to species list requests, address them to the attention of Species Lists at this address. You may fax requests to (916) 414-6712 or 414-6713.

Sincerely,

for Chris Nagano, Chief
Endangered Species Division

Enclosures

ENCLOSURE B

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute *quads*. The United States is divided into these quads, which are about the size of San Francisco. If you requested your list by quad name or number, that is what we used. Otherwise, we used the information you sent us to determine which quad or quads to use.

The animals on your species list are ones that occur within, *or may be affected by projects within*, the quads covered by the list. Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them. Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents. Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regard-less of whether they appear on a quad list.
Plants

Any plants on your list are ones *that have actually been observed* in the quad or quads covered by the list. We have also included either a county species list or a list of species in nearby quads. We recommend that you check your project area for these plants. Plants may exist in an area without ever having been detected there.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your project. We recommend that your surveys include any proposed and candidate species on your list. For plant surveys, we recommend using the enclosed *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Species*. The results of your surveys should be published in any environmental documents prepared for your project.

State-Listed Species

If a species has been listed as threatened or endangered by the State of California, but not by us nor by the National Marine Fisheries Service, it will appear on your list as a Species of Concern. *However you should contact the California Department of Fish and Game for official information about these species.* Call (916) 322-2493 or write Marketing Manager, California Department of Fish and Game, Natural Diversity Data Base, 1416 Ninth Street, Sacramento, California 95814.

Your Responsibilities Under the Endangered Species Act

All plants and animals identified as *listed* on Enclosure A are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the *take* of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal. Take may include significant habitat

modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

> If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, then that agency must engage in a *formal consultation* with the Service. During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a *biological opinion* by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.
>
> If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, then you, the applicant, should apply for an *incidental take permit*. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project. Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the project's direct and indirect impacts to listed species and compen-sates for project-related loss of habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as *critical habitat*. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Maps and boundary descriptions of the critical habitat may be found in the *Federal Register*. The information is also reprinted in the *Code of Federal Regulations* (50 **CFR** 17.95).

Candidate Species

We recommend that you address impacts to *candidate* species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your project.

Species of Concern

Your list may contain a section called *Species of Concern*. This is an informal term that refers to those species that the Sacramento Fish and Wildlife Office believes might be in need of concentrated

conservation actions. Such conservation actions vary depending on the health of the populations and degree and types of threats. At one extreme, there may only need to be periodic monitoring of populations and threats to the species and its habitat. At the other extreme, a species may need to be listed as a Federal threatened or endangered species. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species.

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed, candidate and special concern species in your planning, this should not be a problem. We also continually strive to make our information as accurate as possible. Sometimes we learn that a particular species has a different range than we thought. This should not be a problem if you consider the species on the county that we have enclosed. If you have a long-term project or if your project is delayed, please contact us for a current list. You can also find out the current status of a species by going to the Service's Internet page: www.fws.gov.

ENCLOSURE C

GUIDELINES FOR CONDUCTING AND REPORTING BOTANICAL INVENTORIES FOR FEDERALLY LISTED, PROPOSED AND CANDIDATE PLANTS

(September 23, 1996)

These guidelines describe protocols for conducting botanical inventories for federally listed, proposed and candidate plants, and describe minimum standards for reporting results. The Service will use, in part, the information outlined below in determining whether the project under consideration may affect any listed, proposed or candidate plants, and in determining the direct, indirect, and cumulative effects.

Field inventories should be conducted in a manner that will locate listed, proposed, or candidate species (target species) that may be present. The entire project area requires a botanical inventory, except developed agricultural lands. The field investigator(s) should:

1. Conduct inventories at the appropriate times of year when target species are present and identifiable. Inventories will include all potential habitats. Multiple site visits during a field season may be necessary to make observations during the appropriate phenological stage of all target species.

2. If available, use a regional or local reference population to obtain a visual image of the target species and associated habitat(s). If access to reference populations is not available, investigators should study specimens from local herbaria.

3. List every species observed and compile a comprehensive list of vascular plants for the entire project site. Vascular plants need to be identified to a taxonomic level which allows rarity to be determined.

4. Report results of botanical field inventories that include:

   a. a description of the biological setting, including plant community, topography, soils, potential habitat of target species, and an evaluation of environmental conditions, such as timing or quantity of rainfall, which may influence the performance and expression of target species

   b. a map of project location showing scale, orientation, project boundaries, parcel size, and map quadrangle name

   c. survey dates and survey methodology(ies)

   d. if a reference population is available, provide a written narrative describing the target species reference population(s) used, and date(s) when observations were made

   e. a comprehensive list of all vascular plants occurring on the project site for each habitat type

   f. current and historic land uses of the habitat(s) and degree of site alteration

   g. presence of target species off-site on adjacent parcels, if known

   h. an assessment of the biological significance or ecological quality of the project site in a local and regional context

5. If target species is(are) found, report results that additionally include:

a. a map showing federally listed, proposed and candidate species distribution as they relate to the proposed project

b. if target species is (are) associated with wetlands, a description of the direction and integrity of flow of surface hydrology. If target species is (are) affected by adjacent off-site hydrological influences, describe these factors.

c. the target species phenology and microhabitat, an estimate of the number of individuals of each target species per unit area; identify areas of high, medium and low density of target species over the project site, and provide acres of occupied habitat of target species. Investigators could provide color slides, photos or color copies of photos of target species or representative habitats to support information or descriptions contained in reports.

d. the degree of impact(s), if any, of the proposed project as it relates to the potential unoccupied habitat of target habitat.

6. Document findings of target species by completing California Native Species Field Survey Form(s) and submit form(s) to the Natural Diversity Data Base. Documentation of determinations and/or voucher specimens may be useful in cases of taxonomic ambiguities, habitat or range extensions.

7. Report as an addendum to the original survey, any change in abundance and distribution of target plants in subsequent years. Project sites with inventories older than three years from the current date of project proposal submission will likely need additional survey. Investigators need to assess whether an additional survey(s) is (are) needed.

8. Adverse conditions may prevent investigator(s) from determining presence or identifying some target species in potential habitat(s) of target species. Disease, drought, predation, or herbivory may preclude the presence or identification of target species in any year. An additional botanical inventory(ies) in a subsequent year(s) may be required if adverse conditions occur in a potential habitat(s). Investigator(s) may need to discuss such conditions.

9. Guidance from California Department of Fish and Game (CDFG) regarding plant and plant community surveys can be found in Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities, 1984. Please contact the CDFG Regional Office for questions regarding the CDFG guidelines and for assistance in determining any applicable State regulatory requirements.

ENCLOSURE A

Endangered and Threatened Species that May Occur in
or be Affected by Projects in the Selected Quads Listed Below
Reference File No. 1-1-03-SP-2568

Roseville Energy Park (REP)

July 28, 2003

QUAD: 528C PLEASANT GROVE

Listed Species

Birds

bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

giant garter snake, *Thamnophis gigas* (T)

Amphibians

California red-legged frog, *Rana aurora draytonii* (T)

Fish

delta smelt, *Hypomesus transpacificus* (T)

Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS

winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS

Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS

Sacramento splittail, *Pogonichthys macrolepidotus* (T)

Invertebrates

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

vernal pool tadpole shrimp, *Lepidurus packardi* (E)

Proposed Species

Birds

mountain plover, *Charadrius montanus* (PT)

Invertebrates

Critical habitat, vernal pool invertebrates, *See Federal Register 67:59883* (PX)

Plants

Critical habitat, vernal pool plants, *See Federal Register 67:59883* (PX)

Candidate Species

Birds

Western yellow-billed cuckoo, *Coccyzus americanus occidentalis* (C)

Fish

green sturgeon, *Acipenser medirostris* (C)

Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS

Species of Concern

Mammals

Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

small-footed myotis bat, *Myotis ciliolabrum* (SC)

long-legged myotis bat, *Myotis volans* (SC)

Yuma myotis bat, *Myotis yumanensis* (SC)

San Joaquin pocket mouse, *Perognathus inornatus* (SC)

Birds

tricolored blackbird, *Agelaius tricolor* (SC)

western burrowing owl, *Athene cunicularia hypugaea* (SC)

oak titmouse, *Baeolophus inornatus* (SLC)

Aleutian Canada goose, *Branta canadensis leucopareia* (D)

Swainson's hawk, *Buteo Swainsoni* (CA)

ferruginous hawk, *Buteo regalis* (SC)

Lawrence's goldfinch, *Carduelis lawrencei* (SC)

Vaux's swift, *Chaetura vauxi* (SC)

white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)

little willow flycatcher, *Empidonax traillii brewsteri* (CA)

prairie falcon, *Falco mexicanus* (SC)

American peregrine falcon, *Falco peregrinus anatum* (D)

greater sandhill crane, *Grus canadensis tabida* (CA)

loggerhead shrike, *Lanius ludovicianus* (SC)

Lewis' woodpecker, *Melanerpes lewis* (SC)

long-billed curlew, *Numenius americanus* (SC)

Nuttall's woodpecker, *Picoides nuttallii* (SLC)

white-faced ibis, *Plegadis chihi* (SC)

bank swallow, *Riparia riparia* (CA)

rufous hummingbird, *Selasphorus rufus* (SC)

Reptiles

northwestern pond turtle, *Clemmys marmorata marmorata* (SC)

California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

western spadefoot toad, *Spea hammondii* (SC)

Fish

longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

QUAD: 528D ROSEVILLE

Listed Species

Birds

bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

giant garter snake, *Thamnophis gigas* (T)

Amphibians

California red-legged frog, *Rana aurora draytonii* (T)

Fish

delta smelt, *Hypomesus transpacificus* (T)

Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS

winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS

Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS

Sacramento splittail, *Pogonichthys macrolepidotus* (T)

Invertebrates

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

vernal pool tadpole shrimp, *Lepidurus packardi* (E)

Proposed Species

Birds

mountain plover, *Charadrius montanus* (PT)

Invertebrates

Critical habitat, vernal pool invertebrates, *See Federal Register 67:59883* (PX)

Plants

Critical habitat, vernal pool plants, *See Federal Register 67:59883* (PX)

Candidate Species

Fish

green sturgeon, *Acipenser medirostris* (C)

Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS

Species of Concern

Mammals

Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

small-footed myotis bat, *Myotis ciliolabrum* (SC)

long-eared myotis bat, *Myotis evotis* (SC)

fringed myotis bat, *Myotis thysanodes* (SC)

long-legged myotis bat, *Myotis volans* (SC)

Yuma myotis bat, *Myotis yumanensis* (SC)

San Joaquin pocket mouse, *Perognathus inornatus* (SC)

Birds

tricolored blackbird, *Agelaius tricolor* (SC)

western burrowing owl, *Athene cunicularia hypugaea* (SC)

oak titmouse, *Baeolophus inornatus* (SLC)

Aleutian Canada goose, *Branta canadensis leucopareia* (D)

Swainson's hawk, *Buteo Swainsoni* (CA)

ferruginous hawk, *Buteo regalis* (SC)

Lawrence's goldfinch, *Carduelis lawrencei* (SC)

Vaux's swift, *Chaetura vauxi* (SC)

black swift, *Cypseloides niger* (SC)

white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)

little willow flycatcher, *Empidonax traillii brewsteri* (CA)

prairie falcon, *Falco mexicanus* (SC)

American peregrine falcon, *Falco peregrinus anatum* (D)

greater sandhill crane, *Grus canadensis tabida* (CA)

loggerhead shrike, *Lanius ludovicianus* (SC)

Lewis' woodpecker, *Melanerpes lewis* (SC)

long-billed curlew, *Numenius americanus* (SC)

Nuttall's woodpecker, *Picoides nuttallii* (SLC)

white-faced ibis, *Plegadis chihi* (SC)

bank swallow, *Riparia riparia* (CA)

rufous hummingbird, *Selasphorus rufus* (SC)

California thrasher, *Toxostoma redivivum* (SC)

Reptiles

northwestern pond turtle, *Clemmys marmorata marmorata* (SC)

California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

western spadefoot toad, *Spea hammondii* (SC)

Fish

longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

Plants

big-scale (=California) balsamroot, *Balsamorhiza macrolepis var macrolepis* (SLC)

hispid bird's-beak, *Cordylanthus mollis ssp. hispidus* (SC)

Boggs Lake hedge-hyssop, *Gratiola heterosepala* (CA)

legenere, *Legenere limosa* (SC)

KEY:

(E)	*Endangered*	Listed (in the Federal Register) as being in danger of extinction.
(T)	*Threatened*	Listed as likely to become endangered within the foreseeable future.
(P)	*Proposed*	Officially proposed (in the Federal Register) for listing as endangered or threatened.
(PX)	*Proposed Critical Habitat*	Proposed as an area essential to the conservation of the species.
(C)	*Candidate*	Candidate to become a *proposed* species.
(SC)	*Species of Concern*	May be endangered or threatened. Not enough biological information has been gathered to support listing at this time.
(SLC)	*Species of Local Concern*	Species of local or regional concern or conservation significance.
(MB)	*Migratory Bird*	Migratory bird
NMFS	NMFS species	Under the jurisdiction of the National Marine Fisheries Service. Contact them directly.
(D)	*Delisted*	Delisted. Status to be monitored for 5 years.
(CA)	*State-Listed*	Listed as threatened or endangered by the State of California.
(*)	*Extirpated*	Possibly extirpated from this quad.
(**)	*Extinct*	Possibly extinct.
	Critical Habitat	Area essential to the conservation of a species.

ENCLOSURE A

Endangered and Threatened Species that May Occur in or be Affected by
Projects in the Area of the Following California Counties
Reference File No. 1-1-03-SP-2568

Roseville Energy Park (REP)

July 28, 2003

PLACER COUNTY

Listed Species

Birds

bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

giant garter snake, *Thamnophis gigas* (T)

Amphibians

California red-legged frog, *Rana aurora draytonii* (T)

Fish

Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS

Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS

Lahontan cutthroat trout, *Oncorhynchus (=Salmo) clarki henshawi* (T)

Sacramento splittail, *Pogonichthys macrolepidotus* (T)

delta smelt, *Hypomesus transpacificus* (T) *

winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS

Invertebrates

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

vernal pool tadpole shrimp, *Lepidurus packardi* (E)

Plants

Truckee barberry (proposed for delisting), *Berberis sonnei* (E)

Proposed Species

Birds

mountain plover, *Charadrius montanus* (PT)

Amphibians

California tiger salamander, *Ambystoma californiense* (PT)

Invertebrates

Critical habitat, vernal pool invertebrates, *See Federal Register 67:59883* (PX)

Plants

Critical habitat, vernal pool plants, *See Federal Register 67:59883* (PX)

Candidate Species

Birds

Western yellow-billed cuckoo, *Coccyzus americanus occidentalis* (C) *

Amphibians

mountain yellow-legged frog, *Rana muscosa* (C)

Fish

green sturgeon, *Acipenser medirostris* (C)

Plants

Tahoe yellow-cress, *Rorippa subumbellata* (C)

slender Moonwort (= narrowleaf grapefern), *Botrychium lineare* (C) *

Species of Concern

Mammals

American (=pine) marten, *Martes americana* (SC)

California wolverine, *Gulo gulo luteus* (CA)

Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)

San Joaquin pocket mouse, *Perognathus inornatus* (SC)

Sierra Nevada red fox, *Vulpes vulpes necator* (CA)

Sierra Nevada snowshoe hare, *Lepus americanus tahoensis* (SC)

Yuma myotis bat, *Myotis yumanensis* (SC)

fisher, *Martes pennanti* (SC)

fringed myotis bat, *Myotis thysanodes* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

long-eared myotis bat, *Myotis evotis* (SC)

long-legged myotis bat, *Myotis volans* (SC)

pale Townsend's big-eared bat, *Corynorhinus (=Plecotus) townsendii pallescens* (SC)

small-footed myotis bat, *Myotis ciliolabrum* (SC)

spotted bat, *Euderma maculatum* (SC)

Birds

Aleutian Canada goose, *Branta canadensis leucopareia* (D)

American bittern, *Botaurus lentiginosus* (SC)

American dipper, *Cinclus mexicanus* (SLC)

American peregrine falcon, *Falco peregrinus anatum* (D)

California spotted owl, *Strix occidentalis occidentalis* (SC)

California thrasher, *Toxostoma redivivum* (SC)

Harlequin duck, *Histrionicus histrionicus* (SC)

Lawrence's goldfinch, *Carduelis lawrencei* (SC)

Lewis' woodpecker, *Melanerpes lewis* (SC)
Nuttall's woodpecker, *Picoides nuttallii* (SLC)
Swainson's hawk, *Buteo Swainsoni* (CA)
Vaux's swift, *Chaetura vauxi* (SC)
bank swallow, *Riparia riparia* (CA)
black swift, *Cypseloides niger* (SC)
ferruginous hawk, *Buteo regalis* (SC)
flammulated owl, *Otus flammeolus* (SC)
little willow flycatcher, *Empidonax traillii brewsteri* (CA)
long-billed curlew, *Numenius americanus* (SC)
northern goshawk, *Accipiter gentilis* (SC)
oak titmouse, *Baeolophus inornatus* (SLC)
olive-sided flycatcher, *Contopus cooperi* (SC)
red-breasted sapsucker, *Sphyrapicus ruber* (SC)
rufous hummingbird, *Selasphorus rufus* (SC)
tricolored blackbird, *Agelaius tricolor* (SC)
western burrowing owl, *Athene cunicularia hypugaea* (SC)
white-faced ibis, *Plegadis chihi* (SC)
white-headed woodpecker, *Picoides albolarvatus* (SC)

Reptiles

California horned lizard, *Phrynosoma coronatum frontale* (SC)
northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
southwestern pond turtle, *Clemmys marmorata pallida* (SC)

Amphibians

Mount Lyell salamander, *Hydromantes platycephalus* (SC)
foothill yellow-legged frog, *Rana boylii* (SC)
western spadefoot toad, *Spea hammondii* (SC)

Fish

Pacific lamprey, *Lampetra tridentata* (SC)
river lamprey, *Lampetra ayresi* (SC)

Invertebrates

California linderiella fairy shrimp, *Linderiella occidentalis* (SC)
Lake Tahoe benthic stonefly, *Capnia lacustra* (SC)
Sagehen Creek goracean caddisfly, *Goeracea oregona* (SC)
Shirttail Creek stonefly, *Megaleuctra sierra* (SC)
South Forks ground beetle, *Nebria darlingtoni* (SC)
spiny rhyacophilan caddisfly, *Rhyacophila spinata* (SC)

Plants

Ahart's (dwarf) rush, *Juncus leiospermus var. ahartii* (SC)
Boggs Lake hedge-hyssop, *Gratiola heterosepala* (CA)
Brandegee's clarkia, *Clarkia biloba ssp brandegeae* (SLC)
Butte fritillary, *Fritillaria eastwoodiae* (SC)
Carson Range rock cress, *Arabis rigidissima var. demota* (SC)
Donner Pass buckwheat, *Eriogonum umbellatum var. torreyanum* (SC)
Plumas ivesia, *Ivesia sericoleuca* (SC)
Red Hills soaproot, *Chlorogalum grandiflorum* (SC)
Stebbins' phacelia, *Phacelia stebbinsii* (SC)
big-scale (=California) balsamroot, *Balsamorhiza macrolepis var macrolepis* (SLC)
common moonwort, *Botrychium lunaria* (SC)
felt-leaved (=woolly) violet, *Viola tomentosa* (SLC)
hispid bird's-beak, *Cordylanthus mollis ssp. hispidus* (SC)
legenere, *Legenere limosa* (SC)
long-petaled lewisia, *Lewisia longipetala* (SC)
saw-toothed lewisia, *Lewisia serrata* (SC)
stinkbells, *Fritillaria agrestis* (SLC)

KEY:

(E)	*Endangered*	Listed (in the Federal Register) as being in danger of extinction.
(T)	*Threatened*	Listed as likely to become endangered within the foreseeable future.
(P)	*Proposed*	Officially proposed (in the Federal Register) for listing as endangered or threatened.
(PX)	*Proposed Critical Habitat*	Proposed as an area essential to the conservation of the species.
(C)	*Candidate*	Candidate to become a *proposed* species.
(SC)	*Species of Concern*	Other species of concern to the Service.
(SLC)	*Species of Local Concern*	Species of local or regional concern or conservation significance.
(D)	*Delisted*	Delisted. Status to be monitored for 5 years.
(CA)	*State-Listed*	Listed as threatened or endangered by the State of California.
NMFS	NMFS species	Under jurisdiction of the National Marine Fisheries Service. Contact them directly.
*	*Extirpated*	Possibly extirpated from the area.
**	*Extinct*	Possibly extinct
	Critical Habitat	Area essential to the conservation of a species.

Roseville Energy Park

Appendix 8.2-C
Biological Resources Resumes

- ***Brett D. Hartman***
- ***Eric Htain***
- ***Lenny Malo***
- ***Brent Helm***

October 2003

Roseville Energy Park
Application for Certification

Brett D. Hartman	Tetra Tech FW, Inc.
Assignment: Biology **Years of Experience:** 10	**Education:** MFS, Restoration Ecology, Yale University School of Forestry & Environmental Studies BS, Environmental Science, University of New Hampshire

Selected Project Experience

Wetlands Mitigation Plan for Russell City Energy Center, Calpine Corporation, Hayward, CA—Serving as botanist, performed floristic surveys, vegetation mapping, wetland delineation, and mitigation planning, and development of CWA 401 & 404 permits on this project to design a wetland mitigation plan for a proposed natural gas power plant in Hayward, California. The goal of the mitigation plan was to restore low-grade diked seasonal wetlands and salt marsh on 26 acres in the nearby Hayward Shoreline Regional Park, along San Francisco Bay. The plan design included hydrologic, soil, vegetation, and wildlife analyses of the proposed mitigation site. Habitat for the Salt Marsh Harvest Mouse was integrated into the design. Extensive interagency and public input was incorporated into the plan. A construction plan, monitoring plan, and long-term management plan were developed to ensure project success.

Biological Surveys, 360 Networks, Sacramento Fiber Optic Conduit Installation Project—Biological resource specialist for Sac II construction pair located in the Central Valley. Responsible for pre-construction field surveys. Coordinated with California Department of Fish and Game, and California Public Utilities Commission Inspectors to ensure construction complied with all applicable state and federal regulations.

Biological Surveys, Florida Power & Light, Rio Linda Power Project, AFC, CA—Serving as botanist, contributed to field surveys, AFC document preparation, and subsequent data requests associated with licensing a co-generation plant in Sacramento and Yolo County, CA. Contributed to floristic surveys, vegetation mapping, vernal pool delineation and mitigation planning.

Biological Resources Evaluation, Calpine Corporation, Gilroy Energy Center, Gilroy, CA—Prepared plant section of BA for the Gilroy Energy Center in Gilroy, CA. Included biological review, mitigation measures, and restoration plan for 14 rare, threatened, and endangered serpentine endemics. Plant portion of BA accepted without comment by USFWS.

Biological Monitoring, Level (3) Communications Fiber Optic Conduit Installation Project, CA—NEPA/CEQA documentation and biological monitor for fiber optic conduit project in the Central Valley, foothills, San Bernadino, and mixed conifer forests of the Sierra Nevada.

Biological Assessment for Site 25, Moffett Federal Airfield, CA—Task manager for Biological Assessment (BA) for Site 25 on the Moffett Federal Airfield, CA. Site 25 is a pickleweed-dominated diked seasonal wetland in the south San Francisco Bay, where the Navy plans on implementing remediation for PCB contamination. BA included floristic surveys, habitat mapping, and development of mitigation measures for the salt marsh harvest mouse, the California clapper rail, and the California least tern. BA accepted without comment by US Fish & Wildlife Service.

Sierra Nevada Administrative Study Project, Wildlife and Plant BA/BEs, Plumas National Forest, CA—Co-author of plant Biological Assessment/Biological Evaluation. Prepared vegetation and habitat descriptions, Sierra Nevada Framework (SNFPA) and Herger Feinstein Quincy Library Group (HFQLG) Standards and Guidelines, mitigation measures, and assessment of project effects on habitat and TES Species.

Experience Summary:

- NEPA, ESA, CEQA, and CWA 404 permits
- Threatened, Endangered & Sensitive plant survey protocols
- Wetland delineation and habitat mapping
- Natural resource management and ecosystem restoration

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

Eric Htain	Tetra Tech FW Inc.
Assignment: Biological Resources	**Education:**
Years of Experience: 5	BA, University of California at Irvine, Environmental Studies

Selected Project Experience:

Roseville Energy Park AFC, Roseville, CA—Project Biologist for the licensing of a 150 MW, combined-cycle power plant in Roseville, Sacramento County, CA. Preparing biological resources sections of the AFC. Assisting in the permitting of the power plant to obtain Clean Water Act permits from the Army Corps of Engineers and permits from US Fish and Wildlife Service (USFWS) and California Department of Fish and Game. Conducted a jurisdictional wetland delineation for the approximately 40-acre parcel. Assessed potential project effects on wetlands and protected species.

Gilroy Energy Center AFC, Gilroy, CA—Project Biologist Calpine Corporation's natural gas-fired power plant in Gilroy, Santa Clara County, CA. Prepared the biology section of the Gilroy Phase II Power Project AFC. Conducted general biological surveys for the vicinity of the project. Conducted focused surveys for native trees and raptor nests at the project site. Conducted USFWS protocol level surveys for California red-legged frog. Assisted client in consultation with USFWS and CDFG. Assisted the project manager in coordinating an interdisciplinary team of authors to create supplements to the CEC application.

Creed, Lambie, and Goosehaven Energy Centers, Suisun City, CA—Assisted the project biologist in compliance monitoring of a power plant in Suisun City, CA. Monitored construction of the 230 kV transmission lines for the energy centers. Delineated vernal pools in the transmission line ROW and monitored construction practices to ensure that construction equipment and vehicles did not infringe upon the USFWS established buffer to protect the vernal pools and vernal pool species such as Delta green ground beetle. Prepared summary biological monitoring report.

Tesla Energy Project, Tracy, CA—Conducted surveys for burrowing owls and big tarplant in conjunction with the preparation of an Application for Certification for the FPL Energy Tesla Power Plant project.

King City Energy Center, King City, CA—Assisted in compliance monitoring Calpine Corporation's natural gas-fired power plant in King City, CA. Conducted biological resources surveys for the power plant site and met with California Energy Commission Staff regarding potential effects on biological resources.

North Baja Pipeline Project, PG&E National Energy Group, Blythe, CA—Conducted biological resource surveys for an 80-mile natural gas pipeline from Blythe, CA to the US/Mexico border. Surveys included pre-construction botanical surveys and noxious weed surveys of the pipeline route and alternative alignments. Monitored mitigation measures for construction and installation of the 36-inch natural gas pipeline for biological resources including rare plants, desert tortoise, flat-tail horned lizard, burrowing owl, Couch spadefoot toad, Gila woodpecker, and nesting migratory birds.

Fiber Optic Conduit Permitting, Level 3 Communications, Sacramento to Redding, CA—Responsible for biological resources analysis during preparation of a Proponent's EA and permit applications for the installation of a 150-mile-long fiber optic cable. The corridor traversed five counties through California's Central Valley (Yolo, Colusa, Glenn, Tehama, and Shasta). Biological work performed for this project included focused surveys for protected species including giant garter snake, valley elderberry longhorn beetle, Swainson's hawk, and western burrowing owl. Conducted surveys for rare, threatened, and endangered species; wetlands; and other natural resources along the fiber optic route. Developed mitigation measures and plans for construction of the project in areas of sensitive resources.

Experience Relevant to Projects:

- Experience with CEC, AFCs and CEQA
- Experience with Threatened, Endangered & Sensitive wildlife survey protocols

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Leonard Malo	Tetra Tech FW, Inc.
Assignment: Programmatic Permitting & Section 7/Habitat Conservation Plans **Years of Experience:** 5	**Education:** BS, Ecology, University of California, Berkeley

Selected Project Experience

Pacific Gas and Electric, North Baja Natural Gas Pipeline, Southern CA and Western AZ—Prepared biological reports and assessments to document compliance with NEPA, CEQA, FERC, and federal and state Endangered Species Acts (ESAs) for a proposed 80-mile natural gas line extending from Arizona through California to an interconnection at the U.S./Mexico border. Developed field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Coordinated and conducted T&E species surveys for rare plants, Desert Tortoise, Couch's Spadefoot Toad, Flat-tailed Horned Lizard, Yuma Clapper Rail, Black Rail, Mountain Plover, Burrowing Owl, Western Yellow-billed Cuckoo, and Southwestern Willow Flycatcher. Coordinated and conducted wetland delineations.

AT&T/PF.Net, Fiber Optic Project, CA—Prepared biological reports and assessments to document compliance with NEPA, CEQA, and federal and state ESAs for a proposed installation of a 1,323-mile-long fiber optic telecommunications system from Lamesa, Texas to Los Angeles. Responsible for developing field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Coordinated and conducted T&E species surveys for plants and mammals. Coordinated and conducted wetland delineations. Responsible for implementation and management of the Mitigation Monitoring Plan for the 372 miles of California construction.

Calpine Corporation, Inland Empire Energy Center, Application for Certification, Riverside County, CA—Coordinated and prepared biological reports and assessments to document compliance with CEQA, federal and state ESAs, and biological resources protected by local policies or ordinances. Developed field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Coordinated and conducted threatened and endangered species surveys for wildlife and plants including Coastal California Gnatcatcher, Burrowing Owl, Stephens' kangaroo rat, and Southwestern Arroyo Toad. Coordinated wetland delineations.

Midway Power, LLC, Florida Power and Light Project, Application for Certification, CA—Conducted a biological reconnaissance survey and prepared a biological report. Determined potential impacts to wetland habitat, riparian habitat, locally designated natural communities, and biological resources protected by local policies or ordinances. Coordinated and prepared biological reports and assessments to document compliance with CEQA, federal and state ESAs, and biological resources protected by local policies or ordinances. Developed field survey protocols, field survey schedules, and mitigation packages in accordance with local and federal agency standards. Coordinated T&E species surveys for wildlife and plants including Mountain Plover, Burrowing Owl, San Joaquin Kit Fox, Red-legged Frog, Giant Garter Snake, Swainson's Hawk, Tri-colored blackbird, and California Horned Lark. Coordinated wetland delineations.

360 Networks, Inc., Fiber Optic Project, Northern and Southern CA—Conducted biological reconnaissance surveys and prepared biological reports. Characterized the sites and evaluated whether endangered, threatened, or special status species or their habitats occur or potentially occur. Determined potential impacts to wetland habitat, riparian habitat, locally designated natural communities, and biological resources protected by local policies or ordinances. Responsible for delineating exclusion zones for sensitive biological resources.

Summary of Experience:

- Conducted biological studies under NEPA/CEQA for linear facilities
- Prepared biological reports and assessments in compliance with NEPA, CEQA, FERC, and federal and state Endangered Species Acts
- Conducted threatened and endangered species surveys, wetland delineations, and other waters determinations based on CDFG code 1603, Section 404 (b)(1) of the Clean Water Act, and Section 10 of the Rivers and Harbors Act

Curriculum Vita

BRENT P. HELM
5998 Windbreaker Way
Sacramento, CA. 95823

Phone: (916) 428-7584
E-mail: bhelm69485@aol.com

EDUCATION

Ph.D., Ecology, University of California, Davis, California, 1999.
M.S., Ecology, University of California, Davis, California, 1996.
B.S., Wildlife Management, Humboldt State University, Arcata, California, 1988.

EMPLOYMENT

Owner and Senior Ecologist. 2001 to present. Helm Biological Consulting.
5998 Windbreaker Way, Sacramento, CA. 95823.

Responsibilities include managing staff recruitment; marketing; conducting biological resources inventories; environmental documentation preparation; vegetation and habitat enhancement and creation; and project management.

Duties include:

- preparing regional conservation and management plans for agencies that must resolve conflicts between growth and preservation,
- development and implementation of field surveys for rare, threatened, and endangered plants and wildlife,
- assessing impacts and development of mitigation recommendations for projects that affect sensitive species populations,
- evaluating and describing threats and endangerment status of species,
- preparing biological assessments under the federal Endangered Species Act and designing and constructing habitat for federally listed endangered and threatened plant and animal species,
- developing constraints mapping and analyses for project alternatives to identify fatal flaws and other constraints,
- evaluating the impacts of development projects on botanical, wildlife, and wetland resources for use in EIRs, EISs, environmental assessments, and other environmental documents (evaluation includes determining the significance of occurrences and developing mitigation recommendations), and
- maintaining laboratory equipment (e.g., microscopes, water quality meters, specimen reference collections) and standardizing laboratory safety procedures and techniques.

Adjunct Professor. 1999 to present. San Joaquin Delta College.
5151 Pacific Ave. Stockton, CA 95207-6370.

Responsibilities include planning and implementing curriculum for the Conservation of Natural Resources (NR2) and Introduction to Forestry (NR1) courses. Duties include preparing lecture notes; lecturing on relevant course material; preparing, distributing, and grading tests; evaluating and assisting the progress of students in meeting the stated course objectives and advising and students where to get help, if needed; and miscellaneous administrative duties. In addition, I support and promote student participation in natural resource conservation outside of the classroom, by encouraging students to attend events including field trips, nature walks, environmental workshops, nonprofit fund raising events, etc. I also advise students on possible employment opportunities in the field of natural resources and provide names and phone numbers of key personnel to contact.

Senior Ecologist. 1997 to 2001. May Consulting Services.
14528 Andrus Island Road, Walnut Grove, CA. 95690.

Responsibilities include managing the Walnut Grove office; supervising, mentoring, and training of junior staff; staff recruitment; marketing; conducting biological resources inventories; environmental documentation preparation; vegetation and habitat enhancement and creation; project management; and the establishment and operation of the laboratory.

Project experience includes general and specific plans, residential and commercial development, military base facilities, wastewater treatment plants, reservoirs, transmission line routes, water conveyance facilities, highway corridors, hydroelectric projects, and mitigation banks.

Senior Wildlife Biologist and Botanist. 1989 to 1997. Jones & Stokes Associates, Inc.
2600 V Street Suite 100, Sacramento, CA. 95818

Duties included the management of the botanical and wetland resources functional group; supervising, mentoring, and training junior staff; staff recruitment; project management; marketing; conducting biological resources inventories; environmental documentation preparation; and vegetation and habitat enhancement and creation.

Facilitated large-scale botanical inventory and wetland delineations on numerous projects, including the Tuscarora Company's natural gas pipeline project from Bandon, Oregon to Reno, Nevada; Contra Costa Water District's (CCWD's) Los Vaqueros Reservoir, in Contra Costa and Alameda counties; California Department of Transportation's (Caltrans) relocation of State Route 101 through Willits in Mendocino County; 60,000 acre portion for development of Front County of Denali National Park, Alaska; the Mono Lake EIR on relicensing the Los Angeles Water and Power Department's water rights; and the 6,000 acre Nance Canyon residential development near Chico in Butte County.

Managed field investigations of the U.S. Army Corps of Engineers Merced Stream project in Merced County, Los Vaqueros Reservoir project in Contra Costa and Alameda Counties, Beale Air Force Base in Yuba County, Mather Air Force Base in Sacramento County,

Sequoia National Park in Tulare County; and numerous other projects throughout California and Nevada.

Established, maintained, and expanded the laboratory facilities, which included an extensive aquatic invertebrate reference collection. Also established the firm's herbarium and supporting database that cross references plant and animal specimen collections with species occurrence information.

Wetland Botanist. 1989. EIP Associates, Inc.
1311 I Street, Suite 200, Sacramento, CA. 95814.

Delineated wetlands (under the jurisdiction of the Army Corps of Engineers pursuant to Section 404 of the Clean Water Act); surveyed, mapped, and described sensitive natural resources; and conducted rare plant surveys. Collected, classified, and recorded all plant species associated with vernal pools. Assisted in establishing guidelines for plant species used as vernal pool indicators.

Exotic Plant Horticulturist 1988 to 1989. Exotic Plants.
1801 Howe Ave, Sacramento, CA. 95825.

Duties included the care and maintenance of the green house and associated exotic horticultural plants; purchasing and propagation of plant stock; and distribution of retail plant products.

Invertebrate Biologist. 1988. Northern Prairie Wildlife Research Center.
Sacramento National Wildlife Refuge, Willows, CA. 95988.

Collected, sorted, and identified aquatic invertebrates, to the lowest justifiable taxon, for avian botulism studies at the Sacramento National Wildlife Refuge. Cared for and disposed of diseased waterfowl (i.e., lead poisoning, avian cholera, avian botulism), preformed necropsy on diseased waterfowl, and assisted in annual waterfowl population censusing surveys.

Fisheries Maintenance Technician. 1986 to 1987. Humboldt State University.
Aquaculture Ponds, Arcata, CA. 95521.

Captured, bred, tagged, and released salmonids; fed and cared for breeding fish stock; analyzed water quality (e.g., DO, pH, temperature, turbidity, salinity); recorded and statistically analyzed data; and preformed general maintenance tasks (e.g., repaired ponds, pumps, nets, and fences).

Additional unrelated employment includes experience as a firefighter, ceramics instructor, waiter, prep-cook, gas station mechanic and attendant, construction worker, courtesy clerk, and football and wrestling coach.

RELEVENT EXPERIENCE

Guest Lecture

Title: "Mitigation Banking as a Tool For Conservation" for the Merced Resources Conservation District.
Date: February 17, 1999.
Contact: John Vollmar. Vernal Pool Educational Coordinator. Merced Resources Conservation District.
Phone: (510) 848-9001.

Title: "How and When to Hire a Consultant" for the San Joaquin Resource Conservation District
Date: March 4, 1997.
Contact: Loran May. Vernal Pool Educational Coordinator. San Joaquin Resource Conservation District.
Phone: (916) 776-2500.

Title: "Wetland Mitigation Banking" for the San Joaquin Resource Conservation District
Date: May 6, 1997.
Contact: Loran May. Vernal Pool Educational Coordinator. San Joaquin Resource Conservation District.
Phone: (916) 776-2500.

Title: "Vernal Pool Invertebrates" for University of California Davis Freshwater Invertebrate Ecology (WFB 123) Course.
Date: May 12, 1994, April 13, 1995, and April 11, 1996.
Contact: Nancy Erman. Assistant Professor. Wildlife, Fish & Conservation Biology, University of California, Davis.
Phone: (916) 752-7182.

Title: "Rare, Threatened, and Endangered Fairy Shrimp and Tadpole Shrimp" for the symposium on the Sensitive Biological Resources of the Sacramento Valley: The Science and the Politics.
Date: April 2, 1996.
Contact: Sherry Teresa. Executive Director. The Center for Natural Lands Management, Sacramento, CA.
Phone: (916) 567-4180.

Title: "The Grass Class: The Taxonomy and Biology of California Grasses" for Jones & Stokes Associates, Inc.
Date: March 12, 1996.
Contact: Susan Bushnell. Plant Ecologist. Jones & Stokes Associates, Inc., Sacramento, CA.
Phone: (916) 737-3000.

Title: "The Biology and Ecology of the San Joaquin Vernal Pools and their Inhabitants: A Cross- Section Through San Joaquin County" a roving symposium for the California Inland Invertebrate Working Group.
Date: February 17 & 18, 1996.
Contact: Richard Hill. Biologist. California Department of Transportation (Caltrans), Sacramento, CA.
Phone: (916) 263-3396.

Title: "Fairy Shrimp: Biology, Laws, and Regulations" for Sacramento Municipal Utility District (SMUD).
Date: February 7, 1996.
Contact: Lonn Maier. Environmental Specialist. Sacramento Municipal Utility District, Sacramento, CA.
Phone: (916) 732-6566.

Title: "A Walk On The Wild Side: Wetland Resources in an Urban Environment" for Parkway Venture.
Date: January 27, 1996.
Contact: Rochelle Barcellona. Public Relations Coordinator. Folsom, CA.
Phone: (916) 351-9247.

Title: "Careers in Wildlife, Fisheries & Conservation Biology" for The Internship and Career Center.
Date: January 23, 1996.
Contact: Marge Lee. Coordinator. Environmental & Resource Sciences, University of California, Davis.
Phone: (916) 752-0411.

Title: "Life Along the Sacramento River"
Date: May 31,1995, and January 12, 1996
Contact: Joanna De La Cuesta. Instructor of Elementary Education. Leonardo da Vinci Elementary School, Sacramento, CA.
Phone: (916) 277-6496.

Title: "Vernal Pool Creation: Methods and Myths" for Teichert Aggregate, Inc.
Date: November 3, 1995.
Contact: Randy Sater. Aggregate Resource Division Manager. Teichert Aggregates, Inc., Sacramento, CA.
Phone: (916) 484-3257.

Title: "Macro-invertebrate Monitoring at the Sacramento Regional Wastewater Treatment Plant Demonstration Wetlands Project" for the Sacramento Regional Wastewater Treatment Plant (SRWTP).
Date: August 2 & 3, 1995.
Contact: Chuck Williams. Project Engineer. SRWTP, Sacramento, CA.
Phone: (916) 395-4300.

Title: "The Biology and Ecology of Invertebrates Occurring in Northern California Vernal Pools" a roving symposium for the California Inland Invertebrate Working Group.
Date: February 17 & 18, 1995.
Contact: Richard Hill. Biologist. Caltrans, Sacramento, CA.

PUBLICATIONS AND RESEARCH

Helm, B, P. 1990. Sampling protocol for Branchiopods and other freshwater invertebrates. Jones and Stokes Associates, Inc. Sacramento, CA. 11 pp.

Helm, B. P. 1998. Biogeography of eight large branchiopods endemic to California. Pages 124-139 *in* Witham, C. W., E. T. Bauder, D. Belk, W.R. Ferren Jr., and R. Ornduff (eds.). Ecology, conservation, and management of vernal pool ecosystems –proceeding from a 1996 conference. California Native Plant Society, Sacramento, California. 285 pp.

Helm, B. P. 1999. Feeding ecology of *Linderiella occidentalis* (Dodds) (Crustacea: Anostraca). Doctoral thesis. University of California, Davis. 158 pp.

Helm, B. P. and J. E. Vollmar. 2002. Large Branchiopods. Pages 151-190 *in* Vollmar J. E. (eds.). Wildlife and Rare Plant Ecology of Eastern Merced County's Vernal Pool Grasslands. Sentinel Printers, Inc. Santa Cruz, California. 446 pp.

Helm, B, P. (in review). Laboratory feeding studies of *Linderiella occidentalis* (Dodds) (Crustacea: Anostraca).

Helm, B, P. (in review). The feeding ecology of *Linderiella occidentalis* (Dodds) (Crustacea: Anostraca) within vernal pools.

Helm, B, P. (in review). An observational chamber for viewing feeding fairy shrimp (Crustacea: Anostraca).

Helm, B, P. (in review). Morphology of *Linderiella occidentalis* (Dodds) (Crustacea: Anostraca) filter-feeding apparatus.

Developed a procedure for the analysis of vernal pool soil to detect the presence of anostracan cysts (embryonic eggs) (i.e., dry-season sampling) and established guidelines and procedures for the detection of large branchiopods in seasonally inundated wetlands (i.e., wet-season sampling). U.S. Fish and Wildlife Service Protocol for Surveys of Federally Listed Shrimp (1990).

Conducted studies on the effects of off-road vehicles on the George Town wintering mule dear herd using radio telemetry methods for the California Department of Fish and Game (1996).

Completed range maps for the distribution of all 23 species of anostracans occurring in California which was published in Dr. Denton Belk and Dr. Clyde Eriksen's book titled "Fairy Shrimp of California's Pools, Puddles, and Playas," by Mad River Press, 1999. (1998).

Conducting surveys to determine the distribution, species richness, and abundance of large branchiopods at the Nature Conservancy's Vina Plains Preserve, in Tehama County, California, as part of The Nature Conservancy's five-year study to determine potential effects of grazing and fire on vernal pool ecosystems (1996 to present).

WORKSHOPS AND SPECIAL TRAINING

California Geomorphology. Jones & Stokes Associates, Inc. December 14, 1995.

California Environmental Quality Act (CEQA) Workshop. Jones & Stokes Associates, Inc. November 29, 1995.

Network and Windows Training. Logical Operations' Curriculum Developers. August 16 & 18, 1995.

Facilitating Meetings for Results. Zenger-Miller. September 14, 1995.

CEQA and NEPA Workshop. Jones & Stokes Associates, Inc. October 5, 1994.

How to Interview For Proposals. Jones & Stokes Associates, Inc. July 28, 1994.

Winning Competitive Proposals. Warren P. Yerks. May 8, 1993.

Winning Proposals. Jones & Stokes Associates, Inc. October 21, 1993.

Managers Workshop. Jones & Stokes Associates, Inc. July 7 & 8, 1993.

Wetland Soil Geomorphology Seminar. Kelly & Associates Environmental Sciences, Inc. March 30 & 31, 1992.

The CEQA: A Step-By-Step Approach. Jones & Stokes Associates, Inc. January 28, 1991.

Technical Writing Workshop. Jones & Stokes Associates, Inc. January 8, 1991.

Identification and Biology of California Anostracans Training. Denton Belk. December 4-6, 1991.

Workload Management System: Evaluation and Recommendations for Improvement. Jones & Stoke Associates, Inc. June 24, 1991.

Outline of the California Environmental Quality Act. Jones & Stokes Associates, Inc. May 23 and July 7, 1990.

Wetland Delineation. Wetland Training Institute. April 22-25, 1990.

SPECIAL SKILLS

- oral and written communications
- personal computer software programs and applications (Microsoft Access, Word, Excels, Power Point; Word Perfect; Lotus; Twinspan, Minitab; SAS; Photoshop)
- wildlife management techniques (including trapping, banding, radio telemetry and census surveys)
- wetland delineation
- plant and animal identification
- vegetation classification and mapping
- aerial photo interpretation
- aquatic invertebrate sampling techniques
- operation of total stations, laser levels, camera lucidas, global positioning systems, and scanning electron microscopes.

PROFESSIONAL MEMBERSHIPS

California Inland Invertebrate Working Group

California Native Plant Society

International Union for Conservation of Nature and Natural Resources

Species Survival Commission - North American Invertebrate Specialists Group

Society for Ecological Restoration and Management

Society of Wetland Scientists

The Anostracan Working Group

The Nature Conservancy

The Wildlife Society

REFERENCES

Rick Guantone. Applied Science and Technology Assistant Department Chair. Delta Community College, Stockton, CA. (209) 954-5230.

Doug Conklin, Ph.D. Associate Professor. University of California, Davis, CA. (530) 752-4177.

Robert Gleason. Wildlife Biologist. Northern Prairie Wildlife Research Center. Jamestown, ND. (701) 253-5546.

Roseville Energy Park

Appendix 8.2-D
Jurisdictional Delineation Report for the Roseville Energy Park

October 2003

Roseville Energy Park
Application for Certification

Jurisdictional Delineation Report

for the

ROSEVILLE ENERGY PARK

City of Roseville

Prepared for:

Roseville Electric

Prepared by:

TETRA TECH FW, INC.

September 2003

JURISDICTIONAL DELINEATION REPORT

ROSEVILLE ENERGY PARK

Prepared for:

City of Roseville

Roseville Electric
2090 Hilltop Circle
Roseville, CA 95747

Prepared by:

TETRA TECH FW, INC.
3947 Lennane Drive, Suite 200
Sacramento, CA 95834

September 2003

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APPENDICES

Appendix A Wetland Delineation Data Sheets September 2003

Appendix B Jurisdictional Waters of the U.S. and Wetlands Map

Appendix C Soil Survey of Placer County, California Western Part Map

JURISDICTIONAL DELINEATION REPORT

Roseville Energy Park (REP)

1. Introduction

Tetra Tech FW, Inc. is assisting the City of Roseville with biological and wetlands studies, agency consultations, and permitting for the construction and operation of the Roseville Energy Park (REP). The City of Roseville's electric department, doing business as Roseville Electric (RE), proposes to construct, own, and operate an electrical generating plant in the City of Roseville, Placer County, California (Figure 1).

To reach the REP site, from Sacramento take Highway 99 and turn right at Riego Road (stoplight, north of Sacramento City limits). Riego Road will become Baseline Road. Follow Riego/Baseline for 4.8 miles to Brewer Road. Turn left onto Brewer Road and follow for 3.5 miles. Turn right onto Phillip Road (unpaved gravel road). Follow Phillip Road, it will bend to the right and again to the left. After the left bend, follow Phillip Road until a water treatment facility is visible to the south. There will also be a temporary construction yard (Kiewit) on the north side of Phillip Road. Turn into the construction yard to the north. This is the location of the proposed REP.

The REP will be a natural gas-fired, combined-cycle electrical generating facility rated at a nominal net generating capacity of 119 to 125 megawatts (MW), with the ability to peak-fire to 160 MW. The proposed 40-acre project site is located on City of Roseville property located within the limits of the City of Roseville, adjacent to and north of the City's Pleasant Grove Waste Water Treatment Plant (PGWWTP). The project site is owned by the City of Roseville and is zoned Public/Quasi-Public. Surrounding land uses currently include ranching (agricultural grazing) and rural residential.

2. Purpose

This study was conducted in order to identify wetland and water features. This delineation report illustrates the location and boundaries of all potential features within the proposed construction area of the REP that may be subject to jurisdiction by the U.S. Army Corps of Engineers (Corps) under Section 404 (b)(1) of the Clean Water Act (CWA). It also details and delineates several features not jurisdictional under that same section.

The proposed REP study area crosses listed Public Land Survey Sections (Mount Diablo Base Meridian) within the following USGS 7.5-minute topographic map:

Pleasant Grove Quadrangle
Sections 23, Township 11 North, Range 5 East

The project applicant is:

Mr. Tom Habashi
Director of Utility
City of Roseville
Roseville Electric
2090 Hilltop Circle
Roseville, California 95747

Property owner:

City of Roseville
311 Vernon Street
Roseville, CA 95678

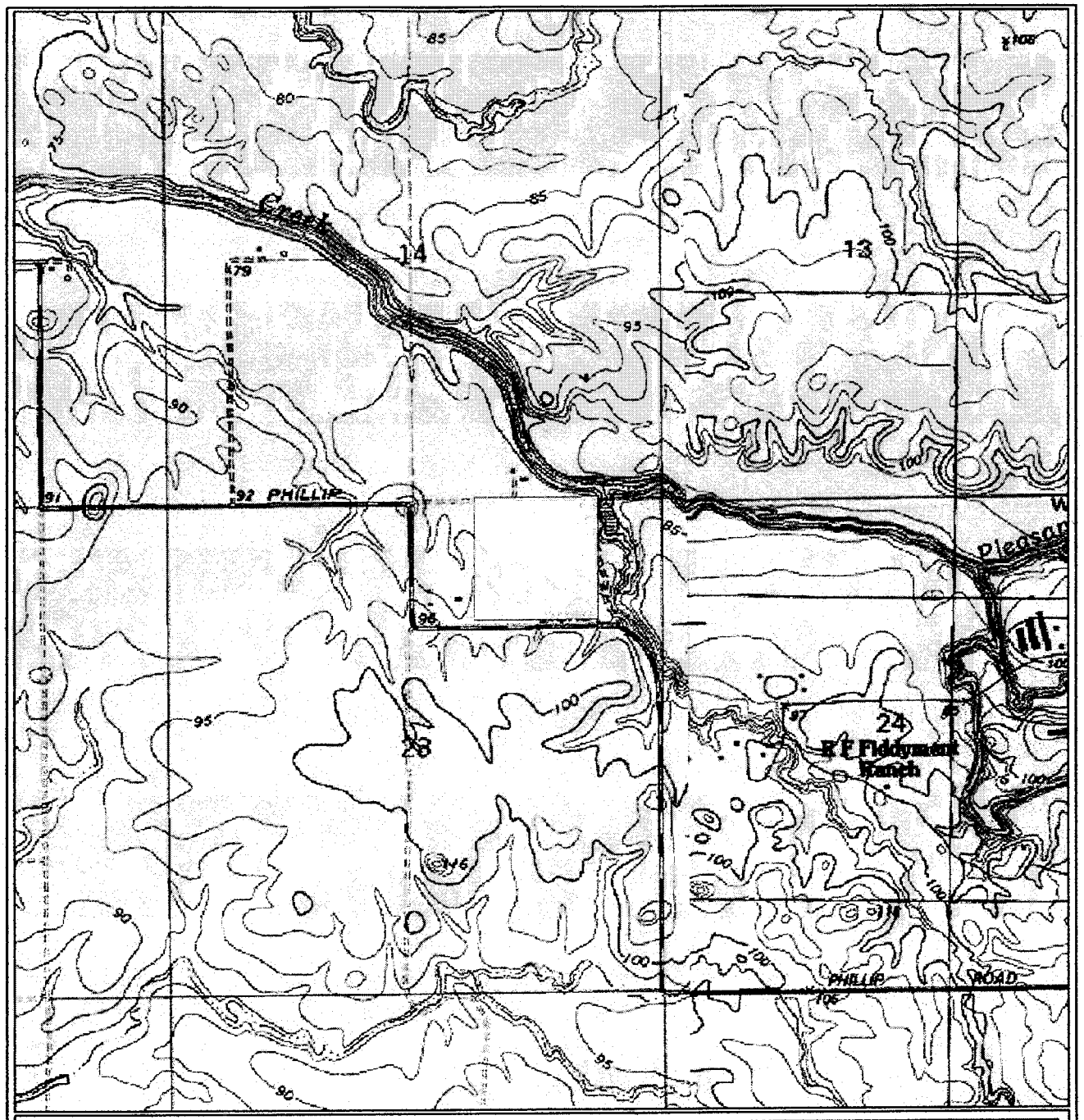
3. Methods

Wetlands and waters of the U.S. are subject to jurisdiction by the Corps under Section 404 (b)(1) of the Clean Water Act (CWA). A wetland delineation evaluating vegetation, soils, and hydrology of potentially jurisdictional features was conducted in accordance with the procedures of the U.S. Army Corps of Engineers Wetlands Delineation Manual (Corps 1987) and the recent January 9, 2001 U.S. Supreme Court issued decision for the Solid Waste Agency of Northern Cook County (SWANCC). Additionally, wetland "type" identification criteria developed by Cowardin, et al (1979) and Reed (1988) were also employed. Wetland delineation data sheets are available in Appendix A. Botanical species names were recorded according to The Jepson Manual Higher Plants of California (Hickman 1993) and Reed (1988). Soil types were confirmed based on the U.S. Department of Agriculture, Soil Conservation Service 1980 Soil Survey of Placer County, California Western Part (SCS 1980).

To determine the soil color(s) and any mottles that may be present, a Munsell Color Book (Munsell Color 2000) was used. Each page of hue has color chips that show values and chromas. Values are shown in columns down the page from as low as 0 to as much as 8, and chromas are shown in rows across the page from as low as 0 to as much as 8. In writing Munsell color notations, the sequence was always hue, value, and chroma e.g. 10YR5/2.)[1]. To determine soil color, biologists placed a small portion of soil (moistened) in the openings behind the color page and matched the soil color to the nearest appropriate color chip.

---

[1] Three features characterize soil color: hue, value, and chroma. Hue refers to the soil color in relation to red, yellow, blue, etc. Value refers to the lightness of the hue. Chroma refers to the strength of the color, or departure from a neutral of the same lightness. Each Munsell Color Book has color charts of different hues, ranging from 10R to 5Y. Each page of hue has color chips that show values and chromas. Values are hown in columns down the page from as low as 0 to as much as 8, and chromas are shown in rows across the page from as low as 0 to as much as 8. In writing Munsell color notations, the sequence was always hue, value, and chroma e.g. 10YR5/2



Legend

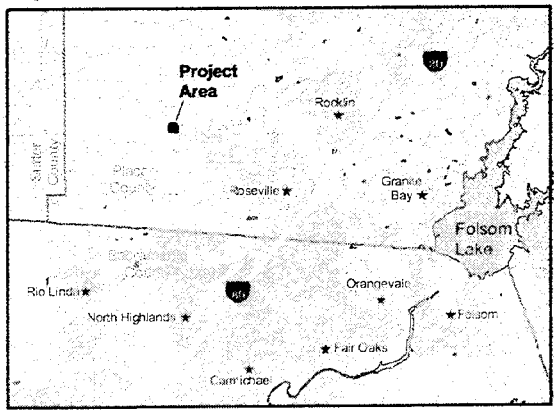
Project Location

Figure 1

Project Location

Roseville Energy Park

City of Roseville
Placer County, California



N

0 500 1,000 2,000
Scale in Feet

Source: National Geographic Topo!, 2003
Pleasant Grove USGS 7.5" Quadrangle
Delineation Area Located in Township 11N, Range 5E, Section 23

D:\Projects_2003\roseville_gps_temp\maps\project_location.mxd Date: Sept 17, 2003
Wayne's D drive

Waters of the U.S. were identified in the field by the presence of a well-defined bed and bank and ordinary high water mark (OHWM). Potential jurisdictional waters of the U.S. in this report also had to demonstrate potential resource value for wildlife species, provide flood control and had to have some connection to a navigable water, its tributaries, and wetlands or be adjacent to a navigable waterway and tributary (Isolated features are not included as 404 jurisdictional but were evaluated and mapped). All potential jurisdictional features within the project study area are noted on a map (Figure 2, Appendix B). Additionally, the soil types within the vicinity of the REP, as listed in the Soil Survey of Placer County, are provided in Figure 3, Appendix C.

4. Definitions

The United States Army Corps of Engineers (Corps) and the United States Environmental Protection Agency (U.S. EPA) regulate the discharge of dredge and fill material into "waters of the United States" under Section 404 of the CWA.

The Corps jurisdiction over non-tidal "waters of the United States" extends to the "ordinary high water mark provided the jurisdiction is not extended by the presence of wetlands" [33 Code of Federal Regulations (CFR), Part 328, Section 328.4]. Waters of the United States are defined as:

> *All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide, all interstate waters including interstate wetlands, all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which would affect interstate or foreign commerce, including such waters which are or could be used by interstate or foreign travelers for recreational or other purposes, or from which fish or shellfish are or could be taken and sold in interstate or foreign commerce, or which are used or could be used for industrial purposes by industries in interstate commerce; all impoundment of waters otherwise defined as waters of the United States interstate commerce, tributaries of waters identified in paragraphs 1-4 of this section, the territorial sea; and wetlands adjacent to waters* (40 CFR, Part 230.3).

Wetlands are defined for regulatory purposes as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR, Part 328.3, 40 CFR, Part 230.3).

The Corps will typically take jurisdiction over the portion of a project site that contains waters of the United States and adjacent wetlands. The Corps will typically not take jurisdiction over

agricultural-irrigation canals and drains or hydrologically isolated features that lack vegetation or a connection to a navigable water, its tributaries, and wetlands.

5. General Existing Conditions and Vegetation Characteristics

The REP is located on the lower alluvial fans in the Sierra Nevada foothills region of California. Community types in the project study area include annual grassland, riparian and oak woodland, minimal vernal pool complexes, seasonal wetlands and rural residential and construction areas. This area has been largely converted to urban development, rangeland or ruderal (disturbed and weedy) areas. Remnants of historic ecosystems remain throughout the Sierra Nevada foothills. The dominant vegetation types at the REP site consist of annual grassland, oak woodland and disturbed ruderal areas.

6. Jurisdictional Wetlands

A wetland delineation evaluating vegetation, soils, and hydrology of potentially jurisdictional features was conducted at the REP site on September 4 and 5, 2003. Potential jurisdictional and non-jurisdictional isolated wetlands found within the REP site area are listed in Table 1. A description of each identified feature is provided following the table. The descriptions of the features include characterizations of acreage, soil types, hydrology, and vegetation, including wetland indicator status noted in brackets.

Table 1. Wetlands within the Study Area.

I.D. Number	Classification	Latitude (DMS)	Longitude (DMS)	**Acreage	Dominant Vegetation	CWA Jurisdictional (Yes/No)
P1	Vernal Pool	38° 47' 30.54" North	121° 22' 34.40" West	0.2	Vasey's coyote-thistle, *Trichostema lanceolatum*, stalked popcornflower, American pillwort, white-head navarretia	Yes
P2	Seasonal Wetland	38° 47' 30.53" North	121° 22' 35.16" West	< 0.1	Hyssop loosestrife, chufa, Italian rye-grass, curly dock, dove weed	Yes
P3	Seasonal Wetland	38° 47' 34.15" North	121° 22' 33.93" West	< 0.1	Italian rye-grass, Vasey's coyote-thistle, barley, common tarweed, pitgland tarweed	Yes
P4	Vernal Pool	38° 47' 36.32" North	121° 22' 33.87" West	< 0.1	Italian rye-grass, Vasey's coyote-thistle, barley, common tarweed, curly dock	Yes
P5	Seasonal Wetland	38° 47' 39.07" North	121° 22' 34.34" West	< 0.1	Italian rye-grass, slender popcorn-flower, fiddle dock	Yes
P6	Seasonal Wetland	38° 47' 31.06" North	121° 22' 49.50" West	0.1	Creeping spikerush, Italian rye-grass, barley	No

I.D. Number	Classification	Latitude (DMS)	Longitude (DMS)	**Acreage	Dominant Vegetation	CWA Jurisdictional (Yes/No)
P7	Seasonal Wetland	38° 47' 37.12" North	121° 22' 45.16" West	0.2	Creeping spikerush, Vasey's coyote-thistle, fiddle dock, Italian rye-grass, dove weed	Yes
P8	Seasonal Wetland	38° 47' 37.94" North	121° 22' 48.37" West	< 0.1	Creeping spikerush, Italian rye-grass, annual rabbit-foot grass	Yes
P9	Seasonal Wetland	38° 47' 42.08" North	121° 22' 47.80" West	< 0.1	Vasey's coyote-thistle, Italian rye-grass, pitgland tarweed	Yes
P10	Seasonal Wetland	38° 47' 41.51" North	121° 22' 45.54" West	< 0.1	Vasey's coyote-thistle, Italian rye-grass, pitgland tarweed	Yes
P11	Seasonal Wetland	38° 47' 42.45" North	121° 22' 49.03" West	< 0.1	Vasey's coyote-thistle, Italian rye-grass	Yes
P12	Seasonal Wetland	38° 47' 42.30" North	121° 22' 49.64" West	< 0.1	Vasey's coyote-thistle, smooth goldfields, Italian rye-grass, barley	Yes
P13	Seasonal Wetland	38° 47' 42.93" North	121° 22' 49.94" West	< 0.1	Italian rye-grass, barley, fiddle dock	Yes
P14	Seasonal Wetland	38° 47' 42.83" North	121° 22' 51.37" West	0.2	creeping spikerush	Yes
P15	Seasonal Wetland	38° 47' 42.85" North	121° 22' 54.83" West	0.1	Vasey's coyote-thistle, Italian rye-grass, barley, stalked popcornflower	Yes
P16	Seasonal Wetland	38° 47' 41.75" North	121° 22' 57.68" West	0.3	Vasey's coyote-thistle, creeping sprikerush, Italian rye-grass, rough cockle-bur	Yes
P17	Seasonal Wetland	38° 47' 41.27" North	121° 22' 53.76" West	< 0.1	Vasey's coyote-thistle, creeping spikerush, barley	Yes
P18	Seasonal Wetland	38° 47' 40.93" North	121° 22' 52.14" West	< 0.1	creeping spikerush, Vasey's coyote-thistle, barley, Italian rye-grass, smooth goldfields	Yes
P19	Seasonal Wetland	38° 47' 37.45" North	121° 22' 54.17" West	< 0.1	Italian rye-grass, barley	No
P20	Seasonal Wetland	38° 47' 34.74" North	121° 22' 51.34" West	< 0.1	toads rush, hyssop loosestrife, Italian rye-grass, fiddle dock	No
P21	Seasonal Wetland	38° 47' 30.94" North	121° 22' 50.65" West	< 0.1	toads rush, Italian rye-grass, pitgland tarweed, shiver grass	No
P22	Seasonal Wetland	38° 47' 30.84" North	121° 22' 50.82" West	< 0.1	hyssop loosestrife, toads rush	No

I.D. Number	Classification	Latitude (DMS)	Longitude (DMS)	**Acreage	Dominant Vegetation	CWA Jurisdictional (Yes/No)
P23	Seasonal Wetland	38° 47' 36.21" North	121° 22' 52.82" West	< 0.1	hyssop loosestrife, Bermuda grass, prostrate knotweed, swamp timothy, annual rabbit-foot grass, chufa	No
P24	Seasonal Wetland	38° 47' 32.01" North	121° 22' 55.93" West	0.1	Bermuda grass, fiddle dock, prostrate amaranth, prostrate knotweed, Italian rye-grass	No
P26	Seasonal Wetland	38° 47' 31.89" North	121° 22' 58.29" West	< 0.1	toads rush, hyssop loosestrife, prostrate knotweed	No
P27	Seasonal Wetland	38° 47' 31.61" North	121° 22' 59.97" West	< 0.1	creeping spikerush, fiddle dock, Italian rye-grass, Lemmon's canary grass, barley	No
P29	Seasonal Wetland	38° 47' 33.38" North	121° 22' 59.42" West	0.1	toads rush, hyssop loosestrife, Italian rye-grass, fiddle dock, annual rabbit-foot grass	No
P30	Seasonal Wetland	38° 47' 34.37" North	121° 22' 58.79" West	< 0.1	Italian rye-grass, barley	No
P31	Seasonal Wetland	38° 47' 34.47" North	121° 22' 59.01" West	< 0.1	maritime rabbit-foot grass, Italian rye-grass	No

Notes:

* P32 and P33 are not included in this report but are present on the map in Appendix B because they were wet at the time of field survey, receive artificial hydrological inputs and occupied vegetated spaces outside of the 100-year floodplain and were hydrological isolated from Pleasant Grove Creek.

** Acreage calculated in GIS database from GARMIN field generated data

Latitude and Longitude data collected in NAD 83

DMS – Degrees, Minutes, Seconds

All Data points taken were within the Pleasant Grove Quadrangle - Township 11 North, Range 5 East, Section 23.

P1:

This vernal pool is located on the southeast side of the study area. This habitat is approximately 0.2 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this feature is provided from Pleasant Grove Creek, upland runoff, precipitation, and surface flow. Hydrology indicators include watermarks, drainage patterns, and oxidized root channels in upper 12 inches of the soil pit. This wetland

feature is adjacent and hydrological connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], *Trichostema lanceolatum*, stalked popcornflower (*Plagiobothrys stipitatus* var. *micranthus*) [OBL], American pillwort (*Pilularia Americana*) [OBL], and white-head navarretia (*Navarretia leucocephala*) [OBL]. Eighty percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P2:

This seasonal wetland occupies a vegetated space on the southeast side of the study area just west of feature P1. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 16-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a silt clay with a matrix color 10YR 5/3 at 0 to 3 inches, a sandy loam with a matrix color 10YR 3/2 at 3 to 6 inches, and a loam with a matrix color 10YR 3/3 and a mottling color of 2.5YR 3/4 at 6 to 16 inches. The mottle abundance was "Many" and the contrast was "Fine" and "Plain." The map type was confirmed with field observations as Xerofluvents (SCS 1980). Hydric soils were determined to be present due to the low-chroma color of the substrate and the aquic moisture regime of the soil. Additionally, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, this basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators also include water marks. This wetland feature is adjacent and hydrological connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of a hyssop loosestrife (*Lythrum hyssopifolium*) [FACW], chufa (*Cyperus esculentus*) [FACW], Italian rye-grass (*Lolium multiflorum*) [FAC], curly dock (*Rumex crispus*) [FACW-], and dove weed (*Eremocarpus setigerus*). Eighty percent of the dominant plant species observed were facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P3:

This seasonal wetland occupies a vegetated space on the southeast side of the study area north of wetland P1. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby

wetlands, these are hydric soils. This basin is frequently ponded for a long duration, greater than 14 days (5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators also include water marks. This wetland feature is adjacent and hydrological connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Italian rye-grass (*Lolium multiflorum*) [FAC], Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], barley (*Hordeum murinum ssp. gussoneanum*) [FAC], common tarweed (*Hemizonia pungens*) [FAC], and pitgland tarweed (*Holocarpha virgata*). Eighty percent of the dominant plant species observed were facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P4:

This vernal pool occupies a vegetated space on the east side of the study area north of wetland P3. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy clay loam with a matrix color 10YR 3/2 and a mottling color of 2.5YR 3/4. The mottle abundance was "Few" and the contrast was "Fine" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). Hydric soils were determined to be present due to the low-chroma color of the substrate and the aquic moisture regime of the soil. Additionally, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils this basin is frequently ponded for a long duration, greater than 14 days (5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface. Wetland hydrology indicators include water marks, drainage patterns, and oxidized root channels in the upper 12 inches of the soil pit. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Italian rye-grass (*Lolium multiflorum*) [FAC], Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], barley (*Hordeum murinum ssp. gussoneanum*) [FAC], common tarweed (*Hemizonia pungens*) [FAC], and curly dock (*Rumex crispus*) [FACW-]. One hundred percent of the dominant plant species observed were facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P5:

This seasonal wetland occupies a vegetated space on the east side of the study area north of wetland P4. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 3/2 at 0 to 2 inches with no mottles, and a matrix color 10YR 3/2 to 3/3 and a mottling color of 5YR 4/6 at 2

to 16 inches. The mottle abundance was "Common" and the contrast was "Medium" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). Hydric soils were determined to be present due to the low-chroma color of the substrate and the aquic moisture regime of the soil. Additionally, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, this basin is frequently ponded for a long duration, greater than 14 days (5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, oxidized root channels in the upper 12 inches of the soil pit, and water-stained leaves. This wetland feature is adjacent and hydrological connected to the 100-year floodplain of the Pleasant Grove Creek. The dominant vegetation consists of Italian rye-grass (*Lolium multiflorum*) [FAC], slender popcorn-flower (*Plagiobothrys stipitatus* var. *micranthus*) [OBL], and fiddle dock (*Rumex pulcher*) [FAC+]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P6:

This feature occupies a vegetated space just east of the project foot print. This habitat is approximately 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a clay with a matrix color 7.5YR 3/2 and a mottling color of 2.5YR 3/6 and 3/4. The mottle abundance was "Many" and the contrast was "Medium" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). Hydric soils were determined to be present due to the low-chroma color of the substrate, the aquic moisture regime of the soil, and soil concretions. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrological isolated from Pleasant Grove Creek. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. Hydrology indicators also include water marks, drainage patterns, oxidized root channels in the upper 12 inches of the soil pit, and water-stained leaves. The dominant vegetation consists of creeping spikerush (*Eleocharis macrostachya*) [OBL], Italian rye-grass (*Lolium multiflorum*) [FAC], and barley (*Hordeum murinum ssp. gussoneanum*) [FAC]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. The recent January 9, 2001 U.S. Supreme Court SWANCC ruling establishes a precedence that hydrolocially isolated features that lack a definitive connection to a navigable water or its tributaries are non jurisdictional under the CWA. Feature P6 is not a jurisdictional wetland under Section 404 of the Clean Water Act.

P7:

This seasonal wetland occupies a vegetated space near the center of the study area. This wetland habitat is approximately 0.2 acres in size. Soils were identified by digging a soil pit to a depth of

12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, oxidized root channels in upper 12 inches of the soil pit, and water-stained leaves. This wetland is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of creeping spikerush (*Eleocharis macrostachya*) [OBL], Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], fiddle dock (*Rumex pulcher*) [FAC+], Italian rye-grass (*Lolium multiflorum*) [FAC], and dove weed (*Eremocarpus setigerus*). Eighty percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P8:

This seasonal wetland occupies a vegetated space near the center of the study area just northwest of wetland P7. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, oxidized root channels in upper 12 inches of the soil pit, and water-stained leaves. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of creeping spikerush (*Eleocharis macrostachya*) [OBL], Italian rye-grass (*Lolium multiflorum*) [FAC], and annual rabbit-foot grass (*Polypogon monspeliensis*)

[FACW+]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P9:

This seasonal wetland occupies a vegetated space within the north central part of the study area. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a long duration, greater than 14 days (5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, and oxidized root channels in upper 12 inches of the soil pit. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], Italian rye-grass (*Lolium multiflorum*) [FAC], and pitgland tarweed (*Holocarpha virgata*). Sixty-six percent of the dominant plant species observed were facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P10:

This seasonal wetland occupies a vegetated space within the central part of the study area just east of wetland P9. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/2 and a mottling color of 10YR 3/2 and 2.5YR 2.5/4 at 0 to 3 inches, and clay with a matrix color 10YR 4/2 and a mottling color 10YR 3/2 at 3 to 12 inches. The mottle abundance was "Common" and the contrast was "Medium" and "Faint" throughout with some "Prominent" at 0 to 3 inches. The map type was confirmed with field observations as Xerofluvents (SCS 1980). Hydric soils were determined to be present due to the low-chroma color of the substrate, the aquic moisture regime of the soil, and soil concretions. Additionally, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland

hydrology indicators include water marks and drainage patterns. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], Italian rye-grass (*Lolium multiflorum*) [FAC], and pitgland tarweed (*Holocarpha virgata*). Sixty-six percent of the dominant plant species observed were facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P11:

This seasonal wetland occupies a vegetated space within the north central part of the study area just west of wetland P9. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a long duration, greater than 14 days (5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, and oxidized root channels in upper 12 inches of the soil pit. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of the Pleasant Grove Creek. The dominant vegetation consists of Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW] and Italian rye-grass (*Lolium multiflorum*) [FAC]. One hundred percent of the dominant plant species observed were facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P12:

This seasonal wetland occupies a vegetated space within the north central part of the study area just west of wetland P11. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and

similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, and oxidized root channels in upper 12 inches of the soil pit. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], smooth goldfields (*Lasthenia glaberrima*) [OBL], Italian rye-grass (*Lolium multiflorum*) [FAC], and barley (*Hordeum murinum ssp. gussoneanum*) [FAC]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P13:

This seasonal wetland occupies a vegetated space within the north central part of the study area just north of wetland P12. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a long duration, greater than 14 days (5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks and drainage patterns. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Italian rye-grass (*Lolium multiflorum*) [FAC], barley (*Hordeum murinum ssp. gussoneanum*) [FAC], and fiddle dock (*Rumex pulcher*) [FAC+]. One hundred percent of the dominant plant species observed were facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P14:

This seasonal wetland occupies a vegetated space within the north central part of the study area just west of wetland P12. This wetland habitat is approximately 0.2 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast

was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, oxidized root channels in the upper 12 inches of the soil pit, and water-stained leaves. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of creeping spikerush (*Eleocharis macrostochya*) [OBL]. One hundred percent of the dominant plant species observed were obligate in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P15:

This seasonal wetland occupies a vegetated space within the northwest part of the study area just west of wetland P14. This wetland habitat is approximately 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, oxidized root channels in the upper 12 inches of the soil pit, and water-stained leaves. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of a Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], Italian rye-grass (*Lolium multiflorum*) [FAC], barley (*Hordeum murinum ssp. gussoneanum*) [FAC], and stalked popcornflower (*Plagiobothrys stipitatus var. micranthus*) [OBL]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P16:

This seasonal wetland occupies a vegetated space within the northwest part of the study area just south of wetland P15. This wetland habitat is approximately 0.3 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 3/3 and a mottling color of 7.5YR 5/6 at 0 to 4 inches, and sandy clay with a matrix color 10YR 3/2 and a mottling color 2.5YR 3/4 at 4 to 12 inches. The mottle abundance was "Common" and the contrast was "Fine" and "Faint" at 0 to 4 inches, and the mottle abundance was "Common" and the contrast was "Medium" and "Prominent" at 4 to 12 inches. The map type was confirmed with field observations as Xerofluvents (SCS 1980). Hydric soils were determined to be present due to the low-chroma color of the substrate and the aquic moisture regime of the soil. Additionally, this basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks and drainage patterns. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], creeping spikerush (*Eleocharis macrostochya*) [OBL], Italian rye-grass (*Lolium multiflorum*) [FAC], and rough cockle-bur (*Xanthium strumarium*) [FAC+]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P17:

This seasonal wetland occupies a vegetated space within the northwest part of the study area just east of wetland P16. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from the Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, and water-stained leaves. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists

of a Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], creeping spikerush (*Eleocharis macrostochya*) [OBL], and barley (*Hordeum murinum ssp. gussoneanum*) [FAC]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P18:

This seasonal wetland occupies a vegetated space within the northwest part of the study area just east of wetland P17. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Though the chroma values are higher than those that would normally meet the criteria for hydric soils, based on expert knowledge of the local climate and similarly vegetated nearby wetlands, these are hydric soils. This basin is frequently ponded for a very long duration, greater than 34 days (12.5% of the growing season) during growing season (SCS 1996). Hydrology for this wetland is provided from Pleasant Grove Creek, upland runoff, precipitation, and surface flows. Wetland hydrology indicators include water marks, drainage patterns, and water-stained leaves. This wetland feature is adjacent and hydrologically connected to the 100-year floodplain of Pleasant Grove Creek. The dominant vegetation consists of creeping spikerush (*Eleocharis macrostochya*) [OBL], Vasey's coyote-thistle (*Eryngium vaseyi*) [FACW], barley (*Hordeum murinum ssp. gussoneanum*) [FAC], Italian rye-grass (*Lolium* multiflorum) [FAC], and smooth goldfields (*Lasthenia glaberrima*) [OBL]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. This feature is jurisdictional under Section 404 (b)(1) of the CWA.

P19:

This feature occupies a vegetated space within the project study area. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 14-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 3/3 and a mottling color of 2.5YR 4/4 at 0 to 10 inches, and clay with a matrix color 10YR 3/3 and a mottling color of 10YR 3/2 at 10 to 14 inches. The mottle abundance was "Common" and the contrast was "Fine" and "Prominent" throughout. The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. Upland runoff, precipitation, and surface

flows support the hydrophytic vegetation present at this site. Hydrology indicators include water marks, oxidized root channels in the upper 12 inches of the soil pit, and water-stained leaves. The dominant vegetation consists of Italian rye-grass (*Lolium multiflorum*) [FAC] and barley (*Hordeum murinum ssp. gussoneanum*) [FAC]. One hundred percent of the dominant plant species observed were facultative in nature. Feature P19 is not a jurisdictional wetland under Section 404 of the CWA.

P20:

This feature occupies a vegetated space within the study area just southeast of feature P23. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 5YR 3/3 with no mottles. The map type was confirmed with field observations as Cometa-Ramona (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. Hydrology indicators included only drainage patterns. The dominant vegetation consists of toads rush (*Juncus bufonius*) [FACW+], hyssop loosestrife (*Lythrum hyssopifolium*) [FACW], Italian rye-grass (*Lolium multiflorum*) [FAC], and fiddle dock (*Rumex pulcher*) [FAC+]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. Feature P20 is not a jurisdictional wetland under Section 404 of the CWA.

P21:

This feature occupies a vegetated space within the south central part of the study area just east of feature P6. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 5YR 3/3 with no mottles. The map type was confirmed with field observations as Cometa-Ramona (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. No primary or secondary hydrology indicators were present. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of toads rush (*Juncus bufonius*) [FACW+], Italian rye-grass (*Lolium multiflorum*) [FAC], pitgland tarweed (*Holocarpha virgata*), and shiver grass (*Aira caryophyllea*). Fifty percent of the dominant plant species observed were obligate or facultative in nature. Feature P21 is not a jurisdictional wetland under Section 404 of the CWA.

P22:

This feature occupies a vegetated space within the south central part of the study area just south of feature P21. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 5YR 3/3 with no mottles. The map type was confirmed with field observations as Cometa-Ramona (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. Hydrology indicators included only water marks. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of hyssop loosestrife (*Lythrum hyssopifolia*) [FACW] and toads rush (*Juncus bufonius*) [FACW+]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. Feature P22 is not a jurisdictional wetland under Section 404 of the CWA.

P23:

This feature occupies a vegetated space within the central part of the study area just southeast of feature P19. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low positioned to the south of Pleasant Grove Creek. The soil is a clay with a matrix color 10YR 3/3 with no mottles at 0 to 10 inches, and duropan below 10 inches. The map type was confirmed with field observations as Cometa-Ramon (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. No primary or secondary hydrology indicators were present. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of hyssop loosestrife (*Lythrum hyssopifolium*) [FACW], Bermuda grass (*Cynodon dactylon*) [FAC], prostrate knotweed (*Polygonum aviculare*) [FAC], swamp timothy (*Crypsis schoenoides*) [OBL], annual rabbit-foot grass (*Polypogon monspeliensis*) [OBL], and chufa (*Cyperus esculentus*) [FAC]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. Feature P23 is not a jurisdictional wetland under Section 404 of the CWA.

P24:

This feature occupies a vegetated space within the southwest part of the study area just east of feature P26. This wetland habitat is approximately 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a

mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. No primary or secondary hydrology indicators were present. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek The dominant vegetation consists of Bermuda grass (*Cynodon dactylon*) [FAC], fiddle dock (*Rumex pulcher*) [FAC+], prostrate amaranth (*Amaranthus blitoides*) [FACW], prostrate knotweed (*Polygonum aviculare*) [FAC], and Italian rye-grass (*Lolium multiflorum*) [FAC]. One hundred percent of the dominant plant species observed were facultative in nature. Feature P24 is not a jurisdictional wetland under Section 404 of the CWA.

P26:

This feature occupies a vegetated space within the southwest part of the study area just west of feature P24. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. No primary or secondary hydrology indicators were present. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of toads rush (*Juncus bufonius*) [FACW+], hyssop loosestrife (*Lythrum hyssopifolium*) [FACW], and prostrate knotweed (*Polygonum aviculare*) [FAC]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. Feature P26 is not a jurisdictional wetland under Section 404 of the CWA.

P27:

This feature occupies a vegetated space within the south west part of the study area just west of feature P24. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 29-inches within a topographic low positioned to the south of Pleasant Grove Creek. The soil has an organic layer at 0 to 0.5 inches. Below the organic layer that the soil is a sandy loam with a matrix color 10YR 3/3 and a mottling color of 7.5YR 5/6 at 0.5 to 3 inches, and a matrix color 10YR 4/3 and a mottling color of 7.5YR 5/8 at 3 to 29 inches. The mottle abundance was "Common" and the contrast was "Fine" and "Faint" throughout. The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff,

precipitation, and surface flows support the hydrophytic vegetation present at this site. Hydrology indicators include drift lines and drainage patterns. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of creeping spikerush (*Eleocharis macrostachya*) [OBL], fiddle dock (*Rumex pulcher*) [FAC+], Italian rye-grass (*Lolium multiflorum*) [FAC], Lemmon's canary grass (*Phalaris lemmonii*) [FACW-], and barley (*Hordeum murinum ssp. gussoneanum*) [FAC]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. Feature P27 is not a jurisdictional wetland under Section 404 of the CWA.

P29:

This feature occupies a vegetated space within the southwest part of the study area just north of feature P27. This habitat is approximately 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. Hydrology indicators include water marks. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of toads rush (*Juncus bufonius*) [FACW+], hyssop loosestrife (*Lythrum hyssopifolium*) [FACW], Italian rye-grass (*Lolium multiflorum*) [FAC], fiddle dock (*Rumex pulcher*) [FAC+], and annual rabbit-foot grass (*Polypogon monspeliensis*) [OBL]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. Feature P29 is not a jurisdictional wetland under Section 404 of the CWA.

P30:

This feature occupies a vegetated space within the southwest part of the study area just northeast of feature P29. This wetland habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. Hydrology indicators include only drainage patterns. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of Italian rye-grass (*Lolium multiflorum*) [FAC]

and barley (*Hordeum murinum ssp. gussoneanum*) [FAC]. One hundred percent of the dominant plant species observed were facultative in nature. Feature P30 is not a jurisdictional wetland under Section 404 of the CWA.

P31:

This feature occupies a vegetated space within the southwest part of the study area just west of feature P30. This habitat is approximately < 0.1 acres in size. Soils were identified by digging a soil pit to a depth of 12-inches within a topographic low of a basin positioned to the south of Pleasant Grove Creek. The soil is a sandy loam with a matrix color 10YR 4/4 and a mottling color of 2.5YR 4/8. The mottle abundance was "Many" and the contrast was "Large" and "Prominent." The map type was confirmed with field observations as Xerofluvents (SCS 1980). The soils did not meet the classic definition of hydric because the soil chroma values were too high. Upland runoff, precipitation, and surface flows support the hydrophytic vegetation present at this site. Hydrology indicators include only drainage patterns. This feature occupies a vegetated space outside of the 100-year floodplain and is hydrologically isolated from Pleasant Grove Creek. The dominant vegetation consists of maritime rabbit-foot grass (*Polypogon maritimus*) [OBL] and Italian rye-grass (*Lolium multiflorum*) [FAC]. One hundred percent of the dominant plant species observed were obligate or facultative in nature. Feature P31 is not a jurisdictional wetland under Section 404 of the CWA.

7. Wetland Functions and Values

Wetland habitats associated with permanent flowing rivers and creeks, as well as intermittent drainage channels, provide food, water, migration and dispersal corridors, and nesting and breeding habitat for a variety of wildlife species. Numerous amphibian, reptile, avian, invertebrate and mammalian species are residents or visitors in wetland habitats due to the vegetation's structural diversity. Wetland habitats are essential breeding, rearing, and feeding grounds for many species of wildlife. Wetlands also perform important flood protection and pollution controls.

8. Waters of the U.S.

The proposed study area includes one potential jurisdictional water of the U.S. The feature number with location information is referenced in Table 2 (see map in Appendix B). Data for this feature was collected from USGS topographic quadrangles, field surveys, and other sources.

Table 2. Potential Jurisdictional Waters within the Project Study Area.

Water ID Number	USGS Quad Name	Waters Type	Average Observed Width @ OHWM (feet)	Twp, Range, Section	Vegetation	Habitat Type	Latitude & Longitude (DMS)
Water 1	Roseville	Ephemeral	8	11N, 5E, 23	Blue and Live Oak, Cottonwood, Italian rye-grass, star-thistle, common tarweed, rabbits foot grass, nuts sedge and curly dock	Oak Woodland Riparian	38° 46' 0.70" North 121° 15' 3.74" West

Notes:

DMS – Degrees, Minutes, Seconds
OHWM = Ordinary high water mark

9. Waters of the U.S. Functions and Values

The feature identified in the above referenced table is a potential jurisdictional feature and is adjacent and hydrological connected to Pleasant Grove Creek. This ephemeral drainage provides natural flood control as a result of its proximity to and location within the 100-year flood plain of Pleasant Grove Creek. This feature is likely to provide food for wildlife, serve as a migration or dispersal corridors for wildlife, and contains habitat that is distinct from the adjacent uplands. This riparian corridor is likely to provide essential breeding, rearing, or feeding grounds for local and migratory wildlife as well.

10. Literature Cited

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS-79-31.

Hickman, J.C., (ed.). 1993. The Jepson Manual – Higher Plants of California. University of California Press, Berkeley. CA.

Munsell Color. 2000. Munsell Soil Color Chart. Gretag Macbeth. New Windsor, New York

Natural Resources Conservation Service. 1996. Field Indicators of Hydric Soils in the United States (Version 3.2). U.S. Department of Agriculture. Washington D.C.

National Resource Conservation Service (NRCS). 2001. Official Series Descriptions. www.statlab.iastate.edu.

Reed, Jr., P.B. 1988. National List of Plant Species that occur in Wetlands: California (Region 0). U.S. Department of the Interior, Fish and Wildlife Service. NERC-88/18.06.

U.S. Army Corps of Engineers (COE). 1987. Wetland Delineation Manual. Waterways Experiment Station, Vicksburg, MS.

U.S. Department of Agriculture, Soil Conservation Service (SCS). 1980. Soil Survey of Placer County, California Western Part.

U.S. Department of Agriculture, Soil Conservation Service (SCS). 1991. Hydric Soils of the United States, In Cooperation with the National Technical Committee for Hydric Soils. Publication Number 1491. Lincoln , NE.

U.S. Department of Agriculture, Soil Conservation Service (SCS). 1996. Field Indicators of Hydric Soils of the United States. Fort Worth, TX.

APPENDIX A

WETLAND DELINEATION DATA SHEETS
SEPTEMBER 2003

DATA FORM

C
P1

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP	Date 9/5/03
Applicant / Owner TOM HABASHI (City of Roseville)	County PLACER
Investigator LENNY MALO, ERIC HEIN	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID Vernal Pool
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID P1

VEGETATION

H = herb

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eryngium vaseyi	H	FACW	9		
2 Eremocarpus setigerus	H	—	10		
3 Trichlostema virgata	H	—	11		
4 Plagiobothrys stipitatus var. micro	H	OBL	12		
5 Pilularia americana	H	OBL	13		
6 Lythrum hyssopifolia	H	FACW	14		
7 Navarretia leucocephala	H	OBL	15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 80%

Remarks
* = Dominants

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Hydrology: Based on expert knowledge of local climate and similar vernal pool wetlands nearby, ~~and based on~~ H. Australis AS of basin depth ponding in this pool occurs greater than 34 days during growing season. ADJACENT

SOILS

C

Map Unit Name (Series and Phase): XEROLUVENTS	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR4/4	2.5YR 4/8	Many / Large / Prom	Sandy Loam
>12					duro-pan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Highest potential area for shrimp

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

B

Project/Site REP	Date 9/5/03
Applicant / Owner T. Habashi (City of Roseville)	County Placer
Investigator L. Malo, E Hain	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID Upland
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID P2 B

VEGETATION

H = herb

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Centaurea solstitialis	H	—	10		
3 Rumex crispus	H	FACW	11		
4 Eremocarpus setigerus	H	—	12		
5 Avena fatua	H	—	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 40%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

B

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - .5"	O	—	—	—	ORGANIC
.5 - 3"	A_1	10YR 3/3	7.5 5/6	COM/FINE/FAINT	SANDY LOAM
3 - 29"	A_2	10YR 4/3	7.5 5/8	COM/FINE/FAINT	SANDY LOAM

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES (NO)	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

A

Project/Site REP			Date 9/5/03
Applicant / Owner T. Habashi (City of Roseville)			County Placer
Investigator L. Malo & E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID Seasonal wetland
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lythrum hyssopifolia	H	FACW	9		
2 Cyperus esculentus	H	FACW	10		
3 Lolium multiflorum	H	FAC*	11		
4 Rumex crispus	H	FACW-	12		
5 Eremocarpus setigerus	H	—	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 80%

Remarks

Based on expert knowledge of local climate and similarly vegetated wetlands nearby, it appears as if basin depth ponding in this wetland occurs > than 34 days during growing season.

Adjacent to FEMA 100 yr flood Plain (hydro connection)

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
☐ Inundated
☐ Saturated in Upper 12 Inches
☒ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (Explain in Remarks)

Roughly 6" lower in elevation than other areas, will be saturated for at least 24 days.

SOILS

1 = FINE

Map Unit Name (Series and Phase): XERORLUVENTS	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 2"		10 YR 5/3	NA		SILT CLAY
3 - 6"		10 YR 3/2	NA		SANDY LOAM
6 - 16"		10 YR 3/3	2.5 YR 3/4	MANY/FINE/PROMIN	LOAM

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

DATA FORM

C

P3

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T. Habashi (City of Roseville)			County Placer
Investigator L. Malo & E Htain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Eryngium vaseyi	H	FACW	10		
3 Hordeum murinum ssp. gusso	H	FAC	11		
4 Hemizonia pungens	H	FAC	12		
5 Holocarpa virgata	H	—	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 80%

Remarks

Based on expert knowledge of local climate and similarly vegetated wetlands nearby, it appears as if basin depth ponding in this wetland occurs > than 14 days during the growing season

Adjacent to FEMA 100yr flood plain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge

☐ Aerial Photographs

☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

☐ Inundated

☐ Saturated in Upper 12 Inches

☒ Water Marks

☐ Drift Lines

☐ Sediment Deposits

☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

☐ Oxidized Root Channels in Upper 12 Inches

☐ Water-Stained Leaves

☐ Local Soil Survey Data

☐ FAC-Neutral Test

☐ Other (Explain in Remarks)

Topo Depressional area - saturated to surface greater than 14 days

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks
Soils inferred from hydro and pond depth & veg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

D

Project/Site REP	Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)	County Placer
Investigator L. Malo, E. Hain	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID vernal pool
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID P4

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Eryngium vaseyi	H	FACW	10		
3 Hordeum murinum ssp. gussoneanum	H	FAC	11		
4 Hemizonia pungens	H	FAC	12		
5 Rumex crispus	H	FACW-	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

Adjacent to FEMA 100 yr floodplain

- ☐ Recorded Data (Describe in Remarks)
  - ☐ Stream, Lake, or Tide Gauge
  - ☐ Aerial Photographs
  - ☐ Other
- ☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Based on expert knowledge of local climate & similarly veg. wetlands nearby it appears as if basin depth ponding in this pool occurs > than 14 days during growing season

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10 YR 3/2	2.5 YR 3/4	FEW/Prom/Fine	sandy clay loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L. Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P5

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Plagiobothrys stipitata	H	OBL	10		
3 Rumex pulcher	H	FAC+	11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100yr floodplain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge

☐ Aerial Photographs

☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

☐ Inundated

☐ Saturated in Upper 12 Inches

☒ Water Marks

☐ Drift Lines

☐ Sediment Deposits

☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

☒ Oxidized Root Channels in Upper 12 Inches

☒ Water-Stained Leaves

☐ Local Soil Survey Data

☐ FAC-Neutral Test

☐ Other (Explain in Remarks)

Based on expert knowledge of local climate & similarly veg. wetlands nearby it appears as if basin depth ponding in this wetland occurs > 14 days during growing season

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 2	A_1	10YR 3/2	—	—	Sandy loam
2 - 16	A_2	10YR 3/2 - 3/3	5YR 4/6	Common / Med / Prom	sandy loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

F

Project/Site REP		Date 9/5/03	
Applicant / Owner T. Hahashi (City of Roseville)		County Placer	
Investigator L. Malo, E. Hain		State CA	
Do Normal Circumstances exist on the site?	(YES) NO	Community ID Seasonal Wetland (SW)	
Is the site significantly disturbed (Atypical Situation)?	YES (NO)	Transect ID	
Is the area a potential Problem Area? (If needed, explain on reverse)	YES (NO)	Plot ID P6	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eleocharis macrostachya	H	OBL	9		
2 Lolium multiflorum	H	FAC*	10		
3 Hordeum murinum ssp. gusso	H	FAC	11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge

☐ Aerial Photographs

☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

☐ Inundated

☐ Saturated in Upper 12 Inches

☒ Water Marks

☐ Drift Lines

☐ Sediment Deposits

☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

☒ Oxidized Root Channels in Upper 12 Inches

☒ Water-Stained Leaves

☐ Local Soil Survey Data

☐ FAC-Neutral Test

☐ Other (Explain in Remarks)

HYDRO ISOLATED FROM PLEASANT GROVE CREEK AND FEMA 100yr FLOOD PLAIN.

SOILS

Map Unit Name (Series and Phase): Xerolluents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 12	A	7.5YR 3/2	2.5YR 3/6/3/4	Many/Med/Prom	clay

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☒ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	(YES) NO	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/8/03
Applicant / Owner T. Habashi (City of Roseville)			County Placer
Investigator L. Malo, E Hfain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P7

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eleocharis macrostachya	H	OBL	9		
2 Eryngium vaseyi	H	FACW	10		
3 Rumex pulcher	H	FAC+	11		
4 Lolium multiflorum	H	FAC*	12		
5 Eremocarpus setigerus	H	—	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 80%

Remarks

Adjacent to FEMA 100yr floodplain

HYDROLOGY

- ☐ Recorded Data (Describe in Remarks)
  - ☐ Stream, Lake, or Tide Gauge
  - ☐ Aerial Photographs
  - ☐ Other
- ☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 Inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Based on expert knowledge of local climate & similarly veg. wetlands nearby, it appears as if basin depth ponding in this wetland occurs > 34 days of growing season

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred from hydro pond depth ; YES

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P8

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eleocharis macrostachya	H	OBL	9		
2 Lolium multiflorum	H	FAC*	10		
3 Polypogon monspeliensis	H	FACW+	11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100yr flood plain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 Inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponding, soil saturation more than 34 days, based on expert knowledge of local climate & similarly vegetated wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	Sandy loam
7/12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred from hydro pattern & veg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	YES	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	NO	Plot ID P9

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eryngium vaseyi	FACW		9		
2 Lolium multiflorum	FAC*		10		
3 Holocarpus virgata	—		11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 66%

Remarks

Adjacent to FEMA 100yr flood plain

HYDROLOGY

- ☐ Recorded Data (Describe in Remarks)
  - ☐ Stream, Lake, or Tide Gauge
  - ☐ Aerial Photographs
  - ☐ Other
- ☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	—	(in)
Depth to Saturated Soil	—	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponds for 14 days based on expert knowledge of local climate and similar veg. wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred from hydro and depth info

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

G

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L. Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P10

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eryngium vaseyi	H	FACW	9		
2 Holocarpus virgata	H	—	10		
3 Lolium multiflorum	H	FAC*	11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 66%

Remarks

HYDROLOGY

Adjacent to FEMA 100yr floodplain

- ☐ Recorded Data (Describe in Remarks)
  - ☐ Stream, Lake, or Tide Gauge
  - ☐ Aerial Photographs
  - ☐ Other
- ☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponds for 34 days based on expert knowledge of local climate and similarly veg wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-3	A	10YR 4/2	10YR 3/2	Common/med/Faint	Sandy loam
			2.5YR 2.5/4	common/med/Prom	
3-12	B	10YR 4/2	10YR 3/2	common/med/faint	clay

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☒ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/15/03
Applicant / Owner T Habashi			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P11

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Eryngium vaseyi	H	FACW	10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100yr flood plain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
☐ Inundated
☐ Saturated in Upper 12 Inches
☒ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
☒ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (Explain in Remarks)

Pond 14 days based on expert knowledge of local climate and similarly veg. wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR4/4	25YR4/8	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred from hydro pond depth & veg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Hair			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P12

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eryngium vaseyi	H	FACW	9		
2 Lasthenia glaberima	H	OBL	10		
3 Lolium multiflorum	H	FAC*	11		
4 Hordeum murinum ssp. gussoneanum	H	FAC	12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100yr Flood plain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge

☐ Aerial Photographs

☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

☐ Inundated

☐ Saturated in Upper 12 Inches

☒ Water Marks

☐ Drift Lines

☐ Sediment Deposits

☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

☒ Oxidized Root Channels in Upper 12 Inches

☐ Water-Stained Leaves

☐ Local Soil Survey Data

☐ FAC-Neutral Test

☐ Other (Explain in Remarks)

Pond 34 days based on expert knowledge of local climate and similar veg. wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? YES NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES NO	Is this Sampling Point Within a Wetland? YES NO
Wetland Hydrology Present?	YES NO	
Hydric Soils Present?	YES NO	

Remarks

Soils inferred by pond depth & veg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Htain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P13

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Hordeum murinum ssp. gussoo	H	FAC	10		
3 Rumex pulcher	H	FAC+	11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

Adjacent to FEMA 100yr flood plain

- ☐ Recorded Data (Describe in Remarks)
  - ☐ Stream, Lake, or Tide Gauge
  - ☐ Aerial Photographs
  - ☐ Other
- ☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponds 14 days based on expert knowledge of climate & similarly vegetated wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred by pond depth & veg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP	Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)	County Placer
Investigator L Malo, E Hain	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID P14

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eleocharis macrostachya	H	OBL	9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100 yr flood plain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	—	(in)
Depth to Saturated Soil	—	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 Inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponds 34 days based on expert knowledge of local climate & similarly veg wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/4	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred from pond depth & veg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P15

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eryngium vaseyi	H	FACW	9		
2 Lolium multiflorum	H	FAC*	10		
3 Hordeum murinum ssp. gussoneanum	H	FAC	11		
4 Plagiobothrys stipitatus ssp. micranthus	H	OBL	12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

Adjacent to FEMA 100yr flood plain

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	—	(in)
Depth to Saturated Soil	—	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☒ Oxidized Root Channels in Upper 12 Inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponds 34 days based on expert knowledge of local climate & similar veg - wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duripan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred from pond depth; vg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

H

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P16

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eryngium vaseyi	H	FACW	9		
2 Eleocharis macrostachya	H	OBL	10		
3 Lolium multiflorum	H	FAC	11		
4 Xanthium strumarium	H	FAC+	12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100yr floodplain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge

☐ Aerial Photographs

☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

☐ Inundated

☐ Saturated in Upper 12 Inches

☒ Water Marks

☐ Drift Lines

☐ Sediment Deposits

☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

☐ Oxidized Root Channels in Upper 12 Inches

☐ Water-Stained Leaves

☐ Local Soil Survey Data

☐ FAC-Neutral Test

☐ Other (Explain in Remarks)

Ponds 34 days based on expert knowledge of local climate and similarly vegetated wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-4	A	10YR 3/3	7.5YR 5/6	common/fine/faint	Sandy loam
4-12	B	10YR 3/2	2.5YR 3/4	common/med/prom	Sandy clay

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

Encountered fill materials and trash in soil pit in upper 12 inches.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P17

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eryngium vaseyi	FACW		9		
2 Eleocharis macrostachya	OBL		10		
3 Hordeum murinum ssp. gussoneanum	FAC		11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100yr floodplain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponding 34 days of growing season based on expert knowledge of local climate & similarly veg wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR4/4	2.5YR4/8	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soil mottled from depth of ponding and veg

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	YES (circled)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	NO (circled)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	NO (circled)	Plot ID P18

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eleocharis macrostachya	H	OBL	9		
2 Eryngium vaseyi	H	FACW	10		
3 Hordeum murinum ssp. guss	H	FAC	11		
4 Lolium multiflorum	H	FAC*	12		
5 Lasthenia glaberima	H	OBL	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

Adjacent to FEMA 100yr floodplain

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0	(in)
Depth to Free Water in Pit	—	(in)
Depth to Saturated Soil	—	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Ponding 34 day based on expert knowledge of local climate & similarly veg. wetlands nearby

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duripan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? (YES) NO
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	(YES) NO	

Remarks

Soils inferred from pond depth: yes

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

I

Project/Site REP	Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)	County Placer
Investigator L Malo, E Hain	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID upland
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID P19

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Avena fatua	H	—	9		
2 Lactuca serriola	H	FAC	10		
3 Hordeum murinum ssp. gussoneanum	H	FAC	11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 66%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Hydrology from Pleasant Grove Creek of FEMA 100yr Flood plain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	5 YR 3/3			sandy loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

H

Project/Site	REP	Date	9/5/03
Applicant / Owner	T Habash (City of Roseville)	County	Placer
Investigator	L Malo, E Hain	State	CA
Do Normal Circumstances exist on the site?	(YES) NO	Community ID	SW
Is the site significantly disturbed (Atypical Situation)?	YES (NO)	Transect ID	
Is the area a potential Problem Area? (If needed, explain on reverse)	YES (NO)	Plot ID	P19

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Hordeum murinum ssp. gussoneanum	H	FAC	10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☒ Oxidized Root Channels in Upper 12 Inches
- ☒ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Hydro isolated from Pleasant Grove Creek & FEMA 100yr flood plain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 10	A	10 YR 3/3	2.5 YR 4/4	common / fine / prom	Sandy loam
10 – 14	B	10 YR 3/3	10 YR 3/2	common / fine / prom	clay

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☒ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

Clay at 10 inches

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Hakashi (City of Roseville)			County Placer
Investigator L Malo, E Hahn			State CA
Do Normal Circumstances exist on the site?	YES	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	NO	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	NO	Plot ID P20

VEGETATION

TOSS

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Juncus bufonius	H	FACW	9		
2 Lythrum hyssopifolia	H	FACW	10		
3 Lolium multiflorum	H	FAC*	11		
4 Rumex pulcher	H	FAC+	12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge

☐ Aerial Photographs

☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

☐ Inundated

☐ Saturated in Upper 12 Inches

☐ Water Marks

☐ Drift Lines

☐ Sediment Deposits

☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

☐ Oxidized Root Channels in Upper 12 Inches

☐ Water-Stained Leaves

☐ Local Soil Survey Data

☐ FAC-Neutral Test

☐ Other (Explain in Remarks)

Hydro isolated from Pleasant Grove Creek & FEMA 100yr floodplain

SOILS

Map Unit Name (Series and Phase): Camela - Ramona	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-2	A_1	—	—	—	fill
2-12	A_2	5yr 3/3			sandy loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P21

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Juncus balticus	H	OBL	9		
2 Lolium multiflorum	H	FAC*	10		
3 Holocarpus virgata	H	—	11		
4 Aira caryophylla	H	—	12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 50%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS		
Depth of Surface Water	0	(in)
Depth to Free Water in Pit	—	(in)
Depth to Saturated Soil	—	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Hydro isolated from Pleasant Grove Creek & FEMA 100yr flood plain

SOILS

Map Unit Name (Series and Phase): Conda Ramona	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	5YR3/3			sandy loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP	Date 9/15/03
Applicant / Owner T Habashi (City of Roseville)	County Placer
Investigator L Malo, E Hain	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID P22

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lythrum hyssopifolia	H	FACW	9		
2 Juncus bufonius	H	OBL	10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Hydro indicated from Pleasant Grove Creek at FEMA 100 yr flood plain

SOILS

Map Unit Name (Series and Phase): Cometa - Ramona	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	5YR 3/3			Sandy loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

J

Project/Site	REP		Date 9/15/03
Applicant / Owner	T Hobashi (City of Roseville)		County Placer
Investigator	L Malo, E Main		State CA
Do Normal Circumstances exist on the site?		(YES) NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?		YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)		YES (NO)	Plot ID P 23

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lythrum hyssopifolia	H	FACW	9		
2 Cynodon dactylon	H	FAC	10		
3 Polygonum aviculare	H	FAC	11		
4 Cryesis schoenoides	H	OBL	12		
5 Polypogon monspeliensis	H	OBL	13		
6 Cyperus esculentes	H	FAC	14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	– (in)
Depth to Saturated Soil	– (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Hydro isolated from Pleasant Grove Creek & FEMA 100yr flood plain

SOILS

Map Unit Name (Series and Phase): Cometa - Ramona	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10	A	10YR 3/3			moist clay
>10					Duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

Manganese stains

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site	REP		Date 9/5/03
Applicant / Owner	T Habashi (Hyd Roseville)		County Placer
Investigator	L Male, E Hain		State CA
Do Normal Circumstances exist on the site?		(YES) NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?		YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)		YES (NO)	Plot ID P24

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Cynodon dactylon		FAC	9		
2 Rumex pulcher		FAC+	10		
3 Amaranthus blitoides		FACW	11		
4 Polygonum aviculare		FAC	12		
5 Lolium multiflorum		FAC	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS

Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

deep topo low area
Hydro isolated from Pleasant Grove Creek & FEMA 100yr Flood plain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-10	A	10YR4/4	2.5YR4/8	many/large/prom	sandy loam
>10					duripan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site	REP		Date 9/5/03
Applicant / Owner	T Hakoshi (City of Roseville)		County Placer
Investigator	L Malo, E Hain		State CA
Do Normal Circumstances exist on the site?		(YES) NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?		YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)		YES (NO)	Plot ID P26

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Juncus balticus	H	OBL	9		
2 Lythrum hyssopifolia	H	FACW	10		
3 Polygonum aviculare	H	FAC	11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge
☐ Aerial Photographs
☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
☐ Inundated
☐ Saturated in Upper 12 Inches
☐ Water Marks
☐ Drift Lines
☐ Sediment Deposits
☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
☐ Oxidized Root Channels in Upper 12 Inches
☐ Water-Stained Leaves
☐ Local Soil Survey Data
☐ FAC-Neutral Test
☐ Other (Explain in Remarks)

Hydrology data from Pleasant Grove Creek & FEMA 100 yr flood plain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 5/6	many/large/prom	sandy loam
>12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/5/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P27

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Eleocharis macrostachya	H	OBL	9		
2 Rumex pulcher	H	FAC+	10		
3 Lolium multiflorum	H	FAC*	11		
4 Phalaris lemmonii	H	FACW-	12		
5 Hordeum murinum ssp. gussoneanum	H	FAC	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☒ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

Hydro isolated from Pleasant Grove Creek & FEMA 100yr flood plain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-0.5	O	—	—	—	organic
0.5-3	A_1	10YR 3/3	7.5YR 5/6	com/fine/faint	Sandy loam
3-29	A_2	10YR 4/3	7.5YR 5/8	com/fine/faint	Sandy loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/15/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P29

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Juncus bufonius	H	OBL	9		
2 Lythrum hyssopifolia	H	FACW	10		
3 Lolium multiflorum	H	FAC*	11		
4 Rumex pulcher	H	FAC+	12		
5 Polypogon monspeliensis	H	OBL	13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	— (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☒ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

hydro isolated from Pleasant Grove Creek & FEMA 100yr floodplain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
7/12					duropan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP			Date 9/15/03
Applicant / Owner T Habashi (City of Roseville)			County Placer
Investigator L Malo, E Hain			State CA
Do Normal Circumstances exist on the site?	(YES)	NO	Community ID SW
Is the site significantly disturbed (Atypical Situation)?	YES	(NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse)	YES	(NO)	Plot ID P 30

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Lolium multiflorum	H	FAC*	9		
2 Hordeum murinum ssp. gussoneanum	H	FAC	10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

- ☐ Stream, Lake, or Tide Gauge
- ☐ Aerial Photographs
- ☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS		
Depth of Surface Water	0	(in)
Depth to Free Water in Pit	—	(in)
Depth to Saturated Soil	—	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

hydro isolated from Pleasant Grove Creek & FEMA 100yr flood plain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR4/4	2.5YR4/8	many/large/prom	sandy loam
>12					duripan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site REP		Date 9/5/03	
Applicant / Owner T Habashi (City of Roseville)		County Placer	
Investigator L Malo, E Hain		State CA	
Do Normal Circumstances exist on the site?	(YES) NO	Community ID SW	
Is the site significantly disturbed (Atypical Situation)?	YES (NO)	Transect ID	
Is the area a potential Problem Area? (If needed, explain on reverse)	YES (NO)	Plot ID P31	

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Polygogon maritimus	H	OBL	9		
2 Lolium multiflorum	H	FAC*	10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks

HYDROLOGY

☐ Recorded Data (Describe in Remarks)

☐ Stream, Lake, or Tide Gauge

☐ Aerial Photographs

☐ Other

☒ No Recorded Data Available

FIELD OBSERVATIONS	
Depth of Surface Water	0 (in)
Depth to Free Water in Pit	— (in)
Depth to Saturated Soil	~ (in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:

☐ Inundated

☐ Saturated in Upper 12 Inches

☐ Water Marks

☐ Drift Lines

☐ Sediment Deposits

☒ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):

☐ Oxidized Root Channels in Upper 12 Inches

☐ Water-Stained Leaves

☐ Local Soil Survey Data

☐ FAC-Neutral Test

☐ Other (Explain in Remarks)

hydro isolated from Pleasant Grove Creek & FEMA 100yr floodplain

SOILS

Map Unit Name (Series and Phase): Xerofluvents	Drainage Class:
Taxonomy (Subgroup)	Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12	A	10YR 4/4	2.5YR 4/8	many/large/prom	sandy loam
>12					duripan

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☒ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

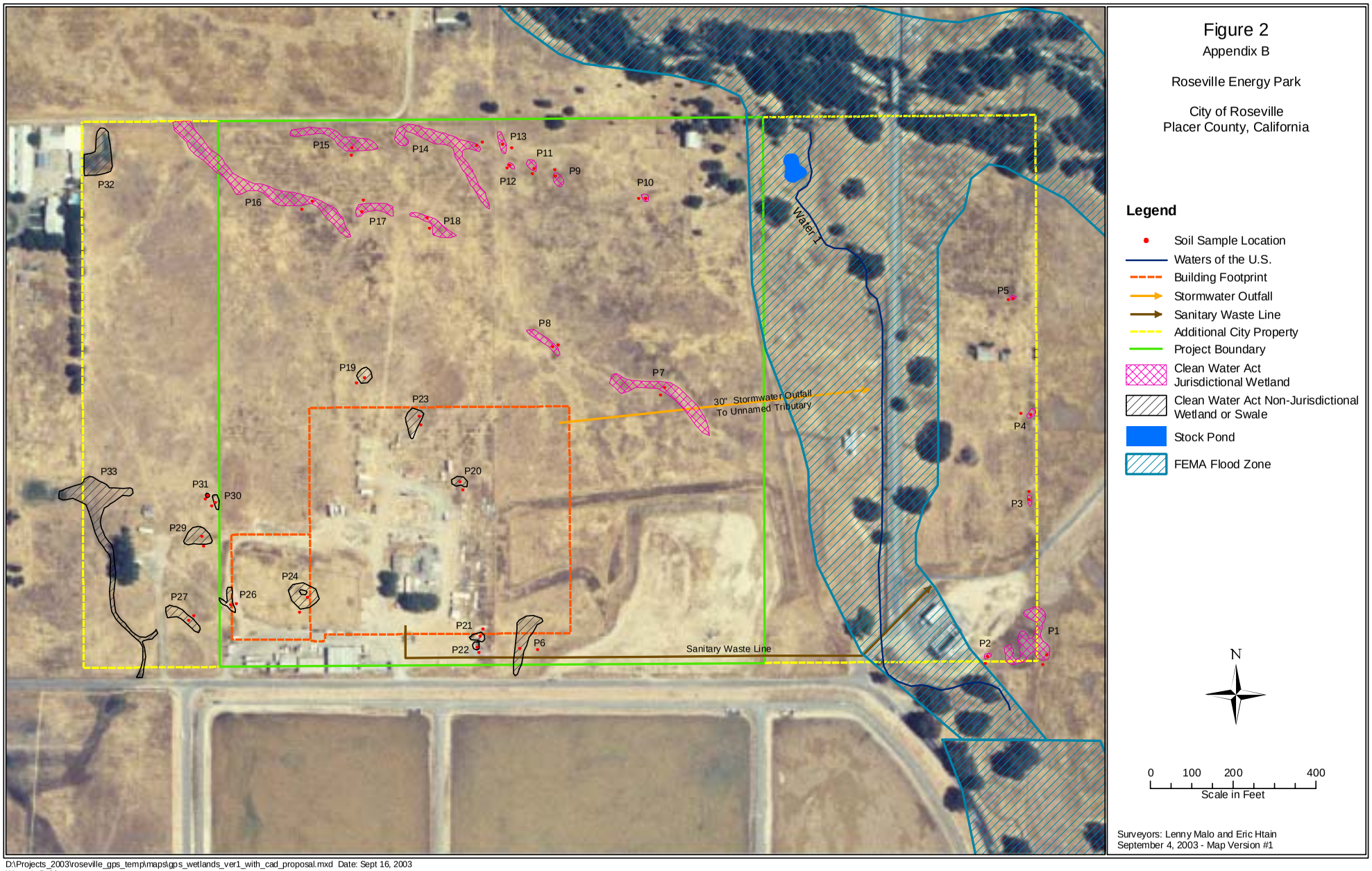
WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

APPENDIX B

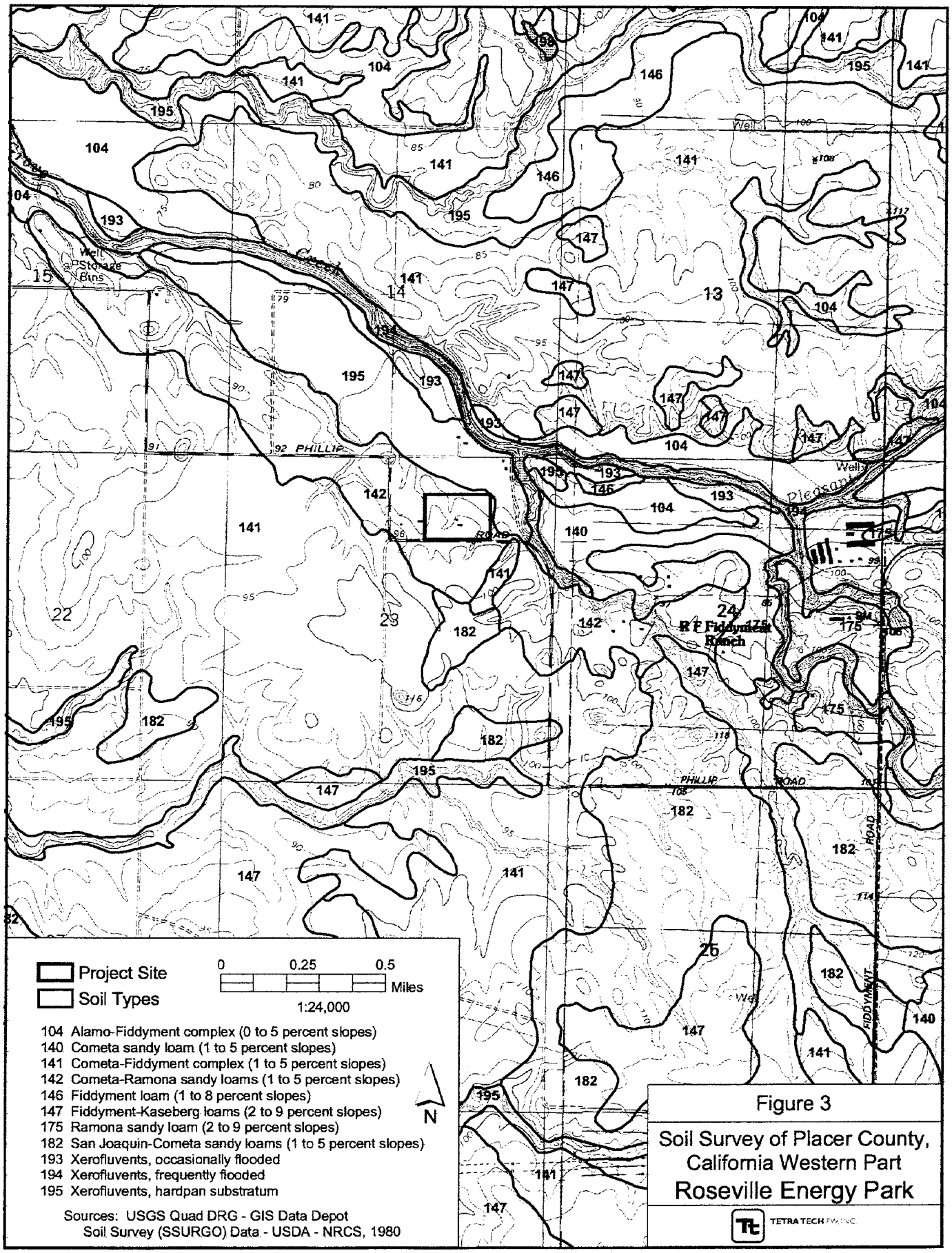
JURISDICTIONAL WATERS OF THE U.S. AND WETLANDS MAP



D:\Projects_2003\roseville_gps_temp\maps\gps_wetlands_ver1_with_cad_proposal.mxd Date: Sept 16, 2003
Wayne's D drive

APPENDIX C

SOIL SURVEY OF PLACER COUNTY, CALIFORNIA WESTERN PART MAP


Project Site
Soil Types
0
0.25
0.5
Miles
1:24,000
104 Alamo-Fiddyment complex (0 to 5 percent slopes)
140 Cometa sandy loam (1 to 5 percent slopes)
141 Cometa-Fiddyment complex (1 to 5 percent slopes)
142 Cometa-Ramona sandy loams (1 to 5 percent slopes)
146 Fiddyment loam (1 to 8 percent slopes)
147 Fiddyment-Kaseberg loams (2 to 9 percent slopes)
175 Ramona sandy loam (2 to 9 percent slopes)
182 San Joaquin-Cometa sandy loams (1 to 5 percent slopes)
193 Xerofluvents, occasionally flooded
194 Xerofluvents, frequently flooded
195 Xerofluvents, hardpan substratum
Sources: USGS Quad DRG - GIS Data Depot
Soil Survey (SSURGO) Data - USDA - NRCS, 1980
N
PHILLIP ROAD
FIDDYMENT ROAD
R F Fiddyment Ranch
Well
Storage Bins
Pleasant
Figure 3
Soil Survey of Placer County, California Western Part
Roseville Energy Park
TETRA TECH FW, INC.

Roseville Energy Park

Appendix 8.3-A
Cultural Resources Resume
• Jenna L. Farrell

October 2003

Roseville Energy Park
Application for Certification

Jenna L. Farrell	Tetra Tech FW, Inc.
Assignment: Cultural Resources	**Education:**
Years of Experience: 5	BS, Anthropology/Archeology, Humboldt State University

Selected Project Experience:

Pico Power Project, Application for CEC Certification, Santa Clara, CA— Served as an archaeologist. Prepared the cultural resources section of the AFC for this natural gas-fired peaking power plant. Conducted cultural resources literature searches and field inventories for prehistoric and historic archaeological properties and historic buildings and structures, and prepared license application. Conducted an archaeological literature search and a field inventory for the power plant site and associated linear routes in Santa Clara County. Consulted with the Native American Heritage Commission and various Native American tribes.

USDA Forest Service, Modoc National Forest, Alturas, CA—Served as an archaeological technician. Assisted with a heritage resource survey, on-site archaeological investigation, site recordation, and prefield research.

Gilroy Energy Center Phase I and ll, Gilroy, CA— Served as an archaeologist. Prepared the cultural resources section of the AFC for this natural gas-fired LM6000 peaking power plant. Planned and conducted cultural resources literature searches and field inventories for prehistoric and historic archaeological properties and historic buildings and structures, and prepared license application. Conducted an archaeological literature search and a field inventory for the power plant site and associated linear routes in Santa Clara County. Consulted with the Native American Heritage Commission and various Native American tribes. Served as a liaison between construction personnel, tribal monitors, and agency representatives. Assisted in the development of an archaeological resource treatment plan.

King City Energy Center, King City, CA—Served as an archaeologist. Prepared the cultural resources section of the Application for Certification under the 21-day process for LM6000 natural gas-fired turbines at the existing power plant facilities for submittal to the California Energy Commission. Planned and conducted cultural resources inventories, and conducted an archaeological literature search and a field inventory for the power plant in Santa Clara and Monterey counties. Consulted with the Native American Heritage Commission and various Native American tribes.

Edwards Air Force Base, Management Region 5, Palmdale, CA—Senior Archaeological Technician for Phase II detailed mapping and test excavation of 29 archaeological sites chosen from various sub-areas of Management Region 5 on the installation's Precision Impact Range Area. Operated high-precision global positioning system equipment for detailed site mapping, conducted test excavations, and performed laboratory analyses to determine National Register eligibility of the 29 archaeological sites.

Oregon and Northern California Fiber Optics Installation Project, 360 Networks Inc.—Served as a Cultural Resources Technician providing technical and professional support in monitoring compliance for the protection of cultural resources for a fiber optic conduit installation program in southern Oregon and northern California. Monitored construction activities and conducted archaeological surveys and test excavations. Worked closely with Native American monitors. Ensured that all construction activities were performed in accordance with California Public Utilities Commission (CPUC) mitigation requirements and USDA Forest Service/agency permit conditions. Served as a liaison between construction personnel, tribal monitors, and agency representatives.

Russell City Energy Center, CA—Served as an archaeologist. Conducted a cultural resource record search and literature review for project area. Prepared and completed the cultural resources section for the Environmental Assessment for the reconductoring of a transmission line.

Experience Summary:

- Archeological field research and monitoring experience
- Evaluations of historic buildings and structures
- Expertise writing cultural resource evaluations, analyses, and reports.

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

Roseville Energy Park

Appendix 8.3-B
Native American Consultation Letters

October 2003

Roseville Energy Park
Application for Certification

STATE OF CALIFORNIA Gray Davis, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
Fax (916) 657-5390
Web Site www.nahc.ca.gov

October 10 2003

Jenna Farrell
Tetra Tech Inc

Sent by Fax: 916-928-0594
No of Pages: 2

RE: Proposed Roseville Energy Park Project, Placer County.

Dear Ms. Palmer:

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend other with specific knowledge. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 653-4038.

Sincerely,

Debbie Pilas-Treadway
Environmental Specialist III

NATIVE AMERICAN CONTACTS
Placer County
October 10, 2003

Todd Valley Miwok-Maidu Cultural Foundation
Christopher Suehead, Cultural Representative
PO Box 1490 Miwok
Foresthill , CA 95631 Maidu
(530) 367-3893 - Voice / Fax
tvmmcf@foothill.net

Rose Enos
15310 Bancroft Road Maidu
Auburn , CA 95603 Washoe
(530) 878-2378

Shingle Springs Band of Miwok Indians
Jeff Murray, Cultural Resources Manager
P.O. Box 1340 Miwok
Shingle , CA 95682 Maidu
(530) 676-8010
(530) 676-8033 Fax

United Auburn Indian Community of the Auburn
Jessica Tavares, Chairperson
661 Newcastle Road, Suite 1 Maidu
Newcastle , CA 95658 Miwok
916 663-3720
916 663-3727 - Fax

United Auburn Indian Community of the Auburn
John Suehead
661 Newcastle Road, Suite 1 Maidu
Newcastle , CA 95658 Miwok
916 663-3720
916 663-3727 - Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regards to the cultural assessmet for the proposed Roseville Energy Park project, Placer County.

TETRA TECH FW, INC.

October 1, 2003
SO-2786-100103-DD

Ms. Debbie Pilas-Treadway
Native American Heritage Commission
915 Capital Mall, Room 364
Sacramento, California 95814

Subject: REQUEST FOR NATIVE AMERICAN REFERRALS AND SACRED LANDS FILE REVIEW FOR THE ROSEVILLE ENERGY PARK IN PLACER COUNTY

Dear Ms. Pilas-Treadway:

The City of Roseville's electric department, doing business as Roseville Electric (RE) will be seeking approval from the California Energy Commission (CEC) to construct and operate the Roseville Energy Park in the City of Roseville, Placer County, California. Tetra Tech FW, Inc. is assisting Roseville Electric in preparing the environmental assessment for the REP's Application for Certification for this project.

The proposed Roseville Energy Park will be a natural gas-fired, combined-cycle electrical generating facility rated at a nominal net generating capacity of 119 to 125 megawatts (MW), with the ability to peak-fire to 160 MW during summer design conditions. The proposed 12-acre project site is located on City of Roseville property within the limits of the City of Roseville, adjacent to and north of the Citys's Pleasant Grove Waste Water Treatment Plant. Surrounding land uses currently include ranching (agricultural grazing) and rural residential. The project area to the south, east, and west, however, is proposed for residential, industrial, and commercial development under the West Roseville Specific Plan (WRSP). REP would construct approximately 6 miles of 10 to 16-inch diameter underground natural gas pipeline will convey gas from Pacific Gas & Electric Company's (PG&E) gas distribution Line 123 to the project site. This pipeline begins at a connection point near the corner of Baseline Road and Country Club Lane.

The vicinity is shown on the attached map and the legal description is provided below.

3947 Lennane Drive, Suite 200, Sacramento, CA 95834
Tel 916.928.0202 Fax 916.928.0594
www.ttfwi.com

TETRA TECH FW, INC.

Roseville Energy Park Project vicinity:

Roseville 7.5 USGS Quad Map-T11N, R5E, section s23, 24 and R6E, section lines 24/19, 25/30, 36/31, 31/5, and 32/4, sections 25 and 24.

Pleasant Grove 7.5 USGS Quad Map-T11N, R5E section lines 23/14, and sections 23 and 26.

Construction for this facility is planned for early spring 2005, and we are in the process of preparing the Roseville Energy Park Application for Certification for the CEC.

We are requesting that you provide us with the names and addresses of potentially affected and interested Native American individuals and organizations to include in a mailing list for notification of the project. Please also notify us if there are any locations that are included in your Sacred Lands Inventory within the project vicinity.

Please reference the "Roseville Energy Park" in your correspondence, and send the information to Tetra Tech FW, INC. 3947 Lennane Dr. Suite 200, Sacramento, CA 95834, or fax it to (916)-928-0594. Please contact me at (916) 928-4801 or jfarrell@ttfwi.com if you have any questions. We greatly appreciate your immediate attention to this matter.

Sincerely,

Jenna Farrell
Cultural Resources

c: D. Davy, Tetra Tech FW, INC.

3947 Lennane Drive, Suite 200, Sacramento, CA 95834
Tel 916.928.0202 Fax 916.928.0594
www.ttfwi.com

TETRA TECH FW, INC.

October 16, 2003
SO-2786-101603-JF

Mr. John Suehead
United Auburn Indian Community of Auburn
661 Newcastle Road, Suite 1
Newcastle, CA 95658

Subject: THE ROSEVILLE ENERGY PARK IN PLACER COUNTY, CA

Dear Mr. Suehead:

The City of Roseville's electric department, doing business as Roseville Electric (RE) will be seeking approval from the California Energy Commission (CEC) to construct and operate the Roseville Energy Park in the City of Roseville, Placer County, California. Tetra Tech FW, Inc. is assisting Roseville Electric in preparing the environmental assessment for the REP's Application for Certification for this project.

The proposed Roseville Energy Park will be a natural gas-fired, combined-cycle electrical generating facility rated at a nominal net generating capacity of 120 to 125 megawatts (MW), with the ability to peak-fire to 160 MW during summer design conditions. The proposed 12-acre project site is located on City of Roseville property within the limits of the City of Roseville, adjacent to and north of the Pleasant Grove Waste Water Treatment Plant. Surrounding land uses currently include ranching (agricultural grazing) and rural residential. REP would construct approximately 6 miles of 10 to 16-inch diameter underground natural gas pipeline will convey gas from Pacific Gas & Electric Company's (PG&E) gas distribution Line 123 to the project site. This pipeline begins at a connection point near the corner of Baseline Road and Country Club Drive.

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The Native American Heritage Commission provided Tetra Tech FW, Inc. with your name and address as someone who may have knowledge of heritage lands or other resources of interest that the Project would potentially affect. Please notify us if there are any sites or locations of specific concern within the Project vicinity.

Please reference the "Roseville Energy Park" in your correspondence, and send the information to Tetra Tech FW, INC. 3947 Lennane Dr. Suite 200, Sacramento, CA 95834, or fax it to (916)-928-0594. Please contact me at (916) 928-4801 or jfarrell@ttfwi.com if you have any questions. We greatly appreciate your immediate attention to this matter.

Sincerely,

Jenna Farrell

Jenna Farrell
Associate Cultural Resources Scientists

c: D. Davy, Tetra Tech FW, INC.

TETRA TECH FW, INC.

October 16, 2003
SO-2786-101603-JF

Ms. Jessica Tavares, Chairperson
United Auburn Indian Community of Auburn
661 Newcastle Road, Suite 1
Newcastle, CA 95658

Subject: THE ROSEVILLE ENERGY PARK IN PLACER COUNTY, CA

Dear Ms. Traveres:

The City of Roseville's electric department, doing business as Roseville Electric (RE) will be seeking approval from the California Energy Commission (CEC) to construct and operate the Roseville Energy Park in the City of Roseville, Placer County, California. Tetra Tech FW, Inc. is assisting Roseville Electric in preparing the environmental assessment for the REP's Application for Certification for this project.

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Jenna Farrell

Jenna Farrell
Associate Cultural Resources Scientist

c: D. Davy, Tetra Tech FW, INC.

TETRA TECH FW, INC.

October 16, 2003
SO-2786-101603-JF

Mr. Jeff Murray, Cultural Resources Manager
Shingle Springs Band of Miwok Indians
PO Box 1340
Shingle Springs, CA 95682

Subject: THE ROSEVILLE ENERGY PARK IN PLACER COUNTY, CA

Dear Mr. Murray:

The City of Roseville's electric department, doing business as Roseville Electric (RE) will be seeking approval from the California Energy Commission (CEC) to construct and operate the Roseville Energy Park in the City of Roseville, Placer County, California. Tetra Tech FW, Inc. is assisting Roseville Electric in preparing the environmental assessment for the REP's Application for Certification for this project.

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Associate Cultural Resources Scientist

c: D. Davy, Tetra Tech FW, INC.

TETRA TECH FW, INC.

October 16, 2003
SO-2786-101603-JF

Mr. Christopher Suehead, Cultural Represenitive
Todd Valley Miwok-Maidu Cultural Foundation
PO Box 1490
Forest Hill, CA 95631

Subject: THE ROSEVILLE ENERGY PARK IN PLACER COUNTY, CA

Dear Mr. Suehead:

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TETRA TECH FW, INC.

October 16, 2003
SO-2786-101603-JF

Ms. Rose Enos
15310 Bancroft Road
Auburn, CA 95603

Subject: THE ROSEVILLE ENERGY PARK IN PLACER COUNTY, CA

Dear Ms. Enos:

The City of Roseville's electric department, doing business as Roseville Electric (RE) will be seeking approval from the California Energy Commission (CEC) to construct and operate the Roseville Energy Park in the City of Roseville, Placer County, California. Tetra Tech FW, Inc. is assisting Roseville Electric in preparing the environmental assessment for the REP's Application for Certification for this project.

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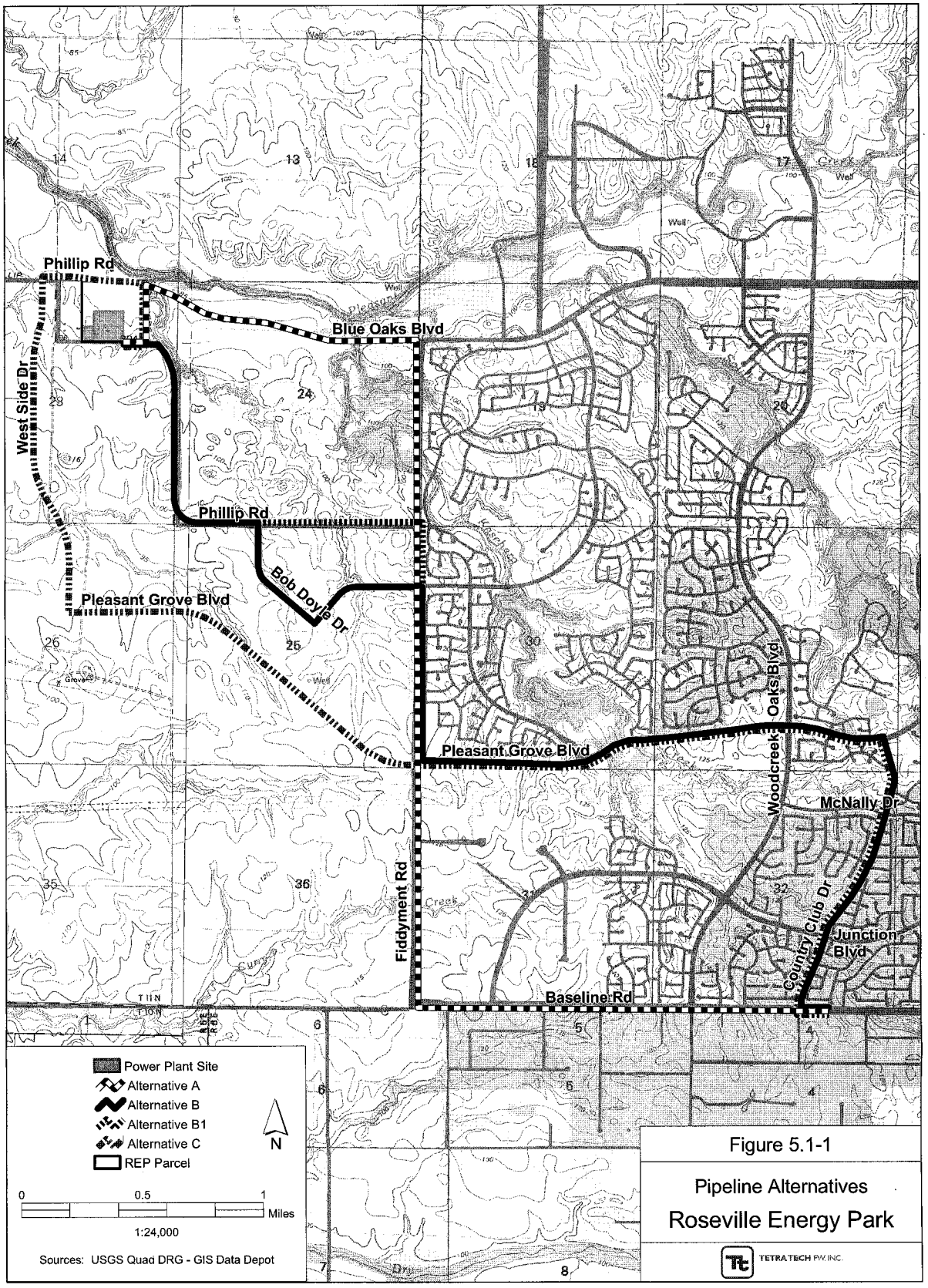

Figure 5.1-1

Pipeline Alternatives

Roseville Energy Park

TETRA TECH FW, INC.

Roseville Energy Park

Appendix 8.3-C

Cultural Resources Inventory Report, Westpark/Fiddyment Ranch and Liveoak Enterprises/Signature Property Development Project By PAR Environmental Services

(Filed separately under a request for confidentiality)

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 8.3-C
CULTURAL RESOURCES

The Cultural Resources Inventory Report has been submitted to the CEC under separate cover with a request for confidentiality.

Roseville Energy Park
Application for Certification

Roseville Energy Park

Appendix 8.3-D

Roseville Energy Facility Cultural Resources
By URS Corporation
and
Historic Resources Inventory and Evaluation Report, Roseville Energy Facility, Roseville, California
By JRP Historical Consulting Services

(Filed separately under a request for confidentiality)

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 8.3-D
CULTURAL RESOURCES

The Roseville Energy Facility Cultural Resources report and Historic Resources Inventory and Evaluation report have been submitted to the CEC under separate cover with a request for confidentiality.

Roseville Energy Park

Appendix 8.3-E
DPR 523 Forms for Prehistoric and Historic Archaeological Sites

(Filed separately under a request for confidentiality)

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 8.3-E
CULTURAL RESOURCES

The DPR 523 Forms for Prehistoric Archaeological Sites have been submitted to the CEC under separate cover with a request for confidentiality.

Roseville Energy Park

Appendix 8.5-A
Material Safety Data Sheets

October 2003

Roseville Energy Park
Application for Certification

AMMONIUM HYDROXIDE (10 - 35% NH3)

MSDS Number: A5916 --- *Effective Date: 03/04/99*

1. Product Identification

Synonyms: Ammonium hydroxide solutions; ammonia aqueous; ammonia solutions
CAS No.: 1336-21-6
Molecular Weight: 35.05
Chemical Formula: NH4OH in H2O
Product Codes:
J.T. Baker: 4807, 5019, 5350, 5358, 5604, 5817, 5820, 5838, 5891, 7847, 9718, 9719, 9721, 9730, 9731, 9733, 9741, 9742
Mallinckrodt: 0124, 0127, 1177, 3248, 3256, 5318, 6665, H007, H010, H893, H894, V044, V066, V592, V649, V893

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Ammonium Hydroxide	1336-21-6	21 - 72%	Yes
Water	7732-18-5	28 - 79%	No
Contains between 10 and 35% ammonia.			

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED OR INHALED. MIST AND VAPOR CAUSE BURNS TO EVERY AREA OF CONTACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 1 - Slight
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Corrosive)

Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White Stripe (Store Separately)

Potential Health Effects

Inhalation:
Vapors and mists cause irritation to the respiratory tract. Higher concentrations can cause burns, pulmonary edema and death. Brief exposure to 5000 ppm can be fatal.
Ingestion:
Toxic! May cause corrosion to the esophagus and stomach with perforation and peritonitis. Symptoms may include pain in the mouth, chest, and abdomen, with coughing, vomiting and collapse. Ingestion of as little as 3-4 mL may be fatal.
Skin Contact:
Causes irritation and burns to the skin.
Eye Contact:
Vapors cause irritation. Splashes cause severe pain, eye damage, and permanent blindness.
Chronic Exposure:
Repeated exposure may cause damage to the tissues of the mucous membranes, upper respiratory tract, eyes and skin.
Aggravation of Pre-existing Conditions:
Persons with pre-existing eye disorders or impaired respiratory function may be more susceptible to the effects of this material.

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4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician, immediately. Wash clothing before reuse.
Eye Contact:
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately. Immediate action is critical to minimize possibility of blindness.

---

5. Fire Fighting Measures

Fire:

Autoignition temperature: 651C (1204F)
Flammable limits in air % by volume:
lel: 16; uel: 25
Explosion:
Flammable vapors may accumulate in confined spaces.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Use water spray to blanket fire, cool fire exposed containers, and to flush non-ignited spills or vapors away from fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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6. Accidental Release Measures

Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment as specified in Section 8. Contain and recover liquid when possible. Do not flush caustic residues to the sewer. Residues from spills can be diluted with water, neutralized with dilute acid such as acetic, hydrochloric or sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 42 they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
50 ppm (NH3)
-ACGIH Threshold Limit Value (TLV):
25 ppm (NH3) (TWA) 35 ppm (STEL)
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded, a full facepiece respirator with an ammonia/methylamine cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:

Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Neoprene and nitrile rubber are recommended materials. Polyvinyl alcohol is not recommended.
Eye Protection:
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

Appearance:
Clear, colorless solution.
Odor:
Ammonia odor.
Solubility:
Infinitely soluble.
Specific Gravity:
0.9 (28% NH4OH)
pH:
11.6 (1.0N)
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
ca. 36C (ca. 97F)
Melting Point:
-72C (-98F)
Vapor Density (Air=1):
0.60 NH3
Vapor Pressure (mm Hg):
115 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

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10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Burning may produce ammonia, nitrogen oxides.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Acids, acrolein, dimethyl sulfate, halogens, silver nitrate, propylene oxide, nitromethane, silver oxide, silver permanganate, oleum, beta-propiolactone. Most common metals.
Conditions to Avoid:
Heat, sunlight, incompatibles, sources of ignition.

11. Toxicological Information

For ammonium hydroxide:
oral rat LD50: 350 mg/kg; eye, rabbit, standard Draize, 250 ug; severe, investigated as a mutagen.
For ammonia:
inhalation rat LC50: 2000 ppm/4-hr; investigated as a tumorigen, mutagen.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Ammonium Hydroxide (1336-21-6)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
This material is not expected to significantly bioaccumulate.
Environmental Toxicity:
This material is expected to be very toxic to aquatic life. The LC50/96-hour values for fish are less than 1 mg/l. The EC50/48-hour values for daphnia are less than 1 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: AMMONIA SOLUTIONS (WITH 10-35% AMMONIA)
Hazard Class: 8
UN/NA: UN2672

Packing Group: III
Information reported for product/size: 385LB

International (Water, I.M.O.)

Proper Shipping Name: AMMONIA SOLUTIONS (WITH 10-35% AMMONIA)
Hazard Class: 8
UN/NA: UN2672
Packing Group: III
Information reported for product/size: 385LB

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Australia	
Ammonium Hydroxide (1336-21-6)	Yes	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	No	Yes	

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Ammonium Hydroxide (1336-21-6)	No	No	No	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Ammonium Hydroxide (1336-21-6)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: 2P
Poison Schedule: S6
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **3** Flammability: **1** Reactivity: **0**

Label Hazard Warning:
POISON! DANGER! CORROSIVE. MAY BE FATAL IF SWALLOWED OR INHALED. MIST AND VAPOR CAUSE BURNS TO EVERY AREA OF CONTACT.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. IMMEDIATE ACTION IS ESSENTIAL FOR EYE EXPOSURES. In all cases call a physician immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 8.
Disclaimer:
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Prepared by: Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

SULFURIC ACID, 52 - 100 %

MSDS Number: S8234 --- *Effective Date: 09/14/00*

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1. Product Identification

Synonyms: Oil of vitriol; Babcock acid; sulphuric acid
CAS No.: 7664-93-9
Molecular Weight: 98.08
Chemical Formula: H2SO4 in H2O
Product Codes:
J.T. Baker: 5030, 5137, 5374, 5802, 5815, 5889, 5960, 5961, 5971, 6902, 9673, 9674, 9675, 9676, 9679, 9680, 9681, 9682, 9684, 9687, 9691, 9693, 9694
Mallinckrodt: 2468, 2876, 2878, 2900, 2904, 3780, 4222, 5524, 5557, H644, H976, H996, V344, V651

---

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	52 - 100%	Yes
Water	7732-18-5	0 - 48%	No

---

3. Hazards Identification

Emergency Overview

POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 3 - Severe (Water Reactive)
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

Potential Health Effects

Inhalation:
Inhalation produces damaging effects on the mucous membranes and upper respiratory tract. Symptoms may include irritation of the nose and throat, and labored breathing. May cause lung edema, a medical emergency.
Ingestion:
Corrosive. Swallowing can cause severe burns of the mouth, throat, and stomach, leading to death. Can cause sore throat, vomiting, diarrhea. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow ingestion or skin contact. Circulatory shock is often the immediate cause of death.
Skin Contact:
Corrosive. Symptoms of redness, pain, and severe burn can occur. Circulatory collapse with clammy skin, weak and rapid pulse, shallow respirations, and scanty urine may follow skin contact or ingestion. Circulatory shock is often the immediate cause of death.
Eye Contact:
Corrosive. Contact can cause blurred vision, redness, pain and severe tissue burns. Can cause blindness.
Chronic Exposure:
Long-term exposure to mist or vapors may cause damage to teeth. Chronic exposure to mists containing sulfuric acid is a cancer hazard.
Aggravation of Pre-existing Conditions:
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician immediately.
Ingestion:
DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician immediately.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Excess acid on skin can be neutralized with a 2% solution of bicarbonate of soda. Call a physician

immediately.
Eye Contact:
Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Call a physician immediately.

---

5. Fire Fighting Measures

Fire:
Concentrated material is a strong dehydrating agent. Reacts with organic materials and may cause ignition of finely divided materials on contact.
Explosion:
Contact with most metals causes formation of flammable and explosive hydrogen gas.
Fire Extinguishing Media:
Dry chemical, foam or carbon dioxide. Do not use water on material. However, water spray may be used to keep fire exposed containers cool.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving this material. Stay away from sealed containers.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB(R) or TEAM(R) 'Low Na+' acid neutralizers are recommended for spills of this product.

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7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, always add the acid to water; never add water to the acid. When opening metal containers, use non-sparking tools because of the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues

(vapors, liquid); observe all warnings and precautions listed for the product.

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8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
For Sulfuric Acid:
- OSHA Permissible Exposure Limit (PEL) -
1 mg/m3 (TWA)
- ACGIH Threshold Limit Value (TLV) -
1 mg/m3(TWA), 3 mg/m3 (STEL), A2 - suspected human carcinogen for sulfuric acid contained in strong inorganic acid mists.

Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge and particulate filter (NIOSH type N100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P particulate filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres. Where respirators are required, you must have a written program covering the basic requirements in the OSHA respirator standard. These include training, fit testing, medical approval, cleaning, maintenance, cartridge change schedules, etc. See 29CFR1910.134 for details.

Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

Appearance:
Clear oily liquid.

Odor:
Odorless.

Solubility:
Miscible with water, liberates much heat.

Specific Gravity:
1.84 (98%), 1.40 (50%), 1.07 (10%)

pH:
1 N solution (ca. 5% w/w) = 0.3; 0.1 N solution (ca. 0.5% w/w) = 1.2; 0.01 N solution (ca. 0.05% w/w) = 2.1.
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
ca. 290C (ca. 554F) (decomposes at 340C)
Melting Point:
3C (100%), -32C (93%), -38C (78%), -64C (65%).
Vapor Density (Air=1):
3.4
Vapor Pressure (mm Hg):
1 @ 145.8C (295F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Concentrated solutions react violently with water, spattering and liberating heat.
Hazardous Decomposition Products:
Toxic fumes of oxides of sulfur when heated to decomposition. Will react with water or steam to produce toxic and corrosive fumes. Reacts with carbonates to generate carbon dioxide gas, and with cyanides and sulfides to form poisonous hydrogen cyanide and hydrogen sulfide respectively.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Water, potassium chlorate, potassium perchlorate, potassium permanganate, sodium, lithium, bases, organic material, halogens, metal acetylides, oxides and hydrides, metals (yields hydrogen gas), strong oxidizing and reducing agents and many other reactive substances.
Conditions to Avoid:
Heat, moisture, incompatibles.

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11. Toxicological Information

Toxicological Data:
Oral rat LD50: 2140 mg/kg; inhalation rat LC50: 510 mg/m3/2H; standard Draize, eye rabbit, 250 ug (severe); investigated as a tumorigen, mutagen, reproductive effector.
Carcinogenicity:
Cancer Status: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a known human carcinogen, (IARC category 1). This classification applies only to mists containing sulfuric acid and not to sulfuric acid or sulfuric acid solutions.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sulfuric Acid (7664-93-9)	No	No	None
Water (7732-18-5)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material may leach into groundwater. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition. When released into the air, this material may be removed from the atmosphere to a moderate extent by dry deposition.
Environmental Toxicity:
LC50 Flounder 100 to 330 mg/l/48 hr aerated water/Conditions of bioassay not specified; LC50 Shrimp 80 to 90 mg/l/48 hr aerated water /Conditions of bioassay not specified; LC50 Prawn 42.5 ppm/48 hr salt water /Conditions of bioassay not specified.
This material may be toxic to aquatic life.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Domestic (Land, D.O.T.)

Proper Shipping Name: SULFURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

International (Water, I.M.O.)

Proper Shipping Name: SULPHURIC ACID (WITH MORE THAN 51% ACID)
Hazard Class: 8
UN/NA: UN1830
Packing Group: II
Information reported for product/size: 440LB

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Sulfuric Acid (7664-93-9)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------

		--Canada--		
Ingredient	Korea	DSL	NDSL	Phil.
Sulfuric Acid (7664-93-9)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\--------

	-SARA 302-		------SARA 313------	
Ingredient	RQ	TPQ	List	Chemical Catg.
Sulfuric Acid (7664-93-9)	1000	1000	Yes	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\--------

		-RCRA-	-TSCA-
Ingredient	CERCLA	261.33	8(d)

Sulfuric Acid (7664-93-9)	1000	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes

SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No

Reactivity: Yes (Pure / Liquid)

Australian Hazchem Code: 2P
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **3** Flammability: **0** Reactivity: **2** Other: **Water reactive**
Label Hazard Warning:
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR CONTACTED WITH SKIN. HARMFUL IF INHALED. AFFECTS TEETH. WATER REACTIVE. CANCER HAZARD. STRONG INORGANIC ACID MISTS CONTAINING SULFURIC ACID CAN CAUSE CANCER. Risk of cancer depends on duration and level of exposure.
Label Precautions:
Do not get in eyes, on skin, or on clothing.
Do not breathe mist.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Do not contact with water.
Label First Aid:
In all cases call a physician immediately. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use. Excess acid on skin can be neutralized with a 2% bicarbonate of soda solution. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **S4106** * * * * * *Effective Date:* ***02/18/03*** * * * * * *Supercedes:* ***05/05/00***

MSDS **Material Safety Data Sheet**

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM HYPOCHLORITE SOLUTION

1. Product Identification

Synonyms: Bleach; hypochlorous acid, sodium salt; soda bleach; sodium oxychloride
CAS No.: 7681-52-9
Molecular Weight: 74.44
Chemical Formula: NaOCl
Product Codes: 9416, P005

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sodium Hypochlorite (as NaOCl)	7681-52-9	5%	Yes
Water	7732-18-5	95%	No

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION

TO EYES AND RESPIRATORY TRACT. CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 2 - Moderate
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
May cause irritation to the respiratory tract, (nose and throat); symptoms may include coughing and sore throat.
Ingestion:
May cause nausea, vomiting.
Skin Contact:
May irritate skin.
Eye Contact:
Contact may cause severe irritation and damage, especially at higher concentration.
Chronic Exposure:
A constant irritant to the eyes and throat. Low potential for sensitization after exaggerated exposure to damaged skin.
Aggravation of Pre-existing Conditions:
Persons with impaired respiratory function, or heart disorders (or disease) may be more susceptible to the effects of the substance.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:
Consider oral administration of sodium thiosulfate solutions if sodium hypochlorite is ingested. Do not administer neutralizing substances since the resultant exothermic reaction could further damage tissue. Endotracheal intubation could be needed if glottic edema compromises the airway. For individuals with significant inhalation exposure, monitor arterial blood gases and chest x-ray.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard. Substance releases oxygen when heated, which may increase the severity of an existing fire. Containers may rupture from pressure build-up.
Explosion:
This solution is not considered to be an explosion hazard. Anhydrous sodium hypochlorite is very explosive.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire. Use water spray to cool fire-exposed containers, to dilute liquid, and control vapor.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
Sodium Hypochlorite:
AIHA (WEEL) - STEL - 2 mg/m3

-OSHA Permissible Exposure Limit (PEL):
0.5 ppm (TWA), 1 ppm (STEL) as Chlorine

-ACGIH Threshold Limit Value (TLV):
1 ppm (TWA), 3 ppm (STEL) as Chlorine
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
Personal Respirators (NIOSH Approved):
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
Eye Protection:
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Colorless to yellowish liquid.
Odor:
Chlorine-like odor.
Solubility:
100% in water.
Density:
1.07 - 1.14
pH:
9 - 10 (neutral solution-no excess sodium hydroxide)
% Volatiles by volume @ 21C (70F):
ca. 95
Boiling Point:
40C (104F) Decomposes slightly
Melting Point:

-6C (21F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
17.5 @ 20C (68F)
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Slowly decomposes on contact with air. Rate increases with the concentration and temperature. Exposure to sunlight accelerates decomposition. Sodium hypochlorite becomes less toxic with age.
Hazardous Decomposition Products:
Emits toxic fumes of chlorine when heated to decomposition. Sodium oxide at high temperatures.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Ammonia (chloramine gas may evolve),amines, ammonium salts, aziridine, methanol, phenyl acetonitrile, cellulose, ethyleneimine, oxidizable metals, acids, soaps, and bisulfates.

Conditions to Avoid:
Light, heat, incompatibles.

---

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a tumorigen and mutagen. Irritation data: eye, rabbit, 10 mg - Moderate

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sodium Hypochlorite (as NaOCl) (7681-52-9)	No	No	3
Water (7732-18-5)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.

Environmental Toxicity:
No information found.

---

13. Disposal Considerations

Dilute with water and flush to sewer if local ordinances allow, otherwise, whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Not regulated.

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Sodium Hypochlorite (as NaOCl) (7681-52-9)	Yes	Yes	Yes	Yes
Water (7732-18-5)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Sodium Hypochlorite (as NaOCl) (7681-52-9)	Yes	Yes	No	Yes
Water (7732-18-5)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\--------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Sodium Hypochlorite (as NaOCl) (7681-52-9)	No	No	No	No
Water (7732-18-5)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\--------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Sodium Hypochlorite (as NaOCl) (7681-52-9)	100	No	No
Water (7732-18-5)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No

SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

Australian Hazchem Code: None allocated.
Poison Schedule: S5
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **2** Flammability: **0** Reactivity: **1**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO EYES AND RESPIRATORY TRACT. CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Avoid breathing mist.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.
Label First Aid:
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. In all cases get medical attention immediately.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 8.
Disclaimer:
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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

MSDS Number: **S3170** * * * * * *Effective Date:* ***11/02/01*** * * * * * *Supercedes:* ***11/17/99***

MSDS **Material Safety Data Sheet**

From: **Mallinckrodt Baker, Inc.**
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

SODIUM BROMIDE

1. Product Identification

Synonyms: Sedoneural
CAS No.: 7647-15-6
Molecular Weight: 102.89
Chemical Formula: NaBr
Product Codes:
J.T. Baker: 3588
Mallinckrodt: 0514, 0535

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sodium Bromide	7647-15-6	100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! HARMFUL IF SWALLOWED. AFFECTS CENTRAL NERVOUS SYSTEM, BRAIN AND EYES. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
Dust may cause irritation to the respiratory tract; symptoms may include coughing and shortness of breath.

Ingestion:
May cause nausea, vomiting and abdominal pain. Ingestions are usually promptly rejected by vomiting, but sufficient absorption may occur to produce central nervous system, eye and brain effects. Symptoms may include skin rash, blurred vision and other eye effects, drowsiness, irritability, dizziness, mania, hallucinations, and coma.
Skin Contact:
Dry material may cause mild irritation. Solutions may cause irritation, redness, and pain.
Eye Contact:
May cause irritation, redness and pain.
Chronic Exposure:
Repeated or prolonged exposure by any route may cause skin rashes (bromaderma). Repeated ingestion of small amounts may cause central nervous system depression, including depression, ataxia, psychoses, memory loss, irritability, and headache.
Aggravation of Pre-existing Conditions:
Persons suffering from debilitation, depression, alcoholism, neurological or psychological disorders may be more susceptible to the effects of this compound.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Call a physician.
Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes.

Remove contaminated clothing and shoes. Wash clothing before reuse. Call a physician.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

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5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures as low as possible. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work

area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):
For conditions of use where exposure to dust or mist is apparent and engineering controls are not feasible, a particulate respirator (NIOSH type N95 or better filters) may be worn. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:
Wear protective gloves and clean body-covering clothing.

Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
White crystals, granules, or powder

Odor:
Odorless.

Solubility:
116 g/100 g water @ 50C (122F)

Specific Gravity:
3.21

pH:
No information found.

% Volatiles by volume @ 21C (70F):
0

Boiling Point:
1390C (2534F)

Melting Point:
755C (1391F)

Vapor Density (Air=1):
No information found.

Vapor Pressure (mm Hg):
No information found.

Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage. Absorbs moisture from air.

Hazardous Decomposition Products:
Oxides of the contained metal and halogen, possibly also free, or ionic halogen.

Hazardous Polymerization:
Will not occur.
Incompatibilities:
Acids, alkaloidal and heavy metal salts, oxidizers, and bromine trifluoride.
Conditions to Avoid:
Moisture and incompatibles.

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11. Toxicological Information

Toxicological Data:
Sodium Bromide: Oral rat LD50: 3500 mg/kg. Investigated as a reproductive effector.
Reproductive Toxicity:
Causes reproductive system effects in laboratory animals.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Sodium Bromide (7647-15-6)	No	No	None

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12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

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13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Not regulated.

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15. Regulatory Information

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--------\Chemical Inventory Status - Part 1\--------------------------------
Ingredient                                        TSCA  EC   Japan  Australia
----------------------------------------------  ----  ---  -----  ---------
Sodium Bromide (7647-15-6)                        Yes  Yes   Yes      Yes

--------\Chemical Inventory Status - Part 2\--------------------------------
                                                        --Canada--
Ingredient                                        Korea  DSL   NDSL  Phil.
----------------------------------------------  -----  ---   ----  -----
Sodium Bromide (7647-15-6)                        Yes   Yes   No     Yes

--------\Federal, State & International Regulations - Part 1\----------------
                                          -SARA 302-    ------SARA 313------
Ingredient                                RQ    TPQ     List  Chemical Catg.
----------------------------------------  ---   -----   ----  --------------
Sodium Bromide (7647-15-6)                No    No      No         No

--------\Federal, State & International Regulations - Part 2\----------------
                                                       -RCRA-    -TSCA-
Ingredient                                CERCLA       261.33     8(d)
----------------------------------------  ------       ------    ------
Sodium Bromide (7647-15-6)                No           No         No


Chemical Weapons Convention:  No     TSCA 12(b):  No     CDTA:  No
SARA 311/312:  Acute: Yes      Chronic: Yes  Fire: No  Pressure: No
Reactivity: No          (Pure / Solid)
```

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **2** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
WARNING! HARMFUL IF SWALLOWED. AFFECTS CENTRAL NERVOUS SYSTEM, BRAIN AND EYES. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT.
Label Precautions:
Avoid breathing dust.
Keep container closed.
Use with adequate ventilation.
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. In all cases call a physician.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

ONDEO Nalco

MATERIAL SAFETY DATA SHEET

PRODUCT

TRASAR® 23263

EMERGENCY TELEPHONE NUMBER
(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **TRASAR® 23263**

APPLICATION : COOLING WATER TREATMENT

COMPANY IDENTIFICATION : ONDEO Nalco Company
ONDEO Nalco Center
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 0 / 1 FLAMMABILITY : 1 / 1 REACTIVITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Based on our hazard evaluation, none of the substances in this product are hazardous.

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

CAUTION
May cause irritation with prolonged contact.
Do not get in eyes, on skin, on clothing. Do not take internally. Wear suitable protective clothing. Keep container tightly closed. Flush affected area with water. Protect product from freezing.
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
May cause irritation with prolonged contact.

SKIN CONTACT :
May cause irritation with prolonged contact.

INGESTION :
Not a likely route of exposure. May cause nausea and vomiting.

INHALATION :
Not a likely route of exposure. Repeated or prolonged exposure may irritate the respiratory tract.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

4. FIRST AID MEASURES

EYE CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

SKIN CONTACT :
Flush affected area with water. If symptoms develop, seek medical advice.

INGESTION :
Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. If symptoms develop, seek medical advice.

INHALATION :
Remove to fresh air, treat symptomatically. If symptoms develop, seek medical advice.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : > 212 °F / > 100 °C (PMCC)

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) and sulfur (SOx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Stop or reduce any leaks if it is safe to do so. Do not touch spilled material. Ventilate spill area if possible. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection).

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Avoid eye and skin contact. Do not take internally. Ensure all containers are labelled. Keep the containers closed when not in use.

STORAGE CONDITIONS :
Store the containers tightly closed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Respiratory protection is not normally needed.

HAND PROTECTION :
Neoprene gloves, Nitrile gloves, Butyl gloves, PVC gloves

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Keep an eye wash fountain available. Keep a safety shower available. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Moderate

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Clear Amber
ODOR	None

SPECIFIC GRAVITY	1.1 @ 77 °F / 25 °C
DENSITY	9.1 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	5
VISCOSITY	10 cps @ 71 °F / 21.66 °C
FREEZING POINT	26 °F / -3.33 °C
VAPOR PRESSURE	Same as water
VOC CONTENT	0.00 %

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen, Oxides of sulfur

11. TOXICOLOGICAL INFORMATION

The following results are for the polymer.

ACUTE ORAL TOXICITY :

Species	LD50	Tested Substance
Rat	> 5,000 mg/kg	Active Substance

Rating : Non-Hazardous

PRIMARY SKIN IRRITATION :

Draize Score	Tested Substance
0.0 / 8.0	Active Substance

Rating : Practically non-irritating

PRIMARY EYE IRRITATION :

Draize Score	Tested Substance
4.7 / 110.0	Active Substance

Rating : Minimally irritating

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Low

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the polymer. The following results are for a similar product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Tested Substance
Bluegill Sunfish	96 hrs	> 1,000 mg/l	Active Substance
Rainbow Trout	96 hrs	> 1,000 mg/l	Active Substance

Rating : Essentially non-toxic

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Tested Substance
Daphnia magna	48 hrs	> 1,000 mg/l		Active Substance
Mysid Shrimp (M. litoralis)	96 hrs	> 1,000 mg/l		Similar Product

Rating : Essentially non-toxic

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 18,000 mg/l

Chemical Oxygen Demand (COD) : 43,000 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Tested Substance
	17,300 mg/l	Similar Product

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Low
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it is not a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous waste, it is not subject to federal regulation. Consult state or local regulation for any additional handling, treatment or disposal requirements. For disposal, contact a properly licensed waste treatment, storage, disposal or recycling facility.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

LAND TRANSPORT :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, none of the substances in this product are hazardous.

CERCLA/SUPERFUND, 40 CFR 117, 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The chemical substances in this product are on the TSCA 8(b) Inventory (40 CFR 710).

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
None of the substances are specifically listed in the regulation.

CALIFORNIA PROPOSITION 65 :
This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
The following substances are disclosed for compliance with State Right to Know Laws:

Sodium Bisulfate	7681-38-1
Water	7732-18-5
Acrylic Polymer	20507700000-5034P
Substituted aliphatic aldehyde	20507700000-5313P

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :
Not considered a WHMIS controlled product.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

INTERNATIONAL CHEMICAL CONTROL LAWS

EUROPE
All substances in this product comply with the notification requirements of the European Commission Directive 67/548/EEC and amendments and are listed on the European Inventory of Existing Commercial Substances (EINECS).

THE PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippine Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, Co.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO

Prepared By : Product Safety Department
Date issued : 12/15/2000
Replaces : 08/23/1996

ONDEO Nalco

MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 8305 PLUS

EMERGENCY TELEPHONE NUMBER
(800) 424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : **NALCO 8305 PLUS**

APPLICATION : COOLING WATER TREATMENT

COMPANY IDENTIFICATION : ONDEO Nalco Company
ONDEO Nalco Center
Naperville, Illinois
60563-1198

EMERGENCY TELEPHONE NUMBER : (800) 424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 1 / 2 FLAMMABILITY : 1 / 1 REACTIVITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Tolyltriazole	64665-57-2	1.0 - 5.0

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

WARNING
Irritating to eyes and skin.
Do not get in eyes, on skin, on clothing. Do not take internally. Keep container tightly closed. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing.
Wear suitable protective clothing, gloves and eye/face protection.
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. May evolve oxides of phosphorus (POx) under fire conditions.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
Can cause moderate irritation.

SKIN CONTACT :
Can cause moderate irritation.

INGESTION :
Not a likely route of exposure. No adverse effects expected.

INHALATION :
Not a likely route of exposure. Aerosols or product mist may irritate the upper respiratory tract.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

4. FIRST AID MEASURES

EYE CONTACT :
Immediately flush eye with water for at least 15 minutes while holding eyelids open. If irritation persists, repeat flushing. Get immediate medical attention.

SKIN CONTACT :
Immediately flush with plenty of water for at least 15 minutes. If symptoms persist, call a physician.

INGESTION :
Do not induce vomiting without medical advice. If conscious, washout mouth and give water to drink. Get medical attention.

INHALATION :
Remove to fresh air, treat symptomatically. Get medical attention.

NOTE TO PHYSICIAN :
Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : None

EXTINGUISHING MEDIA :
This product would not be expected to burn unless all the water is boiled away. The remaining organics may be ignitable. Keep containers cool by spraying with water. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. May evolve oxides of phosphorus (POx) under fire conditions.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

7. HANDLING AND STORAGE

HANDLING :
Avoid eye and skin contact. Do not take internally. Do not get in eyes, on skin, on clothing. Have emergency equipment (for fires, spills, leaks, etc.) readily available. Ensure all containers are labelled. Keep the containers closed when not in use. Use with adequate ventilation.

STORAGE CONDITIONS :
Store the containers tightly closed. Store in suitable labelled containers.

UNSUITABLE CONSTRUCTION MATERIAL :
Product is corrosive to aluminum. Aluminum should not be used for feed, storage, or transportation systems.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
This product does not contain any substance that has an established exposure limit.

ENGINEERING MEASURES :
General ventilation is recommended.

RESPIRATORY PROTECTION :
Respiratory protection is not normally needed.

HAND PROTECTION :
Neoprene gloves, Nitrile gloves, Butyl gloves, PVC gloves

SKIN PROTECTION :
Wear standard protective clothing.

EYE PROTECTION :
Wear chemical splash goggles.

HYGIENE RECOMMENDATIONS :
If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse. Keep an eye wash fountain available. Keep a safety shower available.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Moderate

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow
ODOR	Sweet, Organic

SPECIFIC GRAVITY	1.38 - 1.42 @ 77 °F / 25 °C
DENSITY	11.5 - 11.8 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	11.5 - 13.0
VISCOSITY	7 cps @ 71 °F / 21.7 °C
FREEZING POINT	< -50 °F / < -45.6 °C
VAPOR PRESSURE	0.5 mm Hg @ 100 °F /

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Freezing temperatures.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen, Oxides of phosphorus

11. TOXICOLOGICAL INFORMATION

No toxicity studies have been conducted on this product.

SENSITIZATION :
This product is not expected to be a sensitizer.

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: Moderate

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

ACUTE FISH RESULTS :

Species	Exposure	LC50	Tested Substance
Bluegill Sunfish	96 hrs	450 mg/l	Product
Rainbow Trout	96 hrs	610 mg/l	

Rating : Essentially non-toxic

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Tested Substance
Daphnia magna	48 hrs	> 1,000 mg/l		Product

Rating : Essentially non-toxic

PERSISTENCY AND DEGRADATION :

Total Organic Carbon (TOC) : 23,000 mg/l

Chemical Oxygen Demand (COD) : 57,000 mg/l

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION

Based on our hazard characterization, the potential environmental hazard is: Low
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste. Special Waste Regulations 1996 apply.

Hazardous Waste: D002

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	POTASSIUM HYDROXIDE, TETRAPOTASSIUM PYROPHOSPHATE
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	III
Flash Point :	None

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	POTASSIUM HYDROXIDE, TETRAPOTASSIUM PYROPHOSPHATE
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	III
IATA Cargo Packing Instructions :	820
IATA Cargo Aircraft Limit :	60 L (Max net quantity per package)

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.

Technical Name(s) :	POTASSIUM HYDROXIDE, TETRAPOTASSIUM PYROPHOSPHATE
UN/ID No :	UN 3266
Hazard Class - Primary :	8
Packing Group :	III

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Sodium Tolyltriazole : Irritant

CERCLA/SUPERFUND, 40 CFR 117, 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The chemical substances in this product are on the TSCA 8(b) Inventory (40 CFR 710).

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
None of the substances are specifically listed in the regulation.

CALIFORNIA PROPOSITION 65 :
This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
None of the substances are specifically listed in the regulation.

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :
E - Corrosive Material

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

16. OTHER INFORMATION

None

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Moderate

* The environmental risk is: Low

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, Co.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO

Prepared By : Product Safety Department
Date issued : 07/11/2000
Replaces : 06/24/1998

MATERIAL SAFETY DATA SHEET

PRODUCT

STABREX® ST70

EMERGENCY TELEPHONE NUMBER
(800)462-5378 (24 Hours) (800) I-M-ALERT

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME :	**STABREX® ST70**
APPLICATION :	MICROORGANISM CONTROL CHEMICAL
CHEMICAL DESCRIPTION :	Alkaline liquid bromine antimicrobial, in aqueous solution
COMPANY IDENTIFICATION :	Nalco Chemical Company One Nalco Center Naperville, Illinois 60563-1198
EMERGENCY TELEPHONE NUMBER :	(800)462-5378 (24 Hours) (800) I-M-ALERT

NFPA 704M/HMIS RATING
HEALTH : 3 / 3 FLAMMABILITY : 0 / 0 REACTIVITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Sodium Hydroxide	1310-73-2	1.0 - 5.0

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

DANGER
CORROSIVE. CAUSES SEVERE EYE AND SKIN INJURY. HARMFUL IF INHALED. HARMFUL IF SWALLOWED.
Do not get in eyes, on skin or on clothing. Wear goggles or face shield and rubber gloves when handling. Remove and wash contaminated clothing before reuse. Wash thoroughly after handling.
May evolve hydrogen bromide and bromine under fire conditions. May evolve HCl under fire conditions. May evolve chlorine under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin

HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
Corrosive. Will cause eye burns and permanent tissue damage.

SKIN CONTACT :
May cause severe irritation or tissue damage depending on the length of exposure and the type of first aid administered.

INGESTION :
Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach.

INHALATION :
Not a likely route of exposure. Irritating, in high concentrations, to the eyes, nose, throat and lungs.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

4. FIRST AID MEASURES

IF IN EYES: Immediately flush with plenty of water for at least 15 minutes. Call a physician.

IF ON SKIN: Immediately wash with soap and plenty of water. Remove contaminated clothing and wash before reuse. Get medical attention if irritation persists.

IF SWALLOWED: Drink large quantities of water. Do not induce vomiting. Call a physician or poison control immediately.

^^Take container label or product name and Pest Control Product registration number with you when seeking medical attention.

NOTE TO PHYSICIAN :
Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsions may be needed.

5. FIRE FIGHTING MEASURES

FLASH POINT : None

EXTINGUISHING MEDIA :
Not expected to burn. Use extinguishing media appropriate for surrounding fire.

FIRE AND EXPLOSION HAZARD :
May evolve hydrogen bromide and bromine under fire conditions. May evolve HCl under fire conditions. May evolve chlorine under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Contact with reactive metals (e.g. aluminum) may result in the generation of flammable hydrogen gas.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :
SMALL SPILLS: Contain and absorb with sand or vermiculite and mix well. Collect up and remove to a safe place until disposal. Wash site of spillage thoroughly with water. Assistance can be obtained from waste disposal companies. LARGE SPILLS: Dike to prevent further movement. Recover by pumping or by using a suitable absorbent. Reclaim into recovery or salvage drums. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
This pesticide is toxic to fish and aquatic organisms. Do not discharge effluent containing this product into lakes, streams, ponds, estuaries, oceans or other waters, unless in accordance with the requirements of a National Pollutant Discharge Elimination System (NPDES) permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the local sewage treatment plant authority. For guidance contact your State Water Board or Regional Office of the EPA. Apply this pesticide only as specified on the label.

7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Avoid generating aerosols and mists. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :
Store the containers tightly closed. Store away from incompatible materials. Store in suitable labelled containers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

ACGIH/TLV :
Substance(s)

Sodium Hydroxide	CEILING: 2 mg/m3

OSHA/PEL :
Substance(s)
Sodium Hydroxide CEILING: 2 mg/m3

ENGINEERING MEASURES :
General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :
If significant mists, vapors or aerosols are generated an approved respirator is recommended. A dust, mist, fume cartridge may be used. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
PVC gloves, Rubber gloves, Neoprene gloves, Nitrile gloves, Butyl gloves, Viton™ gloves

SKIN PROTECTION :
Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :
Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Clear Light yellow
ODOR	None

SPECIFIC GRAVITY	1.32 - 1.36 @ 77 °F / 25 °C
DENSITY	11.0 - 11.3 lb/gal
SOLUBILITY IN WATER	Complete
pH (100 %)	13
FREEZING POINT	17 °F / -8.3 °C
VAPOR PRESSURE	7.7 mm Hg, 27 mm Hg @ 77 °F, 115 °F /
VOC CONTENT	0.00 %

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

CONDITIONS TO AVOID :
Avoid storing in direct sunlight to prevent UV degradation of product and subsequent generation of N2.

MATERIALS TO AVOID :
Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with organic materials (e.g. rags, sawdust, hydrocarbon oils or solvents) and avoid reducing agents (e.g. hydrazine, sulfites, sulfide, aluminum or magnesium dust) which can generate heat, fires, explosions and the release of toxic fumes. Do not mix with any sodium hypochlorite or bleach product. Resulting mixture will result in a violent exothermic reaction releasing large amounts of nitrogen gas and liquid sulfuric acid.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Chlorine gas, HCl, Bromine, Hydrogen bromide

11. TOXICOLOGICAL INFORMATION

The following results are for a similar product.

ACUTE ORAL TOXICITY :

Species	LD50	Tested Substance
Rat	< 5,000 mg/kg	Similar Product

PRIMARY SKIN IRRITATION :

Draize Score	Tested Substance
7.9 / 8.0	Similar Product

Rating : Extremely irritating (Corrosive)

CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: High

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Tested Substance
Rainbow Trout	96 hrs	4.5 mg/l	Product
Sheepshead Minnow	96 hrs	16 mg/l	Product
Fathead Minnow	96 hrs	8.3 mg/l	Product

Rating : Toxic

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Tested Substance
Daphnia magna	48 hrs		4.2 mg/l	Product
Mysid Shrimp (A. bahia)	96 hrs	27 mg/l		Product
Ceriodaphnia dubia	48 hrs	1.6 mg/l		Product

Rating : Toxic

CHRONIC INVERTEBRATE RESULTS :

Species	Test Type	IC25	End Point	Tested Substance
Ceriodaphnia dubia	3 Brood	15.6 mg/l	Survival	Product

PERSISTENCY AND DEGRADATION :

Biological Oxygen Demand (BOD) : This material is an oxidizing biocide and is not expected to persist in the environment.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Moderate
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: Moderate

If released into the environment, see CERCLA/SUPERFUND in Section 15.

13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D002

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

METAL CONTAINERS: Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities. PLASTIC CONTAINERS: Do not reuse empty container. Triple rinse (or equivalent). Then puncture and dispose of in a sanitary landfill, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

LAND TRANSPORT :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE ANTIMICROBIAL
UN/ID No :	3266
Hazard Class - Primary :	8
Packing Group :	II
Flash Point :	None
DOT Reportable Quantity (per package) :	35,000 lbs
DOT RQ Component :	SODIUM HYDROXIDE

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE ANTIMICROBIAL
UN/ID No :	3266
Hazard Class - Primary :	8
Packing Group :	II
IATA Cargo Packing Instructions :	812
IATA Cargo Aircraft Limit :	30 L (Max net quantity per package)

MARINE TRANSPORT (IMDG/IMO) :

IMDG Page :	8147-1
Proper Shipping Name :	CORROSIVE LIQUID, BASIC, INORGANIC, N.O.S.
Technical Name(s) :	SODIUM HYDROXIDE, ALKALINE LIQUID BROMINE ANTIMICROBIAL
UN/ID No :	3266
Hazard Class - Primary :	8
Packing Group :	II

15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Sodium Hydroxide : Corrosive

CERCLA/SUPERFUND, 40 CFR 117, 302 :
This product contains the following Reportable Quantity (RQ) Substance. Also listed is the RQ for the product. If a reportable quantity of product is released, it requires notification to the NATIONAL RESPONSE CENTER, WASHINGTON, D.C. (1-800-424-8802).

RQ Substance	RQ
Sodium Hydroxide	35,000 lbs

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product does not contain substances listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
-	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
This product is exempted under TSCA and regulated under FIFRA. The inerts are on the Inventory List.

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under the following use conditions.

This product may be employed in the treatment of papermill influent water systems in plants where paper or paperboard destined for food contact purposes is manufactured as long as the bromide ion concentration in the water is no greater than 22 ppm.

U.S. DEPARTMENT OF AGRICULTURE (USDA) :
USDA Inspection and Grading Programs - Food Safety and Inspection Service:
This product is authorized by USDA for use in federally inspected meat and poultry plants. Authorized use is under category : G5, G7

FEDERAL INSECTICIDE, FUNGICIDE AND RODENTICIDE ACT (FIFRA) :
EPA Reg. No. 1706-179, 1706-179
This product is registered for use as a microorganism control chemical used in: , Pulp and Papermill Systems, Brewery Pasteurizers, Air Washer Systems, Heat tansfer systems, The active ingredients in this formulation (sodium hypochlorite and sodium bromide), react in situ to form a stabalized alkaline bromine antimicrobial.
In all cases follow instructions on the product label.

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311 :
This product contains the following substances listed in the regulation:

Substance(s)	Citations
Sodium Hydroxide :	Sec. 311

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
None of the substances are specifically listed in the regulation.

CALIFORNIA PROPOSITION 65 :
This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
This product is a registered biocide and is exempt from State Right to Know Labelling Laws.

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :

WHMIS CLASSIFICATION :
Pesticide controlled products are not regulated under WHMIS.

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

16. OTHER INFORMATION

Nalco: EHS2818, F105047/104688

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Moderate

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, Co.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight™ (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight™ CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS™ CD-ROM Version), Micromedex, Inc., Englewood, CO

Prepared By : Product Safety Department
Date issued : 09/13/1999
Replaces : 02/15/1999

Material Safety Data Sheet

[Home] [Manufacturer] [Part Number] [NSN] [Help]

SECTION I - Material Identity

Item Name..... BIOCIDE WATER TREATMENT COMPOUND
Part Number/Trade Name..... NALCO 7330 MICROBIOCIDE
National Stock Number..... 6850PNALCO7330
CAGE Code..... 89524
Part Number Indicator..... A
MSDS Number..... 192638
HAZ Code..... B

SECTION II - Manufacturer's Information

Manufacturer Name..... NALCO CHEMICAL COMPANY (BRODY CHEMICAL)
Street..... ONE NALCO CENTER
City..... NAPERVILLE
State..... IL
Country..... US
Zip Code..... 60563-1198
Emergency Phone..... 800-462-5378 (24 HOURS)
Information Phone..... 281-263-7000/ 801-963-2436

MSDS Preparer's Information

MSDS Preparer Name..... RICKY A. STACKHOUSE
Date MSDS Prepared/Revised..... 05NOV02
Date of Technical Review..... 20OCT92
Active Indicator..... Y

Alternate Vendors

Vendor #5 CAGE..... BLHKK

SECTION III - Physical/Chemical Characteristics

Specification Number..... NONE
Specification Type/Grade/Class..... NONE
Hazard Storage Compatibility Code..... T5
NRC License Number..... NR
Net Propellant Weight (Ammo)..... NR
Appearance/Odor..... LIQUID LIGHT GREEN, LIGHT YELLOW, MILD ODOR.
Boiling Point..... NR
Melting Point..... NR

Vapor Pressure..... NR
Vapor Density..... 8.6
Specific Gravity..... 1.026
Decomposition Temperature..... NR
Evaporation Rate..... UNKNOWN
Solubility in Water..... COMPLETE
Percent Volatiles by Volume..... NR
Chemical pH..... 100%
Corrosion Rate..... NR
Container Pressure Code..... 1
Temperature Code..... 4
Product State Code..... L

SECTION IV - Fire and Explosion Hazard Data

Flash Point Method..... NA
Lower Explosion Limit..... N/R
Upper Explosion Limit..... N/R
Extinguishing Media..... NOT EXPECTED TO BURN. USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
Special Fire Fighting Procedures..... FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire/Explosion Hazards..... MAY EVOLVE OXIDES OF CARBON UNDER FIRE CONDITIONS. MAY EVOLVE HCI UNDER FIRE CONDITIONS. MAY EVOLVE OXIDES OF NITROGEN AND SULFUR UNDER FIRE CONDITIONS.

SECTION V - Reactivity Data

Stability..... YES
Stability Conditions to Avoid..... STABLE UNDER NORMAL CONDITIONS.
Materials to Avoid..... CONTACT WITH STRONG OXIDIZERS (CHLORINE, PEROXIDES, CHROMATES, NITIRC ACID, PERCHLORATE, CONCENTRATED OXYGEN, PERMAGANATE) MAY GENERATE HEAT, FIRES, EXPLOSIONS AND/OR TOXIC VAPORS.
Hazardous Decomposition Products..... CARBON MONOXIDE, CARBON DIOXIDE, OXIDES OF NITROGEN (NOX), OXIDES OF SULFUR (SOX) AND HCL MAY BE FORMED.
Hazardous Polymerization..... N/K
Polymerization Conditions to Avoid..... WILL NOT OCCUR
LD50 - LD50 Mixture..... LD50 (ORAL ALBINO RAT) IS 3,810 MG/KG

SECTION VI - Health Hazard Data

Route of Entry: Skin..... YES
Route of Entry: Ingestion..... YES
Route of Entry: Inhalation..... YES

Health Hazards - Acute and Chronic.....	ACUTE-EYE-WILL CAUSE EYE BURNS AND PERMANENT TISSUE DAMAGE. SKIN-MAY CAUSE SEVERE IRRITATION OR TISSUE DAMAGE DEPENDING ON THE LENGTH OF EXPOSURE AND THE TYPE OF FIRST AID ADMINISTERED. INGEST-CORROSIVE; CAUSES CHEMICAL BURNS TO THE MOUTH, THROAT AND LUNGS.
Carcinogenity: NTP.....	NO
Carcinogenity: IARC.....	NO
Carcinogenity: OSHA.....	NO
Explanation of Carcinogenity.....	THE PRODUCT CONTAINS NO INGREDIENT THAT IS LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN.
Symptoms of Overexposure.....	ACUTE- A REVIEW OF AVAILABLE DATA DOES NOT IDENTITY ANY SYMPTIOMS FROM EXPOSURE NOT PREVIOUSLY MENTIONED CHRONIC- A REVIEW OF AVAILABLE DATA DOES NOT IDENTIFY ANY SYMPTOMS FROM EXPOSURE NOT PREVIOUSLY MENTIONED.
Medical Cond. Aggrevated by Exposure....	A REVIEW OF AVAILABLE DATA DOES NOT IDENTIFY ANY WORSENING OF EXISTING CONDITIONS.
Emergency/First Aid Procedures.....	INGEST-DO NOT INDUCE VOMITING. DRINK PROMPTLY A LARGE QUANTITY OF EGG WHITES, GELATIN SOLUTION OR, IF THESE ARE NOT AVAILABLE, DRINK LARGE QUANTITIES OF WATER. INHAL-REMOVE IMMEDIATELY TO FRESH AIR. IF NOT BREATHING, APPLY ARTIFICAL RESPIRATION. CALL A PHYSICIAN. SKIN-WASH THOROUGLY WITH SOAP AND WATER. REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE. EYE-FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MIN. CALL A PHYSICIAN.

SECTION VII - Precautions for Safe Handling and Use

Steps if Material Released/Spilled.....	RESTRICT ACCESS TO AREA AS APPROPRIATE UNTIL CLEAN-UP OPERATIONS ARE COMPLETE. ENSURE CLEAN-UP IS CONDUCTED BY TRAINED PERSONNEL ONLY. VENTILATE SPILL AREA OF POSSIBLE. DO NOT TOUCH SPILLED MATERIAL. STOP OR REDUCE ANY LEAKS IF IT IS SAFE TO DO SO. USE PERSONAL PROTECTIVE EQUIPMENT RECOMMENDED.
Neutralizing Agent.....	N/R
Waste Disposal Method.....	NOTIFY APPROPRIATE GOVERNMENT, OCCUPATIONAL HEALTH AND SAFETY AND ENVIRONMENTAL AUTHORITIES.
Handling and Storage Precautions.....	DO NOT DISCHARGE EFFLUENT CONTAINING THIS PRODUCT INTO LAKES, STREAMS, PONDS, ESTRUARIES, OCEANS OR OTHER WATER, UNLESS IN ACCORDANCE WITH THE REQUIREMENTS OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM.
Other Precautions.....	PESTICIDE WASTES ARE TOXIC. AVOID BREATHING VAPORS OR MIST. DO NOT GET IN

EYES, ON SKIN, OR ON CLOTHING. WASH THOROUGHLY AFTER HANDLING. DO NOT REUSE EMPTY PLASTIC CONTAINERS. METAL CONTAINERS CAN BE RECONDITIONED. TRIPLE RINSE CONTAINERS.

SECTION VIII - Control Measures

Respiratory Protection	AN APPROVED RESPRIATOR IS RECOMMENDED. A DUST, MIST, FUME CARTRIDGE MAY BE USED.
Ventilation	GENERAL VENTILATION IS RECOMMENDED. USE LOCAL EXHAUST VENTILATION IF NECESSARY TO CONTROL AIRBORNE MIST AND VAPOR.
Protective Gloves	IMPERVIOUS, PVC, NEOPRENE GLOVES
Eye Protection	WEAR A FACE SHIELD WITH CHEMICAL SPLASH GOGGLES.
Other Protective Equipment	IMPERVIOUS APRON, BOOTS, PANTS, HOOD AND JACKET. EYE-WASH FACILITIES, SAFETY SHOWER.
Work Hygenic Practices	WASH THOROUGHLY AFTER EACH USE. DO NOT EAT, DRINK,OR SMOKE WHILE WORKING WITH THIS MATERIAL.
Supplemental Health/Safety Data	NOTE TO PHYSICIAN: BASED ON THE INDIVIDUAL REACTIONS OF THE PATIENTS, THE PHYSICIAN'S JUDGMENT SHOULD BE USED TO CONTROL SYMPTOMS AND CLINICAL CONDITION. PROBABLE MUCOSAL DAMAGE MAY CONTRAINDICATE THE USE OF GASTRIC LAVAGE. MEASURES AGAINST CIRCULATORY SHOCK, RESPIRATORY DEPRESSION AND CONVULSIONS MAY BE NEEDED.
Disposal Code	O

SECTION IX - Label Data

Protect Eye	YES
Protect Skin	YES
Protect Respiratory	YES
Chronic Indicator	NO
Contact Code	UNKNOWN
Fire Code	UNKNOWN
Health Code	UNKNOWN
React Code	UNKNOWN
Specific Hazard and Precaution	NO TARGET ORGANS LISTED FOR CHRONIC EXPOSURES

SECTION X - Transportation Data

Container Quantity	58
Unit of Measure	KG

SECTION XI - Site Specific/Reporting Information

Volatile Organic Compounds (P/G)..... .0685
Volatile Organic Compounds (G/L)..... 8.209

SECTION XII - Ingredients/Identity Information

Ingredient #..... 01
Ingredient Name..... 5-CHLORO-2-METHYL-4-ISOTHIOAZOLIN-3-ONE
CAS Number..... 26172554
NIOSH Number..... NX8156850
Proprietary..... NO
Percent..... 1.1
OSHA PEL..... .1MG/M3,STEL .3MG/M3
ACGIH TLV..... NR
Ingredient #..... 02
Ingredient Name..... 2-METHYL-4-ISOTHIAZOLIN-3-ONE
CAS Number..... 2682204
NIOSH Number..... 1003937MI
Proprietary..... NO
Percent..... 0.4
OSHA PEL..... NR
ACGIH TLV..... NR
Ingredient #..... 03
Ingredient Name..... MAGNESIUM NITRATE
CAS Number..... 10377603
Percent..... 5
Ingredient #..... 04
Ingredient Name..... (CUCPD) COPPER
CAS Number..... 7440508
Percent..... 0.25

NOTICE: For additional information, contact BIOENVIRONMENTAL

emedco
Innovative Signs & Safety Solutions

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Search Item Number GO

1-800-44

Regulation Resource Site

On-Line Catalog | Site Home | MSDS | CFR | Safety Resources | S

MSDS Database

Search Resource Site All GO

Material Safety Data Sheet

Name CH 571 RUST INHIBITOR

Company C AND H CHEMICAL INC

MSDS ckdqb

FSC 6850

MSDS Safety Information

```
FSC: 6850
NIIN: 01-464-9445
MSDS Date: 12/08/1997
MSDS Num: CKDQB
Product ID: CANDamp;H 571 RUST INHIBITOR
MFN: 01
Responsible Party
Cage: 0ZAU9
Name: C AND H CHEMICAL INC
Address: 222 STARKEY ST
City: SAINT PAUL MN 55107
Info Phone Number: 651-227-4343
Emergency Phone Number: 800-228-5635X005
```

Item Description Information

```
Item Manager: S9G
Item Name: RUST INHIBITOR
Unit of Issue: CO
Quantitative Expression: 00000000005GL
UI Container Qty: 1
```

Ingredients

```
Cas: 7631-95-0
RTECS #: QA5075000
Name: SODIUM MOLYBDATE
ANDlt; Wt: 10.
OSHA PEL: 5 MG/M3
ACGIH TLV: 5 MG/M3
-------------------------------
Cas: 7632-00-0
RTECS #: RA1225000
Name: SODIUM NITRITE
Percent by Wt: 4.7
Other REC Limits: 2 MG/M3 (BASF)
OSHA PEL: N.E.
ACGIH TLV: N.E.
EPA Rpt Qty: 100 LBS
DOT Rpt Qty: 100 LBS
```

Health Hazards Data

```
Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: NO
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: ACUTE: EYES:  IRRITATION, SEVERE IRRITATION POSSIBLE WITH
```

Most Pop
in Hazard M

- Diamond Pane
- Diamond Pane Yourself
- Panel Characte
- Chemical Haza
- Chemical Warn

Fast Fi

- Confined Spac
- Lockout Check
- CFR - 1910 L Fire Protection
- Asbestos Fact
- Traffic Signs
- Parking Signs
- Industrial Sign
- Tags

PROLONGED CONTACT. SKIN: IRRITATION POSSIBLE WITH PROLONGED CONTACT. INHALATION: BREATHING MISTS OF PRODUCT OR SOLUTION CAUSE IRRITATION OF RE SPIRATORY TRACT. HEADACHE. SWALLOWING: IRRITATION OF MOUTH, THROAT AND STOMACH. STOMACH UPSET. POSSIBLE REDUCED BLOOD PRESSURE, RAPID PULSE, HEADACHE, NAUSEA, VOMITING, VISUAL DISTURBANCES, CYANOSIS, COLLAPSE, AND COMA. EFFECTS OF CHRONIC OVEREXPOSURE: UNKNOWN; NONE EXPECTED BEYOND ACUTE EFFECTS. CHRONIC: UNKNOWN; NONE EXPECTED BEYOND ACUTE EFFECTS.

Explanation Of Carcinogenicity: THIS PRODUCT OR ITS INGREDIENTS HAVE NOT BEEN IDENTIFIED AS A CARCINOGEN OR PROBABLE CARCINOGEN BY NTP, IARC MONOGRAPHS, OR OSHA.

Signs And Symptions Of Overexposure: EYES: IRRITATION. SKIN: IRRITATION. INHALATION: IRRITATION OF RESPIRATORY TRACT, HEADACHE. SWALLOWING: IRRITATION OF MOUTH, THROAT, AND STOMACH, STOMACH UPSET, POSSIBLE REDUCED BLOOD PRESSURE, RAPID PULSE, HEADACHE, NAUSEA, VOMITING, VISUAL DISTURBANCES, CYANOSIS, COLLAPSE, AND COMA.

Medical Cond Aggravated By Exposure: SOME PEOPLE HAVE AN ALLERGIC SENSITIVITY TO NITRITES. OTHERWISE, NONE KNOWN OR EXPECTED.

First Aid: EYES: FLUSH WITH RUNNING WATER HOLDING LIDS APART. REMOVE CONTACT LENSES. CONTINUE FLUSHING FOR 15 MINUTES. GET MEDICAL ASSISTANCE IF IRRITATION PERSISTS. SKIN: FLUSH WITH WATER. REMOVE CONTAMINATED CLOTHING AND WASH BEFORE REUSE. IF IRRITATION DEVELOPS AND PERSISTS, GET MEDICAL ASSISTANCE. INHALATION: MOVE TO FRESH AIR. GET FOR MEDICAL ADVICE OR ASSISTANCE IF BREATHING DIFFICULTY OR IRRITATION IS SEVERE OR CONTINUES. SWALLOWED: RINSE MOUTH WITH LARGE AMOUNTS OF WATER. DRINK WATER, MILK OR OTHER FLUIDS TO DILUTE. DO NOT INDUCE VOMITING. CALL FOR MEDICAL ATTENTION IF DIFFICULTIES AND DISCOMF ORT DEVELOPS.

Handling and Disposal

Spill Release Procedures: SMALL SPILLS: FLUSH TO DRAIN WITH EXCESS WATER. LARE SPILLS: STOP SOURCE OF DISCHARGE. CONTAIN SPILLED MATERIAL, AND KEEP FROM DISCHARGING TO SURFACE WATERS. RECOVER TO DRUM FOR LATER USE, TREATMENT, OR DISPOSAL. FLUSH RESIDUAL TO DRAIN. NOTEFY LOCAL , STATE, OR NATIONAL AUTORITIES IF REQUIRED.

Neutralizing Agent: NOT PROVIDED.

Waste Disposal Methods: NORMALLY SEWER DISPOSABLE IN DILUTE SOLUTIONS. CHECK WITH LOCAL AUTHORITIES ABOUT ANY POSSIBLE RESTRICTIONS.

Handling And Storage Precautions: HANDLING: AVOID UNNECESSARY CONTACT WITH PRODUCT. AVOID BREATHING MISTS OF PRODUCT OR SOLUTION. WASH AFTER USE. PREVENT CONTACT WITH INCOMPATABLE MATERIALS, SEE SECTION ON REACTIVITY. STORAGE: KEEP CO NTAINERS TIGHTLY CLOSED. KEEP FROM FREEZING; MAY RUPTURE CONTAINER OR DEGRADE PRODUCT.

Fire and Explosion Hazard Information

Flash Point Text: NONE

Extinguishing Media: AS NEEDED FOR SURROUNDING FIRE.

Fire Fighting Procedures: FOR ANY CHEMICAL FIRE WEAR SELF CONTAINED BREATHING APPARATUS, AND PROTECTIVE CLOTHING TO PREVENT CONTACT.

Unusual Fire/Explosion Hazard: NONE. HAZARDOUS COMBUSTION PRODUCTS: OXIDES OF CARBON, NITROGEN, AND MOLYBDENUM.

Control Measures

Respiratory Protection: NONE NORMALLY REQUIRED. NIOSH/MSHA APPROVED RESPIRATOR WHERE CONDITIONS MAY CAUSE EXPOSURE LIMITS TO BE EXCEEDED FROM MISTS OR PRODUCT OR SOLUTION.

Ventilation: GENERAL OR LOCAL TO AVOID EXPOSURE TO IRRITATING MISTS IF MISTS ARE GENERATED.

Protective Gloves: CHEMICAL RESISTANT, IMPERMEABLE GLOVES AS NEEDED TO PREVENT EXCESSIVE CONTACT.

Eye Protection: GLASSES, GOGGLES, OR FACE SHIELD WHERE CONDITIONS MAY CAUSE EYE EXPOSURE.

Other Protective Equipment: FULL BODY COVERING AND SHOES AS NEEDED TO PREVENT EXCESSIVE CONTACT. EYE WASH STATIONS OR RUNNING WATER IN THE WORK AREA.

Work Hygienic Practices: WASH AFTER USE. WASH CONTAMINATED CLOTHES BEFORE REUSE.

Supplemental Safety and Health: PRODUCT DESCRIPTION: CLEAR LIQUID. CHEMICAL FAMILY: ALKALINE MINERALS SOLUTION.

Physical/Chemical Properties

HCC: B3
Boiling Point: =100.C, 212.F
B.P. Text: +/- 10 F
Vapor Pres: NOT ESTABLISHED
Vapor Density: NOT ESTABL
Spec Gravity: 1.0 +/-0.1
PH: 9 +/- 1
Evaporation Rate ANDamp; Reference: LIKE WATER (N-BUAC=1)
Solubility in Water: COMPLETE
Appearance and Odor: CLEAR LIQUID ALKALINE MINERALS SOLUTION.
Percent Volatiles by Volume: 80% ORANDlt;

Reactivity Data

Stability Indicator: YES USE CANCER IN ANIMAL STUDIES.
Stability Condition To Avoid: CONTACT WITH INCOMPATABLE MATERIALS.
Materials To Avoid: STRONG OXIDIZING AGENTS, ACIDS, REDUCING AGENTS. DON'T MIX WITH AMINES. CONTAINS NITRITES WHICH MAY REACT WITH SECONDARY AND TERTIARY AMINES IN ACIDIC CONDITIONS TO FORM NITROSOAMINES. SOME NITROSAMINES HAVE BEEN FOUND TO C
Hazardous Decomposition Products: HAZARDOUS COMBUSTION PRODUCTS: OXIDES OF CARBON, NITROGEN, AND MOLYBDENUM.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: HAZARDOUS POLYMERIZATION WILL NOT OCCUR.

Toxicological Information

Toxicological Information: NOT PROVIDED.

Ecological Information

Ecological: NOT PROVIDED.

MSDS Transport Information

Regulatory Information

Sara Title III Information: SODIUM NITRITE CAS#7632-00-0 IS SUBJECT TO REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986. THIS INFORMATION SHOULD BE INCLUDED IN ALL MSDS'S T HAT ARE COPIED AND DISTRIBUTED FOR THIS MATERIAL: SODIUM NITRITE AND SOLUTIONS OF NITRITE COMPOUNDS ARE NEW ADDITIONS TO THE SECTION 313 LISTING IN 1995 AND WERE NOT INCLUDED IN EARLIER NOTIFICATIONS.

Other Information

Other Information: HAZARD IDENTIFICATION: HEALTH-2 (MODERATE; FIRE-0 (INSIGNIFICANT), INSTABILITY-0 (INSIGNIFICANT); OTHER-X. HAZARD SIGNAL (SHORT TERM CONTACT OR INHALATION ONLY): (0=INSIGNIFICANT; 1=SLIGHT; 2=MODERATE ; 3=HIGH; 4=EXTREME). THRESHOLD LIMIT VALUE: NOT ESTABLISHED FOR BLENDED PRODUCT. SEE INGREDIENTS FOR INDIVIDUAL INGREDIENTS.

Transportation Information

Responsible Party Cage: 0ZAU9
Trans ID NO: 151859
Product ID: CANDH 571 RUST INHIBITOR
MSDS Prepared Date: 12/08/1997
Review Date: 08/18/2000
MFN: 1
Net Unit Weight: 46 LBS
Multiple KIT Number: 0

Unit Of Issue: CO
Container QTY: 1

Detail DOT Information

DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail IMO Information

IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION

Detail IATA Information

IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

Detail AFI Information

AFI PSN Code: ZZZ
AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION

HAZCOM Label

Product ID: CANDamp;H 571 RUST INHIBITOR
Cage: 0ZAU9
Company Name: C AND H ENTERPRISES INC
Street: 222 STARKEY ST
City: SAINT PAUL MN
Zipcode: 55107
Health Emergency Phone: 800-228-5635X005
Label Required IND: Y
Date Of Label Review: 03/12/2001
Status Code: C
Label Date: 03/10/2000
Year Procured: 2001
Origination Code: F
Eye Protection IND: YES
Skin Protection IND: YES
Signal Word: CAUTION
Respiratory Protection IND: NO
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None
Hazard And Precautions: EYES: IRRITATION, SEVERE IRRITATION POSSIBLE WITH PROLONGED CONTACT. SKIN: IRRITATION POSSIBLE WITH PROLONGED CONTACT. INHALATION: BREATHING MISTS OF PRODUCT OR SOLUTION CAUSE IRRITATION OF RESPIRATO RY TRACT. HEADACHE. SWALLOWING: IRRITATION OF MOUTH, THROAT AND STOMACH. STOMACH UPSET. POSSIBLE REDUCED BLOOD PRESSURE, RAPID PULSE, HEADACHE, NAUSEA, VOMITING, VISUAL DISTURBANCES, CYANOSIS, COLLAPS E, AND COMA. EFFECTS OF CHRONIC OVEREXPOSURE: UNKNOWN; NONE EXPECTED BEYOND ACUTE EFFECTS.

Disclaimer

(provided with this information by the compiling agencies): This information is formulated for use by elements of the Department of Defense. The United States of America in no manner whatsoever expressly or implied warrants, states, or intends said information to have any application, use or viability by or to any person or persons outside the Department of Defense nor any person or persons contracting with any instrumentality of the United States of America and disclaims all liability for such use. Any person utilizing this instruction who is not a military or civilian employee of the

MATERIAL SAFETY DATA SHEET

(Essentially similar to OSHA form 174, Sept. 1985 - For Compliance with OSHA's Hazard Communication Standard, 29CFR 1910.1200)

Section I - Product Identity: LeadSafe™ (5497, 5498)

Manufacturer's Name:
Fiberlock Technologies, Inc.
630 Putnam Avenue
Cambridge, MA
02139-0802
Mail Address:
P.O. Box 390432
Cambridge, MA 02139-0802

Date of Preparation: January 1, 2000
Information Telephone Number:
(617) 876-8020
Emergency Telephone Numbers:
Weekdays: (617) 876-8020
(After hours, weekends & holidays)
(508) 887-5926, or "CHEM-TEL" Emergency
Contact Number: (800) 255-3924

Section II - Hazardous Ingredients/Identity Information

HAZARDOUS COMPONENT	%	CAS. NO.	OSHA PEL	ACGIH TLV
Trisodium Phosphate*	<0.1	010101-89-0	15 mg/m³	10 mg/m³

*Subject to the reporting requirements of SARA 312. Trisodium Phosphate @ 100% in powder form is a nuisance dust

Section III - Health Hazard Data, Toxicity Data

Route(s) of Entry:
Carcinogenicity?: No
Health Hazards (Acute and Chronic):

EFFECTS OF OVEREXPOSURE: Eye Contact: This product may cause irritation. Direct contact with the liquid or exposure to its' vapors or mists may cause burning, tearing or redness. Skin Contact: This product may cause skin irritation. Prolonged or repeated exposure to this material may cause redness, burning, drying or cracking of the skin or dermatitis. Persons with pre-existing skin disorders may be more susceptible to the effects of this material. Inhalation: If breathing difficulties, dizziness, or light-headedness occur when working in areas with high vapor concentrations, victim should seek air free of vapors. If victim experiences continued breathing difficulties, administer oxygen until medical assistance can be rendered. If breathing stops, begin artificial respiration and seek immediate medical attention. Ingestion (Swallowing): If this product is swallowed, induce vomiting. Seek immediate medical advice and/ or attention.

EMERGENCY AND FIRST AID PROCEDURES: Eye Contact: If this product comes in contact with eyes, gently flush with large quantities of water for at least 15 minutes. If irritation persists, seek immediate medical attention. Skin Contact: Remove contaminated clothing. Cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention. Inhalation: If breathing difficulties, dizziness, or light-headedness occur when working in areas with high vapor concentration, victim should seek air free of vapors. If breathing stops, begin artificial respiration and seek immediate medical attention. Ingestion (Swallowing): If this product is swallowed, induce vomiting. Seek immediate medical advice and/or attention.

Section IV - Reactivity Data

Hazardous Polymerization: Will not occur.
Stability: Stable
Incompatibility: None known.
Hazardous Decomposition Products: Primarily carbon dioxide and some oxides of sulfur

Section V - Physical/Chemical Characteristics (See reference note(s) No. 1, 2 on Reverse)

Boiling Point	215-290°F	Specific Gravity (H_2O=1) Wgt./gal.	1.03
Vapor Pressure (mm Hg) @ 100°C	Unknown	Melting Point Water (Ice)	N/A
Vapor Density (AIR=1) Heavier Lighter	Unknown	Evaporation Rate	Slower than Ether
Solubility in Water	Total	Appearance and Odor	Green Slight/Characteristic

Section VI - Fire and Explosion Hazard Data Non-Flammable

Flash Point:	Flammable Limits:	DOT Hazard Class:	DOT Proper Shipping Name:
None to boiling	Not applicable	Not Regulated	Cleaning Compound, NOI

SUPPLEMENTAL INFORMATION

To comply with New Jersey DOH Right-To-Know labeling law (N.J.A.C. 8:59 - 5.1 & 5.2)

CAS. No.:	CHEMICAL INGREDIENTS:
7732-18-5	Water
010101-89-0	Trisodium Phosphate

HMIS HAZARD RATING			
Health 1	Flammability 0	Reactivity 0	Personal Protection B
HAZARD INDEX			
0=Minimal, 1=Slight, 2=Moderate, 3=Serious, 4=Severe			
PERSONAL PROTECTION CODE			
B=safety glasses, gloves			

Section VII: Precautions for Safe Handling and Use

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Mop up as much as possible, then flush residue with a large volume of water.
WASTE DISPOSAL METHOD: Dispose of product in accordance with applicable local, state and federal regulations.
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Keep containers cool and dry. Keep closure tight and container upright to prevent leakage. Precautionary Labeling: "Keep from Freezing".
OTHER PRECAUTIONS: Do not get in eyes. Avoid skin contact. Prevent prolonged or repeated breathing of vapors or spray mists. Do not handle until the manufacturer's safety precautions and label instructions have been read and understood. Avoid breathing sanding dust.

Section VIII: Control Measures

RESPIRATORY PROTECTION: None required if good ventilation is maintained. Wear respirator (MSHA/ NIOSH-approved or equivalent) suitable for concentrations and types of air contaminants encountered. Use approved chemical/mechanical filters designed to remove particulates in open and restricted ventilation areas. Use MSHA/NIOSH-approved airline type respirators or hood in confined areas.
VENTILATION: Sufficient ventilation, in pattern and volume, should be provided to keep the air contaminant concentration below applicable exposure limits. All application areas should be ventilated in accordance with OSHA regulation 29CFR Part 1910.94.
PROTECTIVE GLOVES: Impervious gloves should be worn if prolonged skin contact is likely. Use neoprene or rubber gloves to prevent prolonged skin contact.
EYE PROTECTION: Use safety eyewear including side shields, face shields, or chemical splash goggles (ANSIZ-87.1 or approved equivalent).
OTHER PROTECTIVE EQUIPMENT: Use disposable or impervious clothing if work clothing contamination is likely. Use protective cream if prolonged skin contact is likely.
HYGIENIC PRACTICES: Wash hands before eating, smoking, or using the washroom. Food or beverages should not be consumed anywhere this product is being applied.

References

1. Sax, N.I., "Dangerous Properties of Industrial Materials", 8th ed., Van Nostrand Reinhold Company, Inc., NY, 1992.
2. American Conference of Governmental Industrial Hygienists, "TLV's and Biological Exposure Indices" for the current year (published annually).
3. U.S. Code of Federal Regulations (CFR) U.S. Dept. of Labor, No. 29, Parts 1900 to 1910.1200. OSHA Communications Standard 29 CFR 1910.1200.
4. Sax, N.I., R.J. "Hazardous Chemicals Desk Reference", Van Nostrand Reinhold Co., Inc., NY, 1987.
5. Fire Protection Guide to Hazardous Materials, 10 ed., National Fire Protection Association, Quincy, MA, 1991.
6. Title III List of Lists, U.S. Environmental Protection Agency publication EPA 560/4-90-011, January 1990.

To return to the page you just left,
select the "back" button on your browser.

SODIUM SULFATE ANHYDROUS

MSDS Number: S5018 --- *Effective Date: 03/01/00*

---

1. Product Identification

Synonyms: Disodium sulfate; sodium sulfate anhydrous; sulfuric acid, disodium salt; sodium sulfate
CAS No.: 7757-82-6
Molecular Weight: 142.04
Chemical Formula: Na_2SO_4
Product Codes:
J.T. Baker: 3375, 3887, 3891, 3898, 3902
Mallinckrodt: 6775, 7803, 8016, 8020, 8022, 8024, 8025, 8026, 8028, 9675

---

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazar
Sodium Sulfate	7757-82-6	90 - 100%	Ye

---

3. Hazards Identification

Emergency Overview

As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 0 - None
Flammability Rating: 0 - None
Reactivity Rating: 0 - None

Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
Not expected to be a health hazard.
Ingestion:
Mildly toxic by ingestion. Slowly absorbed from the alimentary tract. Because of osmotic activity, it will draw water into the lumen of the bowel and may cause purging, fluid loss, blood in stools, fall of blood pressure, and high sodium levels in the blood.
Skin Contact:
No adverse effects expected.
Eye Contact:
No adverse effects expected but dust may cause mechanical irritation.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

---

4. First Aid Measures

Inhalation:
Not expected to require first aid measures.
Ingestion:
Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
Skin Contact:
Wash exposed area with soap and water. Get medical advice if irritation develops.
Eye Contact:
Wash thoroughly with running water. Get medical advice if irritation develops.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard, but violent explosions

occur when potassium sulfate and sodium sulfate are melted with aluminum.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
Use protective clothing and breathing equipment appropriate for the surrounding fire.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Isolate from incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
None established.
Ventilation System:
In general, dilution ventilation is a satisfactory health hazard control for this substance. However, if conditions of use create discomfort to the worker, a local exhaust system should be considered.
Personal Respirators (NIOSH Approved):
For conditions of use where exposure to the dust or mist is apparent, a half-face dust/mist respirator may be worn. For emergencies or instances where the exposure levels are not known, use a full-face positive-pressure, air-supplied respirator.
WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
Skin Protection:
Wear protective gloves and clean body-covering clothing.
Eye Protection:
Use chemical safety goggles. Maintain eye wash fountain and

quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:
Fine white crystalline granules.
Odor:
Odorless.
Solubility:
Soluble in approx. 3.6 parts water, 1 in 2 parts maximum @ 33C (91F).
Density:
2.68
pH:
No information found.
% Volatiles by volume @ 21C (70F):
0
Boiling Point:
No information found.
Melting Point:
844C (1551F)
Vapor Density (Air=1):
No information found.
Vapor Pressure (mm Hg):
No information found.
Evaporation Rate (BuAc=1):
No information found.

---

10. Stability and Reactivity

Stability:
Stable in tightly closed containers under normal conditions of storage.
Hazardous Decomposition Products:
Oxides of sulfur and sodium may form when heated to decomposition.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
In combination with sodium sulfate, aluminum and magnesium will explode @ 800C (1472F); strong mineral acids and bases.
Conditions to Avoid:
Air, moisture, and incompatibles.

---

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Cate
Sodium Sulfate (7757-82-6)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material is expected to leach into groundwater. This material is not expected to significantly bioaccumulate.
Environmental Toxicity:
This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l. The EC50/48-hour values for daphnia are over 100 mg/l.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

14. Transport Information

Not regulated.

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

Ingredient	TSCA	EC	Japan	Austr
Sodium Sulfate (7757-82-6)	Yes	Yes	Yes	Ye

--------\Chemical Inventory Status - Part 2\----------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil
Sodium Sulfate (7757-82-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\----------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313- List	Chemical
Sodium Sulfate (7757-82-6)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\----------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Sodium Sulfate (7757-82-6)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: No Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: No information found.
Poison Schedule: No information found.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **1** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
As part of good industrial and personal hygiene and safety procedure, avoid all unnecessary exposure to the chemical substance and ensure prompt removal from skin, eyes and clothing.

Label Precautions:
None.
Label First Aid:
Not applicable.
Product Use:
Laboratory Reagent.
Revision Information:
No changes.

MSDS Number: **C0497** * * * * * *Effective Date:* ***11/02/01*** * * * * * *Supercedes:* ***11/17/99***

MSDS **Material Safety Data Sheet**

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300
National Response in Canada
CANUTEC: 613-996-6666
Outside U.S. And Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker®

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

CALCIUM SULFATE, ANHYDROUS, POWDER

1. Product Identification

Synonyms: Anhydrous Gypsum; Anhydrite; Anhydrous Calcium Sulfate
CAS No.: 7778-18-9
Molecular Weight: 136.14
Chemical Formula: CaSO4
Product Codes: 1458

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Calcium Sulfate (anhydrous)	7778-18-9	98 - 100%	Yes

3. Hazards Identification

Emergency Overview

WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY BE HARMFUL IF SWALLOWED.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 0 - None
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
Causes irritation to the respiratory tract. Symptoms may include coughing, shortness of breath.
Ingestion:
May cause obstruction in stomach, as it hardens with moisture. Symptoms include stomach pain, distress.
Skin Contact:
Causes irritation, redness, pain.
Eye Contact:
Causes irritation, redness, and pain.
Chronic Exposure:
No information found.
Aggravation of Pre-existing Conditions:
No information found.

---

4. First Aid Measures

Inhalation:
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
Ingestion:
Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.
Skin Contact:
Immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Note to Physician:

Drinking glycerin, gelatin solutions, or large volumes of water may delay the hardening of calcium sulfate in the stomach. Surgical relief of obstruction, particularly at the pylorus, may be necessary.

---

5. Fire Fighting Measures

Fire:
Not considered to be a fire hazard.
Explosion:
Not considered to be an explosion hazard.
Fire Extinguishing Media:
Use any means suitable for extinguishing surrounding fire.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal.

---

7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
-OSHA Permissible Exposure Limit (PEL):
15 mg/m3 total dust, 5 mg/m3 respirable fraction
-ACGIH Threshold Limit Value (TLV):
10 mg/m3 total dust containing no asbestos and < 1% crystalline silica
Ventilation System:
A system of local and/or general exhaust is recommended to keep employee exposures

below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded and engineering controls are not feasible, a half facepiece particulate respirator (NIOSH type N95 or better filters) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest.. A full-face piece particulate respirator (NIOSH type N100 filters) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. If oil particles (e.g. lubricants, cutting fluids, glycerine, etc.) are present, use a NIOSH type R or P filter. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

9. Physical and Chemical Properties

Appearance:

White granules or powder.

Odor:

Odorless.

Solubility:

Slight, 0.24g in 100g of water.

Specific Gravity:

2.96

pH:

No information found.

% Volatiles by volume @ 21C (70F):

0

Boiling Point:

1193C (2179F)

Melting Point:

1450C (2642F) Monoclinic

Vapor Density (Air=1):

No information found.

Vapor Pressure (mm Hg):

No information found.

Evaporation Rate (BuAc=1):

No information found.

---

10. Stability and Reactivity

Stability:
Very hygroscopic. Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Burning may produce sulfur oxides.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Diazomethane, aluminum, phosphorous.
Conditions to Avoid:
Air, moisture, and incompatibles.

---

11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Calcium Sulfate (anhydrous) (7778-18-9)	No	No	None

---

12. Ecological Information

Environmental Fate:
No information found.
Environmental Toxicity:
No information found.

---

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

14. Transport Information

Not regulated.

---

15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Calcium Sulfate (anhydrous) (7778-18-9)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Calcium Sulfate (anhydrous) (7778-18-9)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\--------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Calcium Sulfate (anhydrous) (7778-18-9)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\--------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Calcium Sulfate (anhydrous) (7778-18-9)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

16. Other Information

NFPA Ratings: Health: **1** Flammability: **0** Reactivity: **0**
Label Hazard Warning:
WARNING! CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT. MAY BE HARMFUL IF SWALLOWED.
Label Precautions:
Avoid breathing dust.
Keep container closed.
Use only with adequate ventilation.

Wash thoroughly after handling.
Avoid contact with eyes, skin and clothing.

Label First Aid:

If swallowed, induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Wash clothing before reuse. In all cases, get medical attention.

Product Use:

Laboratory Reagent.

Revision Information:

MSDS Section(s) changed since last revision of document include: 8.

Disclaimer:

****

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****

Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

DELTREX CHEMICALS

A Division of Campbell Brothers Limited
ABN 92 009 657 489
7-11 Burr Court
Laverton North
3026
Postal Address:
P.O Box 118, Newport
Victoria 3015
AUSTRALIA
Telephone: 61/3/9250-1000

EDTA, TETRASODIUM SALT

ISSUED: MAY 19, 2000

Hazardous according to criteria of Worksafe Australia.

IDENTIFICATION

TRADE NAME :	EDTA, Tetrasodium salt
OTHER NAME :	Ethylenediaminetetraacetic acid, tetrasodium salt; EDTA Na4; Crabion TS
U.N. NO. :	None Allocated
DG CLASS :	None Allocated
PACKAGING GP. :	None Allocated
HAZCHEM :	None Allocated
POISON SCHEDULE :	None Allocated
USES :	Detergent industry; Cosmetic industry; Printing industry

PHYSICAL DESCRIPTION/ PROPERTIES

Appearance, odour : White to off white crystalline powder

Melting Point : >300°C (decomposes)

Boiling Point : No data available

Vapour Pressure (20°C) : No data available

Bulk Density : approx 0.65g/cm3

Flash Point (Open Cup) : Not applicable

Explosion Limits : No data available

Solubility in Water : 60g/100ml @ 22°C

OTHER PROPERTIES

pH (1% solution) : 11.0 - 11.5

Stability and Reactivity: : Stable under normal temperatures and pressures. Incompatible with strong oxidising agents. Avoid contact with aluminium, zinc, nickel, copper and copper alloys. Avoid dust generation.

INGREDIENTS

Chemical Name CAS Number Proportion

Ethylenediaminetetraacetic acid, tetrasodium salt 64-02-8 >99%

HEALTH HAZARD INFORMATION

HEALTH EFFECTS

ACUTE EFFECTS

SWALLOWED: May cause gastrointestinal irritation with nausea, vomiting and diarrhoea.

EYE: Causes eye irritation. May cause chemical conjunctivitis.

SKIN: May cause skin irritation.

INHALED: Dust may cause irritation of the respiratory tract. Can produce delayed pulmonary edema.

CHRONIC EFFECTS

No data available.

FIRST AID

SWALLOWED: IF conscious, immediately rinse mouth with water & give water to drink. DO NOT induce vomiting. Seek immediate medical assistance. Do not give liquids to an

unconscious person.

EYE: Immediately irrigate with copious quantities of water for at least 15 minutes. Eyelids to be held open. Seek medical assistance.

SKIN: Remove contaminated clothing. Wash affected area with large amount of soap and water. If irritation develops seek immediate medical assistance.

INHALED: Remove victim from exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. If breathing laboured ensure airways are clear and administer oxygen. If breathing has stopped apply artificial respiration at once. Seek immediate medical assistance.

ADVICE TO DOCTOR

Treat symptomatically.

PRECAUTIONS FOR USE

EXPOSURE STANDARDS

No data available.

Nuisance particulate of 10mg/m3 (TWA) should be observed.

ENGINEERING CONTROLS

Use handling techniques and equipment that minimise dust generation. General or local exhaust ventilation may be necessary to achieve low dust levels.

PERSONAL PROTECTION

Avoid skin and eye contact and inhalation of dust. Wear overalls, safety glasses or goggles and chemical resistant gloves and boots. Respiratory protection is required if airborne concentration is high or unknown. An approved dust/mist respirator may be worn. Always wash hands before smoking, eating, drinking or using the toilet.

FLAMMABILITY

Not flammable.

SAFE HANDLING INFORMATION

STORAGE AND TRANSPORT

Not classified as a dangerous Good by the Australian Code for the Transport of Dangerous Goods by Road and Rail. Store in a cool, dry, well ventilated place. Keep containers tightly closed. Protect from physical damage. Store away from incompatible materials.

SPILLS

Wear proper protective equipment. Ventilate area. Respiratory protection is required in dusty environment. Sweep up spill but avoid generating dust. With a clean shovel, transfer spilled material into clean-labelled containers for disposal.

DISPOSAL

Dispose in accordance with federal, state or local regulations.

FIRE/EXPLOSION HAZARDS

Not considered to be a fire hazard. In sufficient quantity and reduced particle size, this material is capable of causing a dust explosion.

EXTINGUISHING MEDIA: Use extinguishing media appropriate for surrounding fire. Use water spray, dry chemical, carbon dioxide or foam.

Fire fighters to wear self contained breathing apparatus and full protective clothing when fighting fire. When heated to decomposition, irritating and highly toxic gases may be generated.

OTHER INFORMATION

TOXICITY

No data available.

ENVIRONMENTAL IMPACT

No data available.

Hazard Category: Irritant

RISK PHRASES

R36: Irritating to eyes.

SAFETY PHRASES

S25: Avoid contact with eyes.

S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.

S22 Do not breathe dust.

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

CONTACT POINT

Phone: (03) 9250 1000
Phone: 1 800 628 724 (24hr -Emergency Contact)

This MSDS has been prepared from current technical data and summarises at the date of issue our best knowledge of the health and safety information of the product, and in particular how to safely handle and use the product in the workplace. Each user should read this MSDS and consider the information in the context of how the product will be handled and used in the workplace.

If clarification or further information is needed to ensure that an appropriate assessment can be made, the user should contact this company.

Our responsibility for products sold is subject to our standard terms and conditions, a copy of which is sent to our customers and is also available upon request

END OF MSDS NO 071

Figure 8.9-1. Terrain above stack height within 10 miles.

MATERIAL SAFETY DATA SHEET

NALCO

PRODUCT

ELIMIN-OX OXYGEN SCAVENGER

Emergency Telephone Number
Medical (800) 462-5378 (24 hours) (800) I-M-ALERT

SECTION 01 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: ELIMIN-OX OXYGEN SCAVENGER
DESCRIPTION: An aqueous solution of a modified amino compound

NFPA 704M/HMIS RATING: 1/1 HEALTH 0/0 FLAMMABILITY 0/0 REACTIVITY 0 OTHER
0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme

SECTION 02 COMPOSITION AND INFORMATION ON INGREDIENTS

Our hazard evaluation of the ingredient(s) under OSHA's Hazard Communication Rule, 29 CFR 1910.1200 has found none of the ingredient(s) hazardous.

SECTION 03 HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:
CAUTION: May cause skin irritation. Avoid contact with skin and clothing. Avoid prolonged or repeated breathing of vapor. Use with adequate ventilation. Do not take internally.

Empty containers may contain residual product. Do not reuse container unless properly reconditioned.

PRIMARY ROUTE(S) OF EXPOSURE: Eye, Skin

EYE CONTACT: Non-irritating.
SKIN CONTACT: Can cause mild, short-lasting irritation.

SYMPTOMS OF EXPOSURE: A review of available data does not identify any symptoms from exposure.

AGGRAVATION OF EXISTING CONDITIONS: A review of available data does not identify any worsening of existing conditions.

SECTION 04 FIRST AID INFORMATION

EYES: Flush with water for 15 minutes.
SKIN: Flush with water for 15 minutes.
INGESTION: Induce vomiting. Give water. Call a physician.
INHALATION: Remove to fresh air. Treat symptoms. Call a physician.

NOTE TO PHYSICIAN: Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

CAUTION: If unconscious, having trouble breathing or in convulsions, do not induce vomiting or give water.

NALCO CHEMICAL COMPANY ONE NALCO CENTER • NAPERVILLE, ILLINOIS 60563-1198
AREA (630) 305-1000

SECTION 05 FIRE FIGHTING MEASURES

FLASH POINT: None (PMCC) ASTM D-93

EXTINGUISHING MEDIA: Not applicable

UNUSUAL FIRE AND EXPLOSION HAZARD: May evolve NOx under fire conditions. Containers exposed in a fire should be cooled with water to prevent vapor pressure buildup leading to a rupture.

SECTION 06 ACCIDENTAL RELEASE MEASURES

IN CASE OF TRANSPORTATION ACCIDENTS, CALL THE FOLLOWING 24-HOUR TELEPHONE NUMBER (800) I-M-ALERT or (800) 462-5378.

SPILL CONTROL AND RECOVERY:

Small liquid spills: Contain with absorbent material, such as clay, soil or any commercially available absorbent. Shovel reclaimed liquid and absorbent into recovery or salvage drums for disposal. Refer to CERCLA in Section 15.

Large liquid spills: Dike to prevent further movement and reclaim into recovery or salvage drums or tank truck for disposal. Refer to CERCLA in Section 15.

For large indoor spills, evacuate employees and ventilate area. Those responsible for control and recovery should wear the protective equipment specified in Section 8 .

SECTION 07 HANDLING AND STORAGE

Storage : Keep container closed when not in use.

SECTION 08 EXPOSURE CONTROLS AND PERSONAL PROTECTION

RESPIRATORY PROTECTION: Respiratory protection is not normally needed since the volatility and toxicity are low. If significant vapors, mists or aerosols are generated, wear a NIOSH approved or equivalent respirator.

For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a positive pressure, self-contained breathing apparatus is recommended.

VENTILATION: General ventilation is recommended.

PROTECTIVE EQUIPMENT: Use impermeable gloves and chemical splash goggles when

attaching feeding equipment, doing maintenance or handling product. Examples of impermeable gloves available on the market are neoprene, nitrile, PVC, natural rubber, viton and butyl (compatibility studies have not been performed).

The availability of an eye wash fountain and safety shower is recommended.

If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

HUMAN EXPOSURE CHARACTERIZATION: Based on Nalco's recommended product application and our recommended personal protective equipment, the potential human exposure is: LOW.

SECTION 09 PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Colorless	FORM: Liquid	
DENSITY:	8.5-8.6 lbs/gal.	
SOLUBILITY IN WATER:	Completely	
SPECIFIC GRAVITY:	1.02-1.03 @ 60 Degrees F	ASTM D-1298
pH (NEAT) =	6 - 10 pH (at 1%) 6.7	ASTM E-70
VISCOSITY:	3 cps @ 60 Degrees F	ASTM D-2983
FREEZE POINT:	28 Degrees F	ASTM D-1177
FLASH POINT:	None (PMCC)	ASTM D-93
VAPOR PRESSURE:	12 mm Hg @ 68 Degrees F	ASTM D-323
VOLATILE ORGANIC COMPOUND (VOC):	0 lbs/gal.	EPA METHOD 24

NOTE: These physical properties are typical values for this product.

SECTION 10 STABLILITY AND REACTIVITY

INCOMPATIBILITY: Avoid mineral acids and nitrites.

Avoid contact with strong oxidizers (eg. chlorine, peroxides, chromates, nitric acid, perchlorates, concentrated oxygen, permanganates) which can generate heat, fires, explosions and the release of toxic fumes.

STORAGE: Store at temperatures below 120 Degrees F and above 40 Degrees F. At temperatures below 40 Degrees F, this product looses its stability and form precipitates. Once formed, the precipitate cannot be resolubilized and loss of product activity will occur.

THERMAL DECOMPOSITION PRODUCTS: In the event of combustion CO, CO2, NOx may be formed. Do not breathe smoke or fumes. Wear suitable protective equipment.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY STUDIES: Acute toxicity studies have been conducted on this product. The results are shown below.

ACUTE ORAL TOXICITY (ALBINO RATS): LD50 = Greater than 5 g/kg

ACUTE DERMAL TOXICITY (ALBINO RABBITS): LD50 = Greater than 2 g/kg

PRIMARY SKIN IRRITATION TEST (ALBINO RABBITS):
SKIN IRRITATION INDEX DRAIZE RATING: 0.23/8.0 Minimal irritation

PRIMARY EYE IRRITATION TEST (ALBINO RABBITS):
EYE IRRITATION INDEX DRAIZE RATING: 0.33/110.0 Practically non-irritating

HUMAN HAZARD CHARACTERIZATION: Based on our hazard characterization, the potential human hazard is: LOW

SECTION 12 ECOLOGICAL INFORMATION

AQUATIC DATA:

Results below are based on the product.

96 hour static acute LC50 to Bluegill Sunfish = 190 ppm

96 hour static acute LC50 to Rainbow Trout = 360 ppm

96 hour static acute LC50 to Fathead Minnow = 400 mg/L

96 hour no observed effect concentration is 100 mg/L based on no mortality or abnormal effects.

48 hour static acute LC50 to Daphnia magna = 96 mg/L

48 hour no observed effect concentration is 20 mg/L based on no mortality or abnormal effects.

If released into the environment, see CERCLA in Section 15.

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION: Based on our Hazard Characterization, the potential environmental hazard is: MODERATE. Based on Nalco's recommended product application and the product's characteristics, the potential environmental exposure is: LOW.

SECTION 13 DISPOSAL CONSIDERATIONS

DISPOSAL: If this product becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261, since it does not have the characteristics of Subpart C, nor is it listed under Subpart D.

As a non-hazardous liquid waste, it should be solidified with stabilizing agents (such as sand, fly ash, or cement) so that no free liquid remains before disposal to an industrial waste landfill. A non-hazardous liquid waste can also be deep-well injected in accordance with local, state and federal regulations.

SECTION 14 TRANSPORTATION INFORMATION

PROPER SHIPPING NAME/HAZARD CLASS MAY VARY BY PACKAGING, PROPERTIES, AND MODE OF TRANSPORTATION. TYPICAL PROPER SHIPPING NAMES FOR THIS PRODUCT ARE:

ALL TRANSPORTATION MODES : PRODUCT IS NOT REGULATED DURING TRANSPORTATION

SECTION 15 REGULATORY INFORMATION

The following regulations apply to this product.

FEDERAL REGULATIONS:

OSHA'S HAZARD COMMUNICATION RULE, 29 CFR 1910.1200:
Based on our hazard evaluation, this product is not hazardous.

CERCLA, 40 CFR 117, 302:
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312 AND 313:

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355):
This product does not contain ingredients listed in Appendix A and B as an Extremely Hazardous Substance.

SECTIONS 311 and 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370):
Our hazard evaluation has found that this product is not hazardous under 29 CFR 1910.1200.

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely

hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372):
This product does not contain ingredients on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA):
The chemical ingredients in this product are on the 8(b) Inventory List (40 CFR 710).

This product has been certified as KOSHER/PAREVE for year-round use INCLUDING THE PASSOVER SEASON by the CHICAGO RABBINICAL COUNCIL.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261 SUBPART C & D:
Consult Section 13 for RCRA classification.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 (formerly Sec. 307), 40 CFR 116 (formerly Sec. 311):
None of the ingredients are specifically listed.

CLEAN AIR ACT, Sec. 111 (40 CFR 60), Sec. 112 (40 CFR 61, 1990 Amendments), Sec. 611 (40 CFR 82, CLASS I and II Ozone depleting substances):
This product does not contain ingredients covered by the Clean Air Act.

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:
Hydrazine is known to the State of California to cause cancer. This product contains levels of hydrazine as an impurity at less than 0.01%.

MICHIGAN CRITICAL MATERIALS:
This product does not contain ingredients listed on the Michigan Critical Materials Register.

STATE RIGHT TO KNOW LAWS:
The following ingredient(s) are disclosed for compliance with State Right To Know Laws:

Carbohydrazide	497-18-7
Water	7732-18-5

INTERNATIONAL REGULATIONS:

This is not a WHMIS controlled product under The House of Commons of Canada Bill C-70.

SECTION 16 OTHER INFORMATION

None

SECTION 17 RISK CHARACTERIZATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: LOW.

* The environmental risk is: LOW.

Any use inconsistent with Nalco's recommendations may affect our risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

SECTION 18 REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (CD-ROM version), Micromedex, Inc., Englewood, CO.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (CD-ROM version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA).

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, Ohio (CD-ROM version), Micromedex, Inc., Englewood, CO.

Shepard's Catalog of Teratogenic Agents (CD-ROM version), Micromedex, Inc., Englewood, CO.

Suspect Chemicals Sourcebook (a guide to industrial chemicals covered under major regulatory and advisory programs), Roytech Publications (a Division of Ariel Corporation), Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, Washington (CD-ROM version), Micromedex, Inc., Englewood, CO.

PREPARED BY: William S. Utley, PhD., DABT, Manager, Product Safety
DATE CHANGED: 08/12/1997 DATE PRINTED: 03/28/1999

ONDEO Nalco

MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 356

EMERGENCY TELEPHONE NUMBER
(800)424-9300 (24 Hours) CHEMTREC

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME :	**NALCO 356**
APPLICATION :	CORROSION INHIBITOR
CHEMICAL DESCRIPTION :	Amines, Water
COMPANY IDENTIFICATION :	ONDEO Nalco Company ONDEO Nalco Center Naperville, Illinois 60563-1198
EMERGENCY TELEPHONE NUMBER :	(800)424-9300 (24 Hours) CHEMTREC

NFPA 704M/HMIS RATING
HEALTH : 3 / 3 FLAMMABILITY : 2 / 2 REACTIVITY : 0 / 0 OTHER :
0 = Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

2. COMPOSITION/INFORMATION ON INGREDIENTS

Our hazard evaluation has identified the following chemical substance(s) as hazardous. Consult Section 15 for the nature of the hazard(s).

Hazardous Substance(s)	CAS NO	% (w/w)
Morpholine	110-91-8	5.0 - 10.0
Cyclohexylamine	108-91-8	10.0 - 30.0

3. HAZARDS IDENTIFICATION

****EMERGENCY OVERVIEW****

DANGER
Corrosive. Combustible. May cause tissue damage. Harmful if absorbed through skin. Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting.
Do not get in eyes, on skin, on clothing. Do not take internally. Use with adequate ventilation. Keep away from sources of ignition - No smoking. Keep away from heat. Keep container tightly closed and in a well-ventilated place. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. After contact with skin, wash immediately with plenty of water. Protect product from freezing.
Wear a face shield. Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots.
Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

PRIMARY ROUTES OF EXPOSURE :
Eye, Skin, Inhalation

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HUMAN HEALTH HAZARDS - ACUTE :

EYE CONTACT :
Corrosive. Will cause eye burns and permanent tissue damage. Exposure to low vapor concentrations can result in foggy or blurred vision, objects appearing bluish and appearance of a halo around lights. These symptoms are temporary.

SKIN CONTACT :
May cause severe irritation or tissue damage depending on the length of exposure and the type of first aid administered. Harmful if absorbed through skin.

INGESTION :
Not a likely route of exposure. Corrosive; causes chemical burns to the mouth, throat and stomach.

INHALATION :
Irritating, in high concentrations, to the eyes, nose, throat and lungs. Vapors may have a strong offensive odor which may cause sensory response including headache, nausea and vomiting.

SYMPTOMS OF EXPOSURE :
Acute :
A review of available data does not identify any symptoms from exposure not previously mentioned.
Chronic :
A review of available data does not identify any symptoms from exposure not previously mentioned.

AGGRAVATION OF EXISTING CONDITIONS :
A review of available data does not identify any worsening of existing conditions.

HUMAN HEALTH HAZARDS - CHRONIC :
No adverse effects expected other than those mentioned above.

4. FIRST AID MEASURES

EYE CONTACT :
PROMPT ACTION IS ESSENTIAL IN CASE OF CONTACT. Immediately flush eye with water for at least 15 minutes while holding eyelids open. Get immediate medical attention.

SKIN CONTACT :
Immediately flush with plenty of water for at least 15 minutes. For a large splash, flood body under a shower. Remove contaminated clothing. Wash off affected area immediately with plenty of water. Get immediate medical attention. Contaminated clothing, shoes, and leather goods must be discarded or cleaned before re-use.

INGESTION :
DO NOT INDUCE VOMITING. If conscious, washout mouth and give water to drink. Get immediate medical attention.

INHALATION :
Remove to fresh air, treat symptomatically. Get medical attention.

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NOTE TO PHYSICIAN :
Probable mucosal damage may contraindicate the use of gastric lavage. Based on the individual reactions of the patient, the physician's judgement should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

FLASH POINT : 135 °F / 57 °C (PMCC)

This product does not sustain combustion; therefore, it does not meet the definition of hazard class 3 for transportation.

EXTINGUISHING MEDIA :
Dry powder, Carbon dioxide, Foam, Other extinguishing agent suitable for Class B fires, For large fires, use water spray or fog, thoroughly drenching the burning material.
Keep containers cool by spraying with water.

FIRE AND EXPLOSION HAZARD :
Combustible Liquid; may form combustible mixtures at or above the flash point. May evolve oxides of carbon (COx) under fire conditions. May evolve oxides of nitrogen (NOx) under fire conditions. Empty product containers may contain product residue. Do not pressurize, cut, heat, weld, or expose containers to flame or other sources of ignition.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE FIGHTING :
In case of fire, wear a full face positive-pressure self contained breathing apparatus and protective suit.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS :
Restrict access to area as appropriate until clean-up operations are complete. Ensure clean-up is conducted by trained personnel only. Ventilate spill area if possible. Do not touch spilled material. Stop or reduce any leaks if it is safe to do so. Remove sources of ignition. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection). Notify appropriate government, occupational health and safety and environmental authorities.

METHODS FOR CLEANING UP :
SMALL SPILLS: Soak up spill with absorbent material. Place residues in a suitable, covered, properly labeled container. Wash affected area. LARGE SPILLS: Contain liquid using absorbent material, by digging trenches or by diking. Reclaim into recovery or salvage drums or tank truck for proper disposal. Wash site of spillage thoroughly with water. Contact an approved waste hauler for disposal of contaminated recovered material. Dispose of material in compliance with regulations indicated in Section 13 (Disposal Considerations).

ENVIRONMENTAL PRECAUTIONS :
Do not contaminate surface water.

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7. HANDLING AND STORAGE

HANDLING :
Do not get in eyes, on skin, on clothing. Do not take internally. Do not breathe vapors/gases/dust. Use with adequate ventilation. Avoid generating aerosols and mists. Keep away from acids and oxidizing agents. Do not use, store, spill or pour near heat, sparks or open flame. Keep the containers closed when not in use. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

STORAGE CONDITIONS :
Store the containers tightly closed. Store away from heat and sources of ignition. Use proper grounding procedures. Store separately from acids. Store separately from oxidizers. Amine and sulfite products should not be stored within close proximity or resulting vapors may form visible airborne particles.

SUITABLE CONSTRUCTION MATERIAL :
PVC, Stainless steel

UNSUITABLE CONSTRUCTION MATERIAL :
Copper, Brass, Bronze, and their alloys

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE LIMITS :
Exposure guidelines have not been established for this product. Available exposure limits for the substance(s) are shown below.

ACGIH/TLV :

Substance(s)	
Morpholine	TWA: 20 ppm , 71 mg/m3 (Skin)
Cyclohexylamine	TWA: 10 ppm , 41 mg/m3

OSHA/PEL :

Substance(s)	
Morpholine	TWA: 20 ppm , 70 mg/m3 (Skin) STEL: 30 ppm , 105 mg/m3 (Skin)
Cyclohexylamine	TWA: 10 ppm , 40 mg/m3

* A skin notation refers to the potential significant contribution to overall exposure by the cutaneous route, including mucous membranes and the eyes.

ENGINEERING MEASURES :
General ventilation is recommended. Use local exhaust ventilation if necessary to control airborne mist and vapor.

RESPIRATORY PROTECTION :
If significant mists, vapors or aerosols are generated an approved respirator is recommended. An organic vapor cartridge with dust/mist prefilter or supplied air may be used. In event of emergency or planned entry into unknown concentrations a positive pressure, full-facepiece SCBA should be used. If respiratory protection is required,

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institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.

HAND PROTECTION :
Butyl gloves, Most glove materials are of low chemical resistance. Replace gloves regularly.

SKIN PROTECTION :
Wear chemical resistant apron, chemical splash goggles, impervious gloves and boots. A full slicker suit is recommended if gross exposure is possible.

EYE PROTECTION :
Wear a face shield with chemical splash goggles.

HYGIENE RECOMMENDATIONS :
Eye wash station and safety shower are necessary. If clothing is contaminated, remove clothing and thoroughly wash the affected area. Launder contaminated clothing before reuse.

HUMAN EXPOSURE CHARACTERIZATION :
Based on our recommended product application and personal protective equipment, the potential human exposure is: Low

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE	Liquid
APPEARANCE	Light yellow Light green
ODOR	Pungent, Amine

SPECIFIC GRAVITY	0.98 - 1 @ 60 °F / 16 °C
DENSITY	8.2 - 8.3 lb/gal
SOLUBILITY IN WATER	Complete
pH (1 %)	10.3
(100 %)	12
VISCOSITY	5.1 cps @ 77 °F / 25 °C
FREEZING POINT	17 °F / 8 °C
VAPOR PRESSURE	0.5 mm Hg @ 100 °F /
VOC CONTENT	35.4 %

10. STABILITY AND REACTIVITY

STABILITY :
Stable under normal conditions.

HAZARDOUS POLYMERIZATION :
Hazardous polymerization will not occur.

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CONDITIONS TO AVOID :
Heat and sources of ignition including static discharges.

MATERIALS TO AVOID :
Contact with strong acids (e.g. sulfuric, phosphoric, nitric, hydrochloric, chromic, sulfonic) may generate heat, splattering or boiling and toxic vapors. Contact with strong oxidizers (e.g. chlorine, peroxides, chromates, nitric acid, perchlorate, concentrated oxygen, permanganate) may generate heat, fires, explosions and/or toxic vapors. Certain amines in contact with nitrous acid, organic or inorganic nitrites or atmospheres with high nitrous oxide concentrations may produce N-nitrosamines, many of which are cancer-causing agents to laboratory animals. Avoid contact with SO2 or acidic bisulfite products, which may react to form visible airborne amine salt particles.

HAZARDOUS DECOMPOSITION PRODUCTS :
Under fire conditions: Oxides of carbon, Oxides of nitrogen

11. TOXICOLOGICAL INFORMATION

The following results are for the product along with results on the hazardous components.

ACUTE ORAL TOXICITY :

Species	LD50	Tested Substance
Rat	779 mg/kg	Product

Rating : Non-Hazardous

ACUTE DERMAL TOXICITY :

Species	LD50	Tested Substance
Rabbit	2,055 mg/kg	Product

Rating : Non-Hazardous

ACUTE INHALATION TOXICITY :

Species	LC50	Tested Substance
Rat	> 12,000 mg/l (8 hrs)	Morpholine

Rating : Non-Hazardous

PRIMARY SKIN IRRITATION :

Draize Score	Tested Substance
8.0 / 8.0	Product

Rating : Extremely irritating (Corrosive)

PRIMARY EYE IRRITATION :

Draize Score	Tested Substance
110 / 110.0	Product

Rating : Extremely irritating (Corrosive)

SENSITIZATION :
This product is not expected to be a sensitizer.

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CARCINOGENICITY :
None of the substances in this product are listed as carcinogens by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP) or the American Conference of Governmental Industrial Hygienists (ACGIH).

MUTAGENICITY :
Mutagenicity tests on morpholine provided the following results: A bacterial mutagenicity (Ames) bioassay was negative; sister chromatid exchange transformation was positive; mouse lymphoma was weakly positive and rat hepatocyte/DNA repair was negative. A mutagenicity test battery on cyclohexylamine was inconclusive. In a short-term test, cyclohexylamine caused mutation in human white blood cells.

HUMAN HAZARD CHARACTERIZATION :
Based on our hazard characterization, the potential human hazard is: High

12. ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL EFFECTS :

The following results are for the product.

ACUTE FISH RESULTS :

Species	Exposure	LC50	Tested Substance
Rainbow Trout	96 hrs	130 mg/l	Product
Fathead Minnow	96 hrs	75 mg/l	Product

Rating : Slightly toxic

ACUTE INVERTEBRATE RESULTS :

Species	Exposure	LC50	EC50	Tested Substance
Daphnia magna	48 hrs	180 mg/l		Product

Rating : Essentially non-toxic

PERSISTENCY AND DEGRADATION :

Chemical Oxygen Demand (COD) : 573,000 mg/l

Biological Oxygen Demand (BOD) :

Incubation Period	Value	Tested Substance
	1,000 mg/l	

ENVIRONMENTAL HAZARD AND EXPOSURE CHARACTERIZATION
Based on our hazard characterization, the potential environmental hazard is: Moderate
Based on our recommended product application and the product's characteristics, the potential environmental exposure is: High

If released into the environment, see CERCLA/SUPERFUND in Section 15.

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13. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it could meet the criteria of a hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Before disposal, it should be determined if the waste meets the criteria of a hazardous waste.

Hazardous Waste: D001

Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

Do not reuse empty container.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (bill of lading) specific to an order. Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation. Typical Proper Shipping Names for this product are:

LAND TRANSPORT :

Proper Shipping Name :	AMINES, LIQUID, CORROSIVE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, MORPHOLINE
UN/ID No :	UN 2735
Hazard Class - Primary :	8
Packing Group :	II
Flash Point :	57 °C / 135 °F

AIR TRANSPORT (ICAO/IATA) :

Proper Shipping Name :	AMINES, LIQUID, CORROSIVE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, MORPHOLINE
UN/ID No :	UN 2735
Hazard Class - Primary :	8
Packing Group :	II
IATA Cargo Packing Instructions :	812
IATA Cargo Aircraft Limit :	30 L (Max net quantity per package)

MARINE TRANSPORT (IMDG/IMO) :

Proper Shipping Name :	AMINES, LIQUID, CORROSIVE, N.O.S.
Technical Name(s) :	CYCLOHEXYLAMINE, MORPHOLINE
UN/ID No :	UN 2735
Hazard Class - Primary :	8
Packing Group :	II

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15. REGULATORY INFORMATION

NATIONAL REGULATIONS, USA :

OSHA HAZARD COMMUNICATION RULE, 29 CFR 1910.1200 :
Based on our hazard evaluation, the following substance(s) in this product is/are hazardous and the reason(s) is/are shown below.

Morpholine : Corrosive, Flammable
Cyclohexylamine : Corrosive, Flammable

CERCLA/SUPERFUND, 40 CFR 117, 302 :
Notification of spills of this product is not required.

SARA/SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (TITLE III) - SECTIONS 302, 311, 312, AND 313 :

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355) :
This product contains the following substance(s) which is listed in Appendix A and B as an Extremely Hazardous Substance. Listed below are the statutory Threshold Planning Quantity (TPQ) for the substance(s) and the Reportable Quantity (RQ) of the product.

Extremely Hazardous Substance	TPQ	RQ
Cyclohexylamine	10,000 lbs	40,000 lbs

SECTIONS 311 AND 312 - MATERIAL SAFETY DATA SHEET REQUIREMENTS (40 CFR 370) :
Our hazard evaluation has found this product to be hazardous. The product should be reported under the following EPA hazard categories:

X	Immediate (Acute) Health Hazard
-	Delayed (Chronic) Health Hazard
X	Fire Hazard
-	Sudden Release of Pressure Hazard
-	Reactive Hazard

Under SARA 311 and 312, the EPA has established threshold quantities for the reporting of hazardous chemicals. The current thresholds are: 500 pounds or the threshold planning quantity (TPQ), whichever is lower, for extremely hazardous substances and 10,000 pounds for all other hazardous chemicals.

SECTION 313 - LIST OF TOXIC CHEMICALS (40 CFR 372) :
This product does not contain substances on the List of Toxic Chemicals.

TOXIC SUBSTANCES CONTROL ACT (TSCA) :
The chemical substances in this product are on the TSCA 8(b) Inventory (40 CFR 710).

FOOD AND DRUG ADMINISTRATION (FDA) Federal Food, Drug and Cosmetic Act :
When use situations necessitate compliance with FDA regulations, this product is acceptable under : 21 CFR 173.310 Boiler Water Additives

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MATERIAL SAFETY DATA SHEET

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EMERGENCY TELEPHONE NUMBER
(800)424-9300 (24 Hours) CHEMTREC

The following limitations apply:

Maximum dosage	Limitation
40 PPM	in the steam.

This product can not be used where the steam produced will contact milk or milk products.

U.S. DEPARTMENT OF AGRICULTURE (USDA) :
USDA Inspection and Grading Programs - Food Safety and Inspection Service:
This product is authorized by USDA for use in federally inspected meat and poultry plants. Authorized use is under category : G6

This product can not be used where the steam produced will contact milk or milk products.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 / formerly Sec. 307, 40 CFR / formerly Sec. 311 :
None of the substances are specifically listed in the regulation.

CLEAN AIR ACT, Sec. 111 (40 CFR 60, Volatile Organic Compounds), Sec. 112 (40 CFR 61, Hazardous Air Pollutants), Sec. 602 (40 CFR 82, Class I and II Ozone Depleting Substances) :
This product contains the following substances listed in the regulation:

Substance(s)	Citations
Cyclohexylamine :	Sec. 111
Morpholine :	Sec. 111

CALIFORNIA PROPOSITION 65 :
This product does not contain substances which require warning under California Proposition 65.

MICHIGAN CRITICAL MATERIALS :
None of the substances are specifically listed in the regulation.

STATE RIGHT TO KNOW LAWS :
The following substances are disclosed for compliance with State Right to Know Laws:

Water	7732-18-5
Cyclohexylamine	108-91-8
Morpholine	110-91-8

NATIONAL REGULATIONS, CANADA :

WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) :
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION :
B3 - Combustible Liquids, E - Corrosive Material

ONDEO Nalco

MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 356

EMERGENCY TELEPHONE NUMBER

(800)424-9300 (24 Hours) CHEMTREC

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) :
All substances in this product are listed on the Domestic Substances List (DSL), are exempt, or have been reported in accordance with the New Substances Notification Regulations.

INTERNATIONAL CHEMICAL CONTROL LAWS

AUSTRALIA
All substances in this product comply with the National Industrial Chemicals Notification & Assessment Scheme (NICNAS) and are listed on the Australian Inventory of Chemical Substances (AICS).

CHINA
All substances in this product comply with the Chemical Control Law and are listed on the Chemical Inventory of Existing Substances (CIES).

EUROPE
All substances in this product comply with the notification requirements of the European Commission Directive 67/548/EEC and amendments and are listed on the European Inventory of Existing Commercial Substances (EINECS).

JAPAN
All substances in this product comply with the Law Regulating the Manufacture and Importation Of Chemical Substances and are listed on the Ministry of International Trade & industry List (MITI).

KOREA
All substances in this product comply with the Toxic Chemical Control Law (TCCL) and are listed on the Existing Chemicals List (ECL)
This product's trade name is registered with the Korean Ministry of Environment (KMOE).

MALAYSIA
This product contains substance(s) which are not in compliance with the Draft Industrial Chemicals Act and may require additional review.

NEW ZEALAND
This product's trade name is registered with the Environmental Risk Management Authority (ERMA).

THE PHILIPPINES
All substances in this product comply with the Republic Act 6969 (RA 6969) and are listed on the Philippine Inventory of Chemicals & Chemical Substances (PICCS).

16. OTHER INFORMATION

Due to our commitment to Product Stewardship, we have evaluated the human and environmental hazards and exposures of this product. Based on our recommended use of this product, we have characterized the product's general risk. This information should provide assistance for your own risk management practices. We have evaluated our product's risk as follows:

* The human risk is: Low

* The environmental risk is: Moderate

ONDEO Nalco

MATERIAL SAFETY DATA SHEET

PRODUCT

NALCO 356

EMERGENCY TELEPHONE NUMBER

(800)424-9300 (24 Hours) CHEMTREC

Any use inconsistent with our recommendations may affect the risk characterization. Our sales representative will assist you to determine if your product application is consistent with our recommendations. Together we can implement an appropriate risk management process.

This product material safety data sheet provides health and safety information. The product is to be used in applications consistent with our product literature. Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. For any other uses, exposures should be evaluated so that appropriate handling practices and training programs can be established to insure safe workplace operations. Please consult your local sales representative for any further information.

REFERENCES

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, OH., (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

Hazardous Substances Data Bank, National Library of Medicine, Bethesda, Maryland (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, Co.

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man, Geneva: World Health Organization, International Agency for Research on Cancer.

Integrated Risk Information System, U.S. Environmental Protection Agency, Washington, D.C. (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Annual Report on Carcinogens, National Toxicology Program, U.S. Department of Health and Human Services, Public Health Service.

Title 29 Code of Federal Regulations, Part 1910, Subpart Z, Toxic and Hazardous Substances, Occupational Safety and Health Administration (OSHA), (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda MD.

Registry of Toxic Effects of Chemical Substances, National Institute for Occupational Safety and Health, Cincinnati, OH, (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO.

Ariel Insight# (An integrated guide to industrial chemicals covered under major regulatory and advisory programs), North American Module, Western European Module, Chemical Inventories Module and the Generics Module (Ariel Insight# CD-ROM Version), Ariel Research Corp., Bethesda, MD.

The Teratogen Information System, University of Washington, Seattle, WA (TOMES CPS# CD-ROM Version), Micromedex, Inc., Englewood, CO

Prepared By : Product Safety Department
Date issued : 05/09/2000
Replaces : 12/15/1999

ONDEO Nalco Company ONDEO Nalco Center • Naperville, Illinois 60563-1198
(630)305-1000

1 - PRODUCT IDENTIFICATION

PRODUCT NAME: SODIUM BISULFITE
FORMULA: NAHSO3
FORMULA WT: 104.06
CAS NO.: 07631-90-5
NIOSH/RTECS NO.: VZ2000000
COMMON SYNONYMS: HYDROGEN SULFITE SODIUM; SODIUM ACID SULFITE; SODIUM HYDROGEN SULFITE
PRODUCT CODES: 3556,3557
EFFECTIVE: 08/18/86
REVISION #02

PRECAUTIONARY LABELLING
BAKER SAF-T-DATA(TM) SYSTEM

HEALTH - 2 MODERATE
FLAMMABILITY - 0 NONE
REACTIVITY - 1 SLIGHT
CONTACT - 1 SLIGHT

HAZARD RATINGS ARE 0 TO 4 (0 = NO HAZARD; 4 = EXTREME HAZARD).

LABORATORY PROTECTIVE EQUIPMENT

SAFETY GLASSES; LAB COAT

PRECAUTIONARY LABEL STATEMENTS

WARNING
HARMFUL IF SWALLOWED OR INHALED
MAY CAUSE IRRITATION
MAY CAUSE ALLERGIC REACTION.
AVOID CONTACT WITH EYES, SKIN, CLOTHING.
AVOID BREATHING DUST. KEEP IN TIGHTLY CLOSED CONTAINER. USE WITH ADEQUATE
VENTILATION. WASH THOROUGHLY AFTER HANDLING.

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

2 - HAZARDOUS COMPONENTS

COMPONENT	%	CAS NO.
SODIUM BISULFITE	90-100	7631-90-5

3 - PHYSICAL DATA

BOILING POINT: N/A VAPOR PRESSURE(MM HG): N/A

MELTING POINT: N/A VAPOR DENSITY(AIR=1): N/A

SPECIFIC GRAVITY: 1.48 EVAPORATION RATE: N/A
(H2O=1) (BUTYL ACETATE=1)

SOLUBILITY(H2O): APPRECIABLE (MORE THAN 10 %) % VOLATILES BY VOLUME: 0

APPEARANCE & ODOR: WHITE POWDER WITH SO2 ODOR.

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4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (CLOSED CUP N/A

FLAMMABLE LIMITS: UPPER - N/A % LOWER - N/A %

FIRE EXTINGUISHING MEDIA
USE WATER SPRAY.

SPECIAL FIRE-FIGHTING PROCEDURES
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED
(POSITIVE PRESSURE IF AVAILABLE) BREATHING APPARATUS WITH FULL FACEPIECE.
MOVE EXPOSED CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK.
USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL.

UNUSUAL FIRE & EXPLOSION HAZARDS
CLOSED CONTAINERS EXPOSED TO HEAT MAY EXPLODE.

TOXIC GASES PRODUCED
SULFUR DIOXIDE

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5 - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE (TLV/TWA): 5 MG/M3 (PPM)

TOXICITY: LD50 (ORAL-RAT)(MG/KG) - 2000
LD50 (IPR-RAT)(MG/KG) - 650
LD50 (IV-RAT) (MG/KG) - 115

CARCINOGENICITY: NTP: NO IARC: NO Z LIST: NO OSHA REG: NO

EFFECTS OF OVEREXPOSURE

CONTACT WITH SKIN OR EYES MAY CAUSE SEVERE IRRITATION OR BURNS. ALLERGIC REACTION MAY DEVELOP. EXPOSURES TO SMALL AMOUNTS OF SULFITES HAVE BEEN REPORTED TO CAUSE HYPERSENSITIVITY REACTIONS IN CERTAIN INDIVIDUALS, ESPECIALLY ASTHMATICS. A SEVERE ALLERGIC REATION MAY BE FATAL.

TARGET ORGANS
BRAIN, GI TRACT, RESPIRATORY SYSTEM, SKIN

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE
ASTHMA

ROUTES OF ENTRY
INHALATION, SKIN CONTACT

EMERGENCY AND FIRST AID PROCEDURES
CALL A PHYSICIAN.
IF SWALLOWED, IF CONSCIOUS, IMMEDIATELY INDUCE VOMITING.
IF INHALED, REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN.
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. FLUSH SKIN WITH WATER.

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6 - REACTIVITY DATA

STABILITY: STABLE HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID: NONE DOCUMENTED

INCOMPATIBLES: STRONG ACIDS, STRONG OXIDIZING AGENTS

DECOMPOSITION PRODUCTS: OXIDES OF SULFUR, OXIDES

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7 - SPILL AND DISPOSAL PROCEDURES

STEPS TO BE TAKEN IN THE EVENT OF A SPILL OR DISCHARGE
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE CLOTHING.
WITH CLEAN SHOVEL, CAREFULLY PLACE MATERIAL INTO CLEAN, DRY CONTAINER AND
COVER; REMOVE FROM AREA. FLUSH SPILL AREA WITH WATER.

DISPOSAL PROCEDURE
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE, AND LOCAL ENVIRONMENTAL REGULATIONS.

---

8 - PROTECTIVE EQUIPMENT

VENTILATION: USE GENERAL OR LOCAL EXHAUST VENTILATION TO MEET TLV REQUIREMENTS.

RESPIRATORY PROTECTION: NONE REQUIRED WHERE ADEQUATE VENTILATION CONDITIONS EXIST. IF AIRBORNE CONCENTRATION IS HIGH, A DUST/MIST RESPIRATOR IS RECOMMENDED. IF CONCENTRATION EXCEEDS CAPACITY OF RESPIRATOR, A SELF-CONTAINED BREATHING APPARATUS IS ADVISED.

EYE/SKIN PROTECTION: SAFETY GLASSES WITH SIDESHIELDS, PROPER GLOVES ARE RECOMMENDED.

9 - STORAGE AND HANDLING PRECAUTIONS

SAF-T-DATA(TM) STORAGE COLOR CODE: ORANGE (GENERAL STORAGE)

SPECIAL PRECAUTIONS
KEEP CONTAINER TIGHTLY CLOSED. SUITABLE FOR ANY GENERAL CHEMICAL STORAGE
AREA.

10 - TRANSPORTATION DATA AND ADDITIONAL INFORMATION

DOMESTIC (D.O.T.)

PROPER SHIPPING NAME SODIUM HYDROGEN SULFITE, SOLID
HAZARD CLASS ORM-E
LABELS NONE
REPORTABLE QUANTITY 5000 LBS.

INTERNATIONAL (I.M.O.)

PROPER SHIPPING NAME CHEMICALS, N.O.S. (NON-REGULATED)

Material Safety Data Sheet

Chevron Lubricating Oil FM-E

MSDS: 6859
Revision #: 5 **Revision Date:** 12/2/2002

Click here to search the product data sheet database

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

Chevron Lubricating Oil FM ISO 100, 220, 460, FM-E ISO 100

Product Number(s): CPS232104, CPS232105, CPS232106, CPS255106
Synonyms: Chevron Lubricating Oil FM ISO 100, Chevron Lubricating Oil FM ISO 220, Chevron Lubricating Oil FM ISO 460, Chevron Lubricating Oil FM-E ISO 100

Company Identification
ChevronTexaco Global Lubricants
6001 Bollinger Canyon Rd.
San Ramon, CA 94583
United States of America
www.chevron-lubricants.com

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
ChevronTexaco Emergency Information Center: Located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
email : lubemsds@chevron.com
Product Information: (800) LUBE TEK
MSDS Requests: (800) 414-6737

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT

White mineral oil	8042-47-5	60 - 100 %weight
Additives	Mixture	3 - 7 %weight

This material complies with Food And Drug Administration Regulation 178.3570 code of Federal Regulations, Title 21.

CHEVRON Lubricating Oil FM ISO 100 is certified by NSF INTERNATIONAL for drinking water system components. Feed rate of oil to pump must not introduce more than 28 ppb into water.

SECTION 3 HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Not expected to be harmful if swallowed.
Inhalation: Not expected to be harmful if inhaled. Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit. Symptoms of respiratory irritation may include coughing and difficulty breathing.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: No specific first aid measures are required. As a precaution, remove clothing and shoes if contaminated. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: No specific first aid measures are required. Do not induce vomiting. As a precaution, get medical advice.
Inhalation: No specific first aid measures are required. If exposed to excessive levels of material in the air, move the exposed person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

SECTION 5 FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

NFPA RATINGS: Health: 0 Flammability: 1 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Cleveland Open Cup) 457 °F (236 °C) (Min)
Autoignition: NDA
Flammability (Explosive) Limits (% by volume in air): Lower: NA Upper: NA

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in vicinity of spilled material.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use in a well-ventilated area.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances in the workplace. Suggested materials for protective gloves include: Neoprene, Nitrile Rubber, Silver Shield, Viton.

Respiratory Protection: No respiratory protection is normally required.
If user operations generate an oil mist, determine if airborne concentrations are below the occupational exposure limit for mineral oil mist. If not, wear an approved respirator that provides adequate protection from the measured concentrations of this material. For air-purifying respirators use a particulate cartridge.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling	Notation
White mineral oil	ACGIH_TLV	5 mg/m3	10 mg/m3		
White mineral oil	ACGIH	5 mg/m3	10 mg/m3		

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless
Physical State: Liquid
Odor: Petroleum odor
pH: NA
Vapor Pressure: <0.01 mmHg @ 100 °F
Vapor Density (Air = 1): >1
Boiling Point: >600 °F (315 C)
Solubility: Soluble in hydrocarbons; insoluble in water
Freezing Point: NA
Specific Gravity: 0.87 - 0.88 @ 15.6 °C / 15.6 °C
Viscosity: 90 cSt @ 40 °C (Min)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The eye irritation hazard is based on evaluation of data for similar materials or product components.
Skin Irritation: The skin irritation hazard is based on evaluation of data for similar materials or product components.
Skin Sensitization: No product toxicology data available.
Acute Dermal Toxicity: The acute dermal toxicity hazard is based on evaluation of data for similar materials or product components.
Acute Oral Toxicity: The acute oral toxicity hazard is based on evaluation of data for similar materials or product

components.
Acute Inhalation Toxicity: The acute inhalation toxicity hazard is based on evaluation of data for similar materials or product components.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
The 96 hour(s) LC50 for rainbow trout (Oncorhynchus mykiss) is >1000 mg/l.
This material is not expected to be harmful to aquatic organisms.

ENVIRONMENTAL FATE
This material is considered inherently biodegradable. This material is not expected to present any environmental problems other than those associated with oil spills. See Section 6 for Accidental Release Measures.

SECTION 13 DISPOSAL CONSIDERATIONS

Oil collection services are available for used oil recycling or disposal. Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Name: NOT REGULATED AS A HAZARDOUS MATERIAL FOR TRANSPORTATION UNDER 49 CFR
DOT Hazard Class: NOT APPLICABLE
DOT Identification Number: NOT APPLICABLE
DOT Packing Group: NOT APPLICABLE
Additional Information: NOT HAZARDOUS BY U.S. DOT. ADR/RID HAZARD CLASS NOT APPLICABLE.

IMO/IMDG Shipping Name: NOT REGULATED AS DANGEROUS GOODS FOR TRANSPORTATION UNDER THE IMDG CODE
IMO/IMDG Hazard Class: NOT APPLICABLE
IMO/IMDG Identification Number: NOT APPLICABLE
IMO/IMDG Packing Group: NOT APPLICABLE

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:
1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

4_I1=IARC Group 1 15=SARA Section 313

4_I2A=IARC Group 2A 16=CA Proposition 65

4_I2B=IARC Group 2B	17=MA RTK
05=NTP Carcinogen	18=NJ RTK
06=OSHA Carcinogen	19=DOT Marine Pollutant
09=TSCA 12(b)	20=PA RTK

No components of this material were found on the regulatory lists above.

CHEMICAL INVENTORIES:
AUSTRALIA: All the components of this material are listed on the Australian Inventory of Chemical Substances (AICS).
CANADA: All the components of this material are on the Canadian DSL or have been notified under the New Substance Notification Regulations, but have not yet been published in the Canada Gazette.
PEOPLE'S REPUBLIC OF CHINA: All the components of this product are listed on the draft Inventory of Existing Chemical Substances in China.
EUROPEAN UNION: All the components of this material are in compliance with the EU Seventh Amendment Directive 92/32/EEC.
JAPAN: All the components of this product are on the Existing & New Chemical Substances (ENCS) inventory in Japan, or have an exemption from listing.
KOREA: This material contains components that require notification before sale or importation into Korea.
PHILIPPINES: All the components of this product are listed on the Philippine Inventory of Chemicals and Chemical Substances (PICCS).
UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows:
PETROLEUM OIL (Lubricating oil)
WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

SECTION 16 OTHER INFORMATION

NFPA RATINGS:	Health: 0	Flammability: 1	Reactivity: 0
HMIS RATINGS:	Health: 0	Flammability: 1	Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet:1-16

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	-	Threshold Limit Value	TWA	-	Time Weighted Average
STEL	-	Short-term Exposure Limit	PEL	-	Permissible Exposure Limit
			CAS	-	Chemical Abstract Service Number
NDA	-	No Data Available	NA	-	Not Applicable
<=	-	Less Than or Equal To	>=	-	Greater Than or Equal To

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

MSDS Number: **P6928** * * * * * *Effective Date:* ***11/02/01*** * * * * * *Supercedes:* ***02/25/99***

MSDS **Material Safety Data Sheet**

From: **Mallinckrodt Baker, Inc.**
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

PROPYLENE GLYCOL

1. Product Identification

Synonyms: 1,2-propanediol; 1,2-dihdroxypropane; methyl glycol; methylethylene glycol
CAS No.: 57-55-6
Molecular Weight: 76.09
Chemical Formula: CH3CHOHCH2OH
Product Codes:
J.T. Baker: 9402, 9403, U510
Mallinckrodt: 1925, 6263

2. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Propylene Glycol	57-55-6	99 - 100%	Yes

3. Hazards Identification

Emergency Overview

CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.

J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)

Health Rating: 0 - None
Flammability Rating: 1 - Slight
Reactivity Rating: 1 - Slight
Contact Rating: 1 - Slight
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

Potential Health Effects

Inhalation:
No adverse health effects via inhalation.
Ingestion:
Relatively non-toxic. Ingestion of sizable amount (over 100ml) may cause some gastrointestinal upset and temporary central nervous system depression. Effects appear more severe in individuals with kidney problems.
Skin Contact:
Mild irritant and defatting agent, especially on prolonged contact.
Eye Contact:
May cause transitory stinging and tearing.
Chronic Exposure:
Lactic acidosis, stupor and seizures have been reported following chronic ingestion.
Aggravation of Pre-existing Conditions:
Kidney disorders.

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4. First Aid Measures

Inhalation:
Remove to fresh air. Not expected to require first aid measures.
Ingestion:
Not expected to require first aid measures. Give several glasses of water to drink to dilute. If large amounts were swallowed, get medical advice.
Skin Contact:
Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.
Eye Contact:
In case of contact, immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Call a physician if irritation persists.

Note to Physician:
In case of ingestion, monitor for acidosis and central nervous system changes. Exposed persons with previous kidney dysfunction may require special treatment.

5. Fire Fighting Measures

Fire:
Flash point: 99C (210F) CC
Autoignition temperature: 371C (700F)
Flammable limits in air % by volume:
lel: 2.6; uel: 12.5
Material can support combustion.
Explosion:
Containers may explode in heat or fire.
Fire Extinguishing Media:
Dry chemical, foam, water or carbon dioxide.
Special Information:
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Move exposed containers from fire area, if it can be done without risk. Use water to keep fire-exposed containers cool.

6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer!

7. Handling and Storage

Protect container from physical damage. Store in a cool, dry, ventilated area away from sources of heat, moisture, and incompatible substances. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

8. Exposure Controls/Personal Protection

Airborne Exposure Limits:
AIHA Workplace Environmental Exposure Level (WEEL): Vapor and Aerosol = 50ppm; Aerosol, only = 10mg/m3.
Ventilation System:

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Personal Respirators (NIOSH Approved):

If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

Skin Protection:

Wear protective gloves and clean body-covering clothing.

Eye Protection:

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

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9. Physical and Chemical Properties

Appearance:
Clear oily liquid.
Odor:
Odorless.
Solubility:
Miscible in water.
Specific Gravity:
1.0361 @ 20C/4C
pH:
No information found.
% Volatiles by volume @ 21C (70F):
No information found.
Boiling Point:
188.2C (370F)
Melting Point:
-59C (-74F)
Vapor Density (Air=1):
2.6
Vapor Pressure (mm Hg):
0.129 @ 25C (77F)
Evaporation Rate (BuAc=1):
0.01

10. Stability and Reactivity

Stability:
Stable under ordinary conditions of use and storage.
Hazardous Decomposition Products:
Carbon dioxide and carbon monoxide may form when heated to decomposition. Aldehydes or lactic, pyruvic or acetic acids may also be formed.
Hazardous Polymerization:
Will not occur.
Incompatibilities:
Strong oxidizing agents.
Conditions to Avoid:
Heat, flames, ignition sources and incompatibles.

11. Toxicological Information

Oral rat LD50: 20g/kg. Skin rabbit LD50: 20.8g/kg.
Irritation: Eye rabbit/Draize, 500 mg/24H mild.
Investigated as a mutagen and reproductive effector.

--------\Cancer Lists\----------

Ingredient	---NTP Carcinogen--- Known	Anticipated	IARC Category
Propylene Glycol (57-55-6)	No	No	None

12. Ecological Information

Environmental Fate:
When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into water, this material is expected to readily biodegrade. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.
Environmental Toxicity:
No information found.

13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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14. Transport Information

Not regulated.

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15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

Ingredient	TSCA	EC	Japan	Australia
Propylene Glycol (57-55-6)	Yes	Yes	Yes	Yes

--------\Chemical Inventory Status - Part 2\--------

Ingredient	Korea	--Canada-- DSL	NDSL	Phil.
Propylene Glycol (57-55-6)	Yes	Yes	No	Yes

--------\Federal, State & International Regulations - Part 1\--------

Ingredient	-SARA 302- RQ	TPQ	------SARA 313------ List	Chemical Catg.
Propylene Glycol (57-55-6)	No	No	No	No

--------\Federal, State & International Regulations - Part 2\--------

Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Propylene Glycol (57-55-6)	No	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Liquid)

Australian Hazchem Code: None allocated.
Poison Schedule: None allocated.
WHMIS:
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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16. Other Information

NFPA Ratings: Health: **0** Flammability: **1** Reactivity: **0**
Label Hazard Warning:
CAUTION! MAY CAUSE IRRITATION TO SKIN AND EYES.
Label Precautions:
Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Label First Aid:
In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists.
Product Use:
Laboratory Reagent.
Revision Information:
MSDS Section(s) changed since last revision of document include: 8.
Disclaimer:
****

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Prepared by: Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

BOC GASES

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: SULFUR HEXAFLUORIDE

1. Chemical Product and Company Identification

BOC Gases,
Division of
The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

TELEPHONE NUMBER: (908) 464-8100
24-HOUR EMERGENCY TELEPHONE NUMBER:
CHEMTREC (800) 424-9300

BOC Gases
Division of
BOC Canada Limited
5975 Falbourne Street, Unit 2
Mississauga, Ontario L5R 3W6

TELEPHONE NUMBER: (905) 501-1700
24-HOUR EMERGENCY TELEPHONE NUMBER:
(905) 501-0802
EMERGENCY RESPONSE PLAN NO: 20101

PRODUCT NAME: SULFUR HEXAFLUORIDE
CHEMICAL NAME: Sulfur hexafluoride
COMMON NAMES/SYNONYMS: None
TDG (Canada) CLASSIFICATION: 2.2
WHMIS CLASSIFICATION: A

PREPARED BY: Loss Control (908)464-8100/(905)501-1700
PREPARATION DATE: 6/1/95
REVIEW DATES: 6/7/96

2. Composition, Information on Ingredients

INGREDIENT	% VOLUME	PEL-OSHA[1]	TLV-ACGIH[2]	LD_{50} or LC_{50} Route/Species
Sulfur hexafluoride FORMULA: SFI_6 CAS: 2551-62-4 RTECS #: WS4900000	99.8-99.99	1000 ppm TWA	1000 ppm TWA	LD_{50} 5790 mg/kg; intravenous; (Rabbit)

[1] As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)
[2] As stated in the ACGIH 1994-95 Threshold Limit Values for Chemical Substances and Physical Agents

3. Hazards Identification

EMERGENCY OVERVIEW

Simple Asphyxiant - This product does not contain oxygen and may cause asphyxia if released in a confined area. Maintain oxygen levels above 19.5%. Nonflammable. Decomposes to toxic fluoride compounds at temperatures above 400 °F (204 °C).

ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
No	No	No	Yes	No

HEALTH EFFECTS:

Exposure Limits	Irritant	Sensitization
Yes	Yes	No
Teratogen	Reproductive Hazard	Mutagen
No	No	No
Synergistic Effects None reported		

Carcinogenicity: -- NTP: No IARC: No OSHA: No

EYE EFFECTS:
None known.

SKIN EFFECTS:
None known.

INGESTION EFFECTS:
None known. Ingestion is unlikely as product is gas at room temperature.

INHALATION EFFECTS:
Effects of oxygen deficiency resulting from simple asphyxiants may include: rapid breathing, diminished mental alertness, impaired muscular coordination, faulty judgement, depression of all sensations, emotional instability, and fatigue. As asphyxiation progresses, nausea, vomiting, prostration, and loss of consciousness may result, eventually leading to convulsions, coma, and death.

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

NFPA HAZARD CODES	HMIS HAZARD CODES	RATINGS SYSTEM
Health*: 2	Health: 0	0 = No Hazard
Flammability: 0	Flammability: 0	1 = Slight Hazard
Reactivity: 0	Reactivity: 0	2 = Moderate Hazard
		3 = Serious Hazard
* Under fire conditions		4 = Severe Hazard

4. First Aid Measures

EYES:
None required.

SKIN:
None required.

INGESTION:
None required.

INHALATION:
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Victims should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, and if breathing has stopped, administer artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

5. Fire Fighting Measures

Conditions of Flammability: Nonflammable		
Flash point: None	Method: Not Applicable	Autoignition Temperature: None
LEL(%): None	UEL(%): None	
Hazardous combustion products: None		
Sensitivity to mechanical shock: None		
Sensitivity to static discharge: None		

FIRE AND EXPLOSION HAZARDS:
Nonflammable. Decomposes to toxic fluoride compounds under fire conditions.

EXTINGUISHING MEDIA:
None required. Use as appropriate for surrounding materials.

6. Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with inert gas prior to attempting repairs. If leak is in container or container valve, contact the appropriate emergency telephone number listed in Section 1 or call your closest BOC location.

7. Handling and Storage

Electrical classification:
Non-hazardous.

This gas mixture is noncorrosive and may be used with all common structural materials.

Aluminum, stainless steel, copper, brasses or silver recommended for temperatures above 400 °F (204 °C) to prevent decompositon to toxic fluoride compounds.

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve protection outlet piped to use point. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are

stored to exceed 125 °F (52 °C). Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Use a "first in-first out" inventory system to prevent full cylinders being stored for excessive periods of time.

For additional recommendations, consult Compressed Gas Association Pamphlets P-1, P-14, P-9, and Safety Bulletin SB-2.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

8. Exposure Controls, Personal Protection

EXPOSURE LIMITS[1]:

INGREDIENT	% VOLUME	PEL-OSHA[2]	TLV-ACGIH[3]	LD_{50} or LC_{50} Route/Species
Sulfur hexafluoride FORMULA: SFI_6 CAS: 2551-62-4 RTECS #: WS4900000	99.8 to 99.99	1000 ppm TWA	1000 ppm TWA	LD_{50} 5790 mg/kg; Intravenous; (Rabbit)

[1] Refer to individual state of provincial regulations, as applicable, for limits which may be more stringent than those listed here.
[2] As stated in 29 CFR 1910, Subpart Z (revised July 1, 1993)
[3] As stated in the ACGIH 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents.

ENGINEERING CONTROLS:
Local exhaust to prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 19.5%.

EYE/FACE PROTECTION:
Safety goggles or glasses as appropriate for the job.

SKIN PROTECTION:
Protective gloves of material appropriate for the job.

RESPIRATORY PROTECTION:
Positive pressure air line with full-face mask and escape bottle or self-contained breathing apparatus should be available for emergency use.

OTHER/GENERAL PROTECTION:
Safety shoes or other footwear as appropriate for the job.

9. Physical and Chemical Properties

PARAMETER	VALUE	UNITS
Physical state (gas, liquid, solid)	: Gas	
Vapor pressure	: 319.1	psia
Vapor density (Air = 1)	: 5.13	
Evaporation point	: Not Available	
Boiling point	: -82.8	°F
	: -63.8	°C
Freezing point	: -59.4	°F
	: -50.8	°C
pH	: Not Applicable	
Specific gravity	: Not Available	
Oil/water partition coefficient	: Not Available	
Solubility (H20)	: Negligible	
Odor threshold	: Not Applicable	
Odor and appearance	: Colorless, odorless gas	

10. Stability and Reactivity

STABILITY:
Stable below 400 °F (204 °C).

INCOMPATIBLE MATERIALS:
Reported to explode in contact with disilane. Oxygen and certain metals cause slow decomposition to toxic fluorides.

HAZARDOUS DECOMPOSITON PRODUCTS:
Thionyl fluoride compounds including SF2, SF4, S2F2 and S2F10.

HAZARDOUS POLYMERIZATION:
Does not occur.

11. Toxicological Information

Oxygen deficiency during pregnancy has produced developmental abnormalities in humans and experimental animals.

No data given in the Registry of Toxic Effects of Chemical Substances (RTECS) or Sax, Dangerous Properties of Industrial Materials, 7th ed.

12. Ecological Information

No data given.

13. Disposal Considerations

Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to BOC Gases or authorized distributor for proper disposal.

14. Transport Information

PARAMETER	United States DOT	Canada TDG
PROPER SHIPPING NAME:	Sulfur Hexafluoride	Sulfur Hexafluoride
HAZARD CLASS:	2.2	2.2
IDENTIFICATION NUMBER:	UN 1080	UN 1080
SHIPPING LABEL:	NONFLAMMABLE GAS	NONFLAMMABLE GAS

15. Regulatory Information

SARA TITLE III NOTIFICATIONS AND INFORMATION

SARA TITLE III - HAZARD CLASSES:
Sudden Release of Pressure Hazard

16. Other Information

Compressed gas cylinders shall not be refilled without the express written permission of the owner. Shipment of a compressed gas cylinder which has not been filled by the owner or with his/her (written) consent is a violation of transportation regulations.

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES:
Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).

Material Safety Data Sheet

Chevron Special LS Diesel 2

MSDS: 7098
Revision #: 1 **Revision Date:** 06/12/01

Click here to search the product data sheet database

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

SPECIAL LS DIESEL 2

PRODUCT NUMBER(S): CPS225116 CPS225119 CPS272105 CPS272111
CPS272116 CPS272127 CPS272128 CPS272193
CPS272393 CPS272596
SYNONYM: CALCO SPECIAL LS DIESEL 2
CHEVRON SPECIAL LS DIESEL 2

COMPANY IDENTIFICATION

Chevron Products Company
Marketing, MSDS Coordinator
6001 Bollinger Canyon Road
San Ramon, CA 94583

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or
(510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (703)527-3887
Emergency Information Centers
are located in U.S.A.
Int'l collect calls accepted

PRODUCT INFORMATION: MSDS Requests
(800) 689-3998
(510) 242-5357 Technical Information
SPECIAL NOTES: This MSDS covers all Chevron and Calco CARB Low Sulfur Diesel No.2 Fuels. Red dye is added to non-taxable fuel.

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2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % SPECIAL LS DIESEL 2

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
DIESEL FUEL NO. 2			
Chemical Name: FUELS, DIESEL, NO. 2			
CAS68476346	100.00%	350 mg/m3	Chevron TWA
		1000 mg/m3	Chevron STEL

POTENTIALLY

INCLUDING

HDS DISTILLATE, MIDDLE
Chemical Name: DISTILLATES, HYDRODESULFURIZED MIDDLE
CAS64742809 NONE NA

GAS OIL, LIGHT
Chemical Name: DISTILLATES, STRAIGHT RUN MIDDLE
CAS64741442 NONE NA

KEROSENE
Chemical Name: KEROSINE
CAS8008206 NONE NA

HYDRODESULFURIZED KEROSINE
Chemical Name: KEROSINE, HYDRODESULFURIZED
CAS64742810 NONE NA

CAT CRACKED DISTILLATE, LIGHT
Chemical Name: DISTILLATES, LIGHT CATALYTIC CRACKED
CAS64741599 NONE NA

TOTAL SULFUR
< 500.00PPM

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

3. HAZARDS IDENTIFICATION

********** EMERGENCY OVERVIEW **********

Clear to pale yellow liquid if undyed, red liquid if dyed, with a faint petreoleum hydrocarbon odor.

- COMBUSTIBLE LIQUID AND VAPOR
- HARMFUL OR FATAL IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE
- CAUSES SKIN IRRITATION
- POSSIBLE CANCER HAZARD - CONTAINS MATERIAL THAT MAY CAUSE CANCER BASED ON ANIMAL DATA

****

IMMEDIATE HEALTH EFFECTS
EYE:
Not expected to cause prolonged or significant eye irritation.
SKIN:
Contact with the skin causes irritation.
INGESTION:
Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death.
INHALATION:

Excessive or prolonged breathing of this material may cause central nervous system effects. Mists of this material may cause respiratory irritation.
SIGNS AND SYMPTOMS OF EXPOSURE:
Skin irritation: may include pain, reddening, swelling, and blistering.
Respiratory irritation: may include coughing and difficulty breathing.
Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.
CARCINOGENICITY:
Prolonged or repeated skin contact with this material may cause cancer based on animal data. Risk of cancer depends on duration and level of exposure. See Section 11 for additional information.

Whole diesel engine exhaust was reviewed by the International Agency for Research on Cancer (IARC) in their Monograph 46 (1989). Evidence for causing cancer was considered sufficient in animals and limited in humans. IARC placed diesel exhaust in category 2A, considering it probably carcinogenic to humans.

Diesel exhaust is known to the State of California to cause cancer.

4. FIRST AID MEASURES

EYE:
No specific first aid measures are required because this material is not expected to cause eye irritation. As a precaution remove contact lenses, if worn, and flush eyes with water.
SKIN:
Wash skin immediately with soap and water and remove contaminated clothing and shoes. Get medical attention if irritation persists. Discard contaminated clothing and shoes or thoroughly clean before reuse.
INGESTION:
If swallowed, do not induce vomiting. Give the person a glass of water or milk to drink and get immediate medical attention. Never give anything by mouth to an unconscious person.
INHALATION:
Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms continue.
NOTE TO PHYSICIANS:
Ingestion of this product or subsequent vomiting can result in aspiration of light hydrocarbon liquid which can cause pneumonitis.

5. FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Combustible liquid. See section 7 for appropriate handling and storage conditions.
FLAMMABLE PROPERTIES:
FLASH POINT: (P-M) 125F (52C) Minimum
AUTOIGNITION: 494F (257C) NFPA 325M, FO #2
FLAMMABILITY LIMITS (% by volume in air): Lower: 0.6 Upper: 4.7
EXTINGUISHING MEDIA:

CO2, Dry Chemical, AFFF Foam.
NFPA RATINGS: Health 0; Flammability 2; Reactivity 0.
FIRE FIGHTING INSTRUCTIONS:
Use water spray to cool fire-exposed containers and to protect personnel. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887
International Collect Calls Accepted
ACCIDENTAL RELEASE MEASURES:
Eliminate all sources of ignition in the vicinity of the spill or released vapor.

Stop the source of the leak or release. Clean up releases as soon as possible, observing precautions in Exposure Controls/Personal Protection. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations. Contact local environmental or health authorities for approved disposal of this material.

Release of this product should be prevented from contaminating soil and water and from entering drainage and sewer systems. U.S.A. regulations require reporting spills of this material that could reach any surface waters. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

7. HANDLING AND STORAGE

Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85F.

Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, "Flammable and Combustible Liquids", National Fire Protection Association (NFPA) 77, "Recommended Practice on Static Electricity", and/or the American Petroleum Institute (API) Recommended Practice 2003, "Protection Against Ignitions Arising Out of

Static, Lightning, and Stray Currents".

Do not use or store near heat, sparks, or open flames. Use or store only in a well-ventilated area. Keep container closed when material is not in use. Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or properly disposed of.

WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.

Do not taste or swallow. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Keep out of reach of children.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS
If user operations generate airborne material, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION:
No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
SKIN PROTECTION:
No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances. Suggested materials for protective gloves include: <Nitrile> <Viton> <Chlorinated Polyethylene (or Chlorosulfonated Polyethylene or CPE)> <Polyurethane>
RESPIRATORY PROTECTION:
If user operations generate harmful levels of airborne material that is not adequately controlled by ventilation, wear a NIOSH approved respirator that provides adequate protection. Use the following respirators: Organic Vapor.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:

Clear to pale yellow liquid if undyed, red liquid if dyed, with a faint petreoleum hydrocarbon odor.

pH:	NA
VAPOR PRESSURE:	0.04 PSIA @ 40C
VAPOR DENSITY (AIR=1):	>1
BOILING POINT:	176 - 370C (348 - 698F)
FREEZING POINT:	NA
MELTING POINT:	NA
SOLUBILITY:	Soluble in hydrocarbon solvents; insoluble in water.
SPECIFIC GRAVITY:	0.84 @ 15.6/15.6C (Typical)
VISCOSITY:	1.9 - 4.1 cSt @ 40C

10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
None known
CHEMICAL STABILITY:
Stable.
CONDITIONS TO AVOID:
See section 7.
INCOMPATIBILITY WITH OTHER MATERIALS:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
Minimal effects clearing in less than 24 hours.
SKIN EFFECTS:
Moderate irritation at 72 hours. (Moderate erythema). The acute dermal LD50 in rabbits is >5 ml/kg. This material did not cause skin sensitization reactions in a Buehler guinea pig test.
ACUTE ORAL EFFECTS:
The acute oral LD50 in rats is > 5 ml/kg.
ACUTE INHALATION EFFECTS:
The 4-hour inhalation LC50 in rats is > 5 mg/l.

The data above is obtained from studies sponsored by the American Petroleum Institute.
CHRONIC EFFECTS/CARCINOGENICITY:
This product contains a mixture of petroleum hydrocarbons called middle distillates (which means they boil between approximately 350F and 700F). Because of this broad description, many products are considered middle distillates yet they are produced by a variety of different petroleum refining processes. Examples of middle distillates include kerosene, diesel fuel and jet fuel. Dermal treatment with some middle distillates resulted in the formation of skin tumors when repeatedly applied to mice over most of their lifetime. Other studies indicate that pure middle distillates are not genotoxic and that chronic skin irritation is necessary for the skin tumor response to occur. Petroleum middle distillates are not listed as carcinogenic by the IARC, EPA, NTP, or OSHA. This product may contain significant amounts of polynuclear aromatic hydrocarbons (PAH's) which have been shown to cause skin cancer after

prolonged and frequent contact with the skin of test animals. Brief or intermittent skin contact with this product is not expected to have serious effects if it is washed from the skin. While skin cancer is unlikely to occur in human beings following use of this product, skin contact and breathing of mists or vapors should be reduced to a minimum.

This product contains kerosene. CONCAWE (product dossier 94/106) has summarized current health, safety and environmental data available for a number of kerosenes (typically straight-run kerosene, CAS 8008-20-6, or hydrodesulfurized kerosene, CAS 64742-81-0). Following acute exposure to kerosene, signs observed in rats and rabbits were of a low order of toxicity: central nervous system depression occurred following oral exposure, skin irritation (ranging from slight to severe irritation) occurred with dermal exposure, and respiratory tract irritation occurred with inhalation exposure. None of the kerosenes tested produced more than slight eye irritation and none were skin sensitizers. However, intratracheal administration or artificial aspiration of small volumes (0.1 to 0.2 ml) of kerosene into the lungs of rats, chickens and primates resulted in lung damage and/or death. Chronic (3 to 24 months) mouse dermal toxicity studies of kerosenes and jet fuels produced mild to moderate skin irritation, while long-term (2+ years) studies showed moderate to severe skin damage as well as an increased incidence of tumors after long latency periods (probably due to a secondary mechanism related to skin irritancy). In a study in which rats, mice, rabbits and cats were exposed to kerosene aerosol concentrations in the range 0.05 to 120 mg/l for up to four weeks, reductions in respiratory rate, pulmonary hyperaemia, leucocytosis, monocytosis and decreased erythrocyte sedimentation rate were observed, and histological examination revealed inflammatory changes in the respiratory tract (tracheitis, bronchitis and pneumonia).

Hydrodesulfurized kerosene was tested by the Petroleum Product Stewardship Council in a OECD Guideline 421 Reproductive/Developmental Toxicity Study. The kerosene sample was diluted to 494 (60%), 330 (40%), and 165 (20%) mg/kg/day in food grade mineral oil and applied daily during pre-mating and mating to day 19 of gestation. There was no apparent maternal, reproductive, or developmental toxicity at any dose. Males treated for eight weeks had increased relative kidney weights in the high dose group but no microscopic changes in testes or epididymides. No gross anomalies were observed in the pups.

The National Institute of Occupational Safety and Health (NIOSH) has recommended that whole diesel exhaust be regarded as potentially causing cancer. This recommendation was based on test results showing increased lung cancer in laboratory animals exposed to whole diesel exhaust.

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12. ECOLOGICAL INFORMATION

ECOTOXICITY:
A series of studies on the acute toxicity of 4 diesel fuel samples were conducted by one laboratory using water accommodated fractions. The range of effective (EC50) or lethal concentrations (LC50) expressed as loading rates were: The 96-hour LC50 for rainbow trout (Salmo gairdneri) is 21-210 mg/l. The 48-hour EC50 for daphnia (Daphnia magna) is 20-210 mg/l. The 72-hour EC50 in alga (Raphidocellus subcapitata) is 2.6-25 mg/l.
ENVIRONMENTAL FATE:
On release to the environment the lighter components of diesel fuel will

generally evaporate but depending on local environmental conditions (temperature, wind, mixing or wave action, soil type, etc.) the remainder may become dispersed in the water column or absorbed to soil or sediment. Diesel fuel would not be expected to be "readily biodegradable". In a modified Strum test (OECD method 301B) approximately 40% biodegradation was recorded over 28 days. However, it has been shown that most hydrocarbon components of diesel fuel are degraded in soil in the presence of oxygen. Under anaerobic conditions, such as in anoxic sediments, rates of biodegradation are negligible.

13. DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by USEPA under RCRA (40CFR261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: GAS OIL
DOT HAZARD CLASS: COMBUSTIBLE LIQUID
DOT IDENTIFICATION NUMBER: UN1202
DOT PACKING GROUP: III

15. REGULATORY INFORMATION

SARA 311 CATEGORIES:	1. Immediate (Acute) Health Effects:	YES
	2. Delayed (Chronic) Health Effects:	YES
	3. Fire Hazard:	YES
	4. Sudden Release of Pressure Hazard:	NO
	5. Reactivity Hazard:	NO

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory

lists indicated.

FUELS, DIESEL, NO. 2
is found on lists: 19,30,
KEROSINE
is found on lists: 02,10,11,

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows:
DIESEL FUEL
WHMIS CLASSIFICATION:
Class B, Division 3: Combustible Liquids
Class D, Division 2, Subdivision B: Toxic Material
-Skin or Eye Irritation

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16. OTHER INFORMATION

NFPA RATINGS: Health 0; Flammability 2; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
This revision updates Sections 1, 5, & 9.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	- Threshold Limit Value	TWA	- Time Weighted Average
STEL	- Short-term Exposure Limit	TPQ	- Threshold Planning Quantity
RQ	- Reportable Quantity	PEL	- Permissible Exposure Limit
C	- Ceiling Limit	CAS	- Chemical Abstract Service Number
A1-5	- Appendix A Categories	()	- Change Has Been Proposed
NDA	- No Data Available	NA	- Not Applicable

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

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Roseville Energy Park

Appendix 8.5-B
Plot Plan Showing Hazardous Materials Storage Locations

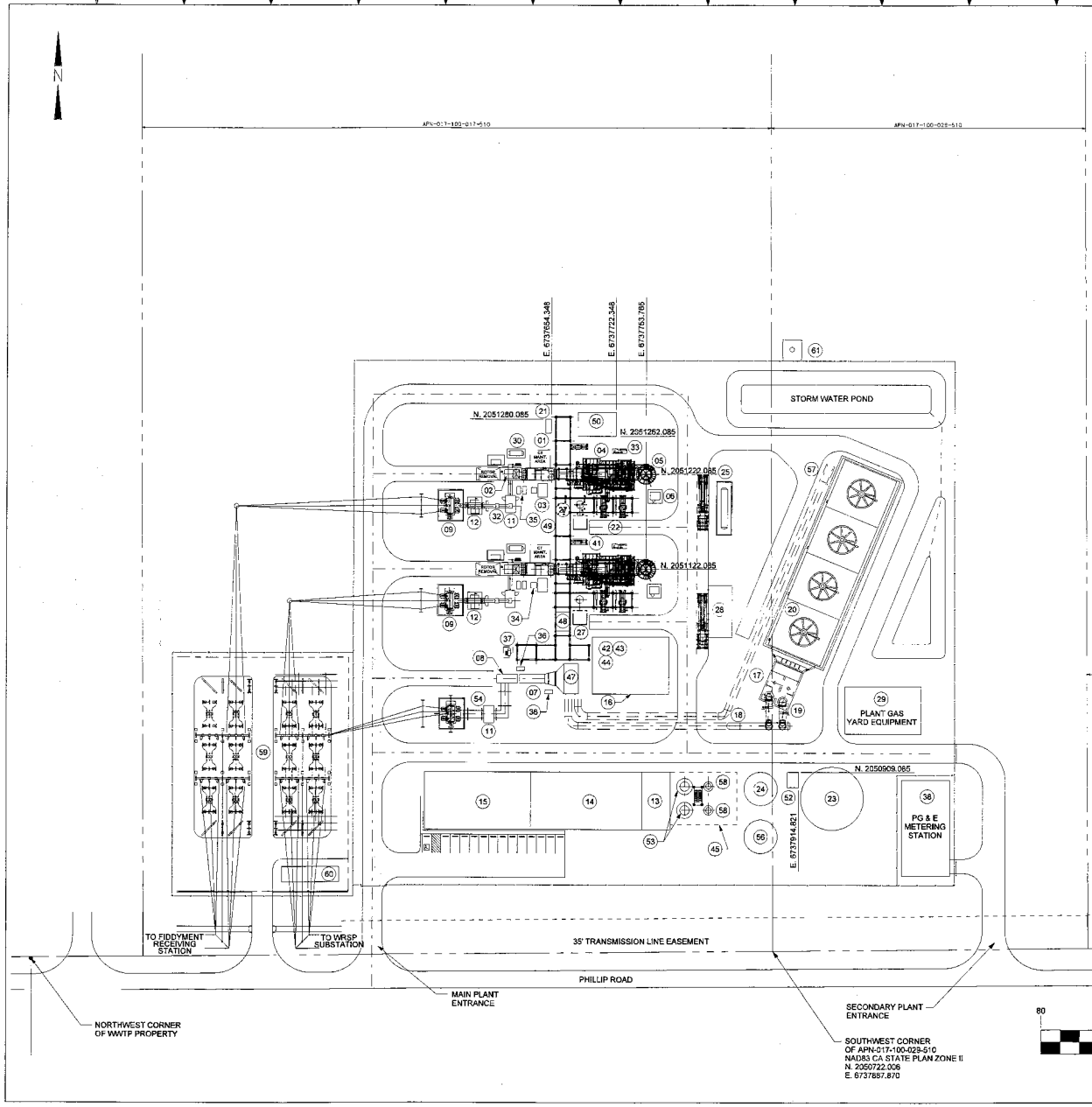
October 2003

Roseville Energy Park
Application for Certification

Table 8.5-B1. REP hazardous materials storage locations.

Chemical	Use	Storage Location	Map No.
Aqueous Ammonia (28% NH_3 +72% H_2O)	Controls nitrogen oxides (NOx) emissions through selective catalytic reduction	Outdoors in the ammonia unloading/storage area	25
Sulfuric Acid (H_2SO_4) (93%)	Circulating water pH control (cooling water treatment and ZLD area)	Cooling tower chemical feed and ZLD area	28, 45
Sodium Hypochlorite (NaOCL) (Industrial Bleach)	Circulating water biological control	Cooling tower chemical feed area	28
Sodium Bromide (NALCO 7342)	Circulating water biological control	Cooling tower chemical feed area	28
NALCO TRASAR 23263	Circulating water mineral dispersant	Cooling tower chemical feed area	28
Sodium Tolyltriazole and Phosphate (NALCO 8305+)	Circulating water corrosion control	Cooling tower chemical feed area	28
Stabalized Bromine (NALCO STABREX ST70)	Circulating water biological control	Cooling tower chemical feed area	28
Isothaiazoline (NALCO 7330)	Circulating water biological control	Cooling tower chemical feed area	28
Sodium nitrite and molybdate (NALCO 8322)	Closed loop cooling water corrosion control	Contained within cooling water piping	28
Trisodium phosphate (NALCO 7208)	HRSG steam side pH and scale control	Cycle chemical feed building	43
Sodium Sulfate	Brine concentrator water chemistry adjustment	Outdoors in ZLD area	45
Calcium Sulfate	Brine concentrator initial startup seeding	Outdoors in ZLD area	45
Chelating Agents (EDTA)	Brine concentrator cleaner	Outdoors in ZLD area	45
Anti-Foam (e.g., NALCO 71 D5 ANTIFOAM)	Brine concentrator to control foaming	Outdoors in ZLD area	45
NALCO ELIMIN-OX	Steam side oxygen scavenger for corrosion control	Cycle chemical feed building	43
Cyclohexylamine and morpholine (NALCO 356)	Condensate and steam pH control	Cycle chemical feed building	42
Sodium Bisulfite	Dechlorination upstream of reverse osmosis unit	Water treatment building	13
Lubricating Oil (synthetic and mineral)	Rotating equipment	Contained within equipment and associated storage tanks	1, 7
Mineral Insulating Oil	Step-up and auxiliary transformers	Contained within transformers (9) and (12)	9, 12
Hydraulic Oil	High-pressure combustion turbine starting system, turbine control valve actuators	Contained within equipment and associated storage tanks	1, 7
Propylene Glycol	Anti-freeze for closed loop cooling water system	Contained within cooling system piping	28
Sulfur Hexafluoride	Switchyard circuit breakers	Switchyard	59
Diesel Fuel	Fuel for engine-driven fire pump and standby generator	Fire pump and standby generator	52, 21
Various Cleaning Chemicals	Periodic chemical cleaning of HRSGs and combustion turbines	Water treatment building//laboratory)/maintenance building	13, 42, 14
Various Laboratory Reagents	Laboratory water analysis	Water treatment sample lab	42

Roseville Energy Park
Application for Certification



LEGEND

33 AMMONIA INJECTION SKID
34 SPRINT SKID
35 WATER INJECTION SKID
36 ST AUXILIARY SKIDS
37 FUTURE 12kV - 480V TRANSFORMER
38 GAS METERING YARD
39 EXCITATION TRANSFORMER (STG) (NOT SHOWN)
40 PLANT BATTERIES & CHARGERS
41 DUCT BURNER SKID
42 SAMPLE PANEL & LAB
43 CYCLE CHEMICAL FEED
44 ELECTRICAL SWITCHGEAR
45 ZERO LIQUID DISCHARGE SYSTEM AREA
46 WASTEWATER SUMP (NOT SHOWN)
47 CONDENSER
48 AIR COMPRESSOR PACKAGE (UNDER PIPE RACK)
49 PIPE RACK
50 AUXILIARY BOILER
51 AUX TRANSFORMER 4160-480 V (NOT SHOWN)
52 FIRE PUMP SKID
53 BRINE CONCENTRATORS
54 ISO PHASE BUS DUCT
55 CONDENSATE PUMPS (NOT SHOWN)
56 COOLING TOWER BLOWDOWN STORAGE TANK
57 OILY WATER SEPARATOR
58 CRYSTALLIZERS
59 ELECTRICAL SWITCHYARD
60 SWITCHYARD CONTROL BUILDING
61 POTABLE WATER WELL (LOCATION IS APPROXIMATE)

1 COMBUSTION TURBINE (CT)
2 CT GENERATOR
3 CT AUXILIARY SKID
4 HEAT RECOVERY STEAM GENERATOR (HRSG)
5 HRSG STACK
6 CONTINUOUS EMISSIONS MONITORS (CEMS)
7 STEAM TURBINE
8 ST GENERATOR
9 GENERATOR STEPUP TRANSFORMER
10 GENERATOR CIRCUIT BREAKER
11 GENERATOR CIRCUIT BREAKER
12 UNIT AUXILIARY TRANSFORMER
13 WATER TREATMENT BLDG
14 WAREHOUSE/MAINTENANCE BLDG
15 ADMIN/CONTROL ROOM BLDG
16 PLANT ELECTRICAL BUILDING
17 AUX COOLING WATER PUMPS
18 CIRCULATING WATER PIPING
19 CIRCULATING WATER PUMPS
20 COOLING TOWER
21 STANDBY GENERATOR
22 BOILER FEED PUMPS
23 SERVICE / FIRE WATER STORAGE TANK
24 DEMIN. WATER STORAGE TANK
25 AMMONIA STORAGE TANK
26 SWITCHYARD CONTROL BUILDING (NOT SHOWN)
27 BLOWDOWN TANK & SUMP
28 COOLING TOWER CHEMICAL FEED BUILDING
29 FUEL GAS COMPRESSOR AREA
30 WATER WASH SUMP
31 WATER WASH SKID (NOT SHOWN)
32 NON-SEGREGATED BUS DUCT

REV	DATE	DESCRIPTION	DRAWN	CHECKED	ENGINEER	PROJECT ENGINEER	PROJECT MANAGER

DRAWN BY DATE
CHECKED BY DATE
ENGINEER DATE
PROJECT ENGINEERING MANAGER DATE
PROJECT MANAGER DATE

CALPINE Power Services

PROJECT NO.

ROSEVILLE ELECTRIC
ROSEVILLE ENERGY PARK
SITE LAYOUT

SCALE 1" = 50'-0"

DWG. NO. RE-S-1001

REVISION K

17-OCT-2003

24x36

Roseville Energy Park

Appendix 8.7-A
Noise Modeling Parameters

October 2003

Roseville Energy Park
Application for Certification

Roseville Energy Park
Sound Power Levels of Vertical Area Sources (Walls)

Name	Result. PWL Day (dBA)	Result. PWL Night (dBA)	Result. PWL" Day (dBA)	Result. PWL" Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Correction Night dB(A)	Sound Reduction R	Sound Reduction Area (m²)	Attenuatio	Operating Time Day (min)	Operating Time Special (min)	Operating Time Night (min)	K0 (dB)	Freq. (Hz)
Air Inlet E	84.4	84.4	60.3	60.3	Lw	WETIN		0	0								0
Air Inlet W	84.4	84.4	60.3	60.3	Lw	WETIN		0	0								0
CTG 1N	95.9	95.9	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG 1S	95.9	95.9	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG 1W	93.5	93.5	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG 2N	95.9	95.9	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG 2S	95.9	95.9	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG 2W	93.5	93.5	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 1E	98.2	98.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 1N	102.2	102.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 1S	102.2	102.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 1W	98.2	98.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 2E	98.2	98.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 2N	102.2	102.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 2S	102.2	102.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
CTG w/ Inlet Air Filters 2W	98.2	98.2	81.9	81.9	Lw"	CTG_LM6000		0	0								0
HRSG 1N	100.3	100.3	74.7	74.7	Lw"	HRSG		0	0								0
HRSG 1NE	88.2	88.2	74.7	74.7	Lw"	HRSG		0	0								0
HRSG 1S	100.3	100.3	74.7	74.7	Lw"	HRSG		0	0								0
HRSG 1SE	88.1	88.1	74.7	74.7	Lw"	HRSG		0	0								0
HRSG 2N	100.3	100.3	74.7	74.7	Lw"	HRSG		0	0								0
HRSG 2NE	88.2	88.2	74.7	74.7	Lw"	HRSG		0	0								0
HRSG 2S	100.3	100.3	74.7	74.7	Lw"	HRSG		0	0								0
HRSG 2SE	88.1	88.1	74.7	74.7	Lw"	HRSG		0	0								0
Inlet Duct 1E	100.9	100.9	82.1	82.1	Lw"	DUCT		0	0								0
Inlet Duct 1N	98.4	98.4	82.1	82.1	Lw"	DUCT		0	0								0
Inlet Duct 1S	98.4	98.4	82.1	82.1	Lw"	DUCT		0	0								0
Inlet Duct 1W	93.5	93.5	82.1	82.1	Lw"	DUCT		0	0								0
Inlet Duct 2E	100.9	100.9	82.1	82.1	Lw"	DUCT		0	0								0
Inlet Duct 2N	98.4	98.4	82.1	82.1	Lw"	DUCT		0	0								0
Inlet Duct 2S	98.4	98.4	82.1	82.1	Lw"	DUCT		0	0								0
Inlet Duct 2W	93.5	93.5	82.1	82.1	Lw"	DUCT		0	0								0

Roseville Energy Park
Sound Power Levels of Point Sources (Pumps & other small equipment)

Name	Result. PWL Day (dBA)	Night (dBA)	Lw / Li Type	Value	norm. dB(A)	Correction Day dB(A)	Night dB(A)	Sound Reduction R	Area (m²)	Attenuatio	Operating Time Day (min)	Special (min)	Night (min)	K0 (dB)	Freq. (Hz)	Direct.	Height (m)		Coordinates X (m)	Y (m)	Z (m)
BFP 1a	103.9	103.9	Lw	BFP		0	0								0	(none)	2	r	-187.86	168.23	2
BFP 1b	103.9	103.9	Lw	BFP		0	0								0	(none)	2	r	-181.7	168.23	0
BFP 2a	103.9	103.9	Lw	BFP		0	0								0	(none)	2	r	-187.86	137.75	2
BFP 2b	103.9	103.9	Lw	BFP		0	0								0	(none)	2	r	-181.7	137.75	0
Circ Pump 1	101	101	Lw	CIRCPUMP		0	0								0	(none)	3.05	r	-134.91	107.55	3.05
Circ Pump 2	101	101	Lw	CIRCPUMP		0	0								0	(none)	3.05	r	-130.51	105.79	3.05
Condenser	104.1	104.1	Lw	CONDENS		0	0								0	(none)	9.1	r	-198.51	113.2	9.1
CTWR Fan 1	104.5	104.5	Lw	FAN		0	0								0	(none)	13.41	r	-105.54	172.68	13.41
CTWR Fan 2	104.5	104.5	Lw	FAN		0	0								0	(none)	13.41	r	-111.69	157.73	13.41
CTWR Fan 3	104.5	104.5	Lw	FAN		0	0								0	(none)	13.41	r	-117.67	142.96	13.41
CTWR Fan 4	104.5	104.5	Lw	FAN		0	0								0	(none)	13.41	r	-124.01	128.18	13.41
Gas Compressor 1	112	112	Lw	GASCOMP		0	0								0	(none)	2.5	r	-100.79	104.03	2.5
Gas Compressor 2	112	112	Lw	GASCOMP		0	0								0	(none)	2.5	r	-93.93	103.68	2.5
GSUT 1	98.4	98.4	Lw	TRANS		0	0								0	(none)	3	r	-236.93	168.94	3
GSUT 2	98.4	98.4	Lw	TRANS		0	0								0	(none)	3	r	-236.93	138.46	3
GSUT 3	98.4	98.4	Lw	TRANS		0	0								0	(none)	3	r	-236.4	101.92	3
ST Generator	85.1	85.1	Lw	STGCOND1		0	0								0	(none)	9.1	r	-218.47	113.1	9.1
Stack Outlet 1	95.5	95.5	Lw	STK_DIR		0	0								0	(none)	37.6	r	-174.41	178.72	37.6
Stack Outlet 2	95.5	95.5	Lw	STK_DIR		0	0								0	(none)	37.6	r	-174.41	148.24	37.6
STG	108.5	108.5	Lw	STEAM		0	0								0	(none)	9.1	r	-210.98	113.1	9.1
ZLD-Concentrator	0	0	Lw			0	0								0	500 (none)	24.4	r	-157.95	76.95	24.4
ZLD-Crystalizer	0	0	Lw			0	0								0	500 (none)	21.3	r	-154.96	77.12	21.3
ZLD-Filter Press	0	0	Lw			0	0								0	500 (none)	5.5	r	-154.96	74.13	5.5
ZLD-Vapor Compressor	105.7	105.7	Lw	ZLD_COMP		0	0								0	(none)	2.4	r	-157.78	74.31	2.4

Roseville Energy Park
Source PWL Spectra

Name	Oktave Spectrum (dB) Weight.	31.5	63	125	250	500	1000	2000	4000	8000	A	lin	Source
Boiiler Feed Pump		97	103	101	100	99	98	97	96	92	103.9	108.6	Pico
Circulating Pump		88	90	92	93	93	93	98	88	81	101	102.1	Pico
Condenser		100	106	105	103	104	98	93	88	84	104.1	111.3	Pico
Cooling Fan		111	109	108	104	101	100	96	90	83	104.5	115.1	Pico
Dry Inlet		94	90	88	83	80	79	76	68	61	83.7	96.6	Pico
Duct		101	96	90	88	78	67	63	53	35	82.1	102.6	Pico revised
Gas Compressor		113	113	110	105	106	103	106	105	104	112	118.4	Pico
Gas Compressor Building - 18 ga		90	90	87	82	83	80	83	82	81	89	95.4	Pico
Gas Compressor Building with Attenuation built in		87	81	72	61	56	47	44	37	30	60.8	88.1	Pico
HRSG		82	82	79	80	74	60	52	47	33	74.7	87.2	Pico
LM6000		90	89	85	84	77	74	73	74	64	81.9	94	Pico revised
Stack		123	118	110	106	96	79	70	65	55	100.7	124.4	Pico
Stack w/Directivity for 90 Degrees		121	115	106	100	88	69	58	51	39	95.5	122.1	T. Adams (emails 8/13/03)
Steam Turbine		111	117	115	110	106	102	99	91	85	108.5	120.4	Pico
STG & Condenser as Area Source		86.4	92.4	90.4	86.4	83.4	78.4	75.4	68.4	63.4	85.1	96.1	Pico
STG & Condenser in a Building		91.4	90.4	82.4	72.4	63.4	52.4	43.4	30.4	19.4	70.3	94.3	Pico
Transformer		95	101	103	98	98	92	87	82	75	98.4	107	Pico
Wet Inlet		85	83	82	77	77	78	78	77	76	84.4	90	Pico revised
ZLD Compressor		106	100	103	101	97	98	102	96	86	105.7	110.6	Gilroy
Boiiler Feed Pump		97	103	101	100	99	98	97	96	92	103.9	108.6	Pico
Circulating Pump		88	90	92	93	93	93	98	88	81	101	102.1	Pico
Condenser		100	106	105	103	104	98	93	88	84	104.1	111.3	Pico
Cooling Fan		111	109	108	104	101	100	96	90	83	104.5	115.1	Pico
Dry Inlet		94	90	88	83	80	79	76	68	61	83.7	96.6	Pico
Duct		101	96	90	88	78	67	63	53	35	82.1	102.6	Pico revised
Gas Compressor		113	113	110	105	106	103	106	105	104	112	118.4	Pico
Gas Compressor Building - 18 ga		90	90	87	82	83	80	83	82	81	89	95.4	Pico
Gas Compressor Building with Attenuation built in		87	81	72	61	56	47	44	37	30	60.8	88.1	Pico
HRSG		82	82	79	80	74	60	52	47	33	74.7	87.2	Pico
LM6000		90	89	85	84	77	74	73	74	64	81.9	94	Pico revised
Stack		123	118	110	106	96	79	70	65	55	100.7	124.4	Pico
Stack w/Directivity for 90 Degrees		121	115	106	100	88	69	58	51	39	95.5	122.1	T. Adams (emails 8/13/03)
Steam Turbine		111	117	115	110	106	102	99	91	85	108.5	120.4	Pico
STG & Condenser as Area Source		86.4	92.4	90.4	86.4	83.4	78.4	75.4	68.4	63.4	85.1	96.1	Pico
STG & Condenser in a Building		91.4	90.4	82.4	72.4	63.4	52.4	43.4	30.4	19.4	70.3	94.3	Pico
Transformer		95	101	103	98	98	92	87	82	75	98.4	107	Pico
Wet Inlet		85	83	82	77	77	78	78	77	76	84.4	90	Pico revised
ZLD Compressor		106	100	103	101	97	98	102	96	86	105.7	110.6	Gilroy

Roseville Energy Park
Obstructions to Noise

Building Structures

Name	RB	Residents	Absorption	Height Begin (m)	
Cooling Tower Deck	x	0		9.1	r
CTG 1		0		4.6	r
CTG w/ Inlet Air Filters 1		0		10.1	r
Inlet Duct 1		0			
HRSG 1		0		19.8	r
Admin/Maint/Water Treat Bldg		0	0.37	7.9	r
Plant Electrical Bldg		0	0.37	4.9	r
Fire Pump House		0	0.37	3	r
CTG 1		0		4.6	r
CTG w/ Inlet Air Filters 1		0		10.1	r
Inlet Duct 1		0			
HRSG 1		0		19.8	r

Cylindrical Structures

Name	Absorption	Center x (m)	Center y (m)	Radius (m)	Height (m)	
CTWR Fan 1		-105.38	172.54	4.9	4.3	r
CTWR Fan 2		-111.59	157.75	4.9	4.3	r
CTWR Fan 3		-117.59	143.07	4.9	4.3	r
CTWR Fan 4		-123.8	128.28	4.9	4.3	r
Stack 1		-174.39	178.7	1.71	36.6	r
Service/Fire Water Storage	0.21	-114.6	74.98	9.86	12.2	r
Demin Water Tank	0.21	-137.55	77.86	5.2	7.32	r
CTWR Blowdown Tank	0.21	-137.64	62.72	5.2	9.8	r
Stack 1		-174.39	148.22	1.71	36.6	r

Roseville Energy Park
Specific Attenuations

Name	Oktave Spectrum (dB)										Source
	31.5	63	125	250	500	1000	2000	4000	8000	Rw	
Roof Directivity	2	3	4	6	8	10	12	14	16	11	LMBE

Roseville Energy Park
Predicted Results at Receptors

Name			Limit. Value		Land Use			Height		Coordinates		
	Day (dBA)	Night (dBA)	Day (dBA)	Night (dBA)	Type	Auto	Noise Type	(m)		X (m)	Y (m)	Z (m)
NE Residence	46.7	46.7	0	0	x		Total	1.5	r	187	582.5	1.5
North Residence	50	50	0	0	x		Total	1.5	r	-165.8	506.7	1.5
NW Residence	50.6	50.6	0	0	x		Total	1.5	r	-453.5	361.7	1.5

Roseville Energy Park
Sound Power Levels of Horizontal Area Sources (Roofs)

Name	Result. PWL		Result. PWL"		Lw / Li			Correction		Sound Reduction		Attenuatio	Operating Time			K0	Freq.
	Day	Night	Day	Night	Type	Value	norm.	Day	Night	R	Area		Day	Special	Night		
	(dBA)	(dBA)	(dBA)	(dBA)			dB(A)	dB(A)	dB(A)		(m²)		(min)	(min)	(min)	(dB)	
CTG 1R	85.4	85.4	73.4	73.4	Lw"	CTG_LM6000		0	0			ROOF_DIR					0
CTG 2R	85.4	85.4	73.4	73.4	Lw"	CTG_LM6000		0	0			ROOF_DIR					0
CTG w/ Inlet Air Filters 1R	89.7	89.7	73.4	73.4	Lw"	CTG_LM6000		0	0			ROOF_DIR					0
CTG w/ Inlet Air Filters 2R	89.7	89.7	73.4	73.4	Lw"	CTG_LM6000		0	0			ROOF_DIR					0
HRSG 1R	86.3	86.3	68.1	68.1	Lw"	HRSG		0	0			ROOF_DIR					0
HRSG 2R	86.3	86.3	68.1	68.1	Lw"	HRSG		0	0			ROOF_DIR					0
Inlet Duct 1R	93.9	93.9	76.3	76.3	Lw"	DUCT		0	0			ROOF_DIR					0
Inlet Duct 2R	93.9	93.9	76.3	76.3	Lw"	DUCT		0	0			ROOF_DIR					0

Roseville Energy Park
Application for Certification

Roseville Energy Park

Appendix 8.7-B
Noise Complaint Resolution Form

October 2003

Roseville Energy Park
Application for Certification

Appendix 8.7-B. Noise Complaint Resolution Form.

NOISE COMPLAINT RESOLUTION FORM **ROSEVILLE ENERGY PARK** **ROSEVILLE, CALIFORNIA**
Complainant's name and address:
Date complaint received: Time complaint received:
Nature of noise complaint:
Definition of problem after investigation by plant personnel:
Initial noise levels at 3 feet: _____ dBA Initial noise levels at the complainant's property: _____ dBA Final noise levels at 3 feet: _____ dBA Final noise levels at the complainant's property: _____ dBA
Description of corrective measures taken:
This information is certified to be correct: Plant Manager's Signature
Approximate installed cost of corrective measures: Date installation completed: Date first letter sent to complainant: (copy attached) Date final letter sent to complainant: (copy attached) *(Attach additional pages and supporting documentation, as required.)*

Roseville Energy Park
Application for Certification

Roseville Energy Park

Appendix 8.8-A
Paleontological Resources Location Data and Map

(Filed under a request for confidentiality)

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 8.8-A
PALEONTOLOGICAL RESOURCES

The Paleontological Resources location data and map have been submitted to the CEC under separate cover with a request for confidentiality.

Roseville Energy Park
Application for Certification

Roseville Energy Park

Appendix 8.14-A
Phase I Environmental Site Assessment
Pleasant Grove Waste Water Treatment Plant (including REP)

October 2003

Roseville Energy Park
Application for Certification

EARTHTEC ltd.
GEOTECHNICAL ENGINEERS • GEOLOGISTS
GEOENVIRONMENTAL CONSULTANTS

PHASE I ENVIRONMENTAL SITE ASSESSMENT UPDATE
PLEASANT GROVE WASTEWATER TREATMENT PLANT
PHILLIP ROAD
PLACER COUNTY, CALIFORNIA
APN: 17-100-20, 27, 18, 17, 29, 30, 31, 15, 35, 34, and 28

EARTHTEC, LTD.
JOB NO. 398022

Prepared for:

MR. ARTHUR J. O'BRIEN, P.E.
CITY OF ROSEVILLE
ENVIRONMENTAL UTILITIES DEPARTMENT
2005 HILLTOP CIRCLE
ROSEVILLE, CALIFORNIA 95747

January 7, 1999

Prepared by:

Nicholas Hinz
Geotechnician

1830 Vernon Street, Suite 7 • Roseville, CA 95678 • (916) 786-5262 • Fax (916) 786-5263 • E-mail: earthtec@pacbell.net

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PHASE I ENVIRONMENTAL SITE ASSESSMENT UPDATE
PLEASANT GROVE WASTEWATER TREATMENT PLANT
PHILLIP ROAD
PLACER COUNTY, CALIFORNIA
APN: 17-100-20, 27, 18, 17, 29, 30, 31, 15, 35, 34, and 28

INTRODUCTION AND SCOPE OF WORK

In accordance with our contract with the City of Roseville, this report presents a review and update of our earlier Phase I Environmental Site Assessment (PESA) (dated May 20, 1998) and PESA Addendum dated (September 9, 1998). The principal focus of this report are the results of assessing new property that may be added to the area (hereafter referred to as the "subject site") involved with the proposed waste water treatment plant. The PESA dated May 20, 1998 described the subject site as consisting of the northeasterly 106± of a larger 556± acre parcel that constitutes APN 17-200-20. Also described in the addendum was a pipeline easement that will occupy the east 30 feet of a parcel to the north (APN 17-100-30) and then continuing 150 feet (north) onto an adjoining parcel (APN 17-100-33), terminating at Pleasant Grove Creek. Additional property that may be involved includes APNs 17-100-15,17-100-17,17-100-18, 17-100-27, 17-100-28, 17-100-29, 17-100-30, 17-100-31, 17-100-34, and 17-100-35.

The parcels compromising the subject site are located along Phillip Road approximately one mile west of Fiddyment Road.

The purpose of our study was to assess the potential for contamination of the subject site utilizing the ASTM E 1527 standard as a guideline. Our scope of work was limited to: (1) performing a drive-by survey of newly added properties and surrounding lands to identify obvious potential sources of contamination; (2) interviewing the current and former owners of the properties to identify potential sources of contamination through the recent past; (3) reviewing historical aerial photographs; (4) reviewing the regulatory agency lists more specifically enumerated under "Governmental Agencies' Lists Reviewed"; and, (5) issuing this report of findings.

This report is intended to serve as a screening device for environmental risk associated with present and past property use. It should be noted that the degree of examination represented by a "Phase I Environmental Site Assessment Update" is not intended to be used as an exhaustive and comprehensive investigation for every conceivable and possible environmental hazard and EARTHTEC, Ltd. does not so imply.

SITE RECONNAISSANCE AND SITE DESCRIPTION

The subject site as described in the PESA report dated May 20, 1998 and the PESA addendum dated September 9, 1998 has not undergone significant change since the time of those reports.

The additional property includes parcels compromising the north one-half of the northeast one-quarter of section 23 and the west three-fourths of section 24 township 11 north, range 5 east. At the time of our reconnaissance the general area was gently rolling grassland with some trees spaced along Pleasant Grove Creek and some of its tributaries.

Parcel 17-100-27 had one shed with a couple of trailers parked nearby on the northeast corner of the property. A horse and an animal boarding/training/grooming center occupied about one-half of parcel 17-100-28. The remainder of the parcel was covered with grass and a few trees.

Parcel 17-100-18 had a house, shed, goat pen, goat shed, a pole mounted transformer and general junk piles situated near the house on the southern half of the property. The northern half of the property appeared to be open grassland, although the house, sheds and junk blocked a clear view of the north half of the parcel from Phillip Road.

Parcel 17-100-29 was open grassland. Parcel 17-100-30 had a mobile home and barn at the north end. A dirt road connected the residence with Phillip Road to the south across the west portion of 17-100-31. Parcel 17-100-30 was otherwise open grassland. Parcel 17-100-31

contained one mobile home, with a pole mounted transformer, on the east portion of the property. A drainage ditch ran from the southeast corner, north along the east edge of the parcel and then northwest toward Pleasant Grove Creek across the north one-third of the parcel. A dirt road ran the length of the parcel along the border with parcel 17-100-15.

Parcel 17-100-15 had a small weathered structure located near a couple of trees on the center of the property. A dirt road connected the building with Phillip Road. The property was otherwise open grassland. Parcel 17-100-35 appeared to be open grassland with a few scattered trees. A full view of both parcels was not attainable from Phillip Road.

Parcel 17-100-34 had several buildings including a house on the north central portion of the property. A significant number of trees were located along a meandering, northwest flowing, seasonal drainage on the north half of the property.

The surrounding areas, for the most part, remain large agricultural parcels.

INTERVIEWS WITH CURRENT AND PREVIOUS PROPERTIES OWNERS

Chain of title information was provided by Placer Title Company. A copy of the documents is provided in Appendix D.

The title information indicates that the Fiddyment family owned all parcels that may be added to the subject site prior to 1946. Today, only parcels 17-100-34 and 17-100-35 are owned by the Fiddyment family. On December 23, 1998, we contacted John S. Fiddyment, a member of the Fiddyment Family Partnership, the owner of these two parcels and asked him the questions contained in the "Environmental Questionnaire for Commercial and Industrial Properties". John S. Fiddyment said that he has been familiar with these parcels for most of his life and that the original Fiddyment ranch was purchased in the mid 1800s. A significant portion of the property has been grazed for approximately 150 years. Waste materials consisting entirely of animal products have been buried on site. There is a high probability that small scale spills and leaks of chemicals have occurred over time from the use of farm machinery. General pesticides and insecticides (such as fly sprays for livestock) have been used and stored on site. It is also likely that some pesticides and fuels are still stored on these parcels in small quantities, at the time of this report. Multiple fuel storage tanks (above ground and/or underground) were used on the property, but were removed around 1970 to 1972. Presently, there are two homes on this property. The family home and barn located on the north central portion of the property were

built in 1948. Five septic tanks and one or two pole mounted transformers service the residences. A northwest/southeast trending landing strip is located on the west half of parcel 17-100-35 and extends south onto the northern portion of parcel 17-100-34.

On June 11, 1959 Ronald D. Leineke acquired parcels 17-100-15, 17-100-17, 17-100-18, 17-100-27, 17-100-28, 17-100-29, 17-100-30, and 17-100-31 from Russel F. and Jean Fiddyment. These parcels changed hands several times until they were sold individually by H St. Apartments, Inc. in 1967. On March 23, 1967 Don P. Liebengood acquired parcel 17-100-18, and Tom Liebengood acquired parcels 17-100-27 and 17-100-28 from H St. Apartments, Incorporated. Parcel 17-100-18 changed hands several times until the present owners, Kamran and Shida Nikbakhsh-Tali, acquired the property on January 15, 1988. We were unable to locate these people.

Ownership of parcels 17-100-27 and 17-100-28 also changed hands several times after being sold by H St. Apartments, Incorporated. Argel (Archie) L. and Willa O'Brien, the present property owners were contacted on December 23, 1998. Archie O'Brien was asked the questions on the "Environmental Questionnaire for Commercial and Industrial Properties". He has been familiar with this property since he and his wife purchased the property on January 19, 1979. Their house was built in 1966 on parcel 17-100-28 along with an animal boarding/training/grooming center. Parcel 17-100-27 remains undeveloped. According to Archie O'Brien, there is a significant possibility that some contamination may be present on parcel 17-100-17 located to the east. Apparently there were close to 100 cars and trucks and other junk located on the

property. The neighbors then complained to the county who issued a citation to Euel D. Keith, Junior. Parcel 17-100-17 was then partially cleaned up.

Jules Oakley acquired parcels 17-100-15 and 17-100-17 from H St. Apartments, Inc. on March 29, 1967. On November 24, 1970, Herman B. Kurtz and Shirley L. Kurtz obtained parcel 17-100-15 from Jules Oakley and held this property to present. Herman B. Kurtz was asked the questions of the "Environmental Questionnaire for Commercial and Industrial Properties" on January 5, 1999. All the answers were in the negative. A barn and chicken shed were built about 20-25 years ago and remain virtually unused.

On May 25, 1971, Euel D. Keith, Jr. and Janet L. Keith acquired parcel 17-100-17 from Jules Oakley. Since that time Janet L. Keith has become deceased and Euel D. Keith remains the sole owner of this parcel. We were unable to located this individual.

On March 29, 1967, H St. Apartments, Inc. granted parcels 17-100-29, 17-100-30, and 17-100-31 to John A. Lucian. These three parcels changed hands many times, but remained grouped with a single owner or group of owners. Amer Jeet and Parminder Kahlon, the current owners of these parcels, acquired this property from Nona D. Glenn on November 9, 1995. We were unable to locate these people.

AERIAL PHOTO REVIEW

Black and white aerial photographs were reviewed at the Placer County Department of Public Works, located in Auburn, California. These photos may be used to provide an indication of past land uses on and around the subject site. Coverage included photos taken in 1964, 1971, 1984, 1987, and 1993.

The 1964 and 1971 photos show little change in the area. Several groups of buildings with interconnecting dirt roads can be seen at the center of the Fiddyment Farm (parcel 17-100-34 and 17-100-35). The beginnings of an air strip described by John S. Fiddyment can be seen in the 1971 photo. The principal activity on this property appears to be grazing. Some rice farming is evident bordering the north side of Pleasant Grove Creek. A portion of this rice field is on parcel 17-100-35. With respect to the remaining parcels forming the focus of this report, they appear as undeveloped grassland. In the 1971 photo, the contrast of parcel 17-100-28 is noticeably different than the surrounding ground.

In the 1984, 1987, and 1993 photos, the parcels appear nearly as they appear today. The buildings, trees, and dirt roads encountered in the field reconnaissance are consistent with the air photos. In the 1984 photo, the photo contrast of parcel 17-100-18 is noticeably different than

the surrounding ground. Some buildings on the Fiddyment ranch that appeared on the 1964 photo no longer appear on the 1984 photo. In the 1987 photo, the photo contrast of parcel 17-100-17, central portions of parcels 17-100-29 and 17-100-30 and the northern half of parcel 17-100-18 is noticeably different than the surrounding ground. This multiple parcel photo contrast is slightly apparent in the 1993 photo.

No areas of grossly discolored or grossly contaminated soils were observed on the photos. As black and white photos, such areas would not be particularly evident; thus, detailed observations and conclusions pertaining to chemical contamination can not be made using photos of this nature. However, the photos do not indicate any activities on the property or in the immediate vicinity that would, in our opinion, increase the potential of contamination of the property by hazardous substances.

GOVERNMENTAL AGENCIES' LISTS REVIEW

Descriptions of governmental agencies' databases which were searched by Vista Environmental Information are contained in the attached Vista "Site Assessment Update Plus Report" (dated December 16, 1998) - Appendix C. The governmental agencies include the United States Environmental Protection Agency (the "EPA"); the CAL/EPA; California Regional Water Quality Control Board - Central Valley Region (the "RWQCB" or "the Board"); California Integrated Waste Management Board; California Department of Health Services; California Department of Toxic Substances Control; and California Office of Environmental Protection. Hereinafter, the lists of these agencies will be termed "the regulatory agency lists".

The subject site is not listed on any of the regulatory agency lists. Nor are there any NPL (National Priorities List) sites within 1½ miles of the parcel. NPL listings are those requiring remediation under the superfund program and represent the highest priority with respect to contaminated sites. There is one unmapped state leaking underground storage tank (LUST) site in the area. This site is associated with the Del Webb Sun City Roseville development located on Fiddyment Road north of Baseline Road. The site is also listed as Phase One Remedial Investigation.

The "Munger Map Book of the California-Alaska Oil and Gas Fields" (38th Edition, June 1994) indicates an oil and gas well approximately two miles to the west-northwest of the subject site. The well was drilled in 1956 to a depth of 3382 feet and is denoted as uncompleted and abandoned.

EARTHTEC, Ltd. makes no representation or warranty regarding the accuracy, quality or completeness of any data provided by governmental or other entity used by EARTHTEC, Ltd. in the preparation of this report. No claim is made for the actual existence or nonexistence of toxins at the subject or adjacent sites. In any event, EARTHTEC, Ltd. shall not be responsible for any direct, incidental, indirect or consequential damages including loss of profits incurred by any party.

OPINION OF CONTAMINATION POTENTIAL AND RECOMMENDATIONS

Based on the information gained during this phase of investigation, it appears that the subject site may have been subjected to activities that would be of concern. Items of principal concern would be the small "junkyard" on parcel 17-100-17 and the potential for spills and leaks associated with the farming activity on parcels 17-100-35 and 17-100-34. The LUST site located along Fiddyment Road is likely to be located far enough away to avoid concern; however, the extent and type of contamination is unknown.

Another particular item of note are the pole-mounted electrical transformers located on several of the parcels. There is a possibility that the insulating fluids contain PCB's. If there is a concern, the transformers can be tested for PCB's by Pacific Gas and Electric. It is our understanding that PG&E's policy is to replace the transformer at no charge to the requesting party if PCB's are found. If PCB's are not found, the requesting party is charged the cost of the testing.

It is our opinion that there is only a moderate potential for widespread contamination of soils on or groundwater beneath the subject site by hazardous substances of concern (chlorinated and/or petroleum hydrocarbons, polychlorinated biphenyls [PCB's], heavy metals, pesticides, herbicides, and other miscellaneous contaminants). We do recommend more detailed

reconnaissance of parcels 17-100-17 and 17-100-34, and 17-100-35 to further investigate the possibility of contamination of the subject site at this time.

LIMITATIONS

This report has been prepared in accordance with practices generally accepted in the current field of Phase I Environmental Site Assessment Updates. No environmental site Assessment Update can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of this site Assessment Update is intended to reduce but not eliminate uncertainty regarding the existence of recognized environmental conditions in connection with a property, recognizing reasonable limits of time and cost.

The findings of this report are valid as of the current date. Changes in the conditions of the property can occur with site modifications and/or the passage of time. These changes may be due to natural processes or to the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or from the broadening of knowledge. Accordingly, the findings and opinions in this report might be invalidated, wholly or partially, by changes outside of our control.

EARTHTEC, Ltd. warrants that this report was prepared under the supervision of a Registered Environmental Assessor in accordance with professional licensing and regulatory guidelines of the State of California. No other warranty, expressed or implied, is made by **EARTHTEC, Ltd.**

Thank you for the opportunity to provide our environmental consulting services. If you have any questions regarding contents of this report, then please contact us.

Sincerely;
EARTHTEC, Ltd.

Nicholas Hinz
Geotechnician
Reviewed by:

Ed Hendrick, REA 05520
Principal Consultant

Roseville Energy Park

Appendix 8.14-B
Phase II Environmental Site Assessment
Pleasant Grove Waste Water Treatment Plant

October 2003

Roseville Energy Park
Application for Certification

PHASE II ENVIRONMENTAL SITE ASSESSMENT
Pleasant Grove Wastewater Treatment Plant
- Adjacent Properties
Roseville, California

REPORT TO

CITY OF ROSEVILLE
ENVIRONMENTAL UTILITIES DEPARTMENT

2005 HILLTOP CIRCLE
ROSEVILLE, CA 95746

6 April 1999
File No. 4274.1

ANDERSON
CONSULTING
GROUP

631 Commerce Drive
Roseville, CA 95678
(916) 786-8883
(916) 786-7891 fax

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Appendix B - Copy of Earthtec, Inc. Phase I Environmental Assessment Report (text only)

1. INTRODUCTION

The City of Roseville's Environmental Utilities Department retained Anderson Consulting Group (ACG) to perform a limited Phase II environmental site assessment of properties adjacent to the proposed Pleasant Grove Wastewater Treatment Plant in Roseville, California. ACG's Phase II investigation e-sponds to potential contamination issues identified in the Phase I site investigation conducted by Earthtec, Inc., on Placer County Assessor Parcels 17-100-17. 17-100-34, and 17-100-35.

The proposed treatment facility is to be located on Phillip Road, approximately 1 mile west of Fiddyment Road The Vicinity Map included as Figure 1 delineates the location of the treatment facility. The properties investigated in this limited study will be maintained by the City of Roseville as open land around the treatment facility.

To perform this limited study, ACG performed the following scope of work:

- Reviewed the Phase I Environmental Assessment Report for Parcels APN 17-1000-15, 27, 28, 20, 27, 28, 29, 30, 31, 34, and 35, by Earthtec, Ltd., dated 7 January 1999.
- Visited the site to observe current land use and determine if potential indications of contamination on Parcels 17-100-17, 34, and 35, and the presence of pole mounted electrical transformers exist that could be verified by visual observations and laboratory testing of a limited number of samples.
- Obtained and conducted laboratory analysis on soil samples from various locations on Parcel 17-100-17 to determine whether storage of automobiles, drums and other debris has resulted in discharge of hydrocarbon fuels and lubricants.
- The soil samples were analyzed as follows:

Contaminant	No. of Samples
Oil & Grease	4
Diesel	4
Gasoline	4
Benzene	4
Toluene	4
Ethylbenzene	4
Xylenes	4
Heavy Metals	4

- Contacted PG & E with regard to the potential for PCB containing oils in electrical service transformers observed on poles within the parcels.
- Prepared this report to present the results of our investigation, and recommendations for further action that may be warranted.

2. SITE DESCRIPTION

2.1 LOCATION

The proposed Pleasant Grove Wastewater treatment facility site is located on the south side of Phillip Road, approximately 1 mile west of Fiddyment Road, in Placer County, California. According to the United States Geological Survey (U.S.G.S.), 7.5 minute topographic map, the treatment facility and adjacent properties investigated in this study are located in the Pleasant Grove and Roseville Quadrangles, Township 11 North and Range 5, Sections 23 and 24.

The proposed treatment plant site encompasses approximately 110 acres, and is bounded on the north and east by Phillip Road and Parcels 17-100-15, 17, 18, 28, 29, 30, 31, and 34. The Site Map included as Figure 2 shows relative locations of the treatment plant and the adjacent properties investigated in this study.

2.2 SITE GEOLOGY AND MORPHOLOGY

The subject site is located on the eastern edge of the Sacramento Valley, in the northern section of the Great Valley geomorphic province in Northern California. The Great Valley province is an approximately 500 mile long north-northwest trending structural trough that lies between the Sierra Nevada and Coast Range mountain provinces. The Klamath Mountains form the valley's northern boundary, and the Tehachapi Mountains form the southern boundary.

According to the 1981 CDMG Geologic Map of Sacramento Quadrangle, Map, the site is underlain by Riverbank Formation alluvial sediment derived from stream channel, alluvial fan, and lacustrine deposits. Site topography in this area is relatively flat, and properties investigated in this study range from 90 to 110 feet above mean sea level (MSL).

2.3 CURRENT AND PAST PROPERTY USES

2.3.1 Parcel 17-100-17

During our site investigation, we observed two permanent structures within the parcel, house and garage. In conformance with our contract, we did not review the exterior or interior of these structures. We did not review for the presence of lead-based paints, asbestos-containing building materials, or radon gas that may be of concern because of these structures.

The presence of farm machinery, feeding troughs, corrals, and open pasture areas indicate this parcel was used for raising livestock in the past. Although we did not observe any cattle during our site visit, the presence of fresh hay in the stable / corral and fresh cattle dung indicate livestock are still being raised on this parcel.

The presence of roofing materials, equipment such as roofing tar hoppers, and scrap roofing materials indicates a portion of the property is being used to store of roofing construction equipment and debris.

2.3.2 Parcel 17-100-34 and 35

These parcels consisted primarily of open pasture land. We observed an existing farm house and several detached structures in the north central portion of the property. We did not identify evidence of current operations during the site reconnaissance. ACG understands that property use has consisted of livestock grazing for since the 1800's.

The Earthtec, Inc. Phase I report stated the presence of pole-mounted electrical transformers within these parcels was not verified. Our observations served to verify their presence.

3. SITE INVESTIGATION

3.1 PRIOR ENVIRONMENTAL INVESTIGATIONS

ACG is aware of three prior environmental investigations conducted for the Pleasant Grove Wastewater Treatment Plant project.

- As noted in the introduction, this Phase II investigation was conducted as a result of recommendations made in Earthtec's January 7 1999 Phase I site investigation.
- Earthtec, Inc. conducted a Phase I Environmental Site Assessment in May 1998, on the parcel 17-100-20 that includes the wastewater treatment plant site.
- In September 1998, an addendum to the Earthtec, Inc study included portions of 17-100-30 and 17-100-33 for a pipeline easement

3.2 REVIEW OF PHASE I REPORT

ACG reviewed the Phase I Preliminary Site Assessment Report. that included Parcels APN 17-100-17, 17-100-34, and 17-100-35 by Earthtec, Inc., dated January 1999. The Earthtec, Inc. study included review of title documents, aerial photo and topographic map review, and review of governmental agency databases provided by on Vista Environmental Information.

Based on the recommendations in Earthtec's January 1999 Report, ACG limited our Phase II environmental site investigation to the following:

1) possible petroleum product or hydrocarbon contamination on parcel 17-100-17,
2) possible agricultural chemical storage / handling on parcels 17-100-34 and 35 within the treatment plant buffer zone, and
3) several pole-mounted electrical transformers located on parcels within the 1000' boundary.

3.3 RECONNAISSANCE OF SUBJECT PROPERTIES

ACG personnel performed a site reconnaissance of the subject properties on March 19, 1998. During the site reconnaissance, ACG observed the following:

3.3.1 Parcel 17-100-17

The approximately 20 acre parcel is relatively flat, with a very gentle (~ 5 foot elevation change) downward slant toward Pleasant Grove Creek, located north of the property. Figure 3 shows the approximate location of structures and observed features.

Permanent structures on Parcel 17-100-17 on the site consist of one approximately 2500 sq. ft. residence, an adjoining 2 car garage located near the rear of the house and a concrete covered patio. A pole mounted electrical transformer is approximately 50 feet west of the house. Temporary structures include a lean-to type corral located west of the house, a wooden fenced corral and feedlot area north of the house. The property perimeter is fenced except in front of the residence.

Adjacent to the north side of the garage, a wooden fenced area encompasses several apparently inoperable cars, trucks, utility trailers, two roofing tar hoppers, and an approximately 30 foot motor home. The utility trailers are full with wood, metal debris, and appliances. The area outside the residence and wooden fenced area is littered with debris including: roofing and construction debris piles, automotive parts and vehicles, sheet metal, and scrap wood. A 12 by 60 foot mobile trailer appeared to be filled to capacity with stored household and maintenance goods such as books, clothing, toys, small appliances, etc.

We did not observe batteries or evidence of gross petroleum product discharge. The vegetation we observed did not show evidence of distress.

An estimated one hundred fifty to two hundred 55 gallon drums are strewn on the site. Most were empty, some contained what ap-

peared to be burned household trash, some contained rainwater, and three were sealed. Labels on the sides of the sealed drums indicated contents originally consisted of poly resin product containing <3% styrene monomers, according to SCAQMD 1162. Two of the five soil samples taken (SS3 and SS4) were obtained from beneath one of the sealed drums.

3.3.2 Parcels 17-100-34 and 17-100-35

We observed a residential building and several outbuildings at approximately the north center portion of the parcels. Within the 1000 foot buffer zone, the properties appear to be used for pasture land. We did not observe evidence of pesticide storage or contamination. We did not observe pole mounted transformers on either of the parcels. A natural seasonal drainage course appears to traverse the property toward Pleasant Grove Creek.

3.3.3 Pole Mounted Electrical Transformers

We observed six pole mounted electrical transformers on properties with southern boundaries along Phillip Road across from the proposed treatment plant site. The approximate transformer locations are noted on the Site Map, Figure 2.

The transformers are grey, with no apparent evidence of rust or leakage. We were not able to read the approximately 2" x 3" labels on the transformers. Ted Robinson from Pacific Gas and Electric Company, indicated PG & E replaced or retrofitted transformers in the early 1970s to comply with state PCB requirements.

Mr. Robinson indicated transformers in Placer County have either been replaced completely, or retrofitted with non-PCB containing oil. He indicated the only contamination risk from transformers occurs through leakage. If a transformer explodes, or if leakage is observed or suspected, PG&E should be contacted immediately to determine if any contaminant has been released.

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4. ASSESSMENT

ACG's Phase II assessment evaluated the potential indication of contaminants as follows:

- Whether the storage of a large number of automobiles, equipment, and other junk resulted in the discharge of contaminated liquids such as petroleum, oil and grease, or heavy metals;
- Whether pole mounted transformers lie within the property that the City of Roseville has expressed an interest; and
- Whether buildings or other features indicating storage or handling of agricultural chemicals within Parcels 17-100-34 and 35 are located within the property that the City of Roseville has expressed an interest.

4.1 SAMPLING PROCEDURES

We hand excavated each sample location to a depth approximately 1 to 1.5 feet. The samples were collected from the excavated soil and placed in 2" diameter by 3" brass sleeves.

After collecting each soil sample, we sealed the brass sleeves with Teflon tape and plastic caps. We then labeled the samples, to indicate the sample identification, date and time collected, and sampler's identification. We preserved the samples in a chilled cooler during transportation to the laboratory. We completed chain-of-custody documentation at the time of collection to maintain a record of sample collection times and custody of the samples. We attached the chain-of-custody record for the samples collected in Attachment B.

4.2 SAMPLING LOCATIONS AND ANALYSES

We collected five soil samples from the various locations on Parcel 17-100-17 for laboratory analysis. The Figure 3 Site Map Sketch shows the approximate location of each sampling location.

SS-1 - Adjacent to 20 gallon metal can near fenced corral / pond area, The can containing grease, and labeled "hydraulic oil".

SS-2 - Control sample. Taken from open pasture area, more than 10 feet from any debris or machinery.

SS-3 - Beneath 55 gallon sealed drum containing label - (layer below SS-3) depth 6 to 8 inches.

SS-4 - Beneath 55 gallon sealed drum containing label - depth 4 inches.

SS-5 - Within fenced area: from surface dark spot beneath pickup truck

We collected Sample SS-4 from a layer of roofing tar discovered above the depth of 4 inches. Our observation indicated that the tar had been discharged onto soil as a liquid which later hardened to a glass-like texture. We collected sample SS-3 from soil directly beneath the roofing tar represented by SS-4 to evaluate potential migration. Analysis of sample SS-4 was held pending results of sample SS-3.

All samples except SS4-UN-DM were tested for contaminants noted below:

- Oil & Grease
- Heavy Metals (Lead, Cadmium, Nickel, Chromium, Zinc)
- Gasoline
- Benzene
- Toluene
- Ethylebenzene
- Xylenes

4.3 SAMPLE ANALYSIS RESULTS

Tables 1 and 2 summarize the analytical results. We discuss the results in the following report sections.

4.3.1 Petroleum Hydrocarbon Results

Samples SS-3 and SS-5 exhibited levels of oil and grease greater than the Reporting Limit of

50 mg/kg, but less than 100 mg/kg. Each sample analyzed exhibited non-detectable levels of TPH as gasoline and BTEX.

4.3.2 Metal Results

Each of the four samples analyzed for metals exhibited relatively similar results. Cadmium and lead were not present at concentrations greater than their reporting limit. Chromium, nickel and zinc were detected at concentrations above their reporting limits in Samples SS-1, SS-2, SS-3, and SS-5. Refer to Table 2 for details.

5. FINDINGS / CONCLUSIONS

We performed this limited Phase II Environmental Site Assessments in general conformance with the scope and limitations of ASTM Practice E 1527 for the subject property. This assessment evaluated the following evidence of recognized environmental conditions in connection with the properties:

- Whether long term storage of old cars and vehicles, farm equipment and machinery, construction debris, and other junk on Parcel 17-100-17. has resulted in petroleum or hydrocarbon contamination of soil.
- Whether pole mounted transformers lie within the property that the City of Roseville has expressed an interest; and
- Whether buildings or other features indicating storage or handling of agricultural chemicals within Parcels 17-100-34 and 35 are located within the property that the City of Roseville has expressed an interest.

5.1.1 Parcel 17-100-17

Land use on this parcel appears to have primarily been livestock grazing, and secondarily as a storage area for equipment debris. The site was littered with several apparently inoperable vehicles, car / truck parts, construction debris piles consisting of scrap wood, roofing materials, and miscellaneous metal, plastic and fabric junk. While this type debris may be esthetically unpleasant, we did not find evidence to indicate gross contamination from petroleum or hydrocarbon fluids.

Each of the 55 gallon steel drums within Parcel 17-100-17 was visually reviewed. Our review indicated that all but seven of the approximately 150 to 200 drums at the site were open-top. Some of the open top drums were empty, some were filled with paper trash, partially burned, and other drums contained wastes that are reported by the owner for use as livestock feed.

We were able to inspect the contents of all but two of the seven closed top drums. We found that the five drums inspected contained water with no indication of sludge or other liquids. We were unable to open two of the closed-top drums. We reported the label information found on the two drums, but we are not able to verify the drum contents.

5.1.2 Parcels 17-100-34 and 17-100-35.

Land use appears to be agricultural. We did not observe evidence of agricultural chemical storage or handling within the parcels. If the land use or if vegetation conditions change, an environmental site assessment should be conducted to determine the of potential type and extent of human exposure to agricultural chemical contamination. .

5.1.3 Pole Mounted Electrical Transformers

We did not observe evidence of PCB containing oil leaking from transformers. If an explosion or leak occurs on any electrical transformers, PG&E should be contacted immediately to determine if any contamination is present.

6. LIMITATIONS

We base the conclusions in this report on judgment and experience. We performed our professional services in accordance with generally accepted environmental engineering principles and practices currently employed in Northern California at the time we performed our services. No other warranty is expressed or implied.

The accompanying report serves as an instrument of service of Anderson Consulting Group (ACG). It summarizes our findings and relates our opinions with respect to the potential for hazardous materials to exist at the site at levels likely to warrant mitigation pursuant to current guidelines regulated by the State of California, as defined in the Health and Safety Code and the California Code of Regulations. We base our findings and opinions on information obtained and provided on given dates, through records review, site review, and related activities. It is possible for conditions to have changed after our observation. For these and associated reasons, we advise clients that we cannot, under any circumstances, warrant or guarantee that not finding indicators of hazardous materials means that hazardous materials do not exist on the site. Additional research, including invasive testing, can reduce your risk, but no techniques now commonly employed can eliminate these risks.

This report presents the facts about the site as presented to us. It is not intended to identify all potential concerns, be completely comprehensive, or to eliminate the risk involved in property acquisition. Consequently, conditions may arise which may not have been addressed in this report.

We prepared this report for the exclusive use of our client. This report applies only for the subject property. We are not responsible for interpretations by others of the data presented in this report. This report does not represent a legal opinion.

We developed this report with limited subsurface exploration data. Possible subsurface variability of soil, rock, and groundwater may exist at the site.

We do not recommend that you use the governmental records portion of this report as a guideline or decision-making tool after 90 days of the issue date, due to the fact that information drawn from the public record is updated on a continual basis and conditions at a site can change over time. After a 90 day lapse of time, we urge you to update this report to reflect new information which may exist.

Our scope of services did not include determining the presence of asbestos- or radon-containing materials, lead-based paints, endangered species, geologic hazards, archeological sites, or ecologically-sensitive areas such as vernal pools and wetlands.

7. SIGNATURE OF ENVIRONMENTAL PROFESSIONAL

ANDERSON CONSULTING GROUP

Nadine L. Langley, .
Project Geologist

Dennis B. Nakamoto, RG, CEG, CH
Environmental Director

8. QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONAL

DENNIS NAKAMOTO, RG, CEG, CH, Environmental Director

Education: B.S., Geology, University of California, Davis, 1977

Mr. Nakamoto has 20 years of experience in the field of environmental consulting, groundwater and soil investigation, hazardous waste remediation and construction oversight. He has managed projects investigating the presence of petroleum products, heavy metals, industrial solvents, agricultural chemicals, and asbestos in soil and groundwater. His responsibilities have also included implementing Community Relations Plans, and holding public meetings to acquaint the local community with progress on investigations and remedial actions.

His technical expertise includes a familiarity with a wide range of exploratory techniques used in subsurface investigations such as hydropunch sampling, direct coring technicques (geoprobe sampling), selective water zone sampling using cone penetrometers, and the interpretation of borehole geophysical logs, including electrical, temperature, neutron, natural gamma, gamma-gamma, video, acoustic (sonic), and hole size (caliper).

NADINE LANGLEY, Project Geologist, CET

Education: B.A., Geology, California State University, Sacramento, 1993

Ms. Langley has more than five years experience with soil technology, following more than six years in the construction trade. Recent projects have included preliminary site assessments and contaminant investigation, geologic hazard investigation, and geotechnical exploration. Nadine routinely performs tasks that include: developing work and sample plans, obtaining, evaluating, and testing soil samples, laboratory soil analysis, geologic mapping and research, aerial photo analysis, soil boring and trench exploration, seismic refraction surveys, slope monitoring instrumentation, drafting site plans, construction monitoring and testing, data interpretation, and writing reports.

Tables

- Table 1 - Petroleum Hydrocarbon Analytical Results
- Table 2 - Heavy Metal Analytical Results

TABLE 1 - PETROLEUM HYDROCARBON ANALYTICAL RESULTS
(milligrams per kilogram [mg/kg])

Sample	Oil and Grease	Gasoline	Benzene	Toluene	Ethylbenzene	Xylenes
SS-1	< 50	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005
SS-2	< 50	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005
SS-3	90	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005
SS-5	58	< 1.0	< 0.005	< 0.005	< 0.005	< 0.005

"<" - Less than the laboratory reporting limit. Compound may be present in concentrations below the reporting limit.

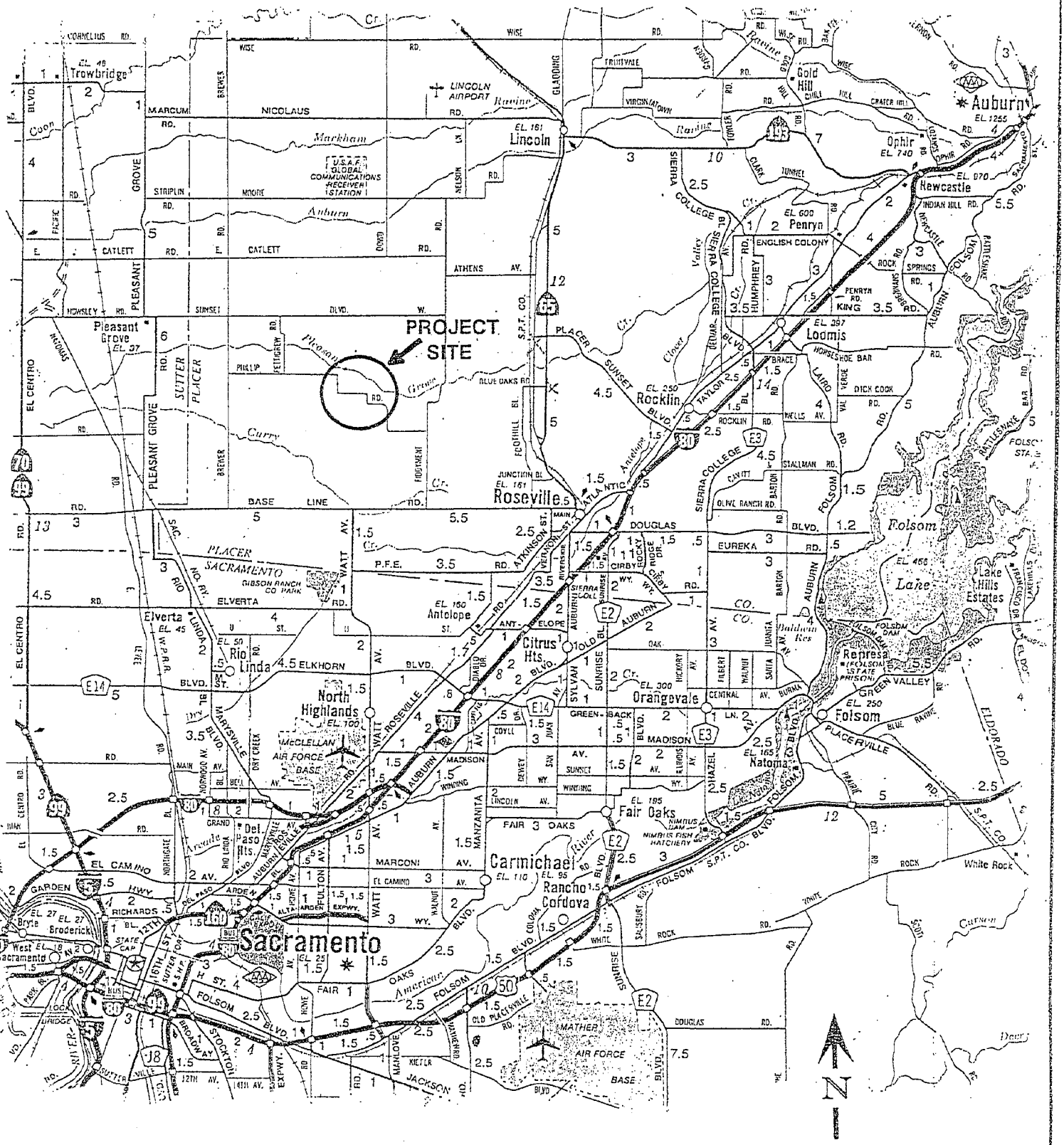
TABLE 5 - HEAVY METAL ANALYTICAL RESULTS
(milligrams per kilogram [mg/kg])

Sample	Chromium	Cadmium	Lead	Nickel	Zinc
SS-1	29.6	< 0.3	< 2.5	24.1	12.3
SS-2	13.8	< 0.3	< 2.5	9.5	12.3
Ss-3	17.5	< 0.3	< 2.5	18.3	25.1
SS-5	16.6	< 0.3	< 2.5	12.3	15.9

"<" - Less than the laboratory reporting limit. Compound may be present in concentrations below the reporting limit.

Figures

- Figure 1 - Vicinity Map
- Figure 2 - Site Plan
- Figure 3 - Sketch Parcel 17-100-17 Site

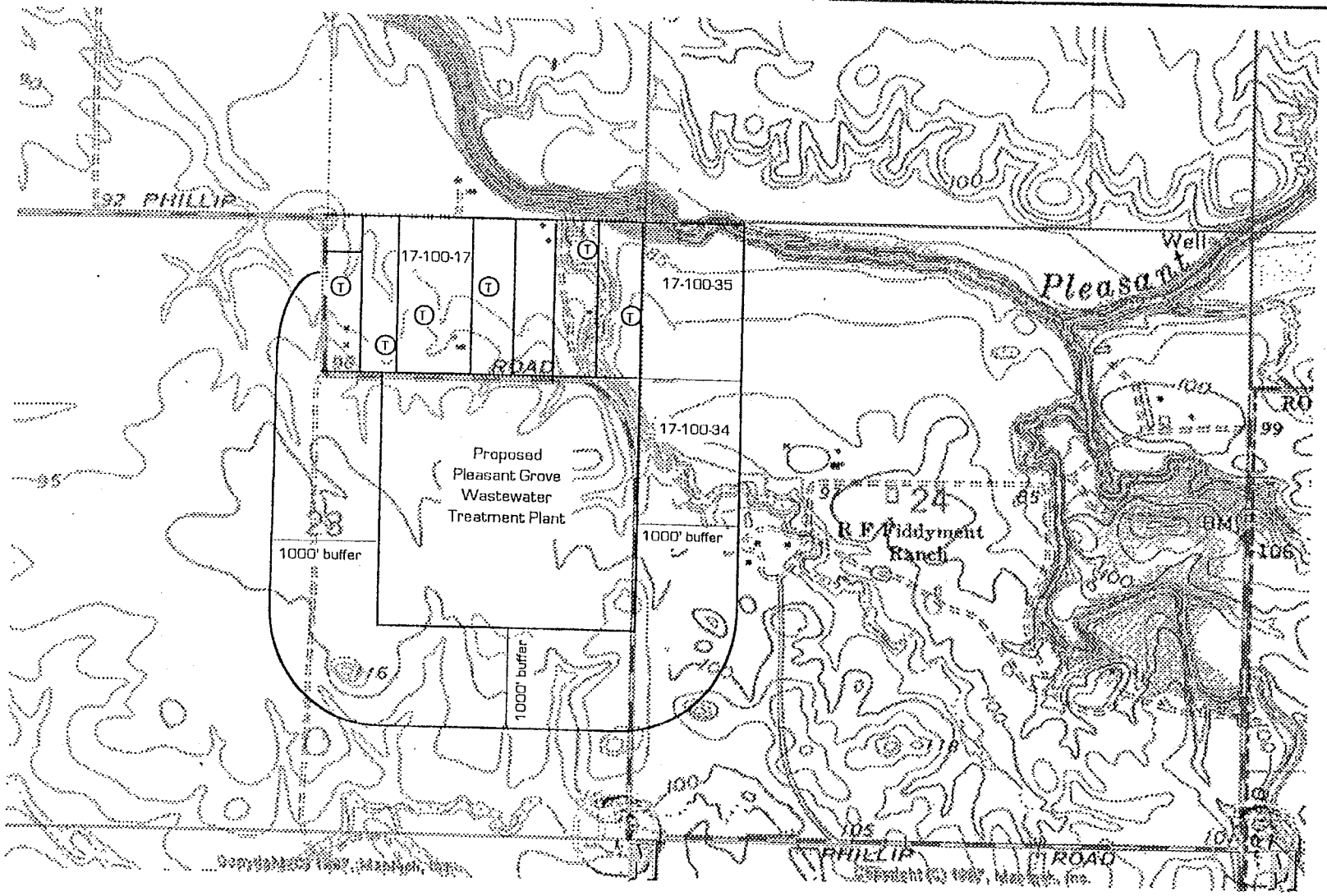


PLEASANT GROVE WASTEWATER TREATMENT PLANT
PHASE II SITE ASSESSMENT - ADJACENT PROPERTIES
Phillip Road, Roseville, Placer County, CA

VICINITY MAP

ANDERSON CONSULTING GROUP
360 Idaho Maryland Road
Grass Valley, CA 95945
(530) 274-3010

File No.	Date	Figure
4274.1	March 1999	1



PLEASANT GROVE WASTEWATER TREATMENT PLANT
PHASE II SITE ASSESSMENT - ADJACENT PROPERTIES
Phillip Road, Roseville, Placer County, CA

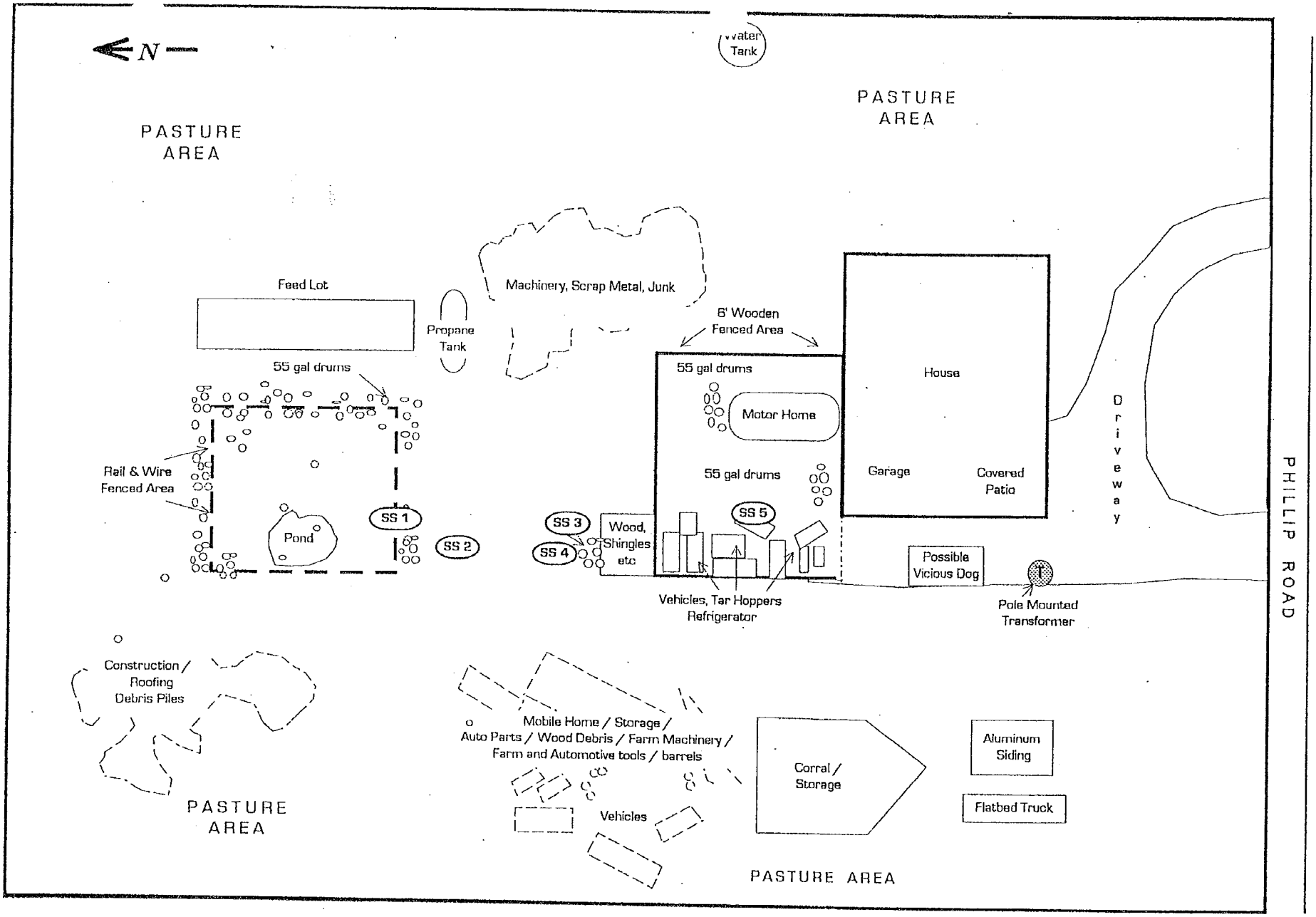
Ⓣ = TRANSFORMER

SITE MAP

Drawn on USGS 7.5 minute TOPO Map Base
Roseville and Pleasant Grove Quadrangles

ANDERSON CONSULTING GROUP
360 Idaho Maryland Road
Grass Valley, CA 95945
(530) 274-3010

File No.	Date	Figure
4274.1	April 1999	2



SITE SKETCH for APN 17-100-17

PLEASANT GROVE WASTEWATER TREATMENT PLANT
PHASE II SITE ASSESSMENT - ADJACENT PROPERTIES
Phillip Road, Roseville, Placer County, CA

(NOT TO SCALE)

ANDERSON CONSULTING GROUP
360 Idaho Maryland Road
Grass Valley, CA 95945
(530) 274-3010

File No.	Date	Figure No.
4274.1	April 1999	3

Appendix A

- Laboratory Data Sheets
- Chain-of-Custody Documentation

EXCELCHEM
ENVIRONMENTAL LABS

500 Giuseppe Court, Suite 9
Roseville, CA 95678
Phone#: (916) 773-3664 Fax#: (916) 773-4784

ANALYSIS REPORT

Attention: Dennis Nakamoto
Anderson Consulting
631 Commerce Drive, Suite 100
Roseville, CA 95678
Project: 4274.1 Rsvl
Method: EPA - CAM Metals

Date Sampled: 03/19/99
Date Received: 03/19/99
Date Analyzed: 03/23/99
Matrix: Soil
Units: mg/kg

Client Sample I.D.		#1 GRS-DM		#2 CTRL		#3 UNDM		#5 PU	
LAB. NO.		S0399346		S0399347		S0399348		S0399350	
ANALYTE		R/L	Results	R/L	Results	R/L	Results	R/L	Results
Lead	EPA 7420	2.5	ND	2.5	ND	25	ND	25	ND
Cadmium	EPA 7130	0.3	ND	0.3	ND	0.3	ND	0.3	ND
Nickel	EPA 7520	1.5	24.1	1.5	9.5	1.5	18.3	1.5	12.3
Chromium	EPA 7190	1.5	29.6	1.5	13.8	1.5	17.5	1.5	16.6
Zinc	EPA 7950	1.5	12.3	1.5	12.3	1.5	25.1	1.5	15.9

QA/QC % RECOVERY						
	MS	MSD	Date Analyzed	LCS	LCSD	Date Analyzed
Lead	103	105	03/23/99	97	100	03/23/99
Cadmium	97	96	03/23/99	98	98	03/23/99
Nickel	91	102	03/23/99	104	102	03/23/99
Chromium	88	89	03/23/99	103	101	03/23/99
Zinc	87	90	03/23/99	89	89	03/23/99

ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.
R/L = Reporting Limit

Laboratory Representative

03/29/99
Date Reported

EXCELCHEM ENVIRONMENTAL LABS IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 2119)

EXCELCHEM
ENVIRONMENTAL LABS

500 Giuseppe Court, Suite 9
Roseville, CA 95678
Phone#: (916) 773-3664 Fax#: (916) 773-4784

ANALYSIS REPORT

Attention: Dennis Nakamoto
Anderson Consulting
631 Commerce Drive, Suite 100
Roseville, CA 95678
Project: 4274.1 Rsvl
Method: EPA 5520

Date Sampled: 03/19/99
Date Received: 03/19/99
Date Analyzed: 03/25/99
Matrix: Soil
Units: mg/kg

Client Sample I.D.	#1 GRS-DM		#2 CTRL		#3 UNDM		#5 PU	
LAB. NO.	S0399346		S0399347		S0399348		S0399350	
ANALYTE	R/L	Results	R/L	Results	R/L	Results	R/L	Results
Oil & Grease	50	ND	50	ND	50	90	50	58

QA/QC % RECOVERY			
	LCS	LCSD	Date Analyzed
Oil & Grease	94	99	03/25/99

ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.
L = Reporting Limit

Laboratory Representative

03/29/99
Date Reported

EXCELCHEM
ENVIRONMENTAL LABS

500 Giuseppe Court, Suite 9
Roseville, CA 95678
Phone#: (916) 773-3664 Fax#: (916) 773-4784

ANALYSIS REPORT

Attention: Dennis Nakamoto
Anderson Consulting
631 Commerce Drive, Suite 100
Roseville, CA 95678
Project: 4274.1 Rsvl
Method: EPA 8015m/8020

Date Sampled: 03/19/99
Date Received: 03/19/99
BTEX/TPHg Analyzed: 03/25,26/99
Matrix: Soil
Units: mg/kg

Client Sample I.D.	#1 GRS-DM		#2 CTRL		#3 UNDM		#5 PU	
LAB. NO.	S0399346		S0399347		S0399348		S0399350	
ANALYTE	R/L	Results	R/L	Results	R/L	Results	R/L	Results
Benzene	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Toluene	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Ethylbenzene	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Total Xylenes	0.005	ND	0.005	ND	0.005	ND	0.005	ND
TPH as Gasoline	1.0	ND	1.0	ND	1.0	ND	1.0	ND

QA/QC %RECOVERY			
	LCS	LCSD	Date Analyzed
Benzene	97	102	03/25/99
Toluene	99	104	03/25/99
Ethylbenzene	104	107	03/25/99
Total Xylenes	107	109	03/25/99

ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.
R/L = Reporting Limit

Laboratory Representative

03/29/99
Date Reported

EXCELCHEM ENVIRONMENTAL LABS IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 2119)

Appendix B

Phase I Preliminary Site Assessment Report,
by Earthtec, Inc., dated January 1999. (text only)

Roseville Energy Park

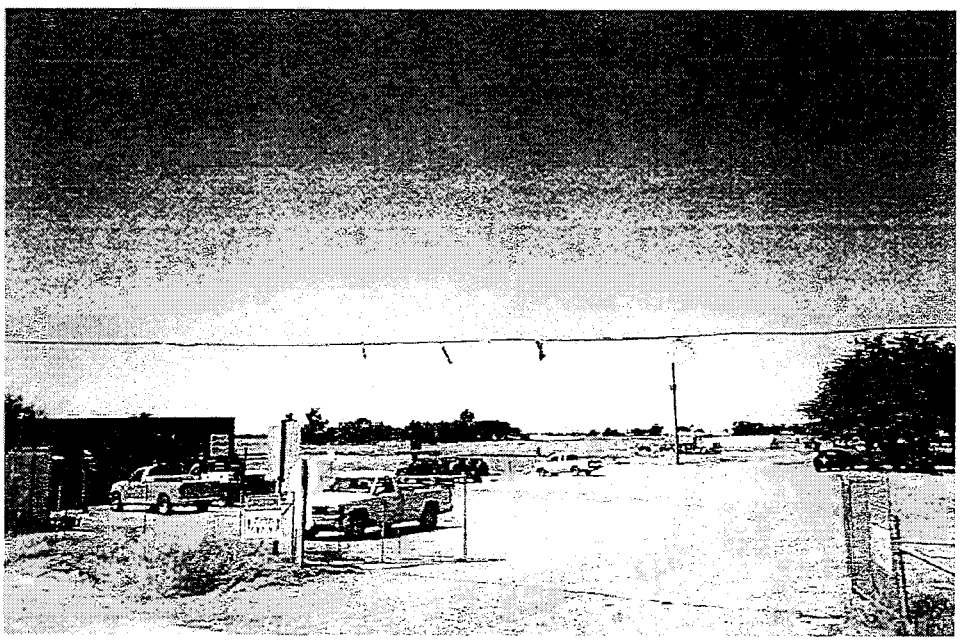
Appendix 8.14-C
Phase I Environmental Site Assessment for the Roseville Energy Facility, L.L.C.

October 2003

Roseville Energy Park
Application for Certification

DOCKET
01-AFC-14
DATE AUG 2001
RECD. AUG 1 0 2001

PHASE I ENVIRONMENTAL SITE ASSESSMENT FOR ROSEVILLE ENERGY FACILITY, L.L.C.



Prepared for
Roseville Energy Facility, L.L.C.
101 California Street, Suite 1950
San Francisco, California 94111

August 2001

URS
500 12th Street, Suite 200
Oakland, California 94607

66-00000089.00

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1.1 PURPOSE

The subject of this Phase I Environmental Site Assessment (ESA) is a 22 acre property directly north of the Pleasant Grove Wastewater Treatment Plant (under construction), adjacent to 5051 Phillip Rd. in Roseville California. The subject property is the proposed location for the Roseville Energy Facility Site (herein referred to as the "Site"). The Site is comprised of portions of properties with the following Assessor's Block and Lot Numbers: 017-100-17, 017-100-18, 017-100-29, 017-100-30, 017-100-31. Figure 1 depicts the location of each of these properties. Figure 2 depicts the proposed location of Roseville Energy Facility project components.

The purpose of this ESA is to provide an evaluation of the potential current presence of recognized environmental conditions at the Site, including potential impacts from known problems in the surrounding area. The evaluation was conducted using readily available public information and materials supplied by Roseville Energy Facility, L.L.C. The term "recognized environmental conditions," as defined by ASTM Designation E 1527-00, means:

> "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimus* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not recognized environmental conditions."

This ESA was performed according to the recommended guidelines established by ASTM Designation E 1527-00, "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process." For the purpose of this report, hazardous substances and petroleum products are jointly referred to as "hazardous materials."

1.2 DETAILED SCOPE-OF-SERVICES

A proposal to perform this Phase I ESA was submitted by URS Corporation (URS) on July 5, 2001 to Roseville Energy Facility, L.L.C. The ESA is part of the Roseville Energy Facility Project Application for Certification (AFC). The scope of work for this ESA was outlined in the California Power Plant Siting Regulations Appendix B (g)(12)(A), which specifies use of ASTM "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process" incorporated by reference into the CEC siting regulations. URS performed the following work:

- Reviewed two environmental site assessments previously conducted on the Site. These documents are included in this report as Appendix A.

1) "Phase I Environmental Site Assessment Update, Pleasant Grove Wastewater Treatment Plant, Phillip Road, Placer County, California, APN: 17-100, 20, 27, 18, 17, 29, 30, 31, 15, 35, 34, and 28," dated January 7, 1999, prepared by Earthtec, Ltd.
2) "Phase II Environmental Site Assessment, Pleasant Grove Wastewater Treatment Plant – Adjacent Properties, Roseville, California," dated April 6, 1999, prepared by Anderson Consulting Group.

- Contracted with Environmental Data Resources, Inc. (EDR) to conduct a regulatory database search of known underground storage tanks (USTs); landfills; hazardous waste generation or treatment, storage and disposal facilities; and subsurface contamination in the surrounding area up to within 1 mile of the center of the Site (or Site boundaries). The EDR report is included as Appendix B.
- Researched Site history by reviewing a chronology of three aerial photographs covering the Site and adjacent areas; and contracting with EDR to research the availability of fire insurance maps of the Site and vicinity. Copies of pertinent portions of these documents are presented in Appendix C.
- Performed an exterior site reconnaissance for obvious evidence of potential contamination such as current hazardous materials storage or use; unusually stained soils, slabs, and pavements; drains, sumps, drums, tanks, and electrical transformers; stressed vegetation; and discarded hazardous materials containers. Photographs of the Site taken during our site reconnaissance are included in Appendix D.
- Interviewed Art O'Brien, City of Roseville Environmental Utilities Department, and Brad Kaufman, Construction Manager for the adjacent Pleasant Grove Wastewater Treatment Plant, to inquire about past and present uses of the Site. Copies of the site reconnaissance notes are included in Appendix E.
- Evaluated the information collected and prepared this report summarizing our findings, opinions and conclusions.

1.3 SIGNIFICANT ASSUMPTIONS

No significant assumptions other than those described below in the next section apply to this ESA.

1.4 LIMITATIONS AND EXCEPTIONS

This report and the associated work have been provided in accordance with the principles and practices generally employed by the local environmental consulting profession. This is in lieu of all warranties, express or implied.

This ESA is not a regulatory compliance audit or an evaluation of the use efficiency of any hazardous materials at the Site. No evaluation for the presence of asbestos-containing building materials, urea-formaldehyde foam insulation, lead-based paint, or other hazardous building materials; methane; radon gas; lead in drinking water; wetlands; cultural and historic resources; industrial hygiene and health and safety; ecological resources and endangered species; indoor air quality; or high voltage power lines is included in our assessment.

Our findings and opinions are based on information available from public sources, historical photographs, maps, and regulatory agency files, lists, and databases; this information is changing continually and is frequently incomplete. Unless we have actual knowledge to the contrary, information obtained from interviews or provided to us by Roseville Energy Facility, L.L.C., has been assumed to be correct and complete. URS does not assume any liability for information that has been misrepresented to us or for items not visible, accessible or present on the Site at the time of the site reconnaissance.

URS cannot warrant or guarantee that not finding indicators of hazardous materials means that hazardous materials do not exist on the Site. There is no investigation that is thorough enough to preclude the presence of materials on the Site that presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable may, in the future, become subject to different regulatory standards and require remediation.

Where records indicate that prior remedial work or tank removals have occurred, there is a risk that the work may not have been performed correctly or completely. In these cases, if the regulatory agency has approved the closure of the tank or other work done, we have assumed that the work was done correctly and completely.

Opinions and judgments expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

1.5 SPECIAL TERMS AND CONDITIONS

The terms and conditions for this ESA are included in our Proposal of July 5, 2001. No other special terms and conditions apply.

1.6 USER RELIANCE

This report has been prepared for use solely by Roseville Energy Facility, L.L.C., in the development and financing of the subject property into a power plant. This report shall not be relied upon by or transferred to any other party, or used for any other purpose, without the express written authorization of URS.

2.1 LOCATION AND LEGAL DESCRIPTION

The Site is located on the north side of Phillip Rd, directly adjacent to 5051 Phillip Rd., in Roseville, California. The Site is comprised of portions of properties with the following Assessor's Block and Lot Numbers: 017-100-17, 017-100-18, 017-100-29, 017-100-30, 017-100-31 (see Figures 1 and 2). The City of Roseville purchased the properties in 1999, and is the current owner.

2.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The Site is a 22-acre plot of mostly undeveloped grassland within a 70+ acre plot owned by the City of Roseville. Currently, the Site is being used as a construction lay-down area for the Pleasant Grove Wastewater Treatment Plant, under construction directly south of the Site at 5051 Phillip Rd.

2.3 CURRENT SITE USE

Construction lay-down includes approximately 15 recreational vehicles, used as temporary housing for construction workers, administration trailers for the construction companies, and hazardous material storage. Additionally, there is a vehicle parking area, as well as a garage and approximately five shipping containers, used to store maintenance and light construction equipment.

2.4 SITE IMPROVEMENTS

An unpaved parking area occupies a portion of the southern half of parcel 017-100-17, and a garage remains from previous residential use.

A hazardous materials storage area has been constructed for use during construction of the Pleasant Grove Wastewater Treatment Plant, and is located on parcel 017-100-17. The area has been excavated to approximately 5 feet below ground surface, and is bermed with soil and lined with plastic. A platform has been constructed at ground level, over the lined area, for the storage of lubricants, diesel, and other construction equipment related materials. The diesel storage tank is mounted on a foundation at the bottom of the area, and is currently in use.

No ponds or lagoons were observed on the Site.

2.5 CURRENT ADJOINING PROPERTY USES

Adjoining properties are mostly undeveloped grassland, used in the past for grazing and agriculture, with two notable exceptions being the Pleasant Grove Wastewater Treatment Plant under construction to the south, and a working dog kennel to the northeast. The closest residential area is a subdivision located approximately 0.8 miles west of the Site.

The ASTM Practice suggests the ESA User, Roseville Energy Facility, L.L.C., in this case, provide documents to the ESA preparer. This section describes any such documents provide to us by Roseville Energy Facility, L.L.C. Also described are documents provided by the Site owner, the City of Roseville. Pertinent portions of these documents are included as Appendix A.

3.1 TITLE RECORDS

Roseville Energy Facility, L.L.C., conducted a title records review under separate cover, and therefore has requested that a title records review not be included in this ESA.

3.2 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

The City of Roseville stated it has no knowledge of: (1) environmental liens associated with the Site, or (2) any use limitations affecting the Site.

3.3 VALUATION REDUCTION FOR ENVIRONMENTAL ISSUES

The City of Roseville stated that the property value of the Site is not reduced due to environmental issues.

3.4 OWNER, SITE MANAGER AND OCCUPANT INFORMATION

The owner of the Site is the City of Roseville. The Site is currently being used, with the owner's approval, as a construction lay-down area for the Pleasant Grove Wastewater Treatment Plant, which is currently under construction directly south of the Site. Historical information was provided in relevant documents (see Section 3.5), and by Arthur O'Brien, representative of the City of Roseville, in an interview on July 31, 2001 (see Section 6.1).

3.5 PREVIOUS PHASE I AND PHASE II ENVIRONMENTAL SITE ASSESSMENTS

Two environmental site assessments were previously conducted on the Site. These assessments were provided to URS by Arthur O'Brien, City of Roseville Department of Environmental Utilities, and are titled as follows:

1) "Phase I Environmental Site Assessment Update, Pleasant Grove Wastewater Treatment Plant, Phillip Road, Placer County, California, APN: 17-100-20, 27, 18, 17, 29, 30, 31, 15, 35, 34, and 28," dated January 7, 1999, prepared by Earthtec, Ltd.

2) "Phase II Environmental Site Assessment, Pleasant Grove Wastewater Treatment Plant – Adjacent Properties, Roseville, California," dated April 6, 1999, prepared by Anderson Consulting Group.

These documents are discussed in Section 4.3, Site Historical Use Information

4.1 REGULATORY RECORDS

4.1.1 Regulatory Database Search Report

An EDR Site Assessment Report was prepared for the Site on July 11, 2001, in accordance with the ASTM recommended guidelines, and is included in this ESA as Appendix B. The EDR report presents the results of a search of 22 Federal databases, 17 State or local databases and one EDR proprietary database, along with a description of each database that includes the following.

- Addresses of known UST sites
- Landfills
- Hazardous waste generation or treatment, storage and disposal facilities
- Subsurface contamination in the surrounding area up to within 1 mile of the center of the Site.

The Site was not listed on any of the databases searched by EDR.

According to the EDR report, **no properties within the designated search area were identified in the following databases**:

Federal ASTM Standard Database*	Radius Search Distance (miles)
National Priority List (NPL)	1.00
Proposed NPL	1.00
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	0.50
Comprehensive Environmental Response, Compensation, and Liability Information System (CERC-NFRAP)	0.25
Corrective Action Report (CORRACTS)	1.00
Resource Conservation and Recovery Information System (RCRIS-TSD)	0.50
Resource Conservation and Recovery Information System, Small Quantity Generator (RCRIS-SQG)	0.25
Resource Conservation and Recovery Information System, Large Quantity Generator (RCRIS-LQG)	0.25
Emergency Response Notification System (ERNS)	TP
State ASTM Standard Database*	
Annual Workplan (AWP)	1.00
Calsites Database (CAL-SITES)	1.00

Federal ASTM Standard Database*	Radius Search Distance (miles)
California Hazardous Material Incident Report System (CHMIRS)	1.00
"Cortese" Hazardous Waste & Substances Site List (CORTESE)	
Notify 65	1.00
Toxic Pits	1.00
State Landfill (SWF/LF)	0.50
Waste Management Unit Database (WMUDS/SWAT))	0.50
Leaking Underground Storage Tank Information System (LUST)	0.50
Hazardous Substance Storage Container Database (UST)	0.25
California Bond Expenditure Plan (Ca. BEP)	1.00
California Facility Inventory Database UST (CA FID UST)	0.25
Federal ASTM Supplemental Database*	
Superfund (CERCLA) Consent Decrees (CONSENT)	1.00
Records of Decision (ROD)	1.00
De-listed National Priority List (NPL)	1.00
Facility Index System (FINDS)	TP
Hazardous Materials Information Reporting System (HMIRS) (Federal listing)	TP
Material Licensing Tracking System (MLTS)	TP
Mines Master Index File (MINES)	0.25
Federal Superfund List Liens (NPL Liens)	TP
PCB Activity Database System (PADS)	TP
RCRA Administrative Action Tracking System (RAATS)	TP
Toxic Chemical Release Inventory System (TRIS)	TP
Toxic Substances Control Act (TSCA)	TP
Federal Insecticide, Fungicide, & Rodenticide Act/Toxic Substances Control Act Tracking System (FTTS)	TP
State ASTM Standard Database*	
Aboveground Petroleum Storage Tank Facilities (AST)	TP
California Spills, Leaks, Investigations, and Cleanups Database	0.50

Federal ASTM Standard Database*	Radius Search Distance (miles)
(CA SLIC)	
Hazardous Waste Information System (HAZNET)	0.25
Placer County Master List of Facilities (Placer Co. MS)	TP
Waste Discharge System (Ca. WDS)	TP
EDR Proprietary Databases*	
Former Manufactured Gas Sites (Coal Gas)	1.00

TP = Refers to databases searched only for the target property.

* Database categories are defined in "Government Records Searched/Data Currency Tracking" section of the EDR report.

No water wells were found in the EDR database search within 1 mile of the Site.

No oil/gas wells were found in the EDR database search within 1 mile of the Site.

The goal of reviewing the database report is to identify facilities that have known and documented environmental problems that may negatively impact the subject Site. URS' criteria for considering a listed facility to be a potential concern include the following:

1. The facility is listed on one of the databases of reported hazardous materials releases (Federal NPL, Federal CORRACTS, Federal CERCLIS, State SPL, State SLIC, State LUST, State Deed Restrictions, and State Toxic Pits), is located potentially upgradient of the subject Site, and is not listed in the database as "closed" or "no further action" (including NFRAP).

2. The facility is listed as a solid waste landfill and located potentially upgradient of the subject Site (not including transfer stations).

3. The facility adjoins the subject Site and is listed as a RCRA large-quantity hazardous waste generator, a CERCLIS NFRAP site, or an UST operator.

According to the EDR Report, no properties within one mile of the Site meet the above requirements

There were approximately 30 sites from various databases that were not mapped due to poor or inadequate address information.

4.1.2 Health Department Records

We requested files from the Placer County Department of Environmental Health for the Site. The files could not be reviewed in the allowable time and scope. If further information is made available in the future, it will be supplemented to this ESA

4.1.3 Building Department Records

We requested files from the City of Roseville Building Department for the Site. The files could not be reviewed in the allowable time and scope. If further information is made available in the future, it will be supplemented to this ESA.

4.1.4 Regional Water Quality Control Board Records

We did not review Regional Water Quality Control Board (RWQCB) records as no records noting the RWQCB were reported in the EDR Radius Report.

4.2 PHYSICAL SETTING SOURCES

The Site is located on the western edge of the California Central Valley, less than ten miles from the Sierra Nevada foothills. The Pleasant Grove, California, 7 1/2-minute topographic quadrangle (U.S. Geological Survey) depicts the Site and its surrounding areas.

4.3 SITE HISTORICAL USE INFORMATION

4.3.1 Aerial Photographs

EDR-Aerial Photography Print Service provided us with three historic aerial photos of the Site and vicinity, from 1958, 1984, and 1994. Only the 1958 and 1994 photographs were reviewed due to the poor quality of the 1984 photograph.

The 1958 photograph indicates that the Site was used for grazing and/or was open space, with no visible structures or improvements. The parcel of land to the south of the Site, across Phillip Rd., was under cultivation at the time of the photograph, whereas other surrounding properties were used for grazing and/or were open space.

The 1994 aerial photograph confirms that the Site was inhabited. Structures, and what are apparently cars, trucks, and junk, are visible as well. A dog kennel is visible on the northeast adjoining property, and three mobile homes are visible on the adjoining properties to the north, the northwest, and the west, respectively. Two structures are visible on the eastern side of the Site.

Copies of aerial photos referenced are included in Appendix C.

4.3.2 Topographic Maps

We reviewed the Pleasant Grove Quadrangle topographic map (created from aerial photographs taken in 1949, revised from aerial photographs in 1966, and photorevision in 1981). The configuration of structures noted in the review of the 1994 aerial photo, with the exception of the dog kennel on the northeast adjoining property, was included on the map after the 1981 photorevision.

4.3.3 Fire Insurance Maps

We contracted with (EDR) to research the availability of fire insurance maps of the Site and vicinity. No maps were available in the Sanborn archives. Typically, fire insurance maps were produced only for urban areas and industrial facilities.

4.3.4 Local Street Directories

Since the subject Site is not located in an urban environment, the Site has not likely been listed under another address. Therefore, local street directories were not reviewed.

4.3.5 Previous Phase I Environmental Site Assessment

According to the 1999 Phase I ESA, the Fiddyment family purchased the parcels in the area and used the land for grazing until approximately 1948. Since that time, the Site and most surrounding properties have been used for residential and small scale agricultural purposes. Parcel 17-100-28, to the northwest of the site, has been used as a dog kennel.

In an interview conducted by Earthtec, Ltd., on December 23, 1998 for the 1999 Phase I ESA, Mr. Argel O'Brien, resident of parcel 17-100-28 and owner of the dog kennel, stated that in the past, approximately 100 cars and trucks, as well as debris piles, were located on parcel 17-100-17. The storage of motor vehicles on the Site indicated to the preparers of the 1999 Phase I ESA that recognized environmental conditions might have been present, and therefore a Phase II ESA was recommended. Results of the Phase II ESA are presented in section 4.3.6 of this report.

Additionally, several pole mounted transformers in the area could possibly contain PCB's. Earthtec, Ltd., states that "[I]f there is a concern, the transformers can be tested for PCB's by Pacific Gas and Electric."

4.3.6 Previous Phase II Environmental Site Assessment

As a result of Earthtec's recommendations in the 1999 Phase I ESA, the City of Roseville contracted the Anderson Consulting Group to perform a Phase II Environmental Site Assessment on parcel 017-100-17. Specifically, Anderson Consulting Group was tasked to determine the following:

(1) whether the existence of transformers on the property (including the two mentioned in section 5.3 of this ESA) could potentially contaminate the area with PCBs, and

(2) whether the storage of a large number of automobiles, equipment, and other debris resulted in the discharge of contaminated liquids such as petroleum, oil and grease, or heavy metals.

In relation to the transformers, Anderson Consulting Group was assured by Mr. Ted Robinson, from Pacific Gas & Electric (PG&E), that transformers in Placer County have either been replaced or retrofitted with oil containing no PCBs. Mr. Robinson stated that if a transformer explodes, or if leakage is observed or suspected, PG&E should be contacted to determine if any contaminant has been released. Anderson Consulting Group did not observe any evidence of leakage from the transformers during their site investigation, thereby precluding the transformers from characterization as an environmental site condition.

In response to task (2), Anderson Consulting Group collected five soil samples from the parcel and tested for oil & grease, gasoline, benzene, toluene, ethylbenzene, xylenes, chromium, cadmium, lead, nickel, and zinc. Sample three was found to contain 90 mg/kg (ppm) of oil & grease, and sample five contained 58 mg/kg (ppm) of oil & grease. These levels are not above regulatory levels of interest. Samples one, two, three, and five contained chromium, nickel, and zinc in levels greater than the detection limit, but not greater than average background metal concentrations in soils in the western United States (as determined by "Background Metal Concentrations in Soils in Northern Santa Clara County, California," Thesis by Christina Marie Scott). Based on these laboratory results, the historical presence of cars and trucks on the property does not likely pose a significant environmental impact to the Site.

4.4 ADJOINING PROPERTY HISTORICAL USE INFORMATION

4.4.1 Aerial Photographs

The description of the aerial photographs described in Section 4.3.1 also pertains to neighboring properties.

4.4.2 Topographic Maps

The description of the topographic maps described in Section 4.3.2 also pertains to neighboring properties.

4.4.3 Fire Insurance Maps

We contracted with (EDR) to research the availability of fire insurance maps of the vicinity. No maps were available in the Sanborn archives.

4.4.4 Local Street Directories

Since the subject Site is not located in an urban environment, the Site has not likely been listed under another address. Therefore, local street directories were not reviewed.

4.4.5 Previous Phase I Environmental Site Assessment

The Historical Use information described in Section 4.3.5 also pertains to neighboring properties.

4.4.6 Previous Phase II Environmental Site Assessment

The Historical Use information described in Section 4.3.6 also pertains to neighboring properties.

5.1 METHODOLOGY AND LIMITING CONDITIONS

We performed our site reconnaissance on July 31, 2001. We were accompanied during our site reconnaissance by Arthur O'Brien, City of Roseville Environmental Utilities Department. Copies of photographs taken during the reconnaissance are included in Appendix D.

We conducted the reconnaissance by walking the periphery of the parcels and visually observing the Site. Additionally, we observed building exteriors and, where appropriate and safe, building interiors.

5.2 GENERAL SITE SETTING

The Site slopes gently from Phillip Rd., on the southern edge of the property, to Pleasant Grove Creek running along the northern edge. A seasonal wetland, approximately 40 feet in diameter, is located 100 feet from Phillip Rd. on parcel 017-100-17. Vegetation is primarily range grass. The Site is primarily flat; however, years of cattle grazing has caused the ground surface to be uneven. Prior to June, 2000, one home was present on each of parcels 017-100-17 and 017-100-18, with trees growing around the homes. The homes were destroyed in June 2000, when the City of Roseville decided to use the properties as a construction lay-down area for the Pleasant Grove Wastewater Treatment Plant. Photos 4 and 16 in Appendix D depict the sites of the destroyed homes.

5.3 EXTERIOR OBSERVATIONS

Parcel 017-100-18

Parcel 017-100-18, the eastern most portion of the Site, currently contains RVs used as temporary housing by construction workers. A house on the parcel was torn down in June 2000, according to the City of Roseville. The only remaining portion of the residence is a shed containing an irrigation system and less than ten cans of paint. A well was not immediately visible. However, if a well does exist at the shed, it should be closed in accordance with Department of Water Resources standards, if it has not already been closed. The irrigation system was not attached to any exterior piping (see Photo 14 in Appendix D). Additionally, construction workers park their RVs on the lot for temporary housing.

Parcels 017-100-17 and 017-100-29

Construction administration trailers and storage areas for construction equipment, consisting of shipping containers and a garage, are the most obvious features on parcels 017-100-17 and 017-100-29. The Site also contains construction workers' RVs, and three debris piles containing old tires, wheels, and empty 55 gallon drums. Solid waste is collected in dumpsters on the Site, and is hauled by Waste Management, Inc. Sewage from the administration trailers flows into the septic systems of the houses that were previously located on parcels 017-100-18 and 017-100-17. Construction workers' RVs are either directly connected to these septic systems, or have on-board sewage containment systems.

Of most interest to this ESA is a hazardous materials storage area on parcel 017-100-17, approximately 200 feet from Phillip Rd. The area includes an aboveground storage tank containing diesel, and various drums containing construction liquids such as lubricating oil and construction cure. According to the construction manager, the storage area is double contained, and is inspected once per week by construction company personnel. No significant spills have been reported. However, during our Site reconnaissance, we noted the presence of oily rags and boxes, with minor soil staining, on the ground near the hazardous materials storage area. (See Photo 10 in Appendix D). Copies of the permit issued by the Roseville Fire Department for the diesel storage tank and the weekly inspection form used by the construction company are included in Appendix A. Photos 7-10 in Appendix D show the area. Additionally, a double contained waste oil storage tank is located adjacent to the hazardous materials storage. The tank stores up to 55 gallons of waste oil, and the contents are hauled off by Ramos Environmental approximately once every six months.

Prior to construction of the hazardous materials storage area on parcel 017-100-17, the Site Occupants, Kiewit Pacific, contracted Gularte & Associates to perform environmental testing of the area. Samples were tested for MTBE, benzene, toluene, ethylbenzene, total xylenes, gasoline, and diesel. No analytes were present in the samples above the detection limits. The construction manager informed us during an interview that they intend to sample the hazardous waste storage area at the end of their operations on the Site as well. A copy of the Gularte & Associates report is included in Appendix A.

Since contamination from oily rags on the ground or leakage of hazardous materials from either the storage area or the waste oil storage tank would be recognized environmental conditions, Roseville Energy Facility should review and confirm that the results of Kiewit Pacific's post-operations testing around the hazardous materials storage area do not reveal any contamination.

Parcel 017-100-30

The portion of parcel 017-100-30 that Roseville Energy Facility, L.L.C., will potentially use contains only grassland. The vegetation does not appear stressed, and no stained soil was found during the reconnaissance. The northern portion of the parcel, however, does contain an abandoned barn and farm equipment, an abandoned mobile home, two pole mounted transformers, and a well. The transformers did not appear to be leaking. However, as noted in section 4.3.6, if in the future the transformers leak or explode, PG&E should be contacted immediately to determine if any contamination has occurred. If the well has not already been closed, it should be done so in accordance with Department of Water Resources standards.

Parcel 017-100-31

The portion of parcel 017-100-031 that Roseville Energy Facility, L.L.C., will potentially use contains nothing but grassland, with no signs of spills or stressed vegetation. An abandoned mobile home is present on the other portion of the parcel.

5.4 INTERIOR OBSERVATIONS

The administration trailers we entered were generally tidy and well kept, and contained office equipment. No stains or corrosion were observed on the floors, walls or ceilings. The shipping containers appeared generally tidy, except for an overflowing trashcan outside one on parcel 017-100-17, near the construction workers' RVs.

We observed the interior of the abandoned barn near Pleasant Grove Creek on parcel 017-100-30. As seen in Photos 21 and 22 in Appendix D, a small patch of stained soil is visible, as are approximately 10 car batteries left in the barn. The presence of the stained soil and used batteries is considered a recognized environmental condition. The small stained area is not likely evidence of significant contamination, but rather is due to a localized spill. The batteries should be removed from the area and appropriately disposed of at an offsite facility.

6.1 OWNER REPRESENTATIVE, SITE MANAGER, LOCAL GOVERNMENT OFFICIAL

Arthur O'Brien, City of Roseville Environmental Utilities Department, was interviewed on July 31, 2001.

Mr. O'Brien stated that the City of Roseville owns and manages the parcels comprising the Site.

Mr. O'Brien reported that asbestos was encountered during the destruction of the house on parcel 017-100-17, and that the asbestos was abated properly. No specific documentation of the abatement activities was provided to URS. However, a letter from NAL Environmental Testing and Consulting, dated October 6, 2000, was provided to URS stating that air clearance results from samples collected at 5300 Phillips [Road] indicated no exceedance of EPA's recommended PCM clearance level of 0.01 fibers/cubic centimeter. That location was cleared for reoccupancy and completion of the renovation/demolition by the general contractor. URS assumes that the work referred to in that letter refers to parcel 017-100-17.

6.2 OCCUPANT REPRESENTATIVE

We interviewed Brad Kaufman, the Construction Manager for Kiewit Pacific, on July 31, 2000. Mr. Kaufman oversees the construction lay-down on the Site, as well as construction activities at the neighboring Pleasant Grove Wastewater Treatment Plant.

Information obtained can be found in the site reconnaissance notes in Appendix E.

Based on the information gathered during the Phase I Environmental Site Assessment procedure established by ASTM Practice E 1527, the following recognized environmental conditions were encountered:

On-Site

- The oil & grease concentrations found in the 1999 Phase II on parcel 017-100-17 are at slightly elevated levels. No heavy metals were found in concentrations above the background levels normal for soils in the general Northern California area (Scott, Christina Marie, Thesis: "Background Metal Concentrations in Soils in Northern Santa Clara County, California."). Metals at these concentrations are not considered to be a significant impact to the Site.
- Mr. O'Brien, from the City of Roseville, reported that asbestos was encountered during the destruction of the house formerly located on parcel 017-100-17, and that the asbestos was abated properly. No specific documentation of the abatement activities was provided to URS. However, a letter from NAL Environmental Testing and Consulting, dated October 6, 2000, and addressed to BD&J Abatement, Inc., was provided to URS stating that air clearance results from samples collected at 5300 Phillips [Road] indicated no exceedance of EPA's recommended PCM clearance level of 0.01 fibers/cubic centimeter. That location was cleared for reoccupancy and completion of the renovation/demolition by the general contractor. It is assumed by URS that the work referred to in that letter refers to parcel 017-100-17.
- The hazardous materials storage area contains an aboveground storage tank containing diesel, and various drums containing construction liquids such as lubricating oil and construction cure. Leaks and spills in or around the hazardous materials storage area were not observed, and construction company personnel inspect the area on a weekly basis. The area is therefore not likely to pose a significant impact to the Site. Roseville Energy Facility, L.L.C., should review and confirm that Kiewit Pacific's post-operations testing of the area does not reveal any contamination.
- URS observed limited, localized staining from oily rags found on the ground near the hazardous materials storage. The area is therefore not likely to pose a significant impact to the Site. However, Kiewit Pacific's housekeeping in this area should be improved: oily rags should be properly stored in barrels until they can be disposed of properly off-site.

Off-Site

- The interior of the abandoned barn on parcel 017-100-30 contains a small patch of stained soil and approximately 10 car batteries. The presence of limited stained soil and approximately 10 used batteries is considered a recognized environmental condition, yet is not likely to significantly impact the Site. The small stained area is not likely to pose a significant impact to the Site. The batteries should be removed from the area and appropriately disposed of at an offsite facility.
- Two transformers were observed on parcel 017-100-30. These transformers were reportedly retrofitted by PG&E and/or reportedly do not contain PCB-containing oil. They are in good condition, and no leaks, spills, or explosions have been reported. Therefore, there is low potential for impact to the Site from these transformers.

We have performed our services for this project in accordance with our contract and Scope of Work agreement and ASTM Practice E 1527 for ESA investigations: no guarantee is either expressed or implied.

The records search was limited to information available from public sources; this information is changing continually and is frequently incomplete. We have assumed that the information provided to us is accurate and complete. We do not assume any liability for information that has been misrepresented to us or for items not visible, accessible, or present on the facility at the time of the site visit.

There is no investigation which is thorough enough to preclude the presence of materials on the Site which is presently, or in the future, may be considered hazardous. Because regulatory evaluation criteria are constantly changing, concentrations of contaminants present and considered to be acceptable may in the future become subject to different regulatory standards and require remediation.

Opinions and judgments expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions. Unless site conditions change, this document and the information contained herein are valid for a period of 180 days according to the ASTM Practice, and were prepared solely for the use of Roseville Energy Facility, L.L.C. No third party shall have the right to rely on URS opinions rendered in connection with the services or in this document without URS written consent and the third party's agreement to be bound to the same conditions and limitations as our client.

No deletions, deviations or additions were made from the ASTM Practice E 1527, except those noted in this report.

No additional services are recommended.

10.1 AERIAL PHOTOGRAPHS

Date	Photographer	Scale
1958	Cartright	1" = 833'
1984	Western State Aerial	1" = 690'
1994	USGS	1" = 666'

10.2 OTHER REFERENCES

American Society for Testing Materials, 2000. Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process: Designation E 1527-00, 27p.

Environmental Data Resources (EDR), 2001. The EDR-Radius Map with GeoCheck, 5051 Phillip Rd., Roseville, California, 95747. July 11, 2001.

Scott, Christina Marie, Thesis: "Background Metal Concentrations in Soils in Northern Santa Clara County, California."

U.S. Geological Survey, 1981 (photorevised from 1967). 7 1/2-minute topographic map of the Pleasant Grove Quadrangle, California, scale: 1:24,000.

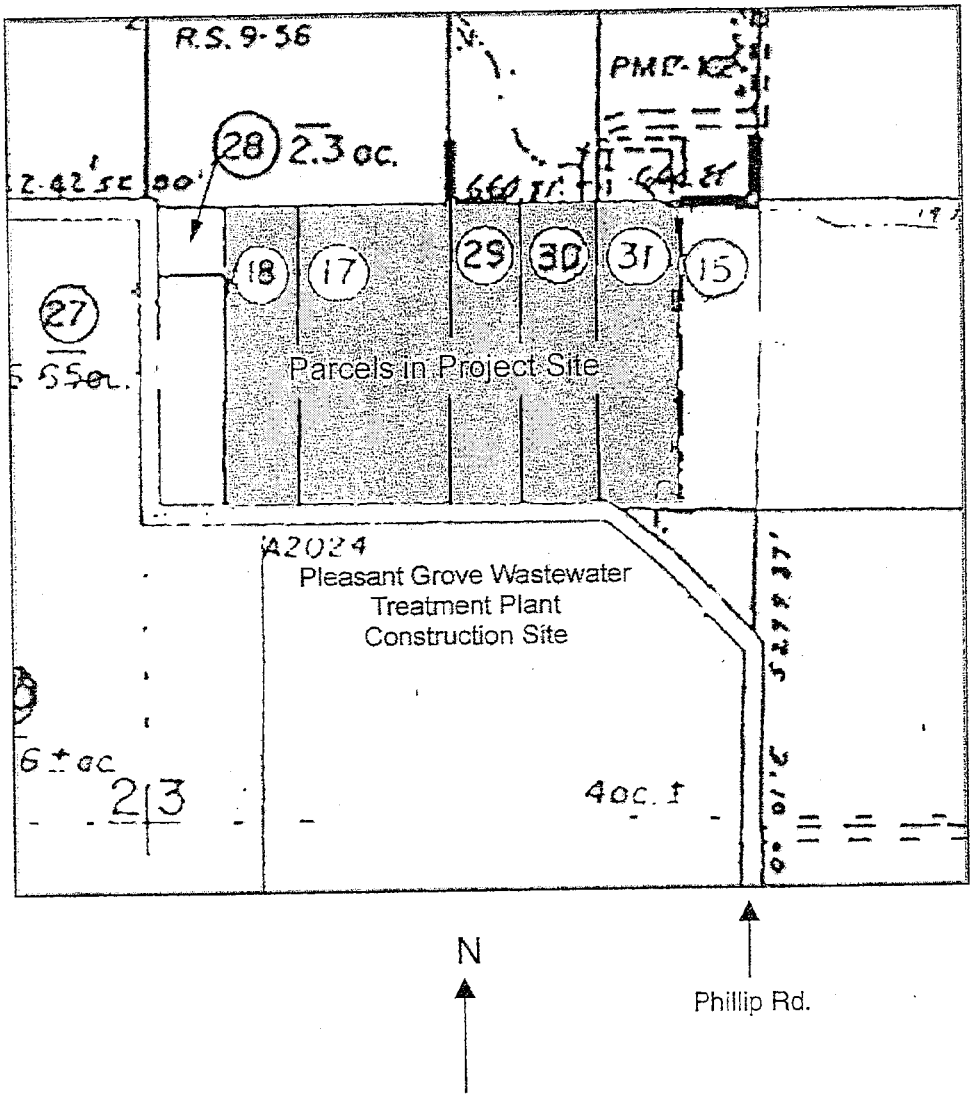
This section includes qualification statements of the environmental professionals responsible for conducting the ESA and preparing this report.

This report was completed by Christopher Gurr, Staff Scientist, trained in the ASTM E-1527 Standard.

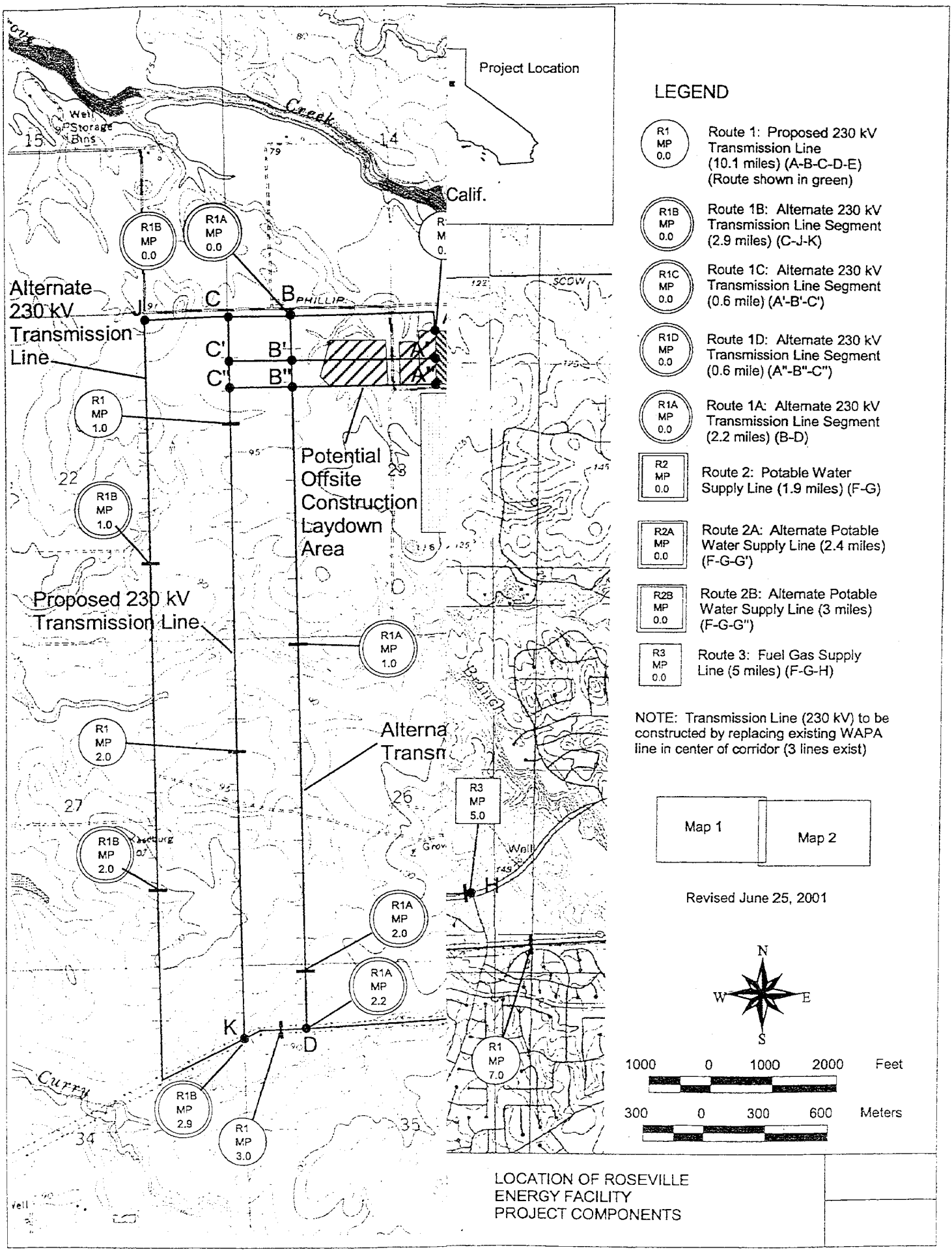
The report was reviewed by Joe Morgan, Senior Project Scientist.

APN	Assessor's Parcel Number
AST	Above-Ground Storage Tank
bgs	Below Ground Surface
URS	URS Corporation
ESA	Environmental Site Assessment
PCBs	Polychlorinated Biphenyls
ppb	Parts Per Billion (µg/L)
ppm	Parts Per Million (mg/Kg)
RBCA	Risk-Based Corrective Action
RWQCB	California Regional Water Quality Control Board, Central Coast Region*
TPH	Total Petroleum Hydrocarbons
UST	Underground Storage Tank
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey

Figures



URS	Roseville Energy Facility Phase I ESA	ASSESSOR'S PARCEL NUMBERS OF PROPERTIES ASSESSED	Figure 1


Project Location
Calif.
Alternate 230 kV Transmission Line
Potential Offsite Construction Laydown Area
Proposed 230 kV Transmission Line
Alterna
Transm
LEGEND
R1 MP 0.0
Route 1: Proposed 230 kV Transmission Line (10.1 miles) (A-B-C-D-E) (Route shown in green)
R1B MP 0.0
Route 1B: Alternate 230 kV Transmission Line Segment (2.9 miles) (C-J-K)
R1C MP 0.0
Route 1C: Alternate 230 kV Transmission Line Segment (0.6 mile) (A'-B'-C')
R1D MP 0.0
Route 1D: Alternate 230 kV Transmission Line Segment (0.6 mile) (A"-B"-C")
R1A MP 0.0
Route 1A: Alternate 230 kV Transmission Line Segment (2.2 miles) (B-D)
R2 MP 0.0
Route 2: Potable Water Supply Line (1.9 miles) (F-G)
R2A MP 0.0
Route 2A: Alternate Potable Water Supply Line (2.4 miles) (F-G-G')
R2B MP 0.0
Route 2B: Alternate Potable Water Supply Line (3 miles) (F-G-G")
R3 MP 0.0
Route 3: Fuel Gas Supply Line (5 miles) (F-G-H)
NOTE: Transmission Line (230 kV) to be constructed by replacing existing WAPA line in center of corridor (3 lines exist)
Map 1
Map 2
Revised June 25, 2001
N
W
E
S
1000 0 1000 2000 Feet
300 0 300 600 Meters
LOCATION OF ROSEVILLE ENERGY FACILITY PROJECT COMPONENTS

Appendix A
User-Provided Documents

Gularte
& ASSOCIATES, INC.
Geotechnical Consultants

P. O. Box 490 ▾ Lincoln, CA 95648

Phone: 916.765.4284
FAX: 916.771.5868

January 17 2001
Project No. 1015

Kiewitt Pacific
Attn: Dave Hazen
5000 Marsh Drive
Concord, CA 94520

PROJECT: PLEASANT GROVE WWTP

Re: Environmental Laboratory Test Results

Dear Dave:

Thanks for continuing to use our services on your Pleasant Grove WWTP project. As you know, we obtained samples from four locations on site and performed environmental testing. Specifically, we obtained a three to one composite sample from the Fueling Area, a three to one composite sample from the Mechanics Area, a sample from the Forklift Spill Area, and a sample from the North Ramp of the Secondary Clarifier. The samples were obtained in brass tubes by drive sampling and maintained in a chilled environment immediately.

We delivered the samples under chain of custody to Excelchem Environmental Laboratories for testing of MTBE via EPA Method 8020, TPH as gas via EPA Method 8015, TPH as diesel via EPA Method 8015, and Btex via EPA Method 8020.

The test results are attached and indicate non detect on all four samples.

Please call if you have any questions.

Respectfully,

Gularte & Associates, Inc.

Greg G. Gularte

REGISTERED PROFESSIONAL ENGINEER
GREG G. GULARTE
No. C58489
Exp. 12/31/03
CIVIL
STATE OF CALIFORNIA

Greg Gularte, P.E.
Project Engineer

EXCELCHEM
ENVIRONMENTAL LABS

500 Giuseppe Court, Suite 9
Roseville, CA 95678
Phone#: (916) 773-3664 Fax#: (916) 773-4784

ANALYSIS REPORT

Attention: Greg Gularte
Gularte & Associates
P.O. Box 490
Lincoln, CA 95648
Project: PGWWTP / 1015
Method: EPA 8020/8015m

Date Sampled: 01/03/01
Date Received: 01/03/01
MTBE/BTEX/TPHg Analyzed: 01/05/01
TPHd Analyzed: 01/10,11/01

Client Sample I.D.	F1+F2+F3		M1+M2+M3		FORK 1		SEC 1	
LAB. NO.	S0101027 A-C		S0101028 A-C		S01010129		S0101030	
ANALYTE	R/L	Results	R/L	Results	R/L	Results	R/L	Results
MTBE	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Benzene	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Toluene	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Ethylbenzene	0.005	ND	0.005	ND	0.005	ND	0.005	ND
Total Xylenes	0.005	ND	0.005	ND	0.005	ND	0.005	ND
TPH as Gasoline	1.00	ND	1.00	ND	1.00	ND	1.00	ND
TPH as Diesel	1.0	ND	1.0	ND	1.0	ND	1.0	ND

QA/QC % RECOVERY		
	LCS	LCSD
Benzene	97	89
Toluene	95	87
Ethylbenzene	98	89
Total Xylenes	96	89
TPH as Diesel	98	104

QA/QC Analyzed: 01/05,11/01
ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.
R/L = Reporting Limit
Water samples reported in µg/L
Soil samples reported in mg/kg

Laboratory Representative

01/16/01
Date Reported

EXCELCHEM ENVIRONMENTAL LABS IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 2119)

NAL
Environmental Testing & Consulting

11622 Fair Oaks Blvd., #111
Fair Oaks, CA 95628

PHONE (916) 965-0555
FAX (916) 965-0549
E-MAIL: nal1@nal1.com

October 6, 2000

Jim Strain
BD&J Abatement, Inc.
P.O. Box 529
Penryn, California 95663

RE: Air & Visual Clearance

Dear Mr. Strain:

This report is regarding the completed air monitoring clearance results for the samples taken on October 6, 2000. The air clearance samples were collected from the Pleasant Grove Water Treatment Plant at 5300 Phillips Avenue in Roseville, California. The three (3) air clearance results are as follows: 5300-1C (<0.002 f/cc); 5300-2C (0.002 f/cc) and 7231-FB-3C (0/100 fibers over fields).

The PCM air clearance samples have passed as the results were below the EPA's recommended PCM clearance level of 0.01 f/cc. The Pleasant Grove Water Treatment Plant has been cleared for re-occupancy and completion of the renovation/demolition work by the general contractor.

FINDINGS

Anthony M. De Arcos, Certified Asbestos Consultant for National Analytical Laboratories, Inc., completed a Visual Inspection and PCM air clearance sampling on October 6, 2000. During the Visual Inspection, De Arcos discovered no visible debris in the commercial property. Because the Visual Inspection showed no asbestos containing construction materials (ACCM), asbestos debris or any other impairments to performing clearance testing, De Arcos proceeded with the PCM air clearance sampling.

Jim Strain, of BD&J Abatement, was called with the verbal results at 4:30 on October 6, 2000. The analytical and air monitoring reports will be mailed to Mr. Strain via the U.S. Mail on Monday October 9, 2000.

5300 Phillips Avenue
October 6, 2000
Continued ...

CONCLUSION

The work areas passed the Visual Inspection by De Arcos. Once the Visual Inspection was completed, De Arcos proceeded with the PCM air clearance sampling using 25 mm cassettes. The cassettes used had a Mixed Cellulose Ester membrane .80 micron pore sizes that are used specifically for PCM sampling. The air monitoring cassettes were calibrated with a Visi-flow meter at 10 lpm's. The air monitors operated for 135 minutes for total cassette volumes of 1350 liters. The total volumes fell within the projected range of 1200 to 1800 liters for PCM sampling. The average concentration of suspect airborne fibers that were found in the three (3) inside samples was 0.002 f/cc. The clearance levels are below the Environmental Protection Agencies (EPA's) PCM clearance level of 0.01 f/cc. The Pleasant Grove Water Treatment Plant has been cleared for re-occupancy by the general contractor and his workers for the completion of the renovation/demolition work. This work can be completed by the General Contractor without concern for his workers in regards to airborne asbestos fibers at the site.

If you have any questions regarding this report or if we can be of further assistance please contact Mike Lee or myself at our office.

Sincerely,

Anthony M. De Arcos
Certified Asbestos Consultant
DOSH #92-0261

The EDR Radius Map™ Report

Roseville Site
5051 Phillip Rd
Roseville, CA 95747

Inquiry Number: 0655283.3r

July 11, 2001

Environmental Data Resources, Inc.

DOCKET

DATE JUL 1 1 2001
RECD. JUL 2 0 2001

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-R.JC

TABLE OF CONTENTS

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Map Findings	6
Orphan Summary	7
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

GeoCheck - Not Requested

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

5051 PHILLIP RD
ROSEVILLE, CA 95747

COORDINATES

Latitude (North):	38.792500 - 38' 47' 33.0"
Longitude (West):	121.383100 - 121' 22' 59.2"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	640425.9
UTM Y (Meters):	4294784.5

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	2438121-G4 PLEASANT GROVE, CA
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL	National Priority List
Proposed NPL	Proposed National Priority List Sites
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP	CERCLIS No Further Remedial Action Planned
CORRACTS	Corrective Action Report
RCRIS-TSD	Resource Conservation and Recovery Information System
RCRIS-LQG	Resource Conservation and Recovery Information System
RCRIS-SQG	Resource Conservation and Recovery Information System
ERNS	Emergency Response Notification System

STATE ASTM STANDARD

AWP	Annual Workplan Sites
Cal-Sites	Calsites Database
CHMIRS	California Hazardous Material Incident Report System
Cortese	"Cortese" Hazardous Waste & Substances Sites List

EXECUTIVE SUMMARY

Notify 65 ..... Proposition 65 Records
Toxic Pits ..... Toxic Pits Cleanup Act Sites
SWF/LF ..... Solid Waste Information System
WMUDS/SWAT ..... Waste Management Unit Database
LUST ..... Leaking Underground Storage Tank Information System
UST ..... Hazardous Substance Storage Container Database
CA BOND EXP. PLAN ..... Bond Expenditure Plan
CA FID UST ..... Facility Inventory Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT ..... Superfund (CERCLA) Consent Decrees
ROD ..... Records Of Decision
Delisted NPL ..... National Priority List Deletions
FINDS ..... Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS ..... Hazardous Materials Information Reporting System
MLTS ..... Material Licensing Tracking System
MINES ..... Mines Master Index File
NPL Liens ..... Federal Superfund Liens
PADS ..... PCB Activity Database System
RAATS ..... RCRA Administrative Action Tracking System
TRIS ..... Toxic Chemical Release Inventory System
TSCA ..... Toxic Substances Control Act
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

AST ..... Aboveground Petroleum Storage Tank Facilities
CA WDS ..... Waste Discharge System
CA SLIC ..... Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
HAZNET ..... Hazardous Waste Information System
CA PLACER CO. MS ..... Master List of Facilities

EDR PROPRIETARY DATABASES

Coal Gas ..... Former Manufactured Gas (Coal Gas) Sites

SURROUNDING SITES: SEARCH RESULTS

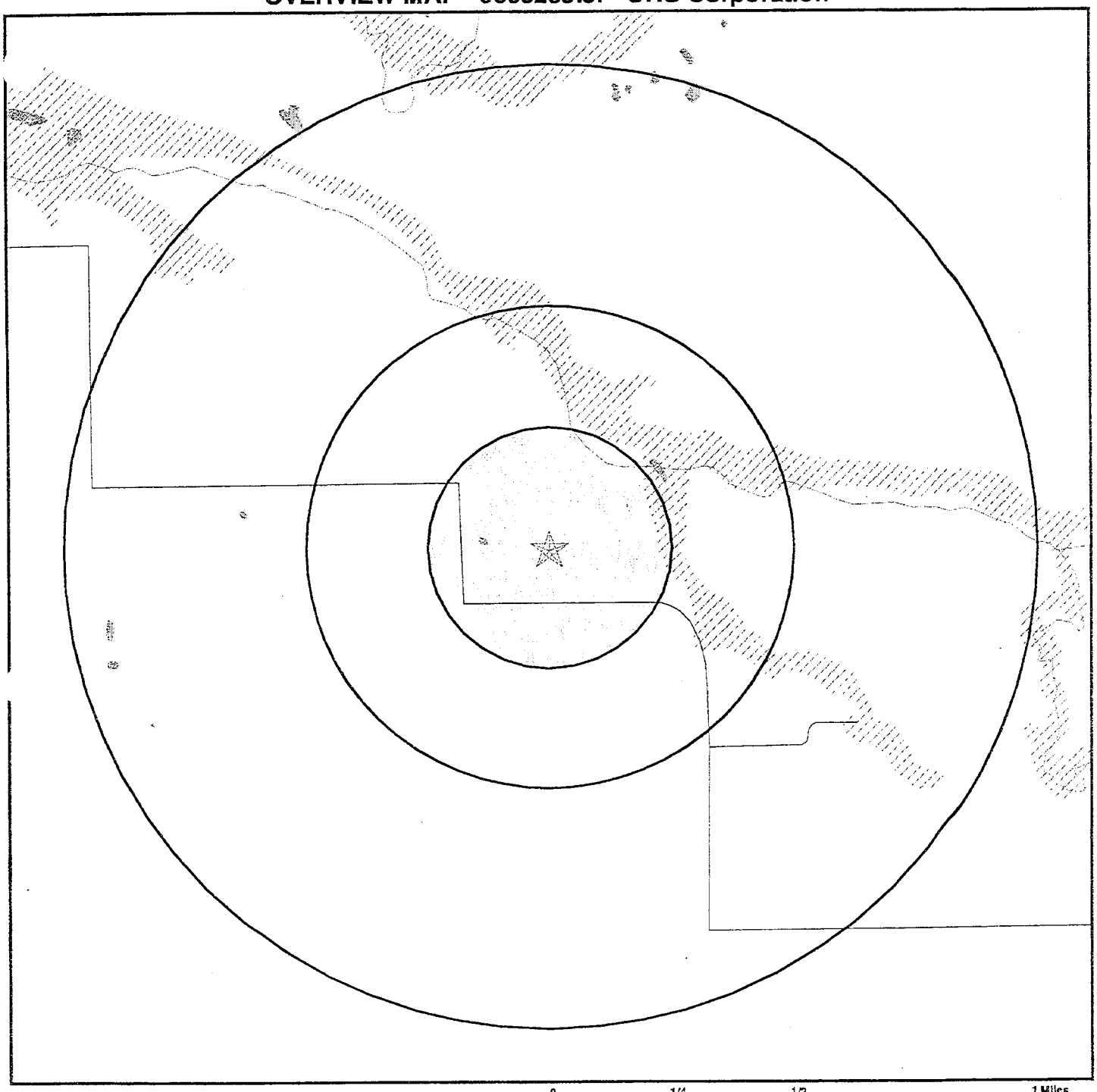
Surrounding sites were not identified.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
WOODCREEK WEST ELEMENTARY - PROPOSED	Cal-Sites
OLD ROSEVILLE CITY LF - SAUGSTAD PARK	SWF/LF
CITY OF ROSEVILLE W/WW LAB	HAZNET
1X ROSEVILLE JOINT UNION HIGH SCHOOL DIS	HAZNET
CITY OF ROSEVILLE	HAZNET
BOWL TRACK 17 IN ROSEVILLE	ERNS
ROSEVILLE YARD TRACK 479	ERNS
ROSEVILLE ANTELOPE YARD	ERNS
ROSEVILLE YARD 1600 VERNON ST	ERNS
ROSEVILLE YARD 1600 VERNON STREET	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE YARDS 1600 VERNON STREET	ERNS
ROSEVILLE RR YARD	ERNS
ROSEVILLE RR YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE SOUTH PACIFIC YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE MP 110.6	ERNS
ROSEVILLE TRAIN YARD	ERNS
ROSEVILLE AND KATELLA RD	ERNS
ROSEVILLE CA RAILYARD TRACK NO. 462	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE YARD TRACK 112 79 TH CAR IN THE TRACK	ERNS
ROSEVILLE YARD ROSEVILLE DIESEL PIT	ERNS
SPRR YARDS/ROSEVILLE CA	ERNS
DEL WEBB SUN CITY ROSEVILLE DEVELOPMENT**	CA SLIC
ROSEVILLE TEL. - CROWDER RD.	CA PLACER CO. MS
PI. CO. DPW, ROSEVILLE MAINT.	CA PLACER CO. MS
PI. CO. DPW, ROSEVILLE MAINT.	CA PLACER CO. MS

OVERVIEW MAP - 0655283.3r - URS Corporation

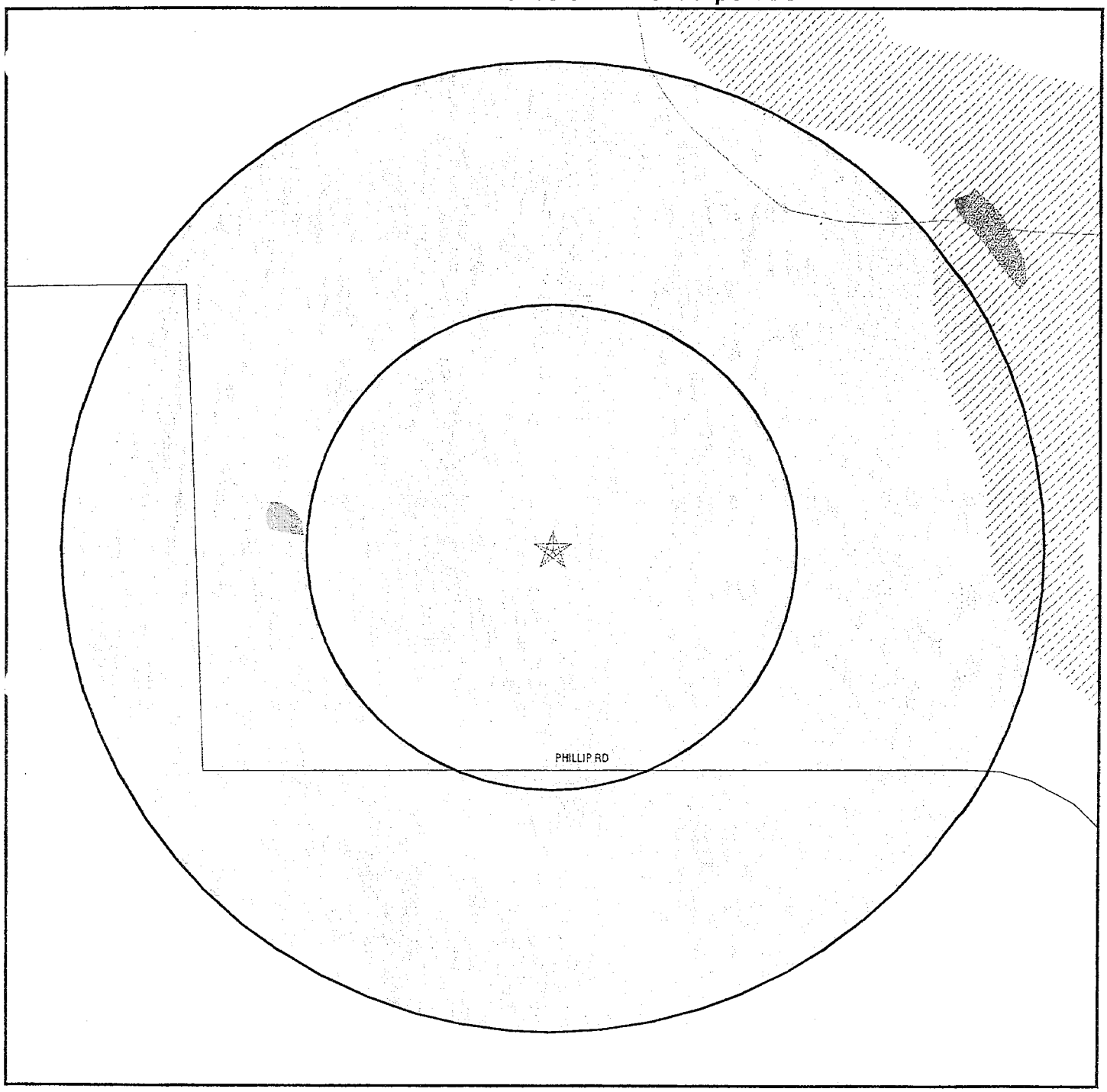


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Wetlands
- Areas of Concern

0 1/4 1/2 1 Miles

TARGET PROPERTY:	Roseville Site	CUSTOMER:	URS Corporation
ADDRESS:	5051 Phillip Rd	CONTACT:	Christopher Gurr
CITY/STATE/ZIP:	Roseville CA 95747	INQUIRY #:	0655283.3r
LAT/LONG:	38.7925 / 121.3831	DATE:	July 11, 2001 7:04 pm

DETAIL MAP - 0655283.3r - URS Corporation



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites (if requested)
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Wetlands
- Areas of Concern

0 1/16 1/8 1/4 Miles

TARGET PROPERTY:	Roseville Site	CUSTOMER:	URS Corporation
ADDRESS:	5051 Phillip Rd	CONTACT:	Christopher Gurr
CITY/STATE/ZIP:	Roseville CA 95747	INQUIRY #:	0655283.3r
LAT/LONG:	38.7925 / 121.3831	DATE:	July 11, 2001 7:04 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.250	0	0	NR	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRIS-TSD		0.500	0	0	0	NR	NR	0
RCRIS Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRIS Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
STATE ASTM STANDARD								
AWP		1.000	0	0	0	0	NR	0
Cal-Sites		1.000	0	0	0	0	NR	0
CHMIRS		1.000	0	0	0	0	NR	0
Cortese		1.000	0	0	0	0	NR	0
Notify 65		1.000	0	0	0	0	NR	0
Toxic Pits		1.000	0	0	0	0	NR	0
State Landfill		0.500	0	0	0	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	0	NR	NR	0
UST		0.250	0	0	NR	NR	NR	0
CA Bond Exp. Plan		1.000	0	0	0	0	NR	0
CA FID UST		0.250	0	0	NR	NR	NR	0
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
AST		TP	NR	NR	NR	NR	NR	0
CA WDS		TP	NR	NR	NR	NR	NR	0
CA SLIC		0.500	0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
HAZNET		0.250	0	0	NR	NR	NR	0
PLACER CO. MS		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY DATABASES								
Coal Gas		1.000	0	0	0	0	NR	0

TP = Target Property

NR = Not Requested at this Search Distance

* Sites may be listed in more than one database

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

NO SITES FOUND

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)	Facility ID
ROSEVILLE	S102361623	OLD ROSEVILLE CITY LF - SAUGSTAD PARK	APN 14-10-25, SW CNR DOUGLAS BLVD,BUJIAN		SWF/LF	31-CR-0011
ROSEVILLE	91234862	BOWL TRACK 17 IN ROSEVILLE	BOWL TRACK 17 IN ROSEVILLE		ERNS	
ROSEVILLE	S102286252	ROSEVILLE TEL. - CROWDER RD.	8000 CROWDER ROAD		CA PLACER CO. MS	PR0002692
ROSEVILLE	S103680218	CITY OF ROSEVILLE W/WW LAB	WEST END OF BOOTH RD	95747	HAZNET	CAL000002949
ROSEVILLE	S104915551	PI. CO. DPW, ROSEVILLE MAINT.	FAIR DR		CA PLACER CO. MS	PR0002946
ROSEVILLE	S104915550	PI. CO. DPW, ROSEVILLE MAINT.	FAIR DR		CA PLACER CO. MS	PR0001021
ROSEVILLE	S104941357	DEL WEBB SUN CITY ROSEVILLE DEVELOPMENT**	FIDDEYMENT ROAD NORTH OF BASE LINE RO		CA SLIC	
ROSEVILLE	S103679435	1X ROSEVILLE JOINT UNION HIGH SCHOOL DIS	OAKMONT HIGH SCHOOL		HAZNET	CAC000190928
ROSEVILLE	96512312	ROSEVILLE YARD TRACK 479	ROSEVILLE YARD TRACK 479		ERNS	
ROSEVILLE	94397520	ROSEVILLE ANTELOPE YARD	ROSEVILLE ANTELOPE YARD		ERNS	
ROSEVILLE	93345097	ROSEVILLE YARD 1600 VERNON ST	ROSEVILLE YARD 1600 VERNON ST		ERNS	
ROSEVILLE	93338953	ROSEVILLE YARD 1600 VERNON STREET	ROSEVILLE YARD 1600 VERNON STREET		ERNS	
ROSEVILLE	93336207	ROSEVILLE YARD	ROSEVILLE YARD		ERNS	
ROSEVILLE	93325642	ROSEVILLE YARDS 1600 VERNON STREET	ROSEVILLE YARDS 1600 VERNON STREET		ERNS	
ROSEVILLE	92262311	ROSEVILLE RR YARD	ROSEVILLE RR YARD		ERNS	
ROSEVILLE	92259772	ROSEVILLE RR YARD	ROSEVILLE RR YARD		ERNS	
ROSEVILLE	91466973	ROSEVILLE YARD	ROSEVILLE YARD		ERNS	
ROSEVILLE	91227510	ROSEVILLE YARD	ROSEVILLE YARD		ERNS	
ROSEVILLE	90190761	ROSEVILLE SOUTH PACIFIC YARD	ROSEVILLE SOUTH PACIFIC YARD		ERNS	
ROSEVILLE	98422302	ROSEVILLE YARD	ROSEVILLE YARD		ERNS	
ROSEVILLE	87637	ROSEVILLE MP 110.6	ROSEVILLE MP 110.6		ERNS	
ROSEVILLE	99614693	ROSEVILLE TRAIN YARD	ROSEVILLE TRAIN YARD		ERNS	
ROSEVILLE	98447412	ROSEVILLE AND KATELLA RD	ROSEVILLE AND KATELLA RD		ERNS	
ROSEVILLE	98443272	ROSEVILLE CA RAILYARD TRACK NO. 462	ROSEVILLE CA RAILYARD TRACK NO. 462		ERNS	
ROSEVILLE	99640603	ROSEVILLE YARD	ROSEVILLE YARD		ERNS	
ROSEVILLE	8710662	ROSEVILLE YARD TRACK 112 79 TH CAR IN THE TRACK	ROSEVILLE YARD TRACK 112 79 TH CAR IN THE TRACK		ERNS	
ROSEVILLE	8710920	ROSEVILLE YARD ROSEVILLE DIESEL PIT	ROSEVILLE YARD ROSEVILLE DIESEL PIT		ERNS	
ROSEVILLE	S103679868	CITY OF ROSEVILLE	SEWER LIFT STA 5 FIDDYMENT RD	95747	HAZNET	CAC001268376
ROSEVILLE	8713663	SPRR YARDS/ROSEVILLE CA	SPRR YARDS/ROSEVILLE CA		ERNS	
ROSEVILLE	S104549108	WOODCREEK WEST ELEMENTARY - PROPOSED	WOODCREEK WEST PARCEL 70	95747	Cal-Sites	31010004

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC).

Date of Government Version: 01/23/01
Date Made Active at EDR: 02/16/01
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 02/05/01
Elapsed ASTM days: 11
Date of Last EDR Contact: 05/07/01

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 01/23/01
Date Made Active at EDR: 02/16/01
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 02/05/01
Elapsed ASTM days: 11
Date of Last EDR Contact: 05/07/01

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 03/16/01
Date Made Active at EDR: 04/30/01
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/26/01
Elapsed ASTM days: 35
Date of Last EDR Contact: 03/26/01

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 03/16/01
Date Made Active at EDR: 04/30/01
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 03/26/01
Elapsed ASTM days: 35
Date of Last EDR Contact: 03/26/01

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 04/20/00
Date Made Active at EDR: 08/01/00
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 06/12/00
Elapsed ASTM days: 50
Date of Last EDR Contact: 06/12/01

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 06/21/00
Date Made Active at EDR: 07/31/00
Database Release Frequency: Semi-Annually

Date of Data Arrival at EDR: 07/10/00
Elapsed ASTM days: 21
Date of Last EDR Contact: 05/29/01

ERNS: Emergency Response Notification System
Source: EPA/NTIS
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 08/08/00
Date Made Active at EDR: 09/06/00
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 08/11/00
Elapsed ASTM days: 26
Date of Last EDR Contact: 04/19/01

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/97
Database Release Frequency: Biennially

Date of Last EDR Contact: 03/19/01
Date of Next Scheduled EDR Contact: 06/18/01

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

ROD: Records Of Decision
Source: NTIS
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 09/30/99
Database Release Frequency: Annually

Date of Last EDR Contact: 04/10/01
Date of Next Scheduled EDR Contact: 07/09/01

DELISTED NPL: National Priority List Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 01/23/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/07/01
Date of Next Scheduled EDR Contact: 08/06/01

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/07/00
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/09/01
Date of Next Scheduled EDR Contact: 07/09/01

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4526
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 11/30/00
Database Release Frequency: Annually

Date of Last EDR Contact: 04/24/01
Date of Next Scheduled EDR Contact: 07/23/01

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 01/30/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/09/01
Date of Next Scheduled EDR Contact: 07/09/01

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959

Date of Government Version: 08/01/98
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/02/01
Date of Next Scheduled EDR Contact: 07/02/01

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 05/23/01
Date of Next Scheduled EDR Contact: 08/20/01

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-260-3936
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/11/00
Database Release Frequency: Annually

Date of Last EDR Contact: 05/18/01
Date of Next Scheduled EDR Contact: 08/13/01

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 06/11/01
Date of Next Scheduled EDR Contact: 09/10/01

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-260-1531
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/98
Database Release Frequency: Annually
Date of Last EDR Contact: 03/26/01
Date of Next Scheduled EDR Contact: 06/25/01

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-1444
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/98
Database Release Frequency: Every 4 Years
Date of Last EDR Contact: 04/24/01
Date of Next Scheduled EDR Contact: 07/23/01

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-564-2501
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 08/30/00
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/26/01
Date of Next Scheduled EDR Contact: 06/25/01

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA
Telephone: 202-564-2501

Date of Government Version: 08/10/00
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/26/01
Date of Next Scheduled EDR Contact: 06/25/01

STATE OF CALIFORNIA ASTM STANDARD RECORDS

AWP: Annual Workplan Sites
Source: California Environmental Protection Agency
Telephone: 916-323-3400
Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 11/08/00
Date Made Active at EDR: 03/02/01
Database Release Frequency: Annually
Date of Data Arrival at EDR: 01/31/01
Elapsed ASTM days: 30
Date of Last EDR Contact: 04/30/01

CAL-SITES: Calsites Database
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database.

Date of Government Version: 10/01/00
Date Made Active at EDR: 11/22/00
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 10/30/00
Elapsed ASTM days: 23
Date of Last EDR Contact: 04/09/01

CHMIRS: California Hazardous Material Incident Report System
Source: Office of Emergency Services
Telephone: 916-464-3283
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/94
Date Made Active at EDR: 04/24/95
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 03/13/95
Elapsed ASTM days: 42
Date of Last EDR Contact: 05/29/01

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
Source: CAL EPA/Office of Emergency Information
Telephone: 916-327-1848
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 04/01/98
Date Made Active at EDR: 09/23/98
Database Release Frequency: Varies

Date of Data Arrival at EDR: 08/26/98
Elapsed ASTM days: 28
Date of Last EDR Contact: 04/30/01

NOTIFY 65: Proposition 65 Records
Source: State Water Resources Control Board
Telephone: 916-657-0696
Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/93
Date Made Active at EDR: 11/19/93
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 11/01/93
Elapsed ASTM days: 18
Date of Last EDR Contact: 04/26/01

TOXIC PITS: Toxic Pits Cleanup Act Sites
Source: State Water Resources Control Board
Telephone: 916-227-4364
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/95
Date Made Active at EDR: 09/26/95
Database Release Frequency: No Update Planned

Date of Data Arrival at EDR: 08/30/95
Elapsed ASTM days: 27
Date of Last EDR Contact: 05/07/01

SWF/LF (SWIS): Solid Waste Information System
Source: Integrated Waste Management Board
Telephone: 916-341-6320
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 02/21/01
Date Made Active at EDR: 04/13/01
Database Release Frequency: Quarterly

Date of Data Arrival at EDR: 03/19/01
Elapsed ASTM days: 25
Date of Last EDR Contact: 03/19/01

WMUDS/SWAT: Waste Management Unit Database
Source: State Water Resources Control Board
Telephone: 916-227-4448
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/00
Date Made Active at EDR: 05/10/00
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/10/00
Elapsed ASTM days: 30
Date of Last EDR Contact: 06/12/01

LUST: Leaking Underground Storage Tank Information System
Source: State Water Resources Control Board
Telephone: 916-445-6532
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/31/01
Date Made Active at EDR: 05/07/01
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/12/01
Elapsed ASTM days: 25
Date of Last EDR Contact: 04/12/01

CA UST:

UST: Hazardous Substance Storage Container Database
Source: State Water Resources Control Board
Telephone: 916-227-4408
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/90
Date Made Active at EDR: 02/12/91
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 01/25/91
Elapsed ASTM days: 18
Date of Last EDR Contact: 04/05/01

CA BOND EXP. PLAN: Bond Expenditure Plan
Source: Department of Health Services
Telephone: 916-255-2118
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/89
Date Made Active at EDR: 08/02/94
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 07/27/94
Elapsed ASTM days: 6
Date of Last EDR Contact: 05/31/94

CA FID UST: Facility Inventory Database
Source: California Environmental Protection Agency
Telephone: 916-445-6532
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/94
Date Made Active at EDR: 09/29/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 09/05/95
Elapsed ASTM days: 24
Date of Last EDR Contact: 12/28/98

STATE OF CALIFORNIA ASTM SUPPLEMENTAL RECORDS

AST: Aboveground Petroleum Storage Tank Facilities
Source: State Water Resources Control Board
Telephone: 916-227-4382
Registered Aboveground Storage Tanks.

Date of Government Version: 03/01/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/08/01
Date of Next Scheduled EDR Contact: 08/06/01

CA WDS: Waste Discharge System
Source: State Water Resources Control Board
Telephone: 916-657-1571
Sites which have been issued waste discharge requirements.

Date of Government Version: 02/14/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/26/01
Date of Next Scheduled EDR Contact: 06/25/01

HAZNET: Hazardous Waste Information System
Source: California Environmental Protection Agency
Telephone: 916-255-1136
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/99
Database Release Frequency: Annually

Date of Last EDR Contact: 05/15/01
Date of Next Scheduled EDR Contact: 08/13/01

LOCAL RECORDS

ALAMEDA COUNTY:

Local Oversight Program Listing of UGT Cleanup Sites
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 08/01/00
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/30/01
Date of Next Scheduled EDR Contact: 07/30/01

Underground Tanks
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 12/01/00
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/30/01
Date of Next Scheduled EDR Contact: 07/30/01

CONTRA COSTA COUNTY:

Site List
Source: Contra Costa Health Services Department
Telephone: 925-646-2286
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 09/01/00
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 06/04/01
Date of Next Scheduled EDR Contact: 09/03/01

FRESNO COUNTY:

CUPA Resources List
Source: Dept. of Community Health
Telephone: 559-445-3271
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 05/01/01
Database Release Frequency: N/A

Date of Last EDR Contact: 05/10/01
Date of Next Scheduled EDR Contact: 08/13/01

KERN COUNTY:

Underground Storage Tank Sites & Tanks Listing
Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Kern County Sites and Tanks Listing.

Date of Government Version: 01/23/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/04/01
Date of Next Scheduled EDR Contact: 09/03/01

LOS ANGELES COUNTY:

List of Solid Waste Facilities
Source: La County Department of Public Works
Telephone: 818-458-5185

Date of Government Version: 09/16/98
Database Release Frequency: Varies

Date of Last EDR Contact: 03/19/01
Date of Next Scheduled EDR Contact: 06/18/01

City of El Segundo Underground Storage Tank
Source: City of El Segundo Fire Department
Telephone: 310-607-2239

Date of Government Version: 02/01/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/23/01
Date of Next Scheduled EDR Contact: 08/20/01

City of Long Beach Underground Storage Tank
Source: City of Long Beach Fire Department
Telephone: 562-570-2543

Date of Government Version: 10/01/99
Database Release Frequency: Annually

Date of Last EDR Contact: 05/30/01
Date of Next Scheduled EDR Contact: 08/27/01

City of Torrance Underground Storage Tank
Source: City of Torrance Fire Department
Telephone: 310-618-2973

Date of Government Version: 02/01/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/23/01
Date of Next Scheduled EDR Contact: 08/20/01

City of Los Angeles Landfills
Source: Engineering & Construction Division
Telephone: 213-473-7869

Date of Government Version: 08/31/99
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/19/01
Date of Next Scheduled EDR Contact: 06/18/01

HMS: Street Number List
Source: Department of Public Works
Telephone: 626-458-3517
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 02/28/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/23/01
Date of Next Scheduled EDR Contact: 08/20/01

Site Mitigation List
Source: Community Health Services
Telephone: 323-890-7806
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/11/01
Database Release Frequency: Annually

Date of Last EDR Contact: 05/23/01
Date of Next Scheduled EDR Contact: 08/20/01

San Gabriel Valley Areas of Concern
Source: EPA Region 9
Telephone: 415-744-2407
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/98
Database Release Frequency: N/A

Date of Last EDR Contact: 06/29/99
Date of Next Scheduled EDR Contact: N/A

MARIN COUNTY:

Underground Storage Tank Sites
Source: Public Works Department Waste Management
Telephone: 415-499-6647
Currently permitted USTs in Marin County.

Date of Government Version: 03/05/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/08/01
Date of Next Scheduled EDR Contact: 08/06/01

NAPA COUNTY:

Sites With Reported Contamination
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 04/02/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/02/01
Date of Next Scheduled EDR Contact: 07/02/01

Closed and Operating Underground Storage Tank Sites
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 11/17/00
Database Release Frequency: Annually

Date of Last EDR Contact: 04/02/01
Date of Next Scheduled EDR Contact: 07/02/01

ORANGE COUNTY:

List of Underground Storage Tank Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/29/00
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/12/01
Date of Next Scheduled EDR Contact: 09/10/01

List of Underground Storage Tank Facilities
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/29/00
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/12/01
Date of Next Scheduled EDR Contact: 09/10/01

List of Industrial Site Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Petroleum and non-petroleum spills.

Date of Government Version: 10/24/00
Database Release Frequency: Annually

Date of Last EDR Contact: 06/12/01
Date of Next Scheduled EDR Contact: 09/10/01

PLACER COUNTY:

Master List of Facilities
Source: Placer County Health and Human Services
Telephone: 530-889-7335
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 04/11/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 03/26/01
Date of Next Scheduled EDR Contact: 06/25/01

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Source: Department of Public Health
Telephone: 909-358-5055
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 01/24/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/23/01
Date of Next Scheduled EDR Contact: 07/23/01

Underground Storage Tank Tank List
Source: Health Services Agency
Telephone: 909-358-5055

Date of Government Version: 12/05/00
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/23/01
Date of Next Scheduled EDR Contact: 07/23/01

SACRAMENTO COUNTY:

CS - Contaminated Sites
Source: Sacramento County Environmental Management
Telephone: 916-875-8450

Date of Government Version: 02/06/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/08/01
Date of Next Scheduled EDR Contact: 08/06/01

ML - Regulatory Compliance Master List
Source: Sacramento County Environmental Management
Telephone: 916-875-8450
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/06/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/08/01
Date of Next Scheduled EDR Contact: 08/06/01

SAN BERNARDINO COUNTY:

Hazardous Material Permits
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 10/02/00
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/12/01
Date of Next Scheduled EDR Contact: 09/10/01

SAN DIEGO COUNTY:

Solid Waste Facilities
Source: Department of Health Services
Telephone: 619-338-2209
San Diego County Solid Waste Facilities.

Date of Government Version: 07/01/98
Database Release Frequency: Annually
Date of Last EDR Contact: 05/29/01
Date of Next Scheduled EDR Contact: 08/27/01

Hazardous Materials Management Division Database
Source: Hazardous Materials Management Division
Telephone: 619-338-2268
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 04/08/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/09/01
Date of Next Scheduled EDR Contact: 07/09/01

SAN FRANCISCO COUNTY:

Local Oversite Facilities
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920

Date of Government Version: 03/30/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/12/01
Date of Next Scheduled EDR Contact: 09/10/01

Underground Storage Tank Information
Source: Department of Public Health
Telephone: 415-252-3920

Date of Government Version: 12/01/00
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/12/01
Date of Next Scheduled EDR Contact: 09/10/01

SAN MATEO COUNTY:

Fuel Leak List
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

Date of Government Version: 03/26/01
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/30/01
Date of Next Scheduled EDR Contact: 07/30/01

Business Inventory
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 06/24/99
Database Release Frequency: Annually
Date of Last EDR Contact: 04/17/01
Date of Next Scheduled EDR Contact: 07/16/01

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report
Source: Santa Clara Valley Water District
Telephone: 408-927-0710

Date of Government Version: 12/31/00
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 04/02/01
Date of Next Scheduled EDR Contact: 07/02/01

Hazaroud Material Facilities
Source: City of San Jose Fire Department
Telephone: 408-277-4659

Date of Government Version: 09/28/00
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/12/01
Date of Next Scheduled EDR Contact: 09/10/01

SOLANO COUNTY:

Leaking Undergroung Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 02/06/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/19/01
Date of Next Scheduled EDR Contact: 06/18/01

Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 02/06/01
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/19/01
Date of Next Scheduled EDR Contact: 06/18/01

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
Source: Department of Health Services
Telephone: 707-525-6565

Date of Government Version: 12/01/00
Database Release Frequency: Quarterly
Date of Last EDR Contact: 04/30/01
Date of Next Scheduled EDR Contact: 07/30/01

SUTTER COUNTY:

Underground Storage Tanks
Source: Sutter County Department of Agriculture
Telephone: 530-822-7500

Date of Government Version: 01/02/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/03/01
Date of Next Scheduled EDR Contact: 07/09/01

VENTURA COUNTY:

Inventory of Illegal Abandoned and Inactive Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County-Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 06/01/99
Database Release Frequency: Annually

Date of Last EDR Contact: 05/30/01
Date of Next Scheduled EDR Contact: 08/27/01

Listing of Underground Tank Cleanup Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/26/00
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/19/01
Date of Next Scheduled EDR Contact: 06/18/01

Underground Tank Closed Sites List
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 11/22/00
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/16/01
Date of Next Scheduled EDR Contact: 07/16/01

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 02/07/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/19/01
Date of Next Scheduled EDR Contact: 06/18/01

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Source: Yolo County Department of Health
Telephone: 530-666-8646

Date of Government Version: 01/23/01
Database Release Frequency: Annually

Date of Last EDR Contact: 04/23/01
Date of Next Scheduled EDR Contact: 07/23/01

California Regional Water Quality Control Board (RWQCB) LUST Records

LUST REG 1: Active Toxic Site Investigation
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220

Date of Government Version: 02/01/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/31/01
Date of Next Scheduled EDR Contact: 08/27/01

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 2: Fuel Leak List
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457

Date of Government Version: 03/21/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/16/01
Date of Next Scheduled EDR Contact: 07/16/01

LUST REG 3: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147

Date of Government Version: 02/20/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/23/01
Date of Next Scheduled EDR Contact: 08/20/01

LUST REG 4: Underground Storage Tank Leak List
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-266-6600

Date of Government Version: 04/12/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/02/01
Date of Next Scheduled EDR Contact: 07/02/01

LUST REG 5: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-255-3125

Date of Government Version: 01/02/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/17/01
Date of Next Scheduled EDR Contact: 07/09/01

LUST REG 6L: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424

Date of Government Version: 04/01/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/09/01
Date of Next Scheduled EDR Contact: 07/09/01

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491

Date of Government Version: 05/01/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/09/01
Date of Next Scheduled EDR Contact: 07/09/01

LUST REG 7: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491

Date of Government Version: 05/14/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/02/01
Date of Next Scheduled EDR Contact: 07/02/01

LUST REG 8: Leaking Underground Storage Tanks
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4498

Date of Government Version: 11/22/00
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/18/01
Date of Next Scheduled EDR Contact: 08/13/01

LUST REG 9: Leaking Underground Storage Tank Report
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 619-467-2952

Date of Government Version: 03/01/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/23/01
Date of Next Scheduled EDR Contact: 07/23/01

California Regional Water Quality Control Board (RWQCB) SLIC Records

SLIC REG 1: Active Toxic Site Investigations
Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220

Date of Government Version: 02/01/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/31/01
Date of Next Scheduled EDR Contact: 08/27/01

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 03/21/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/16/01
Date of Next Scheduled EDR Contact: 07/16/01

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 02/20/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/23/01
Date of Next Scheduled EDR Contact: 08/20/01

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 03/26/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/30/01
Date of Next Scheduled EDR Contact: 07/30/01

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-855-3075
Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 02/01/01
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/11/01
Date of Next Scheduled EDR Contact: 07/09/01

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583

Date of Government Version: 10/01/00
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/09/01
Date of Next Scheduled EDR Contact: 07/09/01

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-3298

Date of Government Version: 06/01/00
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/11/01
Date of Next Scheduled EDR Contact: 07/09/01

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/01/01
Database Release Frequency: Annually

Date of Last EDR Contact: 06/04/01
Date of Next Scheduled EDR Contact: 09/03/01

EDR PROPRIETARY DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

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The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

HISTORICAL AND OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 1999 from the U.S. Fish and Wildlife Service.

Appendix C
Historical Research Documentation

58

Yr 1958

Yr 1984

YC 7994

Appendix D
Site Reconnaissance Photographs

Photo 1: Facing NW
Site from entrance

Photo 2: Facing N
Site from entrance

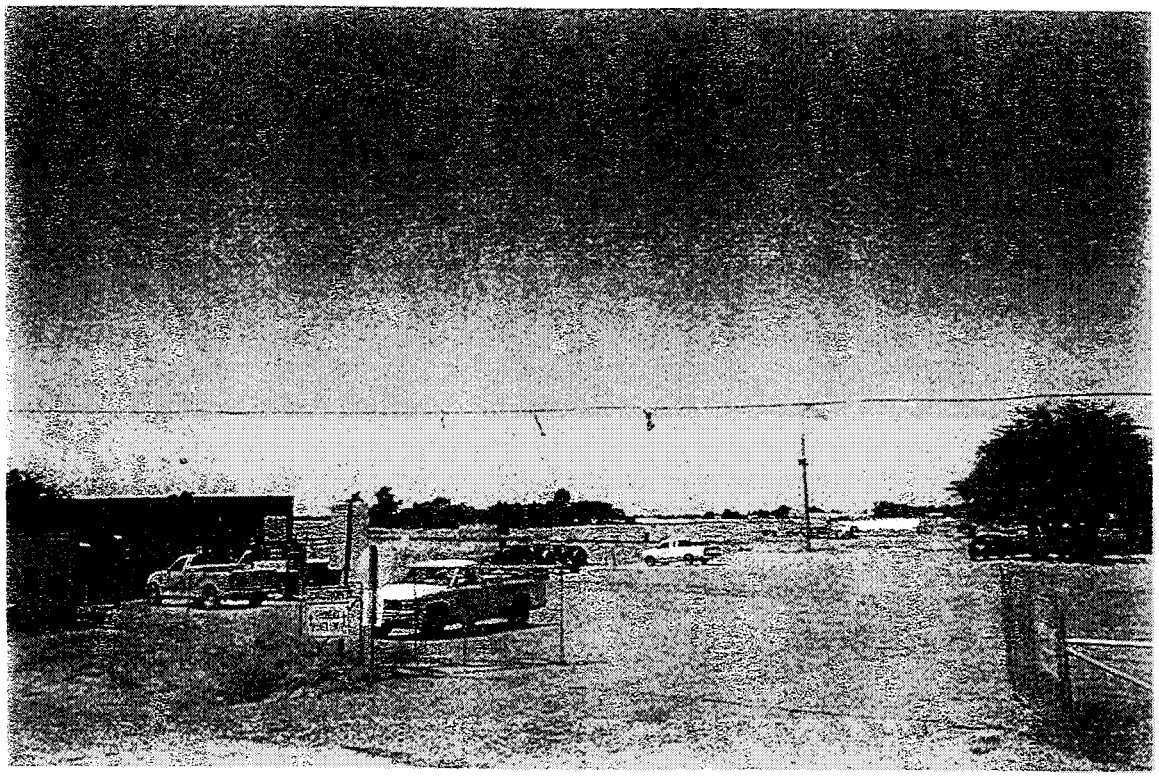


Photo 3: Facing NE
Site from entrance

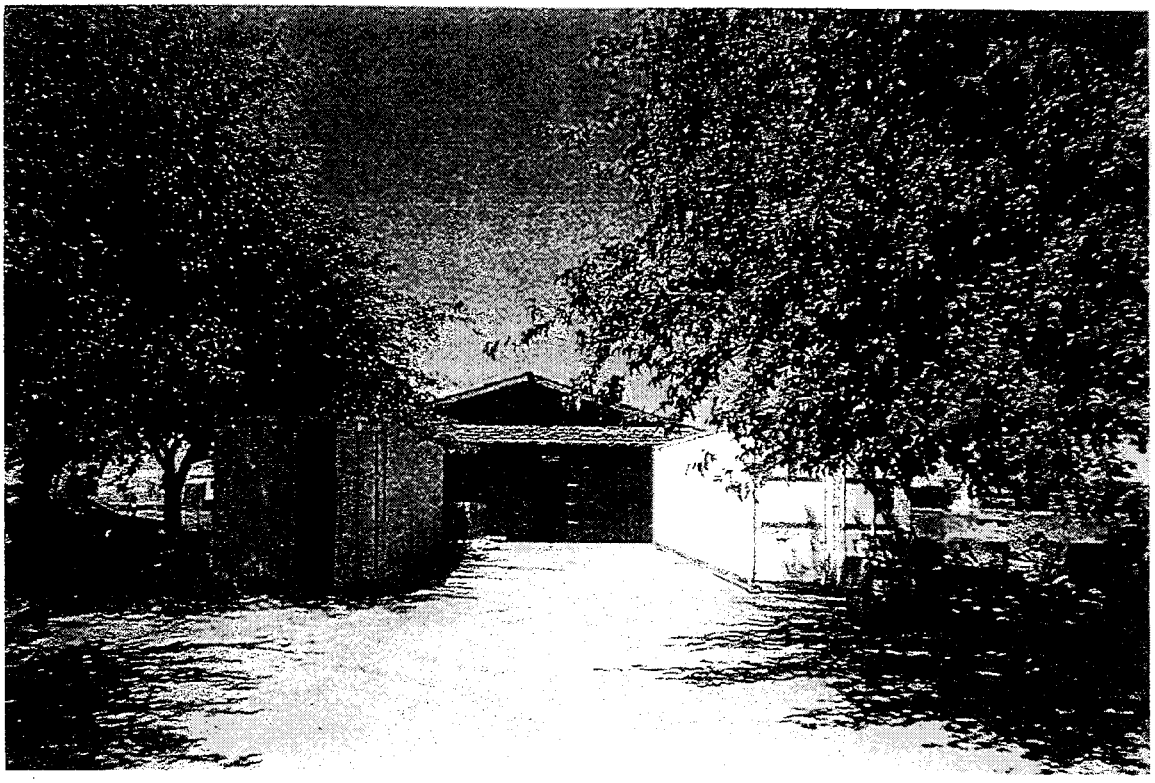


Photo 4: Facing N
APN 017-100-17, Site of Phase II ESA. Garage is pre-existing.
Garage and containers are used for equipment storage.

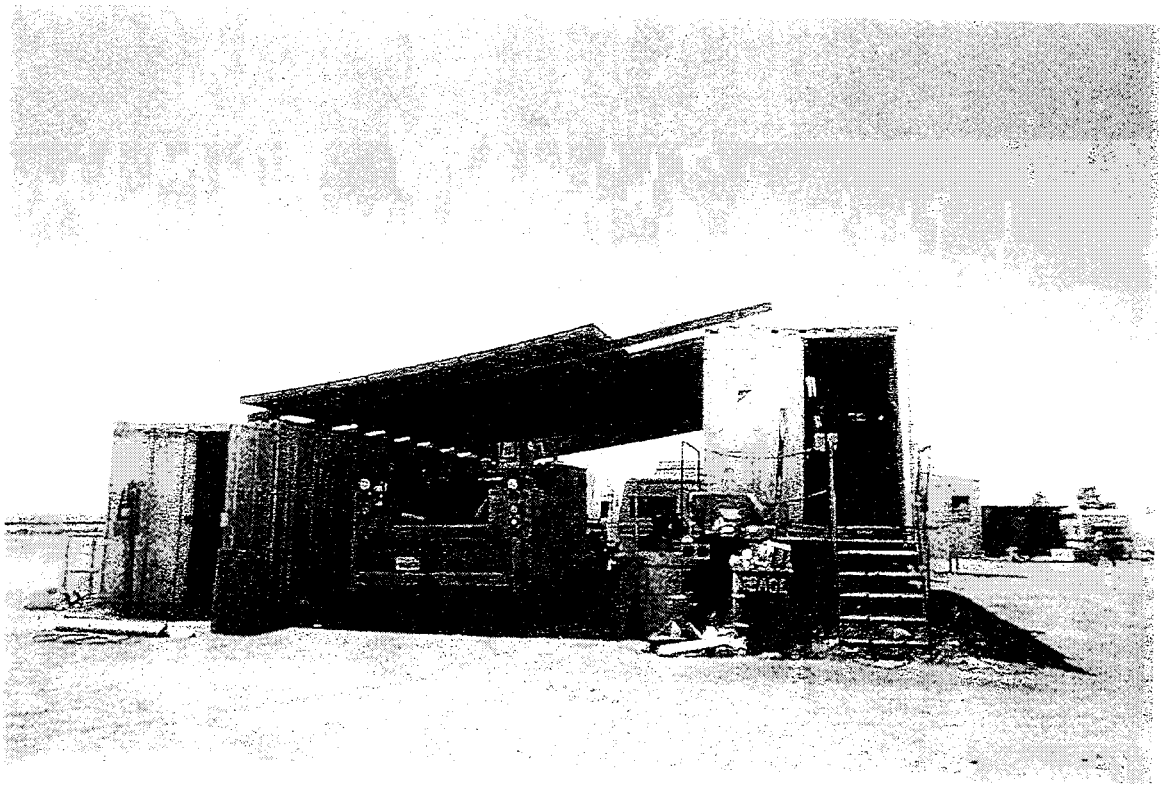


Photo 5: Facing E
APN 017-100-17, Construction equipment storage area.

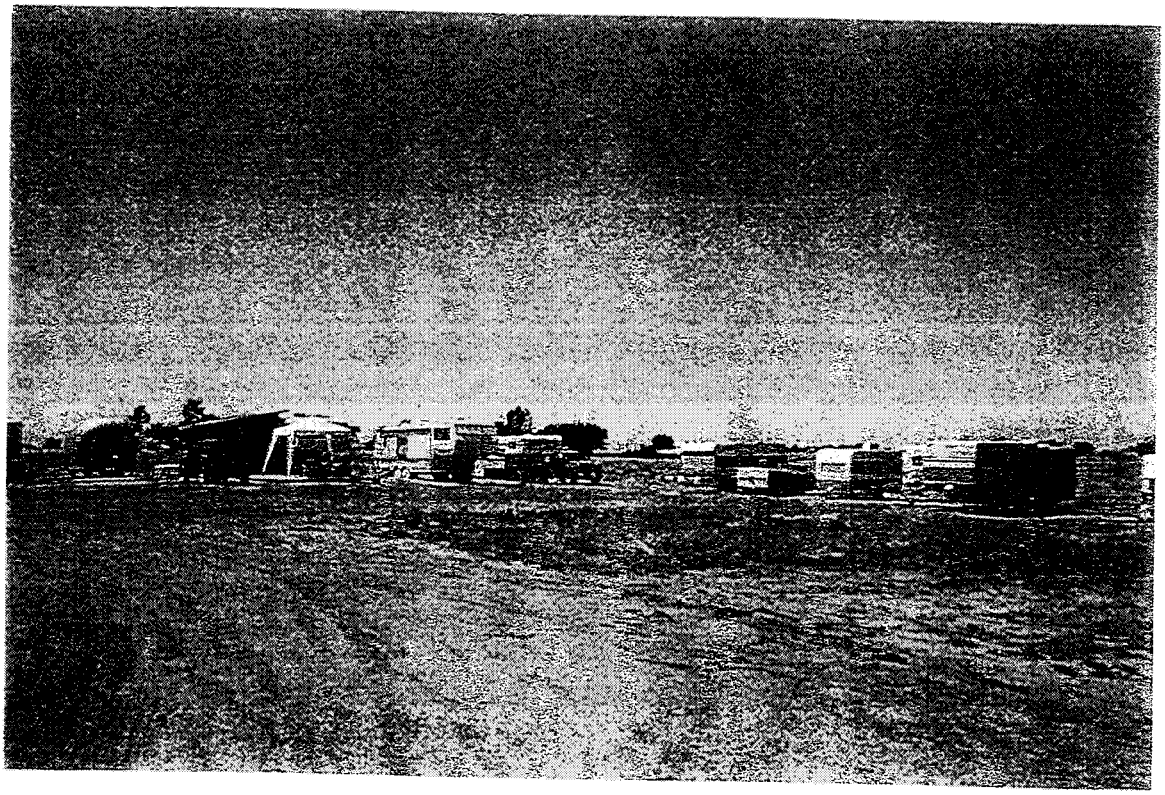


Photo 6: Facing E
APN 017-100-17, Construction workers' mobile homes.

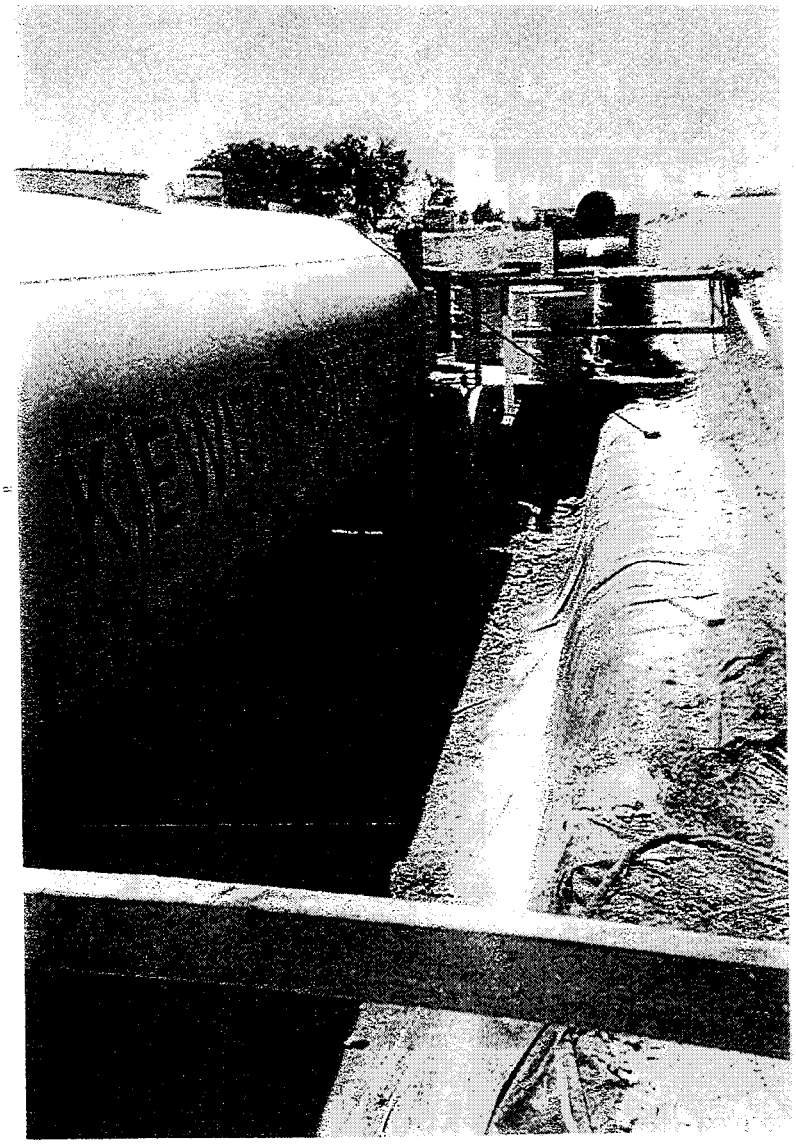


Photo 7: Facing E
APN 017-100-17, Diesel AST; Hazardous Materials storage;
Double-containment pit.

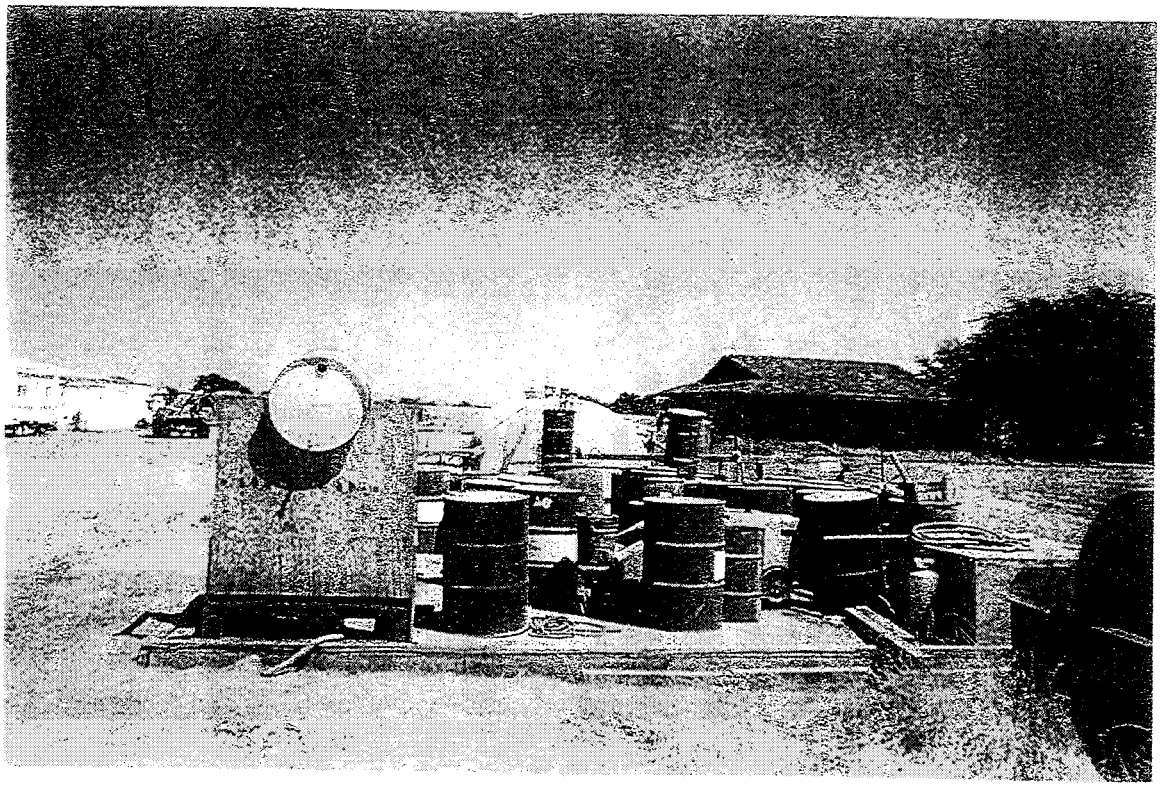


Photo 8: Facing W
APN 017-100-17, Hazardous Materials storage.

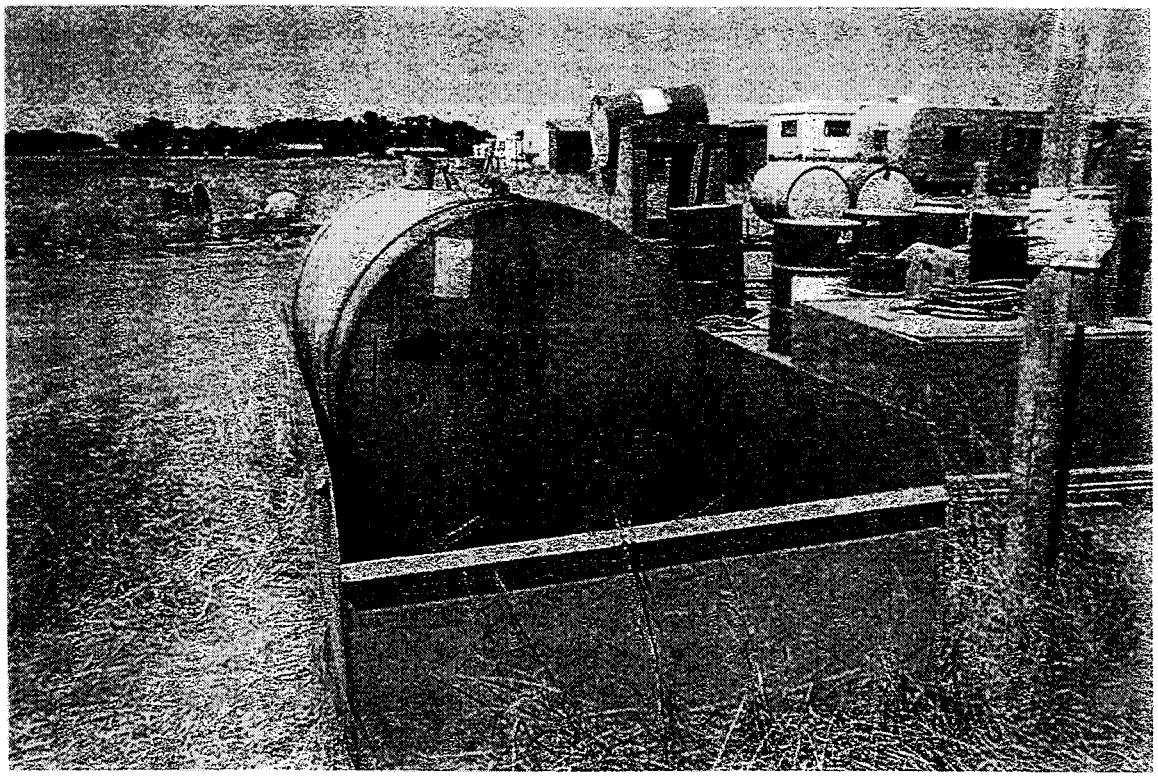


Photo 9: Facing N
APN 017-100-17, Waste oil AST (not in pit).

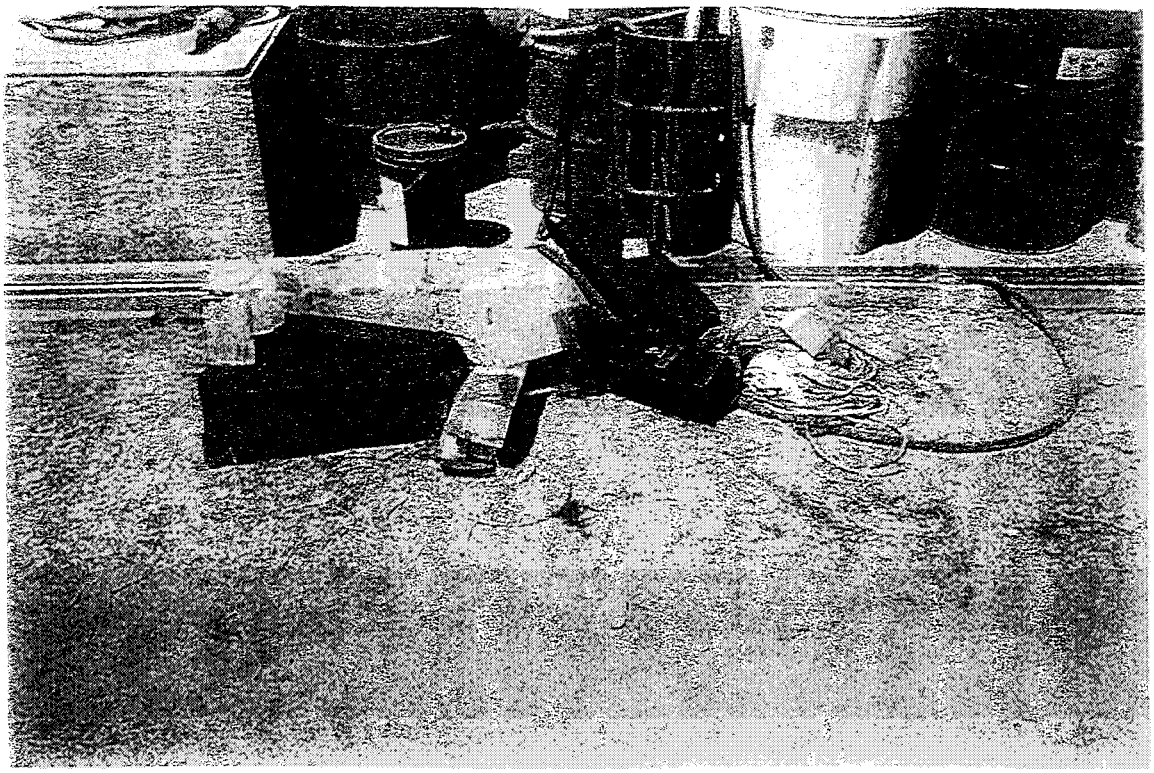


Photo 10: Facing N
APN 017-100-17, Oily rags and boxes, on ground near
Hazardous Materials storage area.

Photo 11: Facing SW
APN 017-100-17, Administration trailer on South end of site.
WWTP in background.

Photo 12: Facing S
APN 017-100-17 Area cordoned off as "sensitive environment."

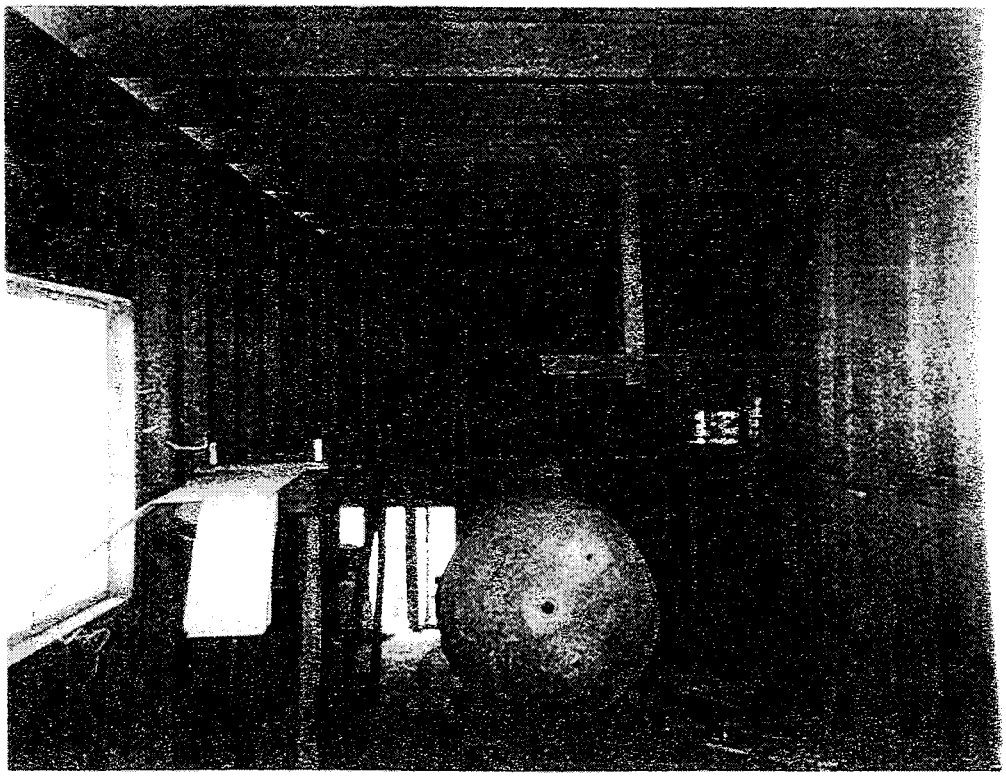


Photo 13: Facing E
APN 017-100-18, Shed near destroyed home. Cans of paint, tank for irrigation system.

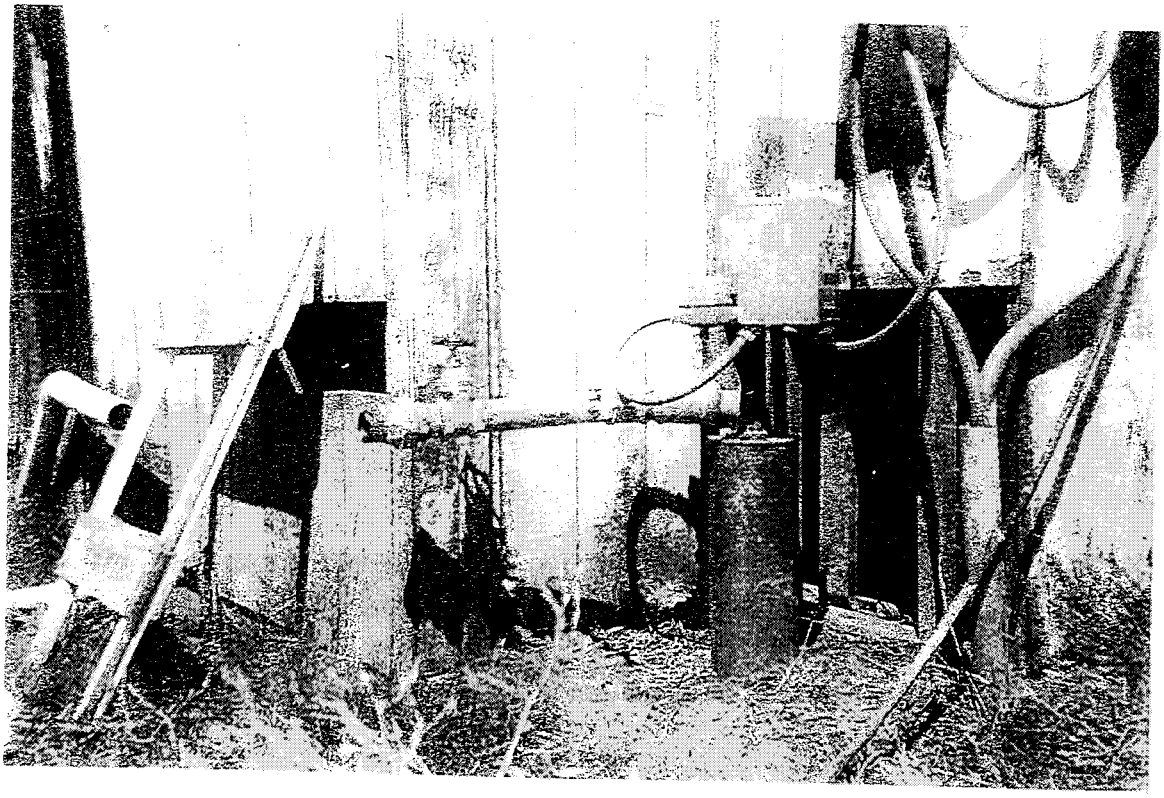


Photo 14: Facing NW
APN 017-100-18, Shed irrigation system components.

Photo 15: Facing W
APN 017-100-18, Debris pile.

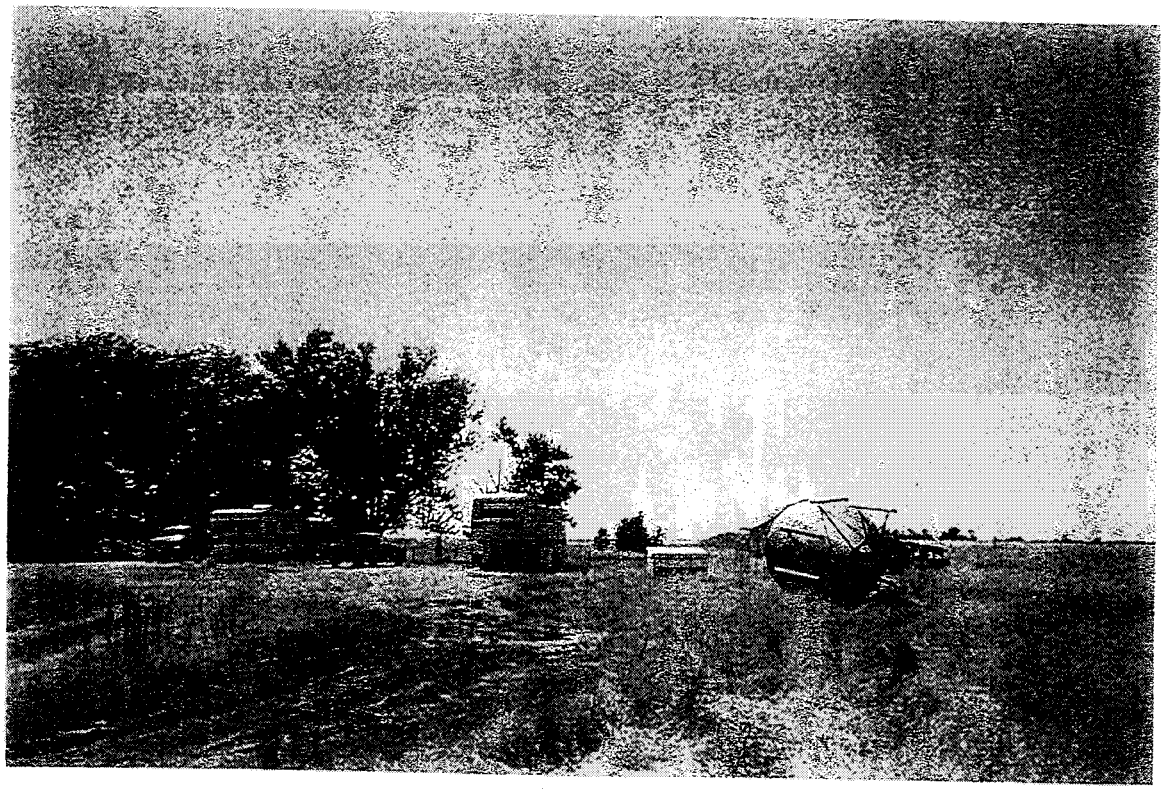


Photo 16:
APN 017-100-18, Location of destroyed house and photos 13-15

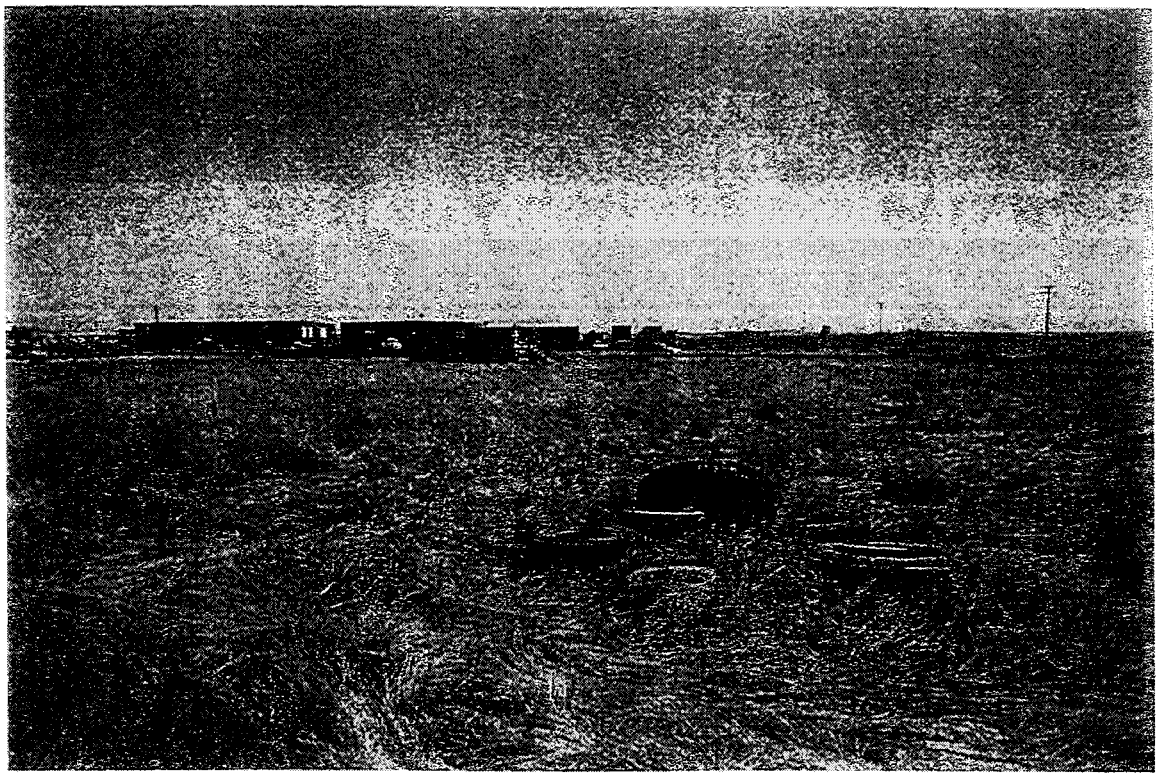


Photo 17: Facing S
APN 017-100-17, Pile of old tires and wheels.

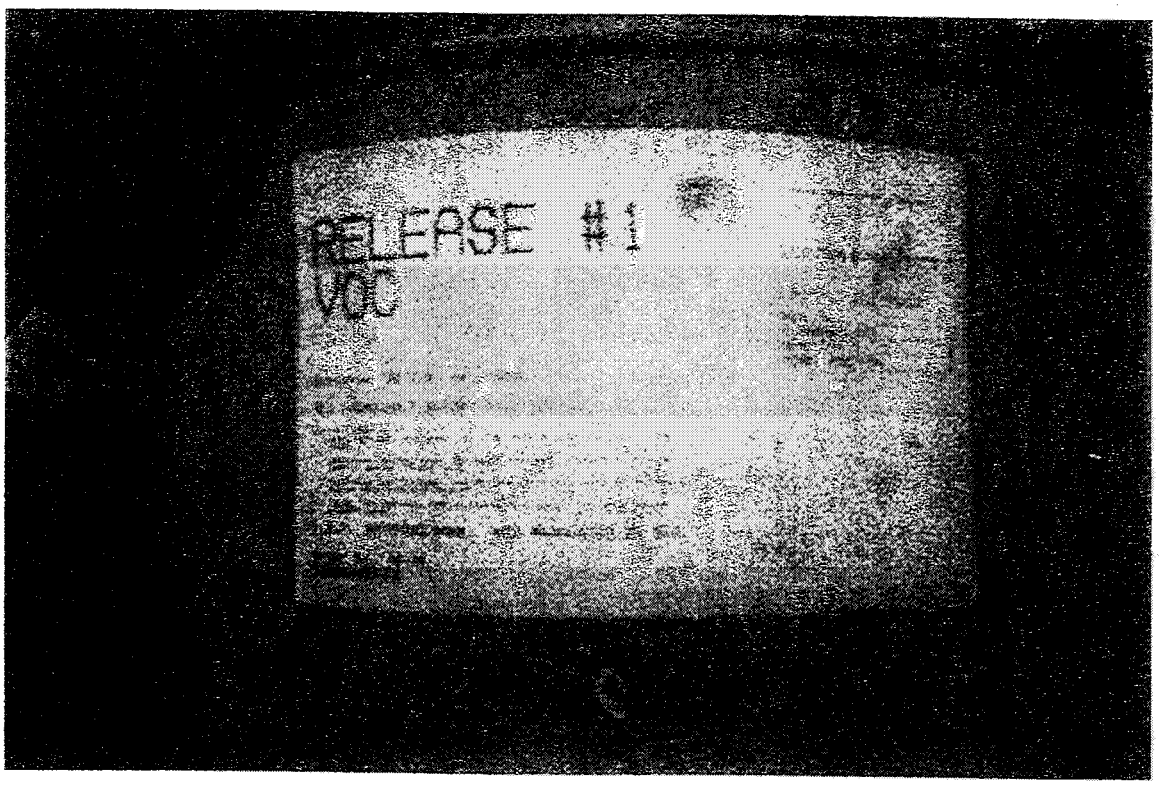


Photo 18:
APN 017-100-17, Label on empty drum at debris pile in photo 19.

Photo 19:
APN 017-100-17, Debris pile near worker's recreational vehicles

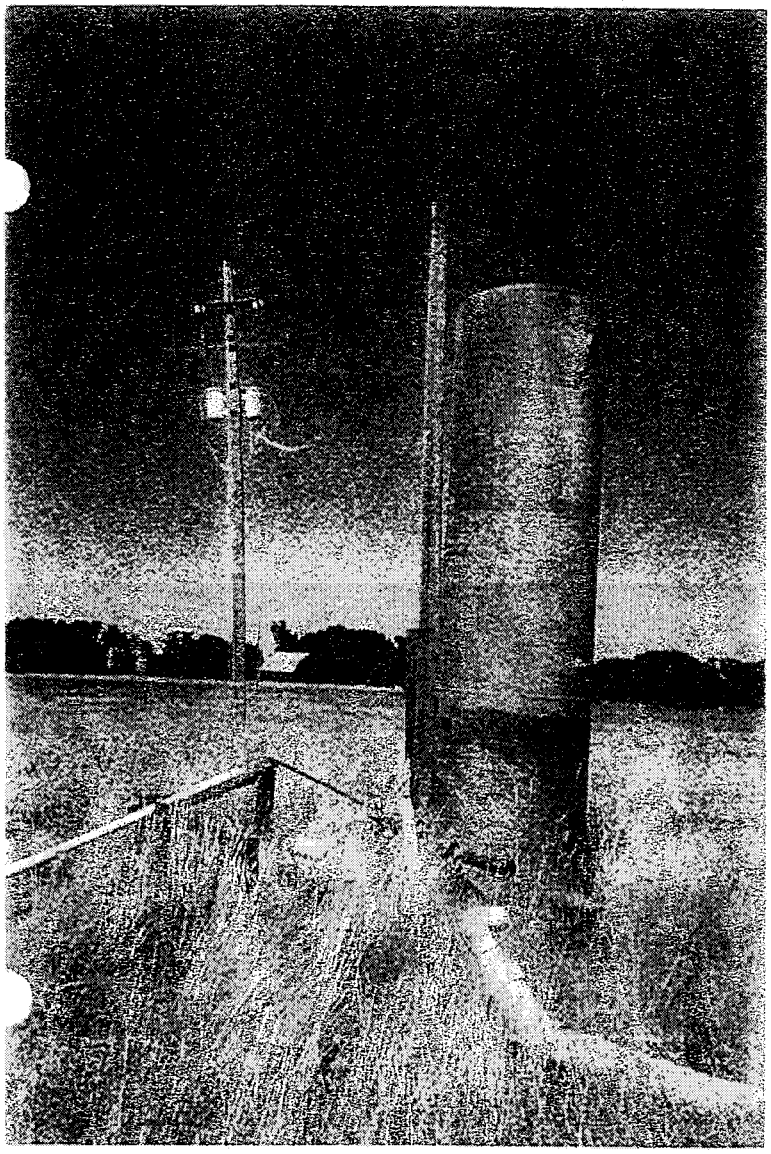


Photo 20: Facing N
APN 017-100-30, Well, transformers, abandoned barn.

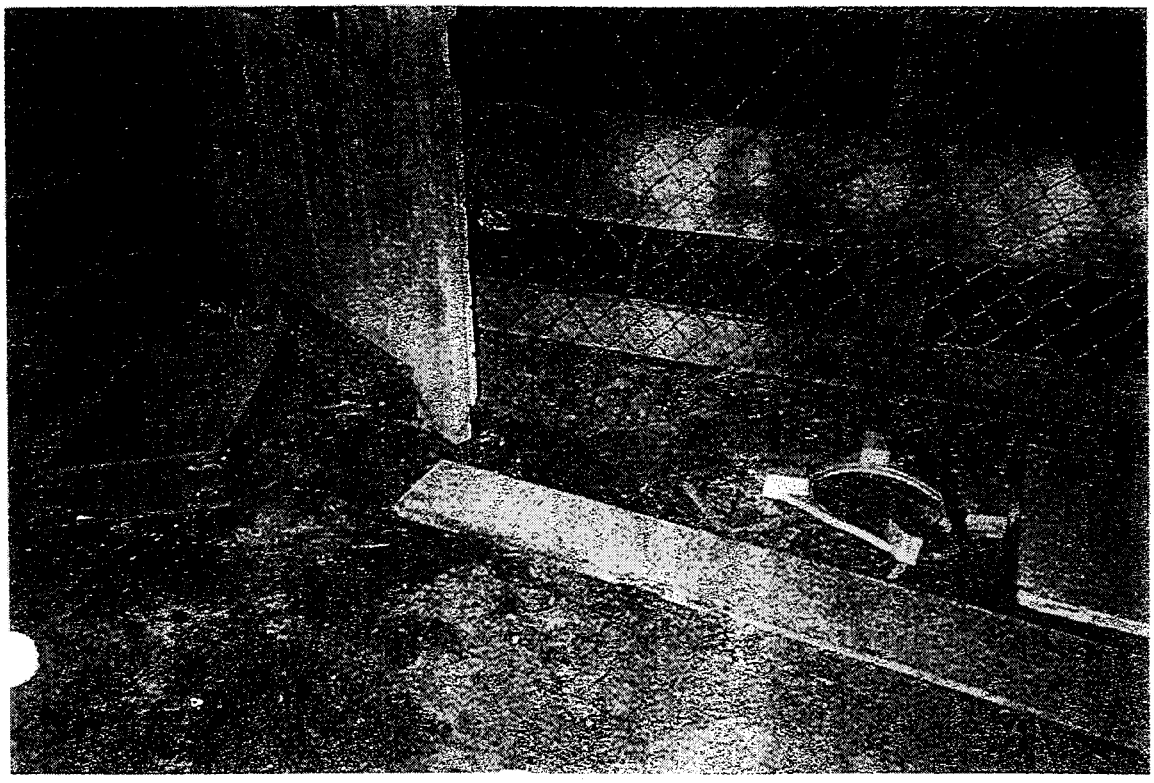


Photo 21:
APN 017-100-30, Stained soil inside barn.

Photo 22:
APN 017-100-30, Car batteries, gas inside barn

Appendix E

Site Reconnaissance Notes

URS

DATE _____

PROJECT NO. _____

PAGE NO. _____ OF _____ BY _____

- New APN number (get Assessors map from Placer Co.)
- Demolished: 1 story house on 17
  2 story house on 18
- There was asbestos in the (17) house, but Roseville Auto correct asbestos clean up procedures (Art O'Brien) does not have manifest
- on (17), garage still exists
- (17) + (18) was demolished ~ July - Sept, 2000
- Construction laydown use since June 2000
- Barn is abandoned on ~~(18)~~ (20) This site was part of the Phase I.
- A mobile home (abandoned & gutted) is on (21)
- " " " " " " " (20)

- Brad Kaufman
- Current Construction Manager
- No Hazardous Waste on site
- Haz Mat:
  - Diesel fuel + lubrication oil, + "other construction fluids."
    form oil, cure
  - no gasoline
  - been permitted by City of Roseville F.D. they've dis
  - ~~Ass~~ pit is double contained
- All Phases in the [illegible] Hazmat Permit

URS

DATE _____

PROJECT NO. _____

PAGE NO. _____ OF _____ BY _____

~~Tatum~~

- Waste oil - 55 gallons is picked up about every 6 months by "Ramos Environmental."

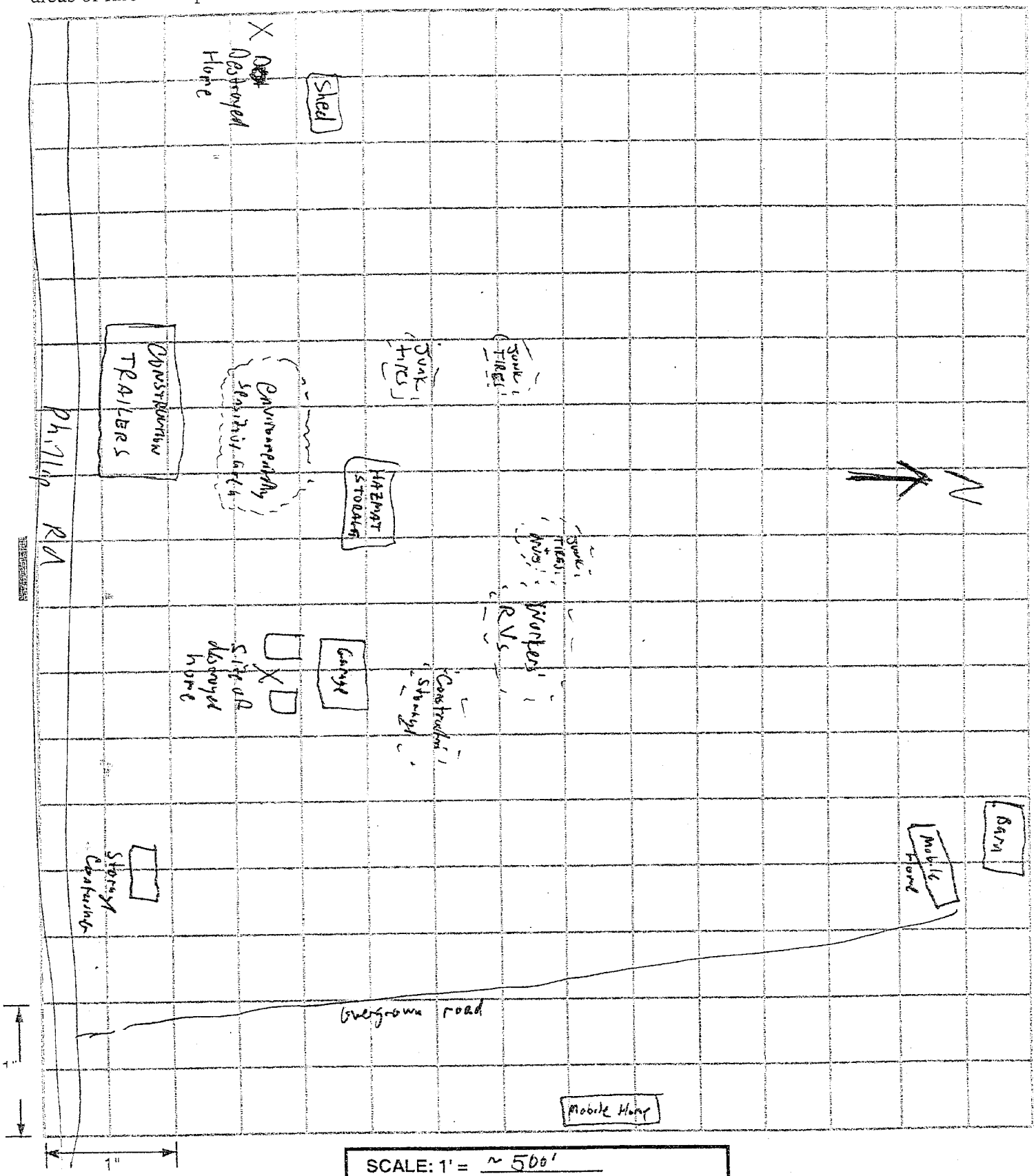
- HazMat storage area is checked + documented approximately every ~~to~~ 7 days.
- No spills have been recorded.
- When ~~they~~ Kiewit leaves, they'll test soils underneath the ~~to~~ storage area.

To sketch on map

- Construction trailers
- HazMat Storage
- 2 destroyed home sites
- 3 junk piles (~~1~~ 2 tires, 1 tires, Drums, refrigerator)
- Barn
- 2 mobile homes
- Workers' RVs.

SITE DRAWING
ASTM

Prepare a site drawing or sketch at not less than 1:600 scale depicting the Property, the improvements on the Property, locations of all environmentally sensitive areas (such as USTs, wells, discarded debris or drums) and areas of known or potential contamination. Include scale and north arrow.



SCALE: 1' = ~ 500'

WHICH WAY IS NORTH?

NAL

National Analytical Laboratories, Inc.

B.D.&J.Abatement, Inc.
P.O. Box 529
Penryn, CA 95663
Phone #: (916) 988-7666
Fax #: (916) 988-2951
Attention: Jim Strain

Job Site:
5300 Phillips Avenue
Roseville, CA

Job #:
BDJ-100600

Login #: 13058
Date/Time Samples Taken: 10/6/00
Date Report Submitted: 10/9/00
NAL ID # / Lot #: 86 / 339
Total Samples: 3

PHASE CONTRAST MICROSCOPY ANALYTICAL REPORT

Sample ID #		Liters/Min	Volume	Fibers per Fields	Fibers per mm2	Fibers per CC	UCL*	8 Hour TWA**
Client ID	5300-1C			< 5.5 / 100	< 7	< 0.002	< 0.010	N/A
N.A.L. #	86 - 339 - 01	10	1350					
Location/ Description:	South Side, Center/ Air Clearance							
Client ID	5300-2C			6 / 100	8	0.002	0.010	N/A
N.A.L. #	86 - 339 - 02	10	1350					
Location/ Description:	North Side, Center/ Air Clearance							
Client ID	5300-FB-3C			< 5.5 / 100	< 7	<	<	N/A
N.A.L. #	86 - 339 - 03	0	0					
Location/ Description:	30 Seconds Cap Off/ Field Blank							

KEY: TWA: Time Weighted Average per sample. Eight hour TWA summary is provided at end of each month.
INF*: Sample not suitable for analysis. See sample description.

Analyst: Michael Sollish

Reviewed By:

Samples analyzed by Phase Contrast Microscopy in accordance with the N.I.O.S.H. 7400 Method utilizing the "A" Counting Rules.

* U.C.L. - Refers to the 95% Upper Confidence Limit, that insures that the differences in measured concentrations between laboratories and within laboratories will be no higher than the U.C.L. This information is based in part on the volume of air sampled and fibers counted.

Hazardous Material Accumulation Area Inspection Report

Site or Job Location_____

1.	Any evidence of leaking containers?	Yes	No
2.	Any evidence of deterioration of containers caused by corrosion or other factors?	Yes	No
3.	All containers properly labeled?	Yes	No
4.	Labels clearly visible?	Yes	No
5.	Aisle space open and clear of obstructions?	Yes	No
6.	All bungs and lids on and tight?	Yes	No
7.	"No Smoking" and "Hazardous Waste Accumulations Area" signs in place?	Yes	No
8.	Spill control equipment in place?	Yes	No
9.	Storage dates under the 90 or 180-day limit?	Yes	No
10.	Incompatible waste separated properly?	Yes	No
11.	Any strange smells?	Yes	No
12.	Communication devices working?	Yes	No

Comments:

Date_____Time_____Signature_____

Note: Any deficiencies noted must be brought to the attention of the *On-Site Coordinator* for immediate attention.

ROSEVILLE FIRE DEPARTMENT

Fire Prevention Bureau
401 Oak Street - Roseville, CA 95678

916-774-5805

LOCATION 5051 Phillips Road BUSINESS NAME Pleasant Grove WWTP

DATE 7-13-00 OCCUPANCY TYPE _____ MAP PAGE _____ BUS. PHONE _____

NO.	HAZARD CONDITION - LOCATION	DATE CLEARED	CODE
	Above ground fuel system is inspected and found in compliance with pertinent requirements.		

Brad
[redacted]
Paul - Permits

☐ A Reasonable Degree of Fire and Life Safety Exists at this Time - No Hazards Noted.

☐ The items above are of such nature as to qualify for the "SELF VERIFICATION" process. A "SELF VERIFICATION form has been left and should be returned to the Fire Dept. within 15 days of this notice being served.

☐ YOU ARE HEREBY NOTIFIED TO CORRECT THE ITEMS LISTED ABOVE BY _____ OR SHOW CAUSE WHY YOU SHOULD NOT BE REQUIRED TO DO SO.

INSPECTORS [signature] | SHIFT | STATION | MANAGER/EMPLOYEE/OWNER [signature]

Roseville Energy Park

Appendix 8.14-D
Phase I Environmental Site Assessment Update, REP Site

October 2003

Roseville Energy Park
Application for Certification

PHASE I
ENVIRONMENTAL SITE ASSESSMENT UPDATE

Roseville Energy Park
Roseville, California

Prepared for:

THE CITY OF ROSEVILLE
Roseville, California

Prepared by:

TETRA TECH FW, INC.

3947 Lennane Drive, Suite 200
Sacramento, CA 95834

September 2003

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EXECUTIVE SUMMARY

Tetra Tech FW conducted a Phase I Environmental Site Assessment (ESA) Update for the Roseville Energy Park (REP) project site (APN: 017-100-017, 029, and 030) on Phillips Road in Roseville, California. The purpose of this Phase I ESA update was to identify, to the extent feasible pursuant to the processes prescribed herein, recognized environmental conditions, if any, associated with the property since the previous Phase I ESAs were prepared (URS 2001, EARTHTEC 1999). This was accomplished by reviewing reasonably ascertainable records, conducting a site reconnaissance, and performing select interviews.

A recognized environmental condition, as defined by the American Society for Testing and Materials (ASTM) Standard Practice E 1527-00, is the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that, without employing sampling, testing, or intrusive techniques, appear to indicate an existing release, a past release, or a material threat of a release into the property's structures or into the ground, groundwater, or surface water of the property.

The site (APN: 017-100-017, 029, and 030) is a 40-acre property owned by the City of Roseville. The site consists of mostly open undeveloped grassland; however, the southwest quadrant of the project site is being used for construction staging and laydown for the Pleasant Grove Waste Water Treatment Plant. A portion of this site will be used for construction of the REP. The site is located on Phillips Road in an area annexed by the City of Roseville near the northwest corner of Roseville's existing city limits.

This Phase I ESA Update has been conducted to update the Phase I ESAs previously performed for these parcels; the findings from the original ESAs can be found in the referenced reports (EARTHTECH 1999 and URS 2001).

Our findings are summarized as follows:

- Historically, the Site was generally used for agricultural purposes. A portion of the site has been used for construction laydown activities supporting construction of the Pleasant Grove Waste Water Treatment Plant since the City of Roseville purchased the Property in 1999. Conditions of the property have not materially changed since the previous Phase I ESA (URS 2001).
- In general, current hazardous material management practices within the construction laydown area could be improved. Specific findings included: 1) unlabeled hazardous material containers, 2) not all hazardous materials are stored in a manner that minimizes the potential for materials to contact soil, 3) improper handling and storage of wet paint waste materials, and 4) improper disposal of partially empty or empty hazardous material containers.

These findings represent a potential recognized environmental condition based on the potential for poorly managed containers to release hazardous materials to the environment (and specific observation of oil release from a small container). Tetra Tech FW recommends that the site be cleaned of used hazardous material containers and they be properly disposed of. In addition, Tetra Tech FW recommends thorough visual inspection of all hazardous material storage areas upon demobilization of construction-related activities and removal of all stored materials. If visual inspections show signs of a past release, then limited surface soil sampling is recommended to assess the potential impact.

- Tetra Tech FW observed 11 lead acid batteries and small quantities of oil in an abandoned barn at the northeast corner of parcel 017-100-30. The batteries did not appear damaged and no signs of corrosion or leakage were observed. In addition, two 5-gallon oil containers were present; both containers were sealed and no signs of leaks or spills were observed. Although no indications of soil contamination were observed, this finding is a recognized environmental condition because these apparently abandoned wastes could ultimately result in a release to soil. Tetra Tech FW recommends that these wastes be properly disposed of and that the underlying soil be visually inspected for indications of leaks following removal of the materials.
- EDR conducted a search of federal, state, and local environmental databases in August 2003. The results of the search indicated one recognized environmental condition believed to be related to the site (5300 Phillips Road). In 1995, waste oil and battery acid were illegally dumped by a tenant. This was reported from the California Hazardous Material Incident Report System (CHMIRS) maintained by the California Office of Emergency Services (OES). OES should be contacted to obtain further information about this report to determine whether it is in reference to the batteries and waste oil observed in the abandoned barn located on parcel 17-100-030 (see discussion in bullet above).
- Abandoned and/or unlabeled drums located in remote areas of the site represent recognized environmental conditions based on uncertainty of past material contents, handling, and disposal practices and the potential for future released from corroding drums. Tetra Tech FW recommends that the single empty drum be removed from the northern portion of parcel 17-100-017 and that its origin be further investigated. We further recommend that the two drums found in the northeast corner of parcel 17-100-030 (potentially containing paint product) be removed and properly disposed of. Depending on the contents and condition of these drums, and the presence of any visual indications of leakage, limited surface soil sampling may be warranted directly beneath these containers.
- Small areas of soil staining were observed from vehicle or equipment leaks within the equipment staging area. Although these were relatively small in scale, the presence of hydrocarbon-impacted soil is a recognized environmental condition. Tetra Tech FW recommends limited soil removal based on visual observations in these areas at the completion of the construction laydown use.
- Several areas of construction-related debris were observed that will require ultimate disposal.

- Observations of the adjacent properties revealed general agricultural activities. No recognized environmental conditions that could impact the site were visually apparent on the surrounding properties.

1.0 INTRODUCTION

This report presents the results of a Phase I Environmental Site Assessment (ESA) update for the Roseville Energy Park (REP) project site (APN: 017-100-017, 029, and 030) on Phillips Road in Roseville, California. This report was prepared by Tetra Tech FW, Inc. (TtFW) for the use of Roseville Electric Department (RE), pursuant to the proposal July 22, 2003. The format of this report is generally consistent with the recommended format in "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process," issued by the American Society for Testing and Materials (ASTM Standard E1527-00).

1.1 PURPOSE

Pursuant to the scope of work, specified in the technical proposal dated July, 2003, the purpose of this Phase I ESA Update was to identify recognized environmental conditions in connection with the property since the previous Phase I Environmental Site Assessments were prepared (EARTHTEC 1999, URS 2001). As defined in the ASTM Standard Practice E1527-00, "recognized environmental conditions" are defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property."

1.2 LIMITING CONDITIONS AND METHODOLOGY USED

Tetra Tech FW's scope of services for this project was limited to the following tasks:

- Database Search
- Local Regulatory Agency File Review
- Site Reconnaissance

The above tasks were accomplished in accordance with the procedures described in the scope of work dated July 22, 2003. This Phase I ESA Update did not include wetlands evaluation, testing for or surveying of asbestos, radon, lead in potable water, lead paint, soil, or groundwater sampling.

2.0 SITE DESCRIPTION

The site (APN: 017-100-017, 029, and 030) is a 40-acre area currently being used as a construction laydown and staging yard for the build out of the Pleasant Grove Waste Water Treatment Plant. A portion of this site will be used for construction of the REP. The site is located on Phillips Road in an area annexed by the City of Roseville near the northwest corner of Roseville's existing city limits.

2.1 SITE LOCATION

The REP project site is located in Placer County and is approximately 16 miles northeast of Sacramento, California. The project site is located directly north of the Pleasant Grove Waste Water Treatment Plant along Philip Road, north of Baseline Road and approximately 1 mile west of Fiddyment Road. The site is located on the Pleasant Grove USGS 7.5 minute topographic map, Section 23 of Township 11N and Range 5E.

2.2 SITE AND VICINITY CHARACTERISTICS

The REP project site is located in an open and rural area historically used for rural residential and grazing land uses. With the exception of the Pleasant Grove Waste Water Treatment Plant, located directly south and across Phillip Road from the project site, land use surrounding the project site consists of rural residences and agricultural grazing.

The closest residence to the project site is located approximately 300 feet north from parcels 017-100-17 and 017-100-29. Other residences in the site vicinity include a rural residence 350 feet west of parcel 017-100-17, a rural residence 700 feet to the northeast of parcel 017-100-30, and a rural residence and additional farmstead buildings located 2,500 feet to the southwest.

The 40-acre RE property area consists of mostly open undeveloped grassland. The southwest quadrant of the project site is being used for construction staging and laydown for the Pleasant Grove Waste Water Treatment Plant. An abandoned and run down barn lies near the northern boundary of parcel 017-100-30; the southern portion of parcel 017-100-17 contains remnants from past activities including shed structures and abandoned vehicles and machinery.

2.3 SITE IMPROVEMENTS

No major site improvements or changes have occurred on the project site since the previous Phase I ESA (URS 2001). However, one important change did take place with the decommissioning and removal of a hazardous materials storage area containing an above ground diesel fuel storage tank. This hazardous materials storage area was located approximately 300 feet north of Phillip Road and consisted of the 20,000 gallon diesel tank and drums of construction liquids such as lubricating oil and construction cure. The hazardous materials storage area and above ground storage tank were removed in October 2002 (Personal communication with Brian McKenzie, Kiewit Pacific).

2.4 ENVIRONMENTAL LIENS

No reported National Priority List (NPL) liens associated with the property were identified in the database search report prepared by EDR Environmental Data Resources, Inc. (EDR, 2003). A copy of the EDR Report is provided in Appendix B.

2.5 CURRENT USES OF THE PROPERTY

The City of Roseville and Kiewit Pacific Company are currently using the Roseville Energy Park project site as a construction staging and laydown yard for the build out of the Pleasant Grove Waste Water Treatment Plant. The site is being utilized to house administrative office trailers, park employee vehicles, stage construction related machinery/vehicles, and store construction materials. In addition, at least one mobile home recreational vehicle (RV) used for temporary employee housing is located on the site.

Photos 1 through 5 in Appendix A show current uses on the project site.

2.6 PAST USES OF THE PROPERTY

This Phase I ESA Update supplements previous Environmental Impact Statements conducted for the project site and is focused on past uses of the property dating only to August 2001. For a description of past uses of the property refer to the previous Phase I ESAs (URS 2001 and EARTHTEC 1999).

Use of the project property during the last two years has consisted of construction staging and laydown for the build out of the Pleasant Grove Wastewater Treatment Plant.

2.7 CURRENT AND PAST USES OF ADJOINING PROPERTY

With the exception of the newly built Pleasant Grove Waste Water Treatment Plant, the adjoining properties have been, and still are rural residential and general agricultural (grazing) land uses. One rural residential property located approximately 350 feet west of parcel 017-100-17 also includes a dog kennel operation.

2.8 PHYSICAL SETTING SOURCES

2.8.1 Geology

The soil classification in the area of the site is predominantly silt-clay. Weathered bedrock can be encountered as shallow as approximately 3 feet beneath the surface. The soil material in this area is well drained, has intermediate water holding capacity, and very slow infiltration rates. The depth to the water greater than 6 feet (EDR 2003).

2.8.2 Hydrogeology

Groundwater within the upper aquifer system occurs under unconfined conditions within its uppermost few hundred feet. Depth to groundwater within the upper aquifer has been measured

at an average of 106.5 feet from the ground surface. The upper aquifer system contains loosely to moderately compacted sands, silt, and gravel of older alluvium, covered by silts and clays interbedded with stream channel deposits of younger alluvium (DWR 2003).

3.0 RECORDS AND DATA REVIEW

3.1 REGULATORY AGENCY DATABASE SEARCH

This section of the report is a compilation of federal, state, and local environmental databases. Information contained in this report is current as of the date the agency database was last updated. However, due to the dynamic nature of environmental laws and data reporting, this information will change over time.

A search of available environmental records was performed by EDR, and a report was issued to Tetra Tech FW on August 21, 2003. TtFW did not participate in the research or compilation of the records report. A copy of this report is provided in Appendix B. Databases reviewed for the subject property and the ASTM Standard E1527-00 search radius around the subject properties included the following:

Table 1. Regulatory Databases and Search Distances

List of Government Databases	
Government Database	**Search Distance**
Federal ASTM Standard	
Federal National Priorities List (NPL)	1.0 mile
Federal Proposed National Priorities List	1.0 mile
Federal Comprehensive Environmental Response Clean-up Liability Information System (CERCLIS)	0.5 mile
Federal CERCLIS No Further Remedial Action Planned (CERC-NFRAP)	0.25 mile
Federal Corrective Action Report (CORRACTS)	1.0 mile
Federal Resource Conservation and Recovery Information System (RCRIS – TSD)	0.5 mile
Federal Resource Conservation and Recovery Information System (RCRIS – LQG)	0.25 mile
Federal Resource Conservation and Recovery Information System (RCRIS – SQG)	0.25 mile
Emergency Response Notification System (ERNS)	Target Property
State ASTM Standard	
California Annual Work Plan (AWP)	1.0 mile
CALSITES	1.0 mile
California Hazardous Material Incident Report System	1.0 mile
Cortese	1.0 mile

List of Government Databases	
Government Database	**Search Distance**
Proposition 65 Records (Notify 65)	1.0 mile
Toxic Pits Cleanup Act Sites (Toxic Pits)	1.0 mile
Solid Waste Information System (SWF/LF)	0.5 mile
Waste Management Unit Database (WMUDS/SWAT)	0.5 mile
Leak Underground Storage Tanks (LUST)	0.5 mile
California Bond Expenditure Plan	1.0 mile
List of Underground Storage Tank Facilities (UST)	0.25 mile
Voluntary Cleanup Program Properties (VCP)	0.5 mile
Underground Storage Tanks on Indian Land (Indian UST)	0.25 mile
California Facility Inventory Database (CA FID UST)	0.25 mile
Hazardous Substance Storage Container Database (HIST UST)	0.25 mile
Federal ASTM Supplemental	
Superfund (CERCLA) Consent Decrees (CONSENT)	1.0 mile
Records of Decision (ROD)	1.0 mile
National Priority List Deletions (Delisted NPL)	1.0 mile
Facility Index System (FINDS)	Target Property
Hazardous Materials Information Reporting System (HMIRS)	Target Property
Material Licensing Tracking System (MLTS)	Target Property
Mines Master Index File (MINES)	0.25 mile
Federal Superfund Liens (NPL Liens)	Target Property
PCB Activity Database System (PADS)	Target Property
Department of Defense Sites (DOD)	0.5 mile
RCRA Administrative Action Tracking System (RAATS)	Target Property
Toxic Chemical Release Inventory System (TRIS)	Target Property
Toxic Substances Control Act (TSCA)	Target Property
Section 7 Tracking Systems (SSTS)	Target Property
FIFRA/TSCA Tracking System (FTTS)	Target Property
State or Local ASTM Supplemental	
Aboveground Petroleum Storage Tank Facilities (AST)	Target Property
Cleaner Facilities (CLEANERS)	0.25 mile
Waste Discharge System (CA WDS)	Target Property
List of Deed Restrictions (DEED)	Target Property
No Further Action Determination (NFA)	0.25 mile

List of Government Databases	
Government Database	**Search Distance**
Unconfirmed Properties Referred to Another Agency (REF)	0.25 mile
School Property Evaluation Program (SCH)	0.25 mile
Properties Needing Further Evaluation (NFE)	0.25 mile
Spills, Leaks, Investigation and Cleanup Cost Recovery Listing (CA SLIC)	0.5 mile
Hazardous Waste Information System (HAZNET)	0.25 mile
EDR Proprietary Historical Databases	
Former Manufactured Gas (Coal Gas) Sites	1.0 mile
Brownfields Database	
Voluntary Cleanup Program Properties	0.5 mile

Environmental Data Resources, Inc. (EDR) was retained to perform an environmental database search for locations identified as hazardous substance and/or hazardous waste facilities near the subject property in accordance with ASTM Standard Practice for Environmental Site Assessments, E 1527-00 search parameters.

Only one site was identified in the search of federal, state and local environmental databases. In 1995, waste oil and battery acid illegally dumped by a tenant were reported at 5300 Phillips Road. This was reported from the California Hazardous Material Incident Report System (CHMIRS) maintained by the California Office of Emergency Services. Based on other references to this street address in association with the project site (URS 2001), it is likely that this database finding is in reference the batteries and oil products that were observed in the abandoned barn on parcel 017-100-30 (also noted in URS 2001).

Several orphan sites were identified in the August 21, 2003 EDR report. Due to poor or inadequate address information, these orphan sites could not be mapped in relation to the property. These orphan sites are listed Table 2. Based on the address descriptions (closest being Del Webb on Fiddyment), it is not likely that these sites have impacted the project site.

Table 2. Database Search Findings of Orphan Sites

Site Name	Site Address	Database(s)
Roseville Cleaners	5098 Foothill Blvd.	CLEANERS
Berry Street Mall – Fingers Landfill	North of Berry St., west of Harding Blvd.	SWF/LF
Roseville Corporation Yard	2055 Hilltop Circle	UST
Roseville W/WW Lab	West end of Booth Rd.	Haznet
Roseville – Dept of Central SVCS	120 Grant St.	Haznet
Roseville Joint Union High School	Oakmont High School	Haznet
City of Roseville	Sewer Lift Station 5 Fiddyment Rd.	Haznet
Bowl Track 17 in Roseville	Bowl Track 17 in Roseville	ERNS
Roseville Rail Yard (several name variations)	1600 Vernon St.	ERNS
Roseville and Katella Rd	Roseville and Katella Rd	ERNS
Roseville Antelope Yard	Roseville Antelope Yard	ERNS
Roseville MP 110.6	Roseville MP 110.6	ERNS
Roseville Sanitary Landfill	Berry St; 1 mile East of Atlantic	FINDS
Del Webb Sun City Roseville	Fiddyment Road north of Baseline Rd.	CA SLIC

3.2 LOCAL AGENCY RECORDS SEARCH

Several local agencies were contacted in order to conduct a records review to identify environmental concerns associated with the site. The City of Roseville Fire Department is the Certified Unified Program Agency (CUPA) for the project area and was contacted in order to identify any hazardous materials/waste plans or records for the site. Steve Anderson, Roseville Fire Department Hazardous Materials Officer, stated that no special records or programs existed for the project site with respect to hazardous materials or wastes (Personal communication with Steve Anderson, Roseville Fire Department Hazardous Materials Officer). Mr. Anderson confirmed that his agency once conducted inspections periodically at the project site for an above ground storage tank containing diesel fuel; however, the storage tank has been removed.

The Placer County Department of Environment Health was contacted on August 21, 2003 in order to review any available hazardous material contamination or hazardous materials spill records for the project site. Sherr Sallae, Hazardous Waste Management Specialist with Placer County stated that the Placer County Department of Environmental Health did not have records pertaining to hazardous waste for the project site and that the City of Roseville Fire Department, the CUPA, managed hazardous waste compliance for the project site.

The Central Valley Regional Water Quality Control Board was also contacted in order to conduct a records review to identity hazardous material contamination from hazardous spills, well

contamination, underground storage tanks, landfills, or treatment, storage and disposal facilities that might effect the project site. Bill Brattain, Department of Landfills and Surface Impoundments, stated that no central database was available at the Regional Water Quality Control Board for records review and that such a review would require contacting each individual agency department. Such a records review is beyond the standard records search practices in ASTM Standard Practice for Environmental Site Assessments, E 1527-00.

4.0 HISTORICAL SITE CONDITIONS AND RECORDS REVIEW

Historically the site has been used for general agricultural (grazaing) and rural residential purposes.

4.1 INTERVIEWS

Information presented in this section is based on interviews with two Kiewit Pacific Company employees. An interview was conducted with the following Kiewit Pacific Company employees:

- Mr. Paul Cassinelli, Project Manager, Kiewit Pacific Company

A summary of the interview is presented in Appendix C. No significant environmental issues were identified during the interview.

- Mr. Brian McKenzie, Project Engineer, Kiewit Pacific Company

Mr. McKenzie provided additional information during a follow-up inquiry. No additional (beyond those observed) significant environmental issues were identified during the interview.

4.2 HISTORICAL AERIAL PHOTOGRAPHS

Aerial photographs were not reviewed as part of this ESA update.

5.0 SITE RECONNAISSANCE

On August 27, 2003, Brad Wheeler of Tetra Tech FW visited the subject site to identify visible indications of recognized environmental conditions, if any, associated with the property. Copies of select photographs taken during the August 27, 2003 site reconnaissance are provided in Appendix A and notes taken during the reconnaissance are provided in Appendix C.

5.1 HAZARDOUS AND NON-HAZARDOUS SUBSTANCES IN CONNECTION WITH IDENTIFIED USES

Hazardous substances currently kept on the site in connection with identified uses include petroleum, oil and lubricant products associated with the vehicles and equipment being staged for the completion of the Pleasant Grove Waste Water Treatment Plant and a bleach product (Bacticide), used for eliminating algae growth within the Pleasant Grove Waste Water Treatment Plant system. In addition, paint wastes were also found accumulated on site within the construction staging yard. These paint wastes were apparently generated during the recent painting of pipes and pumps. With the exception of several containers of compressor oil found in an abandoned barn, all petroleum and oil/lubricant products found during the site reconnaissance were located in the construction staging and laydown area. The only fuel observed on-site was that in machinery and private vehicles staged on-site.

Oils and lubricants were found stored on a secondary containment drum deck (see Photographs 6 and 7). A single 55-gallon drum and approximately 33, 5-gallon containers of gear/bearing oil were stored together on the secondary containment structure. All oil product containers were properly sealed; however, several of the 5 gallon containers did not have labeling. Contents of unlabeled containers was verified in person by Brian McKenzie, Project Engineer, Pacific Kiewit Company who confirmed the containers held gear/bearing oil (McKenzie 2003, personal communication). No soil staining or signs of spills were observed. Figure 1 shows the location of the oil storage area within the project site.

Bacticide, a bleach product, was found stored in small quantities within the construction staging yard. Three poly type 55-gallon drums labeled as bacticide were found stored on a wooden containment deck. Two of the drums were empty but a third was approximately one quarter full. Bacticide was used at times to eliminate algae growth within the wastewater treatment plant system (McKenzie 2003, personal communication). The wooden drum deck holding the small amount of chemicals was not adequate to stop a spill, however, the drums were properly sealed and no signs of soil staining or spills were observed. Figure 1 shows the storage location and Photograph 8 shows the actual storage site.

During the site reconnaissance, waste paint products were found accumulated in two areas near a materials storage container. Approximately 16 buckets containing waste paint and painting products were emanating a strong chemical smell. The buckets did not have lids and were not within secondary containment. No signs of paint spills were observed. Brian McKenzie, Kiewit

Construction stated that painting activities were for piping, pumps, etc. (McKenzie 2003, personal communication). Figure 1 shows the location where paint wastes were found and Photographs 9 and 10 show the actual site.

Small containers of hazardous products were found lying on the bare ground in several areas of the construction staging yard. One small lubricant oil container was found leaking. The presence of product containers on the ground indicates poor handling practices for hazardous materials and leaking containers are evidence some level of soil contamination has occurred. Photos 22 and 23 show hazardous product containers that were found lying on the ground within the construction staging yard.

5.2 HAZARDOUS AND NON-HAZARDOUS SUBSTANCES AND UNIDENTIFIED CONTAINERS

During the site reconnaissance, several unidentified containers were found. In addition, several possibly hazardous items not associated with the identified uses for the property were discovered. Unidentified items found during the site reconnaissance included unlabeled product drums within the construction staging yard, lead acid batteries and oil products found in a barn structure and two abandoned drums found near the extreme northeast corner of parcel 017-100-30.

Three unlabeled drums containing an unknown substance were found during the August 27, 2003 site reconnaissance. Two of the unlabeled drums were found on a secondary containment drum deck next to a materials storage container. The 55-gallon drums were in fair condition and sealed; however, labeling was not present. Following the site reconnaissance, Brian McKenzie, Kiewit Pacific Company, was consulted about the contents of the two drums and he stated that they contained a concrete sealant product (McKenzie 2003, personal communication). No staining on the ground or evidence of spills were observed near the drums. Figure 1 shows the location of the drums and Photograph 11 shows the site.

A third unlabeled drum was found within the construction staging yard. The 55-gallon drum was resting on a wooden pallet without secondary containment. This drum was later identified by Mr. McKenzie as containing concrete curing solution (McKenzie 2003, personal communication). No staining on the ground or evidence of spills were observed at the drum. Figure 1 shows the location of this drum.

Tetra Tech FW observed lead acid batteries and small quantities of oil in an abandoned barn at the northeast corner of parcel 017-100-30. Eleven automobile type lead acid batteries were found on the floor of the barn. Ten of the batteries were resting on a solid metal plate and one battery was resting on the ground surface. The batteries did not appear damaged and no signs of corrosion or leakage were observed. In addition, two 5-gallon containers possibly holding compressor oil were found with the batteries. One of the containers was labeled as 20 HD-05 compressor oil and another as 20w compressor oil. Both containers were sealed and no signs of leaks or spills were present. These lead acid batteries and oil products were also part of the site reconnaissance findings of the URS Phase I ESA, August 2001. Figure 1 shows the location of the abandoned barn where the batteries and oil products were found and Photograph 12 shows the actual site.

Two unlabeled abandoned drums possibly containing hazardous substances were found in the northeast corner of parcel 017-100-30 near the abandoned barn. These drums were found at the extreme northeast corner of the project site and may be outside the project parcel boundaries. The 55-gallon drums were rusted and showed signs of paint drippings along their outer sides. In addition, a partial label remaining on one of the drums appeared to be from the Sherwin Williams Company indicating that the drums may contain a paint product. Figures 1 shows where the drums were found and Photographs 13 and 14 show the actual drums.

Also observed during the August 27, 2003 site reconnaissance was an unidentified empty drum found in a random area near the northern boundary of parcel 017-100-17. The presence of old empty drums found on the project site was mentioned in the previous Phase I reports for the site; however, this drum appears new. Although no odors, stains on the underlying vegetation, or other indications of a release were observed, the presence of a 55-gallon drum in this area could be an indication of hazardous materials mishandling. Figure 1 shows the location of the empty drum and Photograph 21 shows the actual drum.

5.3 STORAGE TANKS

The Environmental Data Resource (EDR) environmental database search conducted for the project site in accordance with ASTM Standard Practice for Environmental Site Assessments, E 1527-00, identified no reports of underground storage tanks (USTs) within the required search distances. Previous Phase I ESA investigations conducted for the Pleasant Grove Wastewater Treatment Plant and the Roseville Energy Park project site also found no indication of USTs. In addition, no physical or visual indications of USTs were observed during the site reconnaissance.

A 20,000-gallon above-ground storage tank used for the storage of diesel fuel was reported in the URS Phase I ESA Assessment for Roseville Energy Facility, August 2001. According to Peter Cassinelli, Project Manager, Kiewit Pacific Company, the storage tank reported by URS was removed in October 2002. Mr. Cassinelli verified the URS report by stating that the above ground tank was within a lined secondary containment area and he provided the results of soil analyses conducted following the removal of the tank. The soil analyses, conducted by Gularte and Associates, Inc. indicated non-detect results for parameters including benzene, toluene, ethylbenzene, xylenes, gasoline and diesel. Results from the Gularte and Associates, Inc. soil analyses are provided in Appendix D. Figure 1 shows the previous location of the storage tank and photograph 15 shows how the site appears today.

5.4 INDICATIONS OF POLYCHLORINATED BIPHENYLS

Electrical transformers were observed during the site reconnaissance on the project site within assessor's parcel 017-100-29 (see Figure 1). The transformers had no indication of leakage (see Photographs 16 and 17). In a Phase II ESA report prepared by Anderson Consulting Group for the Pleasant Grove Waste Water Treatment (Anderson Consulting 1999) it was indicated that Pacific Gas and Electric Company replaced or retrofitted transformers for the area in the early 1970s to comply with state PCB requirements.

5.5 PITS AND TRENCHES

No pits or trenches were observed during the August 27, 2003 site reconnaissance.

5.6 INDICATIONS OF SOLID WASTE

Several debris or waste piles were observed within assessor's parcel 017-100-17 during the August 27, 2003 site reconnaissance. Notably, a debris pile of concrete and brick ruble was observed as well as several waste piles of rubber tires (see Figure 1 for locations of debris/waste piles and Photographs 18, 19, and 20).

5.7 OTHER CONDITIONS OF CONCERN

Several small dark soil stains were noticed within the area utilized for equipment staging indicating small-scale chemical releases to the soil. These are likely from minor petroleum (oils/lubricants) equipment leaks.

Figure 1

Locations of Site Reconnaissance Observations

---- parcel boundaries

observation locations

1 Oil storage area

2 Bacticide storage

3 Paint wastes found within staging yard area

4 Unlabeled drums found within staging yard area

5 Barn structure where lead acid batteries and oil products were found

6 Abandoned drums found in northeast area of project site

7 Location of above ground storage tank removed in 2002

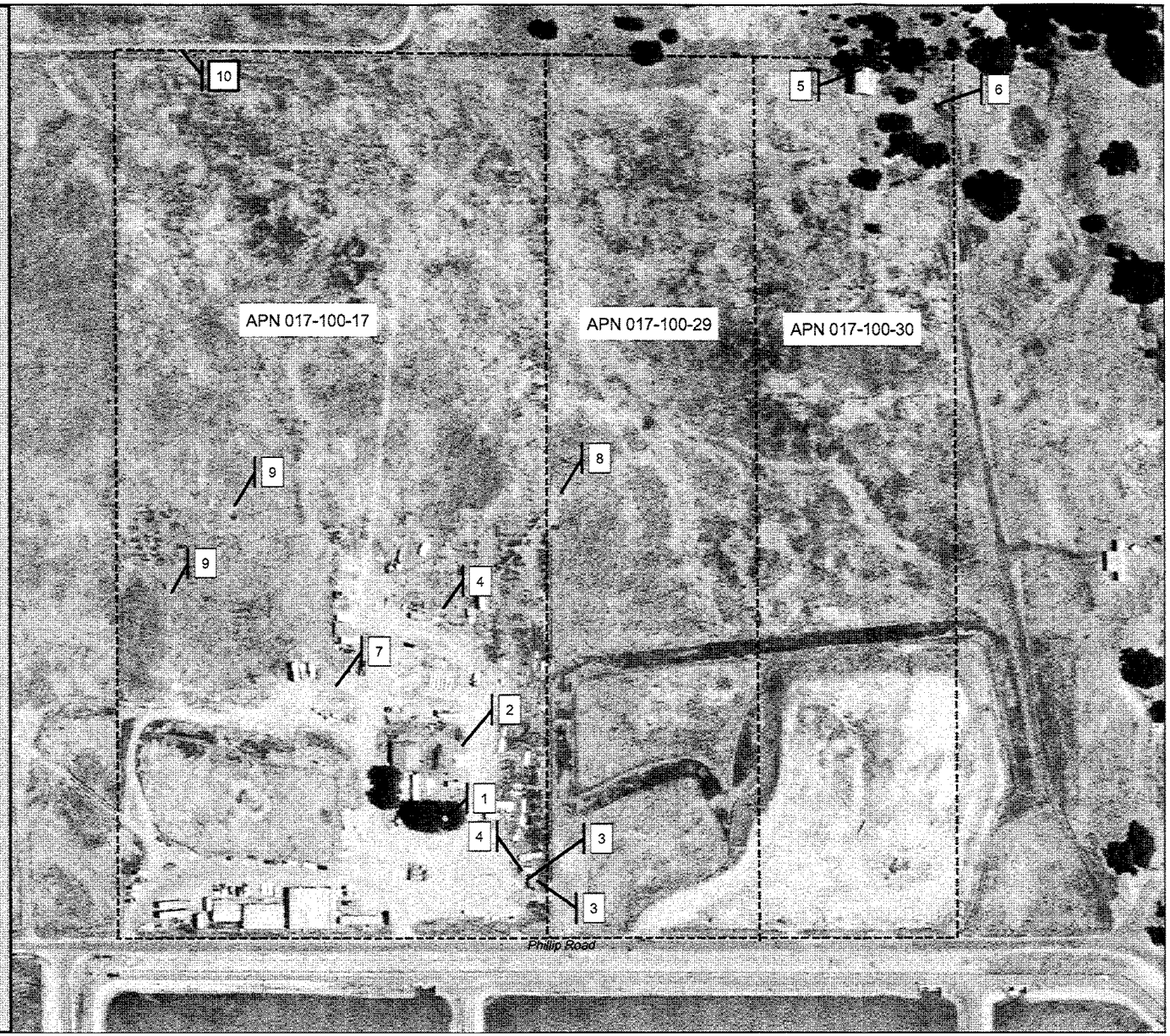
8 Electrical transformers found within parcel 017-100-29

9 Indications of solid waste - tire and concrete piles

10 Unidentified empty drum found at northern boundary of parcel 017-100-17

0 0.05 0.1 0.2

Miles



6.0 FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Tetra Tech FW conducted a Phase I ESA Update for the REP project site (APN: 017-100-017, 029, and 030) on Phillips Road in Roseville, California. The purpose of this Phase I ESA update was to identify, to the extent feasible pursuant to the processes prescribed herein, recognized environmental conditions, if any, associated with the property since the previous Phase I ESAs were prepared (URS 2001, EARTHTEC 1999). Our findings are summarized as follows:

- Historically, the Site was generally used for agricultural purposes. A portion of the site has been used for construction laydown activities supporting construction of the Pleasant Grove Waste Water Treatment Plant since the City of Roseville purchased the Property in 1999. Conditions of the property have not materially changed since the previous Phase I ESA (URS 2001).

- In general, current hazardous material management practices within the construction laydown area could be improved. Specific findings included: 1) unlabeled hazardous material containers, 2) not all hazardous materials are stored in a manner that minimizes the potential for materials to contact soil, 3) improper handling and storage of wet paint waste materials, and 4) improper disposal of partially empty or empty hazardous material containers.

  These findings represent a potential recognized environmental condition based on the potential for poorly managed containers to release hazardous materials to the environment (and specific observation of oil release from a small container). Tetra Tech FW recommends that the site be cleaned of used hazardous material containers and they be properly disposed of. In addition, Tetra Tech FW recommends thorough visual inspection of all hazardous material storage areas upon demobilization of construction-related activities and removal of all stored materials. If visual inspections show signs of a past release, then limited surface soil sampling is recommended to assess the potential impact.

- Tetra Tech FW observed 11 lead acid batteries and small quantities of oil in an abandoned barn at the northeast corner of parcel 017-100-30. The batteries did not appear damaged and no signs of corrosion or leakage were observed. In addition, two 5-gallon oil containers were present; both containers were sealed and no signs of leaks or spills were observed. Although no indications of soil contamination were observed, this finding is a recognized environmental condition because these apparently abandoned wastes could ultimately result in a release to soil. Tetra Tech FW recommends that these wastes be properly disposed of and that the underlying soil be visually inspected for indications of leaks following removal of the materials.

- EDR conducted a search of federal, state, and local environmental databases in August 2003. The results of the search indicated one recognized environmental condition believed to be related to the site (5300 Phillips Road). In 1995, waste oil and battery acid were illegally dumped by a tenant. This was reported from the California Hazardous Material

Incident Report System (CHMIRS) maintained by the California Office of Emergency Services (OES). OES should be contacted to obtain further information about this report to determine whether it is in reference to the batteries and waste oil observed in the abandoned barn located on parcel 17-100-030 (see discussion in bullet above).

- Abandoned and/or unlabeled drums located in remote areas of the site represent recognized environmental conditions based on uncertainty of past material contents, handling, and disposal practices and the potential for future released from corroding drums. Tetra Tech FW recommends that the single empty drum be removed from the northern portion of parcel 17-100-017 and that its origin be further investigated. We further recommend that the two drums found in the northeast corner of parcel 17-100-030 (potentially containing paint product) be removed and properly disposed of. Depending on the contents and condition of these drums, and the presence of any visual indications of leakage, limited surface soil sampling may be warranted directly beneath these containers.
- Small areas of soil staining were observed from vehicle or equipment leaks within the equipment staging area. Although these were relatively small in scale, the presence of hydrocarbon-impacted soil is a recognized environmental condition. Tetra Tech FW recommends limited soil removal based on visual observations in these areas at the completion of the construction laydown use.
- Several areas of construction-related debris were observed that will require ultimate disposal.
- Observations of the adjacent properties revealed general agricultural activities. No recognized environmental conditions that could impact the site were visually apparent on the surrounding properties.

7.0 LIMITATIONS AND EXCEPTIONS OF ASSESSMENTS

This report is prepared for the use of Roseville Electric Department, pursuant to the proposal dated July 29, 2003. The scope of work and the findings should not be considered suitable for other potential users and any use by other parties shall be at their sole risk.

This report is based on review of the limited data, as described therein, in accordance with generally accepted professional practices, applicable to work of similar nature and complexity of similar localities, at the time the services were performed. No warranty, expressed or implied, is made. The scope of this report is limited in nature and intended to provide a preliminary evaluation of the current obvious environmental conditions at the site at the time of the report, and does not constitute definitive or in-depth review of all the potential environmental impairments and situations. Tetra Tech FW, Inc. assumes no responsibility for conditions of which it is unaware and/or as to which there was no opportunity or request for review.

It is important to recognize that even the most comprehensive scope of services may not detect all the environmental liabilities at a particular site. Therefore, nothing herein shall be construed as a representation or certification that the site is either fully characterized or is free of environmental impairments and/or contamination.

In order to conduct the investigation for this report, Tetra Tech FW relied upon the readily available information as discussed in the report, and, unless explicitly included in our scope, included no verification of the accuracy or completeness of documentation or data or possible withholding of information by the interviewees, agencies, or other parties (Please also refer to the EDR Disclaimer, Appendix B).

8.0 REFERENCES

Anderson Consulting Group. 1999. Phase II Environmental Site Assessment, Pleasant Grove Wastewater Treatment Plant, Adjacent Properties, Roseville, California. April 6, 1999.

California Department of Water Resources. 2003. California's Groundwater–Bulletin 118. Sacramento Valley Groundwater Basin Description. Sacramento, CA. http://www.waterplan.water.ca.gov/groundwater/118index.htm

EARTHTEC, Ltd. 1999. Phase I Environmental Site Assessment Update, Pleasant Grove Wastewater Treatment Plant, Phillip Road, Placer County, California, APN: 17-100-20, 27, 18, 17, 29, 30, 31, 15, 35, 34, and 28. January 7, 1999.

EDR Environmental Data Resources, Inc. 2003. Roseville Energy Park, Inquiry Number 1033694.1s. August 21, 2003.

URS. 2001. Phase I Environmental Site Assessment for Roseville Energy Facility, L.L.C. August 2001.

9.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONALS

Preparation of this Report was conducted by the following Tetra Tech FW personnel:

Bradley H. Wheeler
Associate Environmental Scientist

Review of the Report was performed by the following Tetra Tech FW personnel:

Frank Verrier, P.E.
Northern California Operations Manager

APPENDIX A

SITE RECONNAISSANCE PHOTOGRAPHS

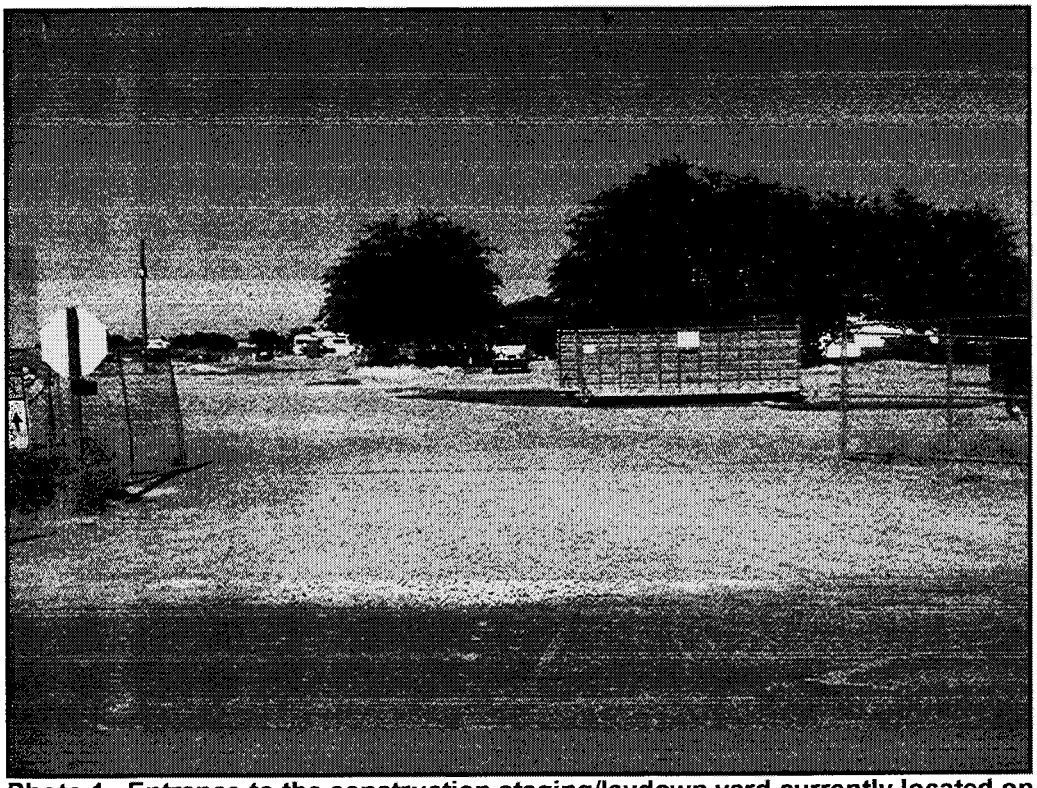


Photo 1. Entrance to the construction staging/laydown yard currently located on the Roseville Energy Park project site

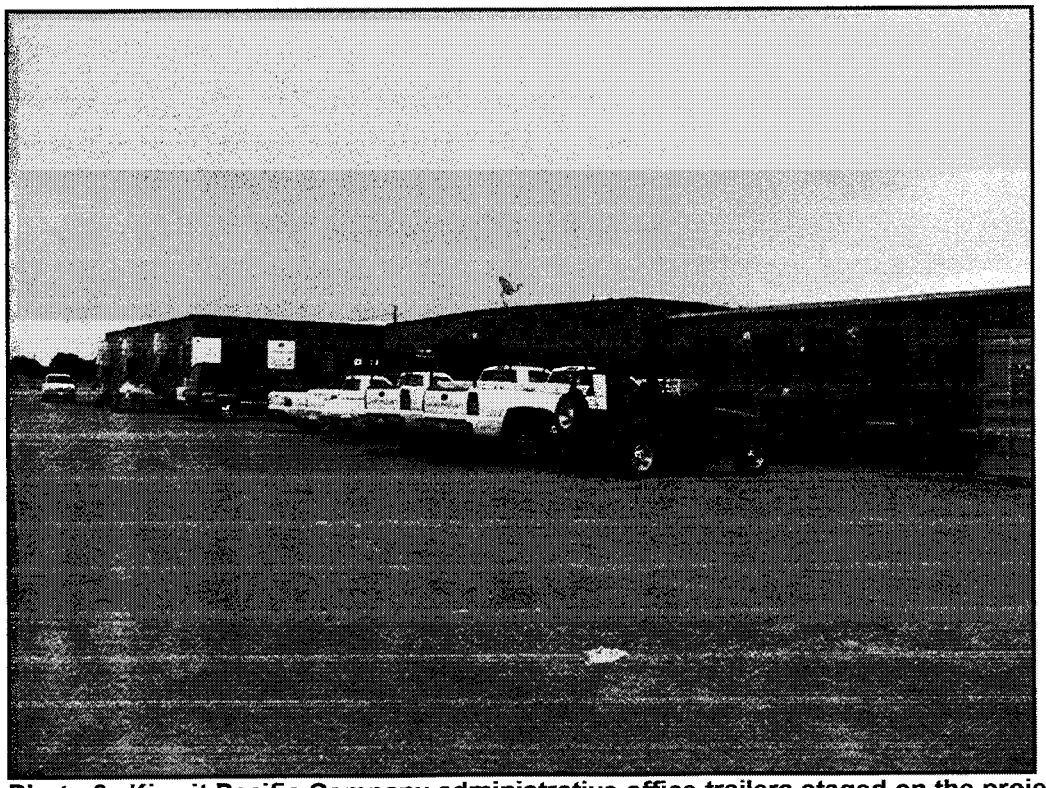


Photo 2. Kiewit Pacific Company administrative office trailers staged on the project site.

Photo 3. City of Roseville administrative office trailer and employee vehicles staged on the project site.

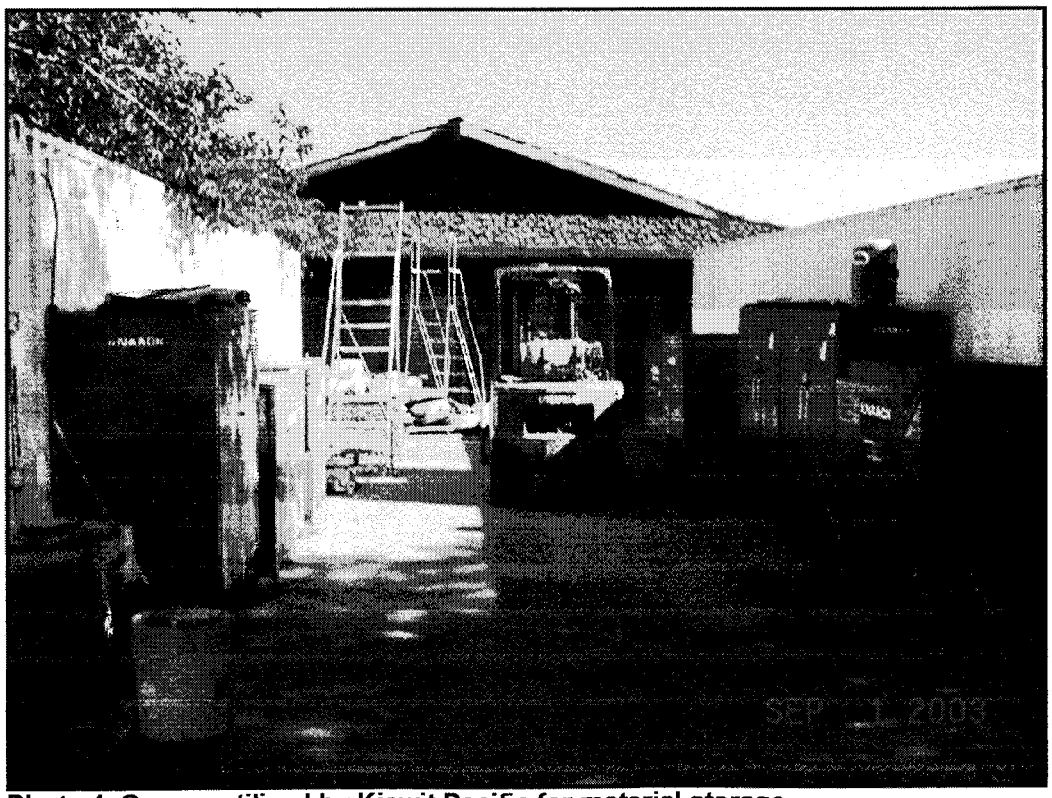


Photo 4. Garage utilized by Kiewit Pacific for material storage.

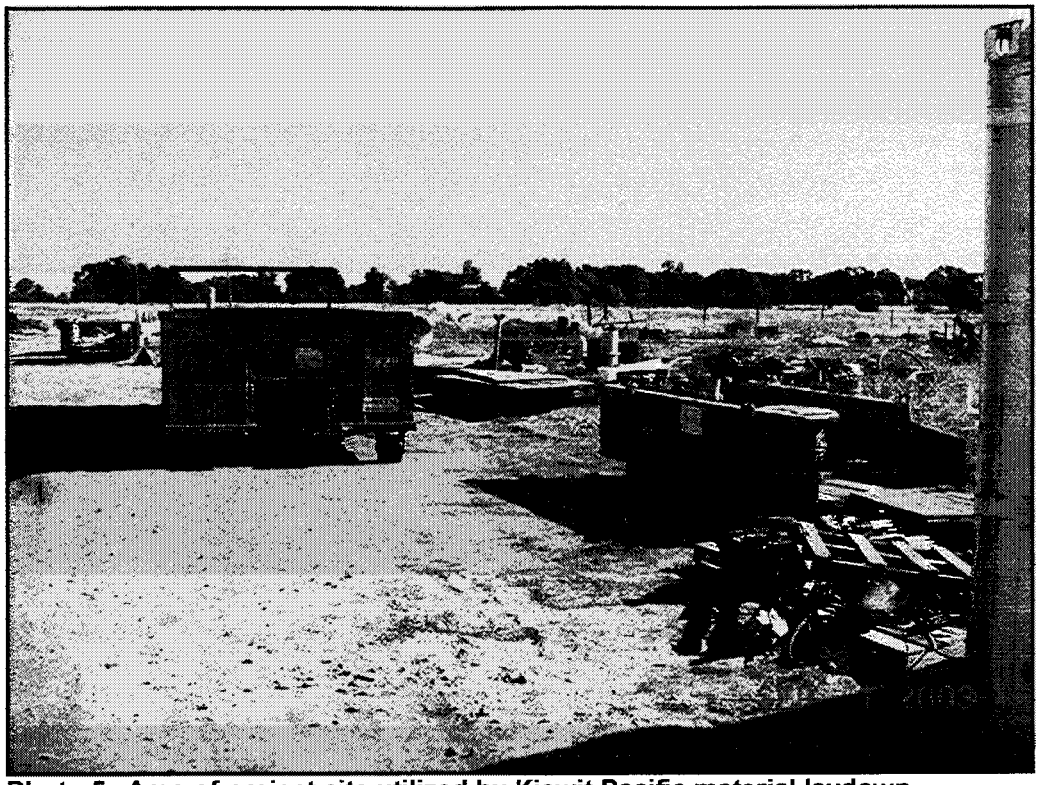


Photo 5. Area of project site utilized by Kiewit Pacific material laydown.

Photo 6. Oil storage area within the construction staging yard.

Photo 7. Another view of the oil storage area within the construction staging yard.

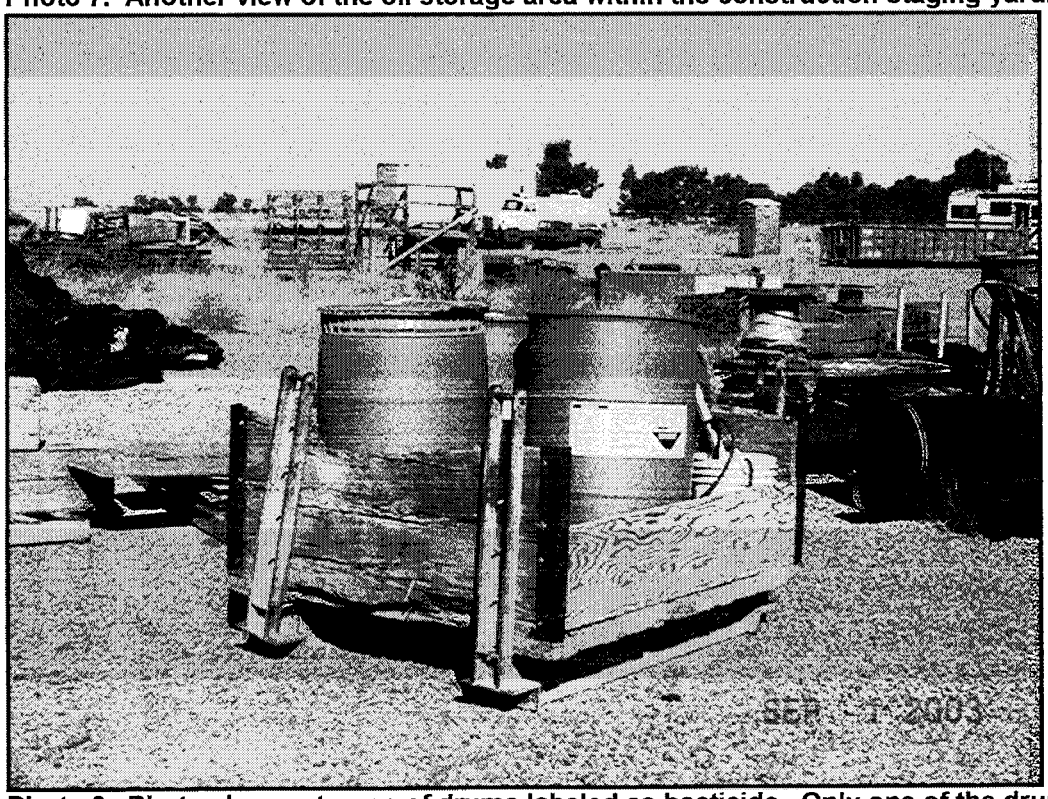


Photo 8. Photo shows storage of drums labeled as bacticide. Only one of the drums held product.

Photo 9. Paint wastes found during site reconnaissance. Large blue drums held trash and smaller containers held wet paint wastes.

Photo 10. Second accumulation of paint waste found approximately fifteen feet from the first.

Photo 11. Two unlabeled drums found within the construction staging yard on project site.

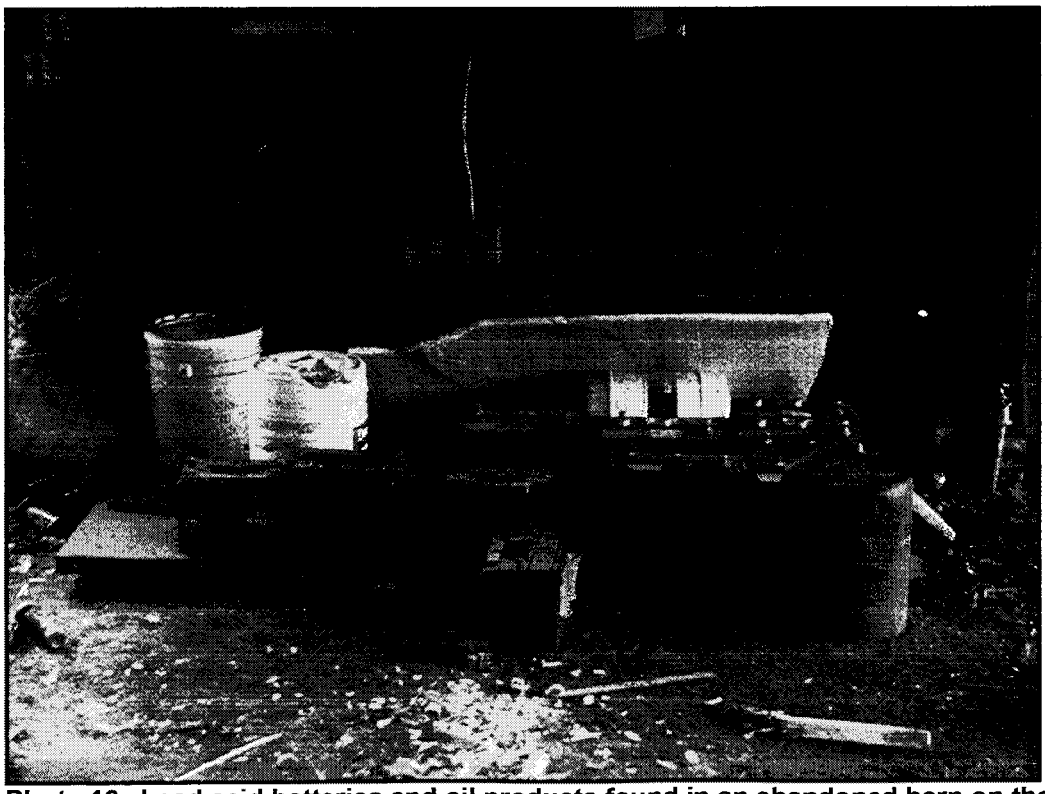


Photo 12. Lead acid batteries and oil products found in an abandoned barn on the northeast corner of parcel 017-100-30.

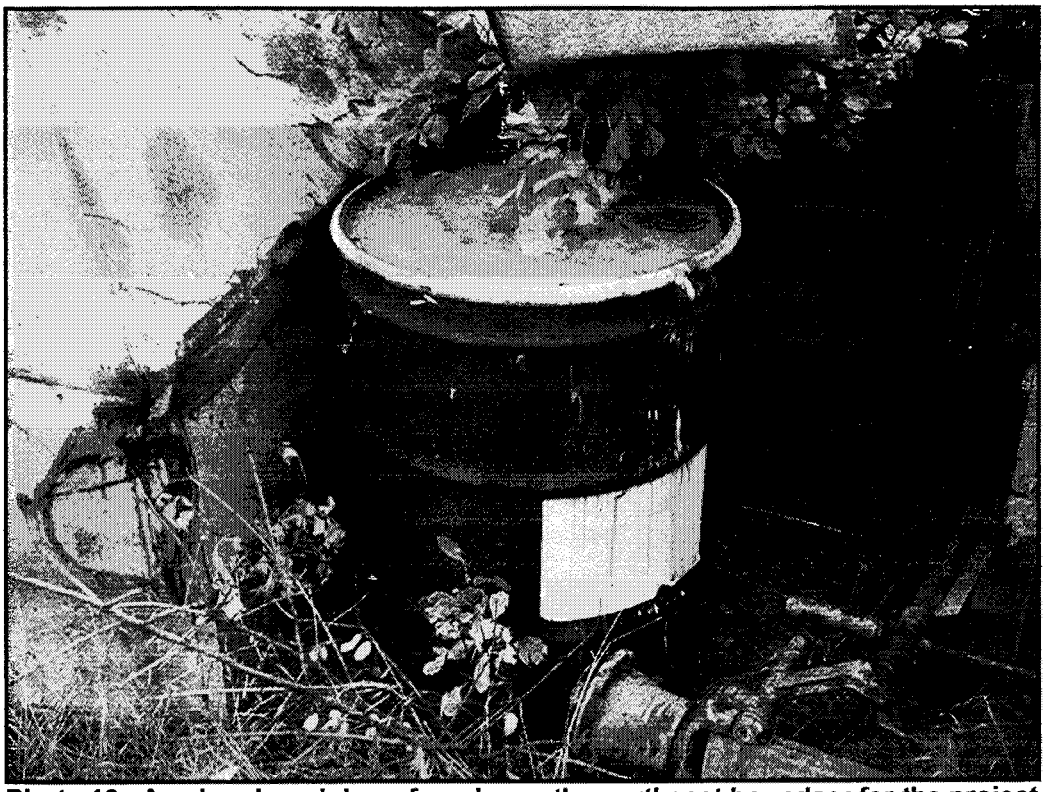


Photo 13. An abandoned drum found near the northeast boundary for the project site.

Photo 14. A second abandoned drum near the northeast boundary of the project site.

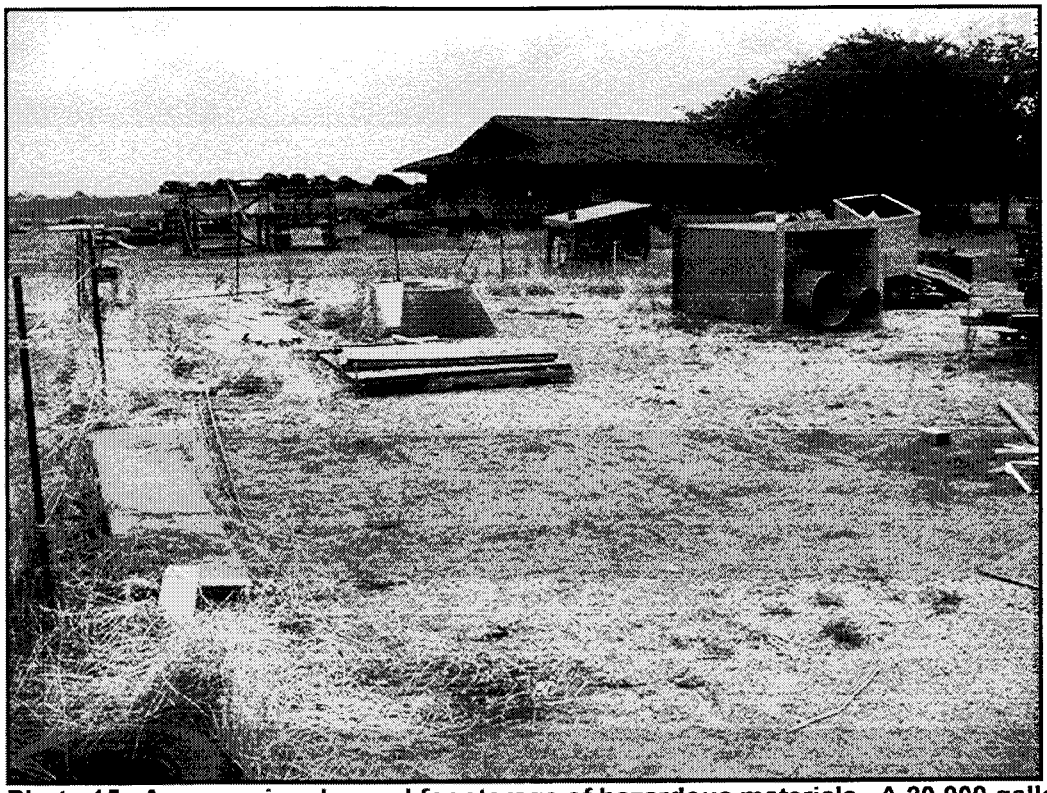


Photo 15. Area previously used for storage of hazardous materials. A 20,000 gallon above ground storage tank was located here.

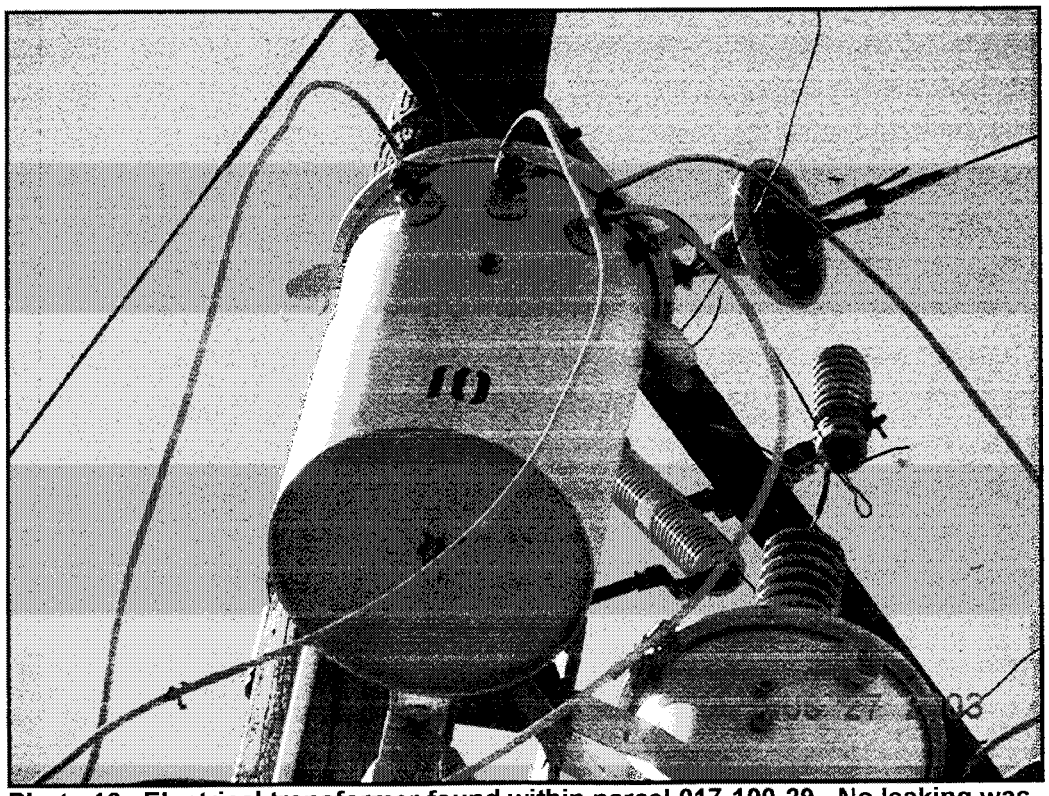


Photo 16. Electrical transformer found within parcel 017-100-29. No leaking was observed.

Photo 17. Second electrical transformer within parcel 017-100-29. No leaking was observed.

Photo 18. Debris pile of concrete and brick within parcel 017-100-17.

Photo 19. Pile of rubber tires found on parcel.

Photo 20. A second pile of rubber tires found on the project site.

Photo 21. Empty and unlabeled drum found at the northern boundary of parcel 017-100-17.

Photo 22. Hazardous product container found on the ground within the construction staging area on the project site.

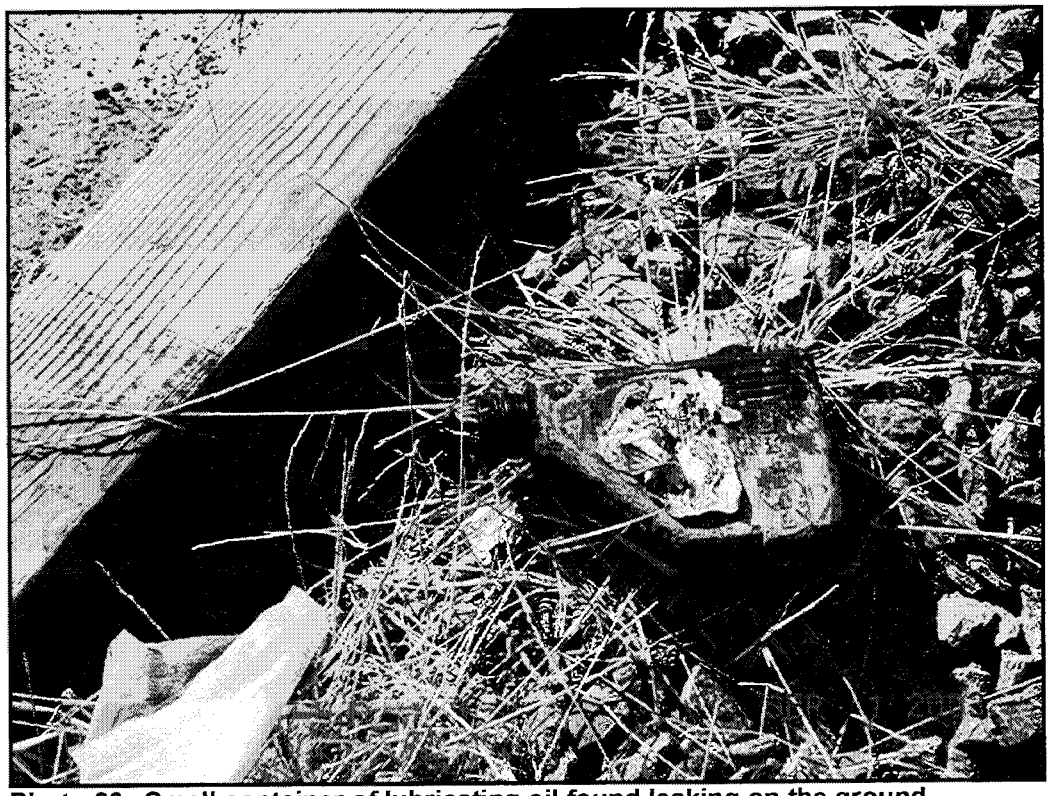


Photo 23. Small container of lubricating oil found leaking on the ground.

APPENDIX B

EDR ENVIRONMENTAL RECORDS SEARCH

The EDR Radius Map
with GeoCheck®

Roseville Energy Park
5051 Phillip Road
Roseville, CA 95747

Inquiry Number: 1033694.1s

August 21, 2003

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06890

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

FORM-CMK

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SECTION	PAGE
Executive Summary	ES1
Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	6
Orphan Summary	8
Government Records Searched/Data Currency Tracking	GR-1

GEOCHECK ADDENDUM

Physical Setting Source Addendum	A-1
Physical Setting Source Summary	A-2
Physical Setting Source Map	A-7
Physical Setting Source Map Findings	A-8
Physical Setting Source Records Searched	A-10

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc. (EDR). The report meets the government records search requirements of ASTM Standard Practice for Environmental Site Assessments, E 1527-00. Search distances are per ASTM standard or custom distances requested by the user.

TARGET PROPERTY INFORMATION

ADDRESS

5051 PHILLIP ROAD
ROSEVILLE, CA 95747

COORDINATES

Latitude (North):	38.791900 - 38˚ 47' 30.8"
Longitude (West):	121.381500 - 121˚ 22' 53.4"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	640566.0
UTM Y (Meters):	4294720.5
Elevation:	91 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	2438121-G4 PLEASANT GROVE, CA
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the ASTM E 1527-00 search radius around the target property for the following databases:

FEDERAL ASTM STANDARD

NPL..... National Priority List
Proposed NPL..... Proposed National Priority List Sites
CERCLIS..... Comprehensive Environmental Response, Compensation, and Liability Information System
CERC-NFRAP..... CERCLIS No Further Remedial Action Planned
CORRACTS..... Corrective Action Report
RCRIS-TSD..... Resource Conservation and Recovery Information System
RCRIS-LQG..... Resource Conservation and Recovery Information System
RCRIS-SQG..... Resource Conservation and Recovery Information System
ERNS..... Emergency Response Notification System

STATE ASTM STANDARD

AWP..... Annual Workplan Sites

EXECUTIVE SUMMARY

Cal-Sites..... Calsites Database
Cortese..... "Cortese" Hazardous Waste & Substances Sites List
Notify 65..... Proposition 65 Records
Toxic Pits..... Toxic Pits Cleanup Act Sites
SWF/LF..... Solid Waste Information System
WMUDS/SWAT..... Waste Management Unit Database
LUST..... Leaking Underground Storage Tank Information System
CA BOND EXP. PLAN..... Bond Expenditure Plan
UST..... List of Underground Storage Tank Facilities
VCP..... Voluntary Cleanup Program Properties
INDIAN UST..... Underground Storage Tanks on Indian Land
CA FID UST..... Facility Inventory Database
HIST UST..... Hazardous Substance Storage Container Database

FEDERAL ASTM SUPPLEMENTAL

CONSENT..... Superfund (CERCLA) Consent Decrees
ROD..... Records Of Decision
Delisted NPL..... National Priority List Deletions
FINDS..... Facility Index System/Facility Identification Initiative Program Summary Report
HMIRS..... Hazardous Materials Information Reporting System
MLTS..... Material Licensing Tracking System
MINES..... Mines Master Index File
NPL Liens..... Federal Superfund Liens
PADS..... PCB Activity Database System
DOD..... Department of Defense Sites
RAATS..... RCRA Administrative Action Tracking System
TRIS..... Toxic Chemical Release Inventory System
TSCA..... Toxic Substances Control Act
SSTS..... Section 7 Tracking Systems
FTTS..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

STATE OR LOCAL ASTM SUPPLEMENTAL

AST..... Aboveground Petroleum Storage Tank Facilities
CLEANERS..... Cleaner Facilities
CA WDS..... Waste Discharge System
DEED..... List of Deed Restrictions
NFE..... Properties Needing Further Evaluation
NFA..... No Further Action Determination
REF..... Unconfirmed Properties Referred to Another Agency
SCH..... School Property Evaluation Program
CA SLIC..... Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
HAZNET..... Hazardous Waste Information System
CA PLACER CO. MS..... Master List of Facilities

EDR PROPRIETARY HISTORICAL DATABASES

Coal Gas..... Former Manufactured Gas (Coal Gas) Sites

BROWNFIELDS DATABASES

VCP..... Voluntary Cleanup Program Properties

EXECUTIVE SUMMARY

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. EDR's definition of a site with an elevation equal to the target property includes a tolerance of +/- 10 feet. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property (by more than 10 feet). Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STATE ASTM STANDARD

CHMIRS: The California Hazardous Material Incident Report System contains information on reported hazardous material incidents, i.e., accidental releases or spills. The source is the California Office of Emergency Services.

A review of the CHMIRS list, as provided by EDR, and dated 12/31/2002 has revealed that there is 1 CHMIRS site within approximately 1 mile of the target property.

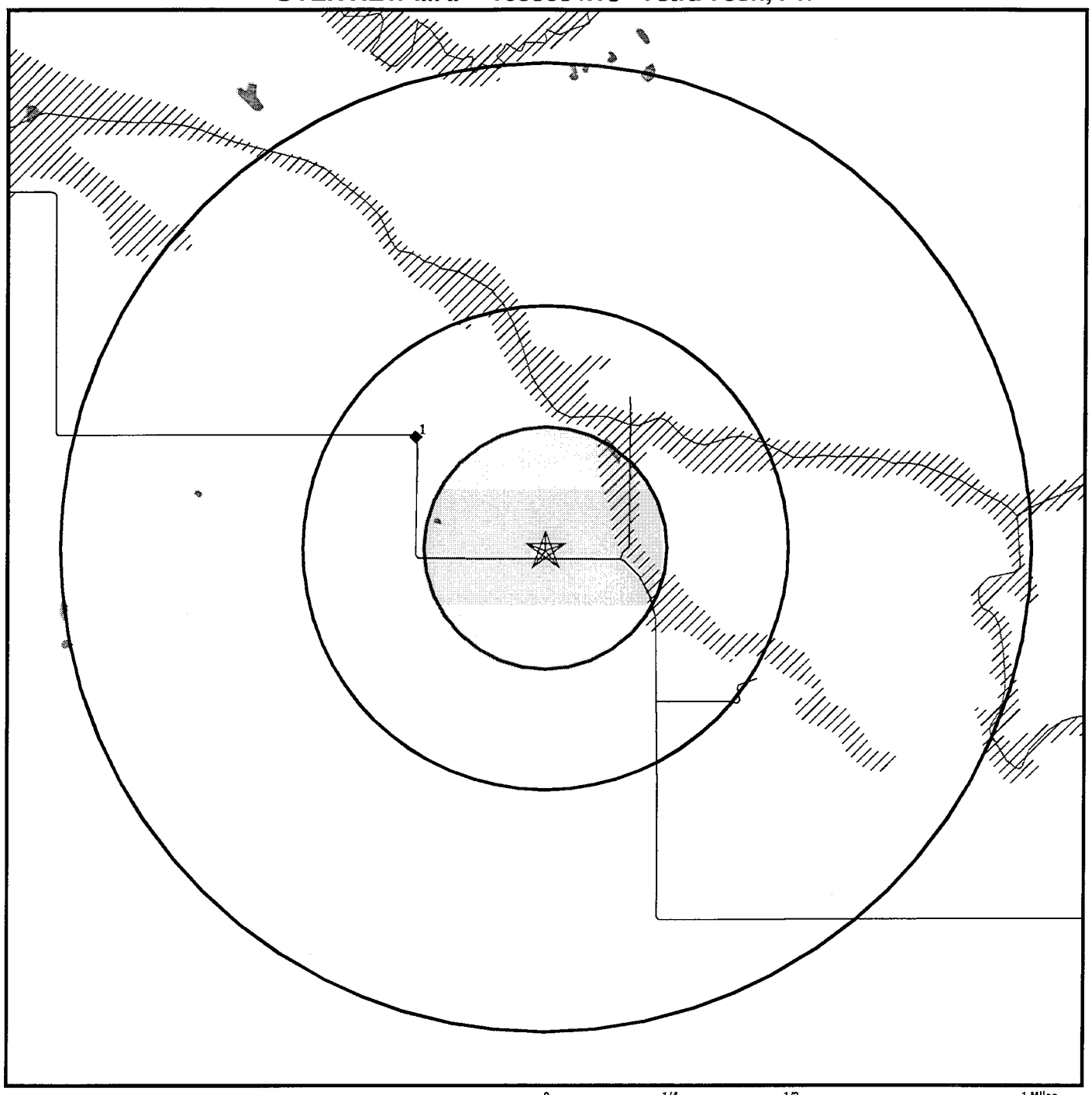
Lower Elevation	Address	Dist / Dir	Map ID	Page
Not reported	5300 PHILLIP RD	1/4 - 1/2 NW	1	6

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
ROSEVILLE CLEANERS	CLEANERS
BERRY STREET MALL - FINGERS LANDFILL	SWF/LF
ROSEVILLE CORPORATION YARD	UST
CITY OF ROSEVILLE W/WW LAB	HAZNET
CITY ROSEVILLE - DEPT OF CENTRAL SVCS	HAZNET
1X ROSEVILLE JOINT UNION HIGH SCHOOL DIS	HAZNET
CITY OF ROSEVILLE	HAZNET
BOWL TRACK 17 IN ROSEVILLE	ERNS
ROSEVILLE YARD TRACK 479	ERNS
ROSEVILLE AND KATELLA RD	ERNS
ROSEVILLE CA RAILYARD TRACK NO. 462	ERNS
ROSEVILLE ANTELOPE YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE YARD TRACK 112 79 TH CAR IN THE TRACK	ERNS
ROSEVILLE YARD ROSEVILLE DIESEL PIT	ERNS
ROSEVILLE YARD 1600 VERNON ST	ERNS
ROSEVILLE YARD 1600 VERNON STREET	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE YARDS 1600 VERNON STREET	ERNS
ROSEVILLE RR YARD	ERNS
ROSEVILLE RR YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE SOUTH PACIFIC YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE MP 110.6	ERNS
ROSEVILLE TRAIN YARD	ERNS
ROSEVILLE YARD	ERNS
ROSEVILLE YARD	ERNS
SPRR YARDS/ROSEVILLE CA	ERNS
ROSEVILLE SANITARY LANDFILL	FINDS
DEL WEBB SUN CITY ROSEVILLE DEVELOPMENT**	CA SLIC

OVERVIEW MAP - 1033694.1s - Tetra Tech, FW



★ Target Property

▲ Sites at elevations higher than or equal to the target property

◆ Sites at elevations lower than the target property

♟ Coal Gasification Sites

National Priority List Sites

Landfill Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Oil & Gas pipelines

100-year flood zone

500-year flood zone

Federal Wetlands

Areas of Concern

N

TARGET PROPERTY:	Roseville Energy Park	CUSTOMER:	Tetra Tech, FW
ADDRESS:	5051 Phillip Road	CONTACT:	Brad Wheeler
CITY/STATE/ZIP:	Roseville CA 95747	INQUIRY #:	1033694.1s
LAT/LONG:	38.7919 / 121.3815	DATE:	August 21, 2003 1:00 pm

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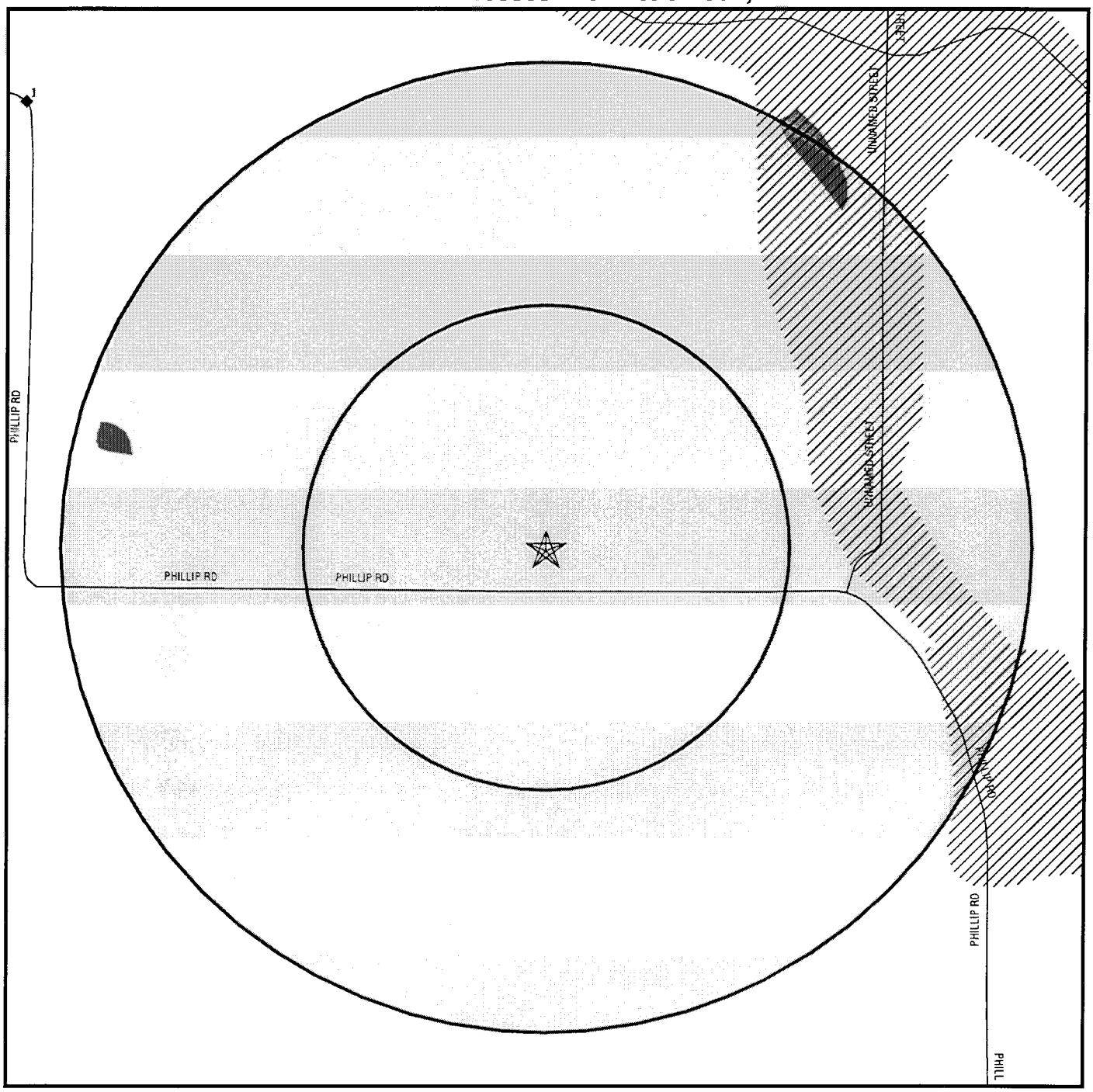
DETAIL MAP - 1033694.1s - Tetra Tech, FW



★ Target Property

▲ Sites at elevations higher than or equal to the target property

◆ Sites at elevations lower than the target property

Coal Gasification Sites

Sensitive Receptors

National Priority List Sites

Landfill Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Oil & Gas pipelines

100-year flood zone

500-year flood zone

Federal Wetlands

Areas of Concern

N

TARGET PROPERTY:	Roseville Energy Park	CUSTOMER:	Tetra Tech, FW
ADDRESS:	5051 Phillip Road	CONTACT:	Brad Wheeler
CITY/STATE/ZIP:	Roseville CA 95747	INQUIRY #:	1033694.1s
LAT/LONG:	38.7919 / 121.3815	DATE:	August 21, 2003 1:00 pm

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MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FEDERAL ASTM STANDARD								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.250	0	0	NR	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRIS-TSD		0.500	0	0	0	NR	NR	0
RCRIS Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRIS Sm. Quan. Gen.		0.250	0	0	NR	NR	NR	0
ERNS		TP	NR	NR	NR	NR	NR	0
STATE ASTM STANDARD								
AWP		1.000	0	0	0	0	NR	0
Cal-Sites		1.000	0	0	0	0	NR	0
CHMIRS		1.000	0	0	1	0	NR	1
Cortese		1.000	0	0	0	0	NR	0
Notify 65		1.000	0	0	0	0	NR	0
Toxic Pits		1.000	0	0	0	0	NR	0
State Landfill		0.500	0	0	0	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	0	NR	NR	0
CA Bond Exp. Plan		1.000	0	0	0	0	NR	0
UST		0.250	0	0	NR	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
CA FID UST		0.250	0	0	NR	NR	NR	0
HIST UST		0.250	0	0	NR	NR	NR	0
FEDERAL ASTM SUPPLEMENTAL								
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
NPL Liens		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
STATE OR LOCAL ASTM SUPPLEMENTAL								
AST		TP	NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CLEANERS		0.250	0	0	NR	NR	NR	0
CA WDS		TP	NR	NR	NR	NR	NR	0
DEED		TP	NR	NR	NR	NR	NR	0
NFE		0.250	0	0	NR	NR	NR	0
NFA		0.250	0	0	NR	NR	NR	0
REF		0.250	0	0	NR	NR	NR	0
SCH		0.250	0	0	NR	NR	NR	0
CA SLIC		0.500	0	0	0	NR	NR	0
HAZNET		0.250	0	0	NR	NR	NR	0
PLACER CO. MS		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Coal Gas		1.000	0	0	0	0	NR	0
BROWNFIELDS DATABASES								
VCP		0.500	0	0	0	NR	NR	0

NOTES:

AQUIFLOW - see EDR Physical Setting Source Addendum

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

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1 **CHMIRS** **S105640358**
NW **5300 PHILLIP RD** **N/A**
1/4-1/2 **ROSEVILLE, CA 30041**
1863 ft.

Relative:
Lower

Actual:
88 ft.

CHMIRS:

OES Control Number:	8397
Chemical Name:	waste oil, transmission oil , battery acid
Extent of Release:	Not reported
Property Use:	Not reported
Incident Date:	Not reported
Date Completed:	Not reported
Time Completed :	Not reported
Agency Id Number :	Not reported
Agency Incident Number :	Not reported
OES Incident Number :	8397
Time Notified :	Not reported
Surrounding Area :	Not reported
Estimated Temperature :	Not reported
Property Management :	Not reported
More Than Two Substances Involved? :	Not reported
Special Studies 1 :	Not reported
Special Studies 2 :	Not reported
Special Studies 3 :	Not reported
Special Studies 4 :	Not reported
Special Studies 5 :	Not reported
Special Studies 6 :	Not reported
Responding Agency Personel # Of Injuries :	NO
Responding Agency Personel # Of Fatalities :	NO
Resp Agncy Personel # Of Decontaminated :	Not reported
Others Number Of Decontaminated :	Not reported
Others Number Of Injuries :	Not reported
Others Number Of Fatalities :	Not reported
Vehicle Make/year :	Not reported
Vehicle License Number :	Not reported
Vehicle State :	Not reported
Vehicle Id Number :	Not reported
CA/DOT/PUC/ICC Number :	Not reported
Company Name :	Not reported
Reporting Officer Name/ID :	Not reported
Report Date :	Not reported
Comments :	Not reported
Facility Telephone Number :	Not reported
Waterway Involved :	NO
Waterway :	Not reported
Spill Site :	RESIDENCE
Cleanup By :	unknown
Containment :	NO
What Happened :	illegally dumped by previous tenant of residence (paul tracy schaffer)who owns a mobil auto repair business named "auto pro " phone# 916-784-8603
Type :	PETROLEUM
Other :	Not reported
Chemical 1 :	Not Reported
Chemical 2 :	Not Reported

(Continued) **S105640358**

Chemical 3 :	Not Reported
Date/Time :	am/30 mar95
Evacuations :	NO

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
ROSEVILLE	1006829066	ROSEVILLE SANITARY LANDFILL	BERRY ST; 1 MI E ATLANTIC ST		FINDS
ROSEVILLE	91234862	BOWL TRACK 17 IN ROSEVILLE	BOWL TRACK 17 IN ROSEVILLE		ERNS
ROSEVILLE	S103680218	CITY OF ROSEVILLE W/WW LAB	WEST END OF BOOTH RD	95747	HAZNET
ROSEVILLE	S105556906	DEL WEBB SUN CITY ROSEVILLE DEVELOPMENT**	FIDDEYMENT ROAD NORTH OF BASE LINE RO		CA SLIC
ROSEVILLE	S105266148	ROSEVILLE CLEANERS	5098 FOOTHILL BLVD	95747	CLEANERS
ROSEVILLE	S105082907	CITY ROSEVILLE - DEPT OF CENTRAL SVCS	120 GRANT ST	95747	HAZNET
ROSEVILLE	U003782320	ROSEVILLE CORPORATION YARD	2055 HILLTOP CIRCLE	95747	UST
ROSEVILLE	S103679435	1X ROSEVILLE JOINT UNION HIGH SCHOOL DIS	OAKMONT HIGH SCHOOL		HAZNET
ROSEVILLE	S105678194	BERRY STREET MALL - FINGERS LANDFILL	N OF BERRY STREET W. OF HARDING BLVD.		SWF/LF
ROSEVILLE	96512312	ROSEVILLE YARD TRACK 479	ROSEVILLE YARD TRACK 479		ERNS
ROSEVILLE	98447412	ROSEVILLE AND KATELLA RD	ROSEVILLE AND KATELLA RD		ERNS
ROSEVILLE	98443272	ROSEVILLE CA RAILYARD TRACK NO. 462	ROSEVILLE CA RAILYARD TRACK NO. 462		ERNS
ROSEVILLE	94397520	ROSEVILLE ANTELOPE YARD	ROSEVILLE ANTELOPE YARD		ERNS
ROSEVILLE	99640603	ROSEVILLE YARD	ROSEVILLE YARD		ERNS
ROSEVILLE	8710662	ROSEVILLE YARD TRACK 112 79 TH CAR IN THE TRACK	ROSEVILLE YARD TRACK 112 79 TH CAR IN THE TRACK		ERNS
ROSEVILLE	8710920	ROSEVILLE YARD ROSEVILLE DIESEL PIT	ROSEVILLE YARD ROSEVILLE DIESEL PIT		ERNS
ROSEVILLE	93345097	ROSEVILLE YARD 1600 VERNON ST	ROSEVILLE YARD 1600 VERNON ST		ERNS
ROSEVILLE	93338953	ROSEVILLE YARD 1600 VERNON STREET	ROSEVILLE YARD 1600 VERNON STREET		ERNS
ROSEVILLE	93336207	ROSEVILLE YARD	ROSEVILLE YARD		ERNS
ROSEVILLE	93325642	ROSEVILLE YARDS 1600 VERNON STREET	ROSEVILLE YARDS 1600 VERNON STREET		ERNS
ROSEVILLE	92262311	ROSEVILLE RR YARD	ROSEVILLE RR YARD		ERNS
ROSEVILLE	92259772	ROSEVILLE RR YARD	ROSEVILLE RR YARD		ERNS
ROSEVILLE	91466973	ROSEVILLE YARD	ROSEVILLE YARD		ERNS
ROSEVILLE	91227510	ROSEVILLE YARD	ROSEVILLE YARD		ERNS
ROSEVILLE	90190761	ROSEVILLE SOUTH PACIFIC YARD	ROSEVILLE SOUTH PACIFIC YARD		ERNS
ROSEVILLE	98422302	ROSEVILLE YARD	ROSEVILLE YARD		ERNS
ROSEVILLE	87637	ROSEVILLE MP 110.6	ROSEVILLE MP 110.6		ERNS
ROSEVILLE	99614693	ROSEVILLE TRAIN YARD	ROSEVILLE TRAIN YARD		ERNS
ROSEVILLE	2002621594	ROSEVILLE YARD	ROSEVILLE YARD		ERNS
ROSEVILLE	2000527976	ROSEVILLE YARD	ROSEVILLE YARD		ERNS
ROSEVILLE	S103679868	CITY OF ROSEVILLE	SEWER LIFT STA 5 FIDDYMENT RD	95747	HAZNET
ROSEVILLE	8713663	SPRR YARDS/ROSEVILLE CA	SPRR YARDS/ROSEVILLE CA		ERNS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Elapsed ASTM days: Provides confirmation that this EDR report meets or exceeds the 90-day updating requirement of the ASTM standard.

FEDERAL ASTM STANDARD RECORDS

NPL: National Priority List
Source: EPA
Telephone: N/A
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/30/03
Date Made Active at EDR: 06/02/03
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 05/05/03
Elapsed ASTM days: 28
Date of Last EDR Contact: 05/09/03

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 6
Telephone: 214-655-6659

EPA Region 8
Telephone: 303-312-6774

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 04/30/03
Date Made Active at EDR: 06/02/03
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 05/05/03
Elapsed ASTM days: 28
Date of Last EDR Contact: 05/05/03

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
Source: EPA
Telephone: 703-413-0223
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 06/16/03
Date Made Active at EDR: 08/01/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 06/23/03
Elapsed ASTM days: 39
Date of Last EDR Contact: 06/23/03

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Source: EPA
Telephone: 703-413-0223
As of February 1995, CERCLIS sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund action or NPL consideration. EPA has removed approximately 25,000 NFRAP sites to lift the unintended barriers to the redevelopment of these properties and has archived them as historical records so EPA does not needlessly repeat the investigations in the future. This policy change is part of the EPA's Brownfields Redevelopment Program to help cities, states, private investors and affected citizens to promote economic redevelopment of unproductive urban sites.

Date of Government Version: 06/11/03
Date Made Active at EDR: 08/01/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 06/23/03
Elapsed ASTM days: 39
Date of Last EDR Contact: 06/23/03

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/31/03
Date Made Active at EDR: 05/08/03
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 04/07/03
Elapsed ASTM days: 31
Date of Last EDR Contact: 06/09/03

RCRIS: Resource Conservation and Recovery Information System
Source: EPA/NTIS
Telephone: 800-424-9346
Resource Conservation and Recovery Information System. RCRIS includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA).

Date of Government Version: 07/11/03
Date Made Active at EDR: 08/18/03
Database Release Frequency: Varies
Date of Data Arrival at EDR: 07/30/03
Elapsed ASTM days: 19
Date of Last EDR Contact: 06/26/03

ERNS: Emergency Response Notification System
Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/02
Date Made Active at EDR: 02/03/03
Database Release Frequency: Annually
Date of Data Arrival at EDR: 01/27/03
Elapsed ASTM days: 7
Date of Last EDR Contact: 04/28/03

FEDERAL ASTM SUPPLEMENTAL RECORDS

BRS: Biennial Reporting System
Source: EPA/NTIS
Telephone: 800-424-9346
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/99
Database Release Frequency: Biennially
Date of Last EDR Contact: 06/16/03
Date of Next Scheduled EDR Contact: 09/15/03

CONSENT: Superfund (CERCLA) Consent Decrees
Source: EPA Regional Offices
Telephone: Varies
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: N/A
Database Release Frequency: Varies
Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

ROD: Records Of Decision
Source: EPA
Telephone: 703-416-0223
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 07/09/03
Database Release Frequency: Annually

Date of Last EDR Contact: 07/07/03
Date of Next Scheduled EDR Contact: 10/06/03

DELISTED NPL: National Priority List Deletions
Source: EPA
Telephone: N/A
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/30/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/05/03
Date of Next Scheduled EDR Contact: 08/04/03

FINDS: Facility Index System/Facility Identification Initiative Program Summary Report
Source: EPA
Telephone: N/A
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 07/25/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 07/02/03
Date of Next Scheduled EDR Contact: 10/06/03

HMIRS: Hazardous Materials Information Reporting System
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/31/03
Database Release Frequency: Annually

Date of Last EDR Contact: 07/23/03
Date of Next Scheduled EDR Contact: 10/20/03

MLTS: Material Licensing Tracking System
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/23/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 07/02/03
Date of Next Scheduled EDR Contact: 10/06/03

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959

Date of Government Version: 06/07/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 06/30/03
Date of Next Scheduled EDR Contact: 09/29/03

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 205-564-4267
Federal Superfund Liens. Under the authority granted the USEPA by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner receives notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/91
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/25/03

PADS: PCB Activity Database System
Source: EPA
Telephone: 202-564-3887
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 03/26/03
Database Release Frequency: Annually
Date of Last EDR Contact: 05/12/03
Date of Next Scheduled EDR Contact: 08/11/03

DOD: Department of Defense Sites
Source: USGS
Telephone: 703-648-5920
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 04/01/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/12/03
Date of Next Scheduled EDR Contact: 08/11/03

RAATS: RCRA Administrative Action Tracking System
Source: EPA
Telephone: 202-564-4104
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/95
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-260-1531
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/01
Database Release Frequency: Annually
Date of Last EDR Contact: 06/27/03
Date of Next Scheduled EDR Contact: 09/22/03

TSCA: Toxic Substances Control Act
Source: EPA
Telephone: 202-260-5521
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/98
Database Release Frequency: Every 4 Years
Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA
Telephone: 202-564-2501

Date of Government Version: 04/15/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/23/03
Date of Next Scheduled EDR Contact: 09/22/03

SSTS: Section 7 Tracking Systems
Source: EPA
Telephone: 202-564-5008
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/00
Database Release Frequency: Annually
Date of Last EDR Contact: 05/09/03
Date of Next Scheduled EDR Contact: 07/21/03

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-564-2501
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/15/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/23/03
Date of Next Scheduled EDR Contact: 09/22/03

STATE OF CALIFORNIA ASTM STANDARD RECORDS

AWP: Annual Workplan Sites
Source: California Environmental Protection Agency
Telephone: 916-323-3400
Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 06/30/03
Date Made Active at EDR: 07/18/03
Database Release Frequency: Annually
Date of Data Arrival at EDR: 07/07/03
Elapsed ASTM days: 11
Date of Last EDR Contact: 07/07/03

CAL-SITES: Calsites Database
Source: Department of Toxic Substance Control
Telephone: 916-323-3400
The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database.

Date of Government Version: 04/28/03
Date Made Active at EDR: 06/23/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 06/02/03
Elapsed ASTM days: 21
Date of Last EDR Contact: 06/02/03

CHMIRS: California Hazardous Material Incident Report System
Source: Office of Emergency Services
Telephone: 916-845-8400
California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/02
Date Made Active at EDR: 08/07/03
Database Release Frequency: Varies
Date of Data Arrival at EDR: 07/11/03
Elapsed ASTM days: 27
Date of Last EDR Contact: 05/27/03

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-9100
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 04/01/01
Date Made Active at EDR: 07/26/01
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 05/29/01
Elapsed ASTM days: 58
Date of Last EDR Contact: 04/29/03

NOTIFY 65: Proposition 65 Records
Source: State Water Resources Control Board
Telephone: 916-445-3846
Proposition 65 Notification Records. NOTIFY 65 contains facility notifications about any release which could impact drinking water and thereby expose the public to a potential health risk.

Date of Government Version: 10/21/93
Date Made Active at EDR: 11/19/93
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 11/01/93
Elapsed ASTM days: 18
Date of Last EDR Contact: 04/21/03

TOXIC PITS: Toxic Pits Cleanup Act Sites
Source: State Water Resources Control Board
Telephone: 916-227-4364
Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/95
Date Made Active at EDR: 09/26/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 08/30/95
Elapsed ASTM days: 27
Date of Last EDR Contact: 05/05/03

SWF/LF (SWIS): Solid Waste Information System
Source: Integrated Waste Management Board
Telephone: 916-341-6320
Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 06/13/03
Date Made Active at EDR: 07/07/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 06/16/03
Elapsed ASTM days: 21
Date of Last EDR Contact: 06/16/03

WMUDS/SWAT: Waste Management Unit Database
Source: State Water Resources Control Board
Telephone: 916-227-4448
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/00
Date Made Active at EDR: 05/10/00
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/10/00
Elapsed ASTM days: 30
Date of Last EDR Contact: 06/17/03

LUST: Leaking Underground Storage Tank Information System
Source: State Water Resources Control Board
Telephone: 916-341-5740
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 04/02/03
Date Made Active at EDR: 04/25/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 04/16/03
Elapsed ASTM days: 9
Date of Last EDR Contact: 07/08/03

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CA BOND EXP. PLAN: Bond Expenditure Plan
Source: Department of Health Services
Telephone: 916-255-2118
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/89
Date Made Active at EDR: 08/02/94
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 07/27/94
Elapsed ASTM days: 6
Date of Last EDR Contact: 05/31/94

CA UST:

UST: Active UST Facilities
Source: SWRCB
Telephone: 916-341-5700
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 04/02/03
Date Made Active at EDR: 04/30/03
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 04/16/03
Elapsed ASTM days: 14
Date of Last EDR Contact: 07/08/03

VCP: Voluntary Cleanup Program Properties
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 04/28/03
Date Made Active at EDR: 06/12/03
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 06/02/03
Elapsed ASTM days: 10
Date of Last EDR Contact: 06/02/03

INDIAN UST: Underground Storage Tanks on Indian Land
Source: EPA Region 9
Telephone: 415-972-3368

Date of Government Version: N/A
Date Made Active at EDR: N/A
Database Release Frequency: Varies
Date of Data Arrival at EDR: N/A
Elapsed ASTM days: 0
Date of Last EDR Contact: N/A

CA FID UST: Facility Inventory Database
Source: California Environmental Protection Agency
Telephone: 916-445-6532
The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/94
Date Made Active at EDR: 09/29/95
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 09/05/95
Elapsed ASTM days: 24
Date of Last EDR Contact: 12/28/98

HIST UST: Hazardous Substance Storage Container Database
Source: State Water Resources Control Board
Telephone: 916-341-5700
The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/90
Date Made Active at EDR: 02/12/91
Database Release Frequency: No Update Planned
Date of Data Arrival at EDR: 01/25/91
Elapsed ASTM days: 18
Date of Last EDR Contact: 07/26/01

STATE OF CALIFORNIA ASTM SUPPLEMENTAL RECORDS

AST: Aboveground Petroleum Storage Tank Facilities
Source: State Water Resources Control Board
Telephone: 916-341-5712
Registered Aboveground Storage Tanks.

Date of Government Version: 05/01/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/05/03
Date of Next Scheduled EDR Contact: 08/04/03

CLEANERS: Cleaner Facilities
Source: Department of Toxic Substance Control
Telephone: 916-225-0873
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 03/11/03
Database Release Frequency: Annually
Date of Last EDR Contact: 07/02/03
Date of Next Scheduled EDR Contact: 10/06/03

CA WDS: Waste Discharge System
Source: State Water Resources Control Board
Telephone: 916-657-1571
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/23/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/23/03
Date of Next Scheduled EDR Contact: 09/22/03

DEED: List of Deed Restrictions
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
The use of recorded land use restrictions is one of the methods the DTSC uses to protect the public from unsafe exposures to hazardous substances and wastes.

Date of Government Version: 07/04/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 07/07/03
Date of Next Scheduled EDR Contact: 10/06/03

NFA: No Further Action Determination
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties at which DTSC has made a clear determination that the property does not pose a problem to the environment or to public health.

Date of Government Version: 04/28/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/02/03
Date of Next Scheduled EDR Contact: 09/01/03

REF: Unconfirmed Properties Referred to Another Agency
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties where contamination has not been confirmed and which were determined as not requiring direct DTSC Site Mitigation Program action or oversight. Accordingly, these sites have been referred to another state or local regulatory agency.

Date of Government Version: 04/28/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/02/03
Date of Next Scheduled EDR Contact: 09/01/03

SCH: School Property Evaluation Program
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 04/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/02/03
Date of Next Scheduled EDR Contact: 09/01/03

NFE: Properties Needing Further Evaluation
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
This category contains properties that are suspected of being contaminated. These are unconfirmed contaminated properties that need to be assessed using the PEA process. PEA in Progress indicates properties where DTSC is currently conducting a PEA. PEA Required indicates properties where DTSC has determined a PEA is required, but not currently underway.

Date of Government Version: 04/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/02/03
Date of Next Scheduled EDR Contact: 09/01/03

HAZNET: Hazardous Waste Information System
Source: California Environmental Protection Agency
Telephone: 916-255-1136
Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/01
Database Release Frequency: Annually

Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/11/03

LOCAL RECORDS

ALAMEDA COUNTY:

Local Oversight Program Listing of UGT Cleanup Sites
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 07/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 07/07/03
Date of Next Scheduled EDR Contact: 10/27/03

Underground Tanks
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 11/26/02
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/12/03
Date of Next Scheduled EDR Contact: 07/28/03

CONTRA COSTA COUNTY:

Site List
Source: Contra Costa Health Services Department
Telephone: 925-646-2286
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 06/16/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 06/05/03
Date of Next Scheduled EDR Contact: 09/01/03

FRESNO COUNTY:

CUPA Resources List
Source: Dept. of Community Health
Telephone: 559-445-3271
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 07/15/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 07/21/03
Date of Next Scheduled EDR Contact: 11/10/03

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Kern County Sites and Tanks Listing.

Date of Government Version: 07/25/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 07/24/03
Date of Next Scheduled EDR Contact: 09/08/03

LOS ANGELES COUNTY:

List of Solid Waste Facilities
Source: La County Department of Public Works
Telephone: 818-458-5185

Date of Government Version: 12/01/02
Database Release Frequency: Varies

Date of Last EDR Contact: 05/19/03
Date of Next Scheduled EDR Contact: 08/18/03

City of El Segundo Underground Storage Tank
Source: City of El Segundo Fire Department
Telephone: 310-607-2239

Date of Government Version: 03/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/19/03
Date of Next Scheduled EDR Contact: 08/18/03

City of Long Beach Underground Storage Tank
Source: City of Long Beach Fire Department
Telephone: 562-570-2543

Date of Government Version: 05/30/02
Database Release Frequency: Annually

Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/25/03

City of Torrance Underground Storage Tank
Source: City of Torrance Fire Department
Telephone: 310-618-2973

Date of Government Version: 02/25/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/19/03
Date of Next Scheduled EDR Contact: 08/18/03

City of Los Angeles Landfills
Source: Engineering & Construction Division
Telephone: 213-473-7869

Date of Government Version: 03/01/02
Database Release Frequency: Varies

Date of Last EDR Contact: 06/16/03
Date of Next Scheduled EDR Contact: 09/15/03

HMS: Street Number List
Source: Department of Public Works
Telephone: 626-458-3517
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 04/03/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/19/03
Date of Next Scheduled EDR Contact: 08/18/03

Site Mitigation List
Source: Community Health Services
Telephone: 323-890-7806
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/07/03
Database Release Frequency: Annually

Date of Last EDR Contact: 05/19/03
Date of Next Scheduled EDR Contact: 08/18/03

San Gabriel Valley Areas of Concern
Source: EPA Region 9
Telephone: 415-972-3178
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/98
Database Release Frequency: No Update Planned

Date of Last EDR Contact: 07/06/99
Date of Next Scheduled EDR Contact: N/A

MARIN COUNTY:

Underground Storage Tank Sites
Source: Public Works Department Waste Management
Telephone: 415-499-6647
Currently permitted USTs in Marin County.

Date of Government Version: 03/04/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 05/05/03
Date of Next Scheduled EDR Contact: 08/04/03

NAPA COUNTY:

Sites With Reported Contamination
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 03/31/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 06/30/03
Date of Next Scheduled EDR Contact: 09/29/03

Closed and Operating Underground Storage Tank Sites
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 03/31/03
Database Release Frequency: Annually

Date of Last EDR Contact: 06/30/03
Date of Next Scheduled EDR Contact: 09/29/03

ORANGE COUNTY:

List of Underground Storage Tank Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/04/02
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/11/03
Date of Next Scheduled EDR Contact: 09/08/03

List of Underground Storage Tank Facilities
Source: Health Care Agency
Telephone: 714-834-3446
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/27/01
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/11/03
Date of Next Scheduled EDR Contact: 09/08/03

List of Industrial Site Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Petroleum and non-petroleum spills.

Date of Government Version: 10/24/00
Database Release Frequency: Annually

Date of Last EDR Contact: 06/11/03
Date of Next Scheduled EDR Contact: 09/08/03

PLACER COUNTY:

Master List of Facilities
Source: Placer County Health and Human Services
Telephone: 530-889-7312
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 07/17/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 06/23/03
Date of Next Scheduled EDR Contact: 09/22/03

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Source: Department of Public Health
Telephone: 909-358-5055
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 06/03/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/21/03
Date of Next Scheduled EDR Contact: 07/21/03

Underground Storage Tank Tank List
Source: Health Services Agency
Telephone: 909-358-5055

Date of Government Version: 05/30/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 04/21/03
Date of Next Scheduled EDR Contact: 07/21/03

SACRAMENTO COUNTY:

CS - Contaminated Sites
Source: Sacramento County Environmental Management
Telephone: 916-875-8406

Date of Government Version: 04/02/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/05/03
Date of Next Scheduled EDR Contact: 08/04/03

ML - Regulatory Compliance Master List
Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 04/03/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 05/05/03
Date of Next Scheduled EDR Contact: 08/04/03

SAN BERNARDINO COUNTY:

Hazardous Material Permits
Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 06/01/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

SAN DIEGO COUNTY:

Solid Waste Facilities
Source: Department of Health Services
Telephone: 619-338-2209
San Diego County Solid Waste Facilities.

Date of Government Version: 08/01/00
Database Release Frequency: Varies
Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/25/03

Hazardous Materials Management Division Database
Source: Hazardous Materials Management Division
Telephone: 619-338-2268
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 03/31/02
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/08/03
Date of Next Scheduled EDR Contact: 10/06/03

SAN FRANCISCO COUNTY:

Local Oversite Facilities
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920

Date of Government Version: 06/20/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

Underground Storage Tank Information
Source: Department of Public Health
Telephone: 415-252-3920

Date of Government Version: 06/20/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

SAN MATEO COUNTY:

Fuel Leak List
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

Date of Government Version: 03/13/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 04/28/03
Date of Next Scheduled EDR Contact: 07/28/03

Business Inventory
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 06/16/03
Database Release Frequency: Annually

Date of Last EDR Contact: 07/08/03
Date of Next Scheduled EDR Contact: 10/13/03

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report
Source: Santa Clara Valley Water District
Telephone: 408-265-2600

Date of Government Version: 07/02/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 06/30/03
Date of Next Scheduled EDR Contact: 09/29/03

Hazardous Material Facilities
Source: City of San Jose Fire Department
Telephone: 408-277-4659

Date of Government Version: 12/11/02
Database Release Frequency: Annually

Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

SOLANO COUNTY:

Leaking Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 12/20/02
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/16/03
Date of Next Scheduled EDR Contact: 09/15/03

Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 12/18/02
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/16/03
Date of Next Scheduled EDR Contact: 09/15/03

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
Source: Department of Health Services
Telephone: 707-565-6565

Date of Government Version: 07/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 07/28/03
Date of Next Scheduled EDR Contact: 10/27/03

SUTTER COUNTY:

Underground Storage Tanks
Source: Sutter County Department of Agriculture
Telephone: 530-822-7500

Date of Government Version: 07/01/01
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 07/07/03
Date of Next Scheduled EDR Contact: 10/06/03

VENTURA COUNTY:

Inventory of Illegal Abandoned and Inactive Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 09/01/02
Database Release Frequency: Annually
Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/25/03

Listing of Underground Tank Cleanup Sites
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/22/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/15/03
Date of Next Scheduled EDR Contact: 09/15/03

Underground Tank Closed Sites List
Source: Environmental Health Division
Telephone: 805-654-2813
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 12/30/02
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/08/03
Date of Next Scheduled EDR Contact: 10/13/03

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 05/21/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 06/16/03
Date of Next Scheduled EDR Contact: 09/15/03

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Source: Yolo County Department of Health
Telephone: 530-666-8646

Date of Government Version: 06/19/03
Database Release Frequency: Annually
Date of Last EDR Contact: 06/19/03
Date of Next Scheduled EDR Contact: 10/20/03

California Regional Water Quality Control Board (RWQCB) LUST Records

LUST REG 1: Active Toxic Site Investigation
Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/01
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/25/03

LUST REG 2: Fuel Leak List
Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457

Date of Government Version: 03/28/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/10/03
Date of Next Scheduled EDR Contact: 10/13/03

LUST REG 3: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147

Date of Government Version: 05/19/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 05/19/03
Date of Next Scheduled EDR Contact: 08/18/03

LUST REG 4: Underground Storage Tank Leak List
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-266-6600
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 08/09/01
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 06/30/03
Date of Next Scheduled EDR Contact: 09/29/03

LUST REG 5: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-255-3125

Date of Government Version: 07/01/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/07/03
Date of Next Scheduled EDR Contact: 10/06/03

LUST REG 6L: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 06/09/03
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491

Date of Government Version: 05/29/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/02/03
Date of Next Scheduled EDR Contact: 10/06/03

LUST REG 7: Leaking Underground Storage Tank Case Listing
Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491

Date of Government Version: 07/02/02
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 06/30/03
Date of Next Scheduled EDR Contact: 09/29/03

LUST REG 8: Leaking Underground Storage Tanks
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4498
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 06/11/03
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 05/12/03
Date of Next Scheduled EDR Contact: 08/11/03

LUST REG 9: Leaking Underground Storage Tank Report
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/01
Database Release Frequency: No Update Planned
Date of Last EDR Contact: 04/21/03
Date of Next Scheduled EDR Contact: 07/21/03

California Regional Water Quality Control Board (RWQCB) SLIC Records

SLIC REG 1: Active Toxic Site Investigations
Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220

Date of Government Version: 04/03/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/25/03

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 03/28/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/10/03
Date of Next Scheduled EDR Contact: 10/13/03

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 05/19/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 05/19/03
Date of Next Scheduled EDR Contact: 08/18/03

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 07/01/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 07/28/03
Date of Next Scheduled EDR Contact: 10/27/03

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-855-3075
Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 07/02/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 07/07/03
Date of Next Scheduled EDR Contact: 10/06/03

SLIC REG 6L: SLIC Sites
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574

Date of Government Version: 06/09/03
Database Release Frequency: Varies
Date of Last EDR Contact: 06/09/03
Date of Next Scheduled EDR Contact: 09/08/03

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583

Date of Government Version: 05/08/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 07/02/03
Date of Next Scheduled EDR Contact: 10/06/03

SLIC REG 7: SLIC List
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491

Date of Government Version: 05/29/03
Database Release Frequency: Varies

Date of Last EDR Contact: 05/27/03
Date of Next Scheduled EDR Contact: 08/25/03

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-3298

Date of Government Version: 04/01/03
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 07/07/03
Date of Next Scheduled EDR Contact: 10/06/03

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980

Date of Government Version: 03/03/03
Database Release Frequency: Annually

Date of Last EDR Contact: 06/02/03
Date of Next Scheduled EDR Contact: 09/01/03

EDR PROPRIETARY HISTORICAL DATABASES

Former Manufactured Gas (Coal Gas) Sites: The existence and location of Coal Gas sites is provided exclusively to EDR by Real Property Scan, Inc. ©Copyright 1993 Real Property Scan, Inc. For a technical description of the types of hazards which may be found at such sites, contact your EDR customer service representative.

Disclaimer Provided by Real Property Scan, Inc.

The information contained in this report has predominantly been obtained from publicly available sources produced by entities other than Real Property Scan. While reasonable steps have been taken to insure the accuracy of this report, Real Property Scan does not guarantee the accuracy of this report. Any liability on the part of Real Property Scan is strictly limited to a refund of the amount paid. No claim is made for the actual existence of toxins at any site. This report does not constitute a legal opinion.

STATE OF CALIFORNIA BROWNFIELDS DATABASES RECORDS

VCP: Voluntary Cleanup Program Properties
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 04/28/03
Database Release Frequency: Quarterly

Date of Last EDR Contact: 06/02/03
Date of Next Scheduled EDR Contact: 09/01/03

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: PennWell Corporation
Telephone: (800) 823-6277
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

STREET AND ADDRESS INFORMATION

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GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

ROSEVILLE ENERGY PARK
5051 PHILLIP ROAD
ROSEVILLE, CA 95747

TARGET PROPERTY COORDINATES

Latitude (North):	38.791901 - 38' 47' 30.8"
Longitude (West):	121.381500 - 121' 22' 53.4"
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	640566.0
UTM Y (Meters):	4294720.5
Elevation:	91 ft. above sea level

EDR's GeoCheck Physical Setting Source Addendum has been developed to assist the environmental professional with the collection of physical setting source information in accordance with ASTM 1527-00, Section 7.2.3. Section 7.2.3 requires that a current USGS 7.5 Minute Topographic Map (or equivalent, such as the USGS Digital Elevation Model) be reviewed. It also requires that one or more additional physical setting sources be sought when (1) conditions have been identified in which hazardous substances or petroleum products are likely to migrate to or from the property, and (2) more information than is provided in the current USGS 7.5 Minute Topographic Map (or equivalent) is generally obtained, pursuant to local good commercial or customary practice, to assess the impact of migration of recognized environmental conditions in connection with the property. Such additional physical setting sources generally include information about the topographic, hydrologic, hydrogeologic, and geologic characteristics of a site, and wells in the area.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata. EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

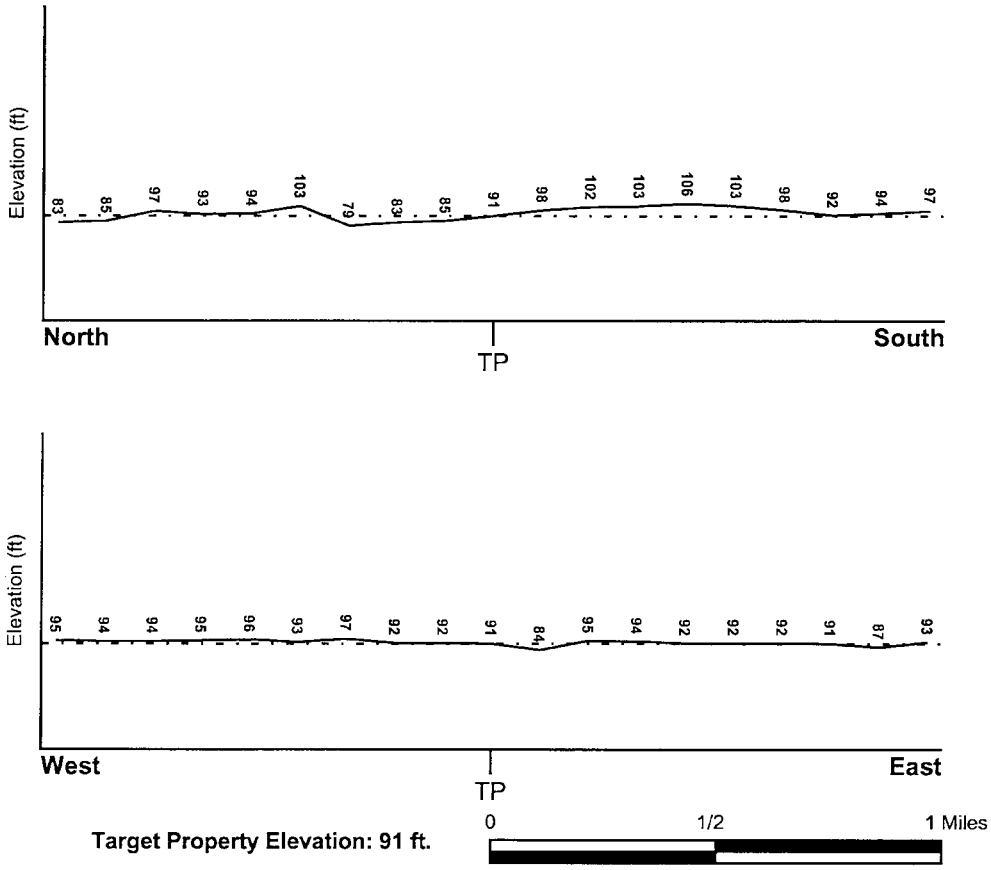
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map:	2438121-G4 PLEASANT GROVE, CA
General Topographic Gradient:	General North
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 91 ft.

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
PLACER, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 0602390400C

Additional Panels in search area: 0602390475E

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
PLEASANT GROVE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site-specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	FIDDYMENT
Soil Surface Texture:	loam
Hydrologic Group:	Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.
Soil Drainage Class:	Well drained. Soils have intermediate water holding capacity. Depth to water table is more than 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	HIGH
Depth to Bedrock Min:	> 21 inches
Depth to Bedrock Max:	> 40 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification			
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil	Permeability Rate (in/hr)	Soil Reaction (pH)
1	0 inches	8 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 7.30 Min: 5.60
2	8 inches	15 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 2.00 Min: 0.60	Max: 7.30 Min: 5.60
3	15 inches	28 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.06 Min: 0.00	Max: 7.80 Min: 6.10
4	28 inches	40 inches	indurated	Not reported	Not reported	Max: 0.00 Min: 0.00	Max: 0.00 Min: 0.00
5	40 inches	44 inches	weathered bedrock	Not reported	Not reported	Max: 0.00 Min: 0.00	Max: 0.00 Min: 0.00

OTHER SOIL TYPES IN AREA

Based on Soil Conservation Service STATSGO data, the following additional subordinant soil types may appear within the general area of target property.

Soil Surface Textures: sandy loam
coarse sandy loam
clay
fine sandy loam

Surficial Soil Types: sandy loam
coarse sandy loam
clay
fine sandy loam

Shallow Soil Types: sandy clay loam
coarse sandy loam

Deeper Soil Types: stratified
coarse sandy loam
indurated

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

According to ASTM E 1527-00, Section 7.2.2, "one or more additional state or local sources of environmental records may be checked, in the discretion of the environmental professional, to enhance and supplement federal and state sources... Factors to consider in determining which local or additional state records, if any, should be checked include (1) whether they are reasonably ascertainable, (2) whether they are sufficiently useful, accurate, and complete in light of the objective of the records review (see 7.1.1), and (3) whether they are obtained, pursuant to local, good commercial or customary practice." One of the record sources listed in Section 7.2.2 is water well information. Water well information can be used to assist the environmental professional in assessing sources that may impact groundwater flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS0148162	1/4 - 1/2 Mile NW

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

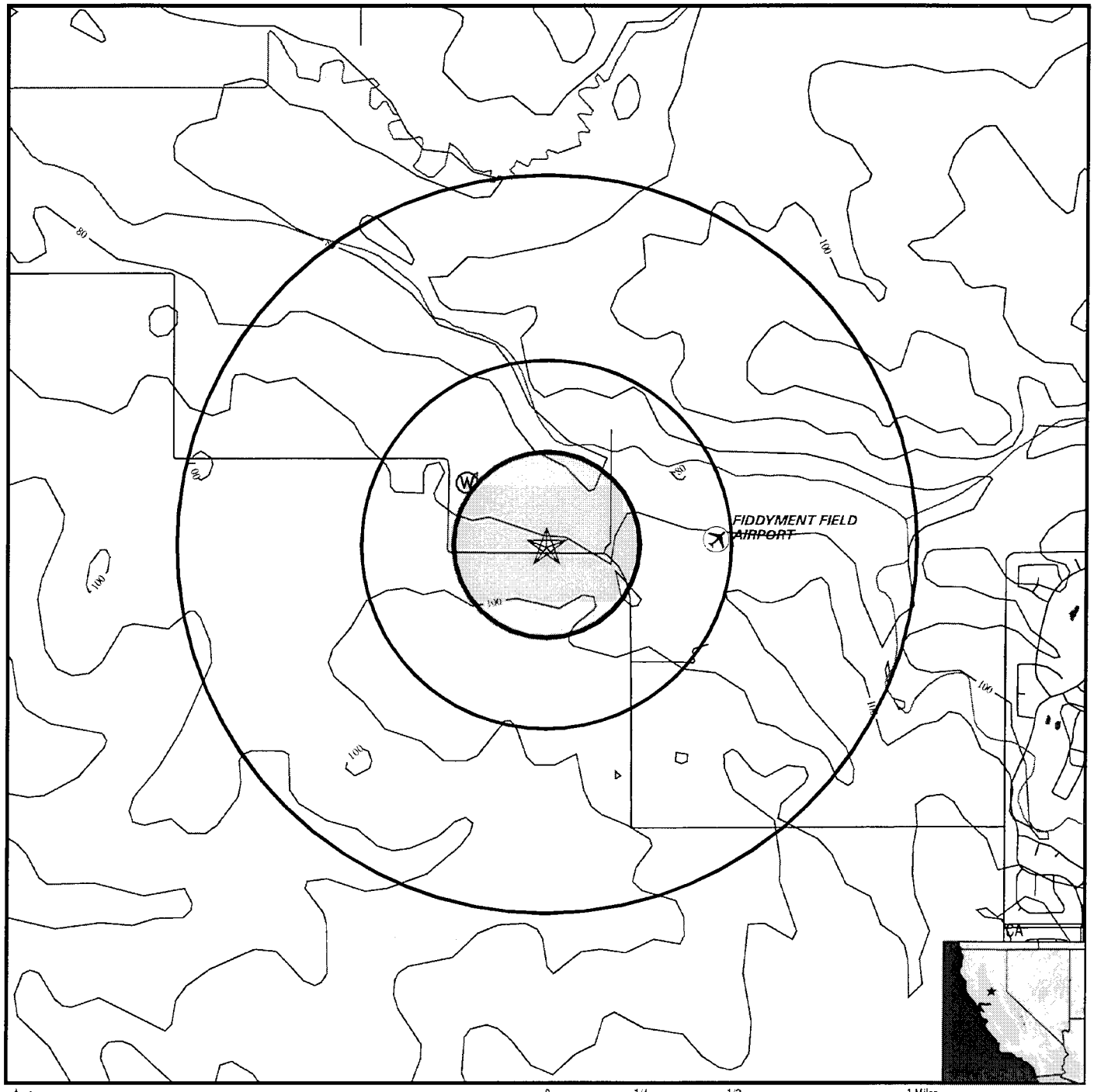
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 1033694.1s



County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Airports
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Closest Hydrogeological Data
Oil, gas or related wells

N

TARGET PROPERTY:	Roseville Energy Park	CUSTOMER:	Tetra Tech, FW
ADDRESS:	5051 Phillip Road	CONTACT:	Brad Wheeler
CITY/STATE/ZIP:	Roseville CA 95747	INQUIRY #:	1033694.1s
LAT/LONG:	38.7919 / 121.3815	DATE:	August 21, 2003 1:00 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation	Database	EDR ID Number
1 **NW** **1/4 - 1/2 Mile** **Lower**	**FED USGS**	**USGS0148162**

Agency:	USGS	Site ID:	384740121230401
Site Name:	011N005E23B001M		
Dec. Latitude:	38.79434		
Dec. Longitude:	-121.38551		
Coord Sys:	NAD83		
State:	CA		
County:	Placer County		
Altitude:	85.00		
Hydrologic code:	18020109		
Topographic:	Valley flat		
Site Type:	Ground-water other than Spring		
Const Date:	Not Reported	Inven Date:	Not Reported
Well Type:	Single well, other than collector or Ranney type		
Primary Aquifer:	Not Reported		
Aquifer type:	Not Reported	Well depth:	195
Hole depth:	Not Reported	Source:	A
Project no:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for PLACER County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for PLACER COUNTY, CA

Number of sites tested: 68

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.466 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.500 pCi/L	100%	0%	0%
Basement	3.043 pCi/L	71%	29%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002. 7.5-Minute DEMs correspond to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 1999 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the national Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

ADDITIONAL ENVIRONMENTAL RECORD SOURCES

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STATE RECORDS

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

California Oil and Gas Well Locations for District 2, 3, 5 and 6
Source: Department of Conservation
Telephone: 916-323-1779

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

APPENDIX C

SITE RECONNAISSANCE AND INTERVIEW FIELD NOTES

Appendix C

Project: Roseville Energy Park
Date: August 27, 2003
Conducted by: Brad Wheeler

Interview
Summary

Name: Paul Cassinelli

Title:
Project Manager

Job role:

Experience at site:
Has been Project Manager on site since May/June 2000.

Current Property Use:
Site is being used by Kiewit Construction as a materials storage yard and vehicle parking lot.

Past Property Use:
Reference prior ESA (URS 2001).

Current Industrial Activities:
Y/N
Past Industrial Activities:
Y/N
Type and Use:

Current Chemicals Used:
Y/N
Past Chemicals Used:
Y/N
Type and Use:

Current Chemicals Stored:
Y/N
Past Chemicals Stored:
Y/N
Type and Use:

Current Chemical mixing areas:
Y/N
Past Chemical mixing areas:
Y/N

Type and Use:

Current Fuels used:
Y/N
Past Fuels used:
Y/N
Type and Use:
20,000 gallon diesel fuel tank was on-site but was removed in October/November 2002. Tank was used for filling fuel truck which in-turn filled machinery/vehicles. Tank had double lined secondary containment and a soil analysis was conducted after the tank was removed.

Current Fuels stored:
Y/N
Only fuels on-site are those that are in vehicles parked on property. Oil and lubricant products are kept on-site.
Past Fuels stored:
Y/N
Type and Use:
Diesel fuel stored in 20,000 gallon above ground tank and petroleum products also stored on site. Diesel and oils/lubricants used for vehicle/machinery operation.

Current Waste generated:
Y/N
Non-hazardous trash is the only waste generated on-site.
Past Waste generated:
Y/N
Type and Use:
In the past used-oils where generated during routine vehicle maintenance. Used oils where kept within a waste accumulation area. Local fire department would inspect accumulation area. Contractor would come and remove wastes for treatment, storage or disposal.

Current and Past Waste disposal methods:
Type and Use
Past waste pick-ups were conducted by a contracted company.

Water source:
Well from previous houses on-site.
Type and Use:

Current or Past Vehicle or equipment maintenance:
Y/N
Note: Diamond Oaks Co. has a rig and a generator on site not associated with Kiewit. Mr. Cassenelli was not aware of Diamond Oaks maintenance routine. In the past vehicle oil changes and maintenance was conducted on site. Used oils were collected and stored at a hazardous waste accumulation area and picked up by a contracted waste company.

Type and Use
Routine/small scale vehicle/machinery maintenance.

Current or Past Floor drains:
Y/N
Type and Use:

Current Sewage Disposal System:
On site trailers are hooked up to historic septic tanks left from houses that were previously on site. Mr. Cassenelli does not believes there is no chance of chemical contamination to septic system from current use. Mr. Cassenelli stated that no chemicals are poured down drains, etc.

Employees with mobile recreational vehicles (RVs) have self contained waste systems. Mobile home users are required to dispose of wastes off site.

Past Sewage Disposal System:
Same

Current or Past Sumps or impoundments:
Y/N
Type and Use:

Current or Past Dry wells:
Y/N
Type and Use:

Current or Past Storage tanks:
ASTs Y/N
Type and Use:
20,000 gallon AST used for Diesel fuel distribution to vehicles. Decommissioned in 2002

Current or Past USTs:
Y/N
Type and Use:

Current or Past Temporary Tanks:
Y/N
Type and Use:
Only temporary tank was used for water storage/distribution for dust control measures 3 years ago. Tank only held water.

Current or Past Pits, Ponds or Lagoons:
Y/N

Type and Use: Temporary water pond used for dust control measures. Pond was lined and no longer exists.

Current Storm Water Management:
Y/N
Type and Use
Storm water management is dictated by the site Storm Water Pollution Prevention Plan (SWPPP). The SWPPP contains best management practices (BMPs) such as silt fencing that Kiewit must implement on site.

Current or Past Agricultural Waste water ponds:
Y/N
Type and Use:

Site Visit Check List and Notes

Date of Visit: August 27, 2003

Visual Observations by: Bradley H. Wheeler

General Site Setting

Current Use of Property:
General Data:

Kiewit Construction uses portions of the property for vehicle parking and materials storage.

Buildings:
Y/N
Type and Use:
Numerous office trailers are on site for Kiewit staff. A garage type building is found near the center of the property. Several abandoned small mobile camper homes are on the property.

Industrial Activities:
Y/N
Type and Use:

Storage Areas:
Y/N
Type and Use:
The property is used as a storage yard and various building materials are kept throughout the site.

Debris Areas or dumps:
Y/N
Several debris areas are found throughout the site. Several small piles of rubber car tires were found in parcel 017-100-17. A small pile of concrete building material debris was also found on parcel 017-100-17 (western side of the property).

Waste Disposal from Operations:
Y/N
Type and Use:
Trash/solid waste is kept in large trash dumpsters/boxes and picked up by a waste management company.

Above Ground Tanks:
Y/N
Type and Use:

Fuel Dispensing:
Y/N
Type and Use:

Indications of USTs:
Y/N

Foundations (former building sites):
Y/N
Type:
Historic concrete foundations were found on site (appeared to be from houses)

Chemical Storage:
Y/N
Type, storage method and quantity:
Chemicals were found being stored at various locals on the property. An area used for the accumulation of paint related products was found at the southeastern side of the storage yard. This area had two unlabeled 55-gallon drums containing an unidentified substance. In addition, numerous open 5-gallon buckets containing waste paint products were being stored. A strong organic solvent odor was being emitted from the area.
A second area of open 5-gallon buckets holding paint waste was found near the first. The buckets were not within any type of secondary containment. No indications of soil staining or spills was observed.

Petroleum products for equipment/vehicles are located in a storage area near the entrance and center of the storage yard. 33 5-gallon containers and a 55-gallon drum holding gear/bearing oil were stored on secondary containment drum decks.

A 55-gallon drum of a possibly hazardous substance was found stored alone near the center of the yard. No labeling was seen on the drum and the drum was not within secondary containment. The drum had a pour spout type top but appeared closed.

3, 55-gallon drums Bacticide, a water treatment anti-fouling chemical containing sodium hypochlorite, were stored within a wooden platform storage deck near the center of the yard. 2 of the drums were empty and 1 drum was approximately one quarter full. The wooden containment deck the drums were in was not capable of controlling a spill. The drums were properly closed and no staining was seen on the ground near the drums.

Drums:
Y/N
Type, condition and Use
See above.

Surface Water:
Y/N
Type and description:

Water Wells:
Y/N
Observed PVC pipe exiting ground to which a hose was connected. This may part of the well system remaining from a previous home that the office trailers currently utilize.
Type and Use:

Septic Systems:
Y/N
Type and Use:
Sewer waste from the office trailers is disposed of via the septic systems remaining from residences once on the property. Did not observe signs of septic systems during the site recon.

Stressed Vegetation:
None, however, due to the season/heat most vegetation is already stressed and dead.

Odors:
No odors found except those present near an accumulation of waste paint products.

Surface Stains:
Only small surface stains on soil associated with vehicle/machinery use were found.

Pooled Liquids:
None

Roads:
Yes (small access roads that travel through laydown and staging area)
Type and Use:
Small, dirt access roads are utilized to access various parts of the storage yard.

Electrical Systems and transformers:
Y/N
Type, ownership, age and Use:
A power line with two transformers was found near the center of parcel 017-100-17. Transformers believed to be owned and serviced by PG&E. No signs of leaking was seen on the transformers.

Heat transfer systems:
Y/N
Type and Use:

Resource Extraction:
Y/N
Type and Use:

APPENDIX D

SOIL SAMPLING RESULTS FROM DIESEL FUEL AST REMOVAL

PO Box 490 Lincoln, CA 95648
Phone 916.765.4284
Fax 916.771.5868

Gularte & ASSOCIATES, INC.

Transmittal

To:	Mark Batolero	**From:**	Greg Gularte
Fax:	(916) 655-1404	**Re:**	Pleasant Grove WWTP
CC:		**Date:**	11/19/02
Fax:		**Pages:**	2

☐ **At Your Request** ☑ **For Your Information** ☐ **For Review** ☐ **Please Respond**

Number	Item
1	Environmental Results for Fuel Tank Soil Sampling; Results are non detect

- **Comments:**

EXCELCHEM
ENVIRONMENTAL LABS

500 Giuseppe Court, Suite 3
Roseville, CA 95678
Phone#: (916) 773-3664 Fax#: (916) 773-4784

ANALYSIS REPORT

Attention: Greg Gularte
Gularte & Associates
961 Washington Blvd., Suite 601
Roseville, CA 95678
Project: PGWWTP / 1015
Method: EPA 8020/8015m

Date Sampled: 11/16/02
Date Received: 11/18/02
BTEX/TPHg Analyzed: 11/18/02
TPHd Analyzed: 11/19/02

Client Sample I.D.	C2-1		C3	
LAB. NO.	S1102377		S1102378	
ANALYTE	R/L	Results	R/L	Results
Benzene	0.005	ND	0.005	ND
Toluene	0.005	ND	0.005	ND
Ethylbenzene	0.005	ND	0.005	ND
Total Xylenes	0.005	ND	0.005	ND
TPH as Gasoline	1.0	ND	1.0	ND
TPH as Diesel	1.0	ND	1.0	ND

QA/QC %RECOVERY		
	LCS	LCSD
Benzene	84	89
Toluene	82	87
Ethylbenzene	81	87
Total Xylenes	83	87
TPH as Diesel	*	*

QA/QC Analyzed: 11/18/02
TPHd QA/QC Analyzed:

ND = Not detected. Compound(s) may be present at concentrations below the reporting limit.
R/L = Reporting Limit
Soil samples reported in mg/kg
* QA/QC to follow

Laboratory Representative

11/19/02
Date Reported

EXCELCHEM ENVIRONMENTAL LABS IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certificate No. 2119)

Roseville Energy Park

Appendix 8.15-A
On-site Well Laboratory Test Report

October 2003

Roseville Energy Park
Application for Certification

MWH Laboratories
A Division of MWH Americas, Inc.

750 Royal Oaks Drive
Suite 100
Monrovia, California 91016-3629
Tel: 626 568 6400
Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory Report

for

City of Roseville/Electic
2090 Hilltop Circle

Roseville , CA 95747

Attention: Russ Nichlos
Fax: 916 774 5583

ACCREDITED IN ACCORDANCE WITH nelac 01114CA

HJR Harry Radke
Project Manager

Report#: 115180

Laboratory certifies that the test results meet all **NELAC** requirements unless noted in the Comments section or the Case Narrative. Following the cover page are QC Report,QC Summary,Data Report,Hits Report, totaling 12 page[s].

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750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
Tel: 626 386 1100
Fax: 626 386 1101
1 800 566 LABS (1 800 566 5227)

Laboratory
Hits Report
#115180

City of Roseville/Electic
Russ Nichlos
2090 Hilltop Circle
Roseville , CA 95747

Samples Received
16-sep-2003 17:19:33

Analyzed	Sample#	Sample ID	Result	UNITS	MRL
	2309160143	LOT 29			
09/18/03		Alkalinity in CaCO3 units	101	mg/l	1.000
09/24/03		Anion Sum - Calculated	3.21	meq/l	.001
09/16/03		Apparent Color	3	ACU	3.000
09/24/03		Arsenic, Total, ICAP/MS	5.1	ug/l	1.000
09/24/03		Barium, Total, ICAP/MS	88	ug/l	2.000
09/24/03		Bicarb.Alkalinity as HCO3,calc	123.	mg/l	.001
09/19/03		Boron, Total, ICAP	0.17	mg/l	.050
09/19/03		Calcium, Total, ICAP	19	mg/l	1.000
09/24/03		Carbon Dioxide,Free(25C)-Calc.	2.46	mg/l	.001
09/24/03		Carbonate as CO3, Calculated	0.799	mg/l	.001
09/24/03		Cation Sum - Calculated	3.26	meq/l	.001
09/16/03		Chloride	34	mg/l	1.000
09/24/03		Chromium, Total, ICAP/MS	7.5	ug/l	1.000
09/23/03		Fluoride	0.21	mg/l	.050
09/24/03		Hydroxide as OH, Calculated	0.02	mg/l	.001
09/18/03		Lab pH	8.0	Units	.001
09/24/03		Langelier Index - 25 degree	-0.069	None	
09/19/03		Magnesium, Total, ICAP	15	mg/l	.100
09/16/03		Nitrate as Nitrogen by IC	1.0	mg/l	.100
09/16/03		Odor	2	TON	1.000
09/17/03		Orthophosphate-P	0.085	mg/l	.010
09/19/03		Potassium, Total, ICAP	1.3	mg/l	1.000
09/18/03		Silica	89	mg/l	.500
09/19/03		Sodium, Total, ICAP	24	mg/l	1.000
09/17/03		Specific Conductance	326	umho/cm	2.000
09/16/03		Sulfate	7.1	mg/l	2.000
09/22/03		Total Dissolved Solid (TDS)	250	mg/l	10.000
09/22/03		Total Hardness as CaCO3 by ICP	109.	mg/l	7.000
09/24/03		Total Nitrate, Nitrite-N, CALC	1.00	mg/l	.100
09/16/03		Turbidity	0.25	NTU	.050
09/24/03		pH of CaCO3 saturation(25C)	8.076	Units	.001

SUMMARY OF POSITIVE DATA ONLY.

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750 Royal Oaks Drive, Suite 100
Monrovia, California 91016-3629
Tel: 626 386 1100
Fax: 626 386 1101
1 800 566 LABS (1 800 566 5227)

Laboratory
Hits Report
#115180

City of Roseville/Electic
Russ Nichlos
2090 Hilltop Circle
Roseville , CA 95747

Samples Received
16-sep-2003 17:19:33

Analyzed	Sample#	Sample ID	Result	UNITS	MRL
	2309160143	LOT 29			
09/22/03		pH of CaCO3 saturation(60C)	7.6	Units	.100

SUMMARY OF POSITIVE DATA ONLY.

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Laboratory Data Report #115180

City of Roseville/Electic
Russ Nichlos
2090 Hilltop Circle
Roseville , CA 95747

Samples Received
09/16/03

Prepared	Analyzed	QC Ref#	Method	Analyte	Result	Units	MRL	Dilution
LOT 29 (2309160143)			**Sampled on 09/15/03 14:15**					
			(EPA/ML 200.8)	Silver, Total, ICAP/MS		ug/l	0.50	1
			(EPA/ML 200.8)	Aluminum, Total, ICAP/MS		ug/l	25	1
	09/18/03 14:59	210209	(SM2320B/E310.1)	Alkalinity in CaCO3 units	101	mg/l	1.0	1
			(ML/SM1040)	Anion Sum - Calculated		meq/l	0.0010	1
			(EPA/ML 200.8)	Arsenic, Total, ICAP/MS		ug/l	1.0	1
	09/19/03 11:50	210323	(ML/EPA 200.7)	Boron, Total, ICAP	0.17	mg/l	0.050	1
			(EPA/ML 200.8)	Barium, Total, ICAP/MS		ug/l	2.0	1
			(EPA/ML 200.8)	Beryllium, Total, ICAP/MS		ug/l	1.0	1
			(SM5210B 405.1)	Biochemical Oxygen Demand,Totl		mg/l	3.0	1
	09/19/03 11:50	210337	(ML/EPA 200.7)	Calcium, Total, ICAP	19	mg/l	1.0	1
			(ML/SM1040)	Cation Sum - Calculated		meq/l	0.0010	1
			(EPA/ML 200.8)	Cadmium, Total, ICAP/MS		ug/l	0.50	1
	09/16/03 12:43	210121	(ML/EPA 300)	Chloride	34	mg/l	1.0	1
	09/22/03 00:00	210365	(SM4500CN-F)	Cyanide	ND	mg/l	0.10	4
			(SM4500-CO2-D)	Carbon Dioxide,Free(25C)-Calc.		mg/l	0.0010	1
			(SM2320B/E310.1)	Carbonate as CO3, Calculated		mg/l	0.0010	1
	09/16/03 00:00	210097	(ML/S2120B)	Apparent Color	3	ACU	3.0	1
			(EPA/ML 200.8)	Chromium, Total, ICAP/MS		ug/l	1.0	1
			(EPA/ML 200.8)	Copper, Total, ICAP/MS		ug/l	2.0	1
	09/17/03 15:34	210089	(ML/S2510B)	Specific Conductance	326	umho/cm	2.0	1
			(SM4500F-C)	Fluoride		mg/l	0.050	1
	09/19/03 11:50	210311	(ML/EPA 200.7)	Iron, Total, ICAP	ND	mg/l	0.10	1
	09/22/03 07:33		(ML/SM2340B)	Total Hardness as CaCO3 by ICP	109.	mg/l	7.0	1
			(SM2320B/E310.1)	Bicarb.Alkalinity as HCO3,calc		mg/l	0.0010	1
			(EPA/ML 245.1)	Mercury		ug/l	0.20	1
	09/19/03 11:50	210316	(ML/EPA 200.7)	Potassium, Total, ICAP	1.3	mg/l	1.0	1
			(ML/SM2330B)	Langelier Index - 25 degree		None	0.0000	1
	09/17/03 07:30	210105	(SM5540C/E425.1)	Surfactants	ND	mg/l	0.050	1
	09/19/03 11:50	210320	(ML/EPA 200.7)	Magnesium, Total, ICAP	15	mg/l	0.10	1
			(EPA/ML 200.8)	Manganese, Total, ICAP/MS		ug/l	2.0	1
			(ML/EPA 200.7)	Sodium, Total, ICAP		mg/l	1.0	1
			(EPA/ML 200.8)	Nickel, Total, ICAP/MS		ug/l	5.0	1

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Laboratory Data Report #115180

City of Roseville/Electic
(continued)

Prepared	Analyzed	QC Ref#	Method	Analyte	Result	Units	MRL	Dilution
	09/16/03 12:43	210123	(ML/EPA 300.0)	Nitrite, Nitrogen by IC	ND	mg/l	0.10	1
			(ML/EPA 300.0)	Total Nitrate, Nitrite-N, CALC		mg/l	0.10	1
	09/16/03 12:43	210119	(ML/EPA 300.0)	Nitrate as Nitrogen by IC	1.0	mg/l	0.10	1
	09/16/03 10:30	210095	(ML/S2150B)	Odor	2	TON	1.0	1
			(SM2320B/E310.1)	Hydroxide as OH, Calculated		mg/l	0.0010	1
	09/17/03 11:40	210104	(ML/S4500P-E)	Orthophosphate-P	0.085	mg/l	0.010	1
			(EPA/ML 200.8)	Lead, Total, ICAP/MS		ug/l	0.50	1
	09/18/03 00:00	210213	(S4500HB/E150.1)	Lab pH	8.0	Units	0.0010	1
			(ML/SM2330B)	pH of CaCO3 saturation(25C)		Units	0.0010	1
			(ML/SM2330A)	pH of CaCO3 saturation(60C)		Units	0.10	1
			(EPA/ML 200.8)	Antimony, Total, ICAP/MS		ug/l	1.0	1
			(EPA/ML 200.8)	Selenium, Total, ICAP/MS		ug/l	5.0	1
	09/18/03 00:00	210116	(EPA/ML 200.7)	Silica	89	mg/l	0.50	1
	09/16/03 12:43	210125	(ML/EPA 300.0)	Sulfate	7.1	mg/l	2.0	1
			(SM 2540C)	Total Dissolved Solid (TDS)		mg/l	10	1
	09/20/03 16:02	210285	(ML/EPA 351.2)	Kjeldahl Nitrogen	ND	mg/l	0.20	1
			(EPA/ML 200.8)	Thallium, Total, ICAP/MS		ug/l	1.0	1
			(ML/SM 5310C)	Total Organic Carbon		mg/l	0.50	1
	09/16/03 16:50	210092	(ML/EPA 180.1)	Turbidity	0.25	NTU	0.050	1
			(EPA/ML 200.8)	Zinc, Total, ICAP/MS		ug/l	5.0	1

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Laboratory
QC Summary
#115180

City of Roseville/Electic

QC Ref #210089 - Specific Conductance **Analysis Date: 09/17/2003**

2309160143 LOT 29

QC Ref #210092 - Turbidity **Analysis Date: 09/16/2003**

2309160143 LOT 29

QC Ref #210095 - Odor **Analysis Date: 09/16/2003**

2309160143 LOT 29

QC Ref #210097 - Apparent Color **Analysis Date: 09/16/2003**

2309160143 LOT 29

QC Ref #210104 - Orthophosphate-P **Analysis Date: 09/17/2003**

2309160143 LOT 29

QC Ref #210105 - Surfactants **Analysis Date: 09/17/2003**

2309160143 LOT 29

QC Ref #210116 - Silica **Analysis Date: 09/18/2003**

2309160143 LOT 29

QC Ref #210119 - Nitrate as Nitrogen by IC **Analysis Date: 09/16/2003**

2309160143 LOT 29

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QC Summary
#115180

City of Roseville/Electic
(continued)

QC Ref #210121 - Chloride **Analysis Date: 09/16/2003**

2309160143 LOT 29

QC Ref #210123 - Nitrite, Nitrogen by IC **Analysis Date: 09/16/2003**

2309160143 LOT 29

QC Ref #210125 - Sulfate **Analysis Date: 09/16/2003**

2309160143 LOT 29

QC Ref #210209 - Alkalinity in CaCO3 units **Analysis Date: 09/18/2003**

2309160143 LOT 29

QC Ref #210213 - Lab pH **Analysis Date: 09/18/2003**

2309160143 LOT 29

QC Ref #210285 - Kjeldahl Nitrogen **Analysis Date: 09/20/2003**

2309160143 LOT 29

QC Ref #210311 - Iron, Total, ICAP **Analysis Date: 09/19/2003**

2309160143 LOT 29

QC Ref #210316 - Potassium, Total, ICAP **Analysis Date: 09/19/2003**

2309160143 LOT 29

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Laboratory
QC Summary
#115180

City of Roseville/Electic
(continued)

QC Ref #210320 - Magnesium, Total, ICAP **Analysis Date: 09/19/2003**

2309160143 LOT 29

QC Ref #210323 - Boron, Total, ICAP **Analysis Date: 09/19/2003**

2309160143 LOT 29

QC Ref #210337 - Calcium, Total, ICAP **Analysis Date: 09/19/2003**

2309160143 LOT 29

QC Ref #210365 - Cyanide **Analysis Date: 09/22/2003**

2309160143 LOT 29

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Laboratory
QC Report
#115180

City of Roseville/Electic

QC Ref #210089 Specific Conductance

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
DUP	Specific Conductance	954	959	UMHO		(0-20)	0.5

QC Ref #210092 Turbidity

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
DUP	Turbidity	0.40	0.40	NTU		(0-20)	0.0

QC Ref #210095 Odor

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
DUP	Odor	2	2	TON		(0-20)	0.0

QC Ref #210097 Apparent Color

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
DUP	Apparent Color	3	3	ACU		(0-20)	0.0

QC Ref #210104 Orthophosphate-P

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 23	09160143	MGL		(0-0)	
LCS1	Orthophosphate-P	0.5	0.513	MGL	102.6	(90-110)	
LCS2	Orthophosphate-P	0.5	0.515	MGL	103.0	(90-110)	0.39
MBLK	Orthophosphate-P	ND	<0.010	MGL			
MS	Orthophosphate-P	0.5	0.506	MGL	101.2	(80-120)	
MSD	Orthophosphate-P	0.5	0.514	MGL	102.8	(80-120)	1.6

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

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Suite 100
Monrovia, California 91016-3629
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Laboratory
QC Report
#115180

City of Roseville/Electic
(continued)

QC Ref #210105 Surfactants

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
AASPKSMP	Spiked sample	Lab # 23	09160143	MGL		(0-0)	
LCS1	Surfactants	0.20	0.203	MGL	101.5	(90-110)	
LCS2	Surfactants	0.20	0.206	MGL	103.0	(90-110)	1.5
MBLK	Surfactants	ND	<0.050	MGL			
MS	Surfactants	0.20	0.198	MGL	99.0	(80-120)	
MSD	Surfactants	0.20	0.201	MGL	100.5	(80-120)	1.5

QC Ref #210116 Silica

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Silica	21.4	22.1	MGL	103.3	(85-115)	
LCS2	Silica	21.4	22.2	MGL	103.7	(85-115)	0.45
MBLK	Silica	ND	<0.50	MGL			
MS	Silica	21.4	21.3	MGL	99.5	(70-130)	
MSD	Silica	21.4	21.5	MGL	100.5	(70-130)	0.93

QC Ref #210119 Nitrate as Nitrogen by IC

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Nitrate as Nitrogen by IC	2.5	2.47	MGL	98.8	(90-110)	
LCS2	Nitrate as Nitrogen by IC	2.5	2.47	MGL	98.8	(90-110)	0.00
MBLK	Nitrate as Nitrogen by IC	ND	<0.10	MGL			
MS	Nitrate as Nitrogen by IC	2.5	2.49	MGL	99.6	(80-120)	
MSD	Nitrate as Nitrogen by IC	2.5	2.46	MGL	98.4	(80-120)	1.2

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining. Criteria for MS and DUP are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

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QC Report
#115180

City of Roseville/Electic
(continued)

QC Ref #210121 Chloride

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Chloride	25	24.6	MGL	98.4	(90-110)	
LCS2	Chloride	25	24.6	MGL	98.4	(90-110)	0.00
MBLK	Chloride	ND	<1.0	MGL			
MS	Chloride	25	25.5	MGL	102.0	(80-120)	
MSD	Chloride	25	25	MGL	100.0	(80-120)	2.0

QC Ref #210123 Nitrite, Nitrogen by IC

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Nitrite, Nitrogen by IC	1.0	0.989	MGL	98.9	(90-110)	
LCS2	Nitrite, Nitrogen by IC	1.0	0.993	MGL	99.3	(90-110)	0.40
MBLK	Nitrite, Nitrogen by IC	ND	<0.10	MGL			
MS	Nitrite, Nitrogen by IC	1.0	1.03	MGL	103.0	(80-120)	
MSD	Nitrite, Nitrogen by IC	1.0	1.02	MGL	102.0	(80-120)	0.98

QC Ref #210125 Sulfate

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Sulfate	50	49.5	MGL	99.0	(90-110)	
LCS2	Sulfate	50	49.2	MGL	98.4	(90-110)	0.61
MBLK	Sulfate	ND	<2.0	MGL			
MS	Sulfate	50	50.4	MGL	100.8	(80-120)	
MSD	Sulfate	50	49.9	MGL	99.8	(80-120)	1.00

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

MWH Laboratories
A Division of MWH Americas, Inc.

750 Royal Oaks Drive
Suite 100
Monrovia, California 91016-3629
Tel: 626 568 6400
Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

Laboratory
QC Report
#115180

City of Roseville/Electic
(continued)

QC Ref #210209 Alkalinity in CaCO3 units

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 23	09160118	MGL		(0-0)	
LCS1	Alkalinity in CaCO3 units	100	98.6	MGL	98.6	(90-110)	
LCS2	Alkalinity in CaCO3 units	100	100	MGL	100.0	(90-110)	1.4
MBLK	Alkalinity in CaCO3 units	ND	<1.0	MGL			
MS	Alkalinity in CaCO3 units	96.2	96.7	MGL	100.5	(80-120)	
MSD	Alkalinity in CaCO3 units	96.2	96.8	MGL	100.6	(80-120)	0.10
RPD_LCS	Alkalinity in CaCO3 units	98.600	100.000	MGL	1.4	(0-10)	
RPD_MS	Alkalinity in CaCO3 units	100.520	100.624	MGL	0.1	(0-10)	

QC Ref #210213 Lab pH

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
DUP	Lab pH	8.2	8.2	UNIT		(0-20)	0.0

QC Ref #210285 Kjeldahl Nitrogen

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 23	09120002	MGL		(0-0)	
LCS1	Kjeldahl Nitrogen	4	3.90	MGL	97.5	(90-110)	
LCS2	Kjeldahl Nitrogen	4	4.10	MGL	102.5	(90-110)	5.0
MBLK	Kjeldahl Nitrogen	ND	<0.20	MGL			
MS	Kjeldahl Nitrogen	4	4.06	MGL	101.5	(90-110)	
MSD	Kjeldahl Nitrogen	4	3.90	MGL	97.5	(90-110)	4.0
RPD_LCS	Kjeldahl Nitrogen	97.500	102.500	MGL	5.0	(0-20)	
RPD_MS	Kjeldahl Nitrogen	101.500	97.500	MGL	4.0	(0-10)	

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining. Criteria for MS and DUP are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

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1 800 566 LABS (1 800 566 5227)

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(continued)

QC Ref #210311 Iron, Total, ICAP

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Iron, Total, ICAP	5.0	5.06	MGL	101.2	(85-115)	
LCS2	Iron, Total, ICAP	5.0	4.62	MGL	92.4	(85-115)	9.1
MBLK	Iron, Total, ICAP	ND	<0.10	MGL			
MS	Iron, Total, ICAP	5.0	5.03	MGL	100.6	(70-130)	
MSD	Iron, Total, ICAP	5.0	5.1	MGL	102.0	(70-130)	1.4

QC Ref #210316 Potassium, Total, ICAP

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Potassium, Total, ICAP	20	19.3	MGL	96.5	(85-115)	
LCS2	Potassium, Total, ICAP	20	17.7	MGL	88.5	(85-115)	8.6
MBLK	Potassium, Total, ICAP	ND	<1.0	MGL			
MS	Potassium, Total, ICAP	20	19.2	MGL	96.0	(70-130)	
MSD	Potassium, Total, ICAP	20	19.5	MGL	97.5	(70-130)	1.6

QC Ref #210320 Magnesium, Total, ICAP

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Magnesium, Total, ICAP	20	20	MGL	100.0	(85-115)	
LCS2	Magnesium, Total, ICAP	20	18.4	MGL	92.0	(85-115)	8.3
MBLK	Magnesium, Total, ICAP	ND	<0.10	MGL			
MS	Magnesium, Total, ICAP	20	19.7	MGL	98.5	(70-130)	
MSD	Magnesium, Total, ICAP	20	20.1	MGL	100.5	(70-130)	2.0

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

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750 Royal Oaks Drive
Suite 100
Monrovia, California 91016-3629
Tel: 626 568 6400
Fax: 626 568 6324
1 800 566 LABS (1 800 566 5227)

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(continued)

QC Ref #210323 Boron, Total, ICAP

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Boron, Total, ICAP	0.5	0.504	MGL	100.8	(85-115)	
LCS2	Boron, Total, ICAP	0.5	0.502	MGL	100.4	(85-115)	0.40
MBLK	Boron, Total, ICAP	ND	<0.050	MGL			
MS	Boron, Total, ICAP	0.5	0.504	MGL	100.8	(70-130)	
MSD	Boron, Total, ICAP	0.5	0.51	MGL	102.0	(70-130)	1.2

QC Ref #210337 Calcium, Total, ICAP

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
LCS1	Calcium, Total, ICAP	50	49.2	MGL	98.4	(85-115)	
LCS2	Calcium, Total, ICAP	50	45.4	MGL	90.8	(85-115)	8.0
MBLK	Calcium, Total, ICAP	ND	<1.0	MGL			
MS	Calcium, Total, ICAP	50	47.9	MGL	95.8	(70-130)	
MSD	Calcium, Total, ICAP	50	48.4	MGL	96.8	(70-130)	1.0

QC Ref #210365 Cyanide

QC	Analyte	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPD (%)
MS	Spiked sample	Lab # 23	09190137	MGL		(0-0)	
LCS1	Cyanide	0.10	0.094	MGL	94.0	(80-120)	
MBLK	Cyanide	ND	<0.025	MGL			
MS	Cyanide	0.10	0.100	MGL	100.0	(80-120)	
MSD	Cyanide	0.10	0.099	MGL	99.0	(80-120)	1.0

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are advisory only, batch control is based on LCS. Criteria for duplicates are advisory only, unless otherwise specified in the method.

Roseville Energy Park

Appendix 10-A
Civil Engineering Design Criteria

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 10A

CIVIL ENGINEERING DESIGN CRITERIA

10 A1 INTRODUCTION

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and construction of civil engineering systems for the Roseville Energy Park (REP). Information that is more specific will be developed during execution of the project to support detailed design, engineering, material procurement specifications, and construction specifications as required by the California Energy Commission (CEC).

10 A2 CODES AND STANDARDS

The design of REP civil engineering systems will be in accordance with laws and regulations of the federal government, the State of California, Placer County, the City of Roseville, and industry standards. The current issue or edition of the documents at the time of filing of this Application for Certification (AFC) will apply. In cases where conflicts between the cited documents exist, requirements of the more conservative document will be used.

10 A2.1 Civil Engineering Codes and Standards

The following codes and standards have been identified as applicable, in whole or in part, to the civil engineering, design, and construction of the REP:

- American Association of State Highway and Transportation Officials (AASHTO) - Standards and Specifications
- American Concrete Institute (ACI) - Standards and Recommended Practices
- American Institute of Steel Construction (AISC) - Standards and Specifications
- American National Standards Institute (ANSI) - Standards
- American Society of Testing and Materials (ASTM) - Standards, Specifications and Recommended Practices
- American Water Works association (AWWA) - Standards and Specifications
- American Welding Society (AWS) - Codes and Standards
- Asphalt Institute (AI) - Asphalt Handbook
- Concrete Reinforcing Steel Institute (CRSI) - Standards
- Factory Mutual (FM) - Standards
- National Fire Protection Association (NFPA) - Standards
- International Conference of Building Officials (ICBO) and California Building Standards Commission - California Building Code (CBC), 2001
- Steel Structures Painting Council (SSPC) - Standards and Specifications

10 A2.2 Engineering Geology Codes, Standards and Certifications

Engineering geology activities will conform to the applicable federal, state, and local laws, regulations, ordinances, and industry codes and standards.

10 A2.2.1 Federal

None are applicable.

10 A2.2.2 State

The Warren-Alquist Act, PRC, Section 25000 et seq. and the California Code of Regulations (CCR), Siting Regulations, Title 20 CCR, Chapter 2, require that an AFC address geologic and seismic aspects.

The California Environmental Quality Act (CEQA), PRC 21000 et seq. and the CEQA Guidelines require those potentially significant effects, including geologic hazards, be identified and a determination made as to whether they can be substantially reduced.

10 A2.2.3 City

California State Planning Law, Government Code Section 65302, requires each city and county to adopt a general plan, consisting of nine mandatory elements, to guide its physical development. Section 65302(f) requires that a seismic safety element be included in the general plan.

Roseville Energy Park

Appendix 10-B
Structural Engineering Design Criteria

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 10B

STRUCTURAL ENGINEERING DESIGN CRITERIA

10 B1 INTRODUCTION

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and construction of structural engineering systems for the Roseville Energy Park (REP). More specific project information will be developed during execution of the project to support detailed design, engineering, material procurement specification and construction specifications as required by the California Energy Commission (CEC).

10 B2 CODES AND STANDARDS

The design of REP structural engineering systems will be in accordance with the laws and regulations of the federal government, the State of California, Placer County, City of Roseville, and industry standards. The current issue or edition of the documents at the time of filing of this Application for Certification (AFC) will apply, unless otherwise noted. In cases where conflicts between the cited documents exist, requirements of the more conservative document will be used.

The following codes and standards have been identified as applicable, in whole or in part, to the structural engineering, design, and construction of the REP:

- California Building Code (CBC), 2001 Edition , including City of Roseville Amendments
- American Institute of Steel Construction (AISC):
  - Manual of Steel Construction—9th Edition
  - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings
  - Specification for Structural Joints Using ASTM A325 or A490 Bolts
  - Code of Standard Practice for Steel Buildings and Bridges
- American Concrete Institute (ACI):
  - ACI 318-99, Building Code Requirements for Structural Concrete
  - ACI 301-99, Specifications for Structural Concrete for Buildings
  - ACI 543R-00, Design, Manufacture, and Installation of Concrete Piles
- American Society of Civil Engineers (ASCE):
  - ASCE 7-98, Minimum Design Loads for Buildings and Other Structures
- American Welding Society (AWS):
  - D1.1—Structural Welding Code—Steel
  - D1.3—Structural Welding Code—Sheet Steel
- Code of Federal Regulations, Title 29—Labor, Chapter XVII, Occupational Safety and Health Administration (OSHA)
  - Part 1910—Occupational Safety and Health Standards
  - Part 1926—Construction Safety and Health Regulations
- National Association of Architectural Metal Manufacturers (NAAMM)—Metal Bar Grating Manual

- OSHA Williams-Steiger Occupational Safety and Health Act of 1970
- Steel Deck Institute (SDI)—Design Manual for Floor Decks and Roof Decks
- Design of Large Steam Turbine-Generator Foundations, ASCE 1987

10 B2.1 CEC Special Requirements

Prior to the start of any increment of construction, the proposed lateral-force procedures for project structures and the applicable designs, plans and drawings for project structures will be submitted for approval.

Proposed lateral-force procedures, designs, plans, and drawings shall be those for:

- Major project structures
- Major foundations, equipment supports, and anchorage
- Large, field-fabricated tanks
- Turbine/generator pedestal
- Switchyard structures

10 B3 STRUCTURAL DESIGN CRITERIA

10 B3.1 Datum

Site topographic elevations will be based on an elevation survey conducted using known elevation benchmarks.

10 B3.2 Frost Penetration

The site is located in an area free of frost penetration. Bottom elevation of all foundations for structures and equipment, however, will be maintained at a minimum of 12 inches below the finished grade.

10 B3.3 Temperatures

The design basis temperatures for structural engineering systems will be as follows:

Maximum	110 Degrees F (°F)
Minimum	15°F

10 B3.4 Design Loads

10 B3.4.1 General

Design loads for structures and foundations will comply with applicable building code requirements.

10 B3.4.2 Dead Loads

Dead loads will consist of the weights of structure and all equipment of a permanent or semi-permanent nature including tanks, bins, wall panels, partitions, roofing, drains, piping, cable trays, bus ducts, and the contents of tanks and bins measured at full operating capacity. The contents of the tanks and bins, however, will not be considered as effective in resisting structure uplift due to wind forces; but will be considered as effective for seismic forces.

10 B3.4.3 Live Loads

Live load will consist of uniform floor live loads and equipment live loads. Uniform live loads are assumed equivalent unit loads that are considered sufficient to provide for movable and transitory loads, such as the weights of people, portable equipment and tools, small equipment or parts, which may be moved over or placed on the floors during maintenance operations, and planking. The uniform live loads will not be applied to floor areas that will be permanently occupied by equipment.

Lateral earth pressures, hydrostatic pressures, and wheel loads from trucks, will be considered as live loads.

Uniform live loads will be in accordance with ASCE Standard 7, but will not be less than the following:

- Roofs — 20 pounds per square foot (psf)
- Floors and Platforms (steel grating and checkered plates) — 100 psf

In addition, a uniform load of 50 psf will be used to account for piping and cable trays, except that where the piping and cable loads exceed 50 psf, the actual loads will be used.

Furthermore, a concentrated load of 3 kips will be applied concurrently to the supporting beams of the floors to maximize stresses in the members, but the reactions from the concentrated loads will not be carried to the columns.

- Floors (elevated concrete floors) — 100 psf

In addition, elevated concrete slabs will be designed to support an alternate concentrated load of 2 kips in lieu of the uniform loads, whichever governs. The concentrated load will be treated as a uniformly distributed load acting over an area of 2.5 square feet, and will be located in a manner to produce the maximum stress conditions in the slabs.

- Control Room Floor — 150 psf
- Stairs, Landings, and Walkways — 100 psf

In addition, a concentrated load of 2 kips will be applied concurrently to the supporting beams for the walkways to maximize the stresses in the members, but the reactions from the concentrated loads will not be carried to the columns.

- Pipe Racks — 100 psf

Where the piping and cable tray loads exceed the design uniform load, the actual loads will be used. In addition, a concentrated load of 15 kips will be applied concurrently to the supporting beams for the walkways to maximize the stresses in the members, but the reactions from the concentrated loads will not be carried to the columns.

- Hand Railings

Hand railings will be designed for either a uniform horizontal force of 50 pounds per linear foot (plf) applied simultaneously with a 100 plf uniform vertical live load, or a 200-pound concentrated load applied at any point and in any direction, whichever governs.

- Slabs on Grade — 250 psf
- Truck Loading Surcharge Adjacent to Structures — 250 psf

- Truck Support Structures — AASHTO-HS-20-44
- Special Loading Conditions — Actual loadings

Laydown loads from equipment components during maintenance and floor areas where trucks, forklifts or other transports will have access and will be considered in the design of live loads.

Live loads may be reduced in accordance with the provisions of CBC Section 1607.

Posting of the floor load capacity signs for all roofs, elevated floors, platforms and walkways will be in compliance with the OSHA Occupational Safety and Health Standard, Walking and Working Surfaces, Subpart D. Floor load capacity for slabs on grade will not be posted.

10 B3.4.4 Earth Pressures

Earth pressures will be in accordance with the recommendations contained in the project-specific geotechnical report.

10 B3.4.5 Groundwater Pressures

Hydrostatic pressures due to groundwater or temporary water loads will be considered if applicable based on geologic conditions.

10 B3.4.6 Wind Loads

The wind forces will be calculated in accordance with CBC 2001 with a basic wind speed of 80 miles per hour (mph) and an exposure category of 'C.'

10 B3.4.7 Seismic Loads

Structures will be designed and constructed to resist the effects of earthquake loads as determined in CBC 2001, Section 1630. The site is located on Seismic Zone 3. The occupancy category of the REP structures is 3 (Special Occupancy Structure) and the corresponding importance factor (I) is 1.0. Other seismic parameters will be obtained from the geotechnical report.

10 B3.4.8 Snow Loads

Snow loads will not be considered.

10 B3.4.9 Turbine-Generator Loads

The combustion turbine-generator and the steam-turbine generator loads for pedestal and foundation design will be furnished by the equipment manufacturers, and will be applied in accordance with the equipment manufacturers' specifications, criteria, and recommendations.

10 B3.4.10 Special Considerations for Steel Stacks

Steel stacks will be designed to withstand the normal and abnormal operating conditions in combination with wind loads and seismic loads, and will include the along-wind and across-wind effects on the stacks. The design will meet the requirements of ASME/ANSI STS-1-1986, "Steel Stacks," using allowable stress design method, except that increased allowable stress for wind loads as permitted by AISC will not be used.

10 B3.4.11 Special Considerations for Structures and Loads During Construction

For temporary structures, or permanent structures left temporarily incomplete to facilitate equipment installations, or temporary loads imposed on permanent structures during construction, the allowable stresses may be increased by 33 percent.

Structural backfill may be placed against walls, retaining walls, and similar structures when the concrete strength attains 80 percent of the design compressive strength (f'_c), as determined by sample cylinder tests. Restrictions on structural backfill, if any, will be shown on the engineering design drawings.

Design restrictions imposed on construction shoring removal that are different from normal practices recommended by the ACI Codes will be shown on engineering design drawings.

Metal decking used as forms for elevated concrete slabs will be evaluated to adequately support the weight of concrete plus a uniform construction load of 50 psf, without increase in allowable stresses.

10 B4 DESIGN BASIS

10 B4.1 General

Reinforced concrete structures will be designed by the strength design method, in accordance with ACI 318, "Building Code Requirements for Structural Concrete."

Steel structures will be designed by the working stress method, in accordance with AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

Allowable soil bearing pressures for foundation design will be in accordance with the "Final Subsurface Investigation and Foundation Report" for the Facility.

10 B4.2 Factors of Safety

The factor of safety for all structures, tanks, and equipment supports will be as follows:

Against Overturning	1.50
Against Sliding	1.50 for Wind Loads 1.10 for Seismic Loads
Against Uplift Due to Wind	1.50
Against Buoyancy	1.25

10 B4.3 Allowable Stresses

Calculated stresses from the governing loading combinations for structures and equipment supports will not exceed the allowable limits permitted by the applicable codes, standards, and specifications.

10 B4.4 Load Factors and Load Combinations

For reinforced concrete structures and equipment supports, using the strength method, the strength design equations will be determined based on CBC 2001, Sections 1612.2, 1612.4, 1909.2 and ACI-318-99 Eqs (9-2), (9-3). The Allowable Stress Design load combinations of CBC 2001 section 1612.3 will be used to assess soil bearing pressure and stability of structures per CBC 2001 sections 1805 and 1629.1, respectively.

Steel-framed structures will be designed in accordance with CBC 2001, Chapter 22, Divisions I, III and IV and the AISC Specification for the Structural Steel Buildings, Allowable Stress Design and Plastic Design, June 1, 1989. Connections will conform to Research Council on Structural Connections of the Engineering Foundation Specification for Structural Joints.

10 B5 Construction Materials

10 B5.1 Concrete and Grout

The design compressive strength (f'_c) of concrete and grout, as measured at 28 days, will be as follows:

Electrical duct bank encasement and lean concrete backfill (Class L-1)	300 psi
Structural concrete (Class S-1)	3000 psi
Structural concrete (Class S-2)	4000 psi
Grout (Class G-1)	5000 psi

The classes of concrete and grout to be used will be shown on engineering design drawings or indicated in design specifications.

10 B5.2 Reinforcing Steel

Reinforcing steel bars for concrete will be deformed bars of billet steel, conforming to ASTM A 615, Grade 60.

Welded wire fabric for concrete will conform to ASTM A 185.

10 B5.3 Structural and Miscellaneous Steel

Structural and miscellaneous steel will generally conform to ASTM A 36, ASTM A 572, or ASTM A992 except in special situations where higher strength steel is required.

High strength structural bolts, including nuts and washers, will conform to ASTM A 325 or ASTM A 490.

Bolts other than high-strength structural bolts will conform to ASTM 307, Grade A.

10 B5.4 Concrete Masonry

Concrete masonry units will be hollow, normal weight, non-load bearing Type I, conforming to ASTM C 129.

Mortar will conform to ASTM C 270, Type S.

Grout will conform to ASTM C 476.

10 B5.5 Other Materials

Other materials for construction, such as anchor bolts, shear connectors, concrete expansion anchors, embedded metal, etc., will conform to industry standards and will be identified on engineering design drawings or specifications.

Roseville Energy Park

Appendix 10-C
Mechanical Engineering Design Criteria

October 2003

Roseville Energy Park
Application for Certification

APPENDIX 10C

MECHANICAL ENGINEERING DESIGN CRITERIA

10 C1 INTRODUCTION

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and construction of mechanical systems for the Roseville Energy Park (REP). More specific project information will be developed prior to construction of REP to support detailed design, engineering, material procurement specifications, and construction specifications as required by the California Energy Commission (CEC).

10 C2 CODES AND STANDARDS

Design of REP mechanical systems and components will be in accordance with the laws and regulations of the federal government, State of California, Placer County, the City of Roseville, and industry standards. The current issue or revision of the documents at the time of the filing of this Application for Certification (AFC) will apply, unless otherwise noted. In cases where conflicts between the cited documents exist, requirements of the more conservative document will be used.

The following codes and standards have been identified as applicable, in whole or in part, to the mechanical engineering, design, and construction of the REP:

- California Building Code, 2001 edition.
- California Mechanical Code (for building mechanical systems)
- California Plumbing Code (for domestic water and sanitary sewer plumbing)
- ASME Boiler and Pressure Vessel Code
- ASME/ANSI B31.1 Power Piping Code
- ASME Performance Test Codes
- ASME Standard TDP-1
- ANSI B16.5, B16.34, and B133.8
- American Boiler Manufacturers Association (ABMA)
- American Gear Manufacturers Association (AFMA)
- Air Moving and Conditioning Association (AMCA)
- American Society for Testing and Materials (ASTM)
- American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
- American Welding Society (AWS)
- Cooling Tower Institute (CTI)
- Heat Exchange Institute (HEI)
- Manufacturing Standardization Society (MSS) of the Valve and Fitting Industry
- National Fire Protection Association (NFPA)

10 C3 MECHANICAL ENGINEERING GENERAL DESIGN CRITERIA

10 C3.1 General

Systems, equipment, materials, and their installation will be designed in accordance with applicable codes, industry standards, and local, state, and federal regulations. They will also conform to the design criteria, manufacturing processes and procedures, and material selection, testing, welding, and finishing procedures specified in this section.

Detailed equipment design will be performed by the various equipment vendors in accordance with the performance and design requirements specified by Roseville Electric. Equipment vendors will be responsible for using construction materials best suited for the intended use.

Asbestos will not be used in the materials and equipment supplied. Where feasible, materials will be selected to withstand the design operating conditions, including expected ambient conditions, for the design life of the plant. It is anticipated that some materials will require replacement during the life of the plant due to corrosion, erosion, etc.

10 C3.2 Pumps

Pumps will be sized in accordance with industry standards. Where feasible, pumps will be sized for maximum efficiency at the normal operating point. Pumps will be designed to be free from excessive vibration throughout the operating range.

10 C3.3 Tanks

Large outdoor storage tanks will not be insulated.

Overflow connections and lines will be provided. Maintenance drain connections will be provided to allow complete tank drainage.

Water tanks will be designed, constructed, and certified to American Water Works Association (AWWA) Standards. Bolted construction for water tanks is acceptable for this type of facility.

Manholes, where provided, will be at least 18 in. in diameter and hinged to facilitate removal. Storage tanks will have ladders and cleanout doors as required to facilitate access/maintenance. Provisions will be included for proper tank ventilation during internal maintenance.

10 C3.4 Heat Exchangers

The surface condenser will be designed in accordance with Heat Exchanger Institute (HEI) standards. Other heat exchangers will be provided as components of mechanical equipment packages and may be shell-and-tube or plate type. Heat exchangers will be designed in accordance with Tubular Exchanger Manufacturers Association (TEMA) or manufacturer's standards. Fouling factors will be specified in accordance with TEMA.

Heat exchangers will include thermal relief valves as required.

10 C3.5 Pressure Vessels

Pressure vessels will include the following features/appurtenances:

- Process, vent, and drain connections for startup, operation, and maintenance
- Materials compatible with the fluid being handled

- A minimum of one manhole and one air ventilation opening (e.g., handhole) where required for maintenance or cleaning access
- For vessels requiring insulation, banding or shop-installed insulation clips spaced not more than 18 in. on center
- Relief valves in accordance with the applicable codes

10 C3.6 Piping and Piping Supports

Stainless steel pipe may be Schedule 5S or 10S where design pressure permits. Underground piping may be high-density polyethylene (HDPE) where permitted by code, operating conditions, and fluid properties. In general, water system piping will be HDPE where embedded or underground, and carbon steel where above ground. High-pressure steam piping will be of alloy steel material suitable for the intended service conditions.

Piping systems containing steam will be of welded construction. Threaded joints will not be used in piping used for steam, lubricating oil, or CTG natural gas service. Natural gas piping components will not use synthetic lubricants. Victaulic or equivalent couplings may be used for low energy aboveground piping, where feasible.

Piping systems will have high point vents and low point drains. Drains with restricting orifices or steam traps with startup and blowdown drains and strainers/crud traps will be installed in low points of steam lines where condensate can collect during normal operation.

Steam piping systems and steam drain lines in the plant will be sloped in the direction of steam flow. Condensate collection in piping systems will be avoided by installing automatic drain devices and manual devices as appropriate.

Steam lines fitted with restricting devices, such as orifices in the process runs, will include adequate drainage upstream of the device to prevent water from collecting in lines.

Hose and process tubing connections to portable components and systems will be compatible with the respective equipment suppliers' standard connections for each service.

Stainless steel piping will be used for portions of the steam turbine and combustion turbine lubricating oil system downstream of the filters. Carbon steel piping will be used elsewhere.

10 C3.7 Valves

10 C3.7.1 General Requirements

Valves will be arranged for convenient operation from floor level where possible and, if required, will have extension spindles, chain operators, or gearing. Hand-actuated valves will be operable by one person. Gear operators will be provided on manual valves 8 inches or larger.

Valves will be arranged to close when the handwheel is rotated in a clockwise direction (when looking at the handwheel from the operating position). The direction of rotation to close the valve will be clearly marked on the face of each handwheel.

Stops limiting the travel of each valve in the open or closed position will be arranged on the exterior of the valve body. Automated valves will be fitted with an indicator to show whether they are open or closed; however, only critical valves will be remotely monitored for position.

Valve materials will be suitable for operation at the maximum working pressure and temperature of the piping to which they are connected. Steel valves will have cast or forged steel spindles. Seats and faces will be of low friction, wear-resistant materials. Valves in throttling service will be selected with design characteristics and of materials that will resist erosion of the valve seats when the valves are operated partly closed.

Valves operating at less than atmospheric pressure will include means to prevent air in-leakage. No provision will be made to repack valve glands under pressure.

10 C3.7.2 Drain and Vent Valves and Traps

Drains and vents in 900-pound class or higher piping and 900° F or higher service will be double valved.

Float-type and inverted bucket-type drain traps will include an air cock and easing mechanism. Internal parts will be constructed from corrosion-resistant materials and will be renewable.

Trap bodies and covers will be cast or forged steel and will be suitable for operating at the maximum working pressure and temperature of the piping to which they are connected. Traps will be piped to drain collection tanks or sumps and returned to the cycle if convenient.

10 C3.7.3 Low Pressure Water Valves

Low pressure water valves will be the butterfly type or gate type of cast iron construction. Cast iron valves will have cast iron bodies, covers, gates (discs), and bridges; the spindles, seats, and faces will be bronze. Fire protection valves will be UL-approved butterfly valves meeting NFPA requirements.

10 C3.7.4 Instrument Air Valves

Instrument air valves will be the ball type of bronze construction, with the valve face and seat of an approved wear-resistant alloy.

10 C3.7.5 Nonreturn Valves

Nonreturn valves for steam service will be in accordance with ANSI standards and will be properly drained. Nonreturn valves in vertical positions will have bypass and drain valves. Bodies will have removable access covers to enable the internal parts to be examined or renewed without removing the valve from the pipeline.

10 C3.7.6 Motor-Actuated Valves

Motor-actuated valves will be fitted with both hand and motor operating gear. The hand and motor actuation mechanisms will be interlocked so that the hand mechanism is disconnected before the motor is started.

Motor actuators will include torque switches to stop the motor automatically when the valve gate has reached the "full open" or "full closed" position.

The motor actuator will be placed in a position relative to the valve that prevents leakage of liquid, steam, or corrosive gas from valve joints onto the motor or control equipment.

10 C3.7.7 Safety and Relief Valves

Safety valves and/or relief valves will be provided as required by code for pressure vessels, heaters, and boilers. Safety and relief valves will be installed vertically. Piping systems that can be over-pressurized by a higher-pressure source will also be protected by pressure relief valves. Equipment or parts of

equipment that can be over-pressurized by thermal expansion of the contained liquid will have thermal relief valves. HRSG safety valves will be flanged.

10 C3.7.8 Instrument Root Valves

Instrument root valves will be specified for operation at the working pressure and temperature of the piping to which they are connected. Test points and sample lines in systems that are 900-pound class or higher service will be double valved.

10 C3.8 Heating, Ventilating, and Air Conditioning

Heating, ventilation, and air conditioning (HVAC) system design will be based on site ambient conditions specified in Section 1.0.

Except for the HVAC systems serving the control room, lab areas, and administration areas, the systems will not be designed to provide comfort levels for extended human occupancy.

Air conditioning will include both heating and cooling of the inlet filtered air. Air velocities in ducts and from louvers and grills will be low enough not to cause unacceptable noise levels in areas where personnel are normally located.

Fans and motors will be mounted on anti-vibration bases to isolate the units from the building structure. Exposed fan outlets and inlets will be fitted with guards. Wire guards will be specified for belt-driven fans and arranged to enclose the pulleys and belts.

Air filters will be housed in a manner that facilitates removal. The filter frames will be specified to pass the air being handled through the filter without leakage.

Ductwork, filter frames, and fan casings will be constructed of mild steel sheets stiffened with mild steel flanges and galvanized. Ductwork will be the sectional bolted type and will be adequately supported. Duct joints will be leaktight.

Grills and louvers will be of adjustable metal construction.

10 C3.9 Thermal Insulation and Cladding

Parts of REP requiring insulation to reduce heat loss or afford personnel safety will be thermally insulated. Minimum insulation thickness for hot surfaces near personnel will be designed to limit the outside lagging surface temperature to a maximum of 140°F, based on 70°F ambient temperature and 2 mph/hr air velocity

The thermal insulation will have as its main constituent calcium silicate, foam glass, fiber glass, or mineral wool, and will consist of pre-formed slabs or blankets, where feasible. Asbestos materials will be prohibited. An aluminum jacket or suitable coating will be provided on the outside surface of the insulation. Where a hard-setting compound is used as an outer coating, it will be nonabsorbent and noncracking. Thermal insulation will be chemically inert even when saturated with water. Insulation system materials, including jacketing, will have a flame spread rating of 25 or less when tested in accordance with ASTM E 84.

Insulation at valves, pipe joints, steam traps, or other points to which access may be required for maintenance will be specified to be removable with a minimum of disturbance to the pipe insulation. At each flanged joint, the molded material will terminate on the pipe at a distance from the flange equal to

the overall length of the flange bolts to permit their removal without damaging the molded insulation. Steam trap stations will be "boxed" for ease of trap maintenance and freeze protection.

Above ground insulated piping will be clad with stucco-embossed aluminum of not less than 0.016-inch thickness and frame reinforced. At the joints, the sheets will be sufficiently overlapped and corrugated to prevent moisture from penetrating the insulation.

Design temperature limits for thermal insulation will be based on system operating temperature during normal operation.

Outdoor and underground insulation, if required, will be moisture resistant.

10 C3.10 Testing

Hydrostatic testing, including pressure testing in accordance with the applicable ASME Codes, will be specified and performed for pressure boundary components where an in-service test is not feasible or permitted by code.

10 C3.11 Welding

Welders and welding procedures will be certified in accordance with requirements of the applicable codes and standards before performing any welding. Indexed records of welder qualifications and weld procedures will be maintained.

10 C3.12 Painting

Except as otherwise specified, equipment will receive the respective manufacturer's standard shop finish. Finish colors will be selected from among the paint manufacturer's standard colors.

Finish painting of uninsulated piping will be limited to that required by OSHA for safety or for protection from the elements.

Piping to be insulated will not be finish painted.

10 C3.13 Lubrication

The types of lubrication specified for facility equipment will be suited to the operating conditions and will comply with the recommendations of the equipment manufacturers.

The initial startup charge of flushing oil will be provided by the equipment manufacturer or contractor and will be the manufacturer's standard lubricant for the intended service. Subsequently, such flushing oil will be sampled and analyzed to determine whether it can also be used for normal operation or must be replaced in accordance with the equipment supplier's recommendations.

Rotating equipment will be splash lubricated, force lubricated, or self-lubricated. Oil drip cups will be provided as necessary. Where automatic lubricators are fitted to equipment, provision for emergency hand lubrication will also be specified. Where applicable, equipment will be designed to be manually lubricated while in operation without the removal of protective guards. Lubrication filling and drain points will be readily accessible.

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Appendix 10-D
Electrical Engineering Design Criteria

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APPENDIX 10D

ELECTRICAL ENGINEERING DESIGN CRITERIA

10 D1 INTRODUCTION

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and construction of electrical engineering systems for the Roseville Energy Park (REP). More specific project information will be developed prior to construction of REP to support detailed design, engineering, material procurement, and construction specifications as required by the California Energy Commission (CEC).

10 D2 CODES AND STANDARDS

Design of the REP electrical systems and components will be in accordance with the laws and regulations of the federal government, State of California, Placer County, City of Roseville, and industry standards. The current issue or revision of the documents at the time of the filing of this AFC will apply, unless otherwise noted. If there are conflicts between the cited documents, the more conservative requirement shall apply.

The following codes and standards have been identified as applicable, in whole or in part, to the electrical engineering, design, and construction of the REP:

- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- Anti-Friction Bearing Manufacturers Association (AFBMA)
- Insulated Cable Engineers Association (ICEA)
- Institute of Electrical and Electronics Engineers (IEEE)
- Illuminating Engineering Society (IES)
- National Electrical Code (NEC)
- National Electrical Manufacturers Association (NEMA)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA)
- Underwriters Laboratories, Inc. (UL)

10 D3 SWITCHYARD, TRANSFORMERS AND FACILITY AUXILIARY SYSTEM

10 D3.1 Switchyard

The switchyard will be air-insulated arranged in a breaker-and-a-half configuration. The switchyard will consist of SF6 circuit breakers for the generator step-up transformers and transmission lines for connection to the local 60 kV grid, with manual disconnect switches on each side of the breakers. Manual disconnect switches will also be provided at each transmission line termination. Motor-operated disconnect switches will be provided for each high voltage connection at the GSUT transformer for isolation and maintenance purposes. Each line will be equipped with the appropriate instrumentation (e.g., potential and current transformers) for protection and metering.

The 60 kV switchyard will be located at the west end of the REP site. The switchyard interconnect arrangement provides for looping the two new 60 kV transmission lines that will be constructed to serve the West Roseville Specific Plan area into the REP switchyard. The two transmission lines will originate at the Roseville Fiddyment Receiving Station.

The SF6 circuit breakers will be dead tank design equipped with bushing current transformers on each phase bushing. Vertical non-load break switches will be located on each side of the breakers to isolate the breaker. Relaying accuracy instrument transformers (current and capacitive voltage transformers) will be included as part of the protective relaying system. Separate metering accuracy instrument transformers will be used for revenue metering.

Aluminum alloy tubular bus will be used. Cable connections between the tubular bus and equipment will be ACSR, AAC, or AAAC cable. Overhead conductor (tube or cable) will meet all electrical and mechanical design requirements.

The switchyard design will meet the requirements of the National Electrical Safety Code—ANSI C2.

A grounding grid consisting of buried conductors and ground rods will be provided to control step and touch potentials in accordance with IEEE Standard 80, Safety in Substation Grounding. All switchyard equipment, and structures will be connected to the grounding grid as required. The switchyard ground grid will be tied to the plant ground grid in at least two (2) places. The switchyard perimeter fence will be grounded separately from the plant perimeter fence.

Shield wires and/or lightning masts will provide lightning protection. The lightning protection system will be designed in accordance with IEEE 998 guidelines.

Protective relaying will meet IEEE requirements and will be coordinated with the utility's requirements.

Each circuit breaker will be provided with independent breaker failure relay protection schemes. Breaker failure protection will be accomplished by fault detector relays and timing relays for each breaker. Each high voltage breaker will have two redundant trip coils.

Interface with the utility supervisory control and data acquisition (SCADA) system including the facility DCS system will be provided as required. Interface will be at the interface terminal box and RTU located in the REP switchyard control building. Method(s) of communication between the facility switchyard and the two substations at the other end of the overhead transmission lines will be included. A remote Terminal Units (RTUs) will allow interface and remote control of the switchyard breakers.

Revenue metering will be provided on the 60kV outgoing lines. Meters and a metering panel will be provided.

10 D3.2 Transformers

The plant will include three, two-winding 13.8 kV to 60 kV main generator step-up transformers, connected delta wye; one for the steam turbine-generator (STG) and one for each of the two combustion turbine-generators (CTGs). The neutral point of the high-voltage (HV) winding will be solidly grounded. Each high voltage bushing on each main generator step-up transformer will be equipped with metal oxide surge arresters. Each transformer will also be equipped with a manually operated, de-energized ("no-load") tap changers located in the HV windings. The step-up transformers will be designed in accordance with ANSI standards C57.12.00, C57.12.90, and C57.91.

10 D3.3 Facility Auxiliary System

Facility power will be supplied through two 13.8 kV to 4.36 kV unit auxiliary transformers, connected upstream of each of the CTG generator circuit breakers. Each unit auxiliary transformer will be two winding, connected delta-wye and will have sufficient capacity to provide the entire facility auxiliary power load.

When offline, the facility's auxiliary power will be back fed from the 60 kV system via the CTG generator step-up transformers and associated unit auxiliary transformers.

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Appendix 10-E
Control Engineering Design Criteria

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APPENDIX 10E

CONTROL ENGINEERING DESIGN CRITERIA

10 E1 INTRODUCTION

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and installation for instrumentation and controls for the Roseville Energy Park (REP). More specific project information will be developed prior to construction of REP to support detailed design, engineering, material procurement specifications, and construction specifications as required by the California Energy Commission (CEC).

10 E2 CODES AND STANDARDS

Design of the REP instrumentation and controls systems and components will be in accordance with the laws and regulations of the federal government, State of California, Placer County, City of Roseville, and industry standards. The current issue or revision of the documents at the time of the filing of this AFC will apply, unless otherwise noted. If there are conflicts between the cited documents, the more conservative requirement shall apply.

The following codes and standards have been identified as applicable, in whole or in part, to the instrumentation and controls engineering, design, and construction of the REP:

- American National Standards Institute (ANSI)
- American Society of Mechanical Engineers (ASME)
- The Institute of Electrical and Electronics Engineers (IEEE)
- The Instrumentation, Systems, and Automation Society (ISA)
- National Electrical Manufacturers Association (NEMA)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA)
- American Society for Testing and Materials (ASTM)

10 E3 CONTROL SYSTEMS DESIGN CRITERIA

10 E3.1 General Plant Control Philosophy

The two combustion turbine generators and the steam turbine generator will include their own microprocessor based control systems with local and remote operator workstations, installed on the turbine-generator control panels and in the main control room, respectively. The gas turbine control panels will be installed in an electrical control enclosure, adjacent to the gas turbine generators, and the steam turbine generator control panel will be installed in the plant electrical building.

Several of the larger packaged subsystems associated with the balance-of-plant (BOP) control system include their own PLC-based dedicated control systems. For larger systems that have dedicated control systems, the Distributed Control System (DCS) will function mainly as a monitor, using network data links to collect, display, and archive operating data.

The DCS will function as the top-level supervisor and controller for the BOP controls. The intent is for the plant operator to be able to completely run the entire plant from the DCS operator station, located in the main control room, without the need to interface to other local panels or devices. The DCS will

provide appropriate hard-wired signals to enable control and operation of all plant systems required for complete automatic operation. Furthermore, Roseville Electric's off-site dispatch center will be able to monitor and control certain outputs of all three generators.

For the heat recovery steam generators (HRSGs), the DCS will directly control level, flow, and temperature loops based on data from transmitters and other field devices. The DCS will also control motors and monitor motor status.

10 E3.2 Pressure Instruments

Pressure instruments will have linear scales with units of measurement in pounds per square inch gauge.

Pressure gauges will have either a blowout disk or a blowout back and an acrylic or shatterproof glass face.

Pressure gauges on process piping will be corrosion resistant and weatherproof.

Steam pressure sensing transmitters or gauges mounted above the steam line will be protected by a loop seal or siphon.

Pressure test points will have isolation valves and caps or plugs. Pressure devices on pulsating services will have pulsation dampers. Pressure devices subject to shock during equipment starts, stops, or transient conditions will be installed on an isolated gauge panel.

10 E3.3 Temperature Instruments

Temperature instruments will have scales with temperature units in degrees Fahrenheit. Exceptions to this are electrical machinery RTDs and transformer winding temperatures, which may be in degrees Celsius.

Dial thermometers will have 4½ or 5-inch diameter (minimum) dials and white faces with black scale markings, and will be every-angle type and bimetal actuated. Dial thermometers will be corrosion resistant and weatherproof.

Temperature elements and dial thermometers will be protected by thermowells except when measuring gas or air temperatures at atmospheric pressure. Temperature test points will have thermowells with caps or plugs.

RTDs will be 100 ohm platinum, three-wire circuits (R_{100}/R_0=1.385). The element will be spring-loaded, mounted in a thermowell, and connected to a head assembly.

Thermocouples (TCs) will be dual-element, ungrounded, spring-loaded, (ANSI Type J or K) for general service (other TC types may be used for special applications). Thermocouple heads will be the cast type with an internal grounding screw.

10 E3.4 Level Instruments

Reflex-glass or magnetic level gauges will be used. Level gauges for high-pressure service will have suitable protection for operating personnel.

Gauge glasses used in conjunction with other level instruments will cover the full range that is covered by the complementary instruments. Level gauges will be selected so that the normal vessel level is approximately at gauge center.

A remote water level indicating system will be provided for each HRSG drum as required by the ASME Boiler and Pressure Vessel Code.

10 E3.5 Flow Instruments

Flow transmitters will be the differential pressure types with the range matching the primary element. In general, linear scales and trend displays will be used for flow indication.

The flow element for HP feedwater flow to each HRSG will be laboratory calibrated venturi flow nozzles or low-loss flow tubes.

Feedwater flow meters will be temperature compensated when the water temperature is greater than 250°F. Critical steam flow meters will be temperature and pressure compensated. Air flow measurements will be temperature compensated.

10 E3.6 Control Valves

Control valves in throttling service will generally be the globe-body cage types with body materials, pressure rating, and valve trims suitable for the service involved. Other style valve bodies (e.g., butterfly, eccentric disk) may also be used when suitable for the intended service.

Valves will be designed to fail in a safe position.

Control valve body size will not be more than two sizes smaller than line size, unless the smaller size is specifically reviewed for stresses in the piping.

Control valves in 600-class service and below will be flanged where economical. Where flanged valves are used, minimum flange rating will be ANSI 300 Class or ANSI 150 Class where appropriate.

Critical service valves will be defined as ANSI 900 Class and higher valves in sizes larger than 2 inches.

Severe service valves will be defined as valves requiring anticavitation trim, low noise trim, or flashing service, with differential pressures greater than 100 psid.

In general, control valves will be specified for a noise level no greater than 90 dBA when measured 3 feet downstream and 3 feet away from the pipe surface.

Valve actuators will use positioners and the highest pressure, smallest size actuator, and will be the pneumatic-spring diaphragm or piston type. Actuators will be sized to shut off against at least 110 percent of the maximum shutoff pressure and designed to function with instrument air pressure.

Hand wheels will be furnished only on those valves that can be manually set and controlled during system operation (to maintain plant operation) and do not have manual bypasses.

Control valve accessories, excluding controllers, will be mounted on the valve actuator unless severe vibration is expected.

Solenoid valves supplied with the control valves will have Class H coils. The coil enclosure will normally be a minimum of NEMA 4 but will be suitable for the area of installation. Terminations will typically be by pigtail wires.

Valve position switches (with input to the DCS for display) will be provided for MOVs and open/close pneumatic valves. Modulating control valves will be used for pump minimum flow recirculation control. Restriction orifice plates may be used where appropriate.

10 E3.7 Instrument Tubing and Installation

Tubing used to connect instruments to the process line will be ½-inch outside diameter copper or stainless steel as necessary for the process conditions. Half-inch O.D. tubing may be used when deemed necessary by the Contractor.

Instrument tubing fittings will be the compression type. One manufacturer will be selected for use so that equipment will be standardized as much as practical throughout the plant.

Differential pressure (flow) instruments will be fitted with three-valve manifolds; two-valve manifolds will be specified for other instruments as appropriate.

Instrument installation will be designed to correctly sense the process variable. Taps on process lines will be located so that sensing lines do not trap air in liquid service or liquid in gas service. Taps on process lines will be fitted with a shutoff (root or gauge valve) close to the process line. Root and gauge valves will be main-line class valves.

Instrument tubing will be supported in both horizontal and vertical runs as necessary. Expansion loops will be provided in tubing runs subject to high temperatures. The instrument tubing support design will allow for movement of the main process line.

10 E3.8 Pressure and Temperature Switches

Field-mounted pressure and temperature switches will have either NEMA Type 4 housings or housings suitable for the environment.

In general, switches will be applied such that the actuation point is within the center one-third of the instrument range.

10 E3.9 Field-Mounted Instruments

Field-mounted instruments will be of a design suitable for the area in which they are located. They will be mounted in areas accessible for maintenance and relatively free of vibration, and will not block walkways or prevent maintenance of other equipment. Freeze protection will be provided as required.

Field-mounted instruments may be grouped on racks when practical. Supports for individual instruments will be prefabricated, off-the-shelf, 2-inch pipestand. Instrument racks and individual supports will be mounted to concrete floors, to platforms, or on support steel in locations not subject to excessive vibration.

Individual field instrument sensing lines will be sloped or pitched in such a manner and be of such length, routing, and configuration that signal response is not adversely affected.

Liquid level controllers will generally be the nonindicating, displacement type with external cages.

10 E3.10 Instrument Air System

Branch headers will have a shutoff valve at the takeoff from the main header. The branch headers will be sized for the air usage of the instruments served, but will be no smaller than 3/8-inch. Each instrument air user will have a shutoff valve and filter at the instrument.

10 E3.11 General Instrument Requirements

Pneumatic signal levels, where used, will be 3 to 15 psig for pneumatic transmitter outputs, controller outputs, electric-to-pneumatic converter outputs, and valve positioner inputs.

Instrument analog signals for electronic instrument systems shall be 4 to 20 mA dc.

The primary sensor full-scale signal level, other than thermocouples, will be between 10 mV and 125 V.

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Appendix 10-F
Chemical Engineering Design Criteria

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APPENDIX 10F

CHEMICAL ENGINEERING DESIGN CRITERIA

10 F1 INTRODUCTION

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and installation of chemical engineering systems for the Roseville Energy Park (REP). More specific project information will be developed prior to REP construction to support detailed design, engineering, material procurement specifications, and construction specifications as required by the California Energy Commission (CEC).

10 F2 DESIGN CODES AND STANDARDS

Design of the REP chemical systems and components will be in accordance with the laws and regulations of the federal government, State of California, Placer County, City of Roseville, and industry standards. The current issue or revision of the documents at the time of the filing of this AFC will apply, unless otherwise noted. If there are conflicts between the cited documents, the more conservative requirement shall apply.

The following codes and standards have been identified as applicable, in whole or in part, to the chemical engineering, design, and construction of the REP:

- ANSI—American National Standards Institute
  - ANSI B31.1—Power Piping Code
  - ANSI/AWS D1.1—Structural Welding Code
- ASME—American Society of Mechanical Engineers
  - ASME Performance Test Code 31—Ion Exchange Equipment
  - ASME Boiler & Pressure Vessel Code, Section VIII, Division 1
- ASTM—American Society for Testing and Materials.
  - ASTM D859-94—Referee Method B for Silica as SiO_2
  - ASTM D888-96—Referee Method A for Dissolved Oxygen
  - ASTM D513-96—Referee Method D for CO_2
- OSHA—Occupational Safety and Health Administration
- SSPC—Steel Structures Painting Council Standards
  - SSPC SP3—Power Tool Cleaning
  - SSPC SP7—Brush-Off Blast Cleaning
  - SSPC SP1—Solvent Cleaning
  - SSPC SP6—Commercial Blast Cleaning
  - SSPC SP5—White Metal Blast Cleaning
- UL—Underwriters Laboratories
- AWWA—American Waterworks Association
  - AWWA 2540-95—Method C for TDS

AWWA B100-80—Standard for Granular Filter Material

Other recognized standards will be used as required to serve as design, fabrication, and construction guidelines when not in conflict with the above-listed standards.

10 F3 GENERAL CRITERIA

10 F3.1 Design Water Quality

10 F3.1.1 Circulating Water

The REP will use recycled water from the City of Roseville's Pleasant Grove Waste Water Treatment Plant (PGWWTP) for circulating water makeup. The recycled water is suitable for use as cooling tower makeup with no additional treatment.

Data from the City of Roseville PGWWTP indicate that the effluent has the characteristics defined in Section 8.15, Water Resources.

10 F3.1.2 Service Water

The PGWWTP recycled water will also be used for non-potable general service water requirements (e.g. plant wash water, and other miscellaneous uses) and landscape irrigation.

10 F3.1.3 Cycle Makeup

Cycle makeup water will typically be provided by the distillate from the Zero Liquid Discharge (ZLD) system. The ZLD system distillate will be further treated via offsite-regenerated mixed bed demineralizers to provide the necessary water quality. Under most operating conditions there is sufficient waste water from cooling tower blowdown to generate an adequate supply of distillate via the ZLD system. However, for periods of low ZLD throughput and relatively high demineralized water demands, service water will be used to augment the supply of distillate. Because the service water is not as high of quality as the ZLD system distillate, the service water will first be treated by reverse osmosis (RO) prior to being blended with the ZLD system distillate. Demineralized water will also be used to supply water for CTG water injection for control of nitrogen oxides (GE LM6000 only) and to increase the power output of the CTG (GE LM6000 "SPRINT" feature).

Water for steam cycle makeup will be the highest quality practical. Minimum quality requirements for cycle makeup water will be as follows:

- Total dissolved solids—0.1mg/l
- Silica as SiO_2—0.02 mg/l
- Specific conductance at demineralizer effluent—0.2 μS/cm
- pH—6.5 to 7.5

10 F3.1.4 Construction Water

Water for use during construction will be recycled water from the PGWWTP.

10 F3.1.5 Fire Protection Water

Water for fire protection will be PGWWTP recycled water supplied from the REP service/fire water storage tank.

10 F3.2 Chemical Conditioning

10 F3.2.1 Cycle Chemical Conditioning

Condensate-feedwater chemical conditioning will consist of an oxygen scavenger supplemented, as required, by amines for condensate corrosion control.

HRSG chemical feed will consist of a mixture of sodium phosphates to control boiler water pH, minimize scale formation, and provide boiler water buffering capacity.

10 F3.2.2 Circulating Water System Chemical Conditioning

Circulating water chemical conditioning will consist of chemicals to minimize corrosion and to control the formation of mineral scale and biofouling. Corrosion and scaling will be controlled by the use of sulfuric acid for alkalinity adjustment in conjunction with corrosion inhibitors and mineral dispersants, as required. Chlorination utilizing sodium hypochlorite, sodium bromide, or other suitable biocide will minimize biofouling of the condenser tubes and the cooling tower.

10 F3.2.3 Closed-Cycle System Chemical Conditioning

Bypass chemical feeders will provide water-conditioning chemicals to the closed cycle cooling system. Makeup water to the closed systems will be condensate quality and an inhibitor (compatible with demineralized water) will be used for corrosion control. **[Note: Confirm whether or not cooling system will be closed cycle]**

10. F3.2.4 Reverse Osmosis Chemical Conditioning

Sodium bisulfite will be introduced upstream of the RO units for oxygen scavenging.

10 F3.3 Chemical Storage

10 F3.3.1 Storage Capacity

Chemical storage tanks for bulk chemicals will, in general, be sized to accept a minimum-sized bulk shipment. The volume of the aqueous ammonia storage tank (for selective catalytic reduction system) will provide at least seven days storage at maximum use.

Specialty chemicals used for makeup cycle water treatment, condensate and feedwater conditioning, circulating water, and miscellaneous uses, will be delivered in totes or bulk according to the availability from the chemical suppliers.

10 F3.3.2 Containment

Chemical storage tanks containing corrosive and hazardous fluids will be surrounded by curbing. Design will allow containment of a full tank capacity spill without overflowing the curbing. For multiple tanks located within the same curbed area, the largest single tank will be used to size the containment volume.

Alternatively, where curbing is not possible, double-walled chemical tanks will be used for bulk chemicals that are corrosive and hazardous, in lieu of containment.

10 F3.3.3 Closed Drains

Waste piping for volatile liquids and wastes with offensive odors, will use closed drains to control noxious fumes and vapors.

10 F3.3.4 Coatings

Tanks, piping, and curbing for chemical storage applications will be provided with a protective coating system. Specific requirements for selection of an appropriate coating will be identified prior to equipment and construction contract procurements.

10 F3.4 Waste Water Treatment

Metal cleaning wastes from pre-operational and operational chemical cleaning of the boiler and preboiler systems of the HRSG will be collected, treated, and disposed offsite by the chemical cleaning contractor. Other maintenance chemical cleaning wastes from the combustion turbine off-line washes will be collected in sumps, tested for compliance with discharge limits, treated, and hauled off-site (if necessary) by a licensed contractor.

Cooling tower blowdown will be treated in the facility's Zero Liquid Discharge (ZLD) system. RO brine, HRSG blowdown, and filter backwash will be discharged directly to the cooling tower basin for use as makeup. Other plant process waste waters such as floor drains, hub drains, as well as miscellaneous waste water streams, will be collected in the plant waste water collection system and passed through an oil/water separator. Discharge from the oil/water separator will be sent to the cooling tower basin. Sanitary waste water will be collected and sent via a new pipeline to the PGWWTP influent junction structure.

Roseville Energy Park

Appendix 10-G1
Geotechnical Report

October 2003

Roseville Energy Park
Application for Certification

ROSEVILLE ENERGY FACILITY
APPLICATION FOR CERTIFICATION
TO CALIFORNIA ENERGY
COMMISSION

DOCKET
01-AFC-14
DATE AUG 06 2001
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APPENDIX L.1 GEOTECHNICAL ENGINEERING STUDY

Roseville Energy Facility
Roseville, California

Prepared for
Roseville Energy Facility, L.L.C.
101 California Street, Suite 1950
San Francisco, California 94111

August 6, 2001

URS
500 12th Street, Suite 200
Oakland, CA 94607

66-00000089.00

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1.1 BACKGROUND

This report presents the results of our geotechnical engineering study for the proposed Roseville Energy Facility (REF). The REF plant site is located in the Sacramento Valley in Western Placer County, approximately five (5) miles north-west of downtown Roseville, California (see Figure 1). The REF plant site is within a larger property that was recently purchased and annexed by the City of Roseville. The plant site is directly across from Phillip Road and north of the Pleasant Grove Waste Water Treatment Plant (PGWWTP), which is currently under construction by the City of Roseville.

URS has completed the REF Application for Certification (AFC) to the California Energy Commission, and has performed geologic, biological, cultural, and paleontological surveys of the site. We have also reviewed the Final Geotechnical Report issued for the Pleasant Grove Wastewater Treatment Plant by España Geotechnical Consulting, dated August 24, 1999.

1.2 PROJECT DESCRIPTION

A conceptual layout plan of the facility is presented in Figure 2. The REF will be located on approximately 22-acres of land committed by lease option to Roseville Energy Facility, L.L.C. This site is located within 73 acres owned by the City of Roseville. A 22-acre construction laydown area is located adjacent to the site. The REF is a nominal 750-megawatt (MW) electrical generating facility with supplemental firing which has the capability of increasing nominal output to 900 MW. The conceptual plant configuration consists of three combustion turbine generators (CTGs) operating in combined cycle mode with supplemental firing. A two-on-one plus a one-on-one configuration or a three one-on-one configuration will be used. The three CTGs are single-fueled, natural gas-fired. Each gas turbine exhausts to its own heat recovery steam generator (HRSG) and stack. The proposed REF project also incorporates a steam turbine system, a condenser system, cooling towers, and step up transformers. Associated pipelines, transmission lines, and other linears are outside the scope of this report.

1.3 SCOPE OF WORK

The purpose of the current geotechnical engineering study was to evaluate the engineering properties of the subsurface materials encountered at the site and to develop engineering recommendations and design criteria for foundations for the proposed REF project. In summary, the scope of our current geotechnical engineering study includes the following items:

- Review existing geotechnical data/studies performed in the project vicinity;
- Perform 6 cone penetration tests at selected site locations to depths of 80 feet each;
- Drill 11 exploratory borings at selected site locations to depths varying from approximately 30 to 80 feet;
- Record blow-counts and collect soil samples from the borings for laboratory testing;

- Perform laboratory testing of soil samples;
- Perform soil resistivity/corrosivity survey; and
- Prepare this geotechnical engineering report summarizing our findings and recommendations, including the following information:

  Site-Specific Evaluation:

  - Discussion of geologic and seismic setting of the project site;
  - Discussion of surface drainage conditions and flooding potential;
  - A Site plan showing the location of proposed structures and approximate locations of exploratory borings;
  - Logs of borings and description of exploration and soil sampling methods;
  - Description of laboratory test procedures and results of tests for engineering properties of soil samples;
  - Description of surface terrain, subsurface soil, bedrock, and groundwater conditions encountered in the borings;
  - Discussion of expansive surface materials and recommended solutions;
  - Discussion of groundwater conditions at the site and impact of groundwater to the proposed construction;
  - Soil corrosivity evaluation, including soil resistivity data obtained in accordance with IEEE – Std 80 ("Wenner Method");
  - Discussion of liquefaction potential at the site; and
  - Classification of soil type and distance to Type A and Type B faults to determine site coefficients required by 1997 Uniform Building Code.

  Foundation Design:

  - Discussion of alternative foundation systems for support of the proposed structures;
  - Recommendations and criteria for foundation design for each major structure including settlement predictions relative to types of foundations and soils;
  - Allowable soil bearing pressures and modulus of subgrade reaction for shallow foundations;
  - Axial compression and tension and lateral capacities for deep foundations (piles or drilled piers), if these foundation types are recommended;
  - Passive and frictional resistance to sliding;
  - Recommendations for grading and site earthwork including fill material criteria and compaction requirements; and
  - Recommendations for pavement design and underground utilities.

2.1 FIELD EXPLORATION PROGRAM

The field exploration program consisted of six Cone Penetration Tests (CPT) and eleven soil borings. The 3 x 1 plant configuration was the basis for locating the borings and CPTs. The CPTs were advanced in the first stage of exploration in order to gain an overall understanding of the subsurface stratigraphy. The soil borings were made in a second phase, and were designed to obtain soil samples at depths of interest as identified by the CPTs. One of the borings was converted into a monitoring well for groundwater elevation observations. The CPT and boring locations are shown on Figure 2, the Site and Geotechnical Investigation Location Plan.

2.1.1 Cone Penetration Tests

Six cone penetration tests (CPT) were made at the site on June 7, 2001 to depths of 80 feet below the existing ground surface. The CPT consists of pushing an instrumented probe into the soil, while recording soil skin friction, tip resistance, and dynamic pore pressures on the probe at 1-foot intervals along the entire test depth. The test procedures conformed to ASTM standard D 5778. The recorded skin friction and tip resistance values were correlated to soil behavior type and other engineering parameters based on the work of Robertson and Campanella (1986, 1989) and others. Pore pressure equilibration tests indicated that static groundwater was not encountered in the CPT depths. The CPT logs and supporting data report are presented in Appendix A, "CPT Site Investigation Report".

2.1.2 Exploratory Soil Borings

Eleven exploratory soil borings were drilled at the site for this study between June 11 and June 19, 2001 to depths ranging from approximately 30.5 to 80.5 feet below the existing ground surface. A groundwater level observation well was installed in boring B-3, and subsequent measurements have been made to record the observed groundwater level in the well. Additional details of the procedures used to drill the borings and to obtain soil samples are given in Appendix B, "Geotechnical Drilling and Sampling Program".

The borings were drilled using a combination of hollow-stem auger and mud-rotary drilling techniques. The soil was sampled approximately every five feet using split spoon and Modified California samplers. The soil cuttings and samples were logged in the field by a geologist with our firm, who visually classified the soils in accordance with the Unified Soil Classification System. Samples of the soils were obtained at selected depths and were taken to our laboratory in Pleasant Hill, California for further visual examination and testing. Logs of borings were prepared based on the field logs, visual examination and laboratory test results, and are presented in Appendix B.

2.2 LABORATORY TESTING

Representative soil samples obtained from the exploratory borings were tested in the URS Pleasant Hill geotechnical laboratory in order to evaluate their engineering properties for use in the analyses. The following laboratory tests were performed on selected soil samples:

- Water content (ASTM D2216)
- Dry density (ASTM D2850)
- Unconfined compressive strength (ASTM D2166)
- Atterberg limits (ASTM D4318)
- Sieve analysis (ASTM D422)

The results of the laboratory tests are summarized in the logs of borings at the corresponding sample depths. The details of the laboratory test results are presented in Appendix C.

3.1 SITE CONDITIONS

Most of the proposed REF plant site is currently undeveloped rangeland, covered by grass and brush. Portions of the site adjacent to Phillip Road are presently being used as a yard and construction laydown area for the PGWWTP construction project. Fencing and several wood-framed structures were also observed at the site. In addition, soil from the PGWWTP construction is stockpiled approximately 15 feet high on the southeastern corner of the site. The site gradually slopes to the north from approximate elevation + 95 MSL at Phillip Road to approximate elevation +82 MSL at the northeast corner of the site. Pleasant Grove Creek is located approximately 500 feet north of the proposed 22-acre REF site development. The overall 73-acre City-owned area also includes vernal pools, which are considered to be sensitive biological habitat.

3.2 GEOLOGIC AND SEISMIC SETTING

The REF Application for Certification (Section 5.3 – Geologic Hazards and Resources) contains a detailed discussion of the geologic and seismic setting of the proposed plant site. This information is briefly summarized in the following section.

3.2.1 Site Geology

The project area is located in Western Placer County, and is in a transition zone between the Sierra Nevada Mountains and the Central Valley of California. In this area, broad alluvial fans emanating from the Sierra Nevada Mountains in the east interfinger with fluvial and lacustrine strata deposited in the Central Valley to the west. The Great (Central) Valley of California is an elongate northwest-southeast-trending geomorphic basin, with large axial fluvial drainage systems largely fed by streams from the Sierra Nevada Mountain Range. The marine and nonmarine sediments have infilled the basin as the result of regional subsidence and sedimentary processes. Climatic, eustatic, and tectonic influences are responsible for the observed present-day surface and subsurface geologic relationships.

The proposed REF power plant site is located on the eastern side of the Sacramento River Valley, on uplifted fluvial floodplain and terrace surfaces of Pleistocene and Holocene age. The site is fairly flat, with limited gently rolling topographic relief resulting from earth-moving operations, erosion, and fluvial processes. The northeast portion of the site, however, is fairly flat, and is located on an aggradational fluvial terrace of Pleasant Grove Creek. The REF is located outside the Federal Emergency Management Agency (FEMA) 100-year floodplain boundary. From estimates shown in the Roseville Regional Wastewater Treatment Service Area Master Plan Environmental Impact Report (ESA, 1996), it appears that the northern portion of the site may be within the 100-year floodplain in the future.

The geologic units mapped at the site include:

Riverbank Formation(Qr). The Riverbank Formation consists of semi-consolidated, poorly-bedded layers of silt, clay, sand, and gravel. It was deposited in a fluvial environment during the

Pleistocene between approximately 100,000 and 400,000 years ago. The Riverbank Formation has been divided by Helley and Harwood (1985) into upper (Qru) and lower (Qrl) members.

Basin Deposits (Qb). The Basin deposits are unconsolidated silts and clays, which were deposited as overbank flood deposits in topographic lows during the Holocene.

Recent Alluvium (Qa). Recent alluvial deposits consist of unconsolidated clay, silt, sand and gravel deposited by Holocene streams and rivers.

3.2.2 Seismicity

The modern tectonic setting of central California is dominated largely by the transform plate boundary contact between the Pacific and North American plates south of the Mendocino triple junction. Right-lateral strike-slip displacement along the major branches of the San Andreas fault system accommodates most of this plate motion, with the remainder generating Holocene tectonism and seismicity at the western continental margin and to the east in the Sierra Nevada and Basin and Range Provinces (Minster and Jordan, 1987; Atwater, 1970). East of the Coast Ranges, the Great Valley and the adjacent Sierra Nevada form a relatively stable crustal block composed of Mesozoic crystalline basement that dips gently to the west (Hill *et al.*, 1991). The western edge of the Sierra Nevada block, beneath the sediments of the Great Valley, is generally thought to be coincident with the western margin of the Great Valley. This region is referred to as the Coast Ranges-Sierran Block (CRSB) boundary zone (Wong and Ely, 1983; Wong *et al.*, 1988), where compressional deformation occurs on reactivated east-verging, low-angle structures (Unruh and Moores, 1992; Unruh and Lettis, 1998). High slip-rate faults associated with the San Andreas fault system lie to the west of this boundary zone.

URS has evaluated various faults that are potential seismic sources for the proposed REF. The faults include: Foothills fault system (north and south), West Tahoe, North Tahoe, East Tahoe, Genoa, CRSB-Dunnigan/Vacaville, Concord-Green Valley, West Napa, and the San Andreas fault zone. Table 1 is reproduced from Section 5.3 of the AFC, and lists the maximum magnitude, fault type, fault distance to site, and deterministic peak ground accelerations for these faults. Further details regarding seismic hazards are provided in the AFC.

Table 1

MCE MEDIAN (50th PERCENTILE) PEAK HORIZONTAL GROUND ACCELERATIONS

		Distances (km)				Peak Horizontal Acceleration (g's)					
Seismic Source	MCE (M_w)	Fault Style	Hori-zontal	Rup-ture[1]	Seismo-genic[2]	Abrahamson & Silva (1997)	Spudich *et al.* (1999)	Campbell (1997)	Sadigh *et al.* (1997)	Boore, et al. (1997)	Weighted Average PGA
Foothills Fault System	6.5	N	18	21	21	0.16	0.15	0.16	0.15	--	0.16
W. Tahoe Fault	7.1	N	110	110	111	0.04	0.03	0.03	0.03	--	0.03
N. Tahoe Fault	7.0	N	112	112	113	0.04	0.03	0.02	0.02	--	0.03
E. Tahoe Fault	7.0	N	116	116	117	0.04	0.03	0.03	0.03	--	0.03
Genoa Fault	7.3	N	127	127	117	0.04	0.03	0.03	0.03	--	0.03
CRSB	7.1	R	61	61	68	0.09	---	0.06	0.09	0.10	0.08
Concord-Green Valley Fault	6.8	S	97	97	97	0.04	--	0.03	0.03	0.06	0.04
West Napa Fault	6.8	S	99	99	99	0.04	--	0.03	0.03	0.05	0.04
San Andreas	8.0	S	150	150	150	0.06	--	0.05	0.04	0.07	0.06

N = Normal Slip, S = Strike Slip, R = Reverse Slip

[1] Assume faults extend to depth of 15 km

[2] Assume depth to seismogenic portion of fault is 2 km

3.3 SUBSURFACE SOIL CONDITIONS

A total of six CPTs were conducted to initially assess the soil conditions and stratigraphy at the REF site (see Appendix A for the CPT logs). The CPTs generally encountered soil with low skin friction and tip resistance in the upper 3 feet of soil. From approximately 3 feet bgs to 6 feet below ground surface (bgs), an increase in skin friction and tip resistance suggested the presence of a 2 to 3 foot layer of stiff fine-grained silt or cemented sand. From a depth of approximately 6 feet to 40 feet bgs, materials with soil behavior types corresponding to silt and clayey silt with occasional clays and stiff fine-grained silt were encountered. At approximately 40 feet bgs, the CPTs encountered a 3-foot thick layer of soil with high skin friction and tip resistance. Then, from approximately 43 feet to 70 feet bgs, soil with characteristics of silt, clayey silt, stiff fine-grained silt and the occasional silty sand was encountered. The bottom 10 feet of the CPTs, to a depth of 80 feet bgs, generally encountered soils with high skin friction and tip resistance.

The subsurface soil conditions encountered in the exploratory borings are summarized below: (see Appendix B for the boring logs):

In Boring B-1, the first 7 feet bgs was dry sandy silt and medium dense silty sand. From 7 feet to 9 feet bgs, medium dense clayey sand was encountered. From a depth of 9 feet to 42 feet bgs, interbedded layers of hard silt and medium dense to dense sandy silt and silty sand were encountered. At a depth of 42 feet bgs, a 3-foot sand layer was encountered, and was underlain by dry, hard silt and clay to the bottom of the boring at a depth of 50.5 feet.

In Boring B-2, the first 5 feet bgs consisted of silt and medium dense silty sand. A layer of very stiff clay was observed from a depth of 5 feet to 8 feet bgs. The underlying layers consisted of very stiff to hard silt, or dense sandy silt and silty sand to the bottom of the boring at 80.5 feet bgs. At a depth of 66 feet bgs, layers of medium stiff, silty clay and hard, sandy clay, were encountered. Possible evidence of perched water was found at a depth of 59 feet bgs (see Section 3.4).

Boring B-3 encountered 3 feet of silt, followed by medium dense sand to a depth of 14 feet bgs. From depths of 14 feet to 60 feet bgs, the boring encountered mostly very stiff silt and clay, with some medium dense sands. Below 60 feet bgs, hard silt layers were found interbedded with dense silty sand and clayey sandy silt, to a depth of 80.5 feet bgs. A monitoring well was installed in this boring upon completion of drilling.

Boring B-4 initially encountered a 3 foot layer of sandy silt. Below this layer, very dense silty sand and clayey silt was encountered to a depth of 12 feet bgs. The next layer encountered was dense sand to a depth of 21 feet bgs. A very stiff clayey silt was encountered in the next 3 foot interval, followed by very dense sandy silt and dense sand which continued to the bottom of the boring at a depth of 30.5 feet bgs.

Boring B-5 encountered 3 feet of clayey sand in the top layer. Below this surface layer, and to a depth 56 feet bgs, was very stiff silt and hard clayey silt, with medium dense clayey sandy silt

and sandy silt layers. From 56 feet to the bottom of the boring at a depth of 80.5 feet bgs, the boring encountered dense to very dense sand layers and hard clayey silt and silt layers.

Boring B-6 encountered 3 feet of clayey sand followed by loose sand with silt to a depth of 7 feet bgs. From a depth of 7 feet to 32 feet bgs, the boring encountered very stiff silt, medium dense silty sand, and dense sandy silt. From a depth of 32 feet to a depth of 67 feet bgs, very stiff silt was encountered, becoming hard at a depth of 45 feet. From 67 feet to the bottom of the boring at 80.5 feet bgs, the boring encountered very dense sand and silty sand.

Boring B-7 penetrated medium dense silty sand and sand with silt to a depth of 12 feet bgs. Very stiff clayey silt, medium dense sand, and hard silt were encountered from 12 feet to 32 feet bgs. Between the depths of 32 feet and 60 feet bgs, the boring encountered sandy silt which varied from medium dense to dense, with a very dense layer in the interval from 40 to 50 feet bgs. Below a depth of 60 feet, the boring found dense sand with silt or sandy silt, including a 9 foot layer of hard silt at a depth of 65 feet bgs. The boring was completed at a depth of 80.5 feet bgs.

Boring B-8 encountered an 8 foot layer of sandy silt below the surface, which became denser below a depth of 4 feet bgs. From a depth of 8 feet to 55 feet bgs, the soil consisted of hard to very stiff clayey silt, very stiff silt and layers of medium to dense sands. The boring then encountered a layer of hard silt to a depth of 65 feet bgs, which was followed by dense sand to the bottom of the boring at a depth of 80.5 feet bgs.

Boring B-9 encountered a layer of silt in the first 3 feet bgs. Very dense sand was encountered below this layer to a depth of 15 feet bgs. From a depth of 15 feet bgs to the bottom of the boring at a depth of 80.5 feet, hard silt, or dense to very dense sand and sandy clayey silt was encountered.

Boring B-10 encountered a 3 foot layer of sandy silt below the surface. Layers of medium dense sandy silt, clayey sand and silty sand followed this layer to a depth of 22 feet bgs. From a depth of 22 feet bgs to the bottom of the boring at a depth of 30.5 feet bgs, the soil was found to be very stiff to hard silt.

Boring B-11 encountered a 3 foot top layer of sandy silt. Dense clayey, silty sand, dense sand, and very stiff silt followed this layer to a depth of 27 feet bgs. From a depth of 27 feet to the bottom of the boring at depth 80.5 feet bgs, the boring encountered medium dense silty sand.

3.4 GROUNDWATER CONDITIONS

The depth to groundwater at the site is unknown at this time. Static groundwater elevations in the area are predicted to be greater than 70 feet bgs by the California Department of Water Resources (1993), but shallower groundwater conditions have been reported for the nearby PGWWTP site investigation. It is possible that perched groundwater conditions exist, and that groundwater elevations vary seasonally.

Upon completion of drilling, a monitoring well was installed in boring B-3 to a depth of 80.5 feet bgs. During initial observations from June 13 – 19, 2001, and subsequent readings on July 5, 2001, and August 5, 2001, the well was found to be dry.

During drilling Boring B-2, the outside of the sampler was observed to be moist at a depth of approximately 60 feet bgs, though the samples were dry. This may be possible evidence of perched groundwater at that location.

Based on the results of the CPTs and soil borings, information obtained from the monitoring well, investigations at the PGWWTP site, and our understanding of the local conditions, we recommend that a design groundwater elevation in excess of 80 feet below ground surface be adopted for the REF site. We also recommend that the B-3 well should be monitored for an annual cycle to verify this design elevation.

4.1 SUMMARY OF SUBSURFACE SOIL CONDITIONS

The site is situated on Holocene and late Pleistocene alluvial and fluvial deposits, which overlie older (Pleistocene) fluvial deposits (Helley and Harwood, 1985). These unconsolidated deposits consist of interbedded layers of various combinations of silt, sand, and clay. Direct observations in deep excavations at the PGWWTP adjacent to the REF site confirm that these soil conditions exist in the project vicinity. There is no rock outcrop at the site, and the borings and CPTs did not encounter bedrock or refusal.

Two subsurface cross sections (Figures 3 and 4) were developed based on the results of the soil borings and CPTs (see Figure 2 for the approximate locations of the cross sections). These cross sections depict the generalized subsurface soil profile and the various soil layers encountered in the borings. The interbedded nature of the alluvial deposits is apparent from the cross-sections. At the time of our study, the boring location elevations had not been surveyed. Therefore, we assumed a common ground surface elevation at all the boring and CPT locations.

In general, the subsurface soils can be grouped into six soil layers: silty sand, clayey silt, silt, sandy silt, silt with clayey silt, and silty sand. Descriptions of these generalized soil types/layers are given below.

Sandy Silt: The upper three feet of soil tended to be sandy silt across the majority of the site. The penetration resistance of this material was not tested, nor were samples obtained for laboratory testing.

Silty sand: From a depth of 3 feet to 10 feet bgs, silty sand predominated. This layer had relatively low blow counts, and was classified as medium dense.

Clayey silt: Clayey silt was found to extend from depths of about 10 feet to 18 feet bgs. These clayey silts had high blow counts and were classified as stiff clayey silt. These high blow counts are indicative of high bearing capacity.

Silt: This layer from a depth of 18 to 33 feet bgs exhibited high blow counts and was classified as very stiff silt.

Sandy silt: Sandy silt was found from depths of 33 feet to 55 feet bgs. This silt ranged from medium dense to very dense.

Silt with clayey silt: At depths of about 55 to 71 feet bgs, silt with clayey silt was found. The penetration blow-counts recorded in this soil material were typically high, an indication of the high shear strength of this material. This soil was classified as very stiff to hard silt.

Silty sand: The bottom layer from a depth of 71 feet to 80.5 feet bgs was found to be dense silty sand. This layer had relatively high blow counts, also showing the potential for high bearing capacities and shear strengths.

4.2 SITE-SPECIFIC EVALUATIONS

The Application for Certification (Section 5.3 – Geologic Hazards and Resources) contains detailed information about geologic hazards at the REF site. That information is briefly described and supplemented in the following sections.

4.2.1 Surface Fault Rupture

There are no fault zones zoned under the Alquist-Priolo Earthquake Fault Zoning Act nearby or in the vicinity of the proposed REF. No active (Holocene) or potentially active (Quaternary) faults were found to cross the plant area (Jennings, 1994). The hazard from ground rupture is judged to be negligible on the basis of this information.

4.2.2 Earthquake Ground Shaking

Moderate earthquake ground shaking is a significant seismic hazard that can be expected in the project area. To estimate the maximum shaking that might occur at the plant area in a future earthquake, deterministic estimates of the peak horizontal ground acceleration were made using five empirical attenuation relationships and the maximum earthquakes listed in Table 1. The highest peak value (0.16 g), assuming deep soil conditions at the site, is expected to occur from a M_w 6.5 earthquake at a distance of about 18 km occurring on the Foothills fault system. The AFC also contains probabilistic assessments of the seismic hazard at the REF site.

4.2.3 Liquefaction

Liquefaction is a phenomenon during which loose, saturated, cohesionless soils (generally sands) temporarily lose shear strength during ground shaking induced by severe earthquakes. Significant factors known to affect the liquefaction potential of soils include grain size distribution, relative density, degree of saturation, the confining stresses acting on the soils, the quality of the soil fines fraction, and the characteristics of the earthquake, such as the intensity and duration of the ground shaking. The exploratory borings indicated that the subsurface materials at this site are in sufficiently dense and stiff condition, and that the static groundwater elevation is at a depth such that the soils are not considered to be susceptible to liquefaction.

Localized layers of medium dense sand were, however, encountered in some borings, and shallow perched groundwater levels have been observed across Phillip Road at the site of the PGWWTP. These materials may have the potential to liquefy during earthquake shaking, potentially resulting in small localized settlements.

4.2.4 Mass Wasting and Slope Stability

The proposed plant area is on a flat alluvial terrace surface, approximately 5 miles (8 km) west of the rangefront near Rocklin. The lack of any significant slopes on or near the site indicates that the hazard from slope instability, both landslides and debris flows/lateral spreads, is negligible.

Significant cutting and grading work producing any slopes in both natural and fill material could potentially introduce a slope stability hazard.

The closest significant drainage to the site, Pleasant Valley Creek, is located approximately 500 feet to the north. Under severe flooding conditions, the Creek may pose an erosion hazard to the plant area. Drainage on and around the site will be controlled by a series of flood control drains; therefore, the hazard of erosion from surface runoff is also considered to be negligible.

4.2.5 Expansive Soils

Expansive soils, typically high in montmorillonite or other similar high plasticity clays, exhibit shrinking-swelling with wetting and drying. The expansion and shrinking can result in differential ground movements beneath foundations. The native soils underlying the REF plant area generally have a low potential for shrink-swell behavior.

4.2.6 Site Soil Profile

The subsurface soil conditions encountered in the exploratory borings indicate that the soil profile at the site consists predominantly of stiff silts. In accordance with Table 16-J of the Uniform Building Code (1997), the subsurface soil conditions correspond to Soil Profile Type S_D (stiff soil profile).

4.2.7 Site Resistivity and Corrosivity Evaluations

A field resistivity survey and laboratory chemical testing program of soil samples obtained from the site was performed. The complete Soil Corrosivity Report is included as Appendix D. The report concludes that the soils at the subject site are negligibly corrosive to corrosive to buried metallic and reinforced concrete structures. Details from the report are excerpted below:

Buried Metallic Structures: Based on the low soil resistivity it is recommended that buried metallic piping system, such as steel and ductile iron, be coated with a bonded dielectic or mortar coating. All non-welded joints should be bonded to provide electrical continuity. Cathodic protection should be installed to provide corrosion protection. Buried metallic piping should be electrically isolated from other structures.

Buried Reinforced Concrete Structures: Buried reinforced concrete structures should be constructed of durable concrete as described in ACI Standards 201.2R and 222R. These recommendations include but are not limited to the following:

- The water/cement ratio should not exceed 0.40.
- A concrete cover of a minimum of 2 inches should be applied over all steel reinforcement.
- Salt-free sand and potable water should be used.
- The concrete should be allowed to cure according to the manufacturer's recommendations.

5.1 FOUNDATION ALTERNATIVES

Based on the results of our geotechnical investigations and foundation design studies, we conclude that the geotechnical conditions at the site are suitable for constructing the proposed REF. Based on the preliminary design loads supplied to us by Patch, Inc., we recommend that the plant facilities be supported on shallow foundations. The underlying alluvial and fluvial deposits should provide adequate bearing capacity for the REF at-grade structures founded on shallow foundations. Under normal loads, settlement of shallow foundations located within these soils should be small and within acceptable limits for the proposed structures. Deep foundations consisting of driven piles or drilled piers are not considered necessary for the REF. However, if further design development results in additional axial or lateral loads on the structures, deep foundations may be reconsidered.

While geotechnical conditions generally appear to be good, proper consideration must still be given to preparation for and design of the foundation system. Recommended requirements for foundation design and earthwork are summarized in the following sections.

5.2 FOUNDATION RECOMMENDATIONS AND SETTLEMENTS

Table 2 presents the preliminary foundation dimensions and loading for major REF structures supplied to us by Patch, Inc, and the computed contact pressure for a footing occupying the complete plan area of the given structure. In actuality, these structures will likely be supported by a combination of mat, spread, and perimeter strip footings, thereby exerting higher contact pressures on smaller bearing areas. Based on our analysis and experience with the soils at this site and similar soils in other areas, it is our opinion that if shallow foundations, mats, or slabs-on-grade bearing on suitable native soil or properly compacted structural fill are employed, then total post-construction settlements will be less than 1-inch. Differential settlements, between adjacent footings over a distance of 50 feet, should be less than ½-inch. These settlements should be accommodated by selecting proper structural (and architectural) design details.

TABLE 2. PRELIMINARY DESIGN LOADS AND BEARING PRESSURES

Structure	Dimensions (ft)	Load (kips)	Bearing Pressure (psf)
Gas Turbine	990 x 18	1,008	566
HRSG	215 x 35	7,494	1952
Steam Turbine	137 x 23	1,510	486
Condenser	54 x 17	1,483	1639
Cooling Tower	600 x 100	11,112	185
Step-up Transformer	36 x 21	415	548

5.3 SPREAD FOOTING FOUNDATIONS

REF structures may be supported on shallow spread or strip footings, or concrete slabs-on-grade founded on properly compacted structural fill. Exterior and interior footings should be founded at least 24 inches below the lowest adjacent finished grades. Spread foundations should be a minimum of 24 and 18 inches wide for square and strip footings, respectively. To limit differential foundation settlements, the following allowable bearing pressures are recommended to determine the footing sizes:

Dead Load	2,500 psf
Dead and Live Load	3,500 psf
All Loads, including wind or seismic	4,500 psf

All footing excavations should be finished in a neat condition. Any softened or disturbed soil should be removed from the footing excavation prior to placing reinforcing steel. Foundation excavations should be free of loose, compressible materials or standing water. To reduce expansive soil effects, the bottom and sides of the excavation should be kept moist prior to concrete placement. It is recommended that the time during which the prepared foundation bearing surface in footing excavations is exposed be kept to a minimum to reduce the potential for disturbance. It is recommended that the footing excavations be observed by URS prior to placing steel and concrete to verify that the recommendations of this report have been followed and that an appropriate bearing stratum is encountered. If unsuitable soils are encountered in the footing excavations, overexcavation and placement of structural fill will be required.

5.4 MAT FOUNDATIONS

It is recommended that mat foundations be designed using the following allowable contact pressures:

Dead Load	2,500 psf
Dead and Live Load	3,500 psf
All Loads, including Wind and Seismic	4,500 psf

Mat foundations may be designed using a uniform modulus of subgrade reaction of 200 pounds per cubic inch. The modulus should be corrected for the dimensions of the mat foundation based on the following formula (Terzaghi, 1955):

$$k_b = k(m + 0.5)/1.5m$$

Where:

k_b = coefficient of subgrade reaction for width b

k = coefficient of subgrade reaction for a 1' x 1' plate (200 pci)

b = column spacing

m = length of loaded area divided by b

5.5 SLABS-ON-GRADE

Preparation of areas beneath concrete slabs-on-grade should be performed in accordance with Section 5.7. Prior to constructing building pads, surficial soils should be scarified to a minimum depth of 8 inches, moisture conditioned to within 3 percent of optimum moisture content, and compacted to at least 95 percent maximum dry density. In order to provide uniform support of the concrete floor slabs, we recommend that the building floor slabs be underlain by a layer of structural fill. The structural fill should have a minimum thickness of 18 inches.

Interior slab-on-grade floors should be provided with an adequate moisture break. The capillary break material should consist of a minimum of 4 inches of free-draining, crushed rock or gravel. The capillary break material should have a maximum particle size of ¾ inch, with no more than 5 percent passing the No. 4 sieve.

In areas where moisture could be detrimental to equipment or floor coverings inside the proposed buildings, a 10-mil polyethylene vapor barrier should be placed over the capillary break material. An approximately 2-inch thick layer of sand should be placed over the barrier to protect it from damage and to aid in curing of the concrete. The sand and gravel layers of the moisture and vapor barriers may be included in the total thickness of the recommended structural fill section of 18 inches.

Concrete slabs-on-grade should be reinforced and should be integrated with a continuous perimeter footing. The thickness and reinforcing details of the slab-on-grade should be computed by the Structural Engineer. Where concrete slabs are designed as beams on an elastic foundation, the compacted subgrade should be assumed to have a modulus of subgrade reaction of 200 pounds per cubic inch.

5.6 FOUNDATION RESISTANCE TO LATERAL LOADS

Resistance to seismically or wind-induced transient lateral loads can be developed by passive earth pressure acting against the sides of footings and mat foundations poured neat against native soil. To estimate resistance to lateral loads, we recommend that an equivalent fluid unit weight of 350 pcf be used to calculate the allowable passive pressure; however, the passive pressure should be limited to a maximum value of 2,800 psf. Base friction can also be mobilized on the bottom of spread footing and mat foundations. An allowable friction coefficient of 0.35 is recommended. These two components of resistance may be mobilized simultaneously.

5.7 SITE GRADING AND EARTHWORK

Depending on the final grading plan, the sitework may involve cut and/or fill sections. In general, the on-site native materials are suitable for use as structural fill, provided they meet the requirements detailed in the following sections. No deep excavations are anticipated for the project. Although not detailed in this report, appropriate erosion and dust control measures should be adopted.

5.7.1 Subgrade Preparation

We recommend that site preparation, excavation and filling be done under the observation of a qualified engineer, and in accordance with the recommendations contained in this report. Site clearing will consist of removal of all construction debris, site improvements, and stripping of all surface vegetation, grass, brush and organic-rich topsoil. The depth of stripping is estimated to range from 4 to 6 inches. Any groundwater monitoring wells at the site should be destroyed in accordance with the well abandonment requirements of the Placer County Division of Environmental Health, unless the wells are designated to be safe by Regulatory Agencies. The materials generated from demolition should be hauled off-site.

After clearing, it is recommended that all undocumented fill materials at locations of proposed structure foundations and paved areas at the site be excavated. Footings should bear on undisturbed native medium dense or stiff soil, as verified by the geotechnical engineer. If the surficial native sandy silt soils at locations of proposed structure foundations are judged to be unsuitable by the geotechnical engineer, these materials shall be overexcavated to a depth of up to 3 feet, and replaced with compacted structural fill.

After excavation to remove undocumented fill and/or unsuitable materials, and prior to placing structural fill, the subgrade should be proof-rolled with a steel-tired roller weighing not less than 12 tons or other appropriate equipment approved by the geotechnical engineer. Any soft or disturbed subgrade areas identified during proof-rolling should be excavated further until firm materials are encountered.

A recommended option to protect undisturbed natural soils in foundation excavations during placement of reinforcing steel is to overexcavate the area about 2 to 3 inches in depth and place a concrete mud slab immediately after the foundation soils have been approved.

5.7.2 Select Fill Material Criteria

All fill materials should be approved by the geotechnical engineer. The fill should be a soil or soil-rock mixture free of organic matter or other unsuitable material. It should not contain rocks or lumps over 3 inches in greatest dimension, should not contain more than 15 percent by weight larger than 2-½ inches, and should have less than 40 percent (by weight) passing the No. 200 sieve. In addition to the above criteria, select fill should meet the following requirements:

Maximum percentage retained on No. 4 Sieve (by weight):	30
Maximum plasticity index:	15

5.7.3 Compaction Requirements of Fill Materials

If possible, preparation of areas to receive fill, and fill placement, should be performed during dry weather conditions. Compaction should take place immediately after subgrade preparation, and the newly prepared areas should be protected against saturation from precipitation. If protective measures are not provided, and the subgrade soils become saturated and spongy due to

rain and/or construction traffic, the required relative compaction may not be achievable. In such an event, soft soils should be removed from the area, and imported sand and gravel, with less than 5 percent passing the No. 200 sieve, should be placed and compacted to bring the affected area up to the proposed grades.

Structural fill soils should be moisture conditioned to within 3 percent of the optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness, and compacted to at least 95 percent relative compaction according to ASTM D 1557. The procedure to achieve proper density of a compacted fill depends on the size and type of compacting equipment, the number of passes, thickness of the layer being compacted, and certain soil properties. When size of the excavation restricts the use of heavy equipment, smaller equipment can be used, but the soil must be placed in thin enough layers to achieve the required compaction.

5.7.4 Utility Trench Backfill

If utility trench excavations encounter perched groundwater, dewatering with sump pumps is recommended. Utility trenches should be backfilled with material conforming to the recommendations for select fill in Section 5.7.2. Trench backfill soils should be moisture conditioned to within 3 percent of the optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness, and compacted to at least 90 percent relative compaction according to ASTM D 1557. Utility trench backfill within three feet of the ground surface should be compacted to at least 95 percent relative compaction according to ASTM D 1557.

5.8 SITE DRAINAGE

Adequate drainage provisions are imperative and we recommend both short- and long-term drainage measures be incorporated into the project design and construction. Surface runoff can be controlled during construction by careful grading practices. Typically, these include the construction of shallow, upgrade perimeter ditches or low earthen berms and the use of temporary sumps to collect runoff and prevent water from damaging exposed subgrades. All collected water should be directed to a positive and permanent discharge system such as the storm sewer.

Permanent control of potential surface discharge of water should be incorporated in the final grading design. Under no circumstances should water be allowed to pond immediately adjacent to structures or paved areas. All pavement drainage should be directed into conduits which carry runoff away from the pavement into storm drain systems or other appropriate outlets. Finished grading adjacent to structures should direct surface water away from the structure.

5.9 PAVEMENT DESIGN

R-value tests were performed on bulk soil samples obtained from the site for design of flexible pavement. R-value test results of 66, 62, 66.5, and 62 were obtained, and a value of 62 was selected for design. Using Caltrans design methodology, pavement structural sections for TI

(Traffic Index) values of 5.0, 6.0, 7.0, and 8.0 were computed. These pavement sections are shown in Table 3. These pavement sections are based on a subgrade uniformly compacted to at least 95 percent relative compaction, and the Class 2 AB compacted to at least 95 percent relative compaction. The pavement section should be constructed in accordance with the provisions of the Caltrans Standard Specifications. Appropriate sloping and drainage details should be provided.

TABLE 3. RECOMMENDED PAVEMENT SECTIONS (R = 62)

Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
5.0	2.5	6.0
6.0	3.0	6.0
7.0	3.5	7.0
7.0	5.5	0.0
8.0	4.5	7.5
8.0	6.5	0.0

5.10 PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

Involvement of the design geotechnical engineer during finalization of the design documents for the project is an important part of the design process. We recommend that final plans and specifications be provided for our review to verify that our recommendations have been interpreted as intended.

Implementation of the site preparation and foundation design recommendations presented in this report requires evaluation of the soil conditions and extent of any unsuitable materials encountered during construction. We recommend the following:

1. Well-qualified technical personnel under the supervision of an experienced geotechnical engineer should be retained to provide observations and testing during all earthwork and foundation construction activities.
2. We should be contacted with any questions that arise regarding application of our recommendations during construction, or if any soil conditions different from those described in this report are encountered.

This geotechnical study has been conducted in accordance with the standard of care commonly used as state-of-practice in the profession. No other warranties are either expressed or implied. The recommendations made in this report are based on the assumption that the subsurface soil and groundwater conditions do not deviate appreciably from those disclosed in the CPTs and exploratory borings. If any variations or undesirable conditions are encountered during construction, we should be notified so that additional recommendations can be made. The foundation recommendations presented in this report are developed exclusively for the proposed Roseville Energy Facility described in this report and are not valid for other locations and construction in the project vicinity.

We should be informed of any changes that are made in the assumptions mentioned in this report (such as the location and configuration of the proposed structures, and the design loads) so that additional recommendations may be given, if necessary. We recommend that URS has the opportunity to review those portions of the project plans and specifications that are affected by the recommendations made in this report to verify that the intent of our recommendations are properly incorporated into the construction documents. We also recommend that URS be retained to observe the site earthwork and foundation construction.

Atwater, T., 1970, "Implications of Plate Tectonics for the Cenozoic Tectonic Evolution of Western North America", *Geological Society of America Bulletin*, 81.

California Department of Water Resources, 1993, Elevation of Ground Water in Wells, Spring 1993.

España Geotechnical Consulting, 1999, Final Geotechnical Report for the Pleasant Grove Wastewater Treatment Plant, Roseville, California, submitted to Carollo Engineers.

Helley, E.J. and Harwood, 1985, "Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California", U.S. Geological Survey, Map-MF-1790.

International Conference of Building Officials, 1997 Uniform Building Code.

Jennings, C.W., 1994, "Fault Activity Map of California and Adjacent Areas", California Division of Mines and Geology, California Geologic Data Map Series, Map No. 6.

Minster, J. B., and Jordan, T. H, "Vector Constraints on Western U. S. Deformations from Space Geodesy, Neotectonics, and Plate Motions", *J. Geophys. Res.*, 92, 4798-4804, 1987.

Robertson, P.K., and Campanella, R.G., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.

Robertson, P.K., and Campanella, R.G., 1989, "Guidelines for Geotechnical Design Using CPT and CPTU", UBC Soil Mechanics Series No. 120, Civil Eng. Dept., Vancouver, B.C., Canada.

Terzaghi, K., 1955, "Evaluation of Coefficients of Subgrade Reaction", *Geotechnique*, Vol. 5, No. 4, December 1955, pp. 297-326.

Unruh, J.R., and Lettis, W.R., 1998, "Kinematics of Transpressional Deformation in the Eastern San Francisco Bay Region", *California Geology*. 26:19-22.

Unruh, J.R., and Moores, E.M., 1992, "Quaternary Blind Thrusting in the Southwestern Sacramento Valley", *California. Tectonics*, 11.

URS, 2001, Roseville Energy Facility, L.L.C., Application for Certification to the California Energy Commission.

Wong, I.G., and Ely, R.W., 1983, "Historical Seismicity and Tectonics of the Coast Ranges-Sierra Block Boundary: Implications to the 1983 Coalinga Earthquakes", *in* Bennet, J. and Sherburne, R. (eds.), *The 1983 Coalinga, California Earthquakes*, California Division of Mines and Geology Special Publication 66.

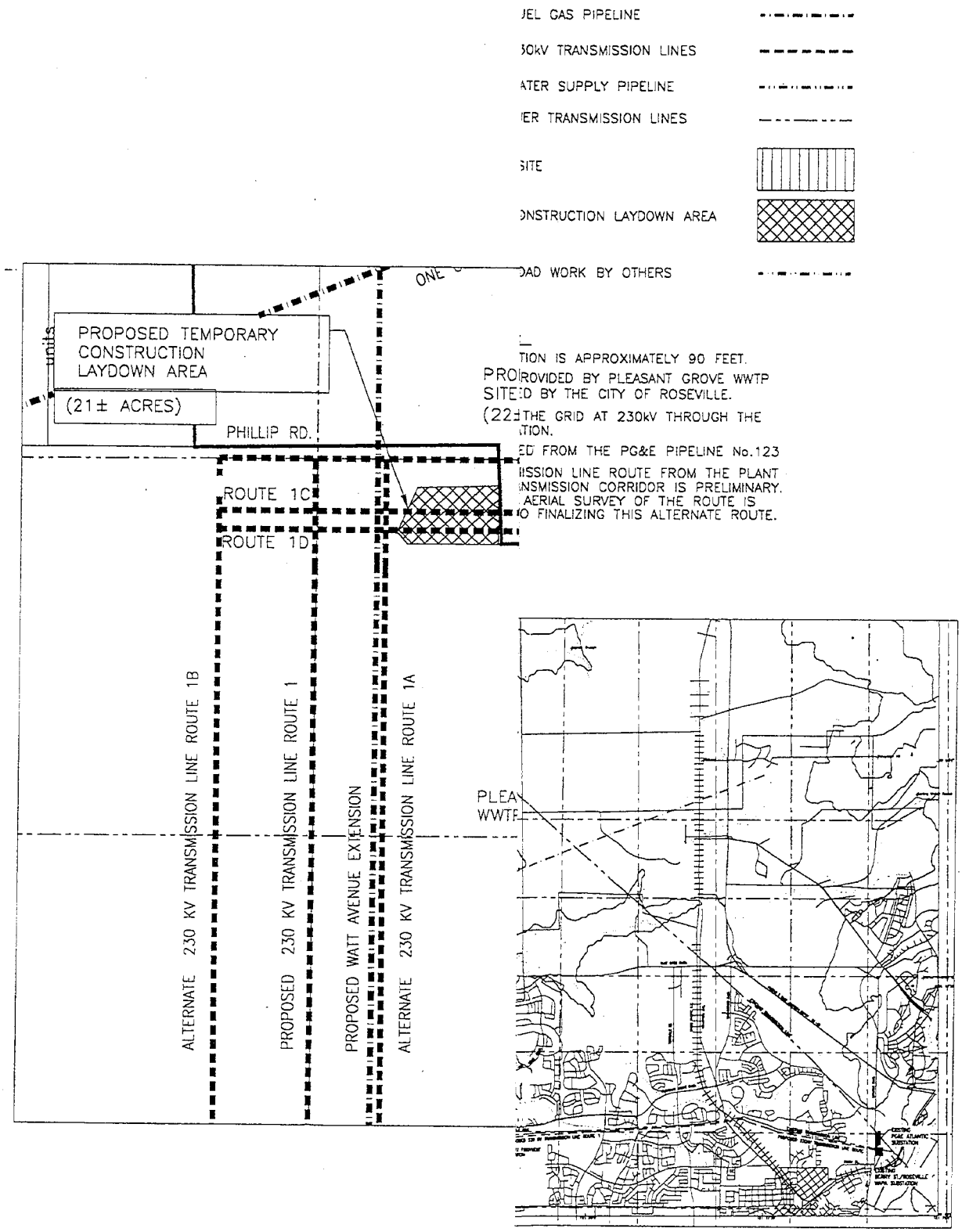
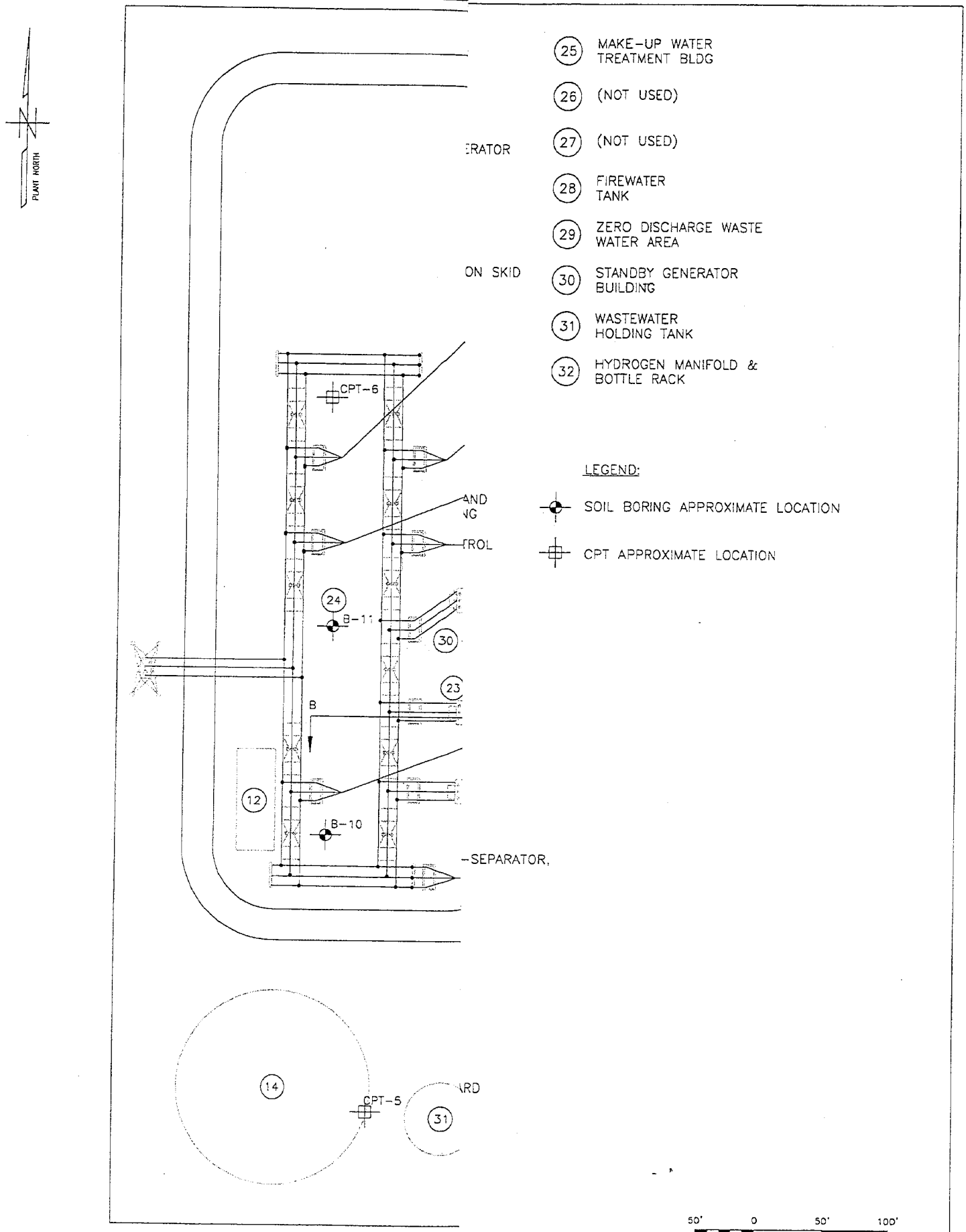


Figure 1. SITE LOCATION PLAN

2001

URS 66-00000089.00-06250



PHILLIP ROAD

URS 66-00000089.00-06250

Figure 2. SITE AND GEOTECHNICAL INVESTIGATION LOCATION PLAN

2001

Appendix A

CPT Site Investigation Report

GREGG

GREGG DRILLING & TESTING, INC.

SPECIALIZING IN ENVIRONMENTAL, GEOTECHNICAL AND IN-SITU TESTING

August 8, 2001

Phil Meymand
URS Greiner
500 12th Street
Oakland, CA 94670-4014

RE: CPT Site Investigation – Roseville Energy Facility, LLC, Roseville, CA
June 7, 2001

Dear Phil,

Please find enclosed a data report and diskette for the site investigation work carried out at the above referenced site on June 7, 2001. Please contact me at our Martinez office if you have any questions/comments concerning the enclosed contents.

Sincerely,

Tim J. Boyd, Operations Manager – CPT Division

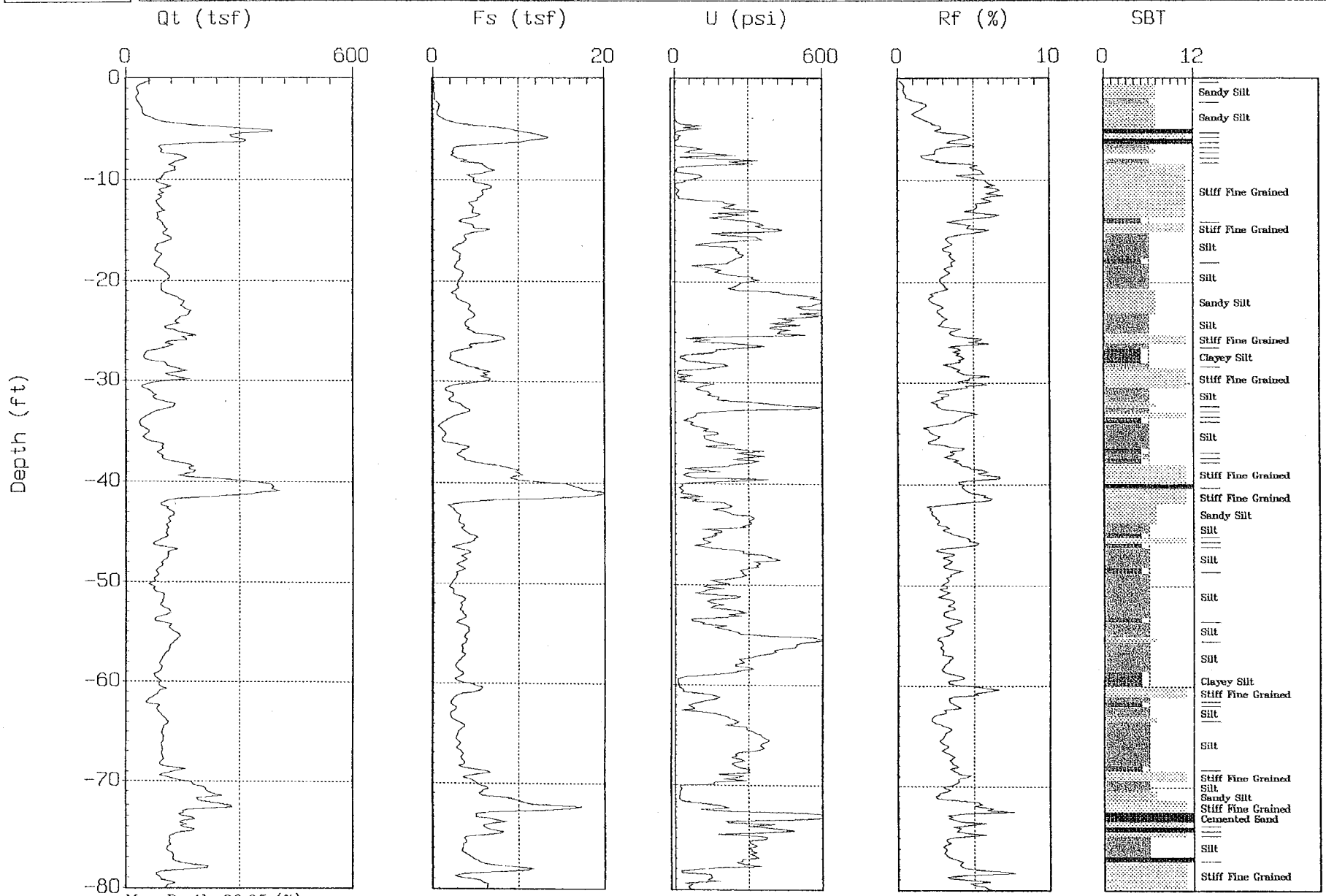
SOUTHERN CALIFORNIA: 2726 WALNUT AVENUE · SIGNAL HILL, CA 90806 · (562) 427-6899 · FAX (562) 427-3314
NORTHERN CALIFORNIA: 950 HOWE ROAD · MARTINEZ, CA 94553 · (925) 313-5800 · FAX (925) 313-0302
CENTRAL CALIFORNIA: P.O. BOX 3618 · PASO ROBLES, CA 93446 · (805) 226-9672
www.greggdrilling.com

GREGG

URS

Site : Roseville Energy Facility, LLC
Location : CPT-01

Geologist: J. Springer
Date : 06:07:01 10:26



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Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

URS

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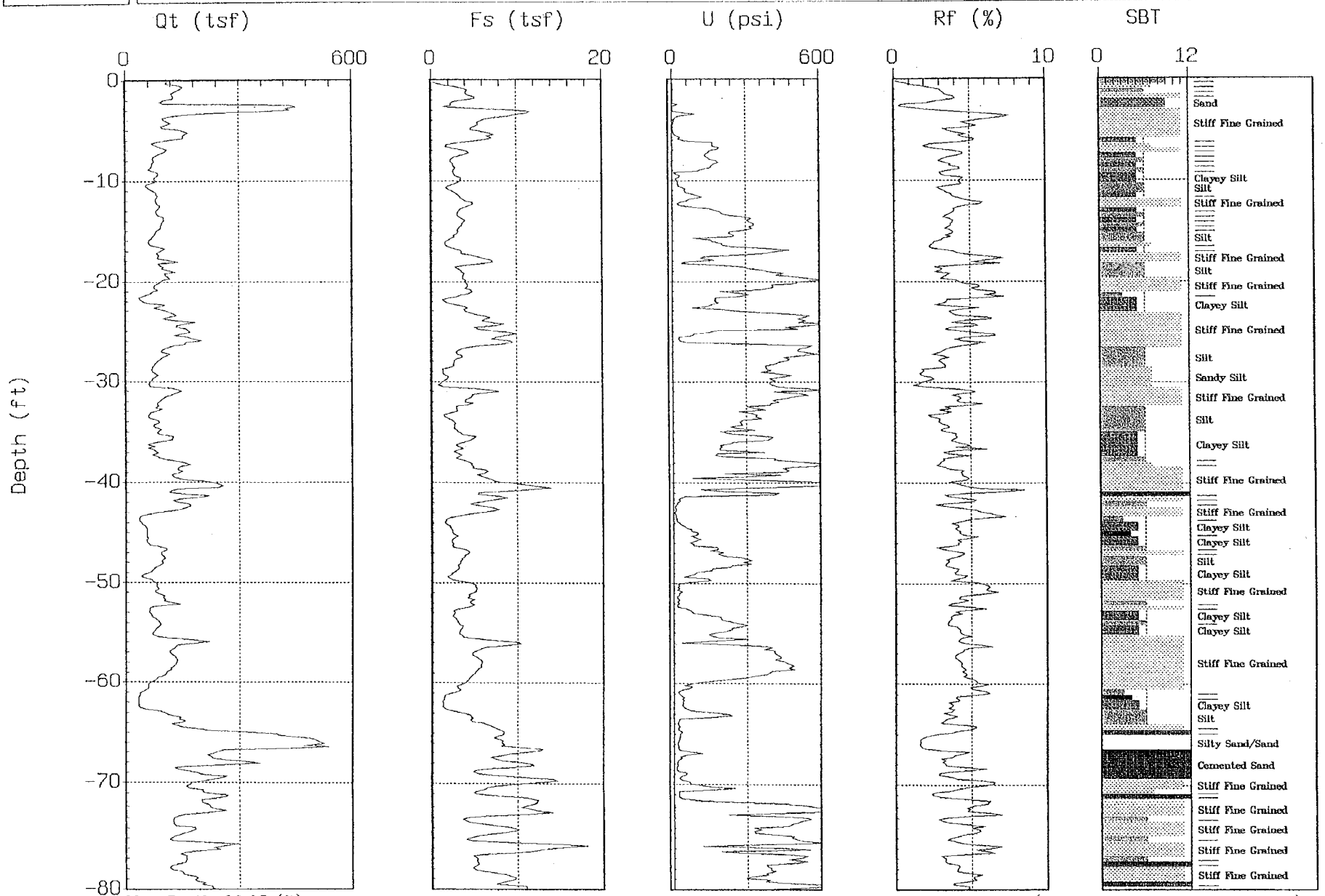
Location : CPT-02

Geologist: J. Springer
Date : 06:07:01 12:38



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Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

URS

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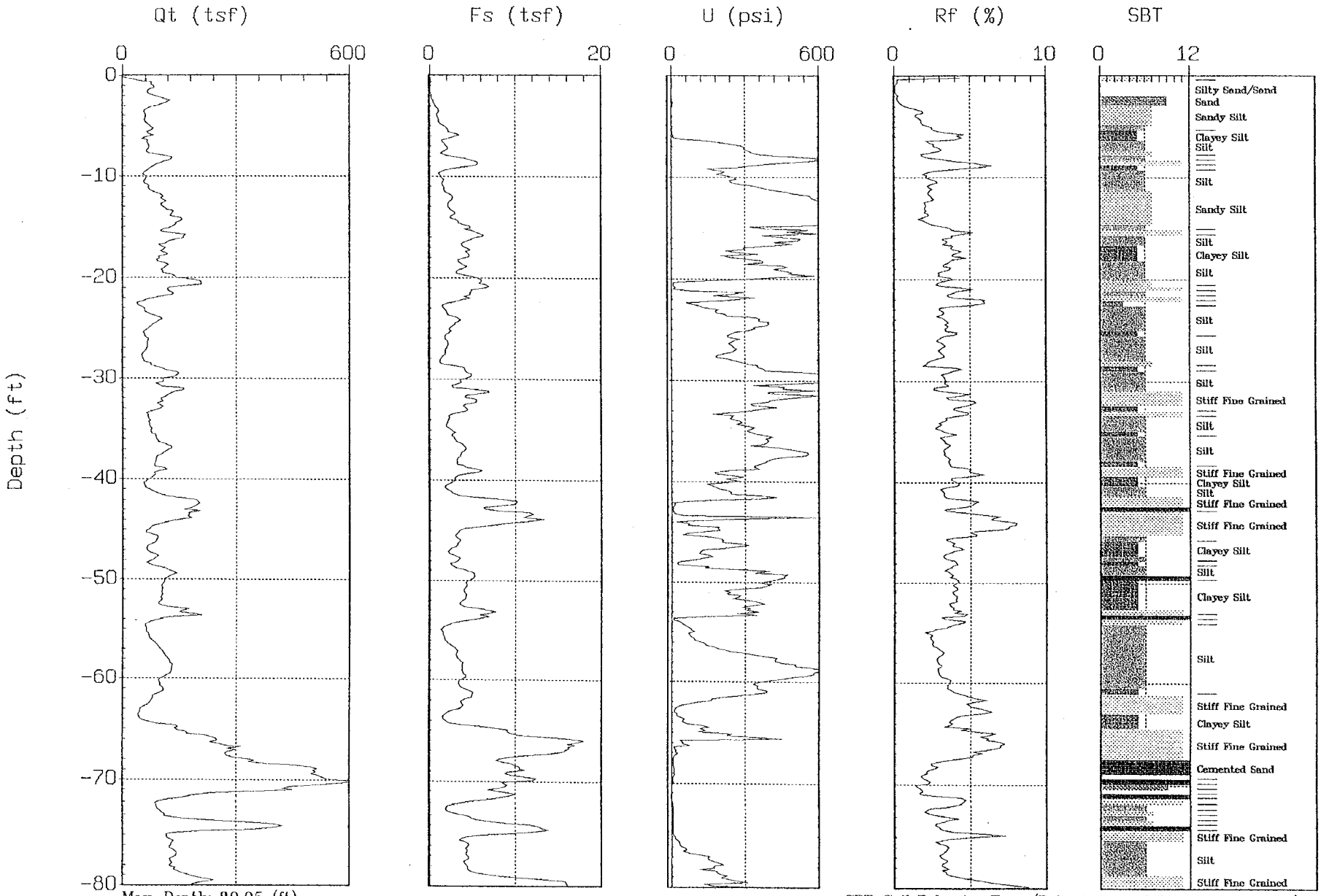

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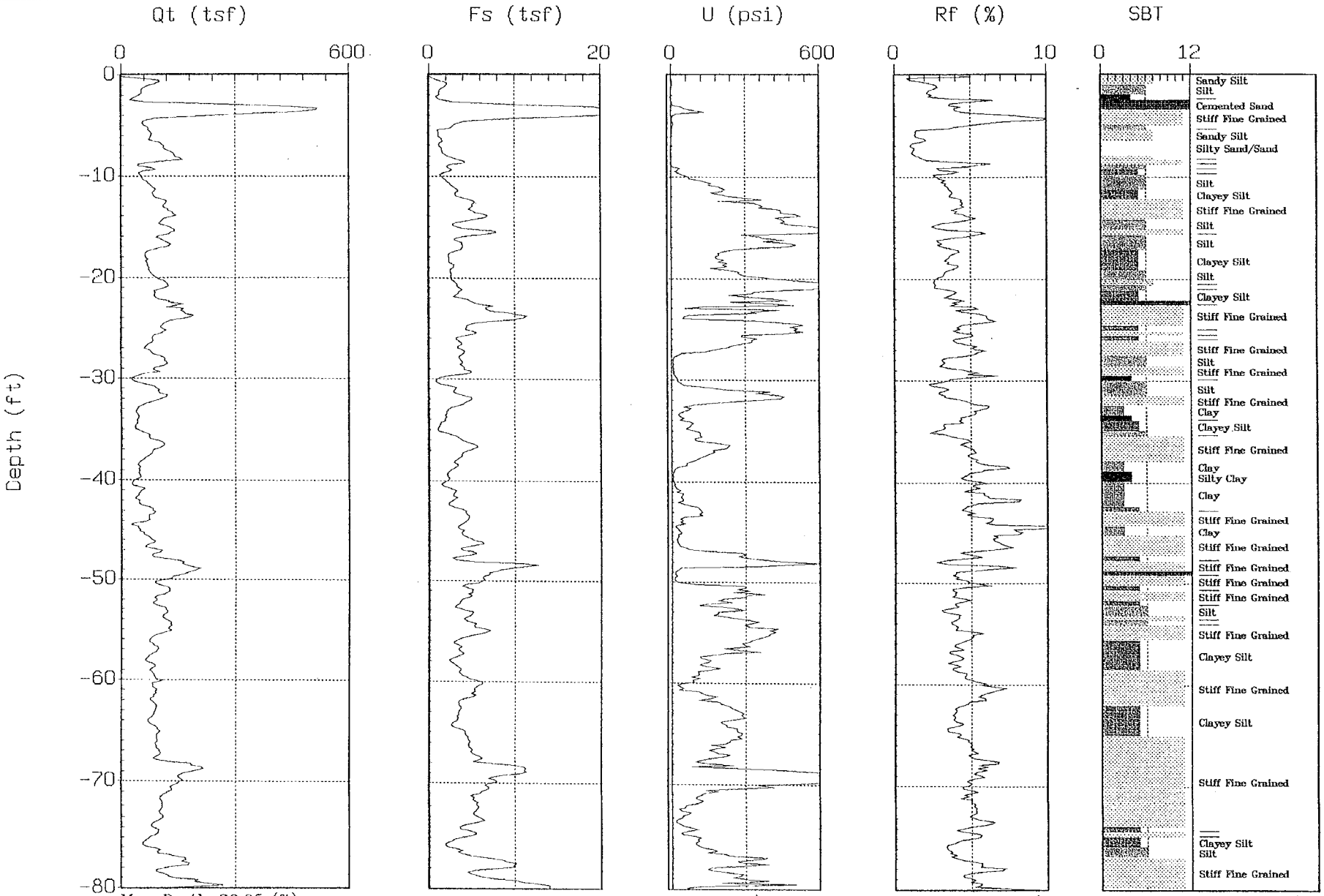

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Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

URS

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Geologist: J. Springer
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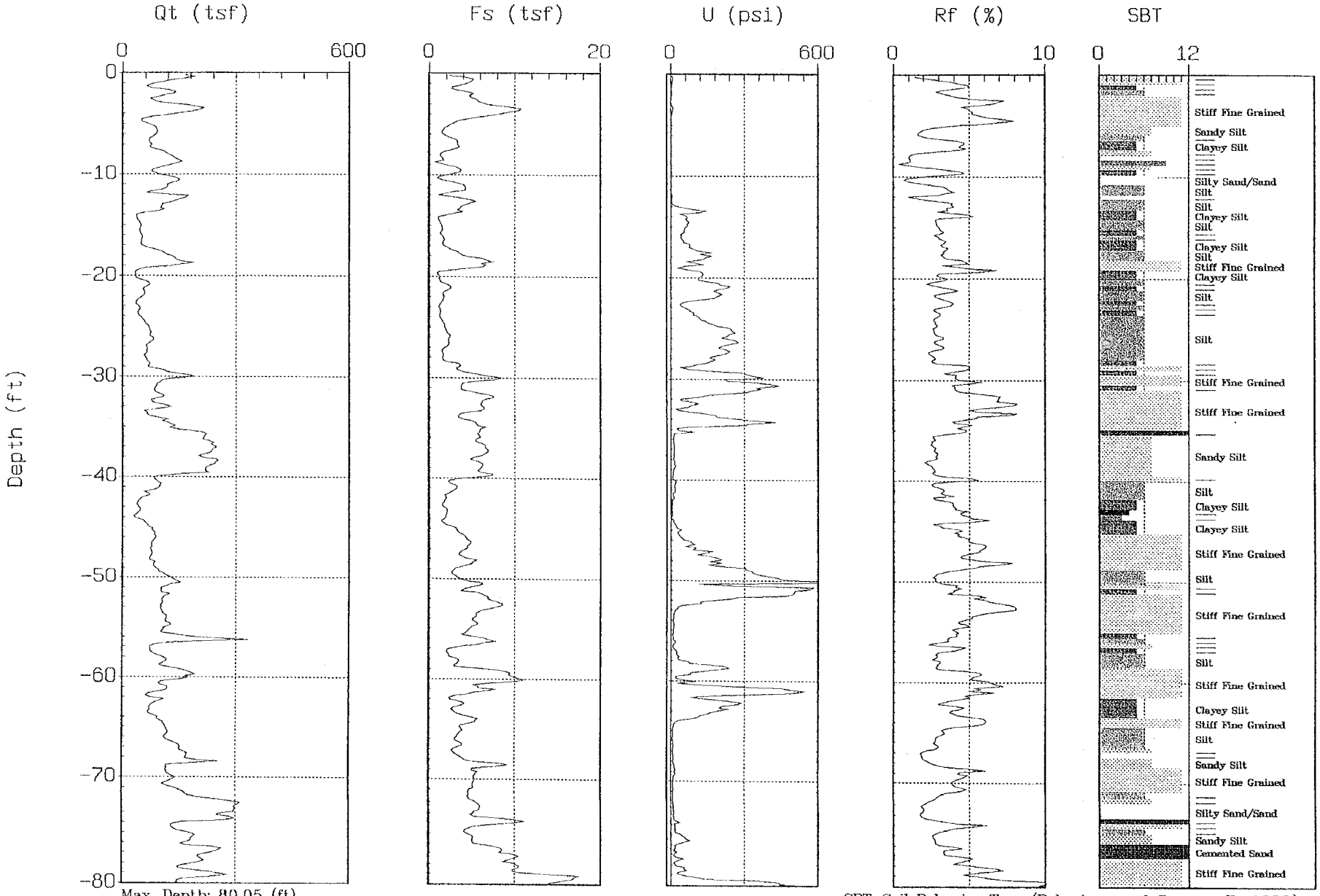

Max. Depth: 80.05 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

GREGG

URS

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Location : CPT-06

Geologist: J. Springer
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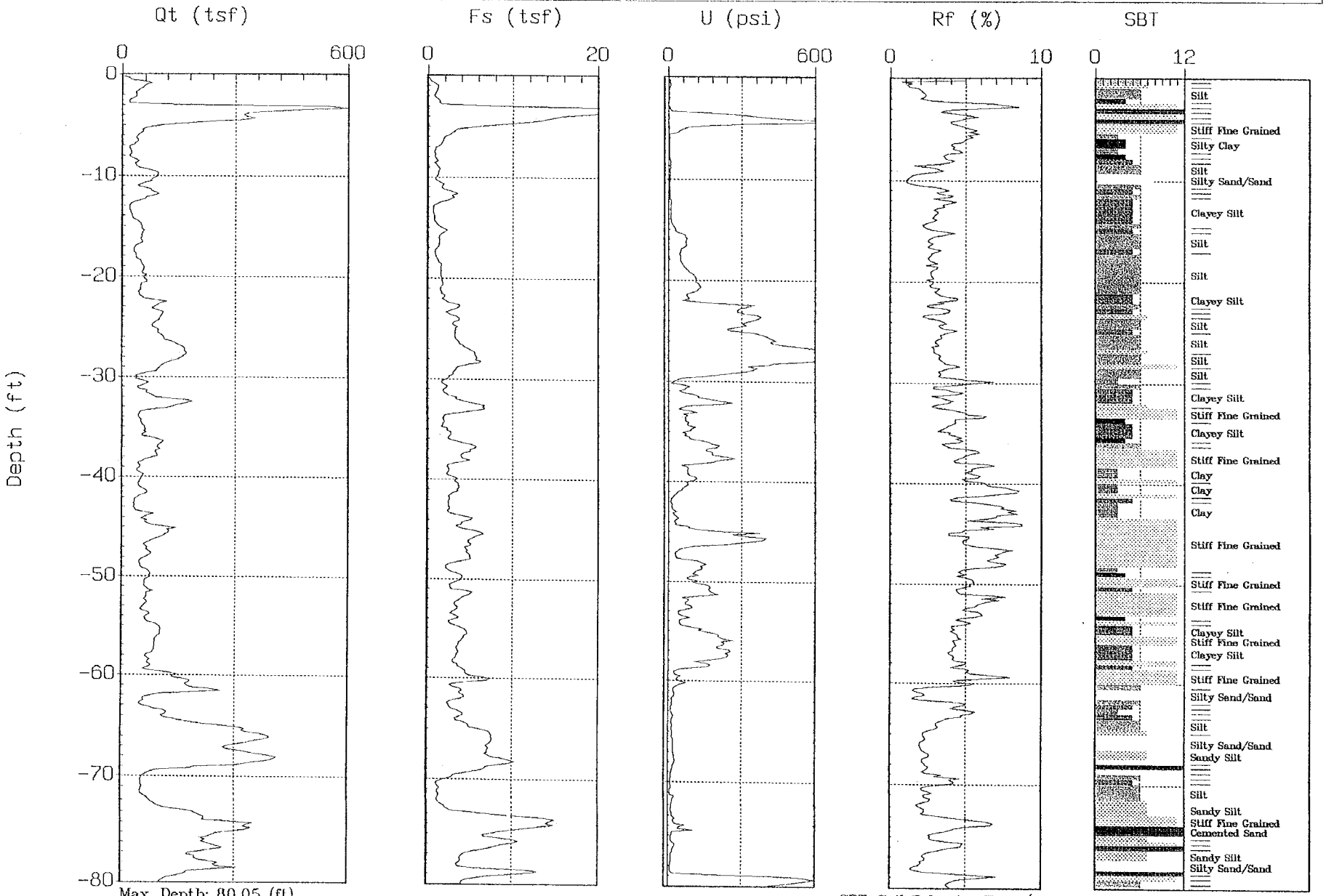

Max. Depth: 80.05 (ft)

Depth Inc.: 0.164 (ft)

SBT: Soil Behavior Type (Robertson and Campanella 1988)

URS

Site:Roseville Energy Geologist: J.Springer
Location:CPT-01 Date:06:07:01 10:26

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(ft): 79.23
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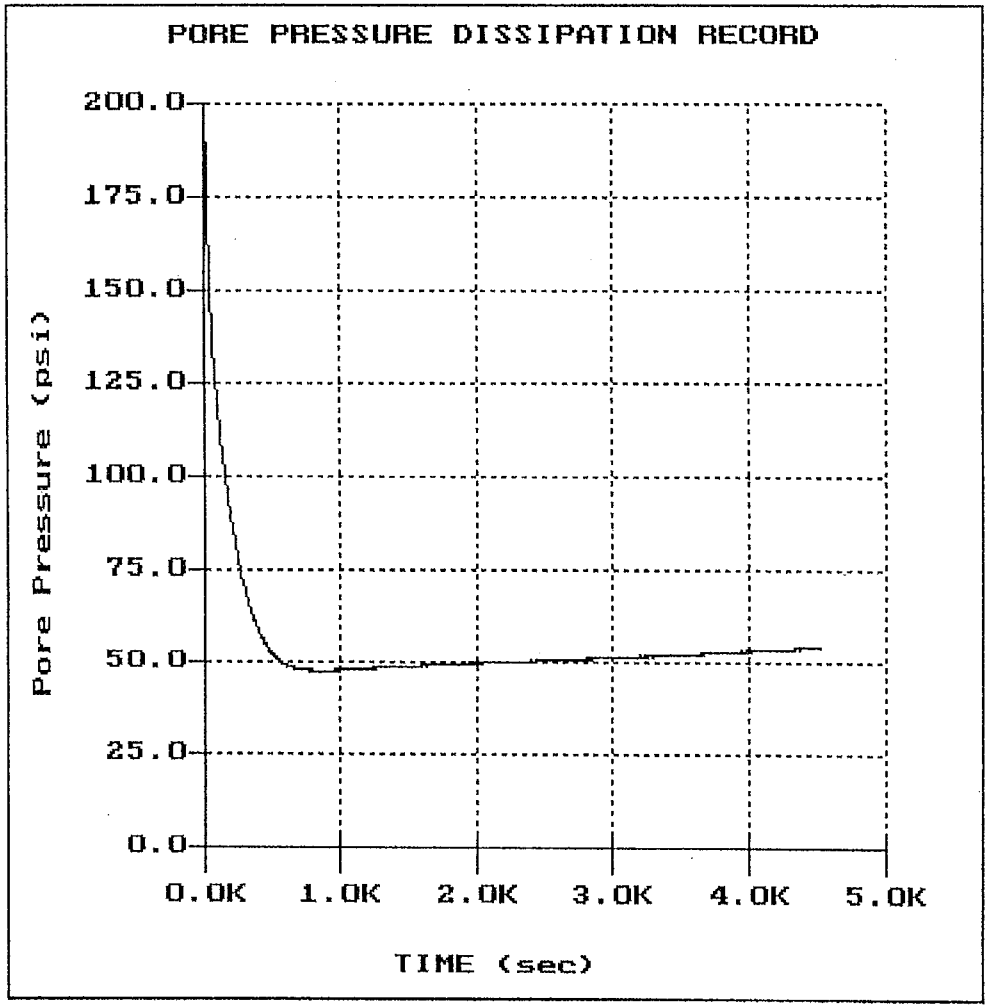


Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
36.91	11.25	75.003	3.166	4.2	2.235	0.000	35.9	24.0	24.0	48.0	4.851	0.00	0.0	0.0	6.0	5
37.89	11.55	133.637	4.077	3.1	2.291	0.000	51.2	33.8	20.0	53.8	8.756	0.00	63.1	40.0	6.0	6
38.88	11.85	135.215	5.826	4.3	2.352	0.000	129.5	84.4	70.3	154.7	0.000	0.00	63.0	40.0	1.0	11
39.86	12.15	205.630	8.972	4.4	2.416	0.000	196.9	126.7	0.0	126.7	0.000	0.00	74.7	42.0	1.0	11
40.85	12.45	166.363	8.803	5.3	2.480	0.000	159.3	101.2	89.9	191.1	0.000	0.00	68.2	40.0	1.0	11
41.83	12.75	156.075	6.380	4.1	2.544	0.000	149.5	93.7	69.7	163.4	0.000	0.00	66.0	40.0	1.0	11
42.81	13.05	105.003	5.791	5.5	2.609	0.000	100.6	62.3	0.0	62.3	0.000	0.00	54.3	38.0	1.0	11
43.80	13.35	40.146	1.791	4.5	2.669	0.000	25.6	15.7	0.0	15.7	2.498	0.00	0.0	0.0	3.0	4
44.78	13.65	54.449	2.411	4.4	2.725	0.000	26.1	15.8	0.0	15.8	3.448	0.00	0.0	0.0	6.0	5
45.77	13.95	57.019	2.396	4.2	2.782	0.000	27.3	16.4	0.0	16.4	3.616	0.00	0.0	0.0	6.0	5
46.75	14.25	97.563	3.711	3.8	2.838	0.000	46.7	27.7	27.7	55.5	6.315	0.00	0.0	0.0	6.0	5
47.74	14.55	97.052	3.360	3.5	2.895	0.000	37.2	21.9	21.9	43.7	6.277	0.00	50.6	36.0	6.0	6
48.72	14.85	66.613	2.693	4.0	2.951	0.000	31.9	18.6	0.0	18.6	4.244	0.00	0.0	0.0	6.0	5
49.70	15.15	64.442	3.283	5.1	3.011	0.000	61.7	35.6	0.0	35.6	0.000	0.00	38.3	34.0	1.0	11
50.69	15.45	82.563	4.907	5.9	3.075	0.000	79.1	45.1	0.0	45.1	0.000	0.00	45.1	34.0	1.0	11
51.67	15.75	112.384	4.538	4.0	3.140	0.000	107.6	60.7	60.7	121.5	0.000	0.00	53.6	36.0	1.0	11
52.66	16.05	67.310	3.113	4.6	3.200	0.000	32.2	18.0	0.0	18.0	4.274	0.00	0.0	0.0	6.0	5
53.64	16.35	80.362	2.834	3.5	3.256	0.000	30.8	17.1	17.1	34.1	5.140	0.00	43.5	34.0	6.0	6
54.63	16.65	79.210	3.351	4.2	3.313	0.000	37.9	20.8	0.0	20.8	5.060	0.00	0.0	0.0	6.0	5
55.61	16.95	140.317	6.574	4.7	3.354	0.019	134.4	73.4	73.4	146.8	0.000	0.00	59.0	38.0	1.0	11
56.59	17.25	125.153	5.966	4.8	3.387	0.050	119.9	65.1	65.1	130.3	0.000	0.00	55.6	38.0	1.0	11
57.58	17.55	130.799	5.437	4.2	3.421	0.080	125.3	67.7	67.7	135.5	0.000	0.00	56.7	38.0	1.0	11
58.56	17.85	118.191	5.328	4.5	3.454	0.111	113.2	60.9	60.9	121.8	0.000	0.00	53.7	36.0	1.0	11
59.55	18.15	83.402	4.249	5.1	3.488	0.142	79.9	42.8	0.0	42.8	0.000	0.00	43.5	34.0	1.0	11
[illegible]	18.45	52.753	2.914	5.5	3.521	0.173	50.5	26.9	0.0	26.9	0.000	0.00	30.3	32.0	1.0	11
[illegible]	18.75	33.780	1.333	3.9	3.551	0.203	16.2	8.6	0.0	8.6	2.002	0.00	0.0	0.0	3.0	5
62.42	19.02	48.649	1.702	3.5	3.575	0.232	23.3	12.3	0.0	12.3	2.990	0.00	0.0	0.0	3.0	5
63.32	19.30	129.989	4.439	3.4	3.598	0.260	49.8	26.3	26.3	52.5	8.409	0.00	55.8	38.0	6.0	6
64.30	19.60	163.187	7.167	4.4	3.628	0.290	156.3	82.1	82.1	164.1	0.000	0.00	62.2	38.0	1.0	11
65.29	19.90	429.096	7.948	1.9	3.659	0.321	102.7	53.7	9.9	63.6	0.000	0.00	89.8	42.0	1.0	8
66.27	20.20	456.457	10.130	2.2	3.688	0.352	109.3	56.9	12.2	69.1	0.000	0.00	91.5	42.0	1.0	8
67.26	20.50	235.591	8.357	3.5	3.716	0.383	112.8	58.5	37.0	95.5	0.000	0.00	72.4	40.0	1.0	12
68.24	20.80	228.291	9.152	4.0	3.745	0.413	109.3	56.5	41.6	98.1	0.000	0.00	71.4	40.0	1.0	12
69.22	21.10	216.389	9.518	4.4	3.776	0.444	207.2	106.7	91.3	197.9	0.000	0.00	69.7	40.0	1.0	11
70.21	21.40	177.304	8.125	4.6	3.810	0.475	169.8	87.0	87.0	174.0	0.000	0.00	63.9	38.0	1.0	11
71.19	21.70	224.725	8.945	4.0	3.841	0.506	107.6	54.9	41.8	96.7	0.000	0.00	70.6	40.0	1.0	12
72.18	22.00	220.938	11.764	5.3	3.872	0.536	211.6	107.5	107.5	215.1	0.000	0.00	70.0	40.0	1.0	11
73.16	22.30	128.350	4.733	3.7	3.902	0.567	49.2	24.9	24.9	49.8	8.259	0.00	54.3	36.0	6.0	6
74.15	22.60	163.331	8.621	5.3	3.931	0.598	156.4	78.9	0.0	78.9	0.000	0.00	61.1	38.0	1.0	11
75.13	22.90	167.971	7.127	4.2	3.965	0.629	160.9	80.8	80.8	161.6	0.000	0.00	61.8	38.0	1.0	11
76.11	23.20	205.458	12.345	6.0	3.998	0.659	196.8	98.4	0.0	98.4	0.000	0.00	67.4	38.0	1.0	11
77.10	23.50	154.745	5.188	3.4	4.028	0.690	59.3	29.6	29.3	59.0	10.002	0.00	59.2	38.0	6.0	6
78.08	23.80	134.016	6.061	4.5	4.057	0.721	128.3	64.2	64.2	128.3	0.000	0.00	55.0	36.0	1.0	11
79.07	24.10	191.322	8.830	4.6	4.091	0.751	183.2	91.6	91.6	183.2	0.000	0.00	65.1	38.0	1.0	11

Gregg In Situ, Inc.
pretation Output - Release 1.00.19c
Run No: 01-0608-1532-1601
Job No: 97-100
Client: URS CORP.
Project: Roseville Energy Facility, LLC
Site: Roseville
Location: CPT-03
Geologist: J. Springer
CPT Date: 01/07/06
CPT Time: 14:02
CPT File: 095C03.COR

Water Table (m): 16.76 (ft): 55.0
Averaging Increment (m): 0.30
Su Nkt used: 15.00
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
0.49	0.15	50.583	0.087	0.2	0.030	0.000	12.1	24.2	0.0	24.2	0.000	0.16	95.0	50.0	1.0	8
1.48	0.45	72.387	0.082	0.1	0.089	0.000	17.3	34.7	0.0	34.7	0.000	0.33	92.0	50.0	1.0	8
2.46	0.75	108.075	0.374	0.3	0.150	0.000	20.7	41.4	0.0	41.4	0.000	0.00	95.0	50.0	1.0	9
3.44	1.05	60.723	0.912	1.5	0.209	0.000	19.4	38.8	1.0	39.8	0.000	0.25	74.8	46.0	1.0	7
4.43	1.35	61.462	1.118	1.8	0.267	0.000	19.6	38.0	2.9	40.9	0.000	0.29	71.6	46.0	1.0	7
5.41	1.65	73.488	2.431	3.3	0.324	0.000	28.2	49.4	0.0	49.4	4.878	0.00	74.0	46.0	10.0	6
6.40	1.95	62.083	1.833	3.0	0.381	0.000	23.8	38.6	8.8	47.3	4.113	0.34	66.8	44.0	10.0	6
7.30	2.22	66.459	1.740	2.6	0.432	0.000	25.5	38.7	8.1	46.8	4.402	0.32	67.0	44.0	10.0	6
8.20	2.50	115.334	4.148	3.6	0.484	0.000	44.2	63.5	0.0	63.5	7.657	0.00	81.1	46.0	10.0	6
9.19	2.80	69.234	2.808	4.1	0.540	0.000	33.2	45.1	0.0	45.1	4.580	0.00	0.0	0.0	10.0	5
10.17	3.10	57.845	1.423	2.5	0.597	0.000	22.2	28.7	8.7	37.3	3.817	0.23	58.4	42.0	10.0	6
11.15	3.40	73.482	1.692	2.3	0.654	0.000	23.5	29.0	7.1	36.1	0.000	0.28	63.9	42.0	1.0	7
12.14	3.70	106.935	2.473	2.3	0.712	0.000	34.1	40.5	7.5	47.9	0.000	0.00	73.4	44.0	1.0	7
13.21	4.02	117.978	2.493	2.1	0.775	0.000	37.7	42.8	6.9	49.7	0.000	0.00	75.1	44.0	1.0	7
14.27	4.35	145.223	3.082	2.1	0.837	0.000	46.4	50.7	7.2	57.8	0.000	0.00	79.9	44.0	1.0	7
15.26	4.65	125.518	5.056	4.0	0.899	0.000	120.2	126.8	0.0	126.8	0.000	0.00	74.7	44.0	1.0	11
16.24	4.95	131.771	4.593	3.5	0.959	0.000	50.5	51.6	0.0	51.6	8.721	0.00	75.2	44.0	10.0	6
17.22	5.25	109.999	4.377	4.0	1.015	0.000	52.7	52.3	0.0	52.3	7.266	0.00	0.0	0.0	10.0	5
18.21	5.55	100.877	3.732	3.7	1.072	0.000	38.6	37.3	17.3	54.6	6.654	0.00	65.9	42.0	10.0	6
19.19	5.85	111.451	3.602	3.2	1.128	0.000	42.7	40.2	15.6	55.8	7.355	0.00	68.0	42.0	10.0	6
20.18	6.15	181.421	5.811	3.2	1.184	0.000	69.5	63.9	0.0	63.9	12.016	0.00	81.3	44.0	10.0	6
21.16	6.45	129.449	5.381	4.2	1.245	0.000	124.0	111.1	0.0	111.1	0.000	0.00	70.9	42.0	1.0	11
22.15	6.75	62.061	3.169	5.1	1.309	0.000	59.4	52.0	52.0	103.9	0.000	0.00	49.1	38.0	1.0	11
23.13	7.05	59.177	1.811	3.1	1.369	0.000	22.7	19.4	15.4	34.8	3.854	0.00	47.1	38.0	6.0	6
24.11	7.35	93.064	3.163	3.4	1.426	0.000	35.6	29.9	17.6	47.5	6.109	0.00	59.5	40.0	10.0	6
25.10	7.65	63.944	2.309	3.6	1.482	0.000	30.6	25.2	23.4	48.6	4.164	0.00	0.0	0.0	6.0	5
26.08	7.95	63.287	1.943	3.1	1.538	0.000	24.2	19.5	16.4	36.0	4.117	0.00	47.4	38.0	6.0	6
27.07	8.25	60.920	1.898	3.1	1.595	0.000	23.3	18.5	17.0	35.5	3.955	0.00	45.8	38.0	6.0	6
28.05	8.55	56.860	1.345	2.4	1.651	0.000	21.8	17.0	13.7	30.6	3.681	0.40	43.3	36.0	6.0	6
29.04	8.85	112.358	4.065	3.6	1.708	0.000	43.0	32.9	20.4	53.4	7.377	0.00	62.3	40.0	10.0	6
30.02	9.15	114.096	3.893	3.4	1.764	0.000	43.7	32.9	19.6	52.5	7.489	0.00	62.3	40.0	10.0	6
31.00	9.45	131.476	4.884	3.7	1.820	0.000	50.4	37.3	21.8	59.2	8.644	0.00	65.9	40.0	10.0	6
31.99	9.75	106.235	4.783	4.5	1.881	0.000	101.6	74.1	65.7	139.8	0.000	0.00	59.3	40.0	1.0	11
32.97	10.05	87.867	3.794	4.3	1.941	0.000	42.1	30.2	30.2	60.4	5.728	0.00	0.0	0.0	6.0	5
33.96	10.35	67.903	2.145	3.2	1.997	0.000	26.0	18.4	18.4	36.8	4.394	0.00	45.6	36.0	6.0	6
34.94	10.65	73.570	2.493	3.4	2.054	0.000	28.2	19.7	19.7	39.3	4.768	0.00	47.5	38.0	6.0	6
35.92	10.95	91.681	3.094	3.4	2.110	0.000	35.1	24.2	21.0	45.1	5.971	0.00	53.5	38.0	6.0	6

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
36.91	11.25	119.292	3.963	3.3	2.166	0.000	45.7	31.0	21.0	52.0	7.808	0.00	60.6	40.0	6.0	6
37.89	11.55	90.236	3.268	3.6	2.223	0.000	34.6	23.2	23.1	46.3	5.868	0.00	52.3	38.0	6.0	6
38.88	11.85	95.132	4.912	5.2	2.283	0.000	91.1	60.3	0.0	60.3	0.000	0.00	53.4	38.0	1.0	11
39.86	12.15	71.004	2.822	4.0	2.343	0.000	34.0	22.2	22.2	44.4	4.577	0.00	0.0	0.0	6.0	5
40.85	12.45	68.190	2.202	3.2	2.400	0.000	26.1	16.9	16.9	33.7	4.386	0.00	43.1	36.0	6.0	6
41.83	12.75	160.079	7.857	4.9	2.460	0.000	153.3	97.7	82.7	180.4	0.000	0.00	67.2	40.0	1.0	11
42.81	13.05	184.963	8.711	4.7	2.524	0.000	177.1	111.5	81.3	192.8	0.000	0.00	71.0	40.0	1.0	11
43.80	13.35	154.062	11.160	7.2	2.589	0.000	147.5	91.7	0.0	91.7	0.000	0.00	65.4	40.0	1.0	11
44.78	13.65	72.935	4.426	6.1	2.653	0.000	69.8	42.9	0.0	42.9	0.000	0.00	43.6	36.0	1.0	11
45.77	13.95	87.080	3.258	3.7	2.713	0.000	41.7	25.3	25.3	50.6	5.624	0.00	0.0	0.0	6.0	5
46.75	14.25	66.752	2.563	3.8	2.769	0.000	32.0	19.2	19.2	38.4	4.265	0.00	0.0	0.0	6.0	5
47.74	14.55	80.764	3.042	3.8	2.826	0.000	38.7	23.0	23.0	46.0	5.196	0.00	0.0	0.0	6.0	5
48.72	14.85	101.450	3.676	3.6	2.882	0.000	38.9	22.9	22.9	45.8	6.571	0.00	51.9	36.0	6.0	6
49.70	15.15	120.779	4.790	4.0	2.943	0.000	115.7	67.4	67.4	134.9	0.000	0.00	56.6	38.0	1.0	11
50.69	15.45	104.181	4.123	4.0	3.003	0.000	49.9	28.8	28.8	57.6	6.745	0.00	0.0	0.0	6.0	5
51.67	15.75	102.203	4.003	3.9	3.059	0.000	48.9	28.0	28.0	56.0	6.610	0.00	0.0	0.0	6.0	5
52.66	16.05	126.501	5.236	4.1	3.120	0.000	121.1	68.6	68.6	137.2	0.000	0.00	57.1	38.0	1.0	11
53.64	16.35	142.914	5.562	3.9	3.181	0.000	68.4	38.4	36.9	75.2	0.000	0.00	60.3	38.0	1.0	12
54.63	16.65	62.360	1.743	2.8	3.239	0.000	23.9	13.3	13.3	26.5	3.941	0.00	36.3	32.0	6.0	6
55.61	16.95	68.327	1.671	2.4	3.277	0.019	26.2	14.5	14.5	28.9	4.335	0.00	38.7	34.0	6.0	6
56.59	17.25	92.094	2.738	3.0	3.302	0.050	35.3	19.4	19.4	38.8	5.916	0.00	47.2	36.0	6.0	6
57.58	17.55	112.991	3.233	2.9	3.328	0.080	43.3	23.7	23.0	46.8	7.306	0.00	52.9	36.0	6.0	6
58.56	17.85	128.016	3.764	2.9	3.354	0.111	49.0	26.8	23.5	50.2	8.303	0.00	56.4	38.0	6.0	6
59.55	18.15	115.542	3.911	3.4	3.379	0.142	44.3	24.1	24.1	48.2	7.468	0.00	53.3	36.0	6.0	6
3	18.45	99.326	3.684	3.7	3.405	0.173	38.0	20.6	20.6	41.2	6.383	0.00	48.9	36.0	6.0	6
61.51	18.75	88.296	4.569	5.2	3.435	0.203	84.6	45.6	0.0	45.6	0.000	0.00	45.4	34.0	1.0	11
62.42	19.02	65.568	3.643	5.6	3.465	0.232	62.8	33.7	0.0	33.7	0.000	0.00	36.7	32.0	1.0	11
63.32	19.30	43.184	1.853	4.3	3.492	0.260	27.6	14.8	0.0	14.8	2.629	0.00	0.0	0.0	3.0	4
64.30	19.60	90.406	4.058	4.5	3.522	0.290	86.6	46.1	0.0	46.1	0.000	0.00	45.7	34.0	1.0	11
65.29	19.90	177.940	11.185	6.3	3.555	0.321	170.4	90.4	0.0	90.4	0.000	0.00	65.0	38.0	1.0	11
66.27	20.20	261.005	16.782	6.4	3.589	0.352	250.0	132.0	0.0	132.0	0.000	0.00	75.8	40.0	1.0	11
67.26	20.50	281.209	12.479	4.4	3.622	0.383	269.3	141.5	92.7	234.2	0.000	0.00	77.8	40.0	1.0	11
68.24	20.80	390.170	9.421	2.4	3.653	0.413	93.4	48.9	13.2	62.1	0.000	0.00	87.1	42.0	1.0	8
69.22	21.10	513.368	10.280	2.0	3.682	0.444	122.9	64.1	10.7	74.8	0.000	0.00	94.9	44.0	1.0	8
70.21	21.40	538.390	9.174	1.7	3.711	0.475	128.9	66.9	8.7	75.6	0.000	0.00	95.0	44.0	1.0	8
71.19	21.70	296.515	8.317	2.8	3.740	0.506	142.0	73.4	30.4	103.8	0.000	0.00	78.9	42.0	1.0	12
72.18	22.00	94.579	2.663	2.8	3.767	0.536	36.2	18.7	18.7	37.3	6.018	0.00	46.1	34.0	6.0	6
73.16	22.30	147.073	4.757	3.2	3.792	0.567	56.3	28.9	27.4	56.3	9.514	0.00	58.6	38.0	6.0	6
74.15	22.60	353.678	12.098	3.4	3.820	0.598	169.4	86.7	37.8	124.5	0.000	0.00	83.7	42.0	1.0	12
75.13	22.90	123.930	5.211	4.2	3.851	0.629	118.7	60.5	60.5	121.0	0.000	0.00	53.5	36.0	1.0	11
76.11	23.20	129.626	4.377	3.4	3.880	0.659	49.7	25.2	25.2	50.4	8.339	0.00	54.7	36.0	6.0	6
77.10	23.50	134.135	4.292	3.2	3.906	0.690	51.4	26.0	26.0	52.0	8.636	0.00	55.5	36.0	6.0	6
78.08	23.80	132.853	4.387	3.3	3.932	0.721	50.9	25.7	25.7	51.3	8.547	0.00	55.2	36.0	6.0	6
79.07	24.10	192.844	10.036	5.2	3.961	0.751	184.7	92.8	92.8	185.6	0.000	0.00	65.8	38.0	1.0	11

Gregg In Situ, Inc.

rpretation Output - Release 1.00.19c

k No: 01-0608-1532-1612

Job No: 97-100

Client: URS CORP.

Project: Roseville Energy Facility, LLC

Site: Roseville

Location: CPT-04

Geologist: J. Springer

CPT Date: 01/07/06

CPT Time: 14:58

CPT File: 095C04.COR

Water Table (m): 16.76 (ft): 55.0

Averaging Increment (m): 0.30

Su Nkt used: 15.00

Phi Method : Robertson and Campanella, 1983

Dr Method : Jamiolkowski - All Sands

Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
0.49	0.15	68.870	1.231	1.8	0.029	0.000	22.0	44.0	0.0	44.0	0.000	0.00	95.0	50.0	1.0	7
1.48	0.45	54.428	1.332	2.4	0.086	0.000	20.8	41.7	0.0	41.7	3.623	0.00	84.4	50.0	10.0	6
2.46	0.75	112.997	4.222	3.7	0.143	0.000	43.3	86.6	0.0	86.6	7.524	0.00	95.0	50.0	10.0	6
3.44	1.05	425.428	20.201	4.7	0.203	0.000	407.4	0.0	0.0	0.0	0.000	0.00	95.0	50.0	1.0	11
4.43	1.35	80.626	6.781	8.4	0.267	0.000	77.2	149.4	0.0	149.4	0.000	0.00	79.4	46.0	1.0	11
5.41	1.65	73.918	1.564	2.1	0.328	0.000	23.6	41.2	4.3	45.5	0.000	0.39	74.0	46.0	1.0	7
6.40	1.95	87.389	1.335	1.5	0.386	0.000	27.9	44.9	2.4	47.3	0.000	0.39	76.4	46.0	1.0	7
7.30	2.22	121.137	1.450	1.2	0.440	0.000	29.0	43.7	0.3	44.0	0.000	0.00	83.9	46.0	1.0	8
9	2.50	128.758	3.123	2.4	0.494	0.000	41.1	58.5	6.4	64.9	0.000	0.00	84.0	46.0	1.0	7
[illegible]19	2.80	59.707	2.257	3.8	0.551	0.000	28.6	38.5	0.0	38.5	3.944	0.00	0.0	0.0	10.0	5
10.17	3.10	58.176	1.776	3.1	0.607	0.000	22.3	28.6	10.8	39.4	3.838	0.28	58.3	42.0	10.0	6
11.15	3.40	83.572	3.006	3.6	0.664	0.000	40.0	49.1	0.0	49.1	5.527	0.00	0.0	0.0	10.0	5
12.14	3.70	100.385	4.185	4.2	0.724	0.000	96.1	113.0	0.0	113.0	0.000	0.00	71.4	44.0	1.0	11
13.21	4.02	122.376	5.164	4.2	0.793	0.000	117.2	131.6	0.0	131.6	0.000	0.00	75.8	44.0	1.0	11
14.27	4.35	114.858	4.895	4.3	0.863	0.000	110.0	118.4	0.0	118.4	0.000	0.00	72.7	44.0	1.0	11
15.26	4.65	130.159	5.540	4.3	0.927	0.000	124.6	129.5	0.0	129.5	0.000	0.00	75.3	44.0	1.0	11
16.24	4.95	111.214	3.620	3.3	0.988	0.000	42.6	42.9	15.0	57.9	7.348	0.00	69.9	42.0	10.0	6
17.22	5.25	85.599	3.213	3.8	1.044	0.000	41.0	40.1	21.2	61.3	5.637	0.00	0.0	0.0	10.0	5
18.21	5.55	66.299	2.386	3.6	1.100	0.000	31.7	30.3	20.3	50.5	4.347	0.00	0.0	0.0	6.0	5
19.19	5.85	74.327	2.635	3.5	1.157	0.000	35.6	33.1	20.6	53.7	4.878	0.00	0.0	0.0	10.0	5
20.18	6.15	106.120	2.840	2.7	1.213	0.000	40.7	36.9	13.3	50.2	6.994	0.00	65.6	42.0	10.0	6
21.16	6.45	100.016	3.465	3.5	1.269	0.000	38.3	34.0	17.2	51.2	6.583	0.00	63.2	40.0	10.0	6
22.15	6.75	116.087	4.553	3.9	1.326	0.000	55.6	48.3	25.2	73.5	7.651	0.00	0.0	0.0	10.0	5
23.13	7.05	153.506	7.889	5.1	1.386	0.000	147.0	124.9	0.0	124.9	0.000	0.00	74.3	42.0	1.0	11
24.11	7.35	145.229	8.347	5.7	1.450	0.000	139.1	115.5	0.0	115.5	0.000	0.00	72.0	42.0	1.0	11
25.10	7.65	107.883	4.768	4.4	1.515	0.000	103.3	84.0	58.9	142.9	0.000	0.00	62.9	40.0	1.0	11
26.08	7.95	80.756	3.570	4.4	1.575	0.000	38.7	30.8	29.4	60.2	5.279	0.00	0.0	0.0	6.0	5
27.07	8.25	71.036	3.736	5.3	1.635	0.000	68.0	53.2	0.0	53.2	0.000	0.00	49.8	38.0	1.0	11
28.05	8.55	113.725	3.640	3.2	1.696	0.000	43.6	33.5	18.2	51.6	7.469	0.00	62.8	40.0	10.0	6
29.04	8.85	90.029	4.359	4.8	1.756	0.000	86.2	65.1	65.1	130.1	0.000	0.00	55.6	38.0	1.0	11
30.02	9.15	38.393	1.256	3.3	1.816	0.000	18.4	13.6	13.6	27.3	2.438	0.33	0.0	0.0	6.0	5
31.00	9.45	92.100	2.939	3.2	1.873	0.000	35.3	25.8	18.7	44.5	6.015	0.00	55.3	38.0	6.0	6
31.99	9.75	98.047	4.469	4.6	1.933	0.000	93.9	67.5	67.2	134.8	0.000	0.00	56.6	38.0	1.0	11
32.97	10.05	43.830	2.411	5.5	1.992	0.000	42.0	29.7	0.0	29.7	2.789	0.00	0.0	0.0	6.0	3
33.96	10.35	43.054	1.718	4.0	2.048	0.000	20.6	14.4	0.0	14.4	2.734	0.00	0.0	0.0	6.0	5
34.94	10.65	45.706	1.435	3.1	2.104	0.000	21.9	15.1	15.1	30.2	2.907	0.42	0.0	0.0	6.0	5
35.92	10.95	87.574	4.000	4.5	2.165	0.000	83.9	57.0	57.0	114.0	0.000	0.00	51.8	38.0	1.0	11

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
36.91	11.25	93.841	4.735	5.0	2.229	0.000	89.9	60.2	60.2	120.4	0.000	0.00	53.3	38.0	1.0	11
37.89	11.55	58.440	3.315	5.7	2.293	0.000	56.0	37.0	0.0	37.0	0.000	0.00	39.4	34.0	1.0	11
38.88	11.85	46.321	2.565	5.5	2.353	0.000	44.4	28.9	0.0	28.9	2.931	0.00	0.0	0.0	6.0	3
39.86	12.15	38.393	1.956	5.1	2.407	0.000	36.8	23.7	0.0	23.7	2.399	0.00	0.0	0.0	3.0	3
40.85	12.45	47.192	2.571	5.4	2.462	0.000	45.2	28.8	0.0	28.8	2.982	0.00	0.0	0.0	6.0	3
41.83	12.75	43.452	2.692	6.2	2.517	0.000	41.6	26.2	0.0	26.2	2.729	0.00	0.0	0.0	6.0	3
42.81	13.05	77.448	3.742	4.8	2.577	0.000	74.2	46.2	0.0	46.2	0.000	0.00	45.8	36.0	1.0	11
43.80	13.35	63.703	4.322	6.8	2.641	0.000	61.0	37.5	0.0	37.5	0.000	0.00	39.8	34.0	1.0	11
44.78	13.65	44.310	3.649	8.2	2.700	0.000	42.4	25.8	0.0	25.8	2.774	0.00	0.0	0.0	6.0	3
45.77	13.95	74.987	5.127	6.8	2.760	0.000	71.8	43.2	0.0	43.2	0.000	0.00	43.9	34.0	1.0	11
46.75	14.25	82.908	4.625	5.6	2.824	0.000	79.4	47.3	0.0	47.3	0.000	0.00	46.4	36.0	1.0	11
47.74	14.55	113.060	5.062	4.5	2.888	0.000	108.3	63.7	63.7	127.4	0.000	0.00	55.0	38.0	1.0	11
48.72	14.85	183.648	9.416	5.1	2.952	0.000	175.9	102.4	94.4	196.8	0.000	0.00	68.6	40.0	1.0	11
49.70	15.15	133.833	6.335	4.7	3.017	0.000	128.2	73.8	73.8	147.6	0.000	0.00	59.2	38.0	1.0	11
50.69	15.45	113.778	4.574	4.0	3.081	0.000	109.0	62.1	62.1	124.2	0.000	0.00	54.2	38.0	1.0	11
51.67	15.75	99.336	4.204	4.2	3.145	0.000	95.1	53.6	53.6	107.3	0.000	0.00	50.0	36.0	1.0	11
52.66	16.05	102.292	3.744	3.7	3.205	0.000	39.2	21.9	21.9	43.8	6.606	0.00	50.6	36.0	6.0	6
53.64	16.35	115.120	4.544	3.9	3.262	0.000	55.1	30.5	30.5	61.0	7.457	0.00	0.0	0.0	6.0	5
54.63	16.65	128.994	6.041	4.7	3.322	0.000	123.5	67.8	67.8	135.6	0.000	0.00	56.7	38.0	1.0	11
55.61	16.95	89.598	4.163	4.6	3.367	0.019	85.8	46.8	0.0	46.8	0.000	0.00	46.1	34.0	1.0	11
56.59	17.25	87.261	3.432	3.9	3.397	0.050	41.8	22.7	22.7	45.3	5.588	0.00	0.0	0.0	6.0	5
57.58	17.55	73.970	3.027	4.1	3.423	0.080	35.4	19.1	0.0	19.1	4.698	0.00	0.0	0.0	6.0	5
58.56	17.85	79.246	3.323	4.2	3.448	0.111	37.9	20.4	0.0	20.4	5.046	0.00	0.0	0.0	6.0	5
59.55	18.15	89.069	4.638	5.2	3.478	0.142	85.3	45.7	0.0	45.7	0.000	0.00	45.5	34.0	1.0	11
60.53	18.45	86.034	5.545	6.4	3.511	0.173	82.4	44.0	0.0	44.0	0.000	0.00	44.3	34.0	1.0	11
61.51	18.75	83.070	4.374	5.3	3.545	0.203	79.6	42.3	0.0	42.3	0.000	0.00	43.2	34.0	1.0	11
62.42	19.02	88.575	3.535	4.0	3.572	0.232	42.4	22.4	22.4	44.9	5.651	0.00	0.0	0.0	6.0	5
63.32	19.30	83.572	3.316	4.0	3.596	0.260	40.0	21.1	21.1	42.2	5.314	0.00	0.0	0.0	6.0	5
64.30	19.60	79.084	2.979	3.8	3.621	0.290	37.9	19.9	19.9	39.8	5.011	0.00	0.0	0.0	6.0	5
65.29	19.90	95.191	4.317	4.5	3.651	0.321	91.2	47.7	0.0	47.7	0.000	0.00	46.7	34.0	1.0	11
66.27	20.20	91.802	4.706	5.1	3.684	0.352	87.9	45.8	0.0	45.8	0.000	0.00	45.5	34.0	1.0	11
67.26	20.50	96.097	5.453	5.7	3.718	0.383	92.0	47.7	0.0	47.7	0.000	0.00	46.7	34.0	1.0	11
68.24	20.80	167.392	9.294	5.6	3.751	0.413	160.3	82.8	0.0	82.8	0.000	0.00	62.5	38.0	1.0	11
69.22	21.10	166.190	8.723	5.2	3.785	0.444	159.2	81.8	0.0	81.8	0.000	0.00	62.1	38.0	1.0	11
70.21	21.40	143.639	6.959	4.8	3.818	0.475	137.6	70.4	0.0	70.4	0.000	0.00	57.8	38.0	1.0	11
71.19	21.70	113.143	5.442	4.8	3.852	0.506	108.4	55.2	0.0	55.2	0.000	0.00	50.9	36.0	1.0	11
72.18	22.00	103.740	5.437	5.2	3.885	0.536	99.3	50.4	0.0	50.4	0.000	0.00	48.3	34.0	1.0	11
73.16	22.30	99.690	5.709	5.7	3.919	0.567	95.5	48.2	0.0	48.2	0.000	0.00	47.0	34.0	1.0	11
74.15	22.60	89.600	4.357	4.9	3.952	0.598	85.8	43.2	0.0	43.2	0.000	0.00	43.8	34.0	1.0	11
75.13	22.90	69.477	3.143	4.5	3.982	0.629	33.3	16.7	0.0	16.7	4.324	0.00	0.0	0.0	6.0	5
76.11	23.20	83.513	3.029	3.6	4.008	0.659	40.0	20.0	20.0	40.0	5.256	0.00	0.0	0.0	6.0	5
77.10	23.50	157.342	7.630	4.8	4.037	0.690	150.7	75.3	75.3	150.7	0.000	0.00	59.6	38.0	1.0	11
78.08	23.80	119.151	7.022	5.9	4.071	0.721	114.1	57.1	0.0	57.1	0.000	0.00	51.6	36.0	1.0	11
79.07	24.10	167.533	8.758	5.2	4.104	0.751	160.4	80.2	0.0	80.2	0.000	0.00	61.2	38.0	1.0	11

Gregg In Situ, Inc.

? pretation Output - Release 1.00.19c

Ru.. No: 01-0608-1532-1623

Job No: 97-100

Client: URS CORP.

Project: Roseville Energy Facility, LLC

Site: Roseville

Location: CPT-05

Geologist: J. Springer

CPT Date: 01/07/06

CPT Time: 15:49

CPT File: 095C05.COR

Water Table (m): 16.76 (ft): 55.0

Averaging Increment (m): 0.30

Su Nkt used: 15.00

Phi Method : Robertson and Campanella, 1983

Dr Method : Jamiolkowski - All Sands

Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
0.49	0.15	141.540	4.259	3.0	0.028	0.000	54.2	108.4	0.0	108.4	9.434	0.00	95.0	50.0	10.0	6
1.48	0.45	101.496	3.640	3.6	0.085	0.000	38.9	77.8	0.0	77.8	6.761	0.00	95.0	50.0	10.0	6
2.46	0.75	95.432	5.523	5.8	0.145	0.000	91.4	182.8	0.0	182.8	0.000	0.00	93.0	50.0	1.0	11
3.44	1.05	185.624	9.378	5.1	0.209	0.000	177.8	355.5	0.0	355.5	0.000	0.00	95.0	50.0	1.0	11
4.43	1.35	68.479	4.329	6.3	0.273	0.000	65.6	125.5	0.0	125.5	0.000	0.00	74.4	46.0	1.0	11
5.41	1.65	86.647	1.743	2.0	0.334	0.000	27.7	47.8	3.8	51.6	0.000	0.00	78.2	46.0	1.0	7
6.40	1.95	74.701	2.834	3.8	0.392	0.000	35.8	57.2	0.0	57.2	4.954	0.00	0.0	0.0	10.0	5
7.30	2.22	85.222	2.793	3.3	0.443	0.000	32.6	49.0	0.0	49.0	5.652	0.00	73.7	44.0	10.0	6
[illegible]	2.50	135.701	1.275	0.9	0.497	0.000	26.0	36.9	0.0	36.9	0.000	0.00	85.4	46.0	1.0	9
9.19	2.80	105.932	2.880	2.7	0.556	0.000	40.6	54.4	9.7	64.2	7.025	0.00	76.7	44.0	10.0	6
10.17	3.10	123.164	1.823	1.5	0.614	0.000	29.5	37.6	2.4	40.0	0.000	0.00	79.6	46.0	1.0	8
11.15	3.40	111.361	3.789	3.4	0.672	0.000	42.7	52.0	0.0	52.0	7.379	0.00	75.4	44.0	10.0	6
12.14	3.70	135.393	3.173	2.3	0.729	0.000	43.2	50.6	7.6	58.2	0.000	0.00	79.9	44.0	1.0	7
13.21	4.02	100.406	3.789	3.8	0.791	0.000	48.1	54.1	0.0	54.1	6.641	0.00	0.0	0.0	10.0	5
14.27	4.35	39.312	1.283	3.3	0.852	0.000	18.8	20.4	16.1	36.5	2.564	0.35	0.0	0.0	6.0	5
15.26	4.65	46.278	1.413	3.1	0.908	0.000	17.7	18.6	12.6	31.2	3.025	0.30	45.9	38.0	6.0	6
16.24	4.95	49.834	1.596	3.2	0.965	0.000	23.9	24.3	16.9	41.2	3.258	0.36	0.0	0.0	6.0	5
17.22	5.25	75.733	2.519	3.3	1.021	0.000	29.0	28.7	14.8	43.5	4.981	0.00	58.4	40.0	10.0	6
18.21	5.55	143.962	5.841	4.1	1.082	0.000	137.9	132.6	0.0	132.6	0.000	0.00	76.0	44.0	1.0	11
19.19	5.85	76.612	3.624	4.7	1.146	0.000	73.4	68.6	54.5	123.0	0.000	0.00	57.1	40.0	1.0	11
20.18	6.15	46.397	1.286	2.8	1.206	0.000	17.8	16.2	13.3	29.5	3.013	0.38	42.0	38.0	6.0	6
21.16	6.45	60.608	2.107	3.5	1.262	0.000	29.0	25.8	20.8	46.7	3.956	0.00	0.0	0.0	6.0	5
22.15	6.75	44.808	1.545	3.4	1.319	0.000	21.5	18.7	18.7	37.4	2.899	0.00	0.0	0.0	6.0	5
23.13	7.05	41.363	1.226	3.0	1.375	0.000	15.8	13.5	13.5	27.0	2.666	0.00	36.8	36.0	6.0	6
24.11	7.35	49.698	1.387	2.8	1.432	0.000	19.0	15.9	14.7	30.6	3.218	0.00	41.5	36.0	6.0	6
25.10	7.65	69.360	1.888	2.7	1.488	0.000	26.6	21.8	14.5	36.3	4.525	0.42	50.5	38.0	6.0	6
26.08	7.95	76.548	2.302	3.0	1.544	0.000	29.3	23.6	16.1	39.7	5.000	0.00	52.8	38.0	6.0	6
27.07	8.25	63.579	1.749	2.8	1.601	0.000	24.4	19.3	15.2	34.5	4.132	0.00	46.9	38.0	6.0	6
28.05	8.55	62.066	1.920	3.1	1.657	0.000	23.8	18.5	17.3	35.7	4.027	0.00	45.7	38.0	6.0	6
29.04	8.85	86.857	3.699	4.3	1.714	0.000	41.6	31.8	29.5	61.3	5.676	0.00	0.0	0.0	6.0	5
30.02	9.15	141.683	6.434	4.5	1.774	0.000	135.7	101.9	66.5	168.4	0.000	0.00	68.4	42.0	1.0	11
31.00	9.45	88.288	4.160	4.7	1.838	0.000	84.6	62.4	62.4	124.7	0.000	0.00	54.4	38.0	1.0	11
31.99	9.75	93.368	6.756	7.2	1.902	0.000	89.4	64.8	0.0	64.8	0.000	0.00	55.5	38.0	1.0	11
32.97	10.05	95.087	5.924	6.2	1.966	0.000	91.1	64.9	0.0	64.9	0.000	0.00	55.5	38.0	1.0	11
33.96	10.35	87.091	4.088	4.7	2.031	0.000	83.4	58.5	58.5	117.1	0.000	0.00	52.5	38.0	1.0	11
34.94	10.65	139.872	5.924	4.2	2.095	0.000	134.0	92.6	66.0	158.5	0.000	0.00	65.7	40.0	1.0	11
35.92	10.95	217.716	5.647	2.6	2.156	0.000	69.5	47.3	14.5	61.8	0.000	0.00	77.9	42.0	1.0	7

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
36.91	11.25	240.123	6.636	2.8	2.214	0.000	76.7	51.5	15.8	67.3	0.000	0.00	80.4	42.0	1.0	7
37.89	11.55	227.554	5.625	2.5	2.272	0.000	72.6	48.2	14.2	62.4	0.000	0.00	78.5	42.0	1.0	7
38.88	11.85	230.146	6.046	2.6	2.330	0.000	73.5	48.1	15.2	63.4	0.000	0.00	78.4	42.0	1.0	7
39.86	12.15	120.491	4.655	3.9	2.387	0.000	46.2	29.9	25.3	55.2	7.874	0.00	59.5	38.0	6.0	6
40.85	12.45	93.636	2.895	3.1	2.443	0.000	35.9	22.9	20.9	43.9	6.080	0.00	52.0	38.0	6.0	6
41.83	12.75	56.254	1.901	3.4	2.500	0.000	26.9	17.0	17.0	34.1	3.584	0.00	0.0	0.0	6.0	5
42.81	13.05	41.559	1.799	4.3	2.556	0.000	26.5	16.6	0.0	16.6	2.600	0.00	0.0	0.0	6.0	4
43.80	13.35	39.690	1.746	4.4	2.613	0.000	25.3	15.7	0.0	15.7	2.472	0.00	0.0	0.0	3.0	4
44.78	13.65	68.612	2.717	4.0	2.669	0.000	32.9	20.1	20.1	40.2	4.396	0.00	0.0	0.0	6.0	5
45.77	13.95	85.071	4.219	5.0	2.729	0.000	81.5	49.3	0.0	49.3	0.000	0.00	47.6	36.0	1.0	11
46.75	14.25	76.780	4.351	5.7	2.793	0.000	73.5	44.0	0.0	44.0	0.000	0.00	44.4	36.0	1.0	11
47.74	14.55	74.800	4.294	5.7	2.858	0.000	71.6	42.4	0.0	42.4	0.000	0.00	43.3	34.0	1.0	11
48.72	14.85	86.173	3.639	4.2	2.918	0.000	41.3	24.2	24.2	48.3	5.550	0.00	0.0	0.0	6.0	5
49.70	15.15	117.744	3.365	2.9	2.974	0.000	45.1	26.2	21.5	47.6	7.651	0.00	55.7	38.0	6.0	6
50.69	15.45	125.541	5.086	4.1	3.035	0.000	120.2	69.0	69.0	138.0	0.000	0.00	57.3	38.0	1.0	11
51.67	15.75	109.594	6.559	6.0	3.099	0.000	105.0	59.6	0.0	59.6	0.000	0.00	53.1	36.0	1.0	11
52.66	16.05	103.267	7.722	7.5	3.163	0.000	98.9	55.6	0.0	55.6	0.000	0.00	51.1	36.0	1.0	11
53.64	16.35	111.013	5.383	4.8	3.227	0.000	106.3	59.2	0.0	59.2	0.000	0.00	52.9	36.0	1.0	11
54.63	16.65	117.777	5.166	4.4	3.292	0.000	112.8	62.2	62.2	124.4	0.000	0.00	54.3	36.0	1.0	11
55.61	16.95	145.629	5.171	3.6	3.333	0.019	55.8	30.6	27.7	58.2	9.485	0.00	60.2	38.0	6.0	6
56.59	17.25	152.171	4.850	3.2	3.359	0.050	58.3	31.8	25.1	56.9	9.917	0.00	61.3	38.0	6.0	6
57.58	17.55	88.031	2.518	2.9	3.384	0.080	33.7	18.3	18.3	36.7	5.638	0.00	45.5	34.0	6.0	6
58.56	17.85	111.246	4.073	3.7	3.410	0.111	42.6	23.1	23.1	46.2	7.182	0.00	52.1	36.0	6.0	6
59.55	18.15	171.301	9.760	5.7	3.439	0.142	164.0	88.5	0.0	88.5	0.000	0.00	64.4	38.0	1.0	11
3	18.45	113.018	6.928	6.1	3.473	0.173	108.2	58.1	0.0	58.1	0.000	0.00	52.3	36.0	1.0	11
[illegible].51	18.75	86.188	3.908	4.5	3.506	0.203	82.5	44.1	0.0	44.1	0.000	0.00	44.4	34.0	1.0	11
62.42	19.02	89.649	3.502	3.9	3.534	0.232	42.9	22.8	22.8	45.7	5.726	0.00	0.0	0.0	6.0	5
63.32	19.30	71.278	3.445	4.8	3.561	0.260	68.3	36.2	0.0	36.2	0.000	0.00	38.7	32.0	1.0	11
64.30	19.60	101.007	4.658	4.6	3.595	0.290	96.7	51.0	0.0	51.0	0.000	0.00	48.6	36.0	1.0	11
65.29	19.90	116.906	3.517	3.0	3.624	0.321	44.8	23.5	23.5	47.1	7.531	0.00	52.7	36.0	6.0	6
66.27	20.20	126.028	3.393	2.7	3.651	0.352	40.2	21.1	19.1	40.1	0.000	0.00	54.7	36.0	1.0	7
67.26	20.50	159.494	3.027	1.9	3.678	0.383	50.9	26.6	14.1	40.6	0.000	0.00	61.4	38.0	1.0	7
68.24	20.80	180.526	6.382	3.5	3.706	0.413	86.4	44.9	36.4	81.3	0.000	0.00	64.8	38.0	1.0	12
69.22	21.10	117.916	5.248	4.5	3.737	0.444	112.9	58.4	58.4	116.8	0.000	0.00	52.5	36.0	1.0	11
70.21	21.40	125.006	5.186	4.1	3.771	0.475	119.7	61.7	61.7	123.3	0.000	0.00	54.0	36.0	1.0	11
71.19	21.70	156.180	4.696	3.0	3.800	0.506	59.8	30.7	25.5	56.2	10.125	0.00	60.3	38.0	6.0	6
72.18	22.00	289.736	5.697	2.0	3.827	0.536	69.4	35.5	11.0	46.5	0.000	0.00	77.9	40.0	1.0	8
73.16	22.30	279.389	6.240	2.2	3.855	0.567	89.2	45.4	16.5	62.0	0.000	0.00	76.8	40.0	1.0	7
74.15	22.60	159.079	6.954	4.4	3.886	0.598	152.3	77.3	77.3	154.6	0.000	0.00	60.5	38.0	1.0	11
75.13	22.90	177.363	4.733	2.7	3.916	0.629	56.6	28.6	19.4	48.0	0.000	0.00	63.5	38.0	1.0	7
76.11	23.20	195.268	6.788	3.5	3.944	0.659	93.5	47.1	37.1	84.1	0.000	0.00	66.2	38.0	1.0	12
77.10	23.50	223.221	9.364	4.2	3.973	0.690	106.9	53.6	44.7	98.3	0.000	0.00	69.9	40.0	1.0	12
78.08	23.80	175.729	9.871	5.6	4.004	0.721	168.3	84.1	0.0	84.1	0.000	0.00	62.9	38.0	1.0	11
79.07	24.10	223.767	14.341	6.4	4.038	0.751	214.3	107.1	0.0	107.1	0.000	0.00	69.7	40.0	1.0	11

Gregg In Situ, Inc.
:pretation Output - Release 1.00.19c
Run No: 01-0608-1532-1639
Job No: 97-100
Client: URS CORP.
Project: Roseville Energy Facility, LLC
Site: Roseville
Location: CPT-06
Geologist: J. Springer
CPT Date: 01/07/06
CPT Time: 16:37
CPT File: 095C06.COR

Water Table (m): 16.76 (ft): 55.0
Averaging Increment (m): 0.30
Su Nkt used: 15.00
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
Used Unit Weights Assigned to Soil Zones

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
0.49	0.15	40.789	0.570	1.4	0.029	0.000	13.0	26.0	0.0	26.0	0.000	0.00	91.7	50.0	1.0	7
1.48	0.45	43.925	0.949	2.2	0.086	0.000	16.8	33.7	0.0	33.7	2.923	0.00	78.2	48.0	10.0	6
2.46	0.75	45.712	2.436	5.3	0.142	0.000	43.8	87.6	0.0	87.6	3.038	0.00	0.0	0.0	10.0	3
3.44	1.05	449.522	19.489	4.3	0.199	0.000	215.2	430.5	0.0	430.5	0.000	0.00	95.0	50.0	1.0	12
4.43	1.35	264.071	11.606	4.4	0.261	0.000	252.9	495.3	0.0	495.3	0.000	0.00	95.0	50.0	1.0	11
5.41	1.65	58.946	3.206	5.4	0.325	0.000	56.5	99.0	0.0	99.0	0.000	0.00	67.6	44.0	1.0	11
6.40	1.95	38.065	1.666	4.4	0.385	0.000	24.3	39.2	0.0	39.2	2.512	0.00	0.0	0.0	10.0	4
7.30	2.22	21.157	0.846	4.0	0.437	0.000	13.5	20.4	18.7	39.1	1.381	0.30	0.0	0.0	6.0	4
8.0	2.50	30.144	0.906	3.0	0.489	0.000	14.4	20.7	11.4	32.1	1.977	0.17	0.0	0.0	10.0	5
9.19	2.80	60.770	1.238	2.0	0.546	0.000	19.4	26.3	5.7	31.9	0.000	0.21	61.1	42.0	1.0	7
10.17	3.10	81.225	1.221	1.5	0.604	0.000	25.9	33.4	4.0	37.4	0.000	0.25	67.9	44.0	1.0	7
11.15	3.40	65.055	2.384	3.7	0.661	0.000	31.2	38.3	16.9	55.3	4.293	0.42	0.0	0.0	10.0	5
12.14	3.70	62.396	2.234	3.6	0.717	0.000	29.9	35.3	16.9	52.2	4.112	0.39	0.0	0.0	10.0	5
13.21	4.02	20.975	0.627	3.0	0.778	0.000	10.0	11.4	11.4	22.8	1.346	0.23	0.0	0.0	6.0	5
14.27	4.35	35.261	0.864	2.4	0.840	0.000	13.5	14.7	9.9	24.7	2.295	0.19	39.3	38.0	6.0	6
15.26	4.65	53.325	1.776	3.3	0.896	0.000	25.5	27.0	17.0	44.0	3.495	0.36	0.0	0.0	6.0	5
16.24	4.95	50.560	1.328	2.6	0.952	0.000	19.4	19.8	11.2	31.1	3.307	0.24	47.8	38.0	6.0	6
17.22	5.25	32.693	0.929	2.8	1.009	0.000	15.7	15.6	15.6	31.2	2.112	0.46	0.0	0.0	6.0	5
18.21	5.55	43.442	1.250	2.9	1.065	0.000	16.6	16.1	12.9	29.0	2.825	0.35	41.9	38.0	6.0	6
19.19	5.85	54.765	1.504	2.7	1.121	0.000	21.0	19.8	12.7	32.5	3.576	0.31	47.8	38.0	6.0	6
20.18	6.15	59.841	1.654	2.8	1.178	0.000	22.9	21.1	13.1	34.2	3.911	0.33	49.6	38.0	6.0	6
21.16	6.45	46.420	1.592	3.4	1.234	0.000	22.2	20.0	20.0	40.0	3.012	0.00	0.0	0.0	6.0	5
22.15	6.75	76.689	2.391	3.1	1.291	0.000	29.4	25.9	15.3	41.2	5.027	0.00	55.4	40.0	6.0	6
23.13	7.05	94.385	2.820	3.0	1.347	0.000	36.2	31.2	15.3	46.4	6.203	0.00	60.7	40.0	10.0	6
24.11	7.35	95.859	3.266	3.4	1.403	0.000	36.7	31.0	17.6	48.6	6.297	0.00	60.6	40.0	10.0	6
25.10	7.65	88.297	3.238	3.7	1.460	0.000	42.3	35.0	23.8	58.8	5.789	0.00	0.0	0.0	6.0	5
26.08	7.95	118.148	3.534	3.0	1.516	0.000	45.3	36.8	16.4	53.1	7.775	0.00	65.5	40.0	10.0	6
27.07	8.25	162.076	5.044	3.1	1.573	0.000	62.1	49.5	17.9	67.4	10.700	0.00	74.0	42.0	10.0	6
28.05	8.55	147.625	5.679	3.8	1.631	0.000	70.7	55.4	27.6	82.9	0.000	0.00	70.8	42.0	1.0	12
29.04	8.85	95.277	3.263	3.4	1.688	0.000	36.5	28.1	19.1	47.2	6.239	0.00	57.8	40.0	6.0	6
30.02	9.15	47.581	2.050	4.3	1.745	0.000	22.8	17.2	0.0	17.2	3.056	0.00	0.0	0.0	6.0	5
31.00	9.45	54.793	2.045	3.7	1.801	0.000	26.2	19.6	19.6	39.1	3.533	0.00	0.0	0.0	6.0	5
31.99	9.75	120.281	3.940	3.3	1.858	0.000	46.1	33.8	19.4	53.2	7.895	0.00	63.1	40.0	10.0	6
32.97	10.05	113.351	5.523	4.9	1.918	0.000	108.6	78.4	72.0	150.4	0.000	0.00	60.9	40.0	1.0	11
33.96	10.35	45.813	1.870	4.1	1.978	0.000	21.9	15.6	0.0	15.6	2.922	0.00	0.0	0.0	6.0	5
34.94	10.65	56.494	2.225	3.9	2.035	0.000	27.1	19.0	19.0	37.9	3.631	0.00	0.0	0.0	6.0	5
35.92	10.95	75.384	3.017	4.0	2.091	0.000	36.1	25.0	25.0	49.9	4.886	0.00	0.0	0.0	6.0	5

Gregg In Situ, Inc.

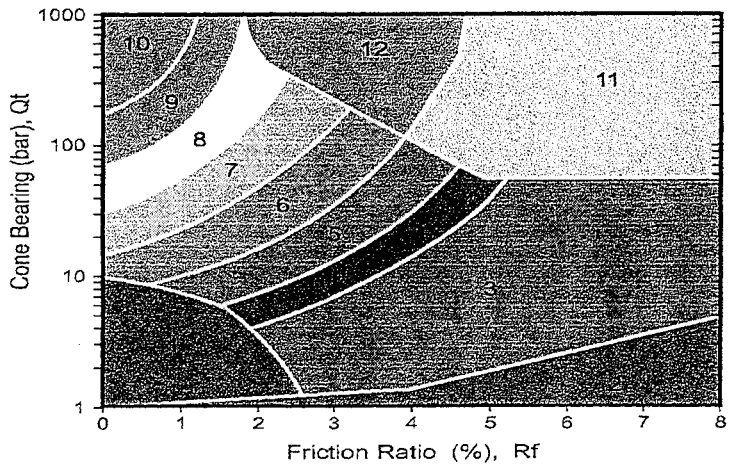
Jo: 01-0608-1532-1639

C.. File: 095C06.COR

Depth (ft)	Depth (m)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	E.Stress (tsf)	Hyd. Pr. (tsf)	N60 (blows/ft)	(N1)60	Delta (N1)60	(N1)60 CS	Su (tsf)	CRR	Dr (%)	Phi (deg)	OCR (ratio)	SBT
36.91	11.25	96.732	5.144	5.3	2.151	0.000	92.6	63.2	0.0	63.2	0.000	0.00	54.7	38.0	1.0	11
37.89	11.55	77.632	4.025	5.2	2.216	0.000	74.3	50.0	0.0	50.0	0.000	0.00	48.0	36.0	1.0	11
38.88	11.85	43.502	2.381	5.5	2.275	0.000	41.7	27.6	0.0	27.6	2.748	0.00	0.0	0.0	6.0	3
39.86	12.15	51.240	3.089	6.0	2.330	0.000	49.1	32.2	0.0	32.2	3.261	0.00	0.0	0.0	6.0	3
40.85	12.45	49.944	3.450	6.9	2.385	0.000	47.8	31.0	0.0	31.0	3.171	0.00	0.0	0.0	6.0	3
41.83	12.75	45.849	2.483	5.4	2.440	0.000	43.9	28.1	0.0	28.1	2.894	0.00	0.0	0.0	6.0	3
42.81	13.05	32.266	2.453	7.6	2.494	0.000	30.9	19.6	0.0	19.6	1.985	0.00	0.0	0.0	3.0	3
43.80	13.35	62.229	4.359	7.0	2.554	0.000	59.6	37.3	0.0	37.3	0.000	0.00	39.6	34.0	1.0	11
44.78	13.65	95.989	4.499	4.7	2.618	0.000	91.9	56.8	56.8	113.6	0.000	0.00	51.7	38.0	1.0	11
45.77	13.95	105.498	5.390	5.1	2.682	0.000	101.0	61.7	0.0	61.7	0.000	0.00	54.0	38.0	1.0	11
46.75	14.25	63.934	4.676	7.3	2.747	0.000	61.2	36.9	0.0	36.9	0.000	0.00	39.4	34.0	1.0	11
47.74	14.55	64.939	4.514	7.0	2.811	0.000	62.2	37.1	0.0	37.1	0.000	0.00	39.5	34.0	1.0	11
48.72	14.85	49.351	2.347	4.8	2.871	0.000	31.5	18.6	0.0	18.6	3.099	0.00	0.0	0.0	6.0	4
49.70	15.15	70.615	3.761	5.3	2.931	0.000	67.6	39.5	0.0	39.5	0.000	0.00	41.3	34.0	1.0	11
50.69	15.45	60.426	2.992	5.0	2.996	0.000	57.9	33.4	0.0	33.4	0.000	0.00	36.5	32.0	1.0	11
51.67	15.75	68.155	4.419	6.5	3.060	0.000	65.3	37.3	0.0	37.3	0.000	0.00	39.6	34.0	1.0	11
52.66	16.05	60.171	3.310	5.5	3.124	0.000	57.6	32.6	0.0	32.6	0.000	0.00	35.8	32.0	1.0	11
53.64	16.35	62.896	3.113	4.9	3.188	0.000	60.2	33.7	0.0	33.7	0.000	0.00	36.7	32.0	1.0	11
54.63	16.65	79.263	3.315	4.2	3.249	0.000	38.0	21.1	0.0	21.1	5.068	0.00	0.0	0.0	6.0	5
55.61	16.95	100.507	4.402	4.4	3.290	0.019	96.3	53.1	53.1	106.1	0.000	0.00	49.7	36.0	1.0	11
56.59	17.25	87.746	3.602	4.1	3.319	0.050	42.0	23.1	23.1	46.1	5.625	0.00	0.0	0.0	6.0	5
57.58	17.55	77.015	3.403	4.4	3.345	0.080	36.9	20.2	0.0	20.2	4.906	0.00	0.0	0.0	6.0	5
58.56	17.85	71.390	3.452	4.8	3.375	0.111	68.4	37.2	0.0	37.2	0.000	0.00	39.6	34.0	1.0	11
59.55	18.15	99.071	5.361	5.4	3.408	0.142	94.9	51.4	0.0	51.4	0.000	0.00	48.8	36.0	1.0	11
60.53	18.45	166.987	4.040	2.4	3.438	0.173	53.3	28.8	16.6	45.3	0.000	0.00	63.7	38.0	1.0	7
61.51	18.75	173.322	4.006	2.3	3.466	0.203	55.3	29.7	16.0	45.7	0.000	0.00	64.6	38.0	1.0	7
62.42	19.02	53.835	2.540	4.7	3.490	0.232	34.4	18.4	0.0	18.4	3.341	0.00	0.0	0.0	3.0	4
63.32	19.30	92.452	3.681	4.0	3.513	0.260	44.3	23.6	23.6	47.2	5.912	0.00	0.0	0.0	6.0	5
64.30	19.60	151.180	4.195	2.8	3.540	0.290	48.3	25.7	19.0	44.7	0.000	0.00	60.4	38.0	1.0	7
65.29	19.90	322.414	7.082	2.2	3.568	0.321	77.2	40.9	11.8	52.7	0.000	0.00	82.0	42.0	1.0	8
66.27	20.20	358.324	7.339	2.0	3.597	0.352	85.8	45.2	11.0	56.3	0.000	0.00	84.9	42.0	1.0	8
67.26	20.50	306.893	7.132	2.3	3.625	0.383	98.0	51.5	16.7	68.2	0.000	0.00	80.3	42.0	1.0	7
68.24	20.80	379.306	8.900	2.3	3.653	0.413	90.8	47.5	12.8	60.3	0.000	0.00	86.3	42.0	1.0	8
69.22	21.10	152.691	4.870	3.2	3.680	0.444	58.5	30.5	26.5	57.0	9.904	0.00	60.1	38.0	6.0	6
70.21	21.40	54.208	1.497	2.8	3.706	0.475	20.8	10.8	10.8	21.6	3.335	0.32	30.3	32.0	3.0	6
71.19	21.70	54.099	1.293	2.4	3.731	0.506	20.7	10.7	10.7	21.5	3.324	0.32	30.2	32.0	3.0	6
72.18	22.00	95.862	1.988	2.1	3.758	0.536	30.6	15.8	15.8	31.6	0.000	0.00	46.5	34.0	1.0	7
73.16	22.30	198.883	9.832	4.9	3.788	0.567	190.5	97.9	97.9	195.7	0.000	0.00	67.3	38.0	1.0	11
74.15	22.60	307.464	13.042	4.2	3.819	0.598	147.2	75.3	45.8	121.1	0.000	0.00	79.6	42.0	1.0	12
75.13	22.90	259.935	8.008	3.1	3.848	0.629	124.5	63.5	33.2	96.7	0.000	0.00	74.7	40.0	1.0	12
76.11	23.20	238.596	8.532	3.6	3.877	0.659	114.2	58.0	38.1	96.1	0.000	0.00	72.2	40.0	1.0	12
77.10	23.50	199.523	4.267	2.1	3.905	0.690	63.7	32.2	16.0	48.2	0.000	0.00	66.9	38.0	1.0	7
78.08	23.80	248.942	5.141	2.1	3.933	0.721	59.6	30.1	11.7	41.7	0.000	0.00	73.2	40.0	1.0	8
79.07	24.10	167.449	8.740	5.2	3.964	0.751	160.4	80.6	0.0	80.6	0.000	0.00	61.7	38.0	1.0	11

CPT Classification Chart
(after Robertson 1990)

Non-Normalized Classification Chart



Zone		Q_t / N	Soil Behaviour Type
1		2	sensitive fine grained
2		1	organic material
3		1	clay
4		1.5	silty clay to clay
5		2	clayey silt to silty clay
6		2.5	sandy silt to clayey silt
7		3	silty sand to sandy silt
8		4	sand to silty sand
9		5	sand
10		6	gravelly sand to sand
11		1	very stiff fine grained *
12		2	sand to clayey sand *

* overconsolidated or cemented

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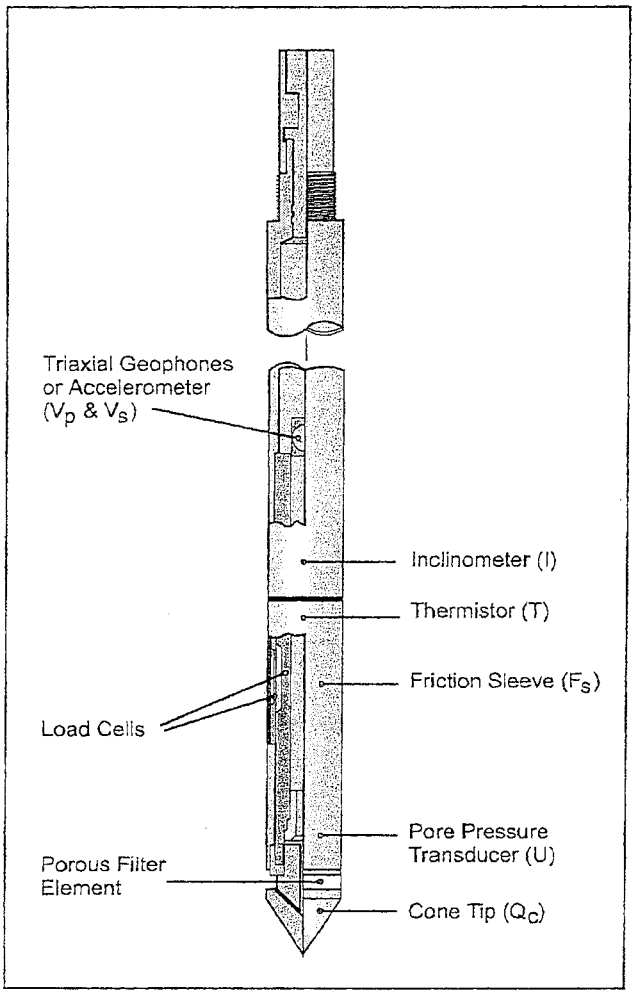
THE PIEZO CONE PENETROMETER



The electrical piezocone (CPTU) is the premier soil logging tool. The CPTU provides a rapid, reliable and economic means of determining soil stratigraphy, relative density, strength and equilibrium groundwater pressures.

Gregg In Situ offers a choice of 2.5, 5, 10 and 15 ton tip (Qc) capacity cones. Our cones also have variable capacity friction sleeves (Fs) and pore pressure (U). The pore pressure can be measured at one of 2 locations, either on the face of the cone tip or behind the cone tip. Pore pressure dissipation data is recorded automatically.

All data is displayed in real time at the ground surface, facilitating the on site decision making process. Field data reduction, plotting and CPT interpretation can be carried out upon request.

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ConeTec

Geotechnical and Environmental Site Investigation Contractors

ConeTec CPT Interpretations as of January 7, 1999 (Release 1.00.19)

ConeTec's interpretation routine should be considered a calculator of current published CPT correlations and is subject to change to reflect the current state of practice. The interpreted values are not considered valid for all soil types. The interpretations are presented only as a guide for geotechnical use and should be carefully scrutinized for consideration in any geotechnical design. Reference to current literature is strongly recommended.

The CPT interpretations are based on values of tip, sleeve friction and pore pressure averaged over a user specified interval (typically 0.25m). Note that Qt is the recorded tip value, Qc, corrected for pore pressure effects. Since all ConeTec cones have equal end area friction sleeves, pore pressure corrections to sleeve friction, Fs, are not required.

The tip correction is: $Qt = Qc + (1-a) \bullet Ud$

where: *Qt* is the corrected tip load
Qc is the recorded tip load
Ud is the recorded dynamic pore pressure
a is the Net Area Ratio for the cone (typically 0.85 for ConeTec cones)

Effective vertical overburden stresses are calculated based on a hydrostatic distribution of equilibrium pore pressures below the water table or from a user defined equilibrium pore pressure profile (this can be obtained from CPT dissipation tests). The stress calculations use unit weights assigned to the Soil Behaviour Type zones or from a user defined unit weight profile.

Details regarding the interpretation methods for all of the interpreted parameters is given in table 1. The appropriate references referred to in table 1 are listed in table 2.

The estimated Soil Behaviour Type is based on the charts developed by Robertson and Campanella shown in figure 1.

Table 1 CPT Interpretation Methods

Interpreted Parameter	Description	Equation	Ref
Depth	mid layer depth		
AvgQt	Averaged corrected tip (Qt)	$AvgQt = \frac{1}{n}\sum_{i=1}^{n} Qt_i$	
AvgFs	Averaged sleeve friction (Fs)	$AvgFs = \frac{1}{n}\sum_{i=1}^{n} Fs_i$	
AvgRf	Averaged friction ratio (Rf)	$AvgRf = 100\% \bullet \frac{AvgFs}{AvgQt}$	
AvgUd	Averaged dynamic pore pressure (Ud)	$AvgUd = \frac{1}{n}\sum_{i=1}^{n} Ud_i$	
SBT	Soil Behavior Type as defined by Robertson and Campanella		1

CPT Interpretations

U.Wt.	Unit Weight of soil determined from: 1) uniform value or 2) value assigned to each SBT zone 3) user supplied unit weight profile		
TStress	Total vertical overburden stress at mid layer depth	$TStress = \sum_{i=1}^{n} \gamma_i h_i$ where γ_i is layer unit weight h_i is layer thickness	
EStress	Effective vertical overburden stress at mid layer depth	$EStress = TStress - Ueq$	
Ueq	Equilibrium pore pressure determined from: 1) hydrostatic from water table depth 2) user supplied profile		
Cn	SPT N_{60} overburden correction factor	$Cn=(\sigma_v')^{-0.5}$ where σ_v' *is in tsf* $0.5 < C_n < 2.0$	
N_{60}	SPT N value at 60% energy calculated from Qt/N ratios assigned to each SBT zone		3
$(N1)_{60}$	SPT N_{60} value corrected for overburden pressure	$N1_{60} = Cn \bullet N_{60}$	3
$\Delta(N1)_{60}$	Equivalent Clean Sand Correction to $(N1)_{60}$	$\Delta(N1)_{60} = \frac{K_{SPT}}{1 - K_{SPT}} \bullet (N1)_{60}$ Where: K_{SPT} is defined as: 0.0 for FC < 5% 0.0167 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	7
$(N1)_{60cs}$	Equivalent Clean Sand $(N1)_{60}$	$(N1)_{60cs} = (N1)_{60} + \Delta(N1)_{60}$	7
Su	Undrained shear strength - Nkt is use selectable	$Su = \frac{Qt - \sigma_v}{N_{kt}}$	2
k	Coefficient of permeability (assigned to each SBT zone)		6
Bq	Pore pressure parameter	$Bq = \frac{\Delta u}{Qt - \sigma_v}$	2
Qtn	Normalized Qt for Soil Behavior Type classification as defined by Robertson, 1990	$Qtn = \frac{Qt - \sigma_v}{\sigma'_v}$	4
Rfn	Normalized Rf for Soil Behavior Type classification as defined by Robertson, 1990	$Rfn = 100\% \bullet \frac{f_s}{Qt - \sigma_v}$	4
SBTn	Normalized Soil Behavior Type (slightly modified from that published by Robertson, 1990. This version includes all the soil zones of the original non-normalized SBT chart - see figure 1)		4
Qc1	Normalized Qt for seismic analysis	$qc1 = qc \bullet (Pa/\sigma_v')^{0.5}$ where: Pa = atm. pressure	5
Qc1N	Dimensionless Normalized Qt1	qc1N = qc1 / Pa where: Pa = atm. pressure	

CPT Interpretations

ΔQc1N1	Equivalent clean sand correction	$\Delta qc1N = \frac{K_{CPT}}{1 - K_{CPT}} \bullet qc1N$ Where: K_{CPT} is defined as: 0.0 for FC < 5% 0.0267 • (FC - 5) for 5% < FC < 35% 0.5 for FC > 35% FC - Fines Content in %	5
Qc1Ncs	Clean Sand equivalent Qc1N	$qc1Ncs = qc1N + \Delta qc1N$	5
Ic	Soil index for estimating grain characteristics	$Ic = [(3.47 - \log Q)^2 + (\log F + 1.22)^2]^{0.5}$	5
FC	Fines content (%)	$FC=1.75(Ic^{3.25}) - 3.7$ $FC=100$ for $Ic > 3.5$ $FC=0$ for $Ic < 1.26$ $FC = 5\%$ if $1.64 < Ic < 2.6$ AND $Rfn<0.5$	8
PHI	Friction Angle	Campanella and Robertson Durunoglu and Mitchel Janbu	1
Dr	Relative Density	Ticino Sand Hokksund Sand Schmertmann 1976 Jamiolkowski - All Sands	1
OCR	Over Consolidation Ratio		1
State Parameter			9
CRR	Cyclic Resistance Ratio		7

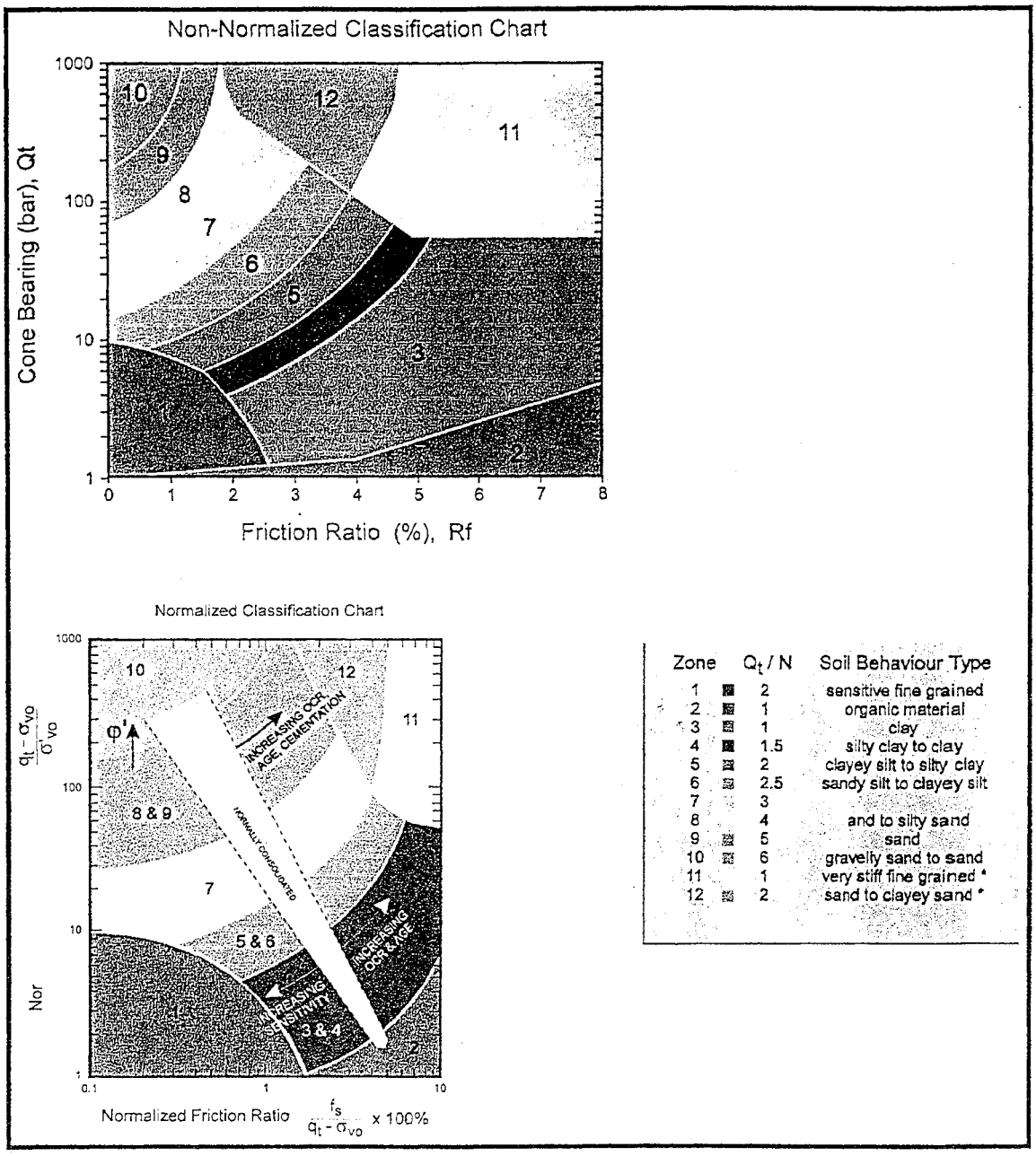

Figure 1 Non-Normalized and Normalized Soil Behaviour Type Classification Charts

Table 2 References

No.	Reference
1	Robertson, P.K. and Campanella, R.G., 1986, "Guidelines for Use, Interpretation and Application of the CPT and CPTU", UBC, Soil Mechanics Series No. 105, Civil Eng. Dept., Vancouver, B.C., Canada
2	Robertson, P.K., Campanella, R.G., Gillespie, D. and Greig, J., 1986, "Use of Piezometer Cone Data", Proceedings of InSitu 86, ASCE Specialty Conference, Blacksburg, Virginia.
3	Robertson, P.K. and Campanella, R.G., 1989, "Guidelines for Geotechnical Design Using CPT and CPTU", UBC, Soil Mechanics Series No. 120, Civil Eng. Dept., Vancouver, B.C., Canada
4	Robertson, P.K., 1990, "Soil Classification Using the Cone Penetration Test", Canadian Geotechnical Journal, Volume 27.
5	Robertson, P.K. and Fear, C.E., 1995, "Liquefaction of Sands and its Evaluation", Keynote Lecture, First International Conference on Earthquake Geotechnical Enginnering, Tokyo, Japan.
6	ConeTec Internal Report
7	Robertson, P.K. and Wride, C.E., 1997, "Cyclic Liquefaction and its Evaluation Based on SPT and CPT", NCEER Workshop Paper, January 22, 1997
8	Wride, C.E. and Robertson, P.K., 1997, "Phase II Data Review Report (Massey and Kidd Sites, Fraser River Delta)", Volume 1 - Data Report (June 1997), University of Alberta.
9	Plewes, H.D., Davies, M.P. and Jefferies, M.G., 1992, "CPT Based Screening Procedure for Evaluating Liquefaction Susceptibility", 45th Canadian Geotechnical Conference, Toronto, Ontario, October 1992.

Appendix B

Geotechnical Drilling And Sampling Program

B.1 FIELD EXPLORATION

Eleven (11) exploratory borings, numbered B-1 through B-11 were drilled for this study using an All Terrain CME 55 drill rig. The borings were advanced using a 4-7/8-inch diameter drill bit on the drill rod. Bentonite drilling mud was used to lift cuttings and support the borehole while it was drilled.

After drilling and sampling, the boreholes were backfilled with lean cement grout, with the exception of B-3, where an observation well was installed. Drill cuttings and wash water was spread on the site.

B.2 SOIL SAMPLING

Sampling Method

Soil samples were obtained at selected depths in the borings by advancing the sampler into the soils at the bottom of the borehole. Two types of sampling equipment were used:

- Split-Spoon Sampler - 1-3/8-inch I.D., 2-inch O.D., standard split-spoon sampler conforming to ASTM Designation D 1586.
- Modified California Sampler - 2-inch I.D., 2-1/2-inch O.D., split-barrel sampler equipped with four to six thin brass tube liners, each 4 inches long.

The modified California and split-spoon samplers were threaded to fit a cutting shoe on one end and a check-valve connection at the other end. After the borehole was drilled to the specified depth, the sampler mounted on the drill rods was lowered to the bottom, seated, and then driven into the soil with a 140-pound hammer falling 30 inches for each blow. The hammer was controlled by a manual cathead-rope system. The number of hammer blows required to advance the sampler each of the three successive 6-inch increments was counted in the field. The number of blows required to advance the sampler the last 12 inches was recorded as the penetration resistance (blows-per-foot).

Sample Handling

Soil from the split-spoon sampler was removed by unscrewing the sampler from the shoe and check-valve connection, separating the two pieces of the split barrel, and scooping the soil into a container which was subsequently sealed. Soil recovered from the split-spoon sampler is disturbed and is of use only for soil identification purposes, index property testing and for determination of moisture content.

Soil recovered from the modified California sampler was retained in the thin brass liners; when the sampler was brought to the surface, the liners were taken from the sample barrel and sealed at both ends with plastic caps.

B.3 LOGS OF BORINGS

The soil samples and cuttings were examined and classified in the field as the drilling proceeded. The samples were later taken to our geotechnical laboratory in Pleasant Hill, California, for further examination and testing. Preliminary visual soil classifications were made in accordance with the Unified Soil Classification System and verified by further inspection of the samples in the laboratory and by testing. Logs of borings were prepared from the field logs and laboratory test data.

The logs of borings show the soil classifications (according to the Unified Soil Classification System) of subsurface strata encountered, locations where soil samples were obtained, type of sampler used, sampling resistance, results of some of the laboratory tests, and the position of the groundwater level if it could be measured.

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Key to Log of Boring / Well

Elevation, feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Well Construction Schematic	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11	12

COLUMN DESCRIPTIONS

1. **Elevation:** Elevation in feet referenced to mean sea level (MSL) or site datum.
2. **Depth:** Depth in feet below the ground surface.
3. **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.
4. **Sample Number:** Sample identification number.
5. **Sampling Resistance:** Number of blows required to advance driven sampler 12 inches beyond first 6-inch interval, or distance noted, using a 140-lb hammer with a 30-inch drop.
6. **Recovery:** Percentage of driven or pushed sample recovered relative to sampled interval; "NA" indicates data not recorded.
7. **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.
8. **Material Description:** Description of material encountered; may include relative density / consistency, moisture, color, and grain size.
9. **Well Construction Schematic:** Graphic depiction of well or piezometer installation; materials are listed in header block; graphic symbols are explained below.
10. **Water Content:** Water content of soil sample measured in laboratory, expressed as percentage of dry weight of specimen.
11. **Dry Unit Weight:** Dry density of soil sample measured in laboratory, in pounds per cubic foot (pcf).
12. **Remarks and Other Tests:** Comments and observations regarding drilling or sampling made by driller or field personnel. Other field and laboratory test results, using the following abbreviations:

LL	Liquid Limit (from Atterberg Limits test), in percent
PI	Plasticity Index (from Atterberg Limits test), in percent
SA	Sieve analysis, percent passing #200 sieve
UC	Unconfined compressive strength test, in psf

TYPICAL SOIL GRAPHIC SYMBOLS

SAND (SP/SW)
SAND with SILT (SP-SM)
SILTY SAND (SM)
CLAYEY SAND (SC)
CLAY (CL)
CLAY (CH)
SILTY CLAY (CL)
CLAYEY SILT (ML)
SILT (ML)
SILT (MH)
SANDY SILT (ML)
GRAVEL (GP/GW)

TYPICAL WELL GRAPHIC SYMBOLS

Blank casing in cement grout
Blank casing in granular bentonite
Blank casing in cement-bentonite grout
Blank casing in filter sand
Blank casing in bentonite pellets
Slotted casing in filter sand

TYPICAL SAMPLER GRAPHIC SYMBOLS

Standard Penetration Test (SPT) unlined split spoon
Shelby tube (3-inch OD, thin-wall, fixed head)
Modified California (2-inch ID) with brass liners
Pitcher barrel with Shelby tube liner
California (2.5-inch ID) split barrel
Bulk or bucket

OTHER GRAPHIC SYMBOLS

First water encountered at time of drilling and sampling (ATD)

Static water level measured after drilling and sampling completed

Change in material properties within a lithologic stratum

--- Inferred or transitional contact between lithologies

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive; actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

Report: GEO_12 K_REY; File: ROSEVILL.GPJ; 8/3/2001 keyenron

Project: Roseville Energy Facility, L.L.C. Project Location: Phillip Road, Roseville, California Project Number: 66-00000089.00 01000	Log of Boring B-1 Sheet 1 of 2

Date(s) Drilled	6/11/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	50.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 87 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Safety hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SANDY SILT (ML) Dry, reddish brown, trace gravel to 1/4 inch				Start drilling at 1055.
85											
							SILTY SAND (SM) Medium dense, dry, gray, fine-grained, micaceous				
	5		B-1-5	29	100			17.1	105	3490	
80							CLAYEY SAND (SC) Medium dense, moist, dark gray, medium-grained, micaceous				
	10		B-1-10	32	100		SILT (ML) Very stiff, dry, gray				
75											
							Becomes hard				
	15		B-1-15	51	100			25.6	93	2240	
70							SILTY SAND (SM) Medium dense, dry, grayish brown, fine-grained, micaceous				
	20		B-1-20	33	100						SA: 21%<#200 sieve
65							SILT (ML) Hard, dry, gray, few caliche stringers				
	25		B-1-25	42	100						
60							SILTY SAND (SM) Dense, dry, brown, fine-grained, micaceous				
	30		B-1-30	45	100						

Figure B-2

URS

K: File: ROSEVILL.GPJ; 8/3/2001 B-01
Report: GEO_10!

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-1

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	30		B-1-30	45	100		SILTY SAND (SM), dense, dry, brown, fine-grained, micaceous *(continued)*				
55							SANDY SILT (ML) Medium dense, dry, brown, micaceous				
	35		B-1-35	31	100			22.9	79	1070	
50							SANDY SILT to SILTY SAND (ML/SM) Medium dense, dry, brown, micaceous				
	40		B-1-40	33	100						
45							SAND (SP) Medium dense to dense, dry, black, medium-grained				
	45		B-1-45	44	100		SILT (ML) Hard, dry, gray with black iron oxide stringers	33.3	74	330	
40							SILT (MH) Hard, dry, medium gray				
	50		B-1-50	61	NA						LL=76, PI=34
							Bottom of boring at 50.5 feet				End drilling at 1345. Borehole dry at time of drilling.
35											
	55										
30											
	60										
25											
	65										

Report: GEO_10F File: ROSEVILL.GPJ: 8/3/2001 B-01

URS

Figure B-2

Project: Roseville Energy Facility, L.L.C. Project Location: Phillip Road, Roseville, California Project Number: 66-00000089.00 01000	Log of Boring B-2 Sheet 1 of 3

Date(s) Drilled	6/11/01 and 6/12/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 84 feet MSL
Groundwater Level and Date Measured	~59 ft (perched) on 6/12/01	Sampling Method(s)	Modified California, SPT	Hammer Data	Safety hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SILT (ML) Dry, reddish brown				Start drilling on 6/11/01 at 1525.
							SILTY SAND (SM) Medium dense, dry, reddish brown				
80	5		B-2-5	32	100			12.0	119	2230	
							CLAY (CL) Very stiff, dry, gray				
							SILT (ML) Hard, dry, olive gray				
75	10		B-2-10	49	100			30.1	86	3720	
70	15		B-2-15	48	100		SANDY SILT (ML) Dense, moist, reddish brown				
65	20		B-2-20	43	100						SA: 75%<#200 sieve
							SILT (ML) Very stiff, dry, light brown, with caliche stringers				
60	25		B-2-25	26	100			29.0	91	3650	
55	30		B-2-30	44	100		Becomes hard	19.7	107	2670	

Report: GEO_105 File: ROSEVILL.GPJ; 8/3/2001 B-02

URS

Figure B-3

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-2

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	65		B-2-65	82/10"	NA		SANDY SILT (ML), very dense, dry, light gray, trace clay *(continued)*				
							SILTY CLAY (CH) Medium stiff, moist, olive gray				
15							SILTY SAND (SM) Very dense, dry, reddish brown				
	70		B-2-70	80	100		SANDY CLAY (CL/CH) Hard, moist, olive gray, fine- to medium-grained sand				
							SILT (ML) Hard, dry, purplish gray				
10											
	75		B-2-75	68	100			22.4	98	3060	
5											
	80		B-2-80	84/11"	100		SILTY SAND (SM) Very dense, moist, medium brown, fine- to medium-grained				
							Bottom of boring at 80.5 feet				End drilling at 1055 on 6/12/01. Borehole dry at time of drilling.
0											
	85										
-5											
	90										
-10											
	95										
-15											
	100										

Report: GEO_10E Filer ROSEVILL.GPJ; 8/3/2001 B-02

URS

Figure B-3

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring / Well B-3

Date(s) Drilled	6/12/01 (drill) and 6/13/01 (set well)	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 85 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Completion	Well installed: 2-in.-dia. Sch. 40 PVC casing, 0.020-in. slotted screen 58.5-78.5 ft, sand up to 53.5 ft, bentonite pellets 51.5-53.5 ft, cement grout to surface (see schematic below)			Location	Refer to site plan

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Well Construction Schematic	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
85	0						SILT (ML) Moist, grayish brown				Start drilling on 6/12/01 at 1250.
							SAND (SP) Medium dense, dry, reddish brown, medium- to coarse-grained, cemented with iron oxide, few caliche stringers				
80	5		B-3-5	38	100				11.8	102	
75	10		B-3-10	31	100		Moist, white, fine-grained As above fine-grained layer, except no iron oxide cementation or caliche stringers				
70	15		B-3-15	17	100		SILTY CLAY (CL) Very stiff, slightly moist, grayish brown				LL=42, PI=19
							SILTY SAND (SM) Medium dense, dry, reddish brown, fine- to medium-grained				
65	20		B-3-20	24	100				20.1	90	UC=570 psf
							SILT (ML) Very stiff, dry, light gray, trace clay, few manganese oxide stringers				
60	25		B-3-25	34	100						
							Becomes stiff				
55	30		B-3-30	19	100				32.3	86	UC=2460 psf

Report: GEO_12 G: File: ROSEVILL.GPJ; 8/3/2001 B-03

URS

Figure B-4

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring / Well B-3

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Well Construction Schematic	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
-55	30		B-3-30	19	100		SILT (ML), stiff, dry, light gray, trace clay, few manganese oxide stringers *(continued)*		--		
							CLAYEY SILT (ML) Very stiff, slightly moist, reddish brown, trace micaceous fine-grained sand				
-50	35		B-3-35	36	100				29.6	91	UC=3250 psf
							Becomes light gray and reddish brown mottled				
-45	40		B-3-40	33	100						
							SILT (ML) Hard, slightly moist, light gray, trace clay, few reddish brown sand stringers				
-40	45		B-3-45	53	100				35.1	81	UC=5690 psf
-35	50		B-3-50	76	100						
-30	55		B-3-55	60	100				19.4	103	UC=2540 psf
							CLAYEY SILT (ML) Very stiff to hard, slightly moist, reddish brown, trace sand				
-25	60		B-3-60	44	100		SAND (SP) Dense, dry, reddish brown, fine- to medium-grained, micaceous				
							SILT (ML) Hard, dry, light gray		-		
							Becomes olive gray				
-20	65		B-3-65	56	100				44.6	74	UC=2060 psf

Report: GEO_12\ ; File: ROSEVILL.GPJ; 8/3/2001 B-03

Figure B-4

URS

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring / Well B-3

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Well Construction Schematic	Water Content, %	Dry Unit Weight, pcf	REMARKS AND OTHER TESTS
	65		B-3-65	56	100		SILT (ML), hard, dry, olive gray *(continued)*				
-15	70		B-3-70	58	75		SAND (SP) Dense, dry, light brown, medium- to coarse-grained, weakly cemented, manganese oxide staining				SA: 54%<#200 sieve
-10	75		B-3-75	50/6"	NA		Becomes very dense, with trace clay				
							SILTY SAND (SM) Dense, dry, brown to grayish brown, fine- to medium-grained				
-5	80		B-3-80	58	NA						
							Bottom of boring at 80.5 feet				End drilling at 1800 on 6/12/01. Borehole dry at time of drilling. Return on 6/13/01 to set well.
0	85										
-5	90										
-10	95										
-15	100										

Report: GEO_12\ ; File: ROSEVILL.GPJ; 8/3/2001 B-03

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Figure B-4

Project: Roseville Energy Facility, L.L.C. Project Location: Phillip Road, Roseville, California Project Number: 66-00000089.00 01000	Log of Boring B-4 Sheet 1 of 2

Date(s) Drilled	6/13/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	30.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 94 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SANDY SILT (ML) Dry, reddish brown				Start drilling at 1015.
90	5		B-4-5	85	100		SILTY SAND (SM) Very dense, dry, reddish brown, fine- to medium-grained	11.8	119	7030	
85	10		B-4-10	77	100		SANDY SILT to SILTY SAND (ML/SM) Very dense, dry, reddish brown, fine- to medium-grained				SA: 51%<#200 sieve
80	15		B-4-15	49	100		SAND (SP) Dense, dry, reddish brown, medium- to coarse-grained	10.9	112		
75	20		B-4-20	51	100						
							CLAYEY SILT (ML) Very stiff to hard, moist, gray				
70	25		B-4-25	82/11"	70		SANDY SILT (ML) Very dense, dry, light brown	28.9	88	4540	
							SAND (SP) Dense, dry, gray, fine- to medium-grained				
65	30		B-4-30	49	NA						

Report: GEO_10B File: ROSEVILL.GPJ; 8/3/2001 B-04

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Figure B-5

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-5

Date(s) Drilled	6/13/01 and 6/14/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 86 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						CLAYEY SAND (SC) Moist, dark brown				Start drilling on 6/13/01 at 1325.
85							SAND (SP) Medium dense, slightly moist, reddish brown(?), fine-grained				
	5		B-5-5	22	NA						
80							CLAYEY SILT (ML) Stiff to very stiff, slightly moist, light gray				
	10		B-5-10	19	NA						
75							Becomes hard				
	15		B-5-15	61	100			26.8	93	4350	LL=45, PI=16
70							SANDY SILT (ML) Medium dense, dry, light brown to reddish brown				
	20		B-5-20	36	100						SA: 54%<#200 sieve
65							SILT (ML) Very stiff, moist, grayish brown, trace clay				
	25		B-5-25	35	67			30.9	86	2580	
60											
	30		B-5-30	61	100		SAND (SP), dense, moist, reddish brown, fine-grained				

Report: GEO_101 S: File: ROSEVILL.GPJ; 8/3/2001 B-05

Figure B-6

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Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-5

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	30		B-5-30	61	100		SAND (SP), dense, moist, reddish brown, fine-grained SILT (ML), very stiff, moist, grayish brown, trace clay *(continued)*				
55											
							Becomes hard, with increased sand content				
	35		B-5-35	53	100			25.6	92	3090	
50											
							SANDY SILT (ML) Medium dense, moist, grayish brown, trace clay				
	40		B-5-40	24	NA						
45											End drilling for 6/13/01 at 1530. Resume drilling on 6/14/01 at 0815.
	45		B-5-45	50	100			33.6	86		
40							SILTY SAND (SM) Dense, dry, reddish brown, fine-grained, micaceous				
							CLAYEY SILT (ML) Hard, dry, light grayish brown				
	50		B-5-50	55	100						
35											
	55		B-5-55	44	100			47.3	69	2640	
30											
							SAND (SP) Dense, dry, reddish brown, medium-grained				
	60		B-5-60	39	100						
25							SILT (ML) Hard, dry, light gray				
							CLAYEY SILT (ML) Hard, dry, reddish brown				
	65		B-5-65	47	100			27.2	87	3360	

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Figure B-6

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-5

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	65		B-5-65	47	100		CLAYEY SILT (ML), hard, dry, reddish brown *(continued)*				
20											
	70		B-5-70	67	100			49.2	72	2490	
15											
							SILTY SAND (SM) Very dense, dry, brown, fine-grained				
	75		B-5-75	50/4"	NA						
10											
	80		B-5-80	54	NA						
5							Bottom of boring at 80.5 feet				End drilling at 1135 on 6/14/01. Borehole dry at time of drilling.
	85										
0											
	90										
-5											
	95										
-10											
	100										

Report: GEO_10E S: File: ROSEVILL.GPJ: 8/3/2001 B-05

Figure B-6

URS

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-6

Sheet 1 of 3

Date(s) Drilled	6/14/01 and 6/15/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 86 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						CLAYEY SAND (SC) Moist, dark brown				Start drilling on 6/14/01 at 1350.
85							SAND with SILT (SW-SM) Loose to medium dense, moist, reddish brown, fine- to coarse-grained				
	5		B-6-5	14	100						SA: 9%<#200 sieve
80							SILTY CLAY (CL) Very stiff, slightly moist, brown, trace sand				
	10		B-6-10	16	100						LL=43, PI=20
75							SILTY SAND (SM) Medium dense, dry, reddish brown				
	15		B-6-15	31	100			23.1	98	3140	
70											
	20		B-6-20	28	75						
65							SANDY SILT (ML) Dense, dry, gray and reddish brown mottled, fine-grained sand, micaceous, trace clay				
	25		B-6-25	60	75						
60											
	30		B-6-30	47	100			24.2	99	3690	

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Figure B-7

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-6

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	30		B-6-30	47	100		SANDY SILT (ML), dense, dry, gray and reddish brown mottled, fine-grained sand, micaceous, trace clay *(continued)*				
-55							SILT (ML) Very stiff, dry, reddish brown				
	35		B-6-35	38	NA						
-50											
	40		B-6-40	34	NA						
-45											
							Becomes hard				
	45		B-6-45	46	50						
-40											
							Becomes gray				
	50		B-6-50	55	100			36.4	80	4780	
-35											
							Becomes gray and reddish brown mottled				
	55		B-6-55	52	NA						
-30											
	60		B-6-60	64	NA						
-25											
	65		B-6-65	57	NA						

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Figure B-7

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-6

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	65		B-6-65	57	NA		SILT (ML), hard, dry, gray and reddish brown mottled *(continued)*				End drilling for 6/14/01 at 1740. Resume drilling on 6/15/01 at 0730.
20											
							SAND (SP) Very dense, dry, reddish brown, medium-grained, cemented with iron oxide				
	70		B-6-70	85	NA						
15											
	75		B-6-75	73	NA						
10											
							SILTY SAND (SM) Very dense, dry, reddish brown				
	80		B-6-80	55	NA						
5							**Bottom of boring at 80.5 feet**				End drilling at 0905 on 6/15/01. Borehole dry at time of drilling.
	85										
0											
	90										
-5											
	95										
-10											
	100										

Report: GEO_108 File: ROSEVILL.GPJ: 8/3/2001 B-06

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Figure B-7

Project: Roseville Energy Facility, L.L.C. Project Location: Phillip Road, Roseville, California Project Number: 66-00000089.00 01000	Log of Boring B-7 Sheet 1 of 3

Date(s) Drilled	6/15/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 87 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SILTY SAND (SM) Dry, reddish brown				
85											
							Medium dense				
	5		B-7-5	26	70			17.4	111	4180	
80											
							SAND with SILT (SP-SM) Medium dense, moist, reddish brown, trace gravel to 1/4 inch				
	10		B-7-10	26	100			14.2	109		SA: 12%<#200 sieve
75											
							CLAYEY SILT (ML) Very stiff, slightly moist, gray, trace sand				
	15		B-7-15	29	NA						
70											
	20		B-7-20	24	NA						
65											
							SAND (SP) Medium dense, dry, dark brown, trace silt				
	25		B-7-25	23	100			20.7	88		
60											
							SILT (ML) Hard, dry, gray				
	30		B-7-30	41	100						

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Figure B-8

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-7

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	30		B-7-30	41	100		SILT (ML), hard, dry, gray *(continued)*				
-55							SANDY SILT (ML) Medium dense, dry, reddish brown, pockets of black manganese oxide staining				
	35		B-7-35	33	100			29.4	91	2920	
-50											
	40		B-7-40	69	100		Becomes very dense				
-45											
	45										
-40											
	50		B-7-50	57	100		Becomes dense	41.4	78	2450	
-35											
	55										
-30											
	60		B-7-60	42	100		SAND with SILT (SP-SM) Dense, dry, gray to reddish brown, fine- to medium-grained	19.6	97	1470	
-25											
	65										

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Figure B-8

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-7

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	65						CLAYEY SILT (ML) Hard, dry, reddish brown and gray mottled				
20											
	70		B-7-70	81	100						LL=41, PI=13
15											
	75						SANDY SILT (ML) Dense, dry, brown				
10											
	80		B-7-80	47	NA						
							Bottom of boring at 80.5 feet				End drilling at 1445. Borehole dry at time of drilling.
5											
	85										
0											
	90										
-5											
	95										
-10											
	100										

URS

Figure B-8

Project: Roseville Energy Facility, L.L.C. Project Location: Phillip Road, Roseville, California Project Number: 66-00000089.00 01000	**Log of Boring B-8** Sheet 1 of 3

Date(s) Drilled	6/18/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 90 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
90	0						SANDY SILT (ML) Dry, reddish brown				Start drilling at 0800.
85	5		B-8-5	43	90		Dense	15.3	114	6640	
							SAND (SP) Medium dense, dry, reddish brown, coarse-grained				
80	10		B-8-10	36	80						
							CLAYEY SILT (ML) Hard, dry, medium gray				
75	15		B-8-15	56	100						
70	20		B-8-20	49	100			29.8	90	2690	
							SANDY SILT (ML) Dense, dry, brown				
65	25		B-8-25	61	100						SA: 60%<#200 sieve
							CLAYEY SILT (ML) Very stiff, slightly moist, light brown				
60	30		B-8-30	30	100						LL=49, PI=13

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Figure B-9

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-8

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
60	30		B-8-30	30	100		CLAYEY SILT (ML), very stiff, slightly moist, light brown *(continued)*				
							SILT (ML) Very stiff, dry, grayish brown				
55	35		B-8-35	33	75						
50	40		B-8-40	24	100			37.2	80	3270	
45	45						SAND (SP) Medium dense, dry, reddish brown, fine-grained, micaceous				
40	50		B-8-50	35	100			18.1	81		
35	55						SILT (ML) Hard, slightly moist, olive gray and reddish brown mottled				
30	60		B-8-60	61	100			40.0	81	2940	
25	65										

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Figure B-9

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Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-8

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	65						SAND (SP) Dense, dry, olive gray and reddish brown mottled, fine-grained, micaceous				
20	70		B-8-70	57	100						
15	75										
10	80		B-8-80	67	NA		Becomes very dense, coarse-grained	13.0	120		
							Bottom of boring at 80.5 feet				End drilling at 1145. Borehole dry at time of drilling.
5	85										
0	90										
-5	95										
-10	100										

Report: GEO_10E ; File: ROSEVILL.GPJ; 8/3/2001 B.08

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Figure B-9

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-9

Date(s) Drilled	6/18/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 91 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SILT (ML) Dry, light grayish brown				Start drilling at 1330.
90											
							SAND (SP) Very dense, dry, reddish brown, medium- to coarse-grained, cemented with iron oxide and caliche				
	5		B-9-5	78	75			9.9	122		
85											
	10		B-9-10	78	90		Caliche-rich layer				
80											
	15		B-9-15	68	100		SILT (ML) Hard, slightly moist, olive gray				
75											
							Becomes very stiff				
	20		B-9-20	36	100			32.1	85	3870	
70											
							Becomes hard				
	25		B-9-25	51	100			29.8	89	3390	
65											
							SANDY SILT to SILTY SAND (ML/SM) Very dense, dry, medium brown, micaceous				
	30		B-9-30	73	100			35.7	83	1770	

Report: GEO_10E ... File: ROSEVILL.GPJ; 8/3/2001 B-09

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Figure B-10

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-9

Date(s) Drilled	6/18/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	80.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 91 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SILT (ML) Dry, light grayish brown				Start drilling at 1330.
90											
							SAND (SP) Very dense, dry, reddish brown, medium- to coarse-grained, cemented with iron oxide and caliche				
	5		B-9-5	78	75			9.9	122		
85											
	10		B-9-10	78	90		Caliche-rich layer				
80											
	15		B-9-15	68	100		SILT (ML) Hard, slightly moist, olive gray				
75											
							Becomes very stiff				
	20		B-9-20	36	100			32.1	85	3870	
70											
							Becomes hard				
	25		B-9-25	51	100			29.8	89	3390	
65											
							SANDY SILT to SILTY SAND (ML/SM) Very dense, dry, medium brown, micaceous				
	30		B-9-30	73	100			35.7	83	1770	

Report: GEO_10f ; File: ROSEVILL.GPJ; 8/3/2001 B-09

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Figure B-10

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-9

Elevation feet	Depth, feet	Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	30		B-9-30	73	100		SANDY SILT to SILTY SAND (ML/SM), very dense, dry, medium brown, micaceous *(continued)*				
60											
							SAND (SP) Dense, dry, reddish brown, fine-grained				
	35		B-9-35	51	100						
55											
							SANDY SILT (ML) Dense, dry, yellowish brown				
	40		B-9-40	47	NA						
50											
	45						SANDY SILT to SILTY SAND (ML/SM) Dense, slightly moist, dark brown, fine-grained				
45											
	50		B-9-50	35	100						SA: 52%<#200 sieve
40											
	55						SILT (ML) Hard, dry, olive gray and reddish brown mottled				
35											
	60		B-9-60	45	100						
30											
	65										

Report: GEO_10E ; File: ROSEVILL.GPJ; 8/3/2001 B-09

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Figure B-10

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-9

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	65						SILTY SAND (SM) Very dense, dry, brown, fine-grained, micaceous				
25											
	70		B-9-70	57	NA						
20											
	75										
15											
							Sand grades fine- to medium-grained				
	80		B-9-80	87/10"	NA						
10							**Bottom of boring at 80.5 feet**				End drilling at 1730. Borehole dry at time of drilling.
	85										
5											
	90										
0											
	95										
-5											
	100										

Report: GEO_10E File: ROSEVILL.GPJ; 8/3/2001 B-09

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Figure B-10

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-10

Sheet 1 of 2

Date(s) Drilled	6/19/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	30.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 94.5 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SANDY SILT (ML) Slightly moist, reddish brown, trace gravel				Start drilling at 0730.
90	5		B-10-5	17	100		SILTY SAND (SM) Medium dense, dry, reddish brown	10.9	118		
85	10		B-10-10	29	100						SA: 23%<#200 sieve
80	15		B-10-15	35	100		Becomes dense				
							SANDY SILT (ML) Medium dense, slightly moist, olive gray				
75	20		B-10-20	28	NA		SAND (SP) Medium dense, dry, gray, fine-grained				
							SILT (ML) Very stiff, slightly moist, olive gray				
70	25		B-10-25	26	NA						
65	30		B-10-30	69	NA		Becomes hard, dry, with trace sand				

Report: GEO_10E File: ROSEVILL.GPJ; 8/3/2001 B-10

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Figure B-11

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-10

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	30		B-10-30	69	NA		SILT (ML), hard, dry, olive gray, trace sand *(continued)*				
							Bottom of boring at 30.5 feet				End drilling at 0845. Borehole dry at time of drilling.
60	35										
55	40										
50	45										
45	50										
40	55										
35	60										
30	65										

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Figure B-11

Project: Roseville Energy Facility, L.L.C. **Project Location: Phillip Road, Roseville, California** **Project Number: 66-00000089.00 01000**	**Log of Boring B-11** Sheet 1 of 2

Date(s) Drilled	6/19/01	Logged By	J. Springer	Checked By	P. Meymand
Drilling Method	Hollow-Stem Auger	Drill Bit Size/Type	8-inch-OD drag bit	Total Depth of Borehole	30.5 feet
Drill Rig Type	CME 55 ATV	Drilling Contractor	All Terrain Drilling	Surface Elevation	approx. 91.5 feet MSL
Groundwater Level and Date Measured	Not encountered ATD	Sampling Method(s)	Modified California, SPT	Hammer Data	Automatic hammer; 140 lbs / 30-inch drop
Borehole Backfill	Neat cement grout	Location	Refer to site plan		

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	0						SANDY SILT (ML) Dry, reddish brown, trace gravel				Start drilling at 0935.
90											
							SAND (SP) Very dense, dry, brown, with caliche stringers				
	5		B-11-5	86	100			13.6	113		
85											
							SILTY SAND (SM) Dense, dry, grayish brown, few caliche stringers				Augers are smoking.
	10		B-11-10	38	100						SA: 45%<#200 sieve
80											
							SAND (SP) Dense, dry, grayish brown, abundant caliche stringers				
	15		B-11-15	48	100						
75											
							SILT (MH) Very stiff, slightly moist, olive gray, trace sand				
	20		B-11-20	22	100						LL=63, PI=23
70											
	25		B-11-25	30	100			30.7	89	3480	
65											
							SILTY SAND (SM) Medium dense, dry, reddish brown, fine- to medium-grained				
	30		B-11-30	29	100			18.7	85	1590	

Report: GEO_10(; File: ROSEVILL.GPJ; 8/3/2001 B-11

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Figure B-12

Project: Roseville Energy Facility, L.L.C.
Project Location: Phillip Road, Roseville, California
Project Number: 66-00000089.00 01000

Log of Boring B-11

Elevation feet	Depth, feet	SAMPLES Type	Number	Sampling Resistance, blows / foot	Recovery, %	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight, pcf	Unconfined Compressive Strength, psf	REMARKS AND OTHER TESTS
	30		B-11-30	29	100		SILTY SAND (SM), medium dense, dry, reddish brown *(continued)*				
							Bottom of boring at 30.5 feet				End drilling at 1055. Borehole dry at time of drilling.
60											
	35										
55											
	40										
50											
	45										
45											
	50										
40											
	55										
35											
	60										
30											
	65										

Report: GEO_10E ; File: ROSEVILL.GPJ; 8/3/2001 B-11

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Figure B-12

Appendix C

Geotechnical Laboratory Test Results

TABLE C-1
SUMMARY OF SOIL LABORATORY DATA

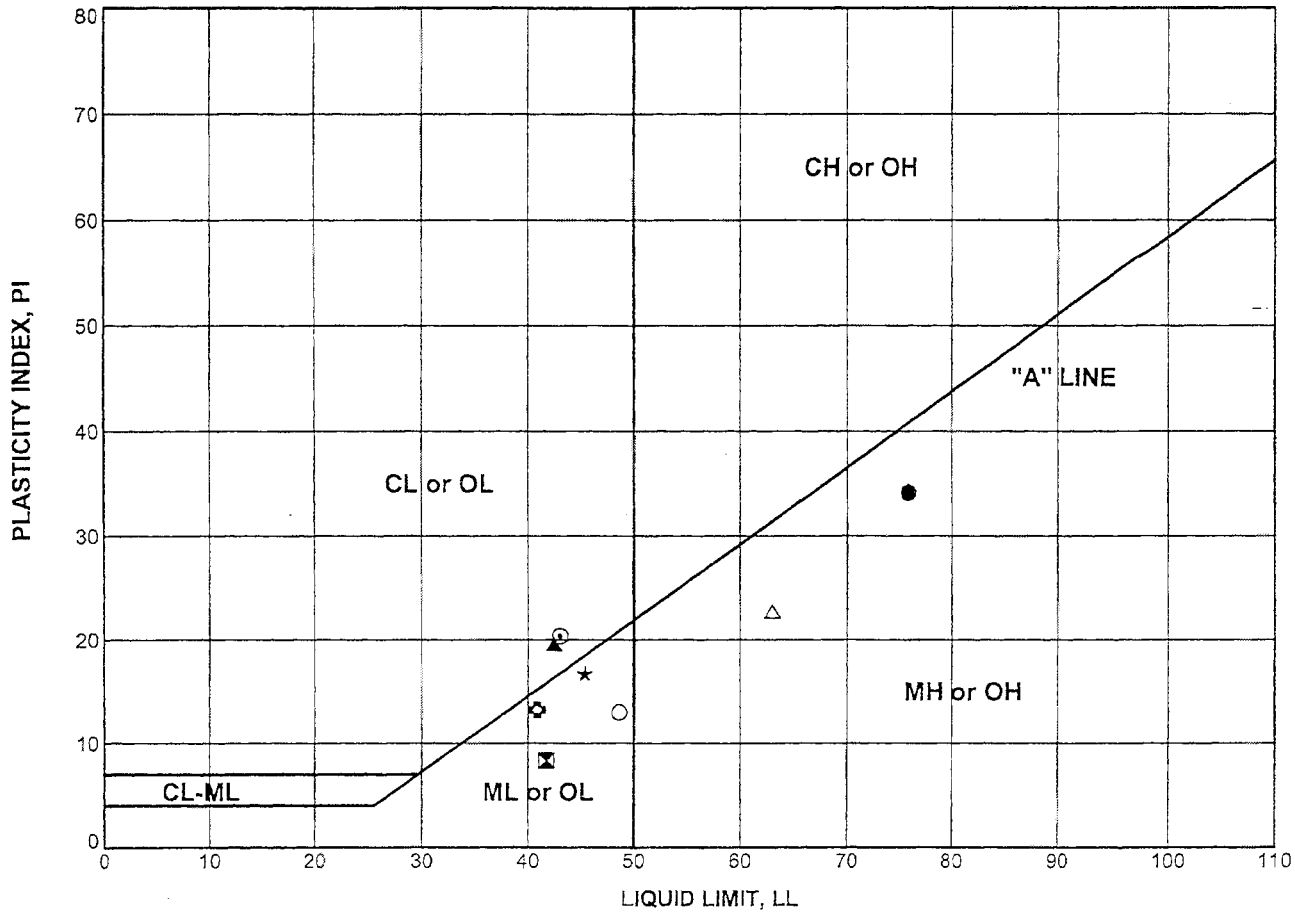
Sample Information				USCS Group Symbol	In Situ Water Content, %	In Situ Dry Unit Weight, pcf	Sieve			Atterberg Limits			Unconfined Compressive Strength, psf
Boring Number	Sample Number	Depth, feet	Elevation, feet MSL				Gravel, %	Sand, %	<#200, %	LL	PL	PI	
B-1	1-5	4.5-5	82.5	SM	17.1	105							3490
B-1	1-15	14.5-15	72.5	ML	25.6	93							2240
B-1	1-20	19.5-20	67.5	SM			0	79	21				
B-1	1-35	34.5-35	52.5	ML	22.9	79							1070
B-1	1-45	44.5-45	42.5	ML	33.3	74							330
B-1	1-50	49.5-50	37.5	MH						76	42	34	
B-2	2-5	4.5-5	79.5	SM	12.0	119							2230
B-2	2-10	9.5-10	74.5	ML	30.1	86							3720
B-2	2-20	19-20.5	64.5	ML			0	25	75				
B-2	2-25	24.5-25	59.5	ML	29.0	91							3650
B-2	2-30	29.5-30	54.6	SM	19.7	107							2670
B-2	2-45	44.5-45	39.5	ML	30.8	88							3250
B-2	2-55	54.5-55	29.5	ML	23.6	96							3710
B-2	2-60	59.5-60	24.5	ML						42	33	9	
B-2	2-75	74.5-75	9.5	ML	22.4	98							3060
B-3	3-5	4.5-5	80.5	SP	11.8	102							
B-3	3-15	14-15.5	70.5	CL						42	23	19	
B-3	3-20	19.5-20	65.5	SM	20.1	90							570
B-3	3-30	29.5-30	55.6	ML	32.3	86							2460
B-3	3-35	34.5-35	50.5	ML	29.6	91							3250
B-3	3-45	44.5-45	40.5	ML	35.1	81							5690
B-3	3-55	54.5-55	30.5	ML	19.4	103							2540
B-3	3-65	64.5-65	20.6	ML	44.6	74							2060
B-3	3-70	69.5-70	15.5	ML			0	46	54				
B-4	4-5	4.5-5	89.5	SM	11.8	119							7030
B-4	4-10	9-10.5	84.5	ML			0	49	51				
B-4	4-15	14.5-15	79.5	SP	10.9	112							
B-4	4-25	24.5-25	69.5	ML	28.9	88							4540
B-5	5-15	14.5-15	71.5	ML	26.8	93				45	29	16	4350
B-5	5-20	19.5-20	66.5	ML			0	46	54				
B-5	5-25	25-25.5	61.0	ML	30.9	86							2580
B-5	5-35	34.5-35	51.5	ML	25.6	92							3090
B-5	5-45	44.5-45	41.5	ML	33.6	86							
B-5	5-55	54.5-55	31.5	ML	47.3	69							2640
B-5	5-65	64.5-65	21.6	ML	27.2	87							3360
B-5	5-70	69.5-70	16.5	ML	49.2	72							2490
B-6	6-5	4.5-5	81.5	SW-SM			0	91	9				

TABLE C-1
SUMMARY OF SOIL LABORATORY DATA

Sample Information				USCS Group Symbol	In Situ Water Content, %	In Situ Dry Unit Weight, pcf	Sieve			Atterberg Limits			Unconfined Compressive Strength, psf
Boring Number	Sample Number	Depth, feet	Elevation, feet MSL				Gravel, %	Sand, %	<#200, %	LL	PL	PI	
B-6	6-10	9-10.5	76.5	CL						43	23	20	
B-6	6-15	14.5-15	71.5	SM	23.1	98							3140
B-6	6-30	29.5-30	56.6	ML	24.2	99							3690
B-6	6-50	49.5-50	36.5	ML	36.4	80							4780
B-7	7-5	5-5.5	82.0	SM	17.4	111							4180
B-7	7-10	9.5-10	77.5	SP-SM	14.2	109	2	86	12				
B-7	7-25	24.5-25	62.5	SP	20.7	88							
B-7	7-35	34.5-35	52.5	ML	29.4	91							2920
B-7	7-50	49.5-50	37.5	ML	41.4	78							2450
B-7	7-60	59.5-60	27.5	SP-SM	19.6	97							1470
B-7	7-70	69.5-70	17.5	ML						41	28	13	
B-8	8-5	4.5-5	85.5	ML	15.3	114							6640
B-8	8-20	19.5-20	70.5	ML	29.8	90							2690
B-8	8-25	24.5-25	65.5	ML			1	39	60				
B-8	8-30	29.5-30	60.6	ML						49	36	13	
B-8	8-40	39.5-40	50.5	ML	37.2	80							3270
B-8	8-50	49.5-50	40.5	SP	18.1	81							
B-8	8-60	59.5-60	30.5	ML	40.0	81							2940
B-8	8-80	79-80.5	10.5	SP	13.0	120							
B-9	9-5	4.5-5	86.5	SP	9.9	122							
B-9	9-20	19.5-20	71.5	ML	32.1	85							3870
B-9	9-25	24.5-25	66.5	ML	29.8	89							3390
B-9	9-30	29.5-30	61.6	ML/SM	35.7	83							1770
B-9	9-50	49-50.5	41.5	ML			0	48	52				
B-10	10-5	4.5-5	90.0	SM	10.9	118							
B-10	10-10	9-10.5	85.0	SM			1	76	23				
B-11	11-5	4.5-5	87.0	SP	13.6	113							
B-11	11-10	9-10.5	82.0	SM			0	55	45				
B-11	11-20	19-20.5	72.0	MH						63	40	23	
B-11	11-25	24.5-25	67.0	MH	30.7	89							3480
B-11	11-30	29.5-30	62.1	SM	18.7	85							1590

NOTE: The laboratory tests were performed in general accordance with the following standards:

Water Content - ASTM Test Method D2216
Dry Unit Weight - ASTM Test Method D2937
Grain Size Analysis by Mechanical Sieving and by Hydrometer - ASTM Test Method D422
Atterberg Limits - ASTM Test Method D4318
Unconfined Compressive Strength Test - ASTM Test Method D2166



Boring Number	Sample Number	Depth (feet)	Test Symbol	Water Content (%)	LL	PL	PI	Classification
B-1	1-50	49.5-50	●		76	42	34	Silt (MH)
B-2	2-60	59.5-60	⊠		42	33	9	Sandy Silt (ML)
B-3	3-15	14-15.5	▲		42	23	19	Silty Clay (CL)
B-5	5-15	14.5-15	★	27	45	29	16	Clayey Silt (ML)
B-6	6-10	9-10.5	⊙		43	23	20	Silty Clay (CL)
B-7	7-70	69.5-70	✿		41	28	13	Clayey Silt (ML)
B-8	8-30	29.5-30	○		49	36	13	Clayey Silt (ML)
B-11	11-20	19-20.5	△		63	40	23	Silt (MH)

.OT_12 PTS; File: ROSEVILL.GPJ; 8/3/2001 B-11
Report: ATTERBE

Roseville Energy Facility, L.L.C.
Phillip Road, Roseville, California
66-00000089.00 01000

PLASTICITY CHART

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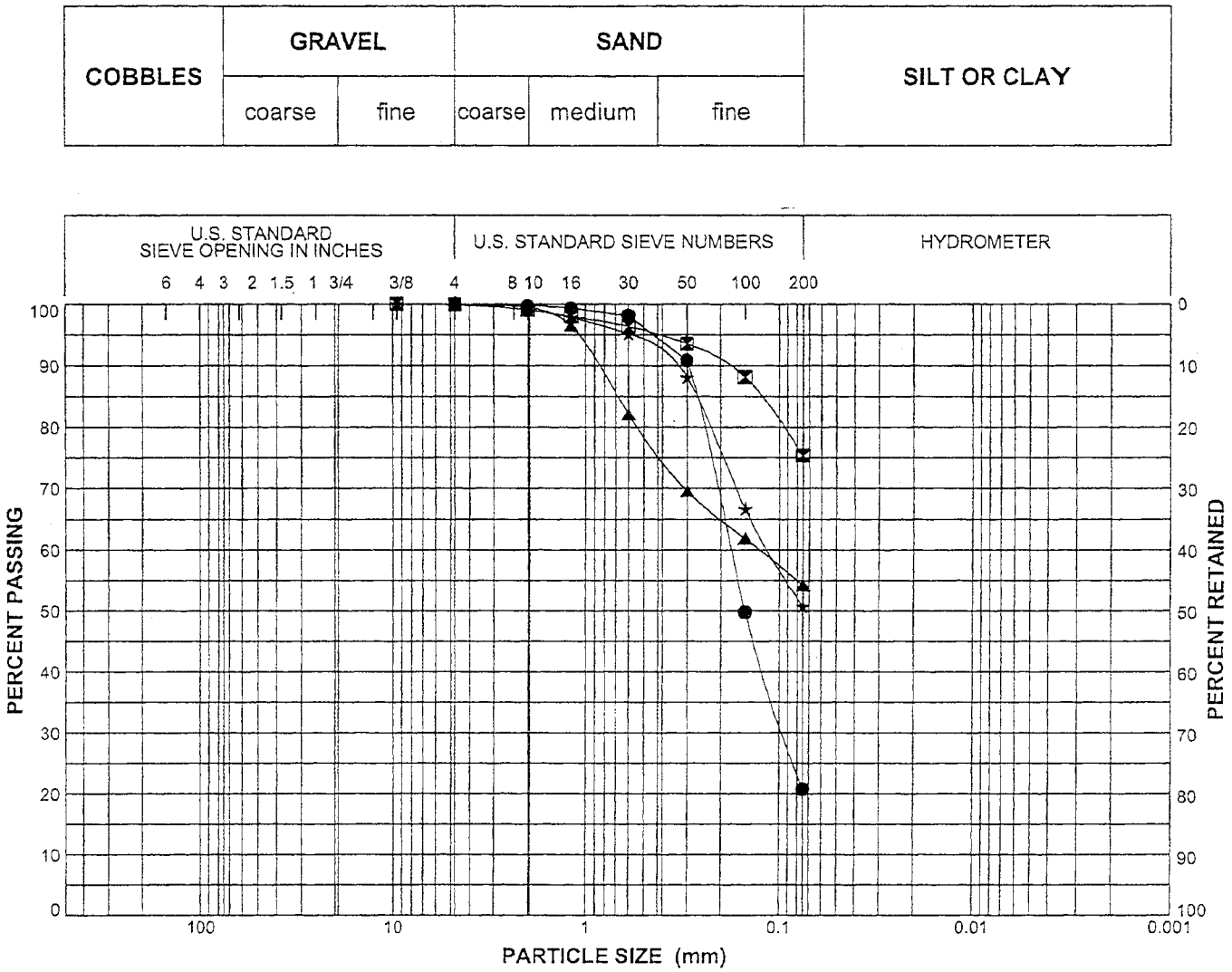
Figure C-1



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Classification
B-1	1-20	19.5-20	●			Silty Sand (SM)
B-2	2-20	19-20.5	⧗			Silt with Sand (ML)
B-3	3-70	69.5-70	▲			Sandy Silt (ML)
B-4	4-10	9-10.5	★			Sandy Silt (ML)

Report: SIEVE_5_...\VES_OAK; File: ROSEVILL.GPJ; 8/3/2001 B-04

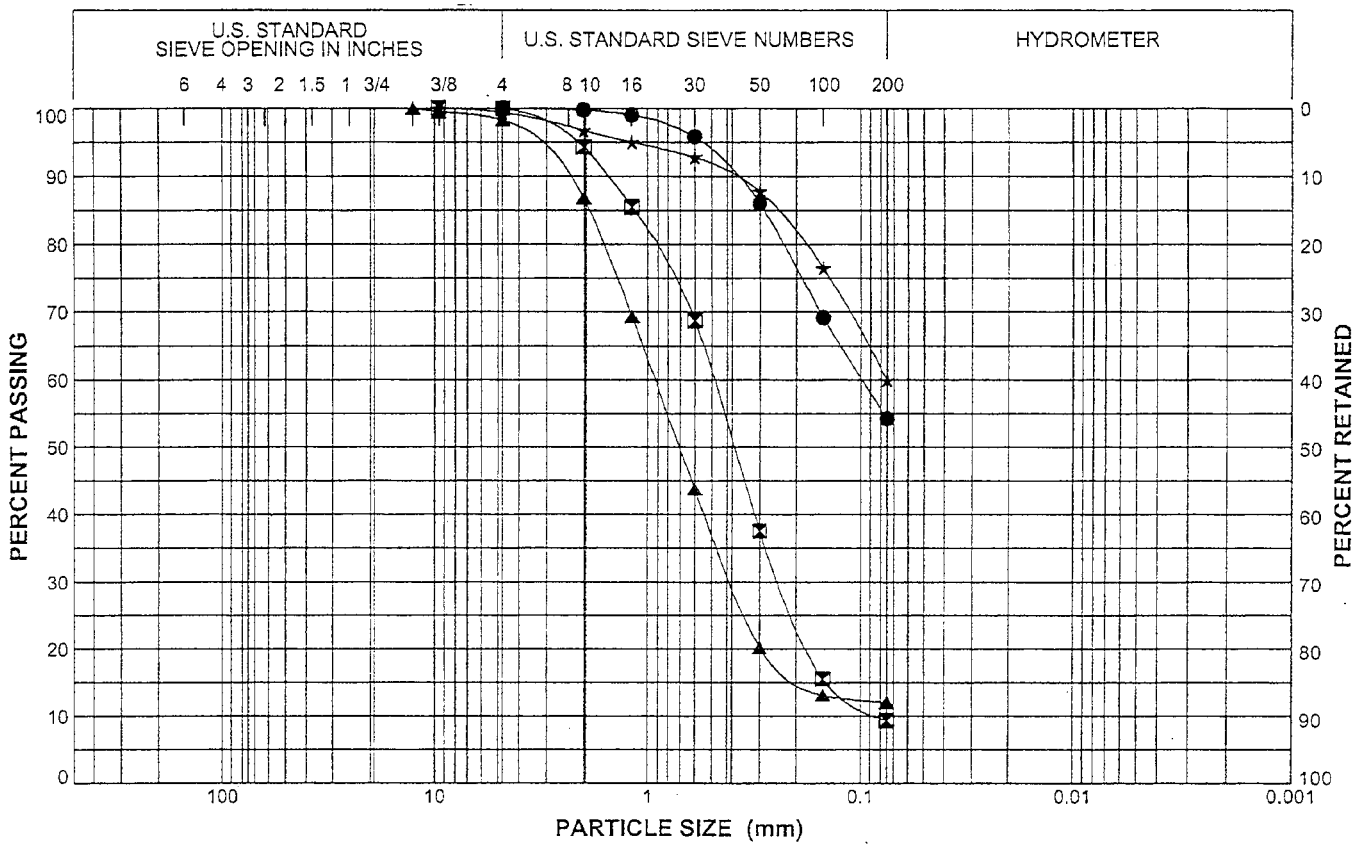
Roseville Energy Facility, L.L.C.
Phillip Road, Roseville, California
66-00000089.00 01000

PARTICLE SIZE DISTRIBUTION CURVES

URS

Figure C-2

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Classification
B-5	5-20	19.5-20	●			Sandy Silt (ML)
B-6	6-5	4.5-5	⊠			Well-graded Sand with Silt (SW-SM)
B-7	7-10	9.5-10	▲			Poorly graded Sand with Silt (SP-SM)
B-8	8-25	24.5-25	★			Sandy Silt (ML)

Report: SIEVE_5_ ..VES_OAK; File: ROSEVILL.GPJ; 8/3/2001 B-08

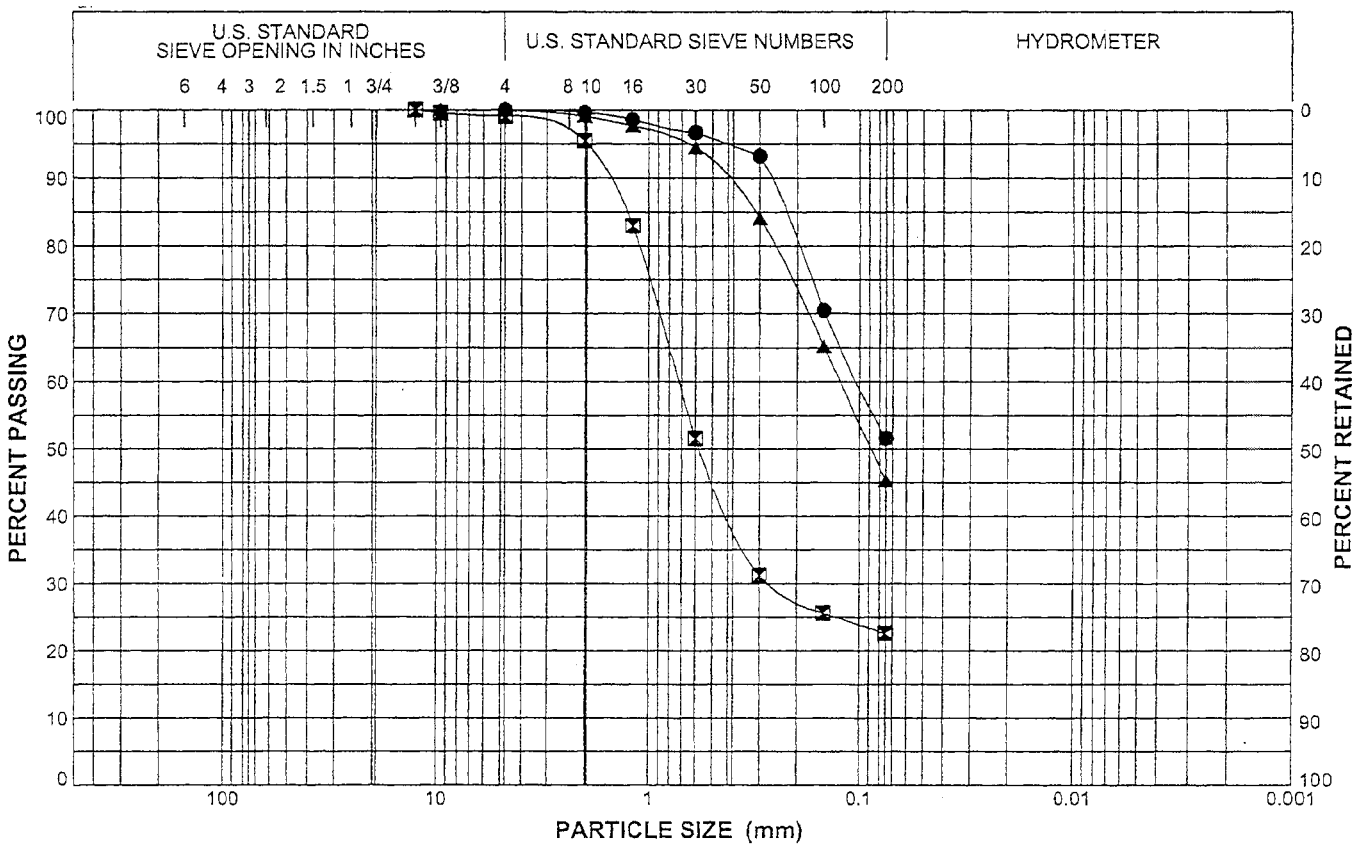
Roseville Energy Facility, L.L.C.
Phillip Road, Roseville, California
66-00000089.00 01000

PARTICLE SIZE DISTRIBUTION CURVES

URS

Figure C-3

COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	



Boring Number	Sample Number	Depth (feet)	Symbol	LL	PI	Classification
B-9	9-50	49-50.5	●			Sandy Silt (ML)
B-10	10-10	9-10.5	⊠			Silty Sand (SM)
B-11	11-10	9-10.5	▲			Silty Sand (SM)

Report: SIEVE_5_ ...XVES_OAK; File: ROSEVILL.GPJ; 8/3/2001 B-11

Roseville Energy Facility, L.L.C.
Phillip Road, Roseville, California
66-00000089.00 01000

PARTICLE SIZE DISTRIBUTION CURVES

URS

Figure C-4

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ASTM D2166
Unconfined Compressive Strength

Project Name: **Roseville Energy Facility, L.L.C.**

7/02/01

Project Number: 66-00000089.00-0100

Location: **Roseville, CA**

Boring/ Sample Number	Moisture Content %	Wet Density pcf	Dry Density pcf	Unconfined Compressive Strength, psf	Strain at Failure	Sample Description
B1-5	17.10	123.48	105.45	3487	4.3%	Brown clayey si-sand to si-fine sa-clay
B1-15	25.59	116.72	92.94	2237	2.5%	Lt . Gray Brown clayey fine sandy silt
B1-35	22.90	97.43	79.28	1073	1.5%	Rusty Brown clayey sa-silt to clayey si-sand
B1-45	33.29	99.10	74.35	331	0.6%	Top: Lt. Brown si-clay/ clayey silt Bot: Dark Brown sand (loose)
B2-5	11.99	132.75	118.53	2234	4.1%	Reddish Brown clayey sand with fine gravel
B2-10	30.13	112.32	86.31	3721	5.6%	Brown clayey sandy silt
B2-25	28.96	117.42	91.05	3652	5.8%	Brown sa-clayey silt with blk carbon stain
B2-30	19.68	128.60	107.46	2671	4.8%	Rusty Brown clayey sand
B2-45	30.78	115.24	88.12	3246	4.9%	Brown clayey fine sa-silt to sa-si clay

URS

ASTM D2166
Unconfined Compressive Strength

Project Name: **Roseville Energy Facility, L.L.C.** 7/02/01

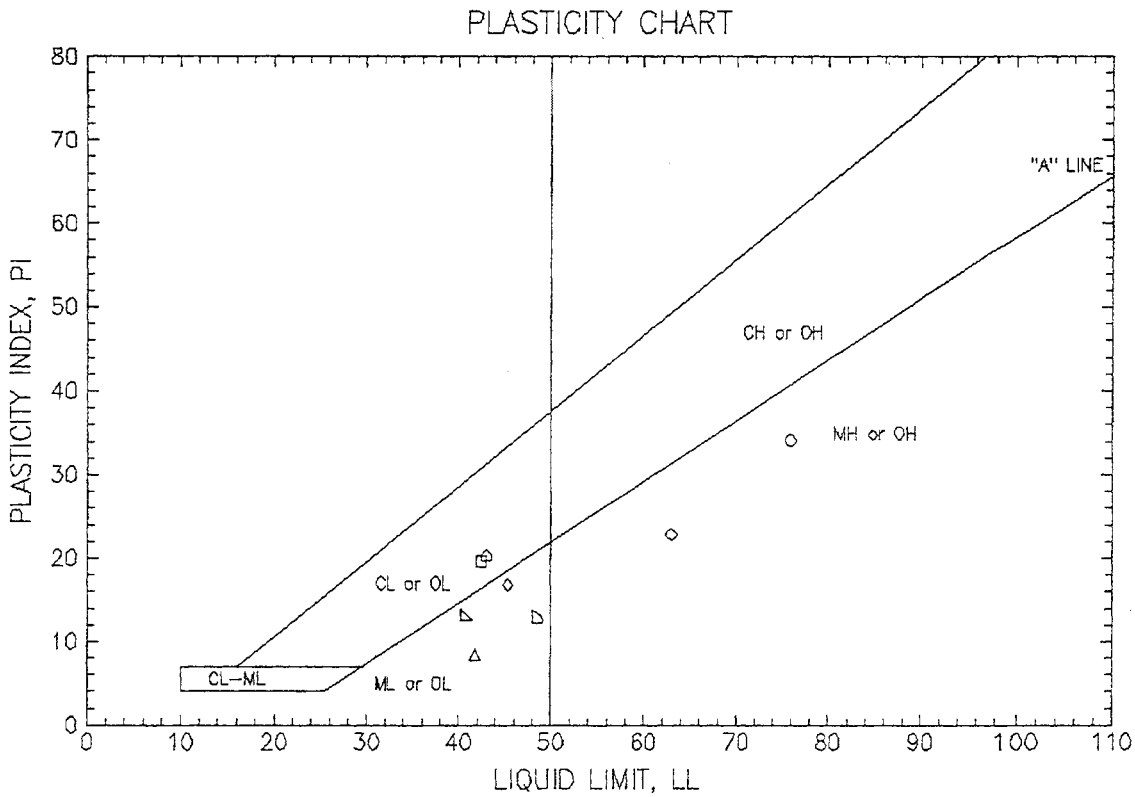
Project Number: 66-00000089.00-0100

Location: **Roseville, CA**

Boring/ Sample Number	Moisture Content %	Wet Density pcf	Dry Density pcf	Unconfined Compressive Strength, psf	Strain at Failure	Sample Description
B4-5	11.77	133.28	119.25	7033	3.1%	Rusty Brown clayey sand
B4-15	10.88	124.30	112.10	NA	NA	Rusty Brown clayey sand
B4-25	28.93	113.35	87.92	4543	4.0%	Brown clayey silt to silty clay
B5-15	26.75	117.77	92.92	4354	4.7%	Lt. Gray Brown clayey sandy silt
B5-25	30.88	112.81	86.19	2579	5.2%	Brown silty clay to clayey silt
B5-35	25.57	116.14	92.49	3092	3.9%	Orange Brown silty clay to clayey silt
B5-45	33.61	115.50	86.44	NA	NA	Rusty Brown clayey silt to silty clay
B5-55	47.31	101.88	69.16	2643	3.0%	Brown silty clay to clayey silt
B5-65	27.23	110.67	86.99	3358	2.4%	Brown silty clay to clayey silt

URS

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Location : Roseville, CA
Date : Fri Aug 03 2001



Symbol	Boring No.	Sample No.	Liquid Limit	Plastic Limit	Plasticity Index
○	B-1	50 feet	75.87	41.72	34.15
△	B-2	60 feet	41.73	33.37	8.36
□	B-3	15 Bag	42.41	22.79	19.62
◇	B-5	15 feet	45.32	28.53	16.79
◺	B-6	10 feet	43.00	22.61	20.39
◺	B-7	70 feet	40.84	27.55	13.29
◺	B-8	30 feet	48.56	35.55	13.00
◇	B-11	20 feet	62.95	40.20	22.75

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-1
Sample No. : 50 feet
Location : Roseville, CA
Soil Description : Tan clayey Silt
Remarks :

Depth : 50 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B01-50
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 211	15.97	28.13	24.55	41.72

Plastic Limit = 41.72

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 132	11.12	25.43	19.34	35	74.09
2) 88	11.18	24.71	18.86	23	76.17
3) 22	10.66	24.48	18.39	15	78.78

Liquid Limit = 75.87
Plastic Index = 34.15

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GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-2
Sample No. : 60 feet
Location : Roseville, CA
Soil Description : Brown clayey silt
Remarks :

Depth : 60 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B02-60
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 16	15.77	28.52	25.33	33.37

Plastic Limit = 33.37

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 216	10.74	23.51	19.79	33	41.10
2) 212	10.73	23.78	19.92	21	42.00
3) 50	11.05	23.73	19.94	18	42.63

Liquid Limit = 41.73
Plastic Index = 8.36

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GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-3
Sample No. : 15 Bag
Location : Roseville, CA
Soil Description : Lt. Brown silty Clay
Remarks :

Depth : 15 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B03-15
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	26	15.84	28.23	25.93	22.79

Plastic Limit = 22.79

Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	119	10.95	23.85	20.08	33	41.29
2)	32	11.06	24.81	20.70	24	42.63
3)	82	11.02	24.13	20.10	15	44.38

Liquid Limit = 42.41
Plastic Index = 19.62

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Fri Aug 03 14:04:19 2001

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-5
Sample No. : 15 feet
Location : Roseville, CA
Soil Description : Grayish Lt. Brown clayey Silt
Remarks :

Depth : 15 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B05-15
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	19	15.91	28.39	25.62	28.53

Plastic Limit = 28.53

Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	15	11.65	25.19	21.04	35	44.20
2)	5	10.93	23.66	19.67	23	45.65
3)	299	10.75	24.02	19.78	15	46.95

Liquid Limit = 45.32
Plastic Index = 16.79

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GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-6
Sample No. : 10 feet
Location : Roseville, CA
Soil Description : Lt. Brown silty Clay with traces of sand
Remarks :

Depth : 10 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B06-10
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	1	16.09	28.89	26.53	22.61

Plastic Limit = 22.61

Liquid Limit

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1)	112	10.92	23.35	19.68	35	41.89
2)	44	10.96	23.27	19.57	24	42.97
3)	47	10.81	23.78	19.79	17	44.43

Liquid Limit = 43.00
Plastic Index = 20.39

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GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-7
Sample No. : 70 feet
Location : Roseville, CA
Soil Description : Lt. Brown silty Clay to clayey Silt
Remarks :

Depth : 70 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B07-70
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 98	15.62	27.98	25.31	27.55

Plastic Limit = 27.55

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 41	11.25	23.83	20.22	34	40.25
2) 49	10.76	23.82	20.03	23	40.88
3) 78	10.69	23.60	19.78	15	42.02

Liquid Limit = 40.84
Plastic Index = 13.29

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-8
Sample No. : 30 feet
Location : Roseville, CA
Soil Description : Brown clayey Silt
Remarks :

Depth : 30 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B08-30
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 12	15.98	28.60	25.29	35.55

Plastic Limit = 35.55

Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 45	10.63	23.26	19.20	35	47.37
2) 118	11.01	23.13	19.16	24	48.71
3) 109	10.72	23.99	19.56	16	50.11

Liquid Limit = 48.56
Plastic Index = 13.00

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GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-11
Sample No. : 20 feet
Location : Roseville, CA
Soil Description : Tan clayey Silt
Remarks :

Depth : 20 feet
Test Date : 07/02/01
Test Method : ASTM D4318

Filename : B11-20
Elevation : NA
Tested by : J. Hebel
Checked by : C. Wason

Plastic Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) 13	15.63	28.36	24.71	40.20

Plastic Limit = 40.20

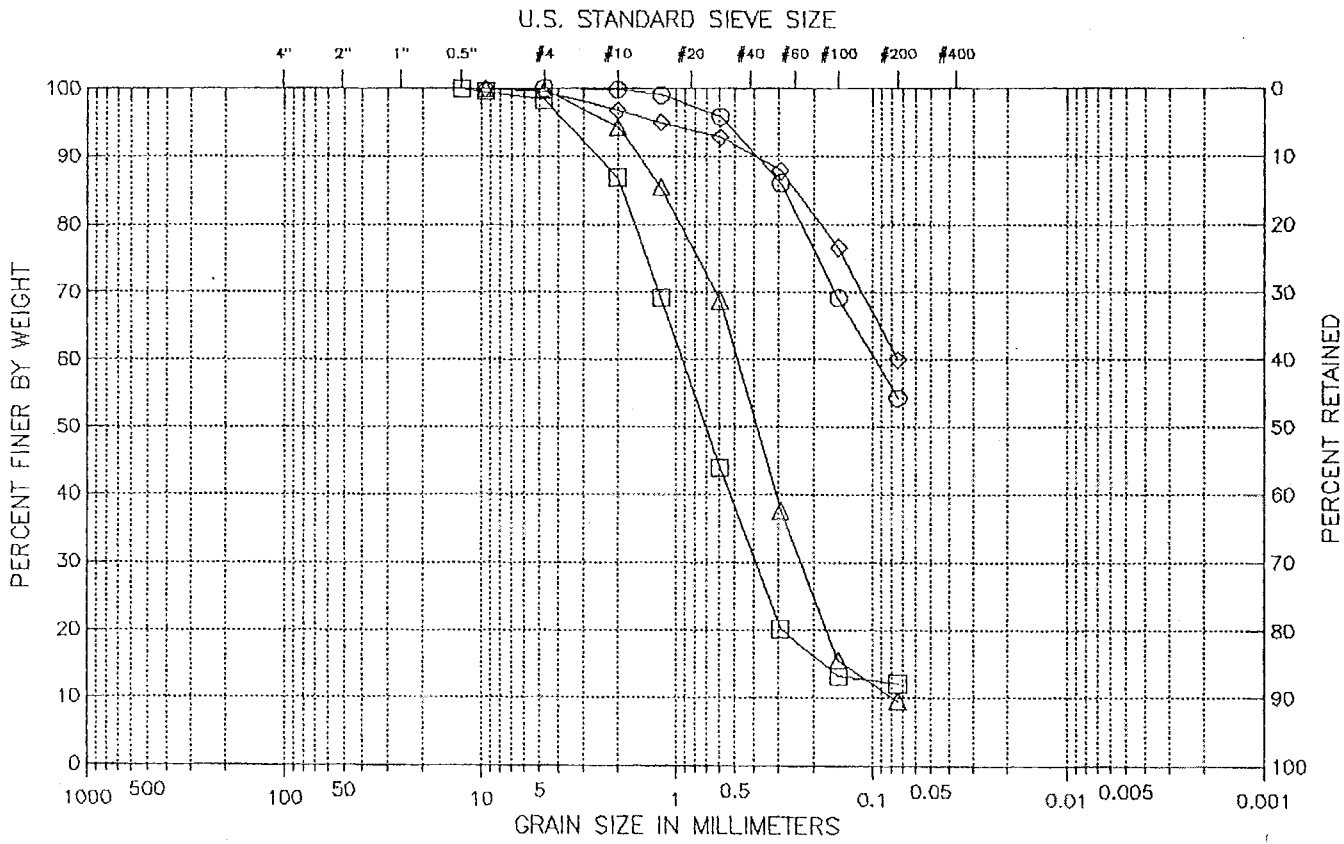
Liquid Limit

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Number of Drops	Moisture Content (%)
1) 34	10.72	23.03	18.34	35	61.55
2) 91	11.07	23.62	18.77	24	62.99
3) 114	10.84	23.18	18.32	16	64.97

Liquid Limit = 62.95
Plastic Index = 22.75

URS

Project : Roseville Energy Facility, L.L.C.
Project No.: 66-00000089.00
Location: Roseville, CA
Date : Fri Aug 03 2001



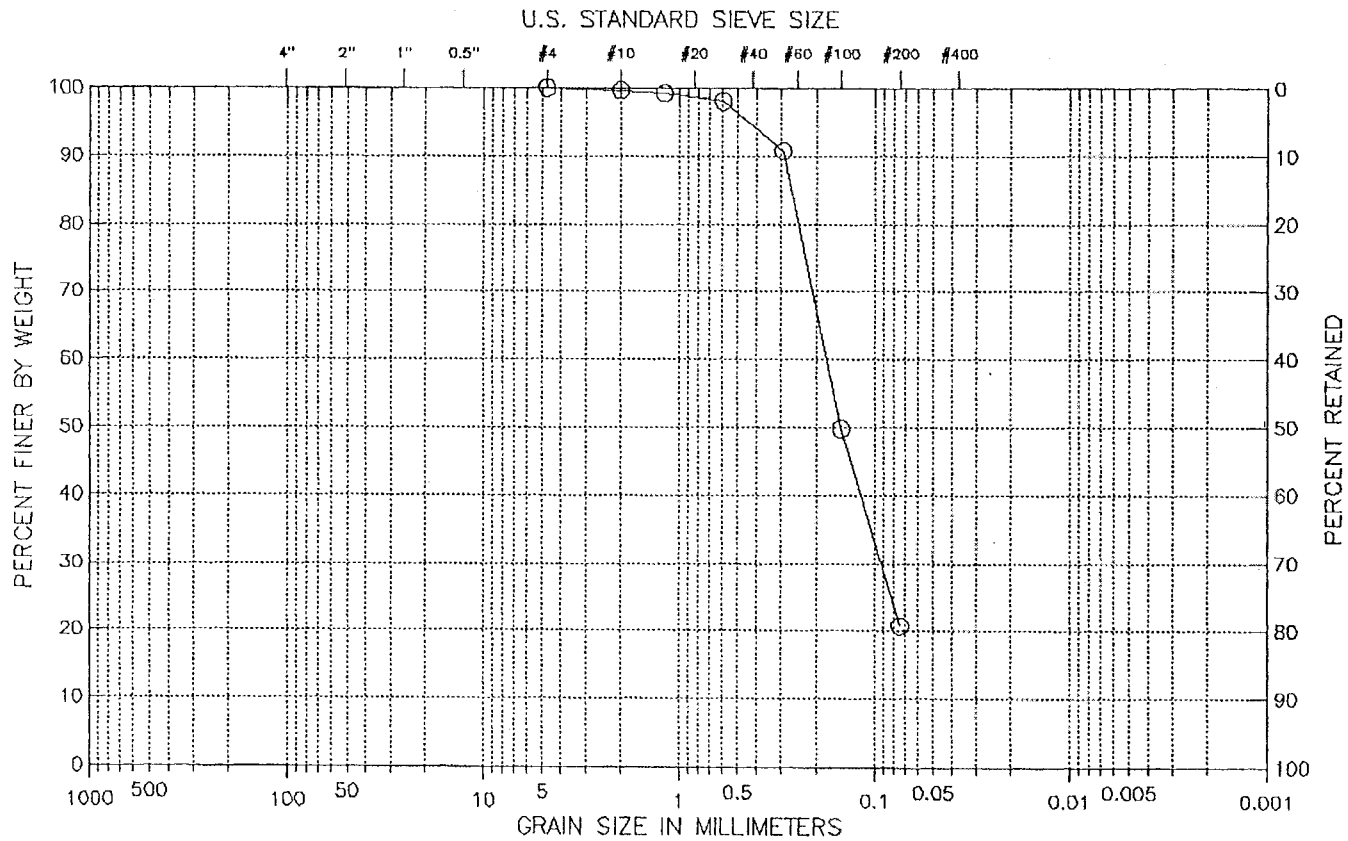
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Symbol	Boring No.	Sample No.	Depth	Filename	Classification / Description
-O-	B-5	20 feet	20 feet	B05-20	Rusty Brown clayey clayey sa-silt / si-sandy clay
-△-	B-6	5 feet	5 feet	B06-05	SW-SM Well-graded sand with silt
-□-	B-7	10 feet	10 feet	B07-10	SM Silty sand
-◇-	B-8	25 feet	25 feet	B08-25	Gray Brown sa-clay silt / sa-si clay w/ iron oxide

Figure 2

URS

Boring No. : B-1 Sample No.: 20 feet Tested by : C. Wason Filename : B01-20	Project : Roseville Energy Facility, L.L.C. Project No.: 66-00000089.00 Location: Roseville, CA Date : Fri Aug 03 2001



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :
(SM) Silty sand
Visual Description :
Rusty Brown silty Sand with mica

Remarks :
Depth: 20 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-1
Sample No. : 20 feet
Location : Roseville, CA
Soil Description : Rusty Brown silty Sand with mica
Remarks : Depth: 20 feet

Depth : 20 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B01-20
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) B1-20	220.92	680.50	606.70	19.13

Average Moisture Content = 19.13

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-2
Sample No. : 20 feet
Location : Roseville, CA
Soil Description : Grayish Rusty Brown clayey sa-Silt / si sandy Clay
Remarks : Depth: 20 feet

Depth : 20 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B02-20
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.36	0.36	100
#10	0.079	2.00	3.55	3.91	99
#16	0.047	1.19	4.31	8.22	98
#30	0.023	0.60	6.58	14.80	96
#50	0.012	0.30	11.26	26.06	94
#100	0.006	0.15	21.89	47.95	88
#200	0.003	0.07	51.71	99.66	75

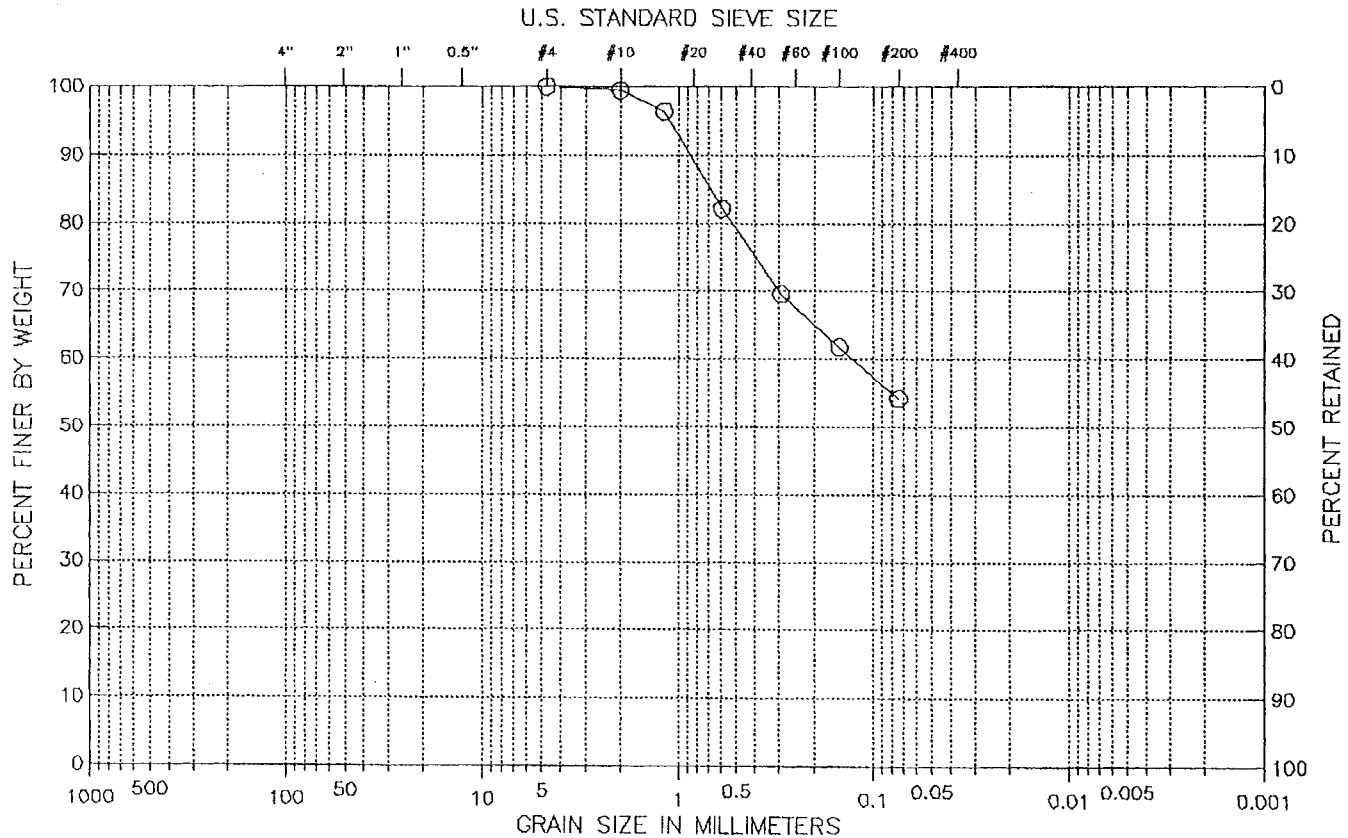
Total Dry Weight of Sample = 405.1

D85 : 0.1253 mm
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

URS

Boring No. : B-3 Sample No.: 70 feet Tested by : C. Wason Filename : B03-70	Project : Roseville Energy Facility, L.L.C. Project No.: 66-00000089.00 Location: Roseville, CA Date : Fri Aug 03 2001



Classification :

Remarks :
Depth: 70 feet

Visual Description :
Grayish Brown sa-clayey silt to sa-si clay

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-3
Sample No. : 70 feet
Location : Roseville, CA
Soil Description : Grayish Brown sa-clayey silt to sa-si clay
Remarks : Depth: 70 feet

Depth : 70 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B03-70
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	B3-70	217.20	793.70	706.60	17.80

Average Moisture Content = 17.80

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-4
Sample No. : 10 feet
Location : Roseville, CA
Soil Description : Brown slightly gray si-sandy clay/clayey sa-silt
Remarks : Depth: 10 feet

Depth : 10 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B04-10
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.73	0.73	100
#10	0.079	2.00	4.42	5.15	99
#16	0.047	1.19	6.27	11.42	98
#30	0.023	0.60	13.74	25.16	95
#50	0.012	0.30	36.72	61.88	88
#100	0.006	0.15	111.96	173.84	67
#200	0.003	0.07	83.36	257.20	51

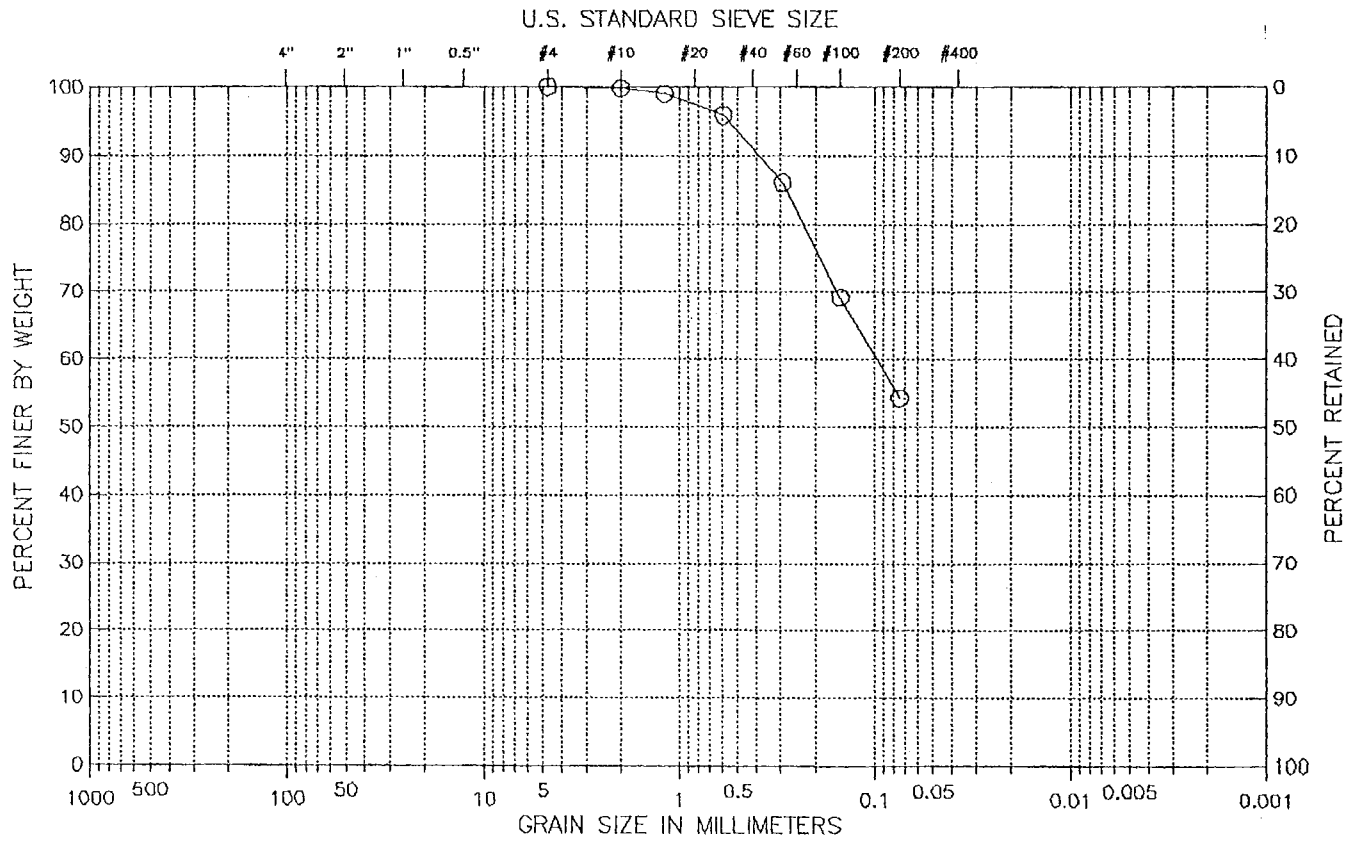
Total Dry Weight of Sample = 522.1

D85 : 0.2669 mm
D60 : 0.1111 mm
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

URS

Boring No. : B-5 Sample No.: 20 feet Tested by : C. Wason Filename : B05-20	Project : Roseville Energy Facility, L.L.C. Project No.: 66-00000089.00 Location: Roseville, CA Date : Fri Aug 03 2001



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Remarks :
Depth: 20 feet

Visual Description :
Rusty Brown clayey clayey sa-silt / si-sandy clay

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-5
Sample No. : 20 feet
Location : Roseville, CA
Depth : 20 feet
Test Date : 07/02/01
Test Method : ASTM D422
Filename : B05-20
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps
Soil Description : Rusty Brown clayey clayey sa-silt / si-sandy clay
Remarks : Depth: 20 feet

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) B5-20	221.88	774.20	662.10	25.46

Average Moisture Content = 25.46

URS

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GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-6
Sample No. : 5 feet
Location : Roseville, CA
Soil Description : Brown silty sand
Remarks : Depth: 5 feet

Depth : 5 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B06-05
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	0.85	0.85	100
#10	0.079	2.00	25.41	26.26	94
#16	0.047	1.19	40.87	67.13	86
#30	0.023	0.60	77.43	144.56	69
#50	0.012	0.30	144.44	289.00	38
#100	0.006	0.15	102.10	391.10	16
#200	0.003	0.07	28.00	419.10	9

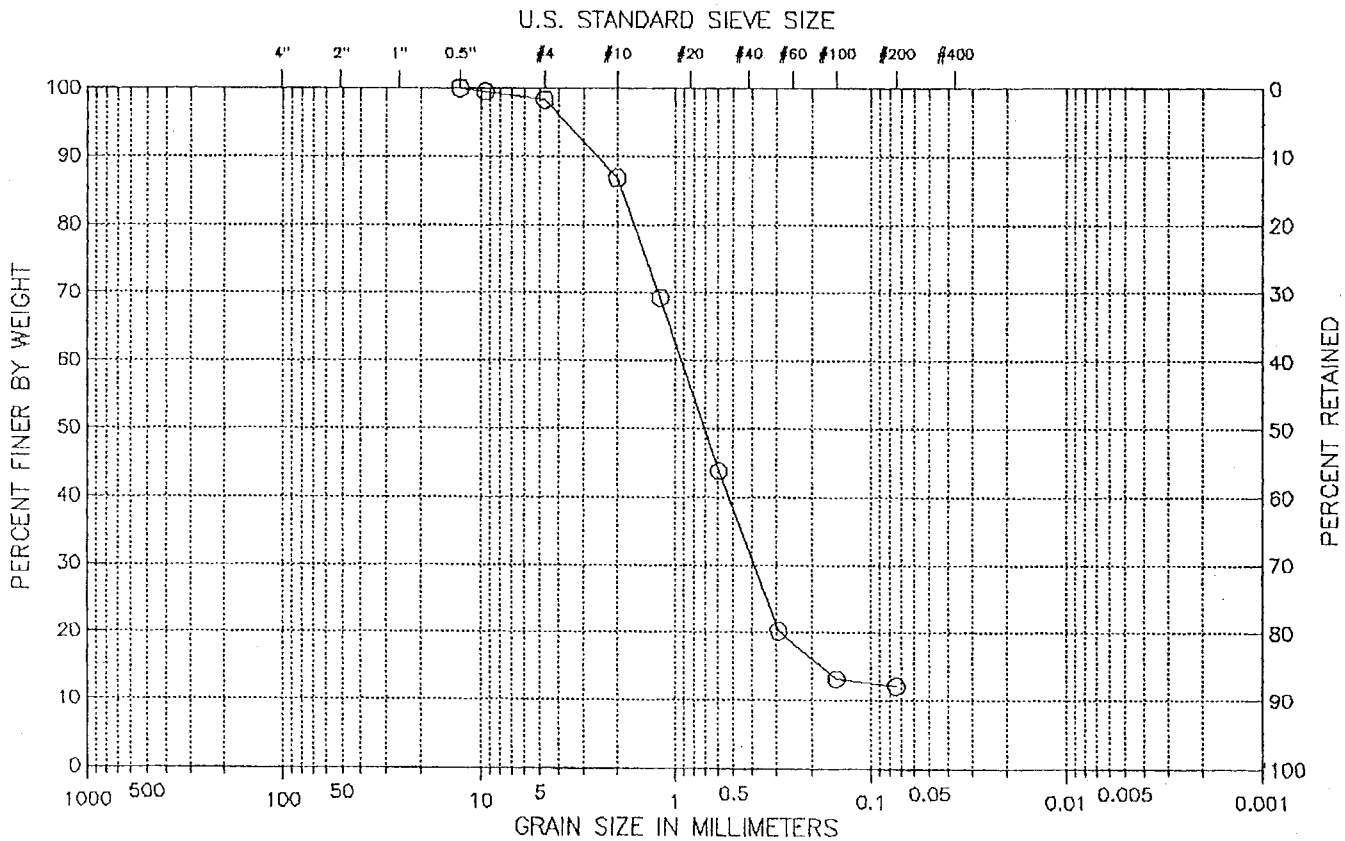
Total Dry Weight of Sample = 463.05

D85 : 1.1655 mm
D60 : 0.4884 mm
D50 : 0.3900 mm
D30 : 0.2332 mm
D15 : 0.1400 mm
D10 : 0.0785 mm

Soil Classification
ASTM Group Symbol : SW-SM
ASTM Group Name : Well-graded sand with silt
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

URS

Boring No. : B-7 Sample No.: 10 feet Tested by : C. Wason Filename : B07-10	Project : Roseville Energy Facility, L.L.C. Project No.: 66-00000089.00 Location: Roseville, CA Date : Fri Aug 03 2001



Classification :
(SM) Silty sand
Visual Description :
Brown silty sand with traces of clay

Remarks :
Depth: 10 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-7
Sample No. : 10 feet
Location : Roseville, CA
Soil Description : Brown silty sand with traces of clay
Remarks : Depth: 10 feet

Depth : 10 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B07-10
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

Natural Moisture Content

	Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1)	B7-10	228.98	763.48	697.10	14.18

Average Moisture Content = 14.18

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville-Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-8
Sample No. : 25 feet
Location : Roseville, CA
Depth : 25 feet
Test Date : 07/02/01
Test Method : ASTM D422
Filename : B08-25
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps
Soil Description : Gray Brown sa-clay silt / sa-si clay w/ iron oxide
Remarks : Depth: 25 feet

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.375"	0.374	9.51	0.00	0.00	100
#4	0.187	4.75	2.18	2.18	99
#10	0.079	2.00	9.48	11.66	97
#16	0.047	1.19	6.44	18.10	95
#30	0.023	0.60	7.97	26.07	93
#50	0.012	0.30	18.11	44.18	88
#100	0.006	0.15	40.99	85.17	77
#200	0.003	0.07	60.18	145.35	60

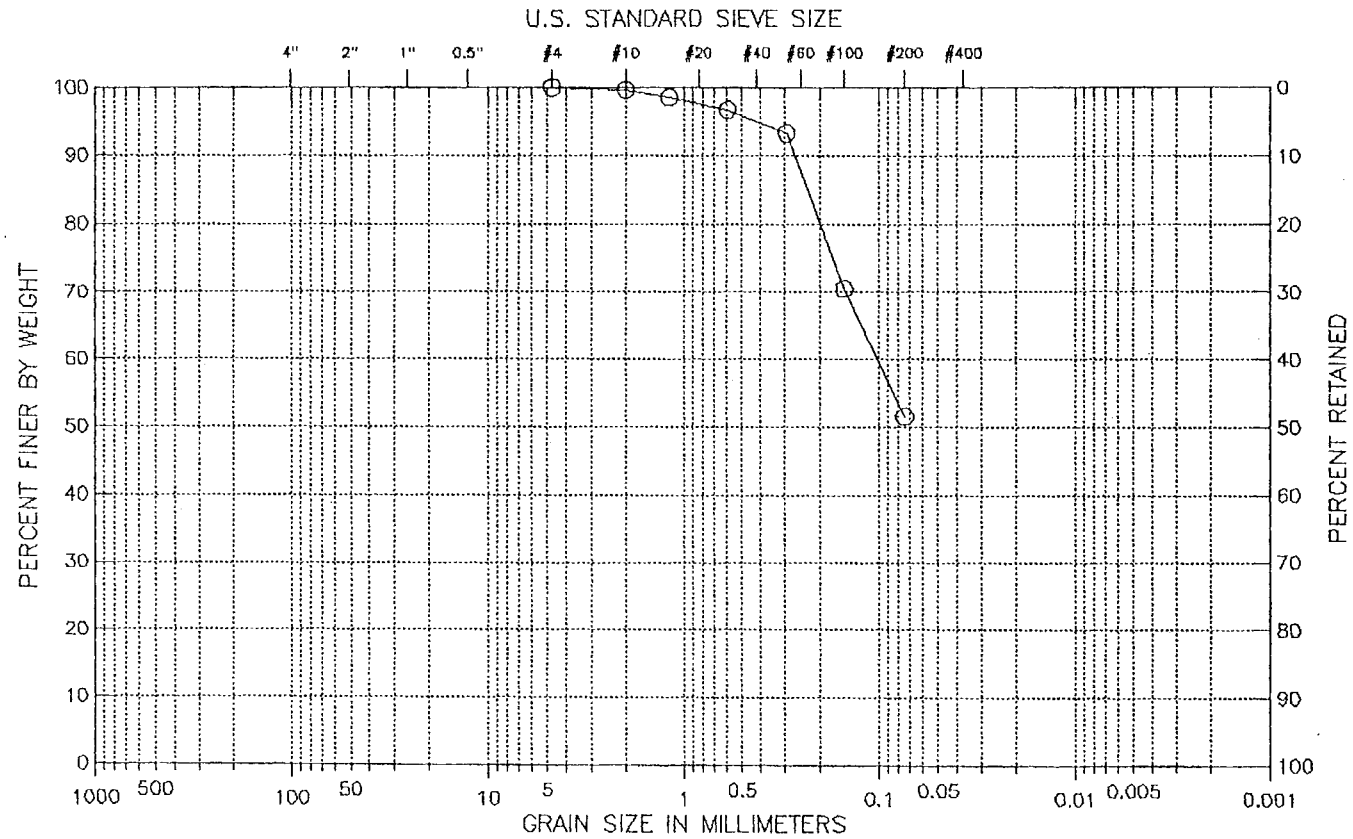
Total Dry Weight of Sample = 362.97

D85 : 0.2486 mm
D60 : 0.0741 mm
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

URS

Boring No. : B-9 Sample No: 50 feet Tested by : C. Wason Filename : B09-50	Project : Roseville Energy Facility, L.L.C. Project No.: 66-00000089.00 Location: Roseville, CA Date : Fri Aug 03 2001



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Visual Description :
Rusty Brown sa clayey silt to sa-silty clay

Remarks :
Depth: 50 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00 Depth : 50 feet
Boring No. : B-9 Test Date : 07/02/01
Sample No. : 50 feet Test Method : ASTM D422
Location : Roseville, CA
Soil Description : Rusty Brown sa clayey silt to sa-silty clay
Remarks : Depth: 50 feet

Filename : B09-50
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) B9-50	217.08	763.30	648.60	26.58

Average Moisture Content = 26.58

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-10
Sample No. : 10 feet
Location : Roseville, CA
Soil Description : Brown slightly gray clayey sand
Remarks : Depth: 10 feet

Depth : 10 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B10-10
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Sieve Openings Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.374	9.51	2.31	2.31	100
#4	0.187	4.75	1.99	4.30	99
#10	0.079	2.00	18.89	23.19	95
#16	0.047	1.19	62.96	86.15	83
#30	0.023	0.60	159.75	245.90	52
#50	0.012	0.30	103.10	349.00	31
#100	0.006	0.15	28.60	377.60	26
#200	0.003	0.07	15.10	392.70	23

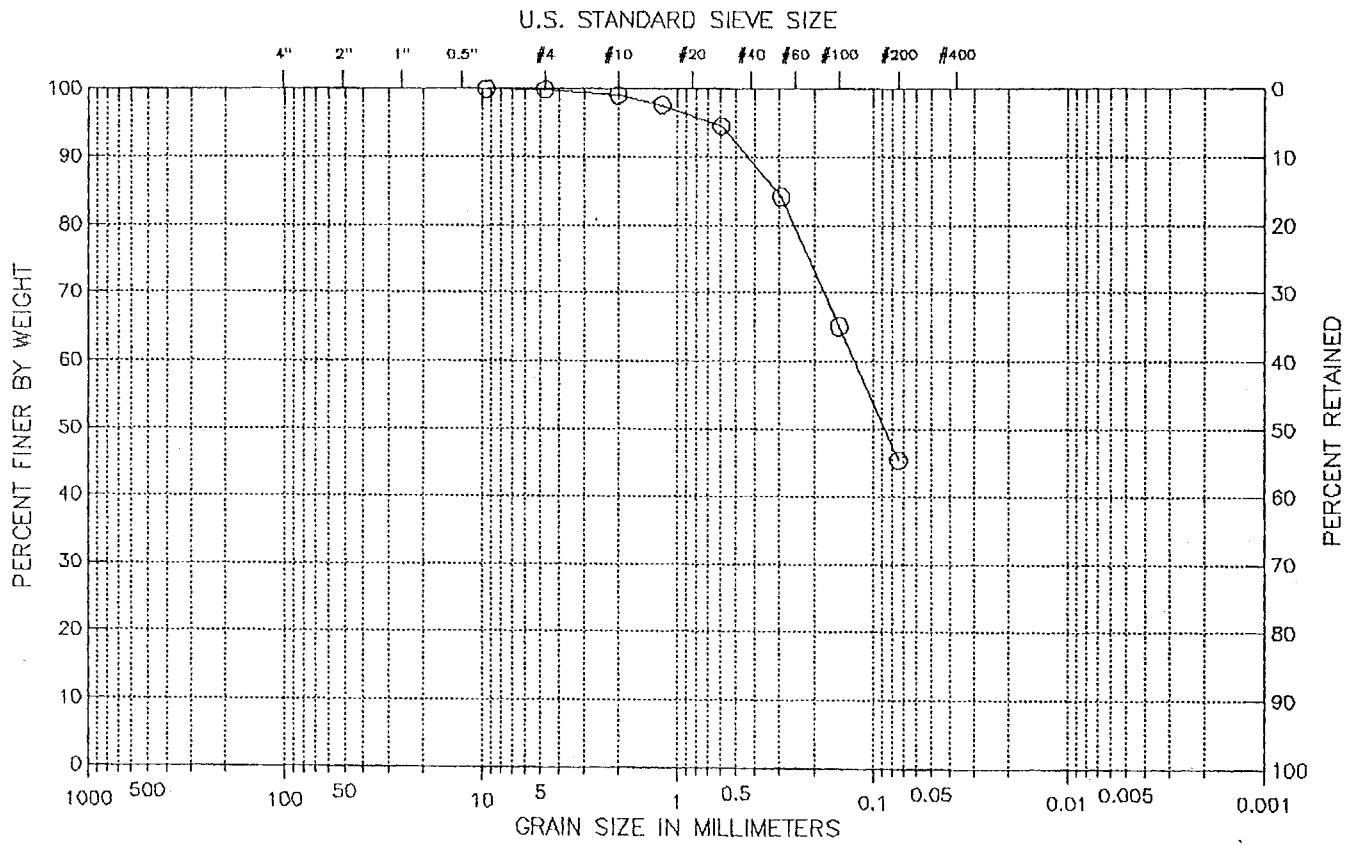
Total Dry Weight of Sample = 507.35

D85 : 1.2928 mm
D60 : 0.7169 mm
D50 : 0.5643 mm
D30 : 0.2547 mm
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-1-b(0)
AASHTO Group Name : Stone Fragments, Gravel and Sand

URS

Boring No. : B-11 Sample No: 10 feet Tested by : C. Wason Filename : B11-10	Project : Roseville Energy Facility, L.L.C. Project No.: 66-00000089.00 Location: Roseville, CA Date : Fri Aug 03 2001



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :

Visual Description :
Brown clayey silty sand

Remarks :
Depth: 10 feet

Figure 1

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : Roseville Energy Facility, L.L.C.
Project No. : 66-00000089.00
Boring No. : B-11
Sample No. : 10 feet
Location : Roseville, CA
Soil Description : Brown clayey silty sand
Remarks : Depth: 10 feet

Depth : 10 feet
Test Date : 07/02/01
Test Method : ASTM D422

Filename : B11-10
Elevation : NA
Tested by : C. Wason
Checked by : C. Capps

Natural Moisture Content

Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) B11-10	218.53	754.80	693.40	12.93

Average Moisture Content = 12.93

URS

R-Value Expansion Pressure of Compacted Soils
ASTM D2844

Project Name: Roseville Energy Facility, L.L.C. 7/12/01

Project Number: 66-00000089.00-01000

Sample Number: **Bulk 1** Depth: 0-8 inches

Description: Brown clayey silty sand

Location: **Roseville, CA**

Test Number	1	2	3	4
Water Added, cc	92	95	98	
Compaction Pressure, psi	350	350	350	
Total weight of Sample, gms	3200.4	3206.1	3196.3	
Weight of Mold, gms	2053.1	2061.3	2055	
Wet Weight at Compaction, gms	1147.3	1144.8	1141.3	
Exudation Load, lbs	7750	5400	3320	
Height of Sample, in	2.52	2.52	2.53	
S @ 1000 pounds	16	18.5	22	
S @ 2000 pounds	28	31	38	
Turns Displacement	4.17	4.29	4.55	
R-Value	74	71	64	
Moisture Content at Compaction, %	9.57	9.82	10.07	
Dry Density, pcf	125.9	125.4	124.2	
Exudation Pressure, psi	617	430	264	
R-Value Corrected for Height	74.5	71.5	64.5	
R-Value @ 300 psi	66			
Expansion, x 0.0001 in	28	24	10	
Expansiion Pressure, psi	122	105	44	
Initial Wet Weight, gms	1200.0			
Initial Dry Weight, gms	1179.2			
Initial Moisture	1.76			

URS

R-Value Expansion Pressure of Compacted Soils
ASTM D2844

Project Name: Roseville Energy Facility, L.L.C. 7/12/01

Project Number: 66-00000089.00-01000

Sample Number: **Bulk 2** Depth: 0-8 inches

Description: Reddish Brown clayey silty sand

Location: **Roseville, CA**

Test Number	1	2	3	4
Water Added, cc	95	100	105	110
Compaction Pressure, psi	350	350	3.50	325
Total weight of Sample, gms	3229.2	3171.8	3201.2	3207.7
Weight of Mold, gms	2080.2	2053.9	2060.1	2066.2
Wet Weight at Compaction, gms	1149	1117.9	1141.1	1141.5
Exudation Load, lbs	6860	5210	4210	3250
Height of Sample, in	2.54	2.49	250	2.52
S @ 1000 pounds	18	22	25	31
S @ 2000 pounds	32	37	43	50
Turns Displacement	4.17	4.29	4.55	5.02
R-Value	71	66	60	52
Moisture Content at Compaction, %	9.91	10.34	10.76	11.18
Dry Density, pcf	124.7	123.3	124.9	123.5
Exudation Pressure, psi	546	415	335	259
R-Value Corrected for Height	71.8	65.5	NA	52.5
R-Value @ 300 psi	**62**			
Expansion, x 0.0001 in	36	24	17	11
Expansiion Pressure, psi	157	105	74	48
Initial Wet Weight, gms	1200.0			
Initial Dry Weight, gms	1178.2			
Initial Moisture	1.85			

URS

R-Value Expansion Pressure of Compacted Soils
ASTM D2844

Project Name: Roseville Energy Facility, L.L.C. 7/12/01

Project Number: 66-00000089.00-01000

Sample Number: **Bulk 3** Depth: 0-8 inches

Description: Reddish Brown clayey silty sand

Location: **Roseville, CA**

Test Number	1	2	3	4
Water Added, cc	105	107	110	
Compaction Pressure, psi	350	350	3.50	
Total weight of Sample, gms	3182.2	3187	3192.1	
Weight of Mold, gms	2058.2	2061.3	2066.2	
Wet Weight at Compaction, gms	1124	1125.7	1125.9	
Exudation Load, lbs	5740	4580	2910	
Height of Sample, in	2.50	2.50	250	
S @ 1000 pounds	18.5	19.5	22	
S @ 2000 pounds	31	33	38	
Turns Displacement	4.13	4.4	4.52	
R-Value	72	69	64	
Moisture Content at Compaction, %	9.92	10.09	10.34	
Dry Density, pcf	123.9	123.9	123.7	
Exudation Pressure, psi	457	365	232	
R-Value Corrected for Height	NA	NA	NA	
R-Value @ 300 psi	**66.5**			
Expansion, x 0.0001 in	34	39	20	
Expansiion Pressure, psi	148	170	87	
Initial Wet Weight, gms	1200.0			
Initial Dry Weight, gms	1187.2			
Initial Moisture	1.08			

URS

R-Value Expansion Pressure of Compacted Soils
ASTM D2844

Project Name: Roseville Energy Facility, L.L.C. 7/12/01

Project Number: 66-00000089.00-01000

Sample Number: **Bulk 4** Depth: 0-8 inches

Description: Reddish Brown clayey silty sand

Location: **Roseville, CA**

Test Number	1	2	3	4
Water Added, cc	95	105	110	
Compaction Pressure, psi	350	350	3.50	
Total weight of Sample, gms	3181.7	3205.7	3175.1	
Weight of Mold, gms	2053.9	2080.2	2053.1	
Wet Weight at Compaction, gms	1127.8	1125.5	1122	
Exudation Load, lbs	4980	4200	3150	
Height of Sample, in	2.52	2.52	2.53	
S @ 1000 pounds	18.5	20	23	
S @ 2000 pounds	31	35	40	
Turns Displacement	4.5	5.03	5.0	
R-Value	70	64	60	
Moisture Content at Compaction, %	10.11	10.96	11.39	
Dry Density, pcf	123.2	122	120.6	
Exudation Pressure, psi	396	334	251	
R-Value Corrected for Height	70.5	64.3	60.5	
R-Value @ 300 psi	**62**			
Expansion, x 0.0001 in	37	34	30	
Expansiion Pressure, psi	161	148	131	
Initial Wet Weight, gms	1200.0			
Initial Dry Weight, gms	1176.1			
Initial Moisture	2.03			

Appendix D

Soil Corrosivity Report

V & A
CONSULTING ENGINEERS INC

August 8, 2001
Ref 01-052<soil_rpt>

Mr. Philip J. Meymand, P.E.
URS Corporation
500 12th Street, Suite 200
Oakland, CA 94607

SUBJECT: Soil Corrosivity Report for the Roseville Energy Facility, LLC

Dear Phil,

V & A Consulting Engineers (V & A) was retained by URS Corporation to perform a soil investigation as part of the Roseville Energy Facility, LLC. The objective of the investigation was to perform soil resistivity testing and chemical analysis of selected soil samples and evaluate these results with respect to the possible levels of soil corrosivity. Soil resistivity was also measured at a depth of 50 feet and 75 feet at six locations for the design of a grounding system.

TESTING SUMMARY

The objective of the investigation was to measure soil resistivities at the subject site and evaluate the results with respect to anticipated corrosion activity. This report provides recommendations for corrosion control for buried metallic structures and buried reinforced concrete structures.

The soil resistivity data indicates that the soils at the subject site are *negligibly corrosive* to *corrosive* to buried metallic structures and buried reinforced concrete structures. Based on the results of the field soil resistivity testing, six soil samples were selected from the boring logs for further analysis. Saturated soil resistivity was measured using an Agra Soil Box to determine the minimum soil resistivity. The minimum resistivity provides information about the soil during wet weather conditions.

Three of the boring samples were selected for further laboratory evaluation. These three samples were tested for pH as well as sulfate, chloride, and bicarbonate ion levels. Laboratory evaluation was performed by Sequoia Analytical Laboratories in accordance with standard analytical methods.

Villalobos & Associates

Lake Merritt Plaza, 1999 Harrison Street
Suite 975, Oakland, CA 94612
PH (510) 446-1989 FX (510) 446-1965
Oakland – Los Angeles – San Diego

TEST METHODS

Field Soil Resistivity

Resistivity of the soil was measured at twelve locations at the project site. Soil resistivity measurements were conducted by the Wenner 4-pin method, utilizing a Soil Resistance Meter, Model 400, manufactured by Nilsson Electrical Laboratory, Inc. The Wenner method involves the use of four metal probes or electrodes, driven into the ground along a straight line, equidistant from each other. An alternating current from the Soil Resistance Meter causes a current to flow through the soil between the outside probes, C1 and C2. Due to the resistance of the soil, the current creates a voltage gradient, which is proportional to the average resistance of the soil mass to a depth equal to the distance between probes. The voltage drop is then measured across pins, P1 and P2. Resistivity of the soil is then computed from the instrument reading according to the following formula:

$$\mathbf{p = 2\pi AR}$$

where:

p = soil resistivity (ohm-cm)
A = distance between probes (cm)
R = soil resistance, instrument reading (ohms)
π = 3.14159

Six of the twelve soil resistivity measurements were conducted at probe spacings of 5, 10, 15, 20, 50, and 75 feet. The other six of the twelve soil resistivity measurements were conducted at probe spacings of 5, 10, 15, and 20 feet. The resistivity values obtained and listed in Table 1 represent the average resistivity of the soil to a depth equal to the pin spacing and the resistivity values for the designated layer of soil.

RESULTS

Data obtained during the field resistivity testing has been summarized in tabular form for analysis and presentation. Table 1 lists the results of the field soil resistivity measurements conducted at the sites.

Corrosion is a natural electrochemical process which is, by definition, accompanied by the flow of electrical current. Therefore, it is important to understand how easily current will travel through a medium surrounding a metal object. Resistivity is a measure of the ability of a soil to conduct an electric current. The higher the resistivity the more difficult it is for the soil to conduct a current.

Soil resistivity is primarily dependent on the chemical and moisture content of the soil. The higher the level of chemical constituents the lower the soil resistivity. Additional moisture generally decreases the soil resistivity up to the point where the maximum solubility for the dissolved ionic chemicals is achieved. Beyond this point, an increase in moisture generally increases the resistivity as the chemicals become more and more diluted. Since corrosion rate depends on current flow to and from a metal and the adjacent medium,

the corrosion activity of steel in soil normally increases as soil resistivity decreases. The following table correlates resistivity values with degree of corrosivity. The interpretation of corrosivity varies among corrosion engineers. However, this table is a generally accepted guide.

SOIL RESISTIVITY (ohm-cm)	DEGREE OF CORROSIVITY
0 - 500	Very Corrosive
500 - 1,000	Corrosive
1,000 - 2,000	Moderately Corrosive
2,000 - 10,000	Mildly Corrosive
Above 10,000	Negligible

Reference: NACE Corrosion Basics, page 191

Results of the soil laboratory analysis are shown in Table 2. A wide variety of soluble salts is typically found in soils. Two soils having the same resistivity may have significantly different corrosion characteristics, depending on the specific ions available. The major constituents which accelerate corrosion are chlorides, sulfates and the acidity (pH) of the soil. Calcium and magnesium tend to form insoluble oxide and bicarbonate precipitates, in basic environments, which can create a protective layer over the metal surface and reduce corrosion activity. Chloride ions tend to break down otherwise protective surface deposits, and can result in corrosion of buried metallic structures and reinforcing steel in concrete structures. Sulfates in soil can be highly aggressive to portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. High concentrations of bicarbonates tend to decrease soil resistivities. However, bicarbonates are not aggressive to buried steel and concrete. Although bicarbonates are not aggressive, lower resistivity environments can promote corrosion activity.

The following tables correlate the effect of chlorides on the rate of corrosion of steel, ductile iron or reinforcing steel in concrete, and the effect of sulfates on concrete:

WATER SOLUBLE CHLORIDE CONCENTRATION (ppm)	DEGREE OF CORROSIVITY
Over 5,000	Severe
1,500 - 5,000	Considerable
500 - 1,500	Corrosive
Below 500	Threshold

Reference: Extrapolation from California Test Method 532, Method for Estimating The Time To Corrosion of Reinforced Concrete Substructures and V & A Consulting Engineers' experience

WATER SOLUBLE SULFATE CONCENTRATION (ppm)	DEGREE OF CORROSIVITY
Over 10,000	Very Severe
1,500 - 10,000	Severe
150 - 1,500	Moderate
0 - 150	Negligible

Reference: ACI-318, Building Code Requirements for Reinforced Concrete

Acidity, as indicated by the pH value, is another important factor of soil. The lower the pH (the more acidic the environment), the higher will be the corrosivity with respect to buried metallic and concrete structures. As pH increases above 7 (the neutral value), conditions become increasingly more alkaline and passive to buried steel structures. V & A has developed a table correlating the effect of pH on the rate of corrosion of buried steel or concrete structures. The data is derived from V & A's extensive experience and review of the literature, e.g., Romanoff M., Underground Corrosion, and Uhlig H., Corrosion and Corrosion Control.

pH	DEGREE OF CORROSIVITY
< 5.5	Severe
5.5-6.5	Moderate
6.5-7.5	Neutral
> 7.5	Negligible

The saturated minimum soil resistivities measured ranged from 1,400 ohm-cm to 7,700 ohm-cm, which is considered *moderately corrosive* to *negligibly corrosive*. The pH ranged from 6.9 to 7.2, which is considered *neutrally corrosive*. The chloride levels ranged from 17 ppm to 38 ppm, which is considered *negligibly corrosive*. The results also show that the level of sulfates ranged from 8 ppm to 16 ppm, which is considered *negligibly corrosive*. The level of bicarbonates ranged from 290 ppm to 380 ppm. High concentrations of bicarbonates tend to decrease soil resistivities. However, bicarbonates are not aggressive to buried steel and concrete. Although bicarbonates are not aggressive, lower resistivity environments can promote corrosion activity.

In summary, based on the soil resistivity, metallic structures placed in this soil environment may experience some corrosion deterioration.

RECOMMENDATIONS

Based upon the low soil resistivity data and review of the project requirements, corrosion monitoring and control will be required to prevent corrosion of the metallic structures. The quality of materials and workmanship should be inspected by a corrosion engineer during construction.

Buried Metallic Structures

Based on the low soil resistivity it is recommended that buried metallic piping systems, such as steel and ductile iron, be coated with a bonded dielectric or mortar coating. All non-welded joints should be bonded to provide electrical continuity. Cathodic protection should be installed to provide corrosion protection. Buried metallic piping should be electrically isolated from other structures.

Buried Reinforced Concrete Structures

Buried reinforced concrete structures should be constructed of durable concrete such as described in ACI Standards 201.2R and 222R. These recommendations include but are not limited to the following:

- The water/cement ratio should not exceed 0.40.
- A concrete cover of a minimum of 2 inches should be applied over all steel reinforcement.
- Salt-free sand and potable water should be used.
- The concrete should be allowed to cure according to the manufacturer's recommendations.

Please call if you have any questions or comments.

Sincerely,
V & A CONSULTING ENGINEERS
The Infrastructure Preservation People

Glenn H. Willson, P.E.
Project Manager

TABLE 1
ROSEVILLE ENERGY FACILITY
FIELD RESISTIVITY TEST DATA

<8/6/01> <Job01-052\Tab1.Soil>

Site No.	Depth (feet)	R1 (ohm) Meter Reading	R1 (ohm) Mult	"K" Factor	Resistivity (ohm-cm)	1/R1 (mhos)	Del (1/R1) Del mhos	R2 (ohm)	"K" FACTOR (cm)	Layer Resistivity (ohm-cm)	Depth (feet)
1	5	2.6	1.0	958	2,490	0.4	-	-	0	2,490	0 - 5
	10	2.5	1.0	1,915	4,788	0.4	0.0	65.0	958	62,241	5 - 10
	15	1.1	1.0	2,873	3,160	0.9	0.5	2.0	958	1,881	10 - 15
	20	-	-	3,830	>3,160	-	0.9	1.1	958	1,053	15 - 20
	50	2.4	1.0	9,576	22,981	0.4	0.4	2.4	5,745	13,789	20 - 50
	75	1.0	1.0	14,363	14,363	1.0	0.6	1.7	4,788	8,208	50 - 75
2	5	1.5	1.0	958	1,436	0.7	-	-	0	1,436	0 - 5
	10	3.8	1.0	1,915	7,277	0.3	0.4	2.5	958	2,373	5 - 10
	15	1.2	1.0	2,873	3,447	0.8	0.6	1.8	958	1,679	10 - 15
	20	-	-	3,830	>3,447	-	0.8	1.2	958	1,149	15 - 20
	50	1.2	1.0	9,576	11,491	0.8	0.8	1.2	5,745	6,894	20 - 50
	75	-	-	14,363	>11,491	-	0.8	1.2	4,788	5,745	50 - 75
3	5	1.8	1.0	958	1,724	0.6	-	-	0	1,724	0 - 5
	10	1.3	1.0	1,915	2,490	0.8	0.2	4.7	958	4,481	5 - 10
	15	1.1	1.0	2,873	3,160	0.9	0.1	7.2	958	6,847	10 - 15
	20	-	-	3,830	>3,160	-	0.9	1.1	958	1,053	15 - 20
	50	1.5	1.0	9,576	14,363	0.7	0.7	1.5	5,745	8,618	20 - 50
	75	1.6	1.0	14,363	22,981	0.6	0.0	24.0	4,788	114,907	50 - 75
4	5	1.2	10.0	958	11,491	0.1	-	-	0	11,491	0 - 5
	10	1.1	10.0	1,915	21,066	0.1	0.0	132.0	958	126,398	5 - 10
	15	3.8	1.0	2,873	10,916	0.3	0.2	5.8	958	5,559	10 - 15
	20	-	-	3,830	>10,916	-	0.3	3.8	958	3,639	15 - 20
	50	-	-	9,576	>10,916	-	0.0	-	5,745	-	20 - 50
	75	-	-	14,363	>10,916	-	0.0	-	4,788	-	50 - 75

TABLE 1
ROSEVILLE ENERGY FACILITY
FIELD RESISTIVITY TEST DATA

<8/6/01> <Job01-052\Tab1.Soil>

Site No.	Depth (feet)	R1 (ohm) Meter Reading	R1 (ohm) Mult	"K" Factor	Resistivity (ohm-cm)	1/R1 (mhos)	Del (1/R1) Del mhos	R2 (ohm)	"K" FACTOR (cm)	Layer Resistivity (ohm-cm)	Depth (feet)
5	5	1.2	10.0	958	11,491	0.1	-	-	0	11,491	0 - 5
	10	1.1	10.0	1,915	21,066	0.1	0.0	132.0	958	126,398	5 - 10
	15	8.0	1.0	2,873	22,981	0.1	0.0	29.3	958	28,088	10 - 15
	20	-	-	3,830	>22,981	-	0.1	8.0	958	7,660	15 - 20
	50	2.1	1.0	9,576	20,109	0.5	0.5	2.1	5,745	12,065	20 - 50
	75	-	-	14,363	>20,109	-	0.5	2.1	4,788	10,054	50 - 75
6	5	1.7	1.0	958	1,628	0.6	-	-	0	1,628	0 - 5
	10	4.4	1.0	1,915	8,427	0.2	0.4	2.8	958	2,653	5 - 10
	15	2.5	1.0	2,873	7,182	0.4	0.2	5.8	958	5,544	10 - 15
	20	-	-	3,830	>7,182	-	0.4	2.5	958	2,394	15 - 20
	50	9.8	1.0	9,576	>7,182	0.1	0.1	9.8	5,745	56,304	20 - 50
	75	-	-	14,363	>7,182	-	0.1	9.8	4,788	46,920	50 - 75
7	5	1.1	1.0	958	1,053	0.9	-	-	0	1,053	0 - 5
	10	1.4	1.0	1,915	2,681	0.7	0.2	5.1	958	4,915	5 - 10
	15	1.3	1.0	2,873	3,734	0.8	0.1	18.2	958	17,428	10 - 15
	20	-	-	3,830	>3,734	-	0.8	1.3	958	1,245	15 - 20
8	5	2.2	1.0	958	2,107	0.5	-	-	0	2,107	0 - 5
	10	4.7	0.1	1,915	900	2.1	1.7	0.6	958	572	5 - 10
	15	3.0	0.1	2,873	862	3.3	1.2	0.8	958	794	10 - 15
	20	-	-	3,830	>862	-	3.3	0.3	958	287	15 - 20

TABLE 2
ROSEVILLE ENERGY FACILITY
SOIL RESISTIVITY AND CHEMICAL DATA

<8/8/01>

<01-052\Tab2>

Item No.	Boring No.	Depth (ft)	Soil Resistivity		Chemical Data			
			As Received (ohm-cm)	Minimum (ohm-cm)	pH	Sulfate (ppm)	Chloride (ppm)	Bicarbonate (ppm)
1	B-2	15	4,000	1,700	7.2	16	38	290
2	B-3	10	4,300	3,200				
3	B-3	15	1,900	1,400	7.2	12	18	380
4	B-5	5	4,000	2,700				
5	B-5	10	3,400	1,900	6.9	8	17	290
6	B-6	20	21,000	7,700				

Roseville Energy Park

Appendix 10-G2
Geotechnical Report

October 2003

Roseville Energy Park
Application for Certification

Carl Gentry

FINAL GEOTECHNICAL REPORT
for the
Pleasant Grove Wastewater Treatment Plant
Roseville, California

ESPAÑA
Geotechnical
Consulting

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FINAL GEOTECHNICAL REPORT
for the
Pleasant Grove Wastewater Treatment Plant
Roseville, California

Submitted to

CAROLLO ENGINEERS
2500 Venture Oaks Way, Suite 320
Sacramento, CA 95833

by

ESPAÑA GEOTECHNICAL CONSULTING

August 24, 1999

ESPAÑA
Geotechnical
Consulting

502 Giuseppe Court, Suite 11
Roseville, CA 95678
(916) 773-2600
FAX (916) 782-4846

August 24, 1999

Carollo Engineers
2500 Venture Oaks Way, Suite 320
Sacramento, CA 95833

Attention: Kathy Marks

Subject: **Final Geotechnical Report**
Pleasant Grove Wastewater Treatment Plant
Roseville, California
EGC Project No. H199

Gentlemen:

The following is our Final Geotechnical Report for the proposed Pleasant Grove Wastewater Treatment Plant to be located along Phillip Road near the intersection of Blue Oaks Boulevard and Fiddyment Ranch Road. A Draft Geotechnical Report, dated April 21, 1999, was previously submitted to you for review and comment. Our work was performed in accordance with your agreement dated June 19, 1998.

Our geotechnical study was completed to evaluate the subsurface conditions at the subject site and provide recommendations for design and construction of the proposed facilities. In general, the site soil conditions were found to be suitable for the proposed improvements using conventional grading methods and foundation designs.

Geotechnical studies utilizing a limited number of exploratory borings relies on an assumption of uniformity of soil between probes. Oftentimes during construction we find this not to be the case. Therefore, in presenting this report we do so with the understanding that we will be allowed to continue on this project by providing geotechnical observation, testing, and inspection services during site grading and construction.

Sincerely,

ESPAÑA GEOTECHNICAL CONSULTING

Patrick Fischer
CEG 1739

REGISTERED GEOLOGIST
Patrick F. Fischer
No. 1739
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

Carlos España
GE 298

REGISTERED PROFESSIONAL ENGINEER
CARLOS ESPAÑA
GE298
Exp. 9/30/
GEOTECHNICAL
STATE OF CALIFORNIA

show expiration date.

H199RF.CAR

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INTRODUCTION

Location and Description of Project

This report presents the results of our geotechnical study of the proposed Pleasant Grove Wastewater Treatment Plant site to be located on west side of Phillip Road, approximately 1 mile west of Fiddyment Road, in Roseville, California. A Vicinity Map is included as Figure 1. Figure 1 is a copy of a portion of the USGS, 7.5 minute, Pleasant Grove and Roseville Quadrangles. A Site Plan, showing the proposed facilities, is included as Figure 2. Figure 2 is a reduction of a preliminary site plan provided by Carollo Engineers.

The topography of the site is gently rolling with shallow drainages that generally flow northward into Pleasant Grove Creek which is located approximately 1,500 feet north of the site at its closest approach. A tributary drainage to Pleasant Grove Creek is located approximately 50 feet off the northeast corner of the site (refer to Figure 1). Based on the site map provided by Carollo Engineers, ground elevations vary from a high of approximately 111 feet at the southeast corner of the site to a low of approximately 85 feet in the northeast portion of the site.

The site is currently unimproved and used as open cattle pasture. It appears that the site has been used only for open pasture and/or dry land farming in the past; indications of past improvements (other than fencing) were not observed. The ground surface is covered by moderately dense grasses. Several trees are present along the northeast site boundary and a single tree is present in the northeast portion of the site.

As proposed, the project is to include facilities for a 12 million gallon per day wastewater treatment plant. The planned improvements are shown on Figure 2 and the primary elements consist of sedimentation ponds bordering the northern portion of the site (Ponds 1, 2, and 3 on Figure 2), an emergency wastewater storage pond on the west side of the site, a storm water detention basin, an influent pump station (IPS), a grit basin (G), a chlorine contact basin (west of the emergency storage pond), secondary clarifiers (SC), oxidation ditches (OD), and associated structures such as chemical storage, maintenance, and administration buildings. The influent pump station will have a total depth of approximately 35 to 40 feet below the finished ground surface and will be fed by a new trunk sewer which will traverse the northeast corner of the site; most other below grade structures will be founded at depths of 10 to 15 feet below the finished ground surface.

We understand that the ponds will be filled for short periods of time, generally less than 1 week, but a water depth of up to 18 inches may be maintained year-round for use as wetland mitigation. Liners are not required for the ponds but it is desired to minimize infiltration from the emergency storage pond on the west side of the site.

Grading plans were not available at the time of this report. Based on preliminary finish elevations provided by Carollo Engineers, the site grade within the central structural area (oxidation ditches, clarifiers, digesters, etc.) will be at an elevation of approximately 102 to 105 feet. Site grade in the northern portion of the structural area (influent pump station, chlorine contact basin, chemical storage, etc.) will be at approximately 95 to 99 feet. The administration and maintenance buildings will be constructed in the

southeast corner of the site which will be raised to an elevation of approximately 110 feet. The storage ponds are proposed to have a bottom elevation of approximately 91 feet; the surrounding embankments will have a top elevation of approximately 100 feet. Both cuts and fills on the order of 5 to 15 feet will be required to achieve final grade throughout the site.

Previous Work

We are not aware of any prior geotechnical work completed specifically for the subject site. A Preliminary Geologic Report was completed by Anderson Consulting Group (1993) for the New Roseville Wastewater Treatment Plant - Siting project.

Purpose and Scope

This Geotechnical Report, prepared by España Geotechnical Consulting, is intended for use by the architects and engineers involved in the Pleasant Grove Wastewater Treatment Plant project. The purpose of our study was to evaluate the subsurface conditions at the subject site in order to provide geotechnical recommendations for design and construction of the project. Our scope of services was outlined in your contract dated June 19, 1998 and is generally as follows:

1. Perform a site reconnaissance. Review the preliminary geologic report for the siting study. Review selected, existing geologic data, aerial photos, maps and other available data pertinent to the site.

2. Drill and sample exploratory borings to depths of 5 to 70 feet at locations of proposed structures, basins, pipelines and tanks, and construct one observation well to a depth of approximately 60 feet below the ground surface for monitoring the ground water level at the site. At selected locations, nuclear gauge density testing was completed to obtain additional data on in-place soil density.

3. Complete laboratory tests on selected soil samples obtained including in-place soil moisture content and density, sieve analysis, hydrometer analysis, expansion index, Atterberg Limits, direct shear strength, unconfined compressive strength, compaction curve, R-Value, corrosivity (pH, resistivity, sulfates, chlorides), and permeability.

4. Prepare a geotechnical report with (I) the results of our field and laboratory investigations with logs of borings, (ii) a description of soil and ground water conditions across the site, and (iii) recommendations for design and construction of the proposed treatment plant, including site grading, foundation design, shoring/dewatering requirements, lateral earth pressures, seismic design parameters, and pavement design.

Our original scope of services included excavation and logging of exploratory trenches. Due to the wet surface soil conditions, we were not able to access the site with a backhoe; therefore, additional borings were drilled to substitute for the trenches. Nuclear density testing proposed to be completed in the trenches was performed at six (6) surface locations throughout the site.

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices in the Sacramento area. This warranty is in lieu of all other warranties, either expressed or implied.

SITE CONDITIONS

General Site Geology

Published geologic literature indicates that the site is immediately underlain by Quaternary (less than 1.6 million years old) alluvial deposits of the Riverbank Formation (Helley and Harwood, 1985; Wagner, D.L., et al, 1981). Figure 3 shows the general geology of the site vicinity.

The Riverbank Formation (Lower Member) typically consists of semi-consolidated and interbedded gravel, sand, and silt. The lower member of the Riverbank Formation unconformably overlies the Turlock Lake Formation which also consists of semi-consolidated alluvial deposits.

Due to the thickness of the overlying alluvium, little is known about the geologic structure at significant depths beneath the site. Based on well data (Harwood and Helley, 1987), the sediments underlying the Quaternary alluvium in this area probably dip gently (2 to 5 degrees) toward the west. The contact with granitic basement rock is located at a depth of more than 2,600 feet below the surface.

Faulting

The site is located in the central Sacramento Valley which is a region with few known faults. Earthquakes typically occur as a result of movement along faults. For the purpose of fault classification, faults are often grouped into the following categories:

Holocene - displacement has occurred within the last 10,000 to 11,000 years.

Late Quaternary - displacement has occurred within the last 700,000 years but evidence of Holocene activity is lacking.

Quaternary - evidence of displacement within the last 1.6 million years.

Pre-Quaternary - no recognized evidence of displacement in Quaternary time.

In general, faults with Holocene rupture are often considered to be "active". Late Quaternary or Quaternary faults are often referred to as "potentially active".

In Table 1 below, the distance between the site and recognized Holocene/Late Quaternary faults within 62 miles (approximately 100 km) of the site is provided. Maximum earthquake magnitudes (moment magnitude) are also shown and are based on seismological data such as maximum historic earthquakes and on geologic data such as fault length and fault displacement parameters. Faults within the 62 mile radius are considered to have the greatest potential for impacting the site if they were to rupture. A Regional

Fault Location Map, showing the general location of Holocene and Late Quaternary age faults, is included as Figure 4.

TABLE 1

HOLOCENE/LATE QUATERNARY FAULTS WITHIN A 63 MILE (100 KM) RADIUS (Jennings, 1994)			
Fault Name	**Distance (miles) and Direction from Site**	**Maximum Credible Earthquake[1]**	**Maximum Probable Earthquake[1]**
Antioch	53 SW	6.70	5.50
Bear Mountains Fault[4]	19 E	6.50[2]	6.00[3]
Cleveland Hill - Swain Ravine[4]	24 NE	6.50[2]	6.00[3]
Coast Range - Sierran Block	37 W	7.00	6.25
Cordelia	50 SW	6.70	4.25
Dunnigan Hills	24 NW	6.50	4.75
Green Valley	54 SW	7.00	6.00
Spenceville - Deadman[4]	16 NE	6.50[2]	6.00[3]
West Napa	60 SW	6.50	5.00
Wolf Creek[4]	17 NE	6.50[2]	6.00[3]

[1] Moment Magnitude (Blake, 1993) [2] Mualchin, 1996 [3] España Geotechnical Consulting
[4] Foothills Fault System

Of the faults listed above, the Coast Range - Sierran Block Boundary Zone, faults associated with the Foothills Fault System, and the Dunnigan Hills Fault are expected to have the greatest impact on the site due to their proximity to the site. The Coast Range - Sierran Block Boundary Zone is a relatively recently recognized seismic source. Faulting within this zone is not well defined at the surface; however, numerous earthquakes along the boundary between the Coast Ranges and the Central Valley have been noted since the 1892 Vacaville-Winters earthquakes with approximate Richter magnitudes ranging from 5.5 to 6.4. The most recent significant event within this zone is the 1983 Coalinga earthquake of Richter magnitude 6.7 (moment magnitude of approximately 6.2) located approximately 160 miles to the south of the site.

The Foothills Fault System is located along the western flank of the Sierra Nevada. Many areas of late Cenozoic faulting and some areas of Quaternary faulting have been identified along this system. Portions of this system have been seismically active in historic time. The most recent event on the Foothills Fault System was the 1975 Oroville earthquake of magnitude 5.6.

The Dunnigan Hills Fault is a northwest trending fault located west of Interstate 5 in the Dunnigan Hills near Zamora. This fault has no historic (within the last 200 years) record of activity; however, geomorphic evidence such offset streams and well-defined, linear scarps indicate relatively recent (Holocene) activity.

It should be noted that the Willows Fault has been inferred to pass by the site approximately 8 miles to the west (Jennings, 1994); however, the existence of this fault at this location is not well substantiated. Activity on the southern portion (Sacramento area) of the Willows Fault is believed to be Pre-Quaternary (no evidence of displacement in approximately the last 1.6 million years) and, therefore, is not considered to be a source of potential ground rupture or ground shaking. Microseismicity (earthquakes with a magnitude less than 3.0) has been noted at the far northern end of the Willows Fault near the town of Willows, approximately 70 miles north of the subject site (Wong, et al, 1988). This activity seems to be restricted to the northern portion of the fault where it branches into the Late Quaternary age Corning Fault. The Willows Fault, south of Sutter Buttes in Sutter County, is not considered to be a seismic source or fault rupture hazard.

Subsurface Soil Conditions

A total of 35 borings were drilled for the project. The approximate boring locations are shown on the Boring Location Map attached as Figure 5. The soil conditions observed in the borings were similar throughout the site. In general, the soil consisted of red-brown to gray-brown, moist, interbedded, medium dense to dense, silty sand and very stiff to hard silt to the maximum depth of our borings (approximately 70 feet below the surface). The northern portion of the site had a predominance of silty sand in the upper 10 to 15 feet while the southern portion of the site had a predominance of silt. At the time of our drilling (March 1999) the surface soil throughout the site was very wet from recent rains. This resulted in typically soft soil conditions to depths of 1 to 1.5 feet below the surface.

The soil profile described above is generalized; therefore, the reader is advised to consult the logs of the exploratory borings, Figures I-1 through I-35 in Appendix I, if the logged soil conditions at a specific location are desired. On the boring logs, the soil type, color, moisture, consistency, and Unified Soil Classification symbol are indicated.

The locations of exploratory borings were surveyed and staked by Carollo Engineers prior to our field work. Elevations of the surveyed locations were provided to us. Several borings were moved a short distance from their previously surveyed location to avoid possible wetland areas. The elevations of these borings were interpolated from elevations shown on the site map provided to us by Carollo Engineers. Accuracy of the boring locations and elevations can only be implied to the degree that these methods warrant.

Ground Water

Perched ground water was encountered in Boring B-3 at a depth of approximately 6 feet and in Boring B-7 at a depth of approximately 4 feet. The perched water appears to be confined to relatively shallow, sandy soil horizons overlying relatively impermeable silts. Ground water was not encountered elsewhere within the site.

An observation well was constructed at the location of Boring B-7. Two wells were completed within the boring; the upper level was screened above a depth of 30 feet (approximately elevation 72 feet) and the second level was screened above a depth of 67 feet (approximately elevation 35 feet). Ground water levels

recorded within these wells is included in Appendix III. Our water level measurements indicated the presence of perched water at a depth of approximately 4.5 feet (elevation 97.5) during drilling which later dropped below a depth of 20 feet (elevation 82). It appears that the perched water was from a limited source at a depth of approximately 4.5 feet which was subsequently depleted (causing the water level to drop below a depth of 20 feet).

Ground water was initially measured at a depth of approximately 65 feet (elevation 37) in the deeper second level which later stabilized at a depth of approximately 66 feet (elevation 36). It appears that this may be the local static ground water level but is likely an accumulation of minor seepage from above this depth. Based on available information (Boyle Engineering Corporation, 1987 and California Department of Water Resources, 1993), static ground water elevations in the area are expected to be greater than 70 to 80 feet below the ground surface

Ground water observations were made in the exploratory borings at the times and under the conditions stated. It should be noted that fluctuations in the level of ground water may occur due to variations in rainfall, temperature, irrigation, and other factors.

Expansive Soil

Soils containing a significant amount of silt and/or clay was observed near the surface at a number of the boring locations. Considering the presence of the silt and clay, the soil was considered to be potentially expansive. Expansion Index tests were run on several samples of the soil to determine the expansion potential. The results of this testing are discussed later in this report.

LABORATORY TEST RESULTS

Selected samples obtained during drilling were tested to determine a variety of physical properties. The test types and procedures used are presented in Appendix II. The test results are presented in Appendix II and on the Boring Logs in Appendix I. A summary of the laboratory test results is presented below.

Dry densities of the undisturbed samples varied from approximately 77 pounds per cubic foot (pcf) to 121 pcf (excluding extreme values). Moisture contents varied from approximately 7% to 42%.

Unconfined compressive strength tests performed on soil samples retrieved from the borings indicated strengths ranged from 0.9 tons per square foot (tsf) to 4.3 (tsf).

Direct shear strength testing performed on both bulk soil samples and relatively undisturbed soil samples resulted in values of cohesion ranging from 350 psf to 1250 psf and phi (ϕ) angles ranging from 17° to 29°.

Compaction tests performed on representative bulk samples of the soil resulted in maximum dry densities ranging from approximately 101 pcf to 131 pcf with optimum moisture contents from about 11% to 19%.

Expansion Index testing performed on selected samples of near surface soil resulted in Expansion Indices ranging from 11 to 53. These values indicate that the site soil has a very low to medium potential for expansion (per 1997 Uniform Building Code, Chapter 18, Table 18-I-B).

R-Value tests were run on bulk samples of the soil anticipated to be near pavement subgrade elevation. The tests resulted in R-Values ranging from 18 to 36.

Grain size distribution tests performed on samples of soil retrieved from the borings confirmed the presence of sandy silt and silty sand as the predominant soils within the site.

Samples of soil anticipated to be in contact with the new structures were tested for sulfate and chloride content, pH and resistivity, and sulfide and redox potential. Both sulfate and chloride levels were low to nondetectable. The pH for all samples ranged from 6.9 to 8.0 (relatively neutral) and resistivities ranged from 1310 to 6305 ohm-cm. Tests for the presence of sulfide were negative in all samples and redox potential ranged from +228 to +361 millivolts. These test results were obtained for corrosion analysis by Carollo Engineers.

Two permeability tests were performed on samples of silty soil expected to underlie the pond areas or expected for use as pond surfacing. The tests resulted in hydraulic conductivities ranging from 2.4×10^{-6} to 2.5×10^{-6} cm/sec.

CONCLUSIONS

Faulting

The subject site does not lie within or adjacent to an Alquist-Priolo Earthquake Fault Zone (Fault Rupture Hazard Zones; Hart, 1994). Field reconnaissance and review of aerial photographs and geologic literature did not disclose the presence of faulting within or adjacent to the site. No known Holocene or Late Quaternary faults pass near the site or trend directly toward the site. Surface rupture due to faulting at the site is not expected to occur.

Ground Shaking

Based on our present knowledge of the geologic conditions within the site, the primary effects of seismic activity such as ground rupture or tectonic creep are not expected to occur. However, some degree of ground motion resulting from activity on nearby faults should be anticipated. The most severe ground motion would be expected to occur if there were to be significant activity along the Foothills Fault System.

Based on a deterministic estimate of ground acceleration at the site (Boore et al, 1993, Site Class B), the peak horizontal ground acceleration (PHGA) for the maximum credible event on the Foothills Fault System is estimated at approximately 0.13g (where g is equal to earth's gravity) and the PHGA for the maximum probable event is approximately 0.10g. Probabilistic seismic hazard maps produced by the California Department of Conservation, Division of Mines and Geology (Peterson et al, 1996; Petersen and Cramer, 1997) indicate that the peak horizontal acceleration for a 10% probability of exceedance in 50 years is

approximately 0.15 to 0.18g. Current California Building Code incorporates design parameters for ground shaking of this magnitude.

Uniform Building Code Seismic Design Criteria

The site is located within Uniform Building Code, Seismic Zone 3. UBC design criteria for the site are as follows:

- The Seismic Zone Factor, Z (UBC, 1997, Table 16-I) is 0.30.
- Soil Profile Type (UBC, 1997, Table 16-J) is S_D.
- The Seismic Coefficient, C_a (UBC, 1997, Table 16-Q) is 0.36.
- The Seismic Coefficient, C_v (UBC, 1997, Table 16-R) is 0.54.

Liquefaction Potential

Liquefaction can occur when loose to medium dense, granular, saturated soils generally within 50 feet of the surface are subjected to ground shaking. The site is underlain by medium dense to dense sands and very stiff to hard silts and, with the exception of some isolated occurrence of perched ground water, ground water is greater than 50 feet below the ground surface. Based on the site soil and ground water conditions, the soils underlying the site are not considered to be liquefiable.

Seismically Induced Settlement

During a seismic event, ground shaking can cause densification of soil which can result in settlement of the ground surface. Considering the typically medium dense to dense and very stiff to hard nature of the soils underlying the site, the potential for seismically induced settlement is considered to be low. Fill placed for site improvement must be placed and compacted in accordance with the project geotechnical report in order to reduce the potential for significant settlement.

Expansive Soil

Clayey soils are sometimes subject to expansion when wetted and contraction when dried. Expansion Index tests indicate that the site soils have a very low to medium potential for expansion. Potentially expansive soil of this type can be mitigated through standard grading practices and/or slight modification of structure foundation depths and loading. Recommendations for minimizing the risk of damage due to potentially expansive soil have been included in the "**Site Grading**," "**Foundation**," and "**Slab-on-grade**" sections of this report.

Compressible Soil

Soils considered to have a significant potential for compressibility under light to moderate structural loads were not encountered on the site.

Slope Stability

Due to the flat lying nature of the sedimentary deposits and the relatively low topographic relief within the site, landsliding is not expected to occur unless unstable slopes are created during grading. The soil conditions and geologic structure (relatively flat lying deposits) are acceptable for construction of the proposed slopes. Cut and fill slopes are expected to be grossly stable at gradients of 2:1 (horizontal to vertical) or flatter. Interior pond slopes are expected to be grossly stable at gradients of 2.5:1 or flatter. Construction of new slopes should be completed in accordance with the grading recommendations provided in this report..

Soil Shrinkage Potential

In-place soil densities were obtained from soil samples retrieved from the exploratory borings and through conventional nuclear gauge testing of the upper 2 to 3 feet of surface soil. These densities were compared to available compaction curves completed for this study in order to evaluate approximate soil shrinkage after excavation and compaction. Each sample was evaluated at 92% relative compaction (based on the ASTM D 1557 test method) assuming a minimum relative compaction specification of 90% of maximum dry density for most areas of the site. The results of this comparison are included in Appendix IV, Table IV-1.

In summary, soil compacted to 92% of maximum dry density has a calculated shrinkage factor ranging from 14% to 34% for soil from the upper 2 feet of the site and -9% (bulking) to 28% for soil from approximately 2 to 6 feet in depth. The typical range of shrinkage is approximately 15% to 25% for the upper 2 feet and -5% to 16% for depths of 2 to 6 feet.

Shrinkage values are estimates only and consider only very limited data. During construction, many factors can contribute to variations from estimated shrinkage values. These factors include variable thicknesses of soil horizons and the degree of uniformity across the site, contractor equipment and compaction processes used, over-compaction or under-compaction, deep compaction of underlying layers, wind loss during grading, stripping losses, topographic changes not reflected on the final site map, and errors in calculations and staking. Prospective users of this data must evaluate these factors in light of their own methods, procedures, and experience.

Materials Suitability

Fill materials are expected to consist of site soils excavated from the proposed pond areas and below grade structure areas. These materials are expected to consist of a mixture of silts and silty sands with some clay which will be suitable for construction of building pads, structure backfill, trench backfill, and pond embankments.

Soil Corrosivity

Samples of soil anticipated to be in contact with the new structures and piping were tested for sulfate and chloride content, pH and resistivity, and sulfide and redox potential. Both sulfate and chloride levels were

low (less than 80 parts per million) to nondetectable. The pH for all samples ranged from 6.9 to 8.0 (relatively neutral) and resistivities ranged from 1310 to 6305 ohm-cm. Tests for the presence of sulfides were negative in all samples and redox potential ranged from +228 to +361 millivolts.

The site soil and ground water conditions and the results of the corrosivity testing indicate that the site soils can be considered non-deleterious to concrete, non-corrosive to reinforced concrete, and mildly to moderately corrosive to metal pipe. Use of Type II cement and a 2 to 3-inch minimum reinforcement cover thickness should be sufficient for reinforced concrete corrosion mitigation. Buried metal pipe should be provided with protective coatings and/or cathodic protection. Based on the site soil conditions, a minimum thickness of galvanized steel-metal pipe equal to 10 gauge for a service life of 50 years is recommended. Corrosion test results are presented in Appendix II, Table II-4 for further review, analysis, and specific corrosion mitigation recommendations by Carollo Engineers.

Pond Seepage

The soils underlying the pond areas generally consist of very stiff to hard silts with medium dense to dense, interbedded, silty sands. Considering the soil types and the predominance of fine-grained soil, infiltration rates within the ponds are expected to be low.

Permeability tests completed on soils from the site resulted in hydraulic conductivities of 2.4×10^{-6} centimeters per second (cm/sec) and 2.5×10^{-6} cm/sec. Empirical estimates based on the soil types in the pond areas suggest hydraulic conductivities ranging from 1.0×10^{-3} to 2.5×10^{-6} cm/sec. Hard silts underlying the pond areas at variable depths are expected to act as relatively impermeable barriers to vertical flow of infiltrating water. Lateral flow of infiltrating water is expected to occur at very slow rates considering the low anticipated permeabilities and short-term loading of the ponds with effluent. Pond basins typically become less permeable with age due to sedimentation that occurs which will also reduce vertical and lateral flows of infiltrating water.

We understand that it may be desirable to line the emergency storage basin with the most impermeable soils available on the site. The most consistently fine-grained soils appear to occur at the proposed locations for the oxidation ditches and secondary clarifiers. Soil removed from this area had a remolded hydraulic conductivity of 2.5×10^{-6} cm/sec.

RECOMMENDATIONS

Site Grading

General

We anticipate that the soil at the site will be excavatable with conventional grading equipment. If grading commences in the early spring or after a period of heavy rainfall, it is possible that the surface soil may be saturated due to underlying, relatively low permeability soils trapping water near the surface. This may create loading, hauling, and fill placement difficulties. Often, a period of at least a month after the last heavy rain of the season is necessary to allow the surface soil to dry sufficiently so that heavy grading

equipment can operate effectively. It is also possible that isolated horizons of wet or saturated sandy soil will also be encountered throughout the year; the likelihood of encountering shallow, wet soil will increase during or shortly following the wet season.

Dewatering is not expected to be necessary for general site grading; however, perched ground water may result in some excessively wet soils. It is expected that isolated areas within the site may require stabilization (overexcavation or drying back) in order to place and compact structural fill and obtain stable subgrades within pavement areas.

Based on the soil conditions encountered in our borings, native soil which does not contain concentrations of organic matter and debris should be suitable for use as fill material. Imported soil, if required for use as engineered fill should be reviewed and approved for use by the project geotechnical engineer prior to transporting to the site. In general, imported soil should have a Plasticity Index not greater than 20, an Expansion Index not exceeding 20, a Liquid Limit less than 35, a particle size not greater than 4 inches, and an R-value greater than 20.

Grading Preparation

Grading preparation should include removal of all dense vegetation, debris, and any saturated (yielding or pumping) soils prior to site work operations. Following general clearing operations, grasses should be stripped from the surface of the site. Where applicable, stripping should extend to a depth of 2 to 3 inches below the surface. Strippings are not to be used within embankment, structural, or pavement fills. Strippings could be stockpiled and used as topsoil in nonstructural areas such as landscape areas (if acceptable to the landscape architect). Strippings used as fill in landscape areas should be placed in the uppermost portion of the fill and not exceed 1 foot in total thickness. Structure locations should be verified prior to placement of strippings in proximity to any structures.

Pond Embankment Preparation and Construction

Foundation soils for the proposed pond embankments shall be firm soils for the full embankment width. Prior to construction of embankment fills, the surface soil should be overexcavated to a depth of 2 feet. The embankment on the east side of Pond 3 (northeast corner of the site, refer to Figure 2) will require 3 to 4 feet of overexcavation due to the presence of deeper alluvial soils in the drainage crossing this portion of the site. Overexcavation should extend outside the toe of all embankments a distance equal to the overexcavation depth unless constrained by property boundaries or other limiting factors; evaluation of limiting conditions and necessary overexcavation at these location can be provided on a case-by-case basis.

All embankment foundation materials shall be approved by the project geotechnical engineer prior to placing fill. Prior to placing fill, all embankment foundation materials shall be scarified to a depth of 8-inches, uniformly moisture conditioned to or above the optimum moisture content and compacted to a minimum of 90% relative compaction in accordance with ASTM D 1557.

After the embankment foundation has been prepared in accordance with the previous paragraphs, fill may be placed. Fills must be placed in horizontal lifts not exceeding 6 inches in compacted thickness. Each

lift should be compacted to a minimum of 90% relative compaction. The fill material shall have a moisture content at the time of compaction which is at or between 1% below optimum to 3% above optimum as determined by the ASTM D 1557 test method. Embankment fill placed against existing slopes should be benched into the slope at intervals frequent enough to remove any loose surface soil (approximately 2 to 4 feet horizontally into the slope for every 1 foot vertical).

Interior pond and storage basin slopes should be constructed no steeper than 2.5:1; exterior slopes should be constructed no steeper than 2:1. Track-walking is not an acceptable method of slope construction or compaction. Slopes should be overbuilt and cut back to finish grade.

Due to the predominance of cohesive soils, the potential for significant erosion is expected to be low; however, finished slopes should be vegetated to reduce the potential for erosion. If growth of vegetation within the basin is undesirable, the bottom and interior slopes could be lime and/or cement-treated which would retard growth of vegetation and provide increased erosion control. If the ponds will retain water throughout the year, erosion due to wind generated wave action should be considered. Lime and/or cement-treatment or rip-rap placed from the toe of the slope up to 1 or 2 feet above sustained water levels could be used to protect slopes from wave erosion. Treatment may reduce percolation of retained water.

For preliminary design purposes, we recommend an 8-inch thick layer of lime and/or cement treated soil; the addition of lime or cement at a rate of approximately 3-5 percent (lime) or 6-12 percent (cement) by dry weight should be anticipated. If use of a lime or cement treated liner is desired, recommendations for design and construction can be provided but additional evaluation and testing of treatment suitability will be required.

General Site Grading

Where placement of fill will be required and following grading preparation, the areas to receive fill should be scarified to a depth of 12 inches, moisture-conditioned to approximately the optimum moisture content, and recompacted to not less than 90% relative compaction. Relative compaction should be based on ASTM D 1557 test specifications.

After the exposed ground surface has been prepared in accordance with the previous paragraphs, fill may be placed. Fills must be placed in horizontal lifts not exceeding 6 inches in compacted thickness. Each lift should be compacted to a minimum of 90% relative compaction, at or above the optimum moisture content.

Where structure pad or subgrade elevations are at existing grade or in cut areas, the soil surface should be scarified 8 inches, moisture conditioned to approximately the optimum moisture content, and compacted to not less than 90% relative compaction. Building pads or subgrades exposing hard or dense, undisturbed (in-place) soil (as determined by the project geotechnical engineer) will not need to be scarified and recompacted.

Fills greater than 5 feet in height, constructed on slopes with a gradient steeper than 6:1 (horizontal to vertical), must be provided with a base key cut into firm soil. The base key should be constructed at the

toe of the fill, extend below the existing surface a minimum of 2 feet into firm soil, and should be a minimum of 10 feet wide. As fill is placed on the slope, benching should be provided at intervals frequent enough to remove any loose surface soil (approximately 2 to 4 feet horizontally into the slope for every 1 foot vertical).

Slope Construction

Fill slopes should be constructed in accordance with the general grading recommendations provided above. Cut and fill slopes should be graded no steeper than 2:1 (horizontal to vertical). Track-walking is not an acceptable method of slope construction or compaction. Slopes should be overbuilt and cut back to finish grade.

Soil Stabilization

It is expected that isolated areas of saturated soil may be encountered that will create difficulties in placing fill and obtaining stable pavement subgrades. Yielding soil conditions can typically be stabilized using one of the methods listed below; however, soil conditions and mitigation methods should be reviewed and approved by the project geotechnical engineer when encountered.

Option 1) Deep scarify and allow to air dry.

Option 2) Remove wet soils to a firm base and allow the wet soil to dry to near optimum moisture content and/or replace with drier soil.

Option 3) Lime or cement treat to reduce the moisture content. For dry-back, typical lime and/or cement quantities of 2% to 4% are commonly used. Mixing and pulverization using disc harrows or rotary mixers may be required to achieve a treated material with even distribution of lime and/or cement (no streaks or pockets of lime/cement).

Travel on treated subgrade should be minimized for a period of 24-48 hours to avoid initiating pumping conditions. Proof roll a test section with heavy rubber-tired equipment to determine if the subgrade will be stable enough for construction to proceed. If severe subgrade yielding (yielding which may create pumping conditions during base and asphalt placement) is observed, work should be stopped and determination of the appropriate procedures for continuing work should be made by the project geotechnical engineer.

Option 4) Within pavement subgrade areas, yielding soils can be removed to a firm base or 2 feet below subgrade elevation, whichever is less. The bottom of the overexcavated area should be observed by the project geotechnical engineer. If the bottom of the overexcavated area is soft or wet, a layer of stabilization fabric (such as Mirafi 500X or equivalent) should be placed and the overexcavation backfilled with Class 2 aggregate baserock. If the bottom of the excavation is firm and relatively unyielding, it may be backfilled with native soil or approved imported soil placed and compacted in accordance with the project specifications for fill placement.

Structure Backfill

Structure backfill should consist of native soils or approved import and must be placed in horizontal lifts not exceeding 6 inches in compacted thickness. Each lift should be compacted to a minimum of 90% relative compaction, at or above the optimum moisture content. In order to minimize the residual lateral earth pressures on structure walls, compaction equipment used behind the walls must be restricted (by load and distance from the wall) so that wall design values are not exceeded. Design guidelines are presented in the "**Lateral Earth Pressures**" section of this report.

Foundations

Shallow Foundations (At-Grade Structures)

Structures such as the Odor Control, Filter Support, Chemical Storage, Holding Tanks/Aerobic Digesters, Administration, Maintenance, and Electrical buildings are expected to be supported by shallow foundation systems. Provided our grading recommendations are followed, the areas including the proposed structures are suited to the use of conventional shallow strip and spread footings.

Continuous strip and isolated interior or exterior footings should be embedded a minimum of 18 inches into the prepared soil subgrade. Footings founded in compacted fill or native soil should be a minimum of 12 inches wide and sized not to exceed an allowable bearing capacity of 3,500 psf for dead plus live loads. The allowable bearing capacity may be increased by 600 psf for each additional foot of footing depth (to a maximum 6,200 psf) and by 33 percent for transient loading.

Due to the presence of some soils with a medium expansion potential, perimeter strip footings for lightly loaded structures should be reinforced with two No. 4 bars, one near the top and one near the bottom of the footing as a minimum.

Below-Grade Structure Foundations

Structures such as the Influent Pump Station, Aerated Grit Basin, Chlorine Contact Basin, Secondary Clarifiers, and the RAS/WAS Pump Station will be constructed as partially buried structures founded at depths of more than 5 feet below the adjacent ground surface. The areas including the proposed structures are suited to construction of the below-grade structures.

Loading for most below grade structures is expected to be less than the excavated soil, therefore, adequate bearing is available for all below-grade structures. If concentrated edge or column loads are required for construction of below-grade structures (more than 5 feet below grade), footings are expected to be founded in native soil and should be sized not to exceed an allowable bearing capacity of 6,200 psf for dead plus live loads. The allowable bearing capacity may be increased by 33 percent for transient loading.

Mat Foundations

Mat foundations, including mats carrying vibratory loads, can be designed using a modulus of subgrade reaction (k) of 200 pci, Young's Modulus of 3000 psi, and Poissons Ratio of 0.35. The modulus of subgrade reaction should be corrected for the plan area of the foundation based on the following formula (Terzaghi, 1955):

$$k_b = k\left(\frac{m+0.5}{1.5m}\right)$$

Where:

k_b = coefficient of subgrade reaction for width "b"
where k_b is no less than $0.67(k)$
k = coefficient of subgrade reaction for a 1'x1' plate (200 pci)
b = width of bays or spacing of line loads or columns
m = length of loaded area divided by "b"

Mat foundations may be placed directly on the prepared subgrade without the use of a rock underlayment.

Buoyancy Protection

The Chlorine Contact Basin, the Influent Pump Station, and other buried structures adjacent to ponds 2 and 3 should be designed for a ground water elevation equal to the sustained water elevation within the ponds. Protection against buoyancy can be provided through subsurface drainage and/or buoyancy resistance from structure weight, soil weight, and side wall friction. The buoyant unit weight of the soil may be taken as 55 pcf and a frictional resistance of 20 psf per foot of wall depth may be used to resist buoyant forces.

Subsurface drainage can consist of a vertical layer of permeable material, such as coarse sand or pea gravel at least 6 inches thick, positioned between the retaining wall and the backfill. If pea gravel is used, a non-woven filter fabric should be placed between it and the backfill to prevent the pea gravel from becoming clogged. A synthetic drainage fabric, such as Enkadrain (made by Akzo Nobel Geosynthetics) or equivalent, may be substituted for the gravel or sandy layer, if desired. Care must be taken during installation to assure that the filter part of the material faces the backfill. Collected water may be removed by installing a perforated drainage pipe along the bottom of the permeable material continuously sloped towards suitable drainage facilities.

Lateral Resistance for Foundations

Lateral forces may be resisted by friction developed between the base of the foundation and the underlying soil and by passive lateral earth pressures. A coefficient of friction to resist sliding of 0.35 can be used. Resistance to lateral loads may be provided by assuming a passive pressure based on an equivalent fluid weight of 450 pcf. In designing structures to resist lateral loads, the upper 12 inches of soil should be ignored and the lateral resistance of the soil should be limited to 3,500 psf.

Settlement

We estimate total settlement for structure foundations designed and constructed in accordance with our recommendations to be on the order of 0.5 to 0.75 inches following construction. Differential settlement should be less than 0.5 inches. This differential settlement could be assumed to occur over a distance of approximately 30 feet.

Other Foundation Construction Requirements

Prior to placement of reinforcement or concrete in footing excavations, all debris and loose soil should be removed. The project geotechnical engineer should be allowed to observe footing excavations prior to placement of concrete or reinforcement.

For at-grade structures using shallow, perimeter, strip footings, the footing excavations should be soaked to close any soil desiccation cracks prior to placement of concrete. Soaking can be achieved by sprinkling and/or soaking with a hose placed in the footing excavation. All standing water and any loose soil washed into the footing excavation by the soaking process should be removed prior to placement of concrete.

Foundations - Pole Supported Structures

Foundations for light poles and other pole-supported structures may be designed using the formula in the Uniform Building Code (1997, Section 1806). An allowable lateral soil-bearing pressure of 150 psf per foot of depth is applicable to the site soil. Where poles will not be adversely affected by ½-inch of lateral motion at the ground surface due to short-term lateral loading, an allowable lateral soil-bearing pressure of 300 psf per foot of depth is applicable.

Slabs-on-Grade

Conventional concrete slabs-on-grade are suitable for pads prepared as recommended herein. Concrete slabs may be designed using a modulus of subgrade reaction, k, of 200 pci for native soil or compacted fill. Interior concrete slabs-on-grade should be a minimum of 4 inches thick in areas subjected to floor loads of less than 250 p.s.f. and a minimum of 5 inches thick where floor loads are equal to or greater than 250 p.s.f. The slabs should be reinforced with a minimum of No. 3 rebar at 24 inches center to center, each-way, or 6x6-W1.4xW1.4 welded wire fabric.

Concrete floor slabs should be underlain by a minimum of 6 inches of washed, compacted, crushed rock. Where moisture sensitive flooring will be placed on concrete floor slabs, a vapor barrier should be included beneath the slab. Crushed rock used beneath floor slabs should be graded so that 100% passes the ¾ inch sieve and less than 5% passes the No. 4 sieve. Crushed rock should be compacted with a minimum of 3 passes with a vibratory type compactor.

Required slab thickness and reinforcement should be determined by the design engineer. Reinforcement must be placed as indicated on the approved plans and supported during concrete placement. Hooking and pulling of reinforcement during concrete placement is not recommended.

Exterior flatwork such as sidewalks, etc. may be placed directly on the prepared subgrade without the use of rock underlayment. The subgrade should be free of debris, uniformly compacted, and thoroughly wetted before the concrete is placed. Reinforcement, as determined by the design engineer, may be required in areas subjected to unusually heavy loads.

Some floor coverings are sensitive to moisture that can be transmitted through the slab. Where these floor coverings are used, the slab should be tested for moisture transmission and/or waterproofed as recommended by the flooring manufacturer. To reduce the potential for moisture to build-up beneath the slab, the exterior subgrade elevations adjacent to floor slabs (for at-grade structures) should be lower than the subgrade elevations beneath the slab and the subgrade should slope away from the exterior of the building at a gradient of at least 2%.

Foundation dimensions, minimum slab thickness, and reinforcing details recommended herein are based upon geotechnical and construction considerations and are not offered in lieu of foundation design by an engineer.

Lateral Earth Pressures

Lateral earth pressures will be used in the design of retaining walls, buried structures, thrust blocks, and for determining passive resistance at footings. Active and at-rest pressures should be calculated based the equivalent fluid weights provided below and on the pressure diagrams shown in Figure 6, which include both static and earthquake induced pressures. For non-yielding walls, residual lateral earth pressures due to compaction equipment should be included as indicated on Figure 6. Typical values of lateral pressure due to compaction equipment are 250 psf for plate compactors, 400 psf for light vibratory compactors (such as a Dynapac CA12PD), and 1000 psf for heavy vibratory compactors (such as a Dynapac CA25PD). Lateral pressures due to compaction equipment can be maintained below 400 psf by using compaction equipment with line loads (static plus dynamic) less than 350 pounds per inch within 6 feet of the wall being backfilled; heavier equipment can be used without restriction at distances greater than 6 feet from the wall. Backfill within 0.5 feet of the wall should be compacted using vibratory plate compactors. If necessary during construction, other compaction equipment load/distance combinations can be evaluated for use behind the wall.

The equivalent fluid weights provided in Table 2 may be used for design of the proposed structures with horizontal backfill. Based on the predominately fine-grained soil conditions and lack of ground water, the drained condition can be used for most of the proposed structures assuming that the native soil is used to backfill against the structures. If granular import is used to backfill against the buried structures, undrained conditions will apply unless back drainage is provided.

Considering the proximity of the Chlorine Contact Basin and Influent Pump Station to the storage ponds and the presence of more granular soils in this portion of the site, the undrained values should be used below the elevation of the sustained water level within the adjacent ponds unless wall backdrainage is provided. The drained condition assumes that the backfill behind the wall is adequately drained to avoid saturation and introduction of hydrostatic pressure. The values given should be considered as ultimate values since they do not include a factor of safety.

TABLE 2

EQUIVALENT FLUID WEIGHTS		
Condition	**Drained Backfill (pcf)**	**Undrained Backfill (pcf)**
Active Condition	45	87
At-Rest Condition	65	97
Passive Condition	450	280 (submerged)

In the design of retaining structures, if any surface loads are closer to the edge of the retaining wall than half of the height, then the design wall pressure should be increased by 0.30q over the whole area of the retaining wall. In this expression, q is the surface surcharge load in psf.

Positive drainage for retaining walls should consist of a vertical layer of permeable material, such as coarse sand or pea gravel at least 6 inches thick, positioned between the retaining wall and the backfill. If pea gravel is used, a non-woven filter fabric should be placed between it and the backfill to prevent the pea gravel from becoming clogged. A synthetic drainage fabric, such as Enkadrain (made by Akzo Industrial Systems Co.) or equivalent, may be substituted for the gravel or sandy layer, if desired. Care must be taken during installation to assure that the filter part of the material faces the backfill. Collected water may be removed either by installing weep holes along the bottom of the wall or by installing a perforated drainage pipe along the bottom of the permeable material continuously sloped towards suitable drainage facilities.

Lateral Resistance for Retaining Structures

Lateral forces may be resisted by friction developed between the base of the footing and the underlying soil. A coefficient of friction to resist sliding of 0.35 can be used. Where passive pressure or friction alone is used against sliding, we recommend that a minimum safety factor of 1.5 be used in design for lateral stability. Where both passive pressure and friction are used to resist sliding, we recommend that a minimum safety factor of 2.0 be used. In designing structures to resist lateral loads, the upper 12 inches of soil should be ignored and the lateral resistance of the soil should be limited to 3,500 psf.

Pavement Design

R-Value tests on bulk soil samples retrieved from the site were completed for design of flexible pavement. R-Values of 21, 18, 36, 20, and 22 were obtained. Based on a design R-Value of 20 and assumed Traffic Indices (T.I.) of 5.0, 6.0, 7.0, and 8.0, pavement structural sections are included below. Asphalt concrete pavement design is based on Caltrans procedures and includes an asphalt thickness safety factor.

TABLE 3

RECOMMENDED PAVEMENT SECTIONS (Design R-Value = 20)		
T.I.	**Asphalt Concrete (inches)**	**Class 2 Baserock (inches)**
5.0	3.0	7.0
5.0	5.0	4.0*
6.0	3.0	10.0
6.0	5.0	6.5
7.0	3.5	13.0
7.0	5.0	10.0
8.0	5.0	14.0
8.0	6.0	11.5

* minimum recommended thickness

These pavement sections are based on the assumption that the subgrade is uniformly compacted to 90% or higher relative compaction and that the baserock is uniformly compacted to 95% or higher relative compaction. The baserock (Class 2) is assumed to have an R-value of 78 or higher and the soil subgrade is assumed to have an R-value of 20 or higher. Class 2 baserock should conform to the appropriate section of the Caltrans Standard Specifications. Relative compaction should be based on ASTM D 1557 test specifications for the determination of maximum dry density. Pavement areas should be sloped at a gradient of 2% or greater to allow for positive surface drainage. Both positive surface slope and uniform compaction are necessary for proper pavement performance.

It is important that the drainage of pavement areas be designed so that water is not allowed under the paved areas. If water is trapped under paving the water can saturate the base course which could result in premature pavement failures.

Where pavement abuts planter or landscape areas, the risk of water saturated subgrade failures can be reduced by using a concrete cut-off curb to mitigate the potential for water from the planter areas from migrating under the concrete into the baserock. The cut-off curb should be 4 inches wide and extend at least 4 inches into the soil subgrade.

Buried Pipe Design

Embedment and Backfill

Considering soil types and ground water elevations, it is anticipated that subgrade soils within the alignment of the proposed trunk sewer could be considered non-yielding. In isolated portions of the site, relatively shallow perched ground water may occur which could result in wet and yielding soil conditions. Some yielding soil should be anticipated and subgrade stabilization may be necessary to obtain a uniform base for pipe placement. Methods of subgrade stabilization will vary with the type of soils encountered but could include methods such as 1) dewatering and drying of the subgrade, 2) removal of yielding soils and replacement with compacted soil, and 3) removal of yielding soils to a depth of 1 to 2 feet and replacement with additional embedment rock (it may be necessary to include a separation geotextile between the rock and the soil subgrade).

Native materials are not likely to be suitable for use as pipe embedment (bedding or initial backfill) soils. Native soil excavated from the site is expected to be suitable for trench backfill.

Pipe Loading Soil Parameters

Backfill Unit Weight

Soils within the site are expected to consist primarily of silts and silty sands. Trench backfill is expected to consist of a mostly uniform mix of these soils. Bulk samples of soil retrieved from the borings along this portion of the alignment were tested for compaction characteristics. Maximum dry densities of the soil tested ranged from 101 pound per cubic foot (pcf) to 131 pcf and optimum moisture contents ranged from 11 to 19 percent. Based on these maximum dry densities and optimum moisture contents, moist backfill unit weight is estimated to have unit weights ranging from approximately 108 pcf to 131 pcf at not less then 90% relative compaction.

Modulus of Soil Reaction - Trunk Sewer Pipe

The Modulus of Soil Reaction (E') has been estimated for pipe embedment material (backfill to surround the pipe) and for the anticipated, native trench wall soils at the pipe springline (horizontal plane through the pipe center). Values of E' for embedment materials (E'_b) and native soils (E'_n) are used in combination to calculate flexible pipe deflections using either the Iowa (Spangler, 1941) or Reclamation (USBR, 1997) equations. Embedment material E'_b values of 2000 and 3000 pounds per square inch (psi) are estimated for clean, coarse-grained soil compacted to at least 85 and 90 percent compaction, respectively, per ASTM D 1557.

An estimated E'_n value for the native soils anticipated in the trench wall at the pipe springline is 5,000 psi for the trunk sewer location. The modulus was estimated using a U.S. Bureau of Reclamation approach (USBR, 1997) which correlates E'_n to native soil consistency based on field blowcounts and laboratory unconfined compressive strengths.

Load Coefficient - Trunk Sewer Pipe

In designing the pipe to resist external loads, Marstons formula is often used. This formula is as follows:

$$W_c = C_d \, w \, (B_d)^2$$

Where:

W_c = Load on pipe (pounds/foot)
C_d = Load coefficient
w = Unit weight of backfill material (pounds/cubic foot)
B_d = Trench width at top of pipe (feet)

and

$$C_d = \frac{1 - e^{-2k\mu' \frac{H}{B_d}}}{2k\mu'}$$

Where:

e = 2.7182818
k = Ratio of active horizontal earth pressure to vertical pressure
μ' = Coefficient of sliding friction between fill material and trench sidewall
H = Vertical height from top of pipe to upper surface of fill

Based on the soil conditions encountered in the proposed trunk sewer location, the value of the product $k\mu'$ may be taken as 0.16.

Seepage

Seepage along buried pipe can be reduced through the use of a concrete collar or apron where pipes enter or exit a water source. Bentonite clay or impermeable grout plugs can be used to reduce seepage along the pipe by placing the plugs at intervals of approximately 500 feet and near junctions with other piping when a granular pipe bedding and/or embedment material is used. Clay or grout plugs should be a minimum of 3 feet wide (parallel to the pipe) and should extend from the base of the trench to a height of 2 feet above the pipe or 1 foot below the surface, whichever height is less, for the full width of the pipe trench. Clay used for plugs should be fully hydrated during placement.

Drainage

Proper drainage is important in the development of the project. Final grading adjacent to structures should be sloped so that the surface water drains away from the structures. Final backfill placed adjacent to foundations should be free of construction debris, properly compacted, and sloped so that storm or irrigation water is not allowed to pond or rest next to the footings. Landscape grading should be designed so that surface water is directed to properly designed drainage facilities. Roof drainage should be designed so that water is not allowed to fall onto soil directly adjacent to footings.

Underground Utility Construction

Generally, we were able to drill our exploratory borings without difficulty. Our experience has shown that if we can auger through material with a continuous flight auger, it should be excavatable with conventional trenching equipment.

With the exception of some isolated locations where perched ground water may occur, dewatering is not anticipated to be necessary for installation of utilities. Perched ground water can be removed through the use of sump pumps. This assumes that construction takes place in the drier months of the year when the surface soil is not saturated and there is no surface water on the site. Trenches should be sloped or braced in accordance with current Cal/OSHA requirements.

Utility trenches should be backfilled with approved on site soil or approved import. Import soil for trench backfill should have a Plasticity Index not greater than 20, an Expansion Index not exceeding 20, a Liquid Limit less than 35 and a particle size not greater than 4 inches in any dimension. Trench backfill should be compacted to a minimum of 90% relative compaction in structural and pavement areas and 85% in landscape areas using mechanical methods. Compaction should be based on ASTM D 1557 test specifications. We recommend a maximum uncompacted lift thicknesses of 1 foot. Jetting is not an acceptable means of compaction.

Thrust blocks may be designed using a passive lateral resistance of 450 psf per foot of depth and should be limited to 3,500 psf.

Temporary Excavations

The owner and contractor should make themselves aware of and become familiar with applicable local, state and federal safety regulations, including the current OSHA Excavation and Trench Safety Standards. Construction site safety generally is the sole responsibility of the Contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. We are providing this information as a service to our client. Under no circumstances should the information provided below be interpreted to mean that España Geotechnical Consulting is assuming responsibility for construction site safety or the Contractor's activities; such responsibility is not being implied and should not be inferred.

According to the Federal Register, 29 CFR Part 1926, Occupational Safety and Health Standards - Excavations, the soil at the subject site appears that it should generally be classified as a Type B soil based on our exploratory borings and testing. Temporary excavations greater than 5 feet deep should be sloped no steeper than a gradient of 1:1 (horizontal to vertical). The impact of traffic vibrations, actual soil conditions exposed in the open trenches, and other factors that may promote trench wall instability must be evaluated at the time of construction and trench sloping adjusted accordingly. Surcharge loads such as trench spoils, equipment, etc. should not be placed adjacent to an open excavation (within a distance of ½ the height of the trench).

Vertical excavations will need to be shored or shielded. If sheet piles are to be used for excavation shoring, predrilling will likely be necessary to install the sheets. Predrilling may be necessary due to the presence

of hard silts and cemented soil horizons. Drilling voids remaining behind the sheets should be backfilled with coarse sand, gravel, or grout. It is expected that trench shields could be used for short-term excavations (open for 24 hours or less) in native materials (not fill) without significant ground movement or raveling.

General Erosion Control

The erosion potential of the soils located on or near the surface of the subject site are considered to be low to moderate. Erosion control measures should be implemented during and after construction to minimize soil erosion. This can be accomplished during construction using the following methods:

- Site grading should be scheduled to avoid periods of heavy rains whenever possible.
- Temporary slopes should be maintained at the flattest possible gradient.
- During the rainy season, exposed soil on sloping ground should be covered as soon as possible. Covers could consist of grass and/or mulch (straw, wood chips, manmade fibers, etc.).
- Water flow over areas disturbed by grading should be minimized. This can be accomplished by placing temporary earth berms at the top of sloped areas.
- Dust should be controlled by sprinkling areas with exposed soil.
- If appropriate, debris basins should be constructed to trap debris and silt prior to entering drainage channels. Hay bales can be used as silt traps along drainage channels and at drop inlets.

Following construction, exposed soil should be vegetated (planted with grasses or shrubs) or covered with a mulch or erosion control fabric to minimize soil erosion. Concentrated flows should be directed away from slopes and be piped or channeled into suitable drainage facilities.

While it is beyond the scope of this report to design a comprehensive erosion control-revegetation program, such a program is essential for this project. The following is a list of selected erosion issues which should be included and expanded upon in the program:

a. During construction, placement of fill directly into drainages should be avoided.

b. Schedule projects so that grading is done during a time of low erosion potential (April through October). If the construction will be active during the rainy season, the area should be winterized by completing the following: (1) temporary best management practices (BMP's) should be in place and inspected before the first rains, (2) disturbed areas should stabilized, (3) on site construction should be cleaned up and removed, (4) permanent BMP's should be installed wherever feasible, and (5) all stockpiled soil should be protected by sediment barriers and covered by an impervious material.

c. Stage construction so that one area can be stabilized before another is disturbed.

d. Apply specific erosion control measures as soon after land disturbance as possible and before the start of the rainy season.

e. Retain existing vegetation wherever feasible and avoid unnecessary disturbance of vegetation.

f. Netting, erosion control fabrics, and/or mulching should be used to attain temporary stability on embankments.

g. An aggressive revegetation program should be started. Every effort should be made to reestablish plant cover that is removed. While it is best to plant native vegetation, it is also important to establish some type of plant material as soon as possible following land disturbance. Because of this, grasses are typically planted as a temporary cover.

h. Road runoff flowing down embankments should be controlled to prevent gully scour.

I. Sediment barriers should be installed to curtail the downslope movement of soil from the embankments and to prevent sediment from directly entering drainage facilities. Temporary sediment barriers are intended to intercept and detain sediment from small disturbed and unprotected areas. These structures are especially applicable on construction sites where land disturbance is temporary and should be located downstream of the disturbed area.

Sediment barriers should be placed both at the toe of embankment slopes and wherever erosion is likely to occur. Proper installation should be followed to avoid sediment movement under the barrier. These structures require inspection and maintenance at least once per week or more often in the event of rain storms. Examples of these structures include Straw Bale Sediment Barriers, Filter Fences, and Berms.

LIMITATIONS

The analyses, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our study, and further assume that probes such as exploratory borings are representative of the subsurface conditions throughout the site; i.e., the subsurface conditions everywhere are not significantly different from those disclosed by the probes.

If during construction different subsurface conditions from those encountered during our exploration or assumed in design are observed or appear to be present, or where variations from our design recommendations are made, we must be advised promptly so that we can review these conditions and modify the applicable recommendations if necessary. We cannot be held responsible for differing site conditions or variations in design or field recommendations not brought to our attention.

Soil conditions cannot be fully determined by borings and, therefore, unanticipated soil conditions are commonly encountered. Such unexpected soil conditions often require that additional expenditures be made

to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

Foundation dimensions, minimum slab thickness, and reinforcing details recommended herein are based upon geotechnical and construction considerations and are not offered in lieu of foundation design by an engineer.

A determination of flooding potential or the existence of wetlands was beyond the scope of this report.

This geotechnical study did not include an investigation regarding the existence, location, or type of possible hazardous materials. If an investigation is necessary, we should be advised. In addition, if any hazardous materials are encountered during construction of the project, the proper regulatory officials should be notified immediately.

Other standards or documents referenced in any given standard cited in this report, or otherwise relied upon by authors of this report, are only mentioned in the given standard; they are not incorporated into it or "included by reference", as that latter term is used relative to contracts or other matters of law.

REFERENCES

Anderson Consulting Group, 1993, Preliminary Geologic Report for the New Roseville Wastewater Treatment Plant - Siting; Consultants report to James M. Montgomery Consulting Engineers, Inc.

Boore, D.M., Joyner, W.B., and Fumal, T.E., 1993, Estimation of Response Spectra and Peak Accelerations from Western North American Earthquakes: An Interim Report; U.S. Geological Survey, Open-File Report 93-509.

Boyle Engineering Corporation, 1987, Western Placer County Water Supply Appraisal, Groundwater Elevations, Spring 1987.

California Department of Water Resources, 1993, Elevation of Ground Water in Wells, Spring 1993.

Hart, E.W., 1994, Fault-Rupture Hazard Zones in California: California Department of Conservation, Division of Mines and Geology, Special Publication 42.

Harwood, D.S. and Helley, E.J., 1987, Late Cenozoic Tectonism of the Sacramento Valley, California: U.S. Geological Survey, Professional Paper 1359.

Helley, E.J. and Harwood, D.S., 1985, Geologic Map of the Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California: U.S. Geological Survey, Map-MF-1790.

Jennings, Charles W., 1994, Fault Activity Map of California and Adjacent Areas with location and ages of Recent Volcanic Eruption.

Livingston, J.G., 1974, Engineering Geologic Map of the Roseville Quad, Placer County, California; Placer County Planning Department.

Maulchin, L., 1996, California Seismic Hazard Map, 1996; California Department of Transportation.

Petersen, M.D., et al, 1996, Probabilistic Seismic Hazard Assessment for the State of California; Department of Conservation, Division of Mines and Geology Open File Report 96-08.

Petersen, M.D. and Cramer, C.H., 1997, Assessing Earthquake Ground Shaking Hazard in California; in California Geology, July/August 1997, p.p. 107-115.

Spangler, M.G., 1941, The Structural Design of Flexible Pipe Culverts; Iowa Engineering Experiment Station Bulletin No. 153, Ames, Iowa.

REFERENCES continued

Sweigert, J., Chima, G., and Senter, E., 1991, Historical Ground Water Levels in Placer County, State of California; The Resources Agency, Department of Water Resources.

Terzaghi, K., 1955, "Evaluation of Coefficients of Subgrade Reaction," in Geotechnique, Vol. 5, No. 4, December 1955, pp. 297-326.

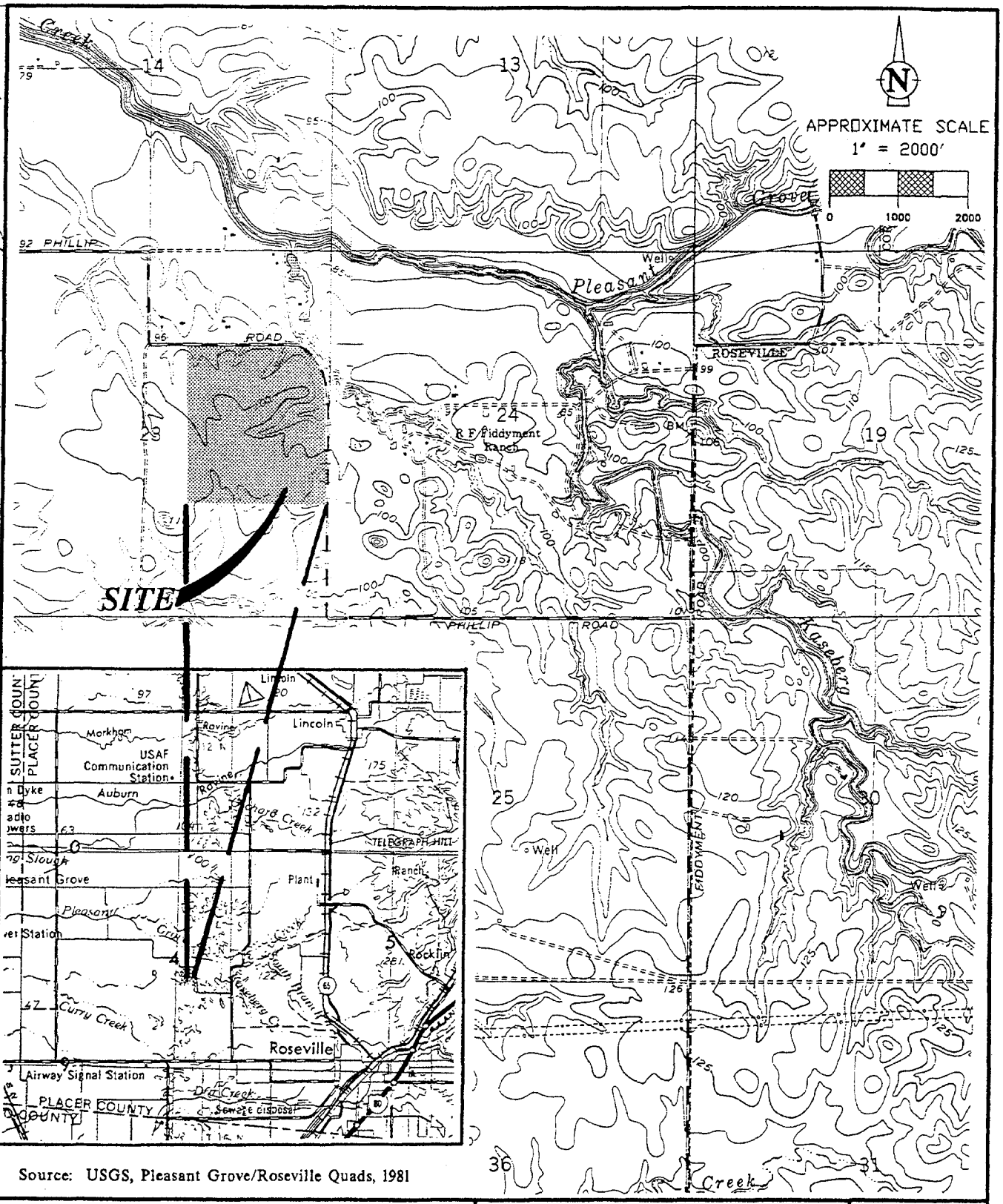
USBR 1997, Method for Prediction of Flexible Pipe Deflection; United States Department of the Interior, Bureau of Reclamation, document M-25.

USDA 1980, Soil Survey of Placer County, California, Western Part, United States Department of Agriculture.

USGS 7.5 Minute Topographic Map (1910, 1953, 1967, photo revised 1975, photo revised 1981); Roseville Quadrangle, U.S. Geological Survey.

Wagner, D.L., et al, 1981, Geologic Map of the Sacramento Quadrangle; DMG Regional Geologic Map Series, Map No. 1A.

Wong, I.G., Ely, W.E., and Kollman, A.C., 1988, Contemporary Seismicity and Tectonics of the Northern and Central Coast Ranges-Sierran Block Boundary Zone, California; Journal of Geophysical Research, Vol. 93, No. B7, Pages 7813-7833.



Source: USGS, Pleasant Grove/Roseville Quads, 1981

VICINITY MAP

Pleasant Grove WWTP

Roseville, California

ESPAÑA Geotechnical Consulting

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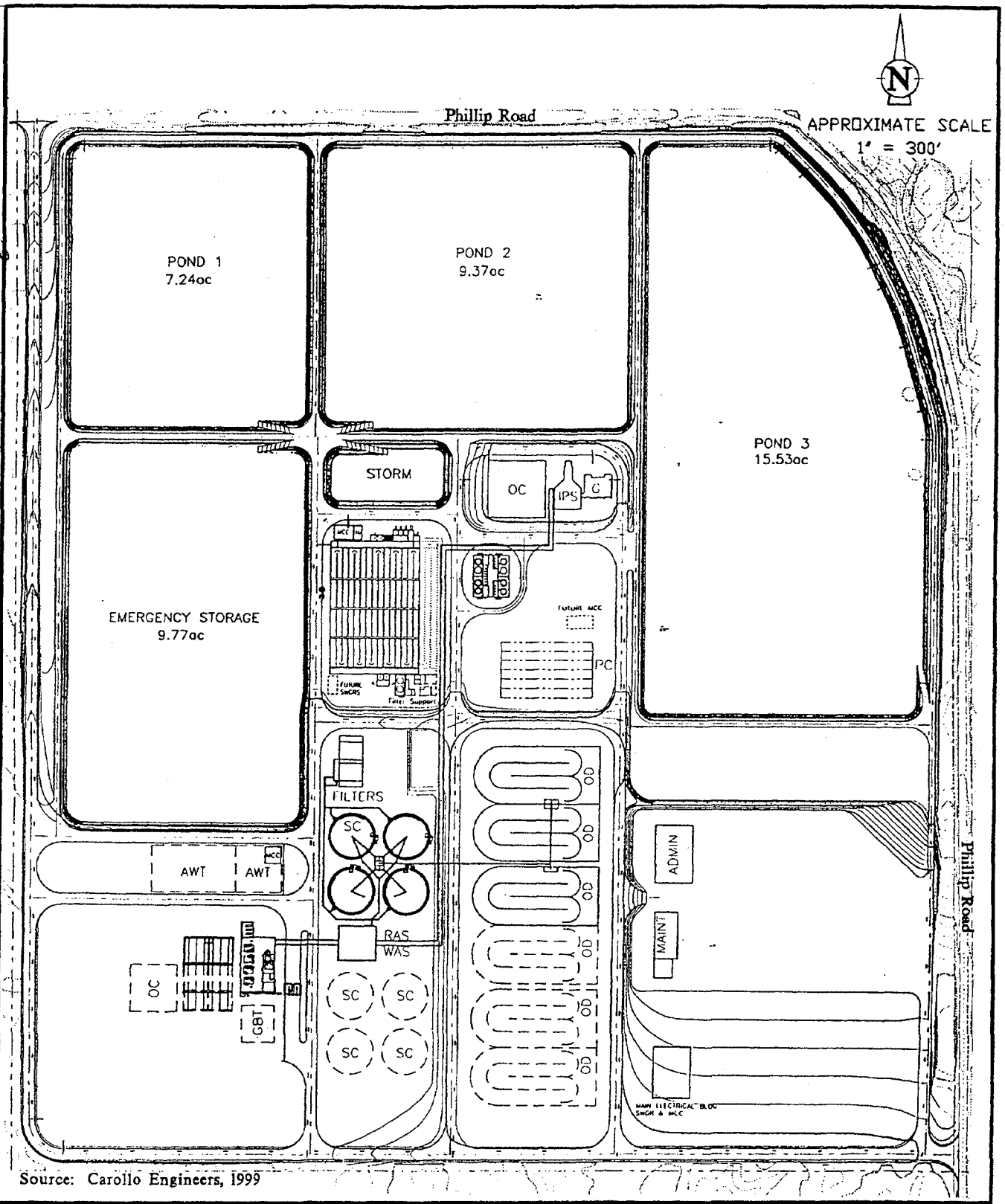
Project No. H199

Figure 1

Drawn by: PFF
Date: 3/99
Field Rep: PFF
Date: 3/99
Checked by: PFF
Date: 4/20/99
Reviewed by:
Date: 4/20/99



Source: Carollo Engineers, 1999

Drawn by: PFF | Date: 3/99 | Field Rep: PFF | Date: 3/99 | Checked by: PFF | Date: 4/20/99 | Reviewed by: [illegible] | Date: 4/20/99

SITE PLAN

Pleasant Grove WWTP

Roseville, California

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Geotechnical Consulting
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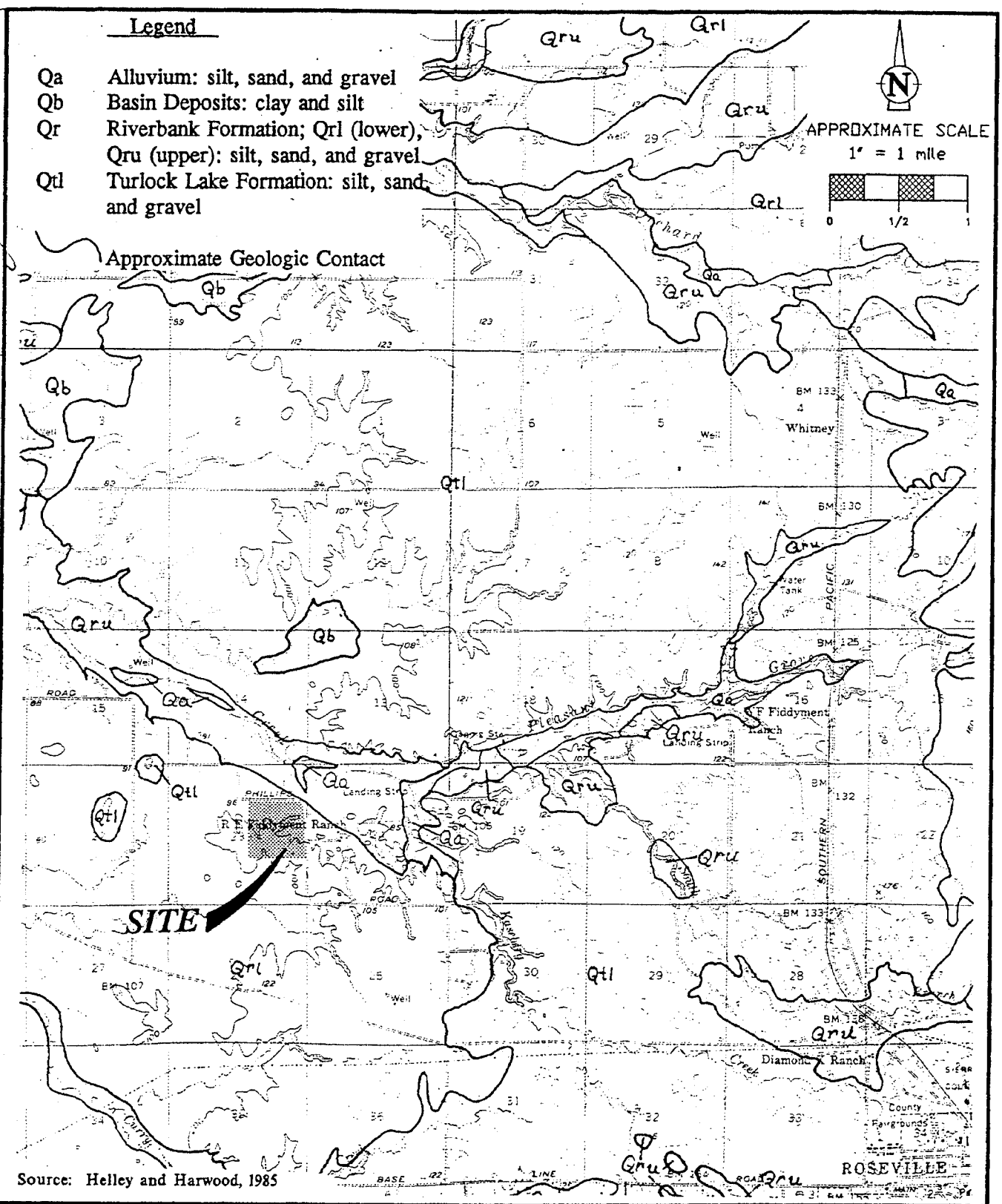
Project No. H199

Figure 2



Drawn by: PFF | Field Rep: PFF | Checked by: PFF | Reviewed by: CC | Date: 4/99 | Date: 4/99 | Date: 4/20/99

GEOLOGIC MAP

Pleasant Grove WWTP

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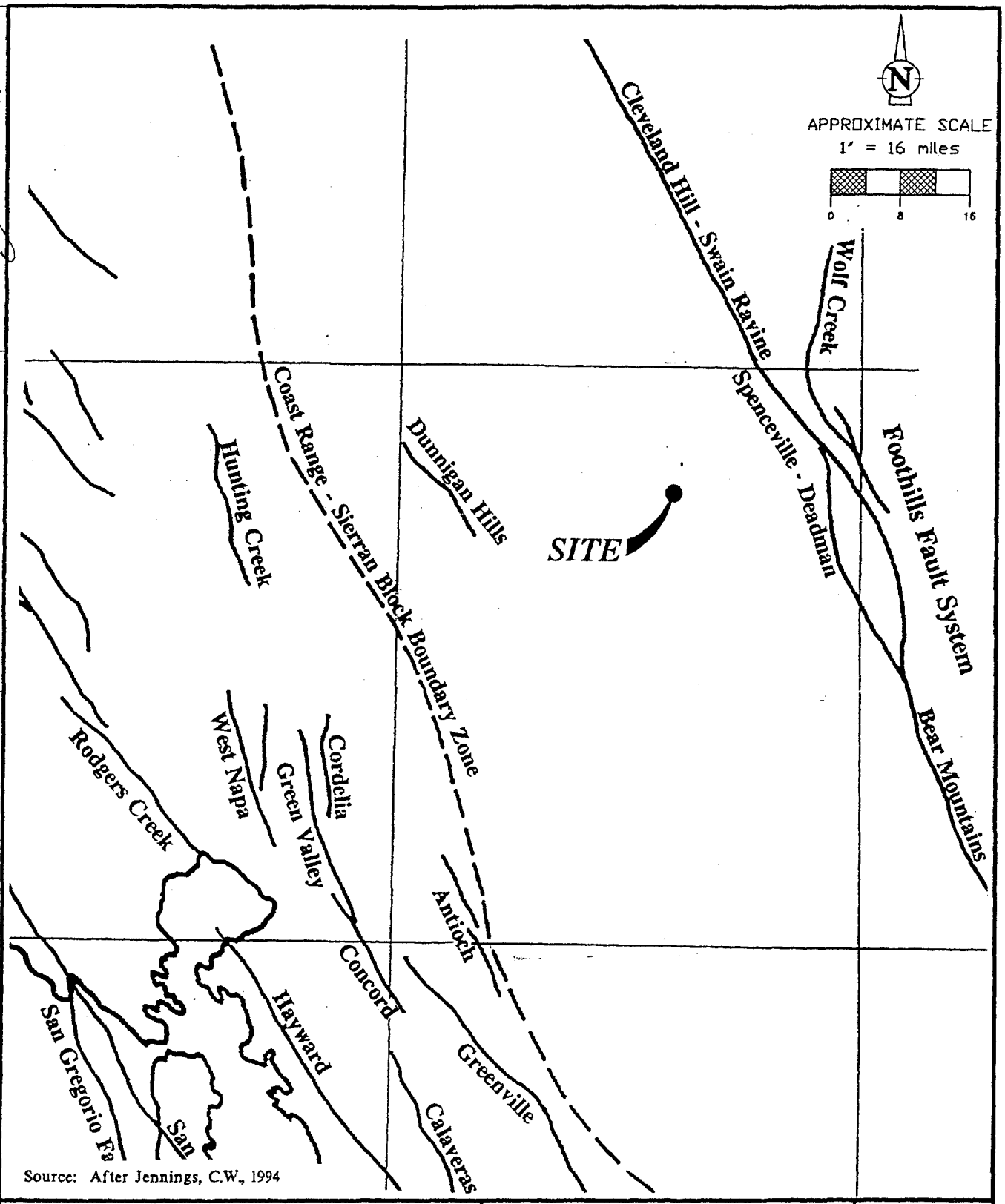
Project No. H199

Figure 3



Source: After Jennings, C.W., 1994

Drawn by: PFF	Date: 4/99	Field Rep: PFF	Date: 4/99	Checked by: PFF	Date: 4/20/99	Reviewed by: GB	Date: 4/20/99

REGIONAL FAULT MAP

Pleasant Grove WWTP

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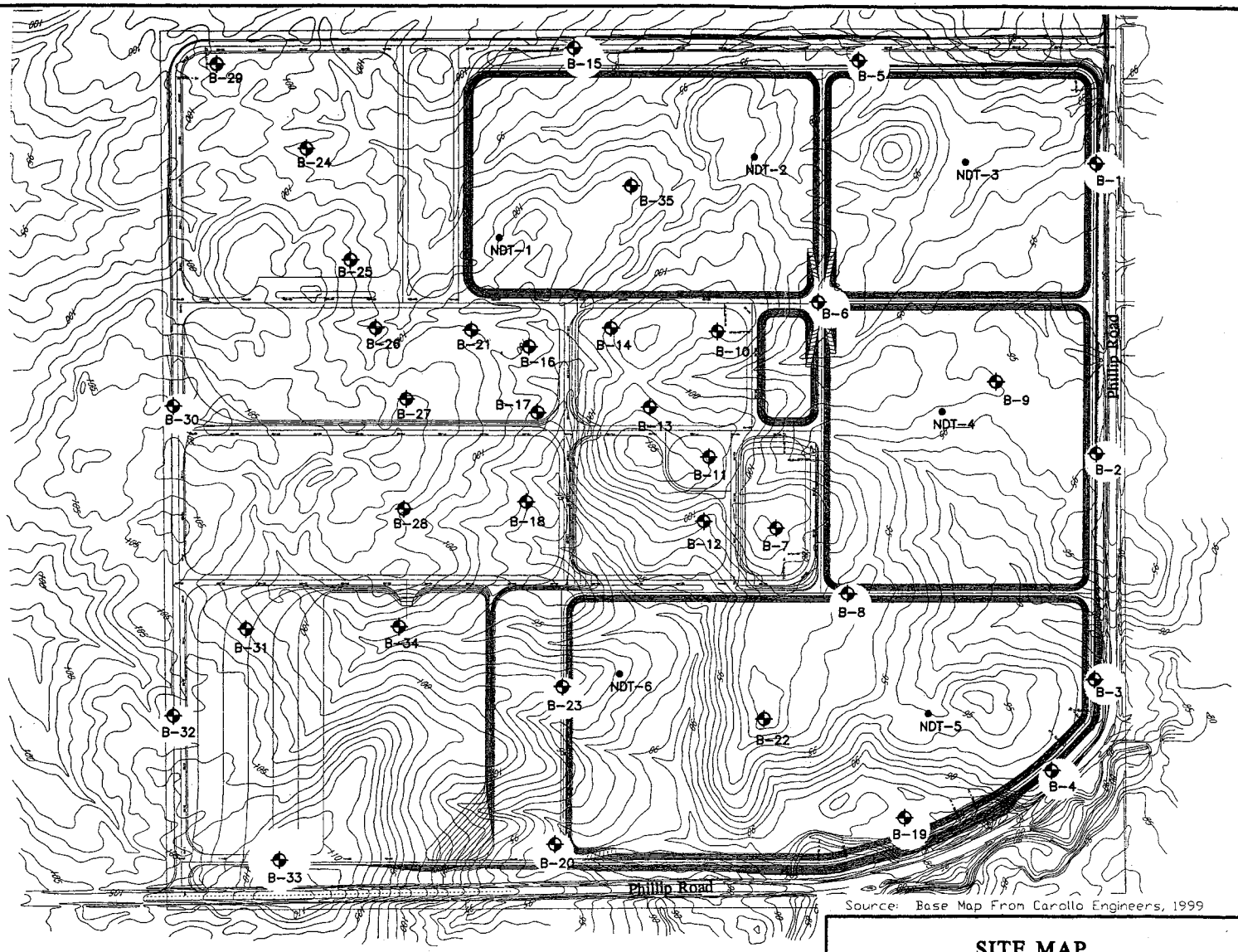
Figure 4



Source: Base Map From Carollo Engineers, 1999

APPROXIMATE SCALE
1" = 250'
0 125 250

Explanation

B-35 Exploratory Boring Location

NDT-6 Nuclear Density Test Location

SITE MAP

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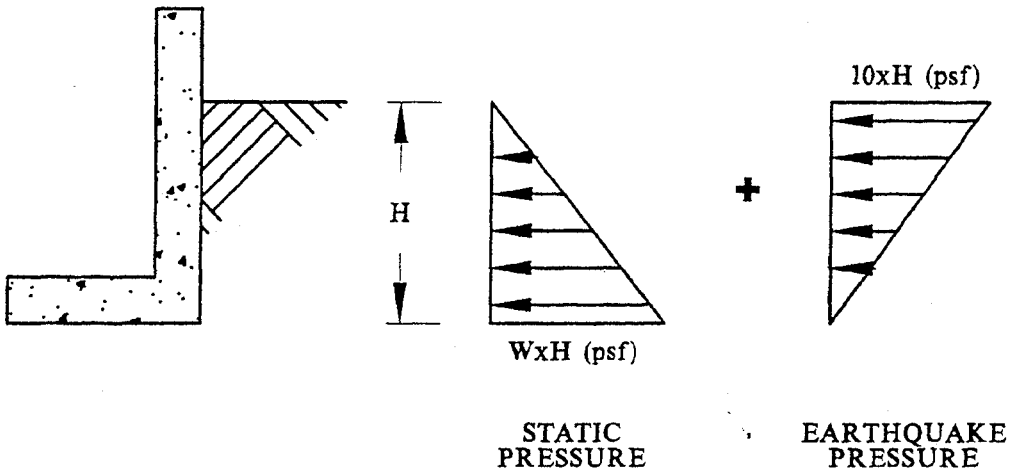
Project No. H199

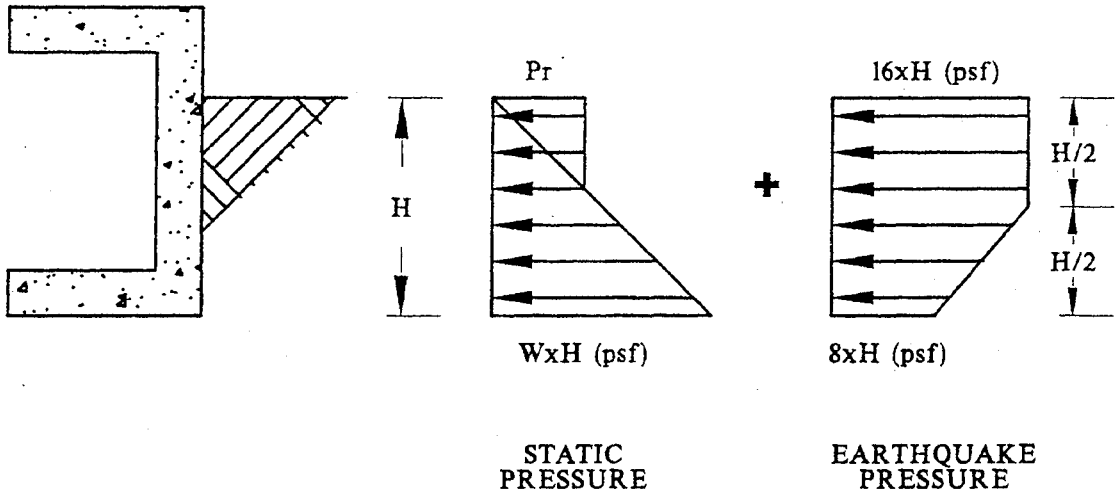
Figure 5

Drawn by: PFF | Date: 4/99 | Field Rep: MEW/JF | Date: 3/99 | Checked by: PFF | Date: 4/20/99 | Reviewed by: | Date: 4/22/99

ACTIVE PRESSURE DISTRIBUTION (YIELDING WALLS)



AT-REST PRESSURE DISTRIBUTION (NON-YIELDING WALLS)



NOTE: W = Equivalent Fluid Weight of soil (refer to text)
Pr = Pressure due to compaction of backfill against non-yielding walls. Typical values are:
Heavy vibratory rollers: 1000 psf; Light vibratory rollers: 400 psf; Plate compactors: 250 psf

LATERAL EARTH PRESSURES Pleasant Grove WWTP Roseville, California	ESPAÑA Geotechnical Consulting 502 Giuseppe Ct., Ste 11, Roseville, CA 95678 (916) 773-2600 FAX (916) 782-4846	Project No. H199 Figure 6

Drawn by: PFF | Date: 3/99 | Field Rep: | Date: | Checked by: PFF | Date: 4/20/99 | Reviewed by: | Date: 4/20/99

APPENDIX I

FIELD INVESTIGATION

The field investigation was completed in March 1999. It consisted of drilling and sampling 35 borings to depths of 5 to 70 feet below existing ground surface. The data obtained during the exploratory investigation is presented on the logs of the borings, Figures I-1 through I-35.

The exploratory borings were drilled with a track mounted CME-750 drill rig, using 8-inch diameter hollow-stem augers. Sampling was accomplished using an automatic hammer dropping a 140-pound weight 30 inches for each blow. The hammer was used to advance a 3.0-inch O.D. by 2.5-inch I.D. split spoon sampler lined with 6-inch long brass tubes. The number of hammer blows required to drive the sampler each successive 6-inch interval, for a total of 18 inches, is recorded on the boring logs as the field blow count. Bulk samples were taken from the cuttings as the drilling progressed and collected in cloth or plastic bags. All borings were backfilled with cuttings except for Boring B-7 which was completed as an observation well.

Two observation wells were installed at boring location B-7. Details of the installation are included in Appendix IV. Installation consisted of placing various lengths of 1-inch diameter, Schedule 40, 0.010-inch slotted and blank PVC pipe through the hollow stem augers. All wells received a sand backfill (#3 Lonestar) around the slotted pipe, followed by a hydrated bentonite-pellet sanitary seal (minimum of 2-foot thick). The remainder of the borehole was backfilled with cement grout and secured with a flush-mounted, Christy-box well cover.

Nuclear density testing was completed at selected locations in order to determine in-place densities of the surface soils. Density testing was completed in accordance with ASTM D 2922 and ASTM D 3017. The test locations are shown on Figure 5 and the test results are presented in Appendix IV.

LOG OF BORING

Boring No. B-1

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 94 feet
Date Drilled: March 3, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		SC	Red-brown, wet, medium dense, silty SAND with clay.				
93	20 50/ 3"	SM	Reddish brown, moist, medium dense to very dense, silty, fine to coarse grained SAND.		1-1	111	14
3							
90							
6	6 14 16				1-2	112	13
87							
9		SC	Light yellowish brown, moist, medium dense, clayey, medium to coarse grained SAND.	Pocket Pen: 4.5 tsf			
84	6 21 32				1-3	113	13
12							
81		ML	Light gray, moist, hard, clayey SILT.	Some iron oxide staining and black mottling.			
15	7 27 41			Pocket Pen: 4.5 tsf	1-4		
78							
18							
75							
21							

Notes: *Total depth of 16.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-1

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LOG OF BORING

Boring No. B-2

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 96 feet
Date Drilled: March 3, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
96 — 0		SC	Red-brown, wet, medium dense, silty SAND with clay.				
	7 13 27		Reddish brown, moist, stiff to very stiff, clayey SILT with some sand.	Pocket Pen: 4.5+ tsf	2-1	113	16
93 — 3				Bulk sample CB-2 collected from a depth of approximately 3 to 5 feet.	CB-2		
	4 5 7			Pocket Pen: 4.5+ tsf	2-2	112	17
90 — 6							
87 — 9		ML					
	4 14 26			Pocket Pen: 4.5+ tsf	2-3		
84 — 12							
81 — 15	9 19 26			Pocket Pen: 4.5+ tsf	2-4		
78 — 18							
75 — 21							

Notes: *Total depth of 16.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-2

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LOG OF BORING

Boring No. B-3

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 91 feet
Date Drilled: March 3, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0	2 3 6	SM	Red-brown, moist to wet, loose to medium dense, silty SAND with some clay.		3-1	119	15
3							
87	23 43 50	ML	Brown, moist, hard to very hard, sandy SILT with clay.	Pocket Pen: 4.5+ tsf	3-2	115	14
6				Some perched water at 6 feet.			
84		ML	Light brown, moist, very stiff to hard, clayey SILT.				
9							
81	13 31 42			Pocket Pen: 4.5+ tsf	3-3	82	39
12							
78							
15	7 13 17			Pocket Pen: 4.5 tsf	3-4		
75							
18							
72							
21							

Notes: *Total depth of 16.5 feet. Some perched water at a depth of 6 feet. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-3

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LOG OF BORING

Boring No. B-4

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 91.5 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: PFF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0 / 90		SM	Brown, wet, loose to medium dense, silty SAND with some clay.				
3 / 87	4 5 9	ML	Light gray-brown, wet, stiff to very stiff, sandy SILT.	Some interbedded fine to medium grained silty sand. Pocket Pen: 1.75 tsf	4-1	89	32
6 / 84							
9 / 81	5 25 50	ML	Light gray-brown, moist, very stiff to hard, slightly cemeneted SILT.	Pocket Pen: 4.5+ tsf	4-2	90	22
12 / 78							
15 / 75	18 23 40		Light gray, moist, very stiff to hard, SILT with some sand.	Pocket Pen: 4.5+ tsf	4-3	96	23
18 / 72							
21	17 26 50	ML		Pocket Pen: 4.5+ tsf	4-4	91	26

Notes: *Total depth of 46.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-4

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LOG OF BORING

Boring No. B-4

ESPAÑA Geotechnical Consulting

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
69							
24							
66	13 19 39				4-5	76	43
27							
63		ML	Brown, moist to wet, hard, sandy SILT with thinly interbedded silty sand and some clay.				
30	15 22 38			Pocket Pen: 4.5+ tsf	4-6	98	24
60							
33							
57		SM	Grades down to a brown, moist to wet, dense, silty SAND with clay.				
36	20 33 36			Pocket Pen: 4.5 tsf	4-7	93	29
54							
39							
51	15 20 21			More of a reddish brown color and some minor voids (1/8" to 1/4" in diam) due to dissolution of organic material. Cemented around voids.	4-8		
42							
48		ML	Light gray-brown, moist, hard, SILT.				
45	19 28 33				4-9		
45							

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Figure I-4

LOG OF BORING

Boring No. B-5

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 94 feet
Date Drilled: March 8, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: MEW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0							
93	8 28 50/ 4"	SM	Brown to reddish brown, moist to wet, dense, silty SAND with with clay.		5-1	100	22
3							
90			Brown, moist, stiff to very stiff, sandy SILT.				
6	5 18 23				5-2	86	18
87		ML		Bulk Sample CB-5-1 collected from a depth of approximately 5 to 10 feet.	CB-5		
9	4 11 18						
84					5-3		
12							
81							
15							
78							
18							
75							
21							

Notes: *Total depth of 10.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-5

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LOG OF BORING

Boring No. B-6

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 96.5 feet
Date Drilled: March 8, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: MEW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moist %
96 / 0		SC	Dark reddish brown, moist to wet, medium dense, clayey SAND.				
93 / 3		ML	Light yellowish brown, moist, stiff to very stiff, sandy SILT with clay.				
90 / 6	7, 19, 27	SC	Red-brown, moist, medium dense, clayey SAND.	Bulk Sample CB-6-2 collected from a depth of approximately 6 to 9 feet.	6-1 CB-6	119	12
87 / 9	5, 33, 50+	ML	Light yellowish brown, moist, hard to very hard SILT.	Some blue-gray mottling.	6-3		
84 / 12							
81 / 15							
78 / 18							
75 / 21							

Notes: *Total depth of 11.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-6

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LOG OF BORING

Boring No. B-7

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 102 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
102 — 0		SM	Brown, wet, loose to medium dense, silty SAND with some clay.				
		SC	Red-brown, moist, medium dense, clayey, fine to medium grained SAND.				
99 — 3				Bulk sample CB-7-1 collected from a depth of approximately 3 to 5 feet.	CB-7		
96 — 6	13 21 23			Some perched water observed at a depth of about 2 to 5 feet. Pocket Pen: 4.5+ tsf	7-2	117	12
93 — 9							
90 — 12	6 17 24			Pocket Pen: 4.2 tsf	7-3	118	14
		SM	Light brown, moist, medium dense to dense, silty, fine grained SAND.				
87 — 15	6 28 43			Pocket Pen: 4.5+ tsf	7-4	95	13
84 — 18							
			Light yellowish brown, moist, very stiff, clayey SILT.				
81 — 21	11 16 26			Pocket Pen: 3.25 tsf	7-5	77	29

Notes: *Total depth of 70 feet. Some perched water at a depth of 2 to 5 feet. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-7

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LOG OF BORING

Boring No. B-7

ESPAÑA Geotechnical Consulting

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
78 — 24							
	10 20 43	ML		Pocket Pen: 3.5 tsf	7-6	72	44
75 — 27							
72 — 30	14 21 31			Pocket Pen: 4.2 tsf	7-7	112	31
69 — 33							
	23 30 36	SM	Red-brown, moist, dense, silty, fine grained SAND.	Pocket Pen: 3.5 tsf	7-8	91	17
66 — 36							
63 — 39		ML	Light brown, moist, very stiff, clayey SILT.	Some black and orange mottling.			
	12 16 23			Pocket Pen: 4.25 tsf	7-9	78	43
60 — 42							
57 — 45	23 25 38	SW	Red-brown, dry to moist, dense, well graded SAND.		7-10	85	12
			Light yellowish brown to gray brown, moist, very stiff to hard, clayey SILT.				

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Figure I-7

LOG OF BORING

Boring No. B-7

ESPAÑA Geotechnical Consulting

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
54 — 48							
	27 42 50+			Pocket Pen: 4.5 tsf Some black and orange mottling.	7-11	81	34
51 — 51							
		ML					
48 — 54							
	20 31 44				7-12	88	23
45 — 57							
			Light gray-brown, moist, very stiff, sandy SILT with clay.				
42 — 60	12 21 40				7-13		
39 — 63							
		ML					
36 — 66							
33 — 69							
30 — 72							

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Figure I-7

LOG OF BORING

Boring No. B-8

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 98 feet
Date Drilled: March 9, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		SC	Red-brown, wet, loose, silty SAND with clay.				
96 / 3	20 50/ 4"	ML	Reddish brown, moist, very stiff to hard, cemented SILT.	Pocket Pen: 4.5+ tsf	8-1	112	13
93 / 6	6 10 15	SM	Red-brown, moist, medium dense, silty, fine grained SAND with some clay.	Pocket Pen: 4.5 tsf Pocket Pen: 4.5+ tsf	8-2	110	17
90 / 9			Light brown, moist, very stiff to hard SILT.				
87 / 12	4 19 24	ML		Pocket Pen: 4.5+ tsf	8-3	105	17
84 / 15	7 15 21	SM	Light brown, moist, medium dense, fine to medium grained, silty SAND.	Pocket Pen: 4.5+ tsf	8-4		
81 / 18							
78 / 21							

Notes: *Total depth of 16.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-8

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LOG OF BORING

Boring No. B-9

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 96 feet
Date Drilled: March 8, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: MEW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
96 — 0		SM	Brown to light brown, moist to wet, medium dense, silty SAND.				
	10 10 24	CL-ML	Brown, moist, stiff to very stiff, silty CLAY with interbedded silty sand.		9-1	100	20
93 — 3				Bulk Sample CB-9-1 collected from a depth of approximately 1 to 5 feet.	CB-9		
	10 10 18				9-2		
90 — 6							
87 — 9							
84 — 12							
81 — 15							
78 — 18							
75 — 21							

Notes: *Total depth of 6.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-9

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LOG OF BORING

Boring No. B-10

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 101 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: APW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		SC	Dark red-brown, wet, loose to medium dense, clayey SAND.	Bulk sample CB-10-1 collected from a depth of approximately 1 to 3 feet.	CB-10		
99 / 3		SM	Red-brown to orange-brown, moist, medium dense, silty SAND with clay.				
96 / 6	7, 21, 30	SW	Red-brown, moist, medium dense to dense, SAND with some silt and clay.		10-2	118	10
93 / 9	5, 21, 32	SM	Light yellowish brown, moist, medium dense to dense, micaceous, silty, fine grained SAND.		10-3	106	15
90 / 12	16, 50	SW	Orange-red, moist, dense, SAND with some silt and clay.		10-4		
87 / 15	4, 22, 33	SP	Light yellowish brown, moist, medium dense to dense, micaceous, fine to medium grained SAND with a trace of silt.		10-5		
84 / 18							
81 / 21							

Notes: *Total depth of 20 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-10

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LOG OF BORING

Boring No. B-11

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 103 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: APW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		ML	Red-brown, wet, stiff, sandy SILT.				
102		SC	Red-brown, moist to wet, dense, clayey SAND with silt.				
3	5 17 50				11-1	125	12
99		CL	Medium brown, moist to wet, very stiff, sandy CLAY.	Bulk sample CB-11-2 collected from a depth of approximately 1 to 5 feet. Pocket Pen: 4.5 tsf	CB-11		
6	15 29 49	SM	Red-brown, moist, dense, silty SAND with CLAY.		11-3	123	10
96							
9							
93	9 31 50				11-4	121	12
12							
90							
15	30 43 50+			Pocket Pen: 4.5 tsf	11-5		
87							
18							
84							
21							

Notes: *Total depth of 16.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-11

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LOG OF BORING

Boring No. B-12

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 99 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: PFF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
99 — 0		SM	Brown, wet, loose to medium dense, silty SAND with clay.				
	24 34 44	SM	Brown, moist, medium dense to dense, silty SAND with clay.	Pocket Pen: 4.5+ tsf	12-1	112	16
96 — 3							
	6 16 23			Pocket Pen: 4.0 tsf	12-2	106	16
93 — 6							
90 — 9		SM	Grades down to a red-brown, wet, medium dense, silty, medium to coarse grained SAND.				
	7 19 24				12-3	110	11
87 — 12							
84 — 15							
81 — 18							
78 — 21							

Notes: *Total depth of 11.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-12

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LOG OF BORING

Boring No. B-13

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 102 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: APW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
102 — 0		SC	Red-brown, wet, loose to medium dense, clayey SAND.				
99 — 3		SM	Orange-brown, moist, silty, micaceous, SAND with clay.				
	12 50/3"			Pocket Pen: 3.5 tsf	13-1	117	9
96 — 6				Becomes medium to coarse grained.			
93 — 9							
	8 27 50			Pocket Pen: 4.5 tsf	13-2	121	11
90 — 12				Becomes fine to medium grained.			
87 — 15	28 50				13-3		
84 — 18	20 49	ML	Light yellowish brown, moist, hard, SILT.		13-4		
81 — 21							

Notes: *Total depth of 20 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-13

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LOG OF BORING

Boring No. B-14

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 101 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: APW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		ML	Red-brown, wet, stiff, sandy SILT with clay.				
99 / 3	5 43 50+	SM	Light orange-brown, moist, dense, silty SAND.		14-1	121	7
96 / 6	8 23 41			Pocket Pen: 4.5+ tsf	14-2	92	25
93 / 9		ML	Light to medium brown, moist, very stiff to hard SILT.				
90 / 12	6 28 50			Pocket Pen: 4.5+ tsf Common dark brown and light orange mottling.	14-3	78	42
87 / 15	7 23 48				14-4	82	38
84 / 18	6 16 35	SP	Light to medium brown, moist, medium dense, micaceous SAND.		14.5		
81 / 21							

Notes: *Total depth of 20 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-14

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LOG OF BORING

Boring No. B-15

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 97 feet
Date Drilled: March 8, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: MEW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		SM	Brown to light brown, medium dense to dense, silty SAND.				
96	20 46 50+	ML	Brown, moist, very stiff to hard, sandy SILT with interbedded silty sand.		15-1	80	20
3							
93							
6	12 14 50+				15-2	88	13
90							
9	19 37 38				15-3	94	9
87							
12							
84							
15							
81							
18							
78							
21							

Notes: *Total depth of 10 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-15

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LOG OF BORING

Boring No. B-16

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 100 feet
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: APW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moistur %
0							
99		ML	Red-brown, moist to wet, soft to stiff, sandy SILT with clay.				
			Light brown, moist, hard, clayey SILT.				
3							
96							
	6 26 50				16-1	80	39
6							
93							
9		ML					
90	14 25 48			Some orange mottling and fine sand.	16-2	84	33
12							
87							
15	9 26 50			Some black mottling and fine sand.	16-3	98	22
84							
18							
81							
21							

Notes: *Total depth of 16.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-16

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LOG OF BORING

Boring No. B-17

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 99 feet
Date Drilled: March 9, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
99 — 0	6, 42, 50/3"	ML	Light gray-brown, moist, hard to very hard, slightly cemented SILT.	Some black and orange mottling, and some interbedded sands. Pocket Pen: 4.5+ tsf	17-1	95	28
96 — 3							
	6, 16, 24	SM	Light brown, moist, medium dense, silty, fined grained, micaceous SAND.	Pocket Pen: 4.5+ tsf	17-2	92	17
93 — 6							
90 — 9	23, 50	ML	Light gray-brown, moist, hard, SILT.		17-3	82	30
87 — 12							
84 — 15							
81 — 18							
78 — 21							

Notes: *Total depth of 11.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-17

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LOG OF BORING

Boring No. B-18

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 97 feet
Date Drilled: March 9, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0			Light yellowish brown, moist, very stiff, sandy SILT.	Some black and orange mottling, and some interbedded sands. Pocket Pen: 4.5 tsf			
96	4 13 29	ML			18-1	103	14
3							
93				Bulk sample CB-18-2 collected from a depth of approximately 3 to 5 feet.	CB-18		
	8 32 50		Light yellowish-brown, moist, hard, SILT.	Pocket Pen: 4.5+ tsf	18-3	79	34
6							
90							
9							
87	11 41 50			Some thin interbedded sands.	18-4	86	5
12							
84		MH					
15	13 27 49			Pocket pen: 4.5+ tsf			
81					18-5	84	34
18							
78							
	11 21 50				18-6		
21							

Notes: *Total depth of 21.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-18

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LOG OF BORING

Boring No. B-19

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 88 feet
Date Drilled: March 9, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		SM	Brown, wet, loose, silty SAND with clay.				
87	3 5 5	SM	Brown, moist to wet, loose to medium dense, silty SAND.		19-1	91	25
3		ML	Light brown, slightly moist, very stiff to hard SILT.				
84	9 17 35				19-2		
6							
81							
9							
78							
12							
75							
15							
72							
18							
69							
21							

Notes: *Total depth of 6.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-19

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LOG OF BORING

Boring No. B-20

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 97 feet
Date Drilled: March 3, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0			Dark gray-brown, moist, medium dense, silty, fine to medium grained SAND with clay.	Pocket Pen: 4.5+ tsf			
96	2 3 15	SC			20-1	113	17
3				Bulk sample CB-20 collected from a depth of approximately 2.5 to 5 feet.	CB-20		
93			Light gray-brown, moist, dense, silty, fine to medium grained SAND.	Pocket Pen: 2.0 tsf			
6	6 31 41	SM			20-2	107	8
90			Light yellowish-brown to gray brown, moist, very stiff SILT.	Some orange mottling.			
9		ML					
87	6 11 15			Pocket Pen: 4.0 tsf	20-3	79	41
12							
84							
15							
81							
18							
78							
21							

Notes: *Total depth of 11.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-20

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LOG OF BORING

Boring No. B-21

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 101 feet
Date Drilled: March 8, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: MEW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0	10 50/ 4"	SM	Red-brown, moist to wet, medium dense, silty SAND.		21-1		
99 / 3		ML	Red-brown to light brown, moist, very stiff, sandy SILT.				
96 / 6	14 29 49		Brown and reddish brown, moist, very stiff, SILT with interbedded sand.	Pocket Pen: 4.5+ tsf	21-2	90	20
93 / 9	8 38 50			Pocket Pen: 4.5+ tsf	21-3	78	37
90 / 12		ML					
87 / 15	12 50			Pocket Pen: 4.5+ tsf	21-4	86	23
84 / 18							
81 / 21	12 40 50	SM	Brown, moist, dense, silty SAND.	Pocket Pen: 2.0 tsf	21-5	87	13
			Brown to light brown, moist, very				

Notes: *Total depth of 25 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-21

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LOG OF BORING

Boring No. B-21

ESPAÑA Geotechnical Consulting

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
78		ML	stiff, sandy SILT.				
24	8 24 35			Pocket Pen: 3.25 tsf	21-6		
75							
27							
72							
30							
69							
33							
66							
36							
63							
39							
60							
42							
57							
45							
54							

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Figure I-21

LOG OF BORING

Boring No. B-22

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 100 feet
Date Drilled: March 9, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0			Dark red-brown, moist to wet, medium dense, clayey, medium grained SAND.				
99	4 6 12	SC			22-1	118	14
3				Bulk sample CB-22 collected from a depth of approximately 3 to 5 feet.	CB-22		
96			Brown, moist, dense to very dense, silty, fine to medium grained SAND with clay.				
	10 50+			Pocket Pen: 4.5+ tsf	22-2	106	15
6							
93		SM					
9							
90	8 24 34			Pocket Pen: 4.0 tsf	22-3	109	14
12							
87							
15							
84							
18							
81							
21							

Notes: *Total depth of 11.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-22

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LOG OF BORING

Boring No. B-23

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 98 feet
Date Drilled: March 9, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		SM	Red-brown, wet, loose to medium dense, silty SAND.				
96 (3)	12 35 50/4"	SM	Brown to orange-brown, moist, dense to very dense, slightly cemented, silty, fine to coarse grained SAND.	Pocket Pen: 4.5+ tsf	23-1	119	8
93 (6)	11 23 30	SC	Brown, moist, medium dense to dense, clayey SAND.	Becomes clayey Pocket Pen: 4.5+ tsf	23-2	109	10
90 (9)							
87 (12)	10 26 38				23-3	94	16
84 (15)							
81 (18)							
78 (21)							

Notes: *Total depth of 11.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-23

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LOG OF BORING

Boring No. B-24

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 99.5 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
99 / 0		ML	Red-brown, wet, stiff, sandy SILT.				
	12 39 50+		Yellowish brown, moist, hard, SILT.	Pocket Pen: 4.5+ tsf	24-1	86	26
96 / 3				Bulk sample CB-24-2 collected from a depth of approximately 2.5 to 5 feet.	CB-24		
	8 19 32			Pocket Pen: 4.5+ tsf			
93 / 6		ML			24-3	79	37
90 / 9							
	17 19 41			Pocket Pen: 4.5+ tsf	24-4	95	22
		SM	Light gray, moist, medium dense to dense, silty, fine grained SAND.				
87 / 12							
84 / 15							
81 / 18							
78 / 21							

Notes: *Total depth of 11.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-24

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LOG OF BORING

Boring No. B-25

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 101 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		ML	Red-brown, wet, stiff, sandy SILT.				
99 (3)	13 26 50+	ML	Dark brown to yellowish brown, moist, hard, sandy SILT.	Some iron oxide staining. Pocket Pen: 4.5+ tsf	25-1	77	21
96 (6)	6 17 35	ML	Light brown to yellowish brown, dry to moist, very stiff to hard SILT.	Pocket Pen: 4.5+ tsf	25-2	86	22
93 (9)							
90 (12)	6 25 50+	ML			25-3	96	23
87 (15)	14 36 50+			Pocket Pen: 4.5+ tsf	25-4		
84 (18)							
81 (21)							

Notes: *Total depth of 16.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-25

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LOG OF BORING

Boring No. B-26

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 100.5 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moistur %
0		ML	Red-brown, wet, stiff, sandy SILT.				
99	39 50/ 3"	ML	Light brown to yellowish brown, moist, hard to very hard, SILT.	Some iron oxide staining. Pocket Pen: 4.5+ tsf	26-1	—	19
3				Bulk sample CB-26-2 collected from a depth of approximately 2.5 to 3 feet.	CB-26		
96	9 17 42	CL-ML	Light brown to yellowish brown, dry to moist, very stiff to hard clayey SILT.	Some iron oxide staining. Pocket Pen: 4.5+ tsf	26-3	87	25
6							
93		ML	Light brown, moist, hard SILT.				
9							
90	8 28 50+			Pocket Pen: 4.5+ tsf	26-4	88	26
12		SM	Light brown, moist, medium dense to dense, silty, fine grained SAND.				
87							
15	6 23 28			Pocket Pen: 2.0 tsf	26-5		
84							
18							
81	11 40 50/ 3"				26-6		
21							

Notes: *Total depth of 21.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-26

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LOG OF BORING

Boring No. B-28

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 101.5 feet
Date Drilled: March 3, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		ML	Red-brown, wet, stiff, sandy SILT.				
99 / 3	10 27 50	CL-ML	Light yellowish brown, moist, hard SILT.	Pocket Pen: 4.5+ tsf	28-1	99	16
96 / 6	6 20 26			Pocket Pen: 4.5+ tsf Some orange mottling.	28-2	88	13
93 / 9		ML	Light brown to gray-brown, moist, hard, sandy SILT.				
90 / 12	13 29 50			Pocket Pen: 4.5+ tsf	28-3	94	18
87 / 15	10 21 46			Pocket Pen: 4.5+ tsf	28-4	93	26
84 / 18		SM	Light gray, moist, dense, silty SAND.				
81 / 21	7 34 44				28-5		

Notes: *Total depth of 21.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-28

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LOG OF BORING

Boring No. B-29

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 101 feet
Date Drilled: March 8, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: MEW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0	16 40 50/ 4"	ML	Brown, moist, very stiff to hard, sandy SILT.		29-1	75	34
99							
3							
96	8 27 45				29-2	81	31
6							
93							
9	6 15 20	SM	Brown, moist, medium dense, silty SAND.		29-3	90	5
90							
12							
87							
15							
84							
18							
81							
21							

Notes: *Total depth of 10.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-29

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LOG OF BORING

Boring No. B-30

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 105.5 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
105 (0)		ML	Gray-brown, wet, stiff, sandy SILT.				
	3 3 14	ML	Gray, moist, stiff to very stiff, micaceous, sandy SILT.		30-1	101	23
102 (3)							
	19 26 43			Pocket Pen: 4.5+ tsf	30-2	95	18
99 (6)							
96 (9)	8 17 19			Pocket Pen: 4.5+ tsf	30-3	94	11
93 (12)							
90 (15)							
87 (18)							
84 (21)							

Notes: *Total depth of 11.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-30

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LOG OF BORING

Boring No. B-31

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 102 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
102 — 0		ML	Gray-brown, wet, stiff, sandy SILT.				
	48 50/ 4"		Light gray, moist, hard, sandy SILT.	Some orange and black mottling. Pocket Pen: 4.5+ tsf	31-1	88	31
99 — 3		ML		Bulk sample CB-31-2 collected from a depth of approximately 3 to 5 feet.	CB-31		
	19 30 44		Light gray, moist, dense, silty, micaceous, fine grained SAND with clay.	Pocket Pen: 2.25 tsf			
96 — 6					31-3	97	26
		SM					
93 — 9							
	6 26 37			Pocket Pen: 2.0 tsf	31-4	88	16
90 — 12			Gray, dry to moist, hard, SILT.				
		ML					
87 — 15	11 26 48			Pocket Pen: 4.5+ tsf Some orange mottling.	31-5		
84 — 18							
81 — 21							

Notes: *Total depth of 16.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-31

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LOG OF BORING

Boring No. B-32

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 105 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
105 — 0		ML	Gray-brown, wet, stiff, sandy SILT.				
	11 30 44	ML	Light brown to gray, moist, hard, SILT.	Some orange and black mottling. Pocket Pen: 4.5+ tsf	32-1	93	24
102 — 3				Bulk sample CB-32-2 collected from a depth of approximately 3 to 5 feet.	CB-32		
	19 50			Pocket Pen: 4.5+ tsf	32-3	102	23
99 — 6		CL	Light gray, moist, hard, silty CLAY.				
96 — 9		ML	Light brown to gray, dry to moist, very stiff to hard, sandy SILT.	Some orange mottling.			
	7 18 31			Pocket Pen: 4.5+ tsf	32-4	92	24
93 — 12							
90 — 15							
87 — 18							
84 — 21							

Notes: *Total depth of 11.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-32

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LOG OF BORING

Boring No. B-33

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 111 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
111 — 0		ML	Brown brown, wet, stiff, sandy SILT.				
	8 35 50	ML	Brown to orange-brown, moist, hard, sandy SILT.	Pocket Pen: 4.5 tsf	33-1	112	15
108 — 3	11 24 50+				33-2	109	15
	17 50/ 4"			Pocket Pen: 4.5+ tsf	33-3	—	16
105 — 6		ML	Light yellowish brown, stiff to very stiff SILT.				
102 — 9				Bulk sample CB-33 collected from a depth of approximately 7 to 10 feet.	CB-33		
	7 18 31	ML	Light yellowish brown, dry to moist, hard, sandy SILT with some clay.	Pocket Pen: 4.5+ tsf	32-4	88	11
99 — 12							
96 — 15							
93 — 18							
90 — 21							

Notes: *Total depth of 11.5 feet. No ground water encountered. This boring log was prepared to provide design information to the engineer for design purposes only.*

Figure I-33

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LOG OF BORING

Boring No. B-34

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 98 feet
Date Drilled: March 2, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
0		ML	Red-brown, wet, stiff, sandy SILT.				
98	10 50 50+		Red-brown to light brown, moist, hard, slightly cemented SILT.	Pocket Pen: 4.5+ tsf	34-1	106	19
3		ML					
93	7 21 50			Pocket Pen: 4.5+ tsf	34-2	84	37
6							
90							
9							
87							
12							
84							
15							
81							
18							
78							
21							

Notes: *Total depth of 6.5 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-34

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LOG OF BORING

Boring No. B-35

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 99 feet
Date Drilled: March 8, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: MEW

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	Density p.c.f.	Moisture %
99 — 0		SM	Red-brown, moist to wet, medium dense, silty SAND.				
	29 36 49		Brown to red-brown, moist, very stiff to hard, sandy CLAY and SILT.		35-1	106	19
96 — 3				Bulk sample CB-35-1 collected from a depth of approximately 1 to 5 feet.	CB-35		
	9 23 39				35-2	93	16
93 — 6		CL-ML					
90 — 9	29 50				35-3	94	21
87 — 12							
84 — 15							
81 — 18							
78 — 21							

Notes: *Total depth of 10 feet. No ground water encountered.*
This boring log was prepared to provide design information to the engineer for design purposes only.

Figure I-35

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LEGEND

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant **Project No.:** H199

Soil Symbols Sampler Symbols and Field Test Data	USCS	DESCRIPTION
	CL	Low Plasticity CLAY
	CH	High Plasticity CLAY
	ML	Low Plasticity SILT
	MH	High Plasticity SILT
	SC	Clayey SAND
	SM	Silty SAND
	SP	Poorly Graded SAND
	SW	Well Graded SAND
	GW	Well Graded GRAVEL
		Pavement
		Fill
4 5 6		3.0-inch O.D. Sampler (2.5-inch I.D.), Blow Counts (4,5,6) for 6-inch intervals using 350 ft-lbs energy hammer
7 8 9		Standard Penetration Test (S.P.T.) Sampler (2-inch O.D.), Blow Counts (7,8,9) for 6-inch intervals
Bulk		Bulk Sample Retrieved
		Ground Water Measured Upon Completion

Figure I-36

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APPENDIX II

LABORATORY TESTING

Samples obtained from the field exploration were contained in sealed brass tubes, bulk sample bags, and small plastic bags depending on the technique used during sampling. These samples were shipped to the laboratory for soils testing. The following tests were performed on selected samples and are shown on the accompanying Figures and Tables:

Laboratory Soil Classification

The field classification is verified in the laboratory by visual examination and by ASTM methods, in accordance with the Unified Soil Classification System. The classification tests include grain size analysis (ASTM D-422) and Atterberg Limits (ASTM D 4318). The final soil classifications are shown on the Boring Logs, Figures I-1 through I-35, Appendix I. The results of the Atterberg Limits testing is included in Table II-1. Grain size analyses are shown on Figures II-1 through II-8.

Moisture-Density

The moisture-density information (ASTM D 2216) provides the dry unit weight and field moisture content for selected undisturbed samples, and the results are shown on the Boring Logs.

Direct Shear

Strength parameters were determined by direct shear testing (ASTM D 3080). Shear tests are made with a direct shear machine at a constant rate of strain. A normal or confining load approximately equal to the existing or future weight of soil above the point of sampling is applied vertically and the soil shear strength is determined at this load. Samples are also tested at higher and lower normal loads in order to determine the angle of internal friction and the cohesion. Test results are included below in Table II-2.

Maximum Density-Optimum Moisture Content

Representative soil samples were tested in the laboratory to determine maximum dry density and optimum moisture content using ASTM D 1557 compaction test method. This procedure uses 25 blows of a 10-pound hammer falling a height of 18 inches on each of five layers in a 1/30 cubic foot cylinder. Test results are shown on Figures II-9 through II-13.

Unconfined Compressive Strength

The unconfined compressive strength (ASTM D 2166) provides an approximation of the compressive strength of a cohesive soil in terms of total stresses. The soil sample is placed in a compression device and the load is increased and recorded until the load values decrease with increasing strain or until 15% strain is reached. Test results are included below on Table II-3.

Corrosion Testing

Selected samples were tested for corrosivity evaluation by Carollo Engineers. Laboratory tests included pH, conductivity, sulfates, chlorides, sulfides, and redox. Test results are shown on Table II-4.

Expansion Index

Remolded, representative samples of the surface soil were tested for their Expansion Index in accordance with A.S.T.M. D 4829. For this test the sample is compacted into a metal ring so that the degree of saturation is between 40% and 60%. The sample is loaded with a surcharge of 144 p.s.f. and saturated for a period of 24 hours at which time the deformation is recorded. The results of the Expansion Index tests are shown in Table II-5.

Permeability Testing

Remolded and relatively undisturbed soil samples were tested for hydraulic conductivity in accordance with ASTM D 5084. The soil samples were loaded to an effective consolidation pressure of 2 psi. The results of the Permeability Tests are shown in Table II-6.

R-Value

R-Value tests were performed on select bulk samples of the near surface soil to determine R-Values for pavement design. Tests were run in accordance with Caltrans Test 301. The results of the-R-Value testing are shown on Figures II-14 through II-18.

TABLE II-1

SUMMARY OF ATTERBERG LIMITS TEST RESULTS

Sample No.	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index
B-18-3	6	52	35	17
B-23-2	6	35	19	16
B-28-1	2	36	17	19
CB-9	1-5	26	14	12
CB-22	3-5	26	17	9
CB-35	1-5	40	21	19

TABLE II-2

SUMMARY OF DIRECT SHEAR TEST RESULTS					
Sample No.	**Depth (ft)**	**Moisture content (% dry wt.)**	**Dry Density (pcf)**	**Cohesion (psf)**	**Friction Angle (degrees)**
B-15-1	2	19.9	80	350	29
B-25-1	2	20.9	77	475	26
CB-22*	3-5	13.7	103	625	17
CB-35*	1-5	13.1	98	1250	21

*Sample was remolded to the density and moisture shown.

TABLE II-3

SUMMARY OF UNCONFINED COMPRESSIVE STRENGTH TEST RESULTS				
Sample No.	**Depth (ft)**	**Moisture content (% dry wt.)**	**Dry Density (pcf)**	**Unconfined Strength (psf)**
B-4-3	16	23	96	6240
B-4-5	26	43	76	5572
B-7-3	11	14	118	1824
B-7-7	31	31	85	3360
B-7-12	56	23	88	3756
B-10-2	6	10	118	3003
B-14-2	6	25	92	5071
B-16-1	6	39	80	8609
B-18-3	6	34	79	4414
B-18-4	11	5	86	2692
B-21-3	10	37	77	3328
B-26-4	11	26	88	2848
B-27-1	2	9	116	4416

TABLE II-4

SUMMARY OF CORROSIVITY TEST RESULTS							
Sample No.	Depth (ft)	pH	Resistivity (ohm-cm)	Sulfate (mg/kg)	Chloride (mg/kg)	Sulfide (qual.)	Redox (mv)
B-1-2	6	8	6305	ND	ND	Negative	+355
B-1-3	11	7.4	2837	ND	ND	Negative	+314
B-2-2	6	7.8	1795	24	ND	Negative	+290
B-3-2	6	7.1	3298	ND	ND	Negative	+295
B-3-3	11	7.0	2134	ND	ND	Negative	+342
B-4-4	21	6.9	1334	ND	ND	Negative	+312
B-4-6	31	7.5	1601	ND	ND	Negative	+323
B-7-2	6	7.1	3444	ND	ND	Negative	+299
B-7-6	26	8.0	1892	ND	ND	Negative	+310
B-7-11	51	7.7	2959	ND	ND	Negative	+361
B-10-3	11	8.0	2886	ND	ND	Negative	+289
B-11-3	6	7.2	3153	ND	ND	Negative	+311
B-16-2	11	7.5	3080	ND	ND	Negative	+305
B-17-1	2	7.8	1504	19	ND	Negative	+314
B-17-2	6	7.6	2668	ND	ND	Negative	+319
B-18-5	16	7.6	2134	ND	ND	Negative	+296
B-21-2	5	7.5	2765	ND	ND	Negative	+313
B-25-2	6	7.9	2086	66	39	Negative	+329
B-27-2	6	7.7	1989	80	ND	Negative	+228
B-28-2	6	7.2	1552	73	74	Negative	+228
B-28-4	16	7.9	1310	42	64	Negative	+296
CB-10	1-3	8.0	5820	19	11	Negative	+285
CB-18	3-5	8.0	2765	ND	ND	Negative	+310
CB-22	3-5	7.0	3613	ND	ND	Negative	+321

mg/kg = milligrams per kilogram (parts per million) of dry soil
Redox = oxidation-reduction potential in millivolts
ND = not detected

TABLE II-5

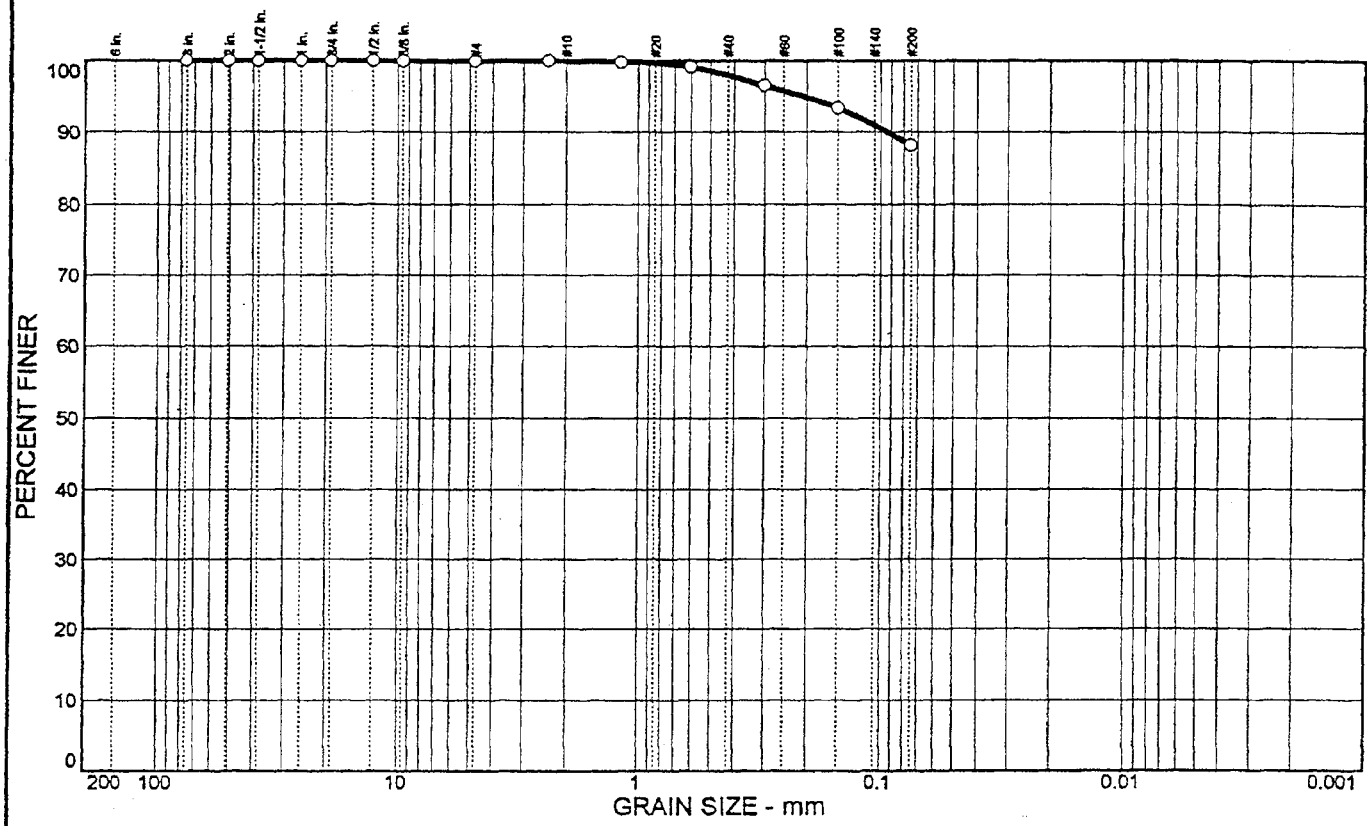
SUMMARY OF EXPANSION INDEX TEST RESULTS		
Sample No.	**Depth (ft)**	**Expansion Index**
B-12-1	3	27
B-24-1	2	53
B-25-1	2	47
CB-22	3-5	28
CB-35	1-5	11

TABLE II-6

SUMMARY OF PERMEABILITY TEST RESULTS			
Sample No.	**Depth (ft)**	**Dry Density (pcf)**	**Hydraulic Conductivity (cm/sec)**
CB-12/CB-26*	2.5-5	99.4	2.5×10^{-6}
B-6-3	11	99.1	2.4×10^{-6}

*Sample was remolded to the density and moisture shown.

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		0.0	11.8			ML			

SIEVE inches size	PERCENT FINER ○		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
	GRAIN SIZE		
D_{60}			
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#8	100.0		
#16	99.9		
#30	99.2		
#50	96.5		
#100	93.4		
#200	88.2		

SOIL DESCRIPTION

○ Silt

REMARKS:

○

○ Location: B-9-1

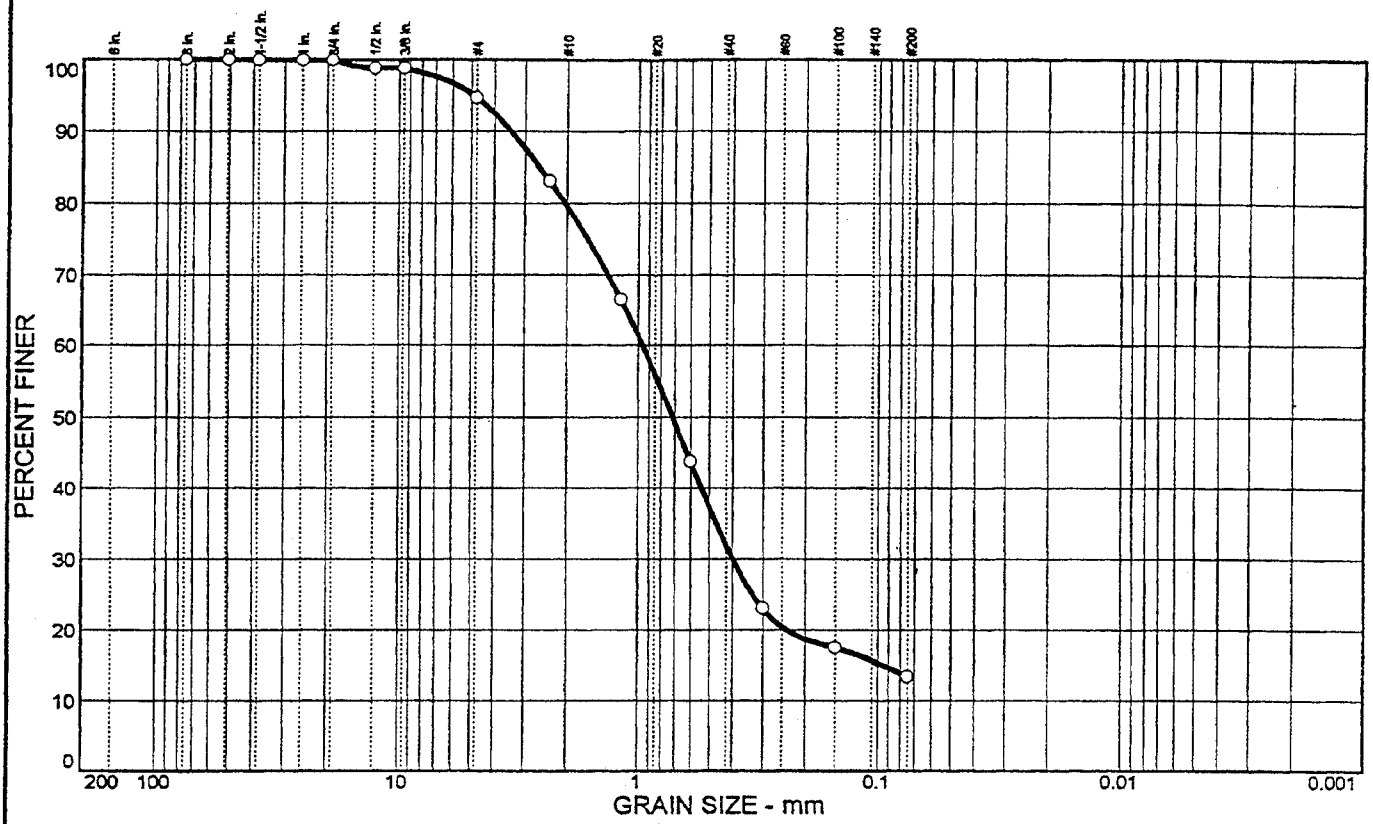
ESPAÑA GEOTECHNICAL CONSULTING

Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199 Figure II-1

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		5.3	81.3			SM			

SIEVE inches size	PERCENT FINER ○		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	98.8		
3/8	98.8		
	GRAIN SIZE		
D_{60}	0.955		
D_{30}	0.398		
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	94.7		
#8	83.1		
#16	66.6		
#30	43.8		
#50	23.1		
#100	17.5		
#200	13.4		

SOIL DESCRIPTION

○ Silty sand

REMARKS:

○

○ Location: B-10-2

ESPAÑA GEOTECHNICAL CONSULTING

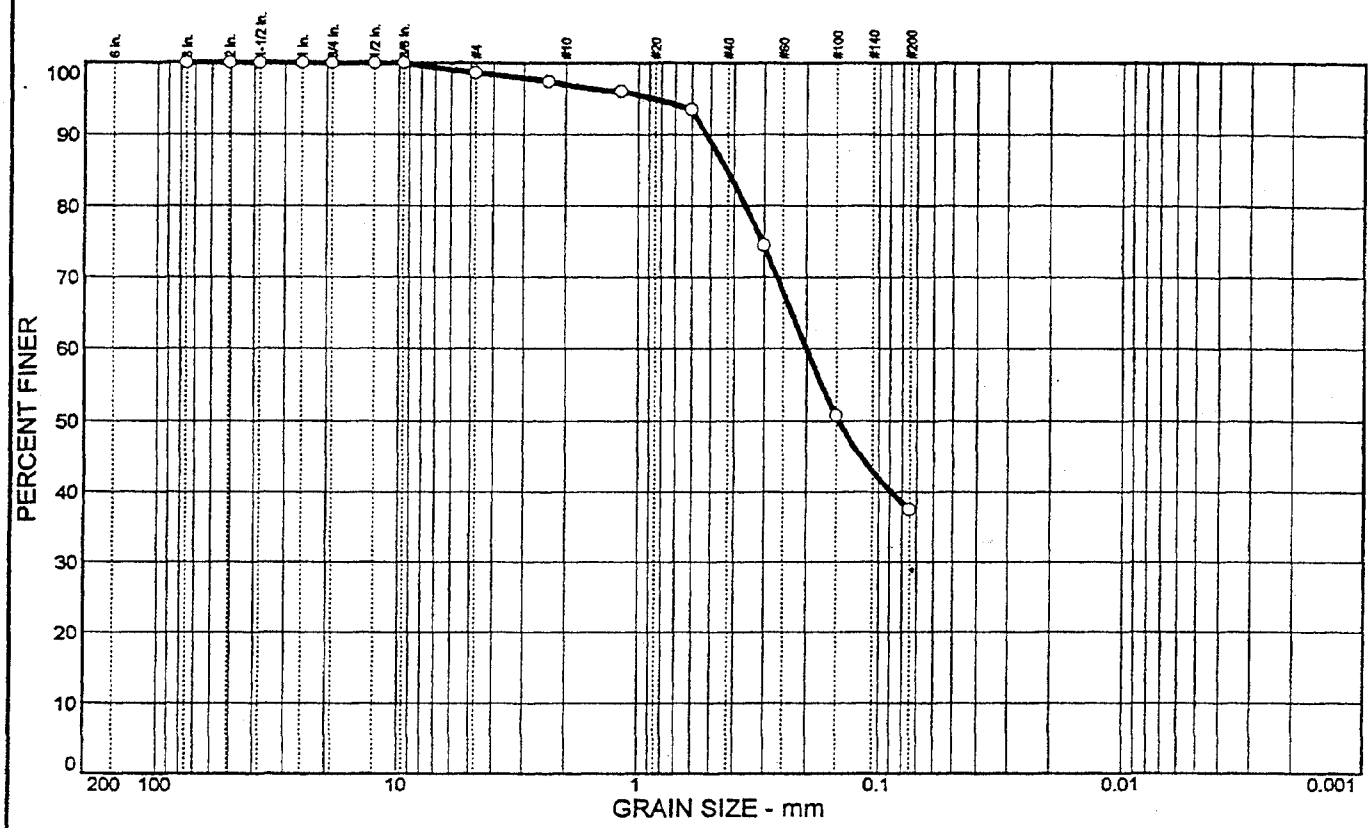
Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199

Figure II-2

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		1.4	61.1			SM			

SIEVE inches size	PERCENT FINER ○		
3	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
	GRAIN SIZE		
D_{60}	0.199		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	98.6		
#8	97.4		
#16	96.0		
#30	93.5		
#50	74.5		
#100	50.8		
#200	37.5		

SOIL DESCRIPTION

○ Silty sand

REMARKS:

○

○ Location: B-22-2

ESPAÑA GEOTECHNICAL CONSULTING

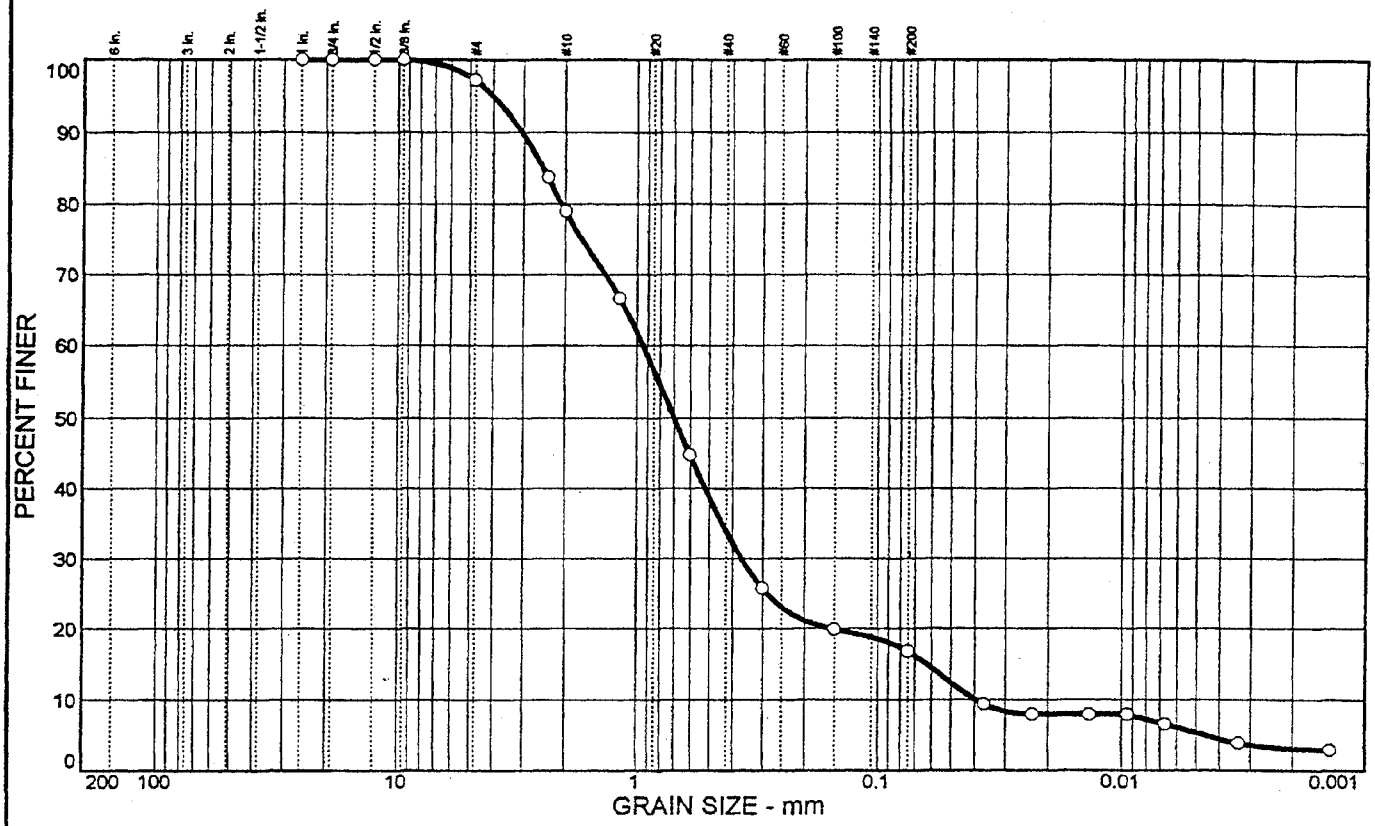
Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199

Figure II-3

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		2.8	80.4	11.4	5.4	SM			

SIEVE inches size	PERCENT FINER ○		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
	GRAIN SIZE		
D_{60}	0.938		
D_{30}	0.366		
D_{10}	0.0394		
	COEFFICIENTS		
C_c	3.62		
C_u	23.79		

SIEVE number size	PERCENT FINER ○		
#4	97.2		
#8	83.7		
#10	79.0		
#16	66.7		
#30	44.8		
#50	25.8		
#100	19.9		
#200	16.8		

SOIL DESCRIPTION

○ Silty sand

REMARKS:

○

○ Location: B-23-2

ESPAÑA GEOTECHNICAL CONSULTING

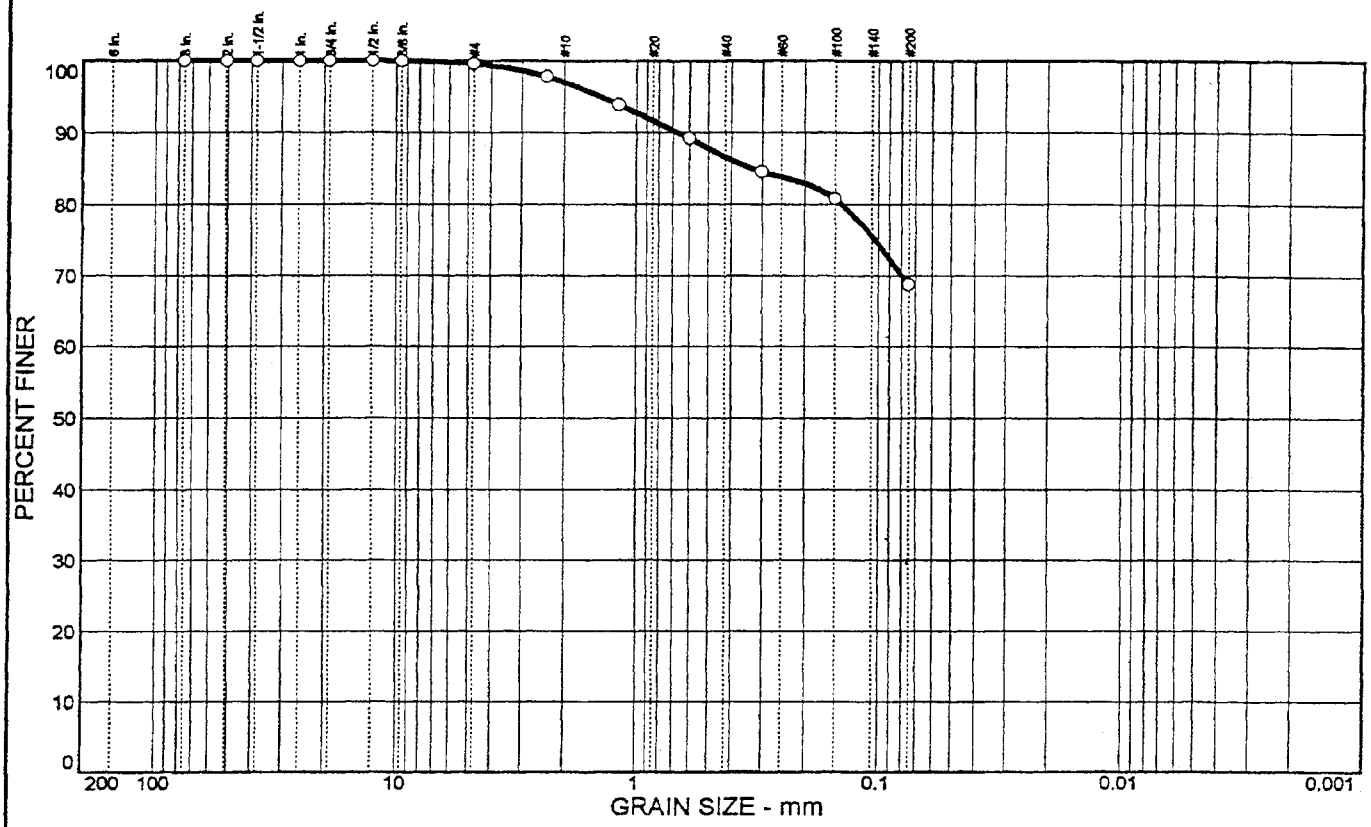
Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199

Figure II-4

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		0.4	30.8			ML			

SIEVE inches size	PERCENT FINER ○		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
	GRAIN SIZE		
D_{60}			
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	99.6		
#8	97.8		
#16	93.9		
#30	89.2		
#50	84.6		
#100	80.8		
#200	68.8		

SOIL DESCRIPTION

○ Sandy silt

REMARKS:

○

○ Location: CB-5

ESPAÑA GEOTECHNICAL CONSULTING

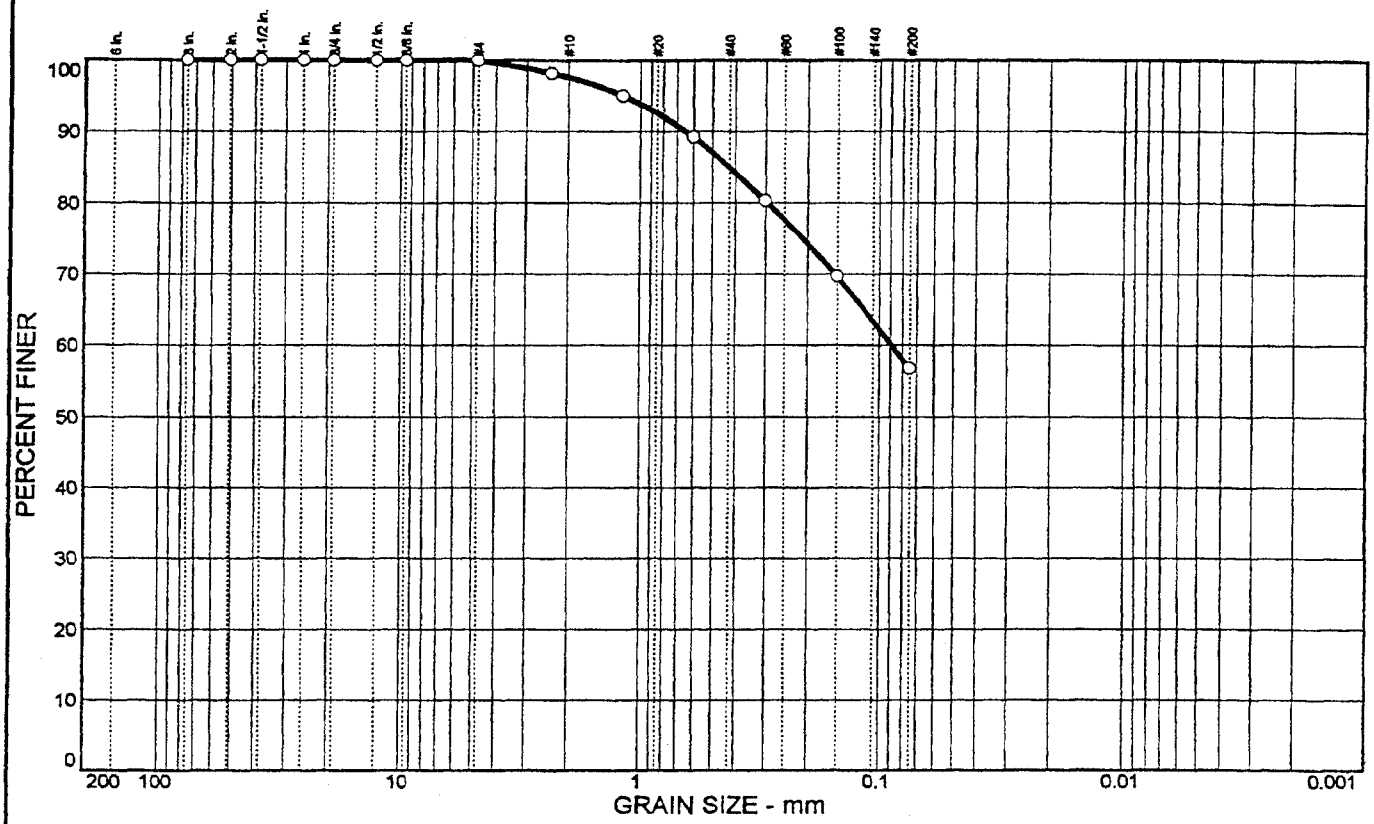
Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199

Figure II-5

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		0.0	43.2			ML			

SIEVE inches size	PERCENT FINER ○		
3	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
	GRAIN SIZE		
D_{60}	0.0885		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	100.0		
#8	98.2		
#16	95.0		
#30	89.2		
#50	80.3		
#100	69.7		
#200	56.8		

SOIL DESCRIPTION

○ sandy Clay/Silt

REMARKS:

○

○ Location: CB-9

ESPAÑA GEOTECHNICAL CONSULTING

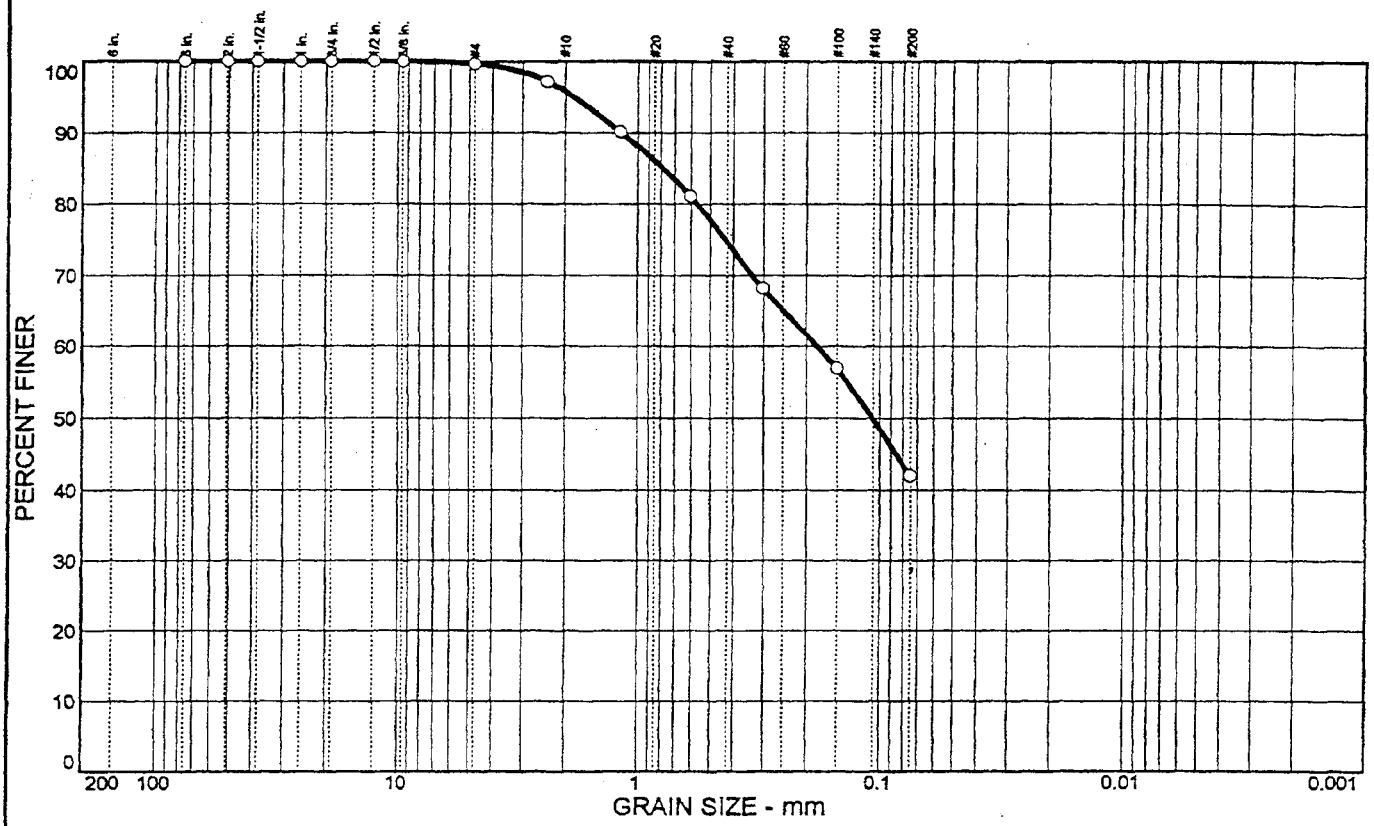
Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199

Figure II-6

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
○		0.3	57.7			SM			

SIEVE inches size	PERCENT FINER ○		
3	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
	GRAIN SIZE		
D_{60}	0.180		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER ○		
#4	99.7		
#8	97.2		
#16	90.1		
#30	81.1		
#50	68.2		
#100	56.9		
#200	42.0		

SOIL DESCRIPTION

○ Silty sand

REMARKS:

○

○ Location: CB-22

ESPAÑA GEOTECHNICAL CONSULTING

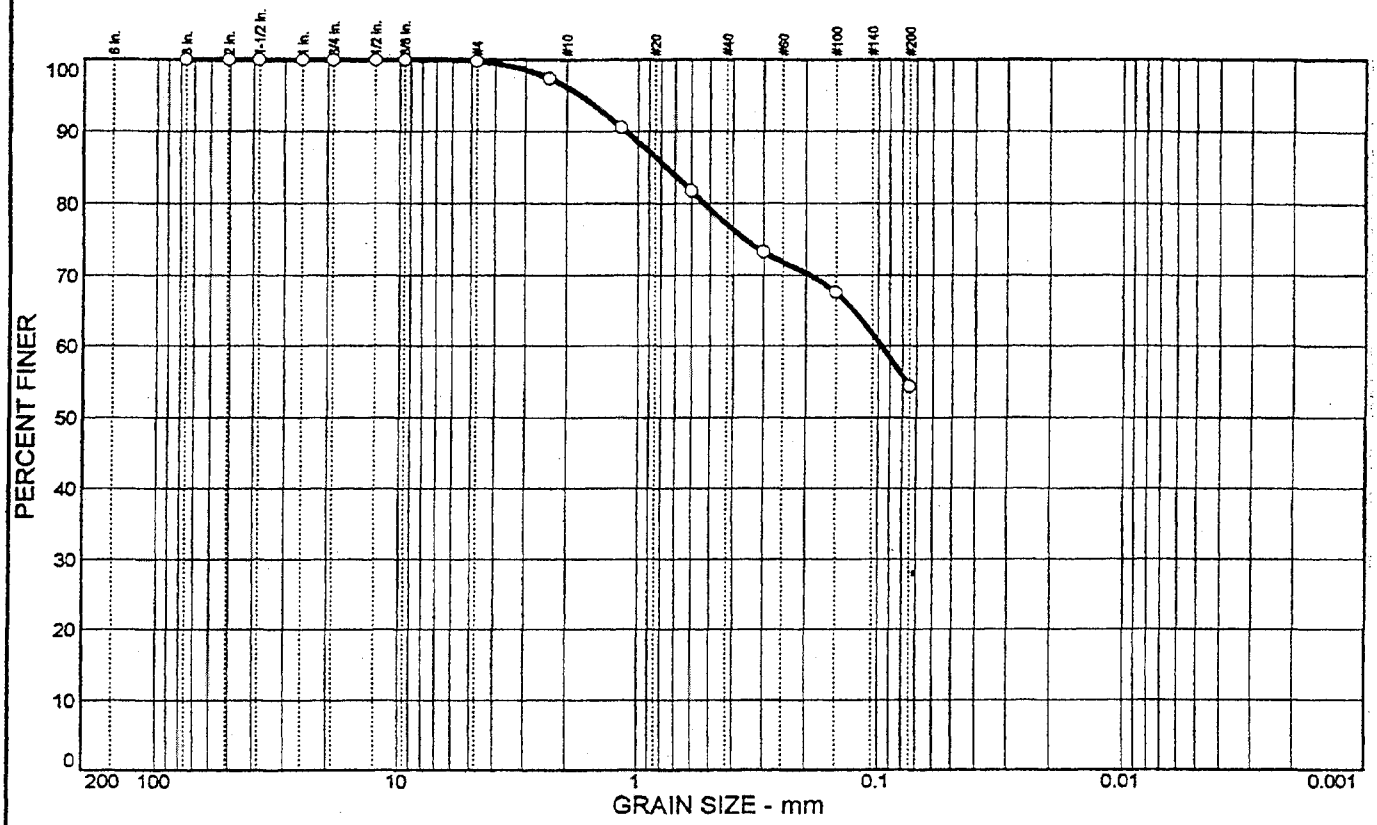
Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199

Figure II-7

GRAIN SIZE DISTRIBUTION TEST REPORT



	% + 3"	% GRAVEL	% SAND	% SILT	% CLAY	USCS	AASHTO	PL	LL
O		0.2	45.4			ML			

SIEVE inches size	PERCENT FINER O		
3"	100.0		
2"	100.0		
1.5"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
	GRAIN SIZE		
D_{60}	0.0970		
D_{30}			
D_{10}			
	COEFFICIENTS		
C_c			
C_u			

SIEVE number size	PERCENT FINER O		
#4	99.8		
#8	97.4		
#16	90.6		
#30	81.8		
#50	73.3		
#100	67.6		
#200	54.4		

SOIL DESCRIPTION

O sandy Silt/Clay

REMARKS:

O

O Location: CB-35

ESPAÑA GEOTECHNICAL CONSULTING

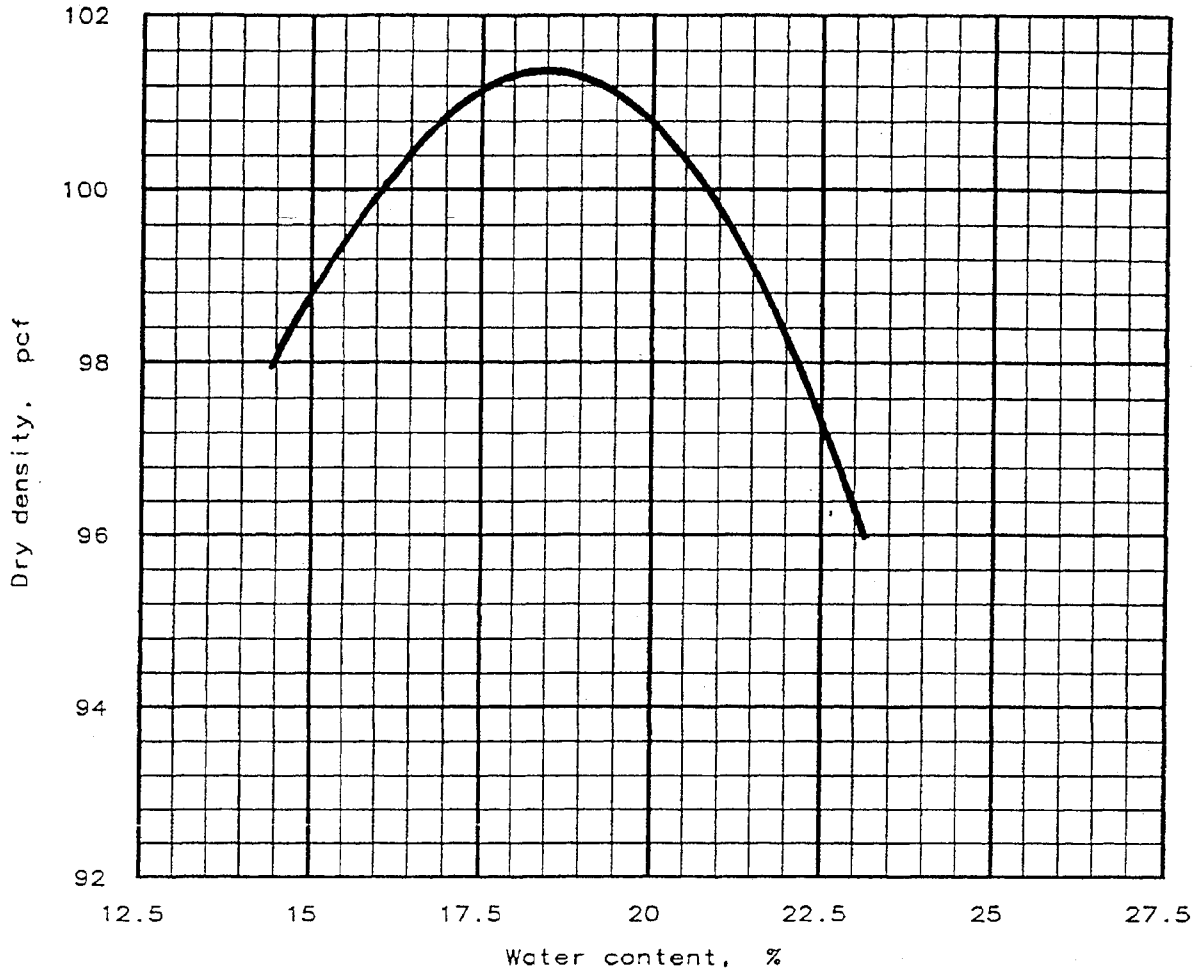
Client: Carollo Engineers

Project: Pleasant Grove WasteWater Treatment Plant

Project No.: H199

Figure II-8

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 1557-91 Method A, Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 101.4 pcf Optimum moisture = 18.5 %	Refer to Boring Log

Project No.: H199
Project: Pleasant Grove WWTP
Location: B-5 (CB 5-1)

Date: 4/9/99

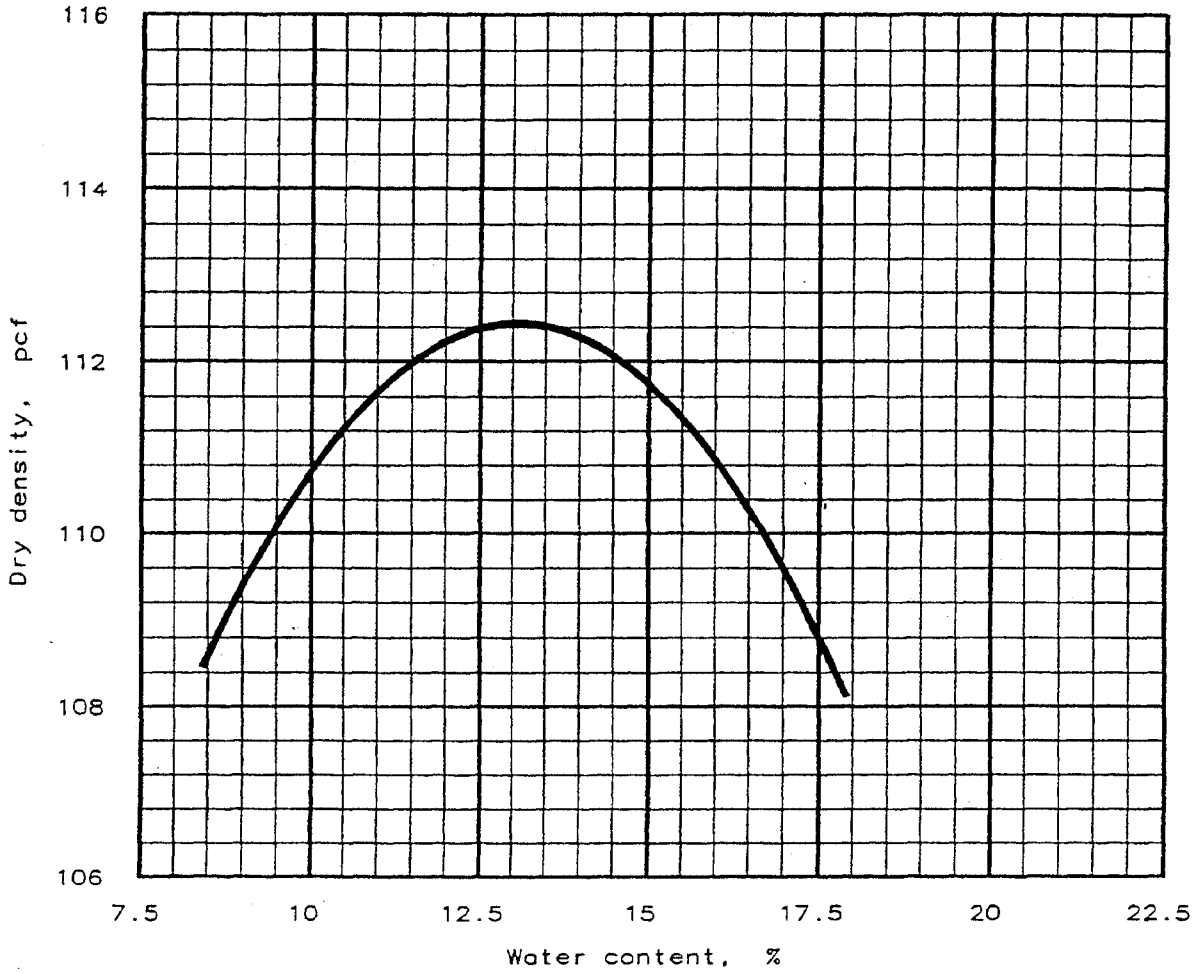
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

ESPAÑA GEOTECHNICAL CONSULTING

Fig. No. 11-9

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 1557-91 Method A, Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 112.5 pcf Optimum moisture = 13.1 %	refer to Boring Log

Project No.: H199

Project: Pleasant Grove WWTP

Location: B-9 (CB-9)

Date: 4/9/99

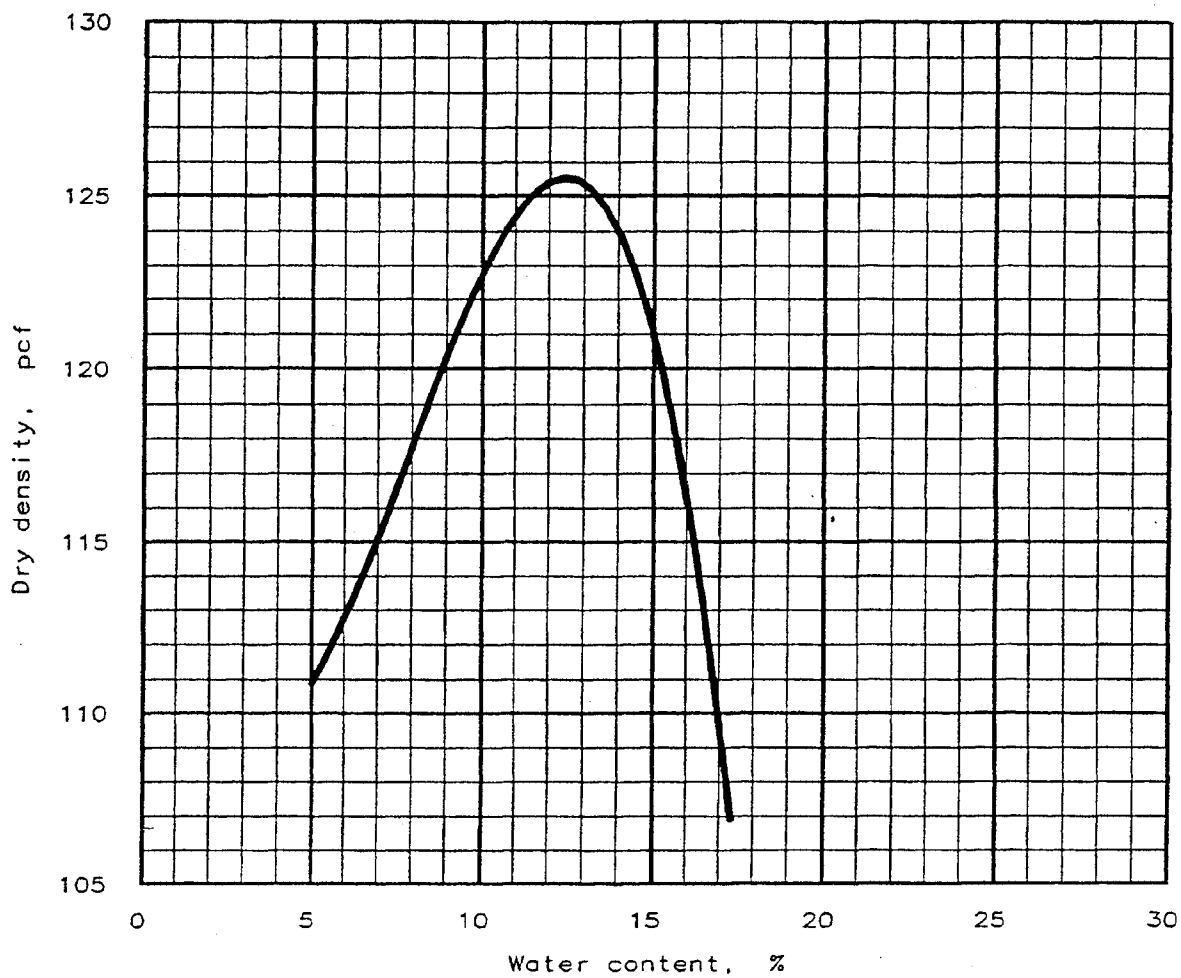
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

ESPAÑA GEOTECHNICAL CONSULTING

Fig. No. 11-10

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 1557-91 Method A, Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 125.5 pcf Optimum moisture = 12.5 %	refer to Boring Log

Project No.: H199

Project: Pleasant Grove WWTP

Location: CB-22

Date: 4/8/99

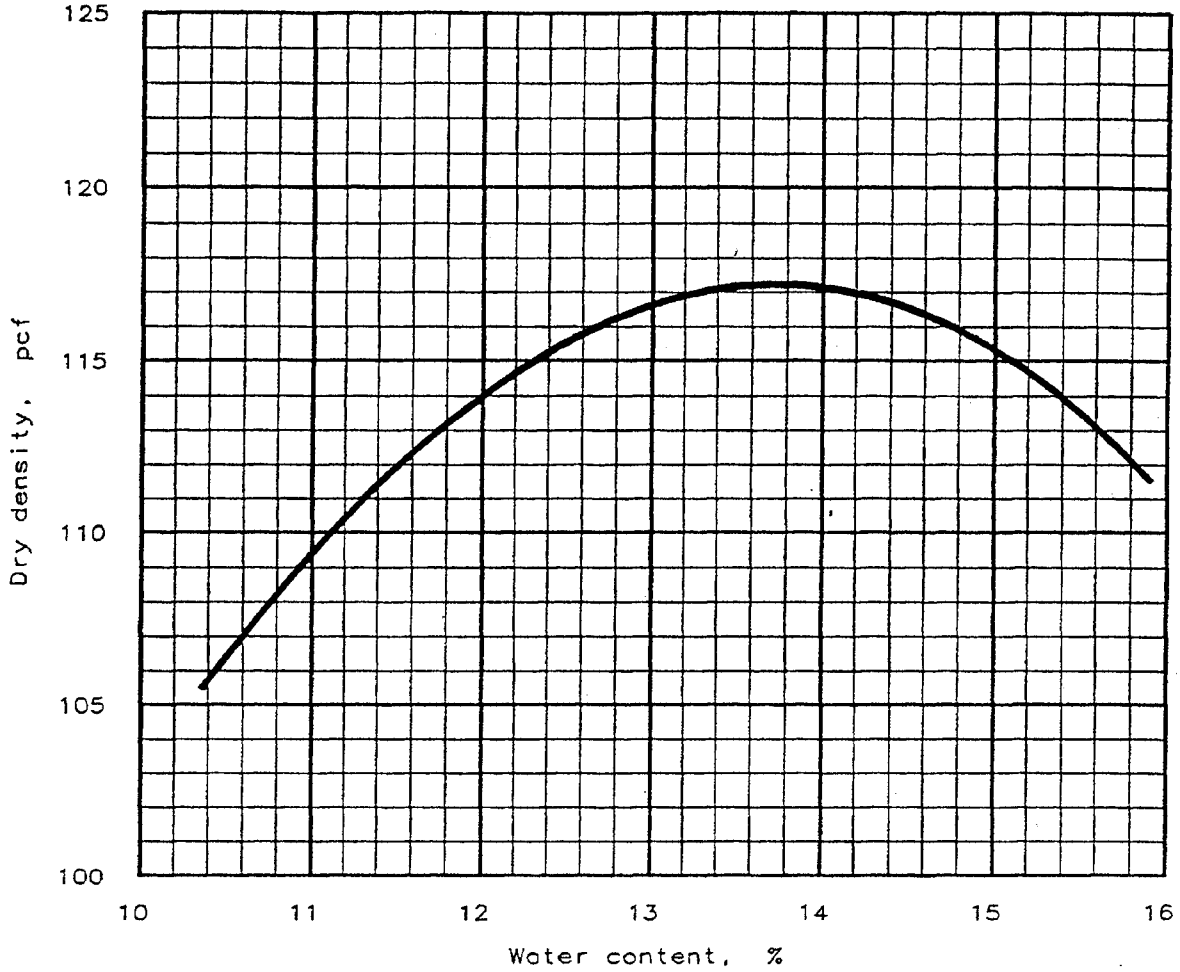
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

ESPAÑA GEOTECHNICAL CONSULTING

Fig. No. II-11

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 1557-91 Method A, Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 117.2 pcf Optimum moisture = 13.7 %	refer to Boring Log

Project No.: H199

Project: Pleasant Grove WWTP

Location: B-35 (CB-35-1)

Date: 4/9/99

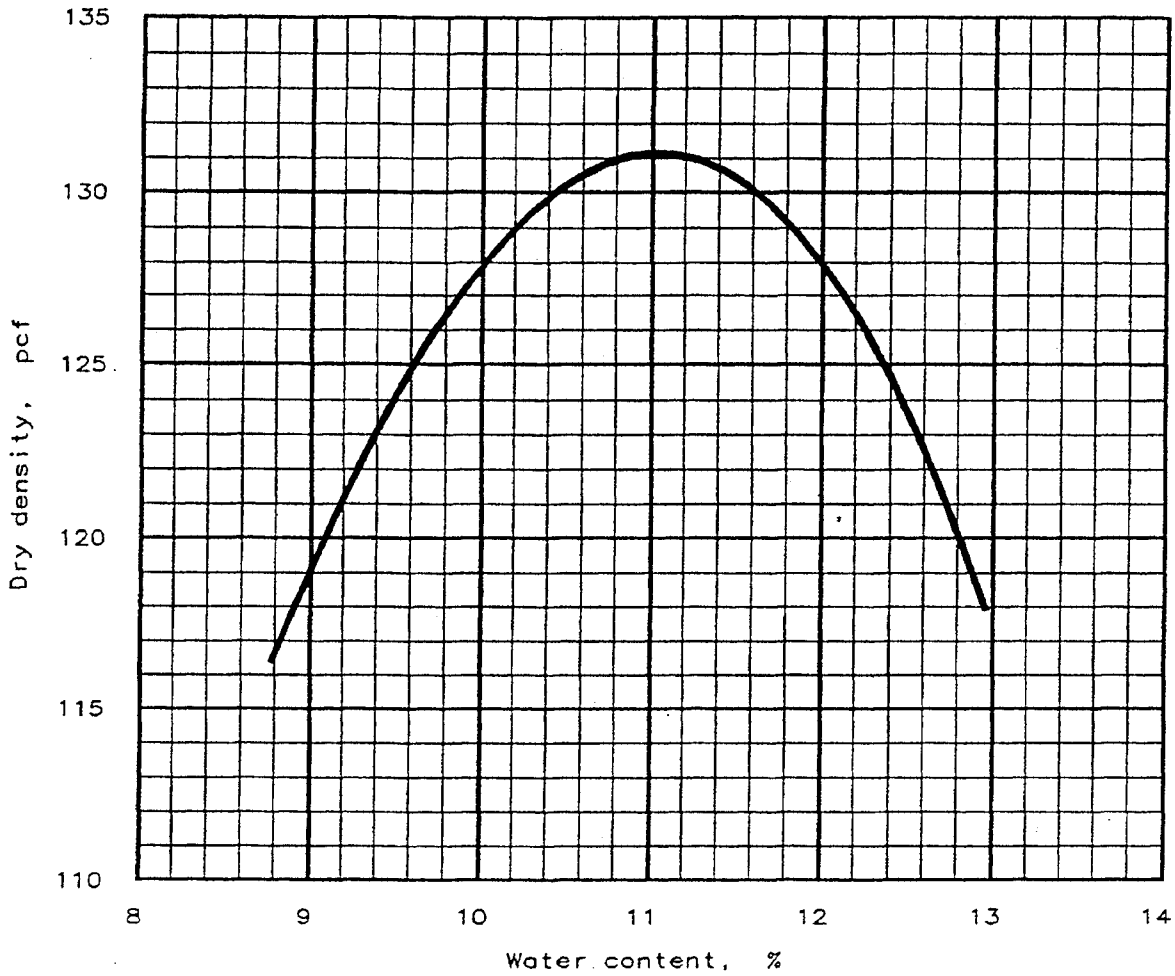
Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

ESPAÑA GEOTECHNICAL CONSULTING

Fig. No. 11-12

MOISTURE-DENSITY RELATIONSHIP TEST



Test specification: ASTM D 1557-91 Method A, Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 131.1 pcf Optimum moisture = 11.0 %	refer to Boring Log

Project No.: H199

Project: Pleasant Grove WWTP

Location: NDT-3 and NDT-5 (NDT3/NDT5 mix)

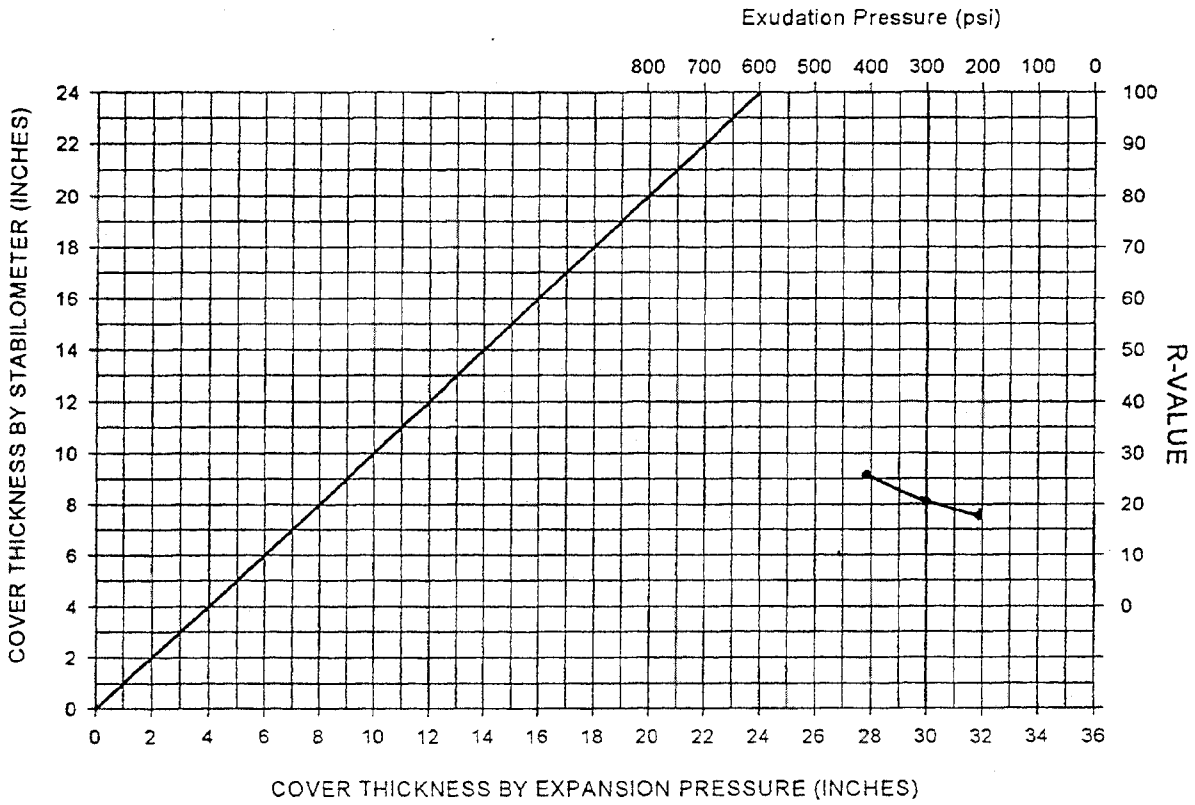
Date: 04/13/99

Remarks:

MOISTURE-DENSITY RELATIONSHIP TEST

ESPAÑA GEOTECHNICAL CONSULTING

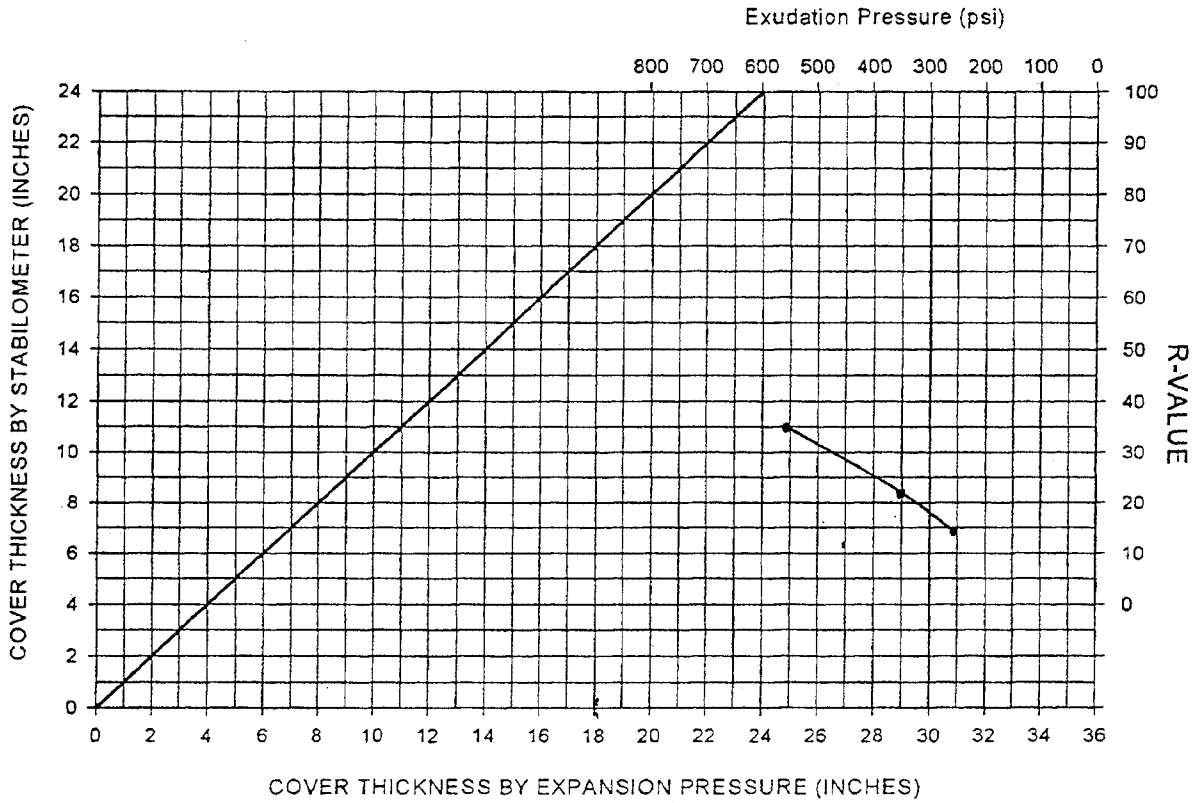
Fig. No. II-13



Date: 3/22/99
Project Name: Espana Lab Testing; Roseville WWTP
Sample: CB-2; 3-5'

Specimen	A	B	C
Exudation Pressure, p.s.i.	410	306	211
Expansion dial (.0001")	32	15	20
Expansion Pressure, p.s.f.	139	65	87
Resistance Value, "R"	26	21	18
% Moisture at Test	12.8	13.3	13.8
Dry Density at Test, p.c.f.	121.6	119.8	118.2
"R" Value at 300 p.s.i., Exudation Pressure	21		

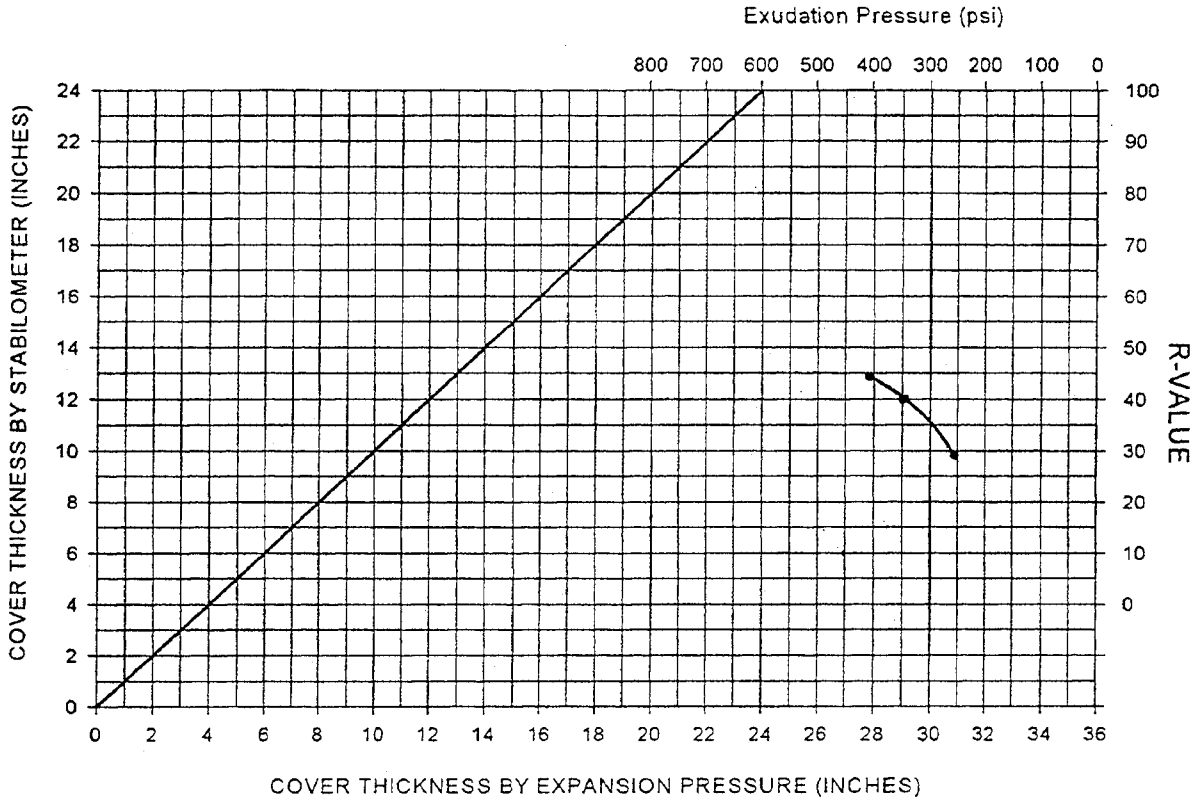
File No: 4015.0.61	R VALUE TEST	
ANDERSON CONSULTING GROUP	CAL-301	FIGURE II-14



Date: 3/22/99
Project Name: Espana Lab Testing; Roseville WWTP
Sample: CB-7-1; 3-5'

Specimen	A	B	C
Exudation Pressure, p.s.i.	557	350	263
Expansion dial (.0001")	40	21	11
Expansion Pressure, p.s.f.	173	91	48
Resistance Value, "R"	35	22	14
% Moisture at Test	11.3	12.2	13.2
Dry Density at Test, p.c.f.	125.8	122.8	121.5
"R" Value at 300 p.s.i., Exudation Pressure	18		

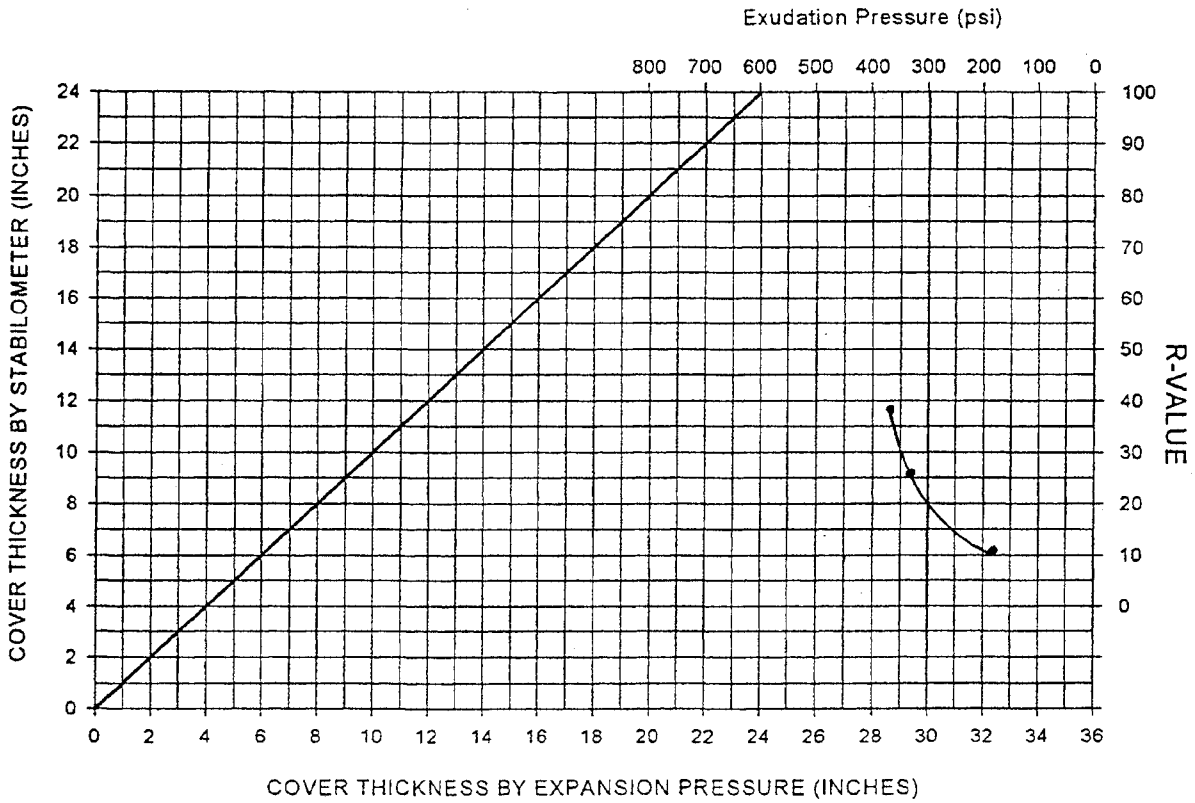
File No: 4015.0.61	R VALUE TEST	
ANDERSON CONSULTING GROUP	CAL-301	FIGURE II-15



Date: 3/23/99
Project Name: Espana Lab Testing; Roseville WWTP
Sample: CB-24-2; 2.5-5'

Specimen	A	B	C
Exudation Pressure, p.s.i.	414	350	263
Expansion dial (.0001")	93	81	66
Expansion Pressure, p.s.f.	403	351	286
Resistance Value, "R"	44	40	29
% Moisture at Test	17.3	17.8	18.2
Dry Density at Test, p.c.f.	109.2	108.3	107.5
"R" Value at 300 p.s.i., Exudation Pressure	36		

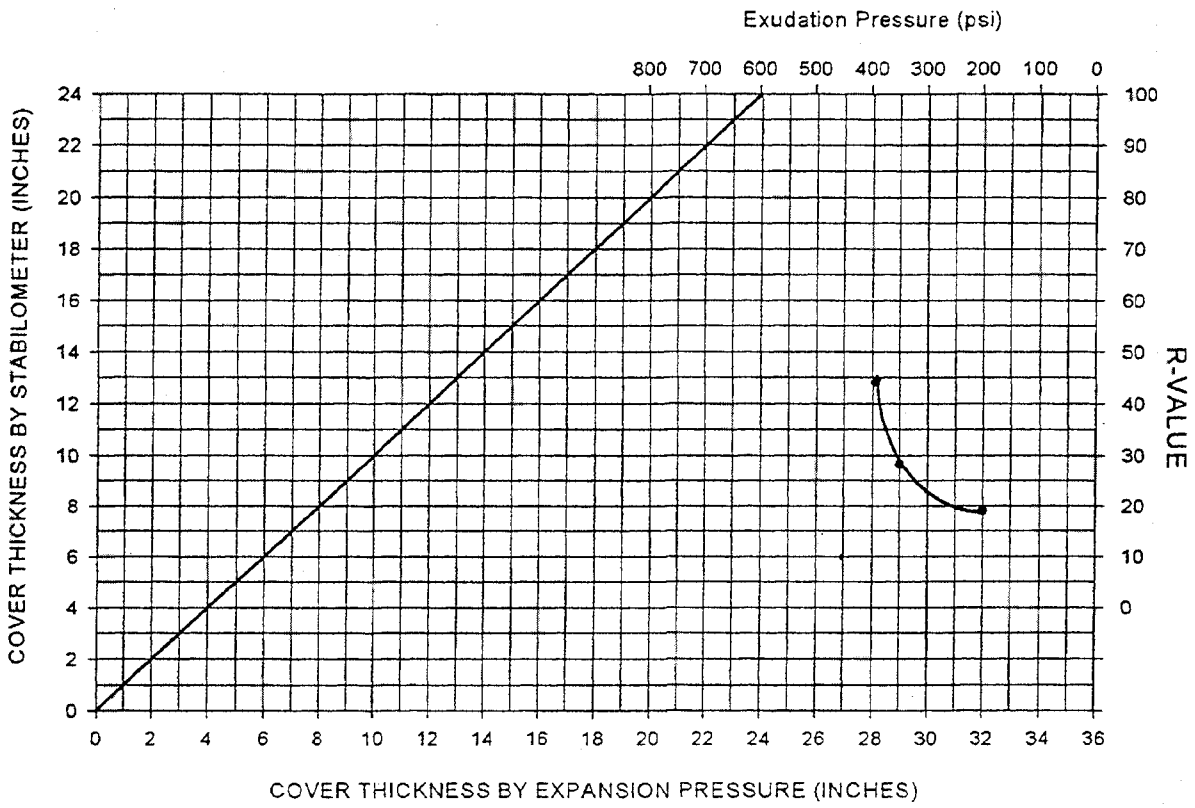
File No: 4015.0.61	R VALUE TEST	
ANDERSON CONSULTING GROUP	CAL-301	FIGURE II-16



Date: 3/22/99
Project Name: Espana Lab Testing; Roseville WWTP
Sample: CB-32-2; 3-5'

Specimen	A	B	C
Exudation Pressure, p.s.i.	370	334	179
Expansion dial (.0001")	34	25	9
Expansion Pressure, p.s.f.	147	108	39
Resistance Value, "R"	38	26	11
% Moisture at Test	15.1	16.0	17.0
Dry Density at Test, p.c.f.	115.3	113.5	111.4
"R" Value at 300 p.s.i., Exudation Pressure	20		

File No: 4015.0.61	R VALUE TEST	
ANDERSON CONSULTING GROUP	CAL-301	FIGURE II-17



Date: 3/22/99
Project Name: Espana Lab Testing; Roseville WWTP
Sample: CB-35; 1-2'

Specimen	A	B	C
Exudation Pressure, p.s.i.	390	346	199
Expansion dial (.0001")	46	35	29
Expansion Pressure, p.s.f.	199	152	126
Resistance Value, "R"	44	28	19
% Moisture at Test	15.5	16.5	17.4
Dry Density at Test, p.c.f.	114.5	112.2	109.0
"R" Value at 300 p.s.i., Exudation Pressure	22		

File No: 4015.0.61	R VALUE TEST	
ANDERSON CONSULTING GROUP	CAL-301	FIGURE II-18

APPENDIX III

Table III-1

SUMMARY OF GROUND WATER ELEVATIONS IN OBSERVATION WELLS							
Well No.[1]	Reference Elevation[2] (ft. msl)	Well Depth (ft)	Bottom Elevation (ft)	Ground Water Elevation (ft)			
				3/8/99	3/18/99	4/7/99	4/19/99
7A	102	30	72	97.50	96.50	89.42	81.90
7B	102	67	35	37.50	35.83	36.33	35.80

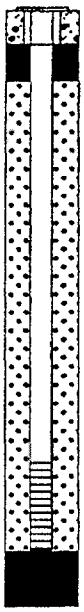
[1] Both wells were completed in the same boring
[2] Reference elevation is approximately the top of the Christy-box

WELL DETAILS

Well No. B-7A

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 102
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	MONITORING WELL INSTALLATION DETAILS
0						 Flush-mounted cover set in concrete. Bentonite seal. Blank 1" PVC casing with No. 3 lonestar sand.
100						
10						
90						
20						
80						
30						Slotted 1" PVC casing. Slotting 0.01 inch.
70						Endcap. Bentonite seal.
40						
60						
50						
50						
60						
40						
70						

Notes: *Well was completed in the same borehole as well B-7B.*

Figure III-1

502 Giuseppe Court, Suite 11, Roseville, CA 95678
(916) 773-2600 FAX (916) 782-4846

WELL DETAILS

Well No. B-7B

ESPAÑA Geotechnical Consulting

Project: Pleasant Grove Wastewater Treatment Plant
Project No.: H199
Elevation: 102
Date Drilled: March 5, 1999
Drilling Method: CME 850, 8-inch hollow-stem auger
Logged By: JF

Elevation/ Depth	Soil Symbols Sampler Symbols and Field Test Data	USCS	MATERIAL DESCRIPTION	REMARKS	Sample Number	MONITORING WELL INSTALLATION DETAILS
0						Flush-mounted cover set in concrete. Bentonite seal. Blank 1" PVC casing with No. 3 Lonestar sand.
100						
10						
90						
20						
80						
30						Bentonite seal.
70						Blank 1" PVC casing with No. 3 Lonestar sand.
40						
60						
50						
50						
60						Slotted 1" inch PVC casing. Slotting 0.01 inch.
40						
70						Endcap.

Notes: *Well was completed in the same borehole as well B-7A.*

Figure III-2

502 Giuseppe Court, Suite 11, Roseville, CA 95678
(916) 773-2600 FAX (916) 782-4846

APPENDIX IV

TABLE IV-1

ESTIMATED SHRINKAGE				
Sample No.	Sample Depth (ft)	In-Place Dry Density (pcf)	Maximum Dry Density (pcf)	% Shrinkage at 92% Comp.[2]
B-1-1	2	111	117.2	-3
B-1-2	6	112	117.2	-4
B-2-1	2	113	117.2	-5
B-2-2	6	112	117.2	-4
B-3-1	2	119	125.5	-3
B-3-2	6	115	117.2	-6
B-4-1	6	89	101.4	5
B-5-1	3	100	112.5	4
B-6-1	6	119	125.5	-3
B-7-2	6	117	125.5	-1
B-8-1	2	112	117.2	-4
B-8-2	6	110	117.2	-2
B-9-1	2	100	112.5	4
B-10-2	6	118	125.5	-3
B-11-1	3	125	125.5	-8
B-11-3	6	123	125.5	-6
B-12-1	3	112	117.2	-4
B-12-2	6	106	117.2	2
B-13-1	5.5	117	125.5	-1

[1] Compaction curves selected as most appropriate for material type, boring location, depth.
[2] Shrinkage based on the following formula:

$$\text{Percent shrinkage} = \frac{(\text{\% Relative Compaction})(\text{Maximum Dry Density}) - (\text{In-place soil density})}{\text{In-place soil density}}$$

TABLE IV-1 (continued)

ESTIMATED SHRINKAGE				
Sample No.	Sample Depth (ft)	In-Place Dry Density (pcf)	Maximum Dry Density (pcf)	% Shrinkage at 92% Comp.[2]
B-14-1	3	121	125.5	-5
B-14-2	6	92	101.4	1
B-15-1	2	80	101.4	16
B-15-2	6	88	101.4	6
B-16-1	6	80	101.4	16
B-17-1	2	95	112.5	9
B-17-2	6	92	112.5	13
B-18-1	2	103	117.2	5
B-19-1	6	91	112.5	14
B-20-1	2	113	125.5	2
B-20-2	6	107	117.2	1
B-21-2	5	90	112.5	15
B-22-1	2	118	125.5	-2
B-22-2	6	106	117.2	2
B-23-1	2	119	125.5	-3
B-23-2	6	109	117.2	-1
B-24-1	2	86	101.4	8
B-24-3	6	79	101.4	18
B-25-1	2	77	101.4	21
B-25-2	6	86	101.4	8

[1] Compaction curves selected as most appropriate for material type, boring location, depth.
[2] Shrinkage based on the following formula:

$$\text{Percent shrinkage} = \frac{(\text{\% Relative Compaction})(\text{Maximum Dry Density}) - (\text{In-place soil density})}{\text{In-place soil density}}$$

TABLE IV-1 (continued)

ESTIMATED SHRINKAGE				
Sample No.	Sample Depth (ft)	In-Place Dry Density (pcf)	Maximum Dry Density (pcf)	% Shrinkage at 92% Comp.[2]
B-26-3	6	87	101.4	7
B-27-1	2	116	125.5	0
B-27-2	6	78	101.4	20
B-28-1	2	99	112.5	5
B-28-2	6	88	112.5	18
B-29-1	1.5	75	101.4	24
B-29-2	5	81	101.4	15
B-30-1	2	101	112.5	2
B-30-2	6	95	112.5	9
B-31-1	2	88	112.5	18
B-31-3	6	97	112.5	7
B-32-1	2	93	101.4	0
B-32-3	6	102	112.5	1
B-33-1	2	112	117.2	-4
B-33-2	3.5	109	117.2	-1
B-34-1	2	88	101.4	6
B-34-2	6	84	101.4	11
B-35-1	2	106	117.2	2
B-35-2	5	93	112.5	11

[1] Compaction curves selected as most appropriate for material type, boring location, depth.

[2] Shrinkage based on the following formula:

$$\text{Percent shrinkage} = \frac{(\text{\% Relative Compaction})(\text{Maximum Dry Density}) - (\text{In-place soil density})}{\text{In-place soil density}}$$

TABLE IV-2

ESTIMATED SHRINKAGE FROM NUCLEAR DENSITY TESTS				
Test Location No.	Test Depth (ft)	In-Place Dry Density (pcf)	Maximum Dry Density (pcf)	% Shrinkage at 92% Comp.[2]
NDT-1	0.5	92	131.1	31
NDT-1	1.0	86	117.2	25
NDT-1	2.0	86	117.2	25
NDT-2	0.5	90	131.1	34
NDT-2	1.0	83	112.5	25
NDT-2	2.0	81	112.5	28
NDT-3	0.5	94	131.1	28
NDT-3	1.0	92	117.2	17
NDT-3	2.0	93	117.2	16
NDT-4	0.5	96	131.1	26
NDT-4	1.0	93	131.1	30
NDT-4	1.5	95	117.2	14
NDT-5	0.5	96	131.1	26
NDT-5	1.0	88	117.2	23
NDT-5	1.5	82	117.2	31
NDT-6	0.5	105	131.1	15
NDT-6	1.0	102	131.1	18
NDT-6	2.0	85	117.2	27

[1] Compaction curves selected as most appropriate for material type, boring location, depth.

[2] Shrinkage based on the following formula:

$$\text{Percent shrinkage} = \frac{(\text{\% Relative Compaction})(\text{Maximum Dry Density}) - (\text{In-place soil density})}{\text{In-place soil density}}$$