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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: G:\San Diego\10_Staff\Air Quality Staff\San Miguel\urb.urb924

Project Name: San Miguel

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	13.16	42.80	22.77	0.00	17.61	2.13	19.74	3.68	1.96	5.64	4,210.75

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.17	0.08	1.60	0.00	0.01	0.01	71.61

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.68	7.61	3.93	0.01	1.03	0.41	1,264.25

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.85	7.69	5.53	0.01	1.04	0.42	1,335.86

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 5/3/2010-6/9/2010 Active Days: 28	3.04	25.05	13.51	0.00	17.61	1.25	18.86	3.68	1.15	4.83	2,371.71
Mass Grading 05/03/2010-06/17/2010	3.04	25.05	13.51	0.00	17.61	1.25	18.86	3.68	1.15	4.83	2,371.71
Mass Grading Dust	0.00	0.00	0.00	0.00	17.60	0.00	17.60	3.68	0.00	3.68	0.00
Mass Grading Off Road Diesel	3.00	24.99	12.46	0.00	0.00	1.25	1.25	0.00	1.15	1.15	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Time Slice 6/10/2010-6/17/2010 Active Days: 6	5.13	**42.80**	**22.77**	0.00	**17.61**	**2.13**	**19.74**	**3.68**	**1.96**	**5.64**	**4,210.75**
Mass Grading 05/03/2010-06/17/2010	3.04	25.05	13.51	0.00	17.61	1.25	18.86	3.68	1.15	4.83	2,371.71
Mass Grading Dust	0.00	0.00	0.00	0.00	17.60	0.00	17.60	3.68	0.00	3.68	0.00
Mass Grading Off Road Diesel	3.00	24.99	12.46	0.00	0.00	1.25	1.25	0.00	1.15	1.15	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Trenching 06/10/2010-06/17/2010	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03
Trenching Off Road Diesel	2.06	17.69	8.22	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,714.64
Trenching Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Time Slice 6/18/2010-11/25/2010 Active Days: 115	1.23	9.29	5.47	0.00	0.00	0.58	0.59	0.00	0.53	0.54	979.47
Building 06/18/2010-12/03/2010	1.23	9.29	5.47	0.00	0.00	0.58	0.59	0.00	0.53	0.54	979.47
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.01	0.09	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.62
Building Worker Trips	0.02	0.03	0.58	0.00	0.00	0.00	0.01	0.00	0.00	0.00	68.47

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Time Slice 11/26/2010-12/3/2010 Active Days: 6	3.27	21.39	14.32	**0.00**	0.01	1.62	1.63	0.01	1.49	1.49	2,190.22
Asphalt 11/26/2010-12/11/2010	2.04	12.10	8.86	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,210.75
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.01	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.83
Paving Worker Trips	0.06	0.11	1.83	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.69
Building 06/18/2010-12/03/2010	1.23	9.29	5.47	0.00	0.00	0.58	0.59	0.00	0.53	0.54	979.47
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.01	0.09	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.62
Building Worker Trips	0.02	0.03	0.58	0.00	0.00	0.00	0.01	0.00	0.00	0.00	68.47
Time Slice 12/6/2010-12/10/2010 Active Days: 5	2.04	12.10	8.86	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,210.75
Asphalt 11/26/2010-12/11/2010	2.04	12.10	8.86	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,210.75
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.01	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.83
Paving Worker Trips	0.06	0.11	1.83	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.69
Time Slice 12/13/2010-12/29/2010 Active Days: 13	**13.16**	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10
Coating 12/12/2010-12/29/2010	13.16	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10
Architectural Coating	13.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10

Phase Assumptions

Phase: Mass Grading 5/3/2010 - 6/17/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 3.5

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Maximum Daily Acreage Disturbed: 0.88

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 6/10/2010 - 6/17/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 11/26/2010 - 12/11/2010 - Default Paving Description

Acres to be Paved: 0.1

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 6/18/2010 - 12/3/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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Phase: Architectural Coating 12/12/2010 - 12/29/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.00	0.06	0.05	0.00	0.00	0.00	68.80
Hearth - No Summer Emissions							
Landscape	0.12	0.02	1.55	0.00	0.01	0.01	2.81
Consumer Products	0.00						
Architectural Coatings	0.05						
TOTALS (lbs/day, unmitigated)	0.17	0.08	1.60	0.00	0.01	0.01	71.61

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
San Miguel Training Facility buildings	0.68	7.61	3.93	0.01	1.03	0.41	1,264.25
TOTALS (lbs/day, unmitigated)	0.68	7.61	3.93	0.01	1.03	0.41	1,264.25

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 80 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
San Miguel Training Facility buildings		5.35	1000 sq ft	8.60	46.01	412.85
					46.01	412.85

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	34.8	0.8	99.0	0.2
Light Truck < 3750 lbs	0.0	2.7	94.6	2.7
Light Truck 3751-5750 lbs	0.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	0.0	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	60.0	40.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	0.0	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	65.2	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	100.0
Motorcycle	0.0	64.3	35.7	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
San Miguel Training Facility buildings				2.0	1.0	97.0

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Combined Winter Emissions Reports (Pounds/Day)

File Name: G:\San Diego\10_Staff\Air Quality Staff\San Miguel\urb.urb924

Project Name: San Miguel

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	13.16	42.80	22.77	0.00	17.61	2.13	19.74	3.68	1.96	5.64	4,210.75

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.05	0.06	0.05	0.00	0.00	0.00	68.80

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.68	8.42	3.85	0.01	1.03	0.41	1,250.94

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.73	8.48	3.90	0.01	1.03	0.41	1,319.74

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 5/3/2010-6/9/2010 Active Days: 28	3.04	25.05	13.51	0.00	17.61	1.25	18.86	3.68	1.15	4.83	2,371.71
Mass Grading 05/03/2010-06/17/2010	3.04	25.05	13.51	0.00	17.61	1.25	18.86	3.68	1.15	4.83	2,371.71
Mass Grading Dust	0.00	0.00	0.00	0.00	17.60	0.00	17.60	3.68	0.00	3.68	0.00
Mass Grading Off Road Diesel	3.00	24.99	12.46	0.00	0.00	1.25	1.25	0.00	1.15	1.15	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Time Slice 6/10/2010-6/17/2010 Active Days: 6	5.13	**42.80**	**22.77**	0.00	**17.61**	**2.13**	**19.74**	**3.68**	**1.96**	**5.64**	**4,210.75**
Mass Grading 05/03/2010-06/17/2010	3.04	25.05	13.51	0.00	17.61	1.25	18.86	3.68	1.15	4.83	2,371.71
Mass Grading Dust	0.00	0.00	0.00	0.00	17.60	0.00	17.60	3.68	0.00	3.68	0.00
Mass Grading Off Road Diesel	3.00	24.99	12.46	0.00	0.00	1.25	1.25	0.00	1.15	1.15	2,247.32
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Trenching 06/10/2010-06/17/2010	2.09	17.75	9.26	0.00	0.01	0.88	0.89	0.00	0.81	0.81	1,839.03
Trenching Off Road Diesel	2.06	17.69	8.22	0.00	0.00	0.88	0.88	0.00	0.81	0.81	1,714.64
Trenching Worker Trips	0.03	0.06	1.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	124.39
Time Slice 6/18/2010-11/25/2010 Active Days: 115	1.23	9.29	5.47	0.00	0.00	0.58	0.59	0.00	0.53	0.54	979.47
Building 06/18/2010-12/03/2010	1.23	9.29	5.47	0.00	0.00	0.58	0.59	0.00	0.53	0.54	979.47
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.01	0.09	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.62
Building Worker Trips	0.02	0.03	0.58	0.00	0.00	0.00	0.01	0.00	0.00	0.00	68.47

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Time Slice 11/26/2010-12/3/2010 Active Days: 6	3.27	21.39	14.32	**0.00**	0.01	1.62	1.63	0.01	1.49	1.49	2,190.22
Asphalt 11/26/2010-12/11/2010	2.04	12.10	8.86	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,210.75
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.01	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.83
Paving Worker Trips	0.06	0.11	1.83	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.69
Building 06/18/2010-12/03/2010	1.23	9.29	5.47	0.00	0.00	0.58	0.59	0.00	0.53	0.54	979.47
Building Off Road Diesel	1.21	9.16	4.81	0.00	0.00	0.58	0.58	0.00	0.53	0.53	893.39
Building Vendor Trips	0.01	0.09	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.62
Building Worker Trips	0.02	0.03	0.58	0.00	0.00	0.00	0.01	0.00	0.00	0.00	68.47
Time Slice 12/6/2010-12/10/2010 Active Days: 5	2.04	12.10	8.86	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,210.75
Asphalt 11/26/2010-12/11/2010	2.04	12.10	8.86	0.00	0.01	1.04	1.05	0.00	0.95	0.96	1,210.75
Paving Off-Gas	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.01	0.10	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.83
Paving Worker Trips	0.06	0.11	1.83	0.00	0.01	0.01	0.02	0.00	0.00	0.01	217.69
Time Slice 12/13/2010-12/29/2010 Active Days: 13	**13.16**	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10
Coating 12/12/2010-12/29/2010	13.16	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10
Architectural Coating	13.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.01	0.01	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.10

Phase Assumptions

Phase: Mass Grading 5/3/2010 - 6/17/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 3.5

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Maximum Daily Acreage Disturbed: 0.88

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 6/10/2010 - 6/17/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 11/26/2010 - 12/11/2010 - Default Paving Description

Acres to be Paved: 0.1

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 6/18/2010 - 12/3/2010 - Default Building Construction Description

Off-Road Equipment:

1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

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Phase: Architectural Coating 12/12/2010 - 12/29/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.00	0.06	0.05	0.00	0.00	0.00	68.80
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping - No Winter Emissions							
Consumer Products	0.00						
Architectural Coatings	0.05						
TOTALS (lbs/day, unmitigated)	0.05	0.06	0.05	0.00	0.00	0.00	68.80

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
San Miguel Training Facility buildings	0.68	8.42	3.85	0.01	1.03	0.41	1,250.94
TOTALS (lbs/day, unmitigated)	0.68	8.42	3.85	0.01	1.03	0.41	1,250.94

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Temperature (F): 60 Season: Winter

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
San Miguel Training Facility buildings		5.35	1000 sq ft	8.60	46.01	412.85
					46.01	412.85

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	34.8	0.8	99.0	0.2
Light Truck < 3750 lbs	0.0	2.7	94.6	2.7
Light Truck 3751-5750 lbs	0.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	0.0	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	60.0	40.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	0.0	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	65.2	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	100.0
Motorcycle	0.0	64.3	35.7	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
San Miguel Training Facility buildings				2.0	1.0	97.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: G:\San Diego\10_Staff\Air Quality Staff\San Miguel\urb.urb924

Project Name: San Miguel

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (tons/year unmitigated)	0.23	1.11	0.64	0.00	0.30	0.06	0.36	0.06	0.06	0.12	111.88

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.03	0.01	0.29	0.00	0.00	0.00	13.07

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.12	1.44	0.71	0.00	0.19	0.07	229.92

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	0.15	1.45	1.00	0.00	0.19	0.07	242.99

Construction Unmitigated Detail Report:

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CONSTRUCTION EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010	0.23	1.11	0.64	0.00	0.30	0.06	0.36	0.06	0.06	0.12	111.88
Mass Grading 05/03/2010-06/17/2010	0.05	0.43	0.23	0.00	0.30	0.02	0.32	0.06	0.02	0.08	40.32
Mass Grading Dust	0.00	0.00	0.00	0.00	0.30	0.00	0.30	0.06	0.00	0.06	0.00
Mass Grading Off Road Diesel	0.05	0.42	0.21	0.00	0.00	0.02	0.02	0.00	0.02	0.02	38.20
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.11
Trenching 06/10/2010-06/17/2010	0.01	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.52
Trenching Off Road Diesel	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.14
Trenching Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37
Building 06/18/2010-12/03/2010	0.07	0.56	0.33	0.00	0.00	0.04	0.04	0.00	0.03	0.03	59.26
Building Off Road Diesel	0.07	0.55	0.29	0.00	0.00	0.03	0.03	0.00	0.03	0.03	54.05
Building Vendor Trips	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.07
Building Worker Trips	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.14
Asphalt 11/26/2010-12/11/2010	0.01	0.07	0.05	0.00	0.00	0.01	0.01	0.00	0.01	0.01	6.66
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	0.01	0.07	0.04	0.00	0.00	0.01	0.01	0.00	0.01	0.01	5.39
Paving On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08
Paving Worker Trips	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20
Coating 12/12/2010-12/29/2010	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Architectural Coating	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12

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Phase Assumptions

Phase: Mass Grading 5/3/2010 - 6/17/2010 - Default Fine Site Grading/Excavation Description

Total Acres Disturbed: 3.5

Maximum Daily Acreage Disturbed: 0.88

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 6 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 6/10/2010 - 6/17/2010 - Default Trenching Description

Off-Road Equipment:

2 Excavators (168 hp) operating at a 0.57 load factor for 8 hours per day

1 Other General Industrial Equipment (238 hp) operating at a 0.51 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 0 hours per day

Phase: Paving 11/26/2010 - 12/11/2010 - Default Paving Description

Acres to be Paved: 0.1

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Phase: Building Construction 6/18/2010 - 12/3/2010 - Default Building Construction Description

Off-Road Equipment:

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1 Cranes (399 hp) operating at a 0.43 load factor for 4 hours per day

2 Forklifts (145 hp) operating at a 0.3 load factor for 6 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 8 hours per day

Phase: Architectural Coating 12/12/2010 - 12/29/2010 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	0.00	0.01	0.01	0.00	0.00	0.00	12.56
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscape	0.02	0.00	0.28	0.00	0.00	0.00	0.51
Consumer Products	0.00						
Architectural Coatings	0.01						
TOTALS (tons/year, unmitigated)	0.03	0.01	0.29	0.00	0.00	0.00	13.07

Area Source Changes to Defaults

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
San Miguel Training Facility buildings	0.12	1.44	0.71	0.00	0.19	0.07	229.92
TOTALS (tons/year, unmitigated)	0.12	1.44	0.71	0.00	0.19	0.07	229.92

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2011 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
San Miguel Training Facility buildings		5.35	1000 sq ft	8.60	46.01	412.85
					46.01	412.85

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	34.8	0.8	99.0	0.2
Light Truck < 3750 lbs	0.0	2.7	94.6	2.7
Light Truck 3751-5750 lbs	0.0	0.4	99.6	0.0
Med Truck 5751-8500 lbs	0.0	0.9	99.1	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.0	0.0	81.2	18.8
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	60.0	40.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	0.0	0.0	22.2	77.8
Heavy-Heavy Truck 33,001-60,000 lbs	65.2	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	100.0
Motorcycle	0.0	64.3	35.7	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	0.0	88.9	11.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	12.7	7.0	9.5	13.3	7.4	8.9
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
San Miguel Training Facility buildings				2.0	1.0	97.0

May 3, 2010

Ms. Lisa Coburn-Boyd
Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, CA 91978

Subject: Biological Resources Letter Report for the San Miguel Fire Department Regional Training Facility

Dear Ms. Coburn-Boyd:

ICF was retained to conduct biological surveys and prepare a Biological Resources Letter Report for the San Miguel Fire Department Regional Training Facility Project. This letter report analyzes potential effects on sensitive biological resources associated with construction of a regional training facility for the San Miguel Fire Department within the fenced limits of the Otay Water District's (District) 640-1 Reservoir site. Access to the proposed training facility will be via the existing paved access road from Jamacha Road to the 640-1 Reservoir and via an existing dirt road off the paved access road (used during construction of the 640-1 Reservoir). Improvements are proposed to the existing paved access road and paving of the existing dirt road is also proposed; however, clearing of vegetation along these roads (or widening of the road) is not proposed as part of the project in order to avoid impacts to sensitive biological resources.

PROJECT DESCRIPTION, LOCATION, AND SETTING

Project Location

The San Miguel Fire Department Regional Training Facilities Project site is located within Rancho San Diego, an unincorporated community located in San Diego County, California (See Figures 1 and 2 provided in Attachment A). Nearby streets include Fury Lane to the north, Via Escuda to the northwest, Cuyamaca Community College to the east, the Jamacha and Campo Road junction to the south, and Via Palma to the west. The approximately 3.5-acre site of the proposed training facility is located on the Jamul Mountains USGS Quadrangle (Figure 2).

Project Description

This project plans to develop a Regional Emergency Services Training Center (RESTC) in partnership with the District, the San Miguel Consolidated Fire Protection District and the

Heartland Training Facility Authority (HTFA). The RESTC has secured a long-term lease for 3.5 acres of property from the District for the facility. This existing site will be co-used and co-habitated as it is a working pump site and training location for the District.

The RESTC will provide emergency services training to fire and public utilities entities to meet modern day training standards and requirements. This facility will provide training props including a pre engineered 5-story training prop; a simulated hazardous materials prop; a vehicle extrication area; and a water recovery system.

The RESTC's facility and operational requirements will be met by extending the electrical conveyances, water lines, sewer lines and storm drains that exist on-site. Access to the site will be via the existing access road that runs perpendicular to Jamacha Road and Campo Road/State Route 94. Estimated use of the facility will be from 0800 hours to 1700 hours Monday through Friday, with occasional weekend training as needed.

Study Methods

Prior to conducting surveys for the project, searches of available literature and databases were conducted to determine sensitive species previously detected or with potential to occur in the survey area. Available data that were reviewed included the California Natural Diversity Database (CNDDB; CNDDB 2009; Alpine, Dulzura, El Cajon, Imperial Beach, Jamul Mountains, La Mesa, National City, Otay Mesa, and Otay Mountain quadrangles), California Native Plant Society Inventory of Rare and Endangered Plants (CNPS 2007), the U.S. Department of Agriculture (USDA) soil survey of the area (USDA 1973) and U.S. Geologic Survey (USGS) topographic maps. In addition, the Biological Technical Report for Otay Water District's 640-1 Reservoir Project (RC Biological Consulting Inc. 2005) was used to identify sensitive resources observed during protocol surveys of the area in 2005.

General Biological Survey

On 27 February 2008, K. Fischer and A. Borcher of ICF conducted a site visit to categorize and map the plant communities within the project footprint, identify the potential for jurisdictional waters, and assess the habitat suitability for special-status plant and animal species. This survey was conducted from 1000 to 1130. Weather conditions consisted of calm winds, clear skies, and a temperature of 63 to 65 degrees Fahrenheit.

The survey area was traversed by meandering transects in an effort to accurately categorize vegetation communities and to identify the locations of any sensitive species readily detectable. Vegetation communities were mapped on a "one-inch equals 400 feet" aerial photograph of the project area in the field and later digitized into a geographic information system (GIS) coverage using ArcGIS software; updated vegetation mapping was conducted during the 2009 Quino

checkerspot butterfly (*Euphydryas editha quino*; Quino) surveys. All plant species observed were noted, and plants that could not be identified in the field were identified later using taxonomic keys including Beauchamp (1986) and Hickman (1993), or verified with herbarium specimens at the San Diego Natural History Museum. Animal species were detected through direct observation or from calls, tracks, scat, nests, or other signs. In addition, the biologists were surveying for host plant species used by Quino in order to assess if focused surveys are necessary.

Due to the timing of the surveys, nocturnal wildlife species would not have been readily detected as only daytime surveys were conducted. A complete list of the plant and wildlife species observed within the project area is provided as Attachments B and C, respectively.

Quino Checkerspot Butterfly

Based on the initial survey, it was determined that focused surveys for Quino were required. The focused surveys for this species, conducted in 2008 and 2009, followed U.S. Fish and Wildlife Service (USFWS; 2002) protocol, which requires weekly surveys for a minimum of five weeks conducted during acceptable weather conditions as defined by the USFWS. Conditions when surveys should not be performed include fog, drizzle, or rain; sustained winds greater than 24 km (15 mi) per hour measured 1.2-1.8 m (4-6 ft) above ground level; a temperature in the shade at ground level less than 15.5 ^{o}C (60 ^{o}F) on a clear, sunny day; or less than 21°C (70°F) on an overcast day. The surveys were conducted at an average rate of 10-15 acres per hour. For this project, biologists first walked the project area looking for host plant species such as dot-seed plantain (*Plantago erecta*), woolly plantain (*Plantago ovata*), owl's-clover (*Castilleja exserta*), Coulter's snapdragon (*Antirrhinum coulterianum*) and southern Chinese houses (*Collinsia concolor*). Once the habitat assessment was complete, weekly surveys commenced in areas that were deemed appropriate for the species. During each survey, the biologist slowly walked transects throughout all habitat that could potentially support Quino larvae and adults. Surveyors stopped periodically to scan adjacent areas for moving butterflies. All butterfly species observed were identified and recorded. Personnel permitted to work with this species conducted the surveys. The 2009 focused survey report is provided in Attachment D of this report.

Coastal California Gnatcatcher

The coastal California gnatcatcher is known to occur within the coastal sage scrub located immediately adjacent but outside of the proposed project footprint as documented during surveys conducted for the 640-1 Reservoir Project by RC Biological Consulting Inc. (RC Biological Consulting Inc. 2005). No suitable habitat for this species (breeding or foraging) would be impacted by the proposed project. Therefore, focused surveys for this species were not conducted by ICF for the proposed project.

Environmental Setting

The project area consists of the fenced limits of approximately 70 acres owned by the District and located near the intersection of Jamacha and Campo Roads. Existing water reservoirs and associated pipelines and additional facilities occur within the 70 acres, including the recently constructed 640-1 Reservoir.

The approximately 3.5-acre project site is located along the eastern boundary of the 70-acre site immediately north of an existing reservoir and two existing buildings/associated facilities. Elevation within the 3.5-acre project site ranges from 500 to 550 feet above mean sea level (AMSL). The project site consists primarily of disturbed/developed areas. However, a small portion of the temporary impact area associated with construction of the 640-1 Reservoir and an adjacent fill slope, which has been seeded with coastal sage scrub species, would be impacted as a result of the proposed project. The temporary impact area associated with the 640-1 Reservoir has been seeded to fulfill mitigation requirements to revegetate all temporary impact areas (1:1 ratio; HDR 2006). The adjacent fill slope has been seeded for erosion control and is not part of a revegetation site. All mature coastal sage scrub is located immediately east of the project site and outside of the fenced limits of the 70 acre site. Surrounding land uses consist of undeveloped land to the east and northeast and disturbed/developed areas within the District's 640-1 Reservoir Project site to the west and south.

One soil type from one soil series, as defined by the U.S. Department of Agriculture, is mapped within the survey area (USDA 1973). The entire survey area is mapped as Friant rocky fine sandy loam (30-70% slopes).

The ***Friant*** soil series is characterized by shallow, well drained soils that formed in material weathered from mica schist, quartz schist and gneiss. It is normally found on mountainous uplands and have slopes of 9 to 75 percent. The mean annual precipitation is about 18 inches and the mean annual air temperature is about 62 degrees Fahrenheit. The surface layer is usually 0 to 3 inches thick and slightly acidic. The topsoil is brown, dark brown or dark yellowish brown sandy loam with medium granular structure. The subsoil is dark brown in color, pH neutral, fine sandy loam and is 4 to 122 inches thick. The substratum is gray and yellowish brown, slightly weathered quartz mica schist with reddish brown clay films coating some of the minor fracture and joint planes. Runoff is medium to very rapid.

HABITAT AND VEGETATION COMMUNITIES

The project footprint consists primarily of disturbed/developed lands (Figure 3). However, a small portion of the temporary impact area associated with construction of the 640-1 Reservoir and an adjacent fill slope, which has been seeded with coastal sage scrub species, would be impacted as a result of the proposed project. The temporary impact area associated with the 640-

1 Reservoir has been seeded to fulfill mitigation requirements to revegetate all temporary impact areas (1:1 ratio; HDR 2006). The adjacent fill slope has been seeded for erosion control and is not part of a revegetation site. While these areas have been recently seeded with coastal sage scrub species, neither of these areas warrant the mapping classification of coastal sage scrub and instead are classified as disturbed habitat. All mature coastal sage scrub is located immediately east of the project footprint and outside of the fenced limits of the 70-acre site as well as along the western edge of the existing paved access road and along both sides of the existing dirt construction access road.

Disturbed Habitat

Disturbed habitat consist of the existing dirt roads, unvegetated areas that were used for staging for the District's 640-1 Reservoir Project that was recently constructed, as well as the two areas discussed above that have been recently seeded with coastal sage scrub species (Figure 3). The areas recently seeded with coastal sage species do not warrant the mapping classification of coastal sage scrub, a sensitive vegetation community, as they are still in the early stages of growth (low and sparse vegetation) and do not provide suitable habitat (nesting or foraging) for wildlife species, including the coastal California gnatcatcher. Disturbed habitat is not considered sensitive by any local, state, or federal agencies.

Urban/Developed Lands

Urban/developed lands consist of the existing paved roads and structures (Figure 3). Urban/developed lands are not considered sensitive by any local, state, or federal agencies.

Coastal Sage Scrub

Coastal sage scrub is found in coastal areas from Los Angeles County south into Baja California. Holland (1986) describes this vegetation community as being comprised of low-growing, aromatic, drought-deciduous, soft-woody shrubs that have an average height of three to four feet. The community typically is found on sites with steep, dry slopes or on clay-rich soils that are slow to release stored water. Dominant species usually include coastal sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), broom baccharis (*Baccharis sarothroides*), and white sage (*Salvia apiana*).

All areas in the project vicinity warranting the mapping classification of coastal sage scrub are located outside of the project footprint and outside the fenced limits of the 70 acre site owned by the District. The coastal sage scrub in the project vicinity is characterized by low growing, sparse shrub species, open bare ground, and non-native plant species. Dominant plant species in this community in the project vicinity include California buckwheat, broom baccharis, deerweed

(*Lotus scoparius*), common sow thistle (*Sonchus oleraceus*), long-beaked filaree (*Erodium brachycarpum*), and tocalote (*Centaurea melitensis*). This vegetation community is considered sensitive by local, state, and federal agencies and is known to support the federally-listed coastal California gnatcatcher. However, areas that warrant mapping as this vegetation community are not located within the project impact area.

SPECIAL STATUS SPECIES

The following section discusses special status species observed or detected within the survey area, as well as special status species with potential to occur. A special status plant species is one that is listed by federal or state agencies as threatened or endangered and is considered sensitive by one or more special interest groups, such as the California Native Plant Society (e.g., CNPS List 1, 2, 3, and 4 Plant Species). A special status wildlife species is one that is listed by federal or state agencies as threatened, endangered or species of special concern.

Special Status Plant Species

The CNDDB search, CNPS search and field survey identified 82 sensitive plant species that occur or have potential to occur in the project vicinity (Attachment E). The CNDDB and CNPS searches were conducted for the Alpine, Dulzura, El Cajon, Imperial Beach, Jamul Mountains, La Mesa, National City, Otay Mesa, and Otay Mountain quadrangles (CNDDB 2009; CNPS 2007). During the site visit on 27 February 2008, one special status plant species was detected in the immediate vicinity of the project footprint: San Diego sunflower (*Vigiera laciniata*). Special status plant species observed or determined to have a high potential to occur within the project footprint are discussed below. Other sensitive plant species and their potential to occur on site are outlined in Attachment E. Discussions of the plants species incorporate information from Reiser 1994, Hickman 1993 and CNPS 2007.

San Diego Sunflower (*Vigiera laciniata)*

CNPS List 4

San Diego sunflower is a shrub commonly found in dry scrub habitats below 914 m (3000 ft). Diegan coastal sage scrub is the preferred habitat of this species, which is often a co-dominant element of the shrub community with California sagebrush. Three San Diego sunflower plants were observed along the immediate edge of the dirt road that will be paved as an access route for the project. As no vegetation removal is required for paving of this road, impacts should not occur to these individuals.

Special Status Wildlife Species

The CNDDB search and field survey identified 56 sensitive wildlife species that occur or have potential to occur in the project vicinity (Attachment F). The CNDDB search was conducted for the Alpine, Dulzura, El Cajon, Imperial Beach, Jamul Mountains, La Mesa, National City, Otay Mesa, and Otay Mountain quadrangles (CNDDB 2009). No special status wildlife species were detected within the project footprint during any of the field surveys. Due to the highly disturbed nature of the area within the project footprint, it provides little to no value for wildlife species. Sensitive wildlife species and their potential to occur on site are outlined in Attachment F.

Although the project footprint consists primarily entirely of disturbed habitat and urban/developed lands and does not support any of Quino's potential host plants, the coastal sage scrub adjacent to the project footprint has some potential to support Quino host plants. Therefore, focused surveys for Quino butterfly were conducted between March 23 and April 22, 2008 and between March 5 and March 31, 2009. No adult quino or larvae were detected during the focused surveys conducted for this species.

Coastal California gnatcatchers are known to occur in the immediate area surrounding the project footprint as documented by surveys conducted for the 640-1 Reservoir Project (RC Biological Consulting Inc. 2005). As this species is known to occur in the immediate vicinity, and as no suitable habitat (breeding or foraging) for this species occurs within the project footprint, focused surveys for this species were not conducted by ICF.

JURISDICTIONAL WETLANDS AND WATERWAYS

Wetlands and other waters are considered to be sensitive biological resources and are protected by various federal, state, and local regulations. The U.S. Army Corps of Engineers (USACE) and the Regional Water Quality Control Board (RWQCB) regulate waters of the U.S., including wetlands, under the authority of Sections 404 and 401, respectively, of the federal Clean Water Act (CWA). The term "waters of the U.S." encompasses many types of waters, including waters currently or historically used in interstate or foreign commerce; all waters subject to the ebb and flow of tides; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including ephemeral and intermittent streams), mudflats, sandflats, wetlands, sloughs, etc., the use, degradation or destruction of which could affect interstate or foreign commerce; all impoundments of waters otherwise defined as waters of the U.S.; tributaries of waters of the U.S.; territorial seas; and wetlands adjacent to waters of the U.S. (USACE 1987). Under the Porter-Cologne Act, the RWQCB's jurisdiction also includes isolated wetlands and other waters that are not jurisdictional under the CWA. The California Department of Fish and Game (CDFG) takes jurisdiction over lakes, rivers, and streams under Section 1600 et seq. of the Fish and Game Code.

The USACE defines wetlands as areas that are dominated by hydrophytic plant species, exhibit wetland hydrology, and have hydric soils. Areas that do not meet these criteria but exhibit a defined channel are considered non-wetland waters of the U.S. CDFG jurisdiction extends across the bed, banks, and channel of these features and includes areas beneath a riparian canopy, even if the canopy areas are well away from the stream channel (such as in riparian areas). The RWQCB takes jurisdiction of waters of the U.S. as defined by the USACE as well as other surface waters, which include isolated wetlands (e.g., vernal pools) and stream channels.

No jurisdictional features were detected within the project footprint during any of the field surveys.

SIGNIFICANCE OF PROJECT IMPACTS AND PROPOSED MITIGATION

Potential impacts to vegetation communities, sensitive plants, sensitive wildlife, and other sensitive resources are discussed in this section as well as an analysis of the significance of the impacts, and anticipated mitigation requirements.

Impact Definitions

Biological resource impacts can be considered direct, indirect, or cumulative. They will also be either permanent or temporary in nature.

- Direct: Occur when biological resources are altered, disturbed, or destroyed during project implementation. Examples include clearing vegetation, encroaching into wetland buffers, diverting surface water flows, and the loss of individual species or their habitats.
- Indirect: Occur when project-related activities affect biological resources in a manner that is not direct. Examples include elevated noise and dust levels, increased human activity, decreased water quality, and the introduction of invasive wildlife (i.e., domestic cats and dogs) and plants.
- Temporary: Temporary impacts can be direct or indirect and are considered reversible. Examples include the removal of vegetation from areas that will be revegetated, elevated noise levels, and increased levels of dust.
- Permanent: Permanent impacts can be direct or indirect and are not considered reversible. Examples include the removal of vegetation from areas that will have permanent structures placed on them or landscaping an area with nonnative plant species.

Analysis of Project Effects

Impacts to sensitive biological resources are discussed below. Project impacts would include grading, paving, and construction of buildings and other facilities within the approximately 3.5-acre project site which occurs entirely within existing disturbed/developed areas of the District's 70-acre property (Figure 4). In addition, while widening of the existing dirt/paved access roads is not proposed, regrading/paving is proposed but impacts would not occur beyond the existing disturbed/developed areas.

Sensitive Vegetation Communities

As sensitive vegetation communities are not located within the project footprint, the project would not result in impacts to sensitive vegetation communities. However, the project would result in impacts to 0.063 acre of a coastal sage scrub revegetation site as well as approximately 0.12 acres of adjacent areas/slopes not within a revegetation site that have all been seeded with coastal sage scrub species but have not yet established into areas warranting the classification of coastal sage scrub. While these areas do not yet represent an established coastal sage scrub vegetation community, they include a portion of a revegetation site used to fulfill mitigation requirements associated with the District's construction of the 640-1/-2 reservoirs and if left undisturbed would eventually establish into mature coastal sage scrub. Therefore, the District proposes to mitigate these impacts.

Sensitive Plants

Sensitive plant species observed within the survey area consisted of three individuals of San Diego sunflower, which were observed along the edge of the existing dirt access road. As no road widening is proposed and no vegetation removal is required for paving of the road, impacts to individuals of San Diego sunflower are not anticipated.

Sensitive Wildlife

The proposed project would not result in direct impacts to suitable habitat (i.e., mature coastal sage scrub) known to support, or likely to support, sensitive species such as the coastal California gnatcatcher. However, increased noise during construction could result in potential impacts to the coastal California gnatcatcher (or other special status bird/raptor species or species protected by the Federal Migratory Bird Treaty Act), if construction is proposed during the breeding season.

No significant indirect impacts are anticipated to occur as a result of operation of the San Miguel Regional Training Facility due to the nature and frequency of the proposed activities as well as the existing ongoing activities in the project vicinity.

Jurisdictional Wetlands and Waterways

As jurisdictional wetlands and waterways do not occur within the project footprint, impacts to such resources would not occur as a result of the proposed project.

Mitigation Measures and Design Considerations

The proposed project has been designed such that the existing paved and dirt access roads are not proposed to be widened in order to avoid direct impacts to the adjacent coastal sage scrub vegetation. However, the project has the potential to result in indirect impacts to sensitive wildlife species known to occur (i.e., the coastal California gnatcatcher) or with potential to occur within the adjacent coastal sage scrub vegetation resulting from increased noise during construction. Therefore, in order to avoid potential indirect impacts to the coastal California gnatcatcher, construction should not occur during the breeding season (March 1 – August 15). However, if construction is proposed during the breeding season for the gnatcatcher, U.S. Fish and Wildlife Service protocol surveys will be required in order to determine species presence/absence. If no gnatcatchers are detected within 300 feet of the proposed grading/construction then no restrictions on grading will be necessary. If present, measures to minimize noise impacts will be required and should include temporary noise walls/berms. If the survey is not conducted and construction is proposed during the species' breeding season, presence would be assumed and a temporary wall/berm would be required. Noise levels from grading/construction activities during the breeding season should not exceed 60dBA hourly LEQ at the edge of the occupied habitat, or the ambient noise level if noise levels already exceed 60dBA hourly LEQ.

The proposed project would result in impacts to 0.063 acre of a coastal sage revegetation site and an adjacent approximately 0.12 acre that have been seeded with coastal sage scrub species but that have not yet established into areas warranting the classification as coastal sage scrub. It is proposed that impacts to the 0.063 acre of the revegetation site and the additional 0.12 acre area be mitigated at a ratio of 2:1 through the use of available credits at the District's San Miguel Habitat Management Area (HMA, Figure 5).

CUMULATIVE IMPACTS

A cumulative impact analysis is an assessment of how the proposed project, whose impacts may not be individually significant, could contribute significantly to the total impacts to sensitive resources occurring in the project vicinity. As this project occurs within the already disturbed boundary of the 640-1 Reservoir Project and as impacts to sensitive biological resources have been avoided by the proposed project, construction of the San Miguel Fire Department training

Facility will not contribute to any potentially significant cumulative impact to biological resources in the project vicinity.

CONCLUSIONS

The proposed project has the potential to result in indirect impacts to the coastal California gnatcatcher, known to occur in the project vicinity, as a result of increased noise during construction. Therefore, either construction will not occur during the breeding season (March 1 – August 15) or measures will be implemented to reduce construction noise to 60 dBA hourly LEQ at the edge of occupied habitat (or the ambient noise level if noise levels already exceed 60 dBA hourly LEQ) in order to avoid potential impacts to this species.

In addition, the project would result in impacts to a portion of a coastal sage scrub revegetation site and adjacent seeded slopes that have not yet established into areas warranting the classification as coastal sage scrub. However, the District proposes to mitigate impacts to these areas at a 2:1 ratio through the use of available coastal sage scrub credits with the HMA.

If you have any questions regarding the contents of this letter report, please contact me at (858) 578-8964.

Sincerely,

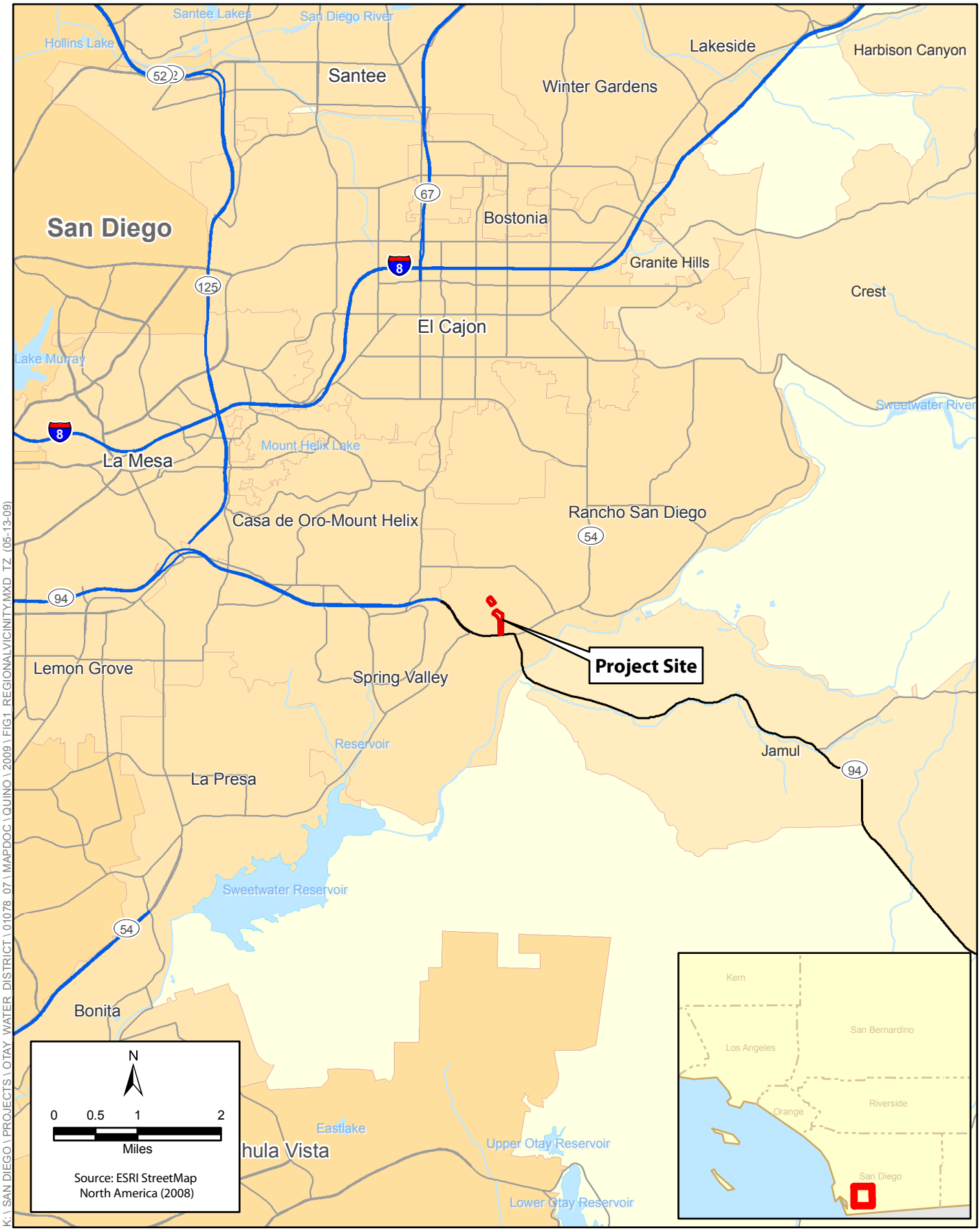
Erin Schorr
Senior Biologist/Project Manager

ATTACHMENTS

Attachment A	Figures 1–5
Attachment B	Vascular Plant Species Observed within the San Miguel Regional Training Facility Project Area
Attachment C	Wildlife Species Detected within the San Miguel Regional Training Facility Project Area
Attachment D	Quino Checkerspot Butterfly Survey Report for the San Miguel Fire Department Regional Training Facility
Attachment E	Sensitive Plant Species and their Potential to Occur on the Sweetwater Summit Campground Project Site
Attachment F	Sensitive Wildlife Species with Potential to Occur within the San Miguel Regional Training Facility Project Area
Attachment G	References

ATTACHMENT A

FIGURES



K:\ SAN DIEGO \ PROJECTS \ OTAY WATER DISTRICT \ 01078 07 \ MAPDOC \ QUINO \ 2009 \ FIG1 REGIONALVICINITY.MXD TZ (05-13-09)

ICF Jones & Stokes
an ICF International Company

Figure 1
Regional Vicinity
San Miguel Fire Department Regional Training Facility

K:\SAN DIEGO\PROJECTS\OTAY WATER DISTRICT\01078 07\MAPDOC\MND\FIG2 SITELOCATION.MXD TZ (10-07-09)

ICF Jones & Stokes
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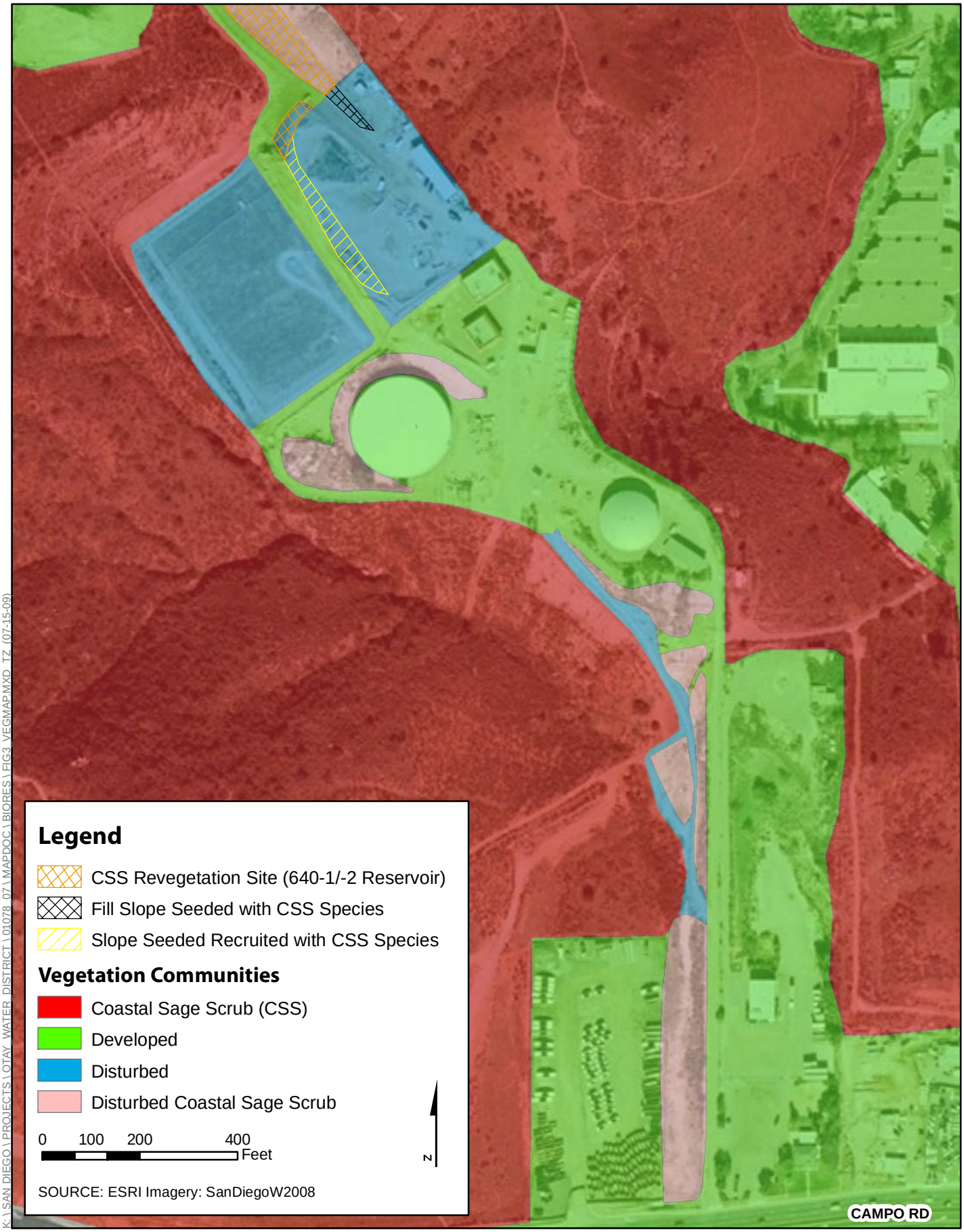
Figure 2
Site Location
San Miguel Fire Department Regional Training Facility



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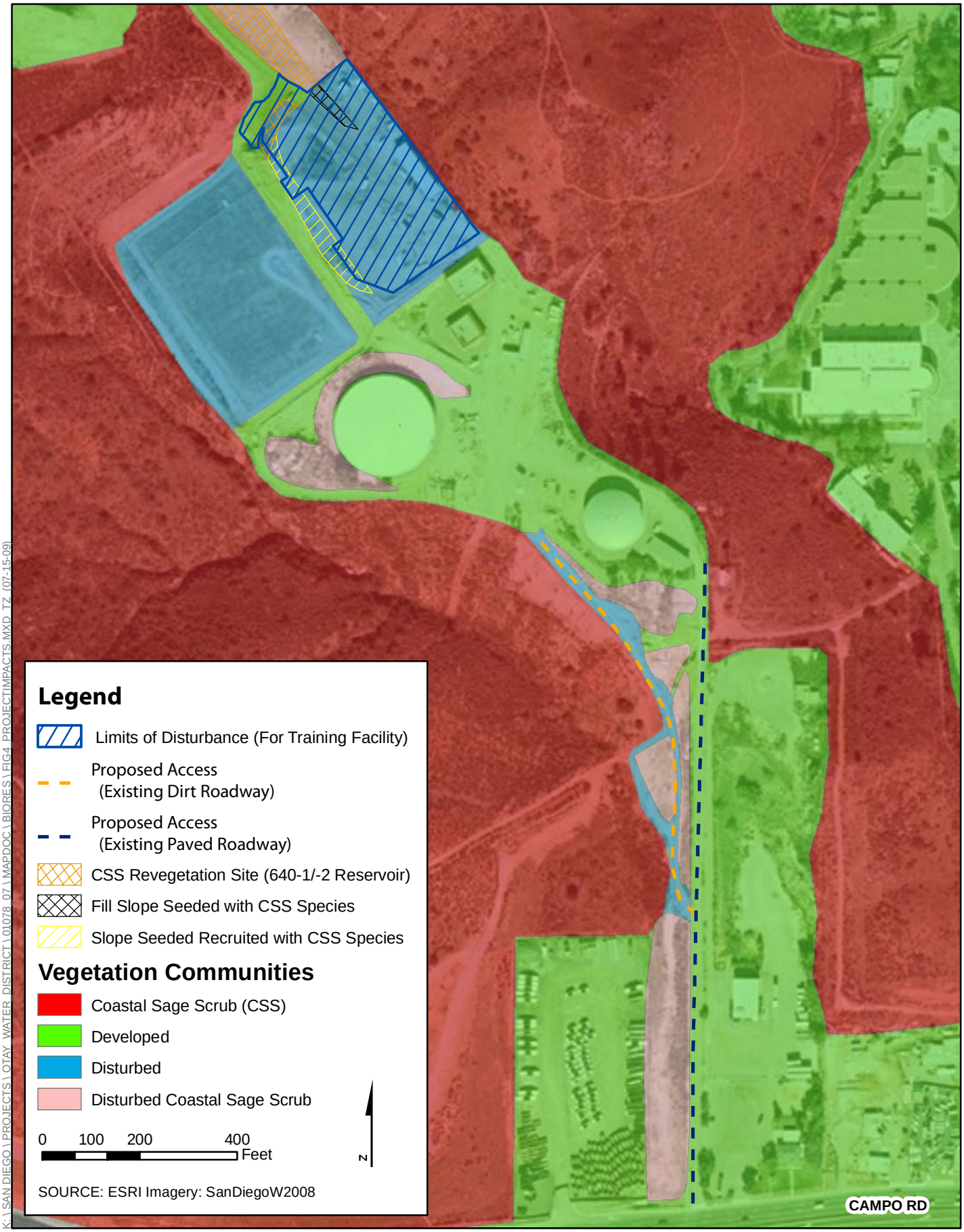
ICF Jones & Stokes
an ICF International Company

Figure 3
Vegetation Communities



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ICF Jones & Stokes
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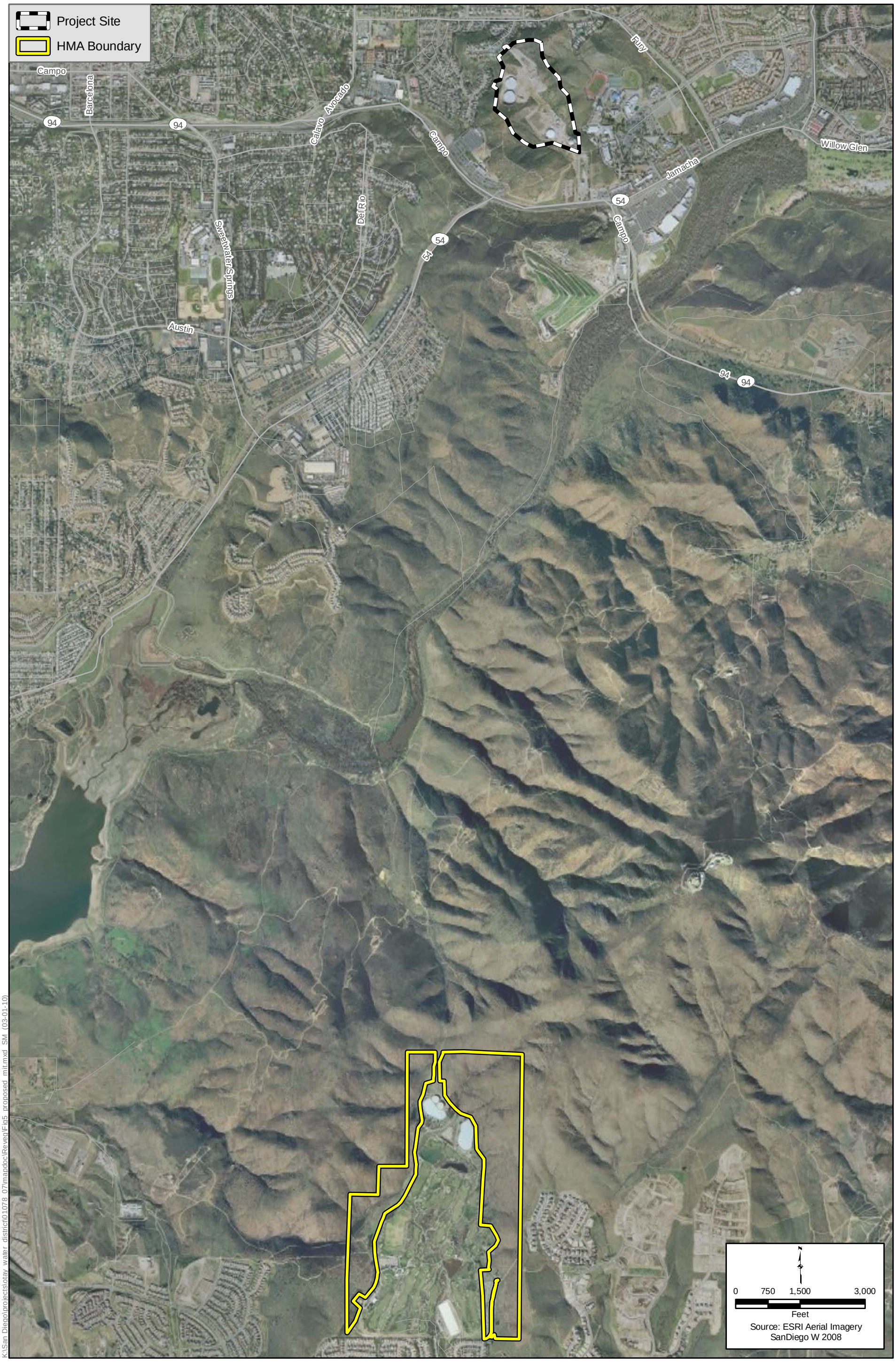
Figure 4
Project Impacts



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ICF Jones & Stokes
an ICF International Company

Figure 5
Proposed Mitigation Site:
Otay's Habitat Management Area

ATTACHMENT B

Vascular Plant Species Observed within the San Miguel Regional Training Facility Project Area

Vascular Plant Species Observed within the San Miguel Regional Training Facillity Project Area

Scientific Name	Common Name	Status
**Daucus carota*	Carrot, queen anne's lace	
Artemisia californica	Coastal sagebrush	
Baccharis sarothroides	Broom baccharis	
**Centaurea melitensis*	Tocalote	
Encelia californica	California encelia	
Gutierrezia californica	California matchweed	
**Hedypnois cretica*	Crete hedypnois	
**Lactuca serriola*	Prickly lettuce	
**Senecio vulgaris*	Common groundsel	
**Sonchus oleraceus*	Common sow-thistle	
Uropappus lindleyi	Silver puffs	
Viguiera laciniata	San diego sunflower	CNPS List 4
Cryptantha sp.	Cryptantha	
Pectocarya sp.	Pectocarya	
Plagiobothrys sp.	Popcornflower	
**Hirschfeldia incana*	Short-pod mustard	
**Salsola tragus*	Russian-thistle, tumbleweed	
Crassula connata	Pygmy weed	
Lotus scoparius var. scoparius	Coastal deerweed	
**Erodium cicutarium*	Red-stem filaree/storksbill	
**Malva parviflora*	Cheeseweed	
**Eucalyptus sp.*	Gum	
Camissonia bistorta	California sun cup	
Eriogonum fasciculatum var. fasciculatum	California buckwheat	
**Anagallis arvensis*	Scarlet pimpernel, poor man's weatherglass	
**Nicotiana glauca*	Tree tobacco	
**Avena barbata*	Slender wild oat	
**Bromus diandrus*	Ripgut grass	
**Bromus madritensis ssp. rubens*	Foxtail chess	

Scientific and common names are from Hickman (1993) and Skinner and Pavlik (1994). Additional common plant names are taken from Abrams (1923, 1944), Abrams and Ferris (1951, 1960), Beauchamp (1986), McAuley (1996), Munz (1974), Raven (1986), Roberts (1989), and Sawyer and Wolf (1995).

* Non-native plant species

Status – CNPS List 4: Limited distribution and are uncommon but not presently rare or endangered

ATTACHMENT C

Wildlife Species Detected within the San Miguel Regional Training Facility Project Area

Wildlife Species Detected within the San Miguel Regional Training Facility Project Area

Common Name	Scientific Name	Status
Butterflies		
Sara orangetip	*Anthocharis sara*	
Behr's metalmark	*Apodemia virgulti*	
Funereal duskywing	*Erynnis funeralis*	
Acmon blue	*Icaricia acmon*	
Pale swallowtail	*Papilio eurymedon*	
Checkered white	*Ponita protodice*	
Painted lady	*Vanessa cardui*	
BIRDS		
California quail	*Callipepla californica*	
Common raven	*Corvus corax*	
Bewick's wren	*Thryomanes bewickii*	
House finch	*Carpodacus mexicanus*	
White-crowned sparrow	*Zonotrichia leucophrys*	
California/Brown towhee	*Piplio crissalis*	
MAMMALS		
California ground squirrel	*Spermophilus beecheyi*	
Desert cottontail	*Sylvilagus audubonii*	

ATTACHMENT D

Quino Checkerspot Butterfly Survey Report for the San Miguel Fire Department Regional Training Facility

Quino Checkerspot Butterfly Survey Report

for the

San Miguel Fire Department Regional Training Facility

San Diego County, California

Prepared for:

Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, California 91978-2096

Prepared by:

ICF Jones & Stokes
9775 Businesspark Avenue
San Diego, CA 92131

May 2009

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Table 3. Reference Site Dates, Conditions, and Observations 9

I. SUMMARY

Protocol surveys for the Quino checkerspot butterfly (Quino) were conducted on the proposed 3-acre site of the San Miguel Regional Training Facility (including associated proposed access roads) located in the City of Spring Valley in southern San Diego County, California. The project site is to be leased by the San Miguel Fire Department from the Otay Water District. While the project footprint consists entirely of disturbed/developed areas, the areas immediately adjacent to the project footprint support disturbed coastal sage scrub.

A total of five weekly surveys were conducted over the course of the 2009 flight season (March 1–April 1). Quino was not detected during the five focused surveys. No potential host plants were observed on site. A total of seven butterfly species were detected within the survey area, including acmon blue, Behr's metalmark, checkered white, funereal duskywing, pale swallowtail, Sara's orangetip, and painted lady.

Focused surveys for Quino were also conducted in 2005 by RC Biological Consulting Inc. for the Otay Water District's 640-1 Reservoir Project, which included a portion of the proposed project site and by ICF Jones & Stokes in 2008. No Quino adults or larvae were detected during any of these surveys (RC Biological Consulting Inc. 2005).

II. INTRODUCTION

ICF Jones & Stokes conducted protocol surveys to determine presence/absence of the Quino checkerspot butterfly (*Euphydryas editha quino*) (Quino) for the San Miguel Fire Department Regional Training Facility project site. This site is located just off of Campo Road northwest of the intersection of Campo Road and Jamacha Boulevard in the city of Spring Valley, in southern San Diego County, California (Figures 1 and 2). A total of five weekly surveys were conducted between March 1 and April 1, 2009, in accordance with the U.S. Fish and Wildlife Service (USFWS) Year 2002 Protocol (USFWS 2002).

A habitat assessment was conducted by A. Borcher and K. Mozumder on January 13, 2009. At this time it was determined that 9 acres of non-excluded areas, as defined by the USFWS (USFWS 2002), occurred within the 12-acre survey area (includes project footprint and adjacent natural habitat). Excluded areas, not recommended for Quino surveys, are defined as:

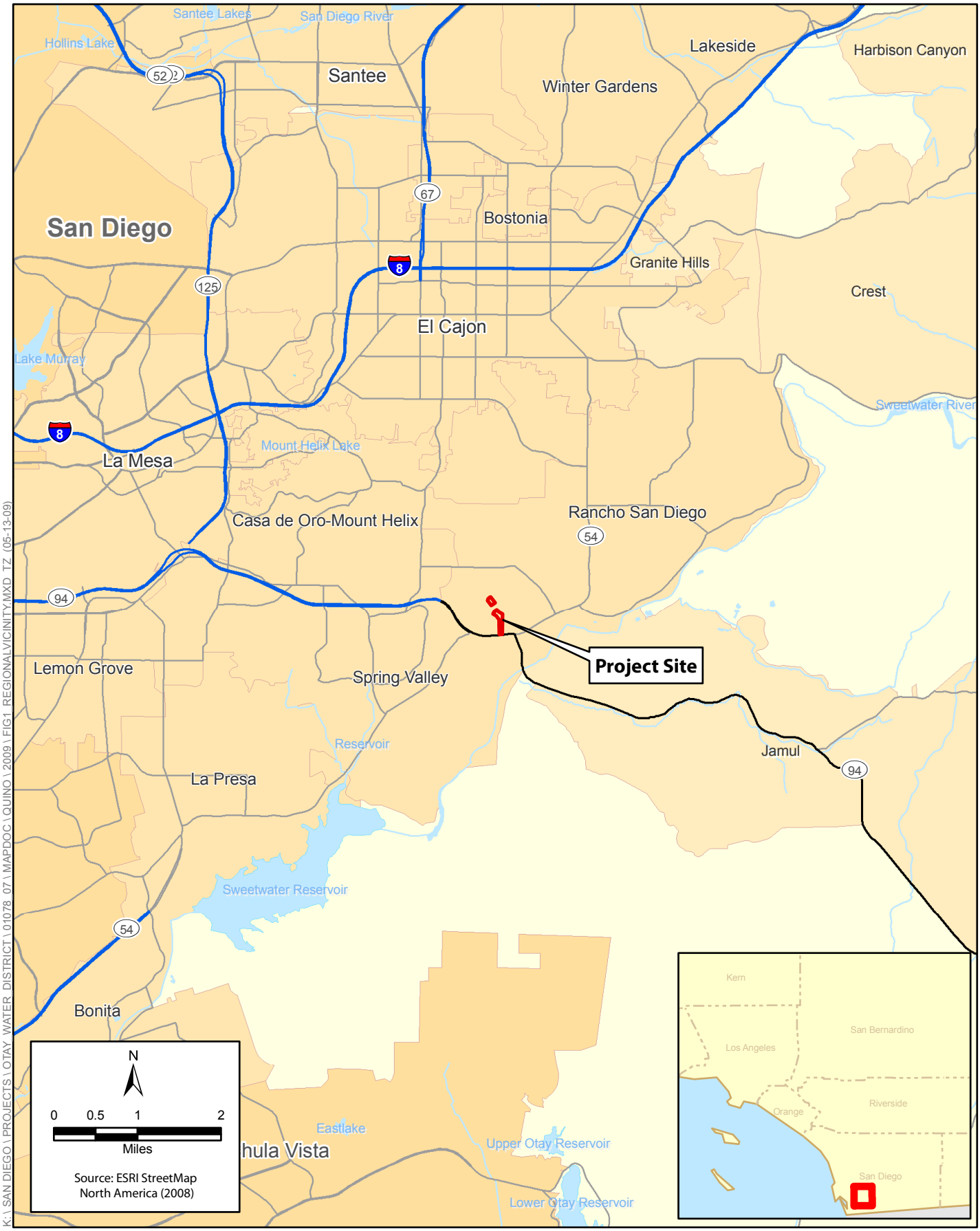
- orchards, developed areas or in-fill parcels largely dominated by nonnative vegetation;
- active/in-use agricultural fields without natural or remnant inclusions of native vegetation; or
- closed-canopy forest or riparian area, dense chaparral and small openings completely enclosed within a closed-canopy or dense chaparral area.

The project footprint consists of developed and disturbed areas; disturbed coastal sage scrub occurs immediately adjacent to the project footprint and along the existing/proposed access roads. The survey area includes the project footprint and a 100-foot buffer west of the proposed access roads that includes disturbed coastal sage scrub. While developed areas were excluded from the surveys, disturbed areas with potential to support Quino host plants and located adjacent to disturbed coastal sage scrub were included in the survey area**.** This report documents the results of the 2009 focused surveys conducted in the non-excluded areas.

Physical Characteristics

The San Miguel Regional Training Facility project site supports disturbed/developed areas. However, disturbed coastal sage scrub occurs adjacent to the project footprint and along the existing/proposed access roads (Figure 3). The project footprint is also included in the Otay Water District's 640-1 Reservoir Project site, which is currently under construction. The proposed project site is currently used for construction staging and contains a metal storage structure, stockpiles of piping, etc. The survey area is surrounded by developed and undeveloped areas supporting native and nonnative vegetation.

The survey area ranges in elevation from 370 feet in the southern portion to 560 feet in the northern portion. Soils on site consist of Friant rocky fine sandy loam (30 to 70 percent slopes) and Placentia sandy loam (2 to 9 percent slopes) (Bowman 1973). Soils from the Friant series are shallow, well drained sandy loams that form in material weathered from mica schist, quartz schist, and gneiss. Soils from the Placentia series are well drained with a clay subsoil and were formed in granitic alluvium.



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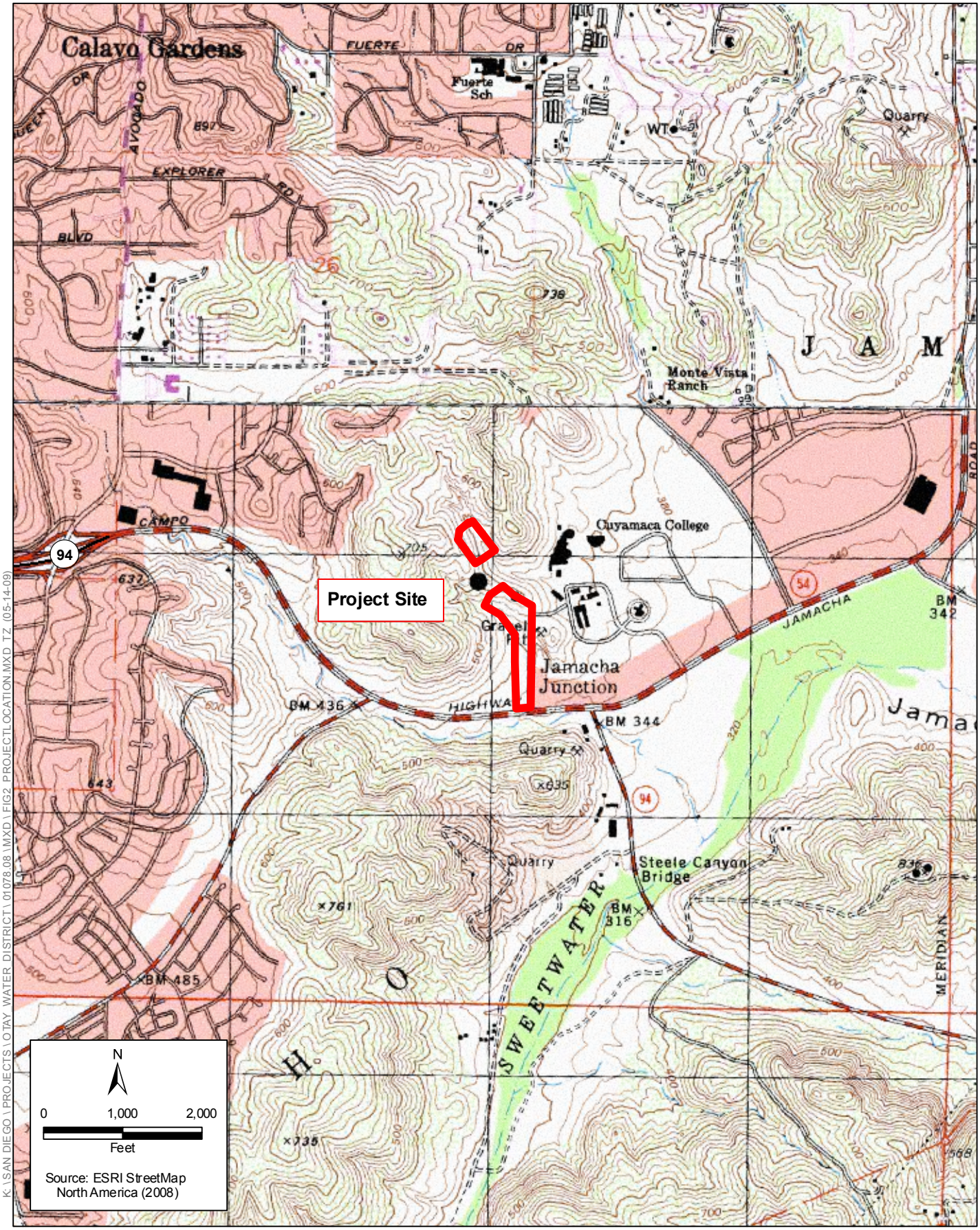
ICF Jones & Stokes
an ICF International Company

Figure 1
Regional Vicinity
San Miguel Fire Department Regional Training Facility



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ICF Jones & Stokes
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Figure 2
Project Location
San Miguel Fire Department Regional Training Facility

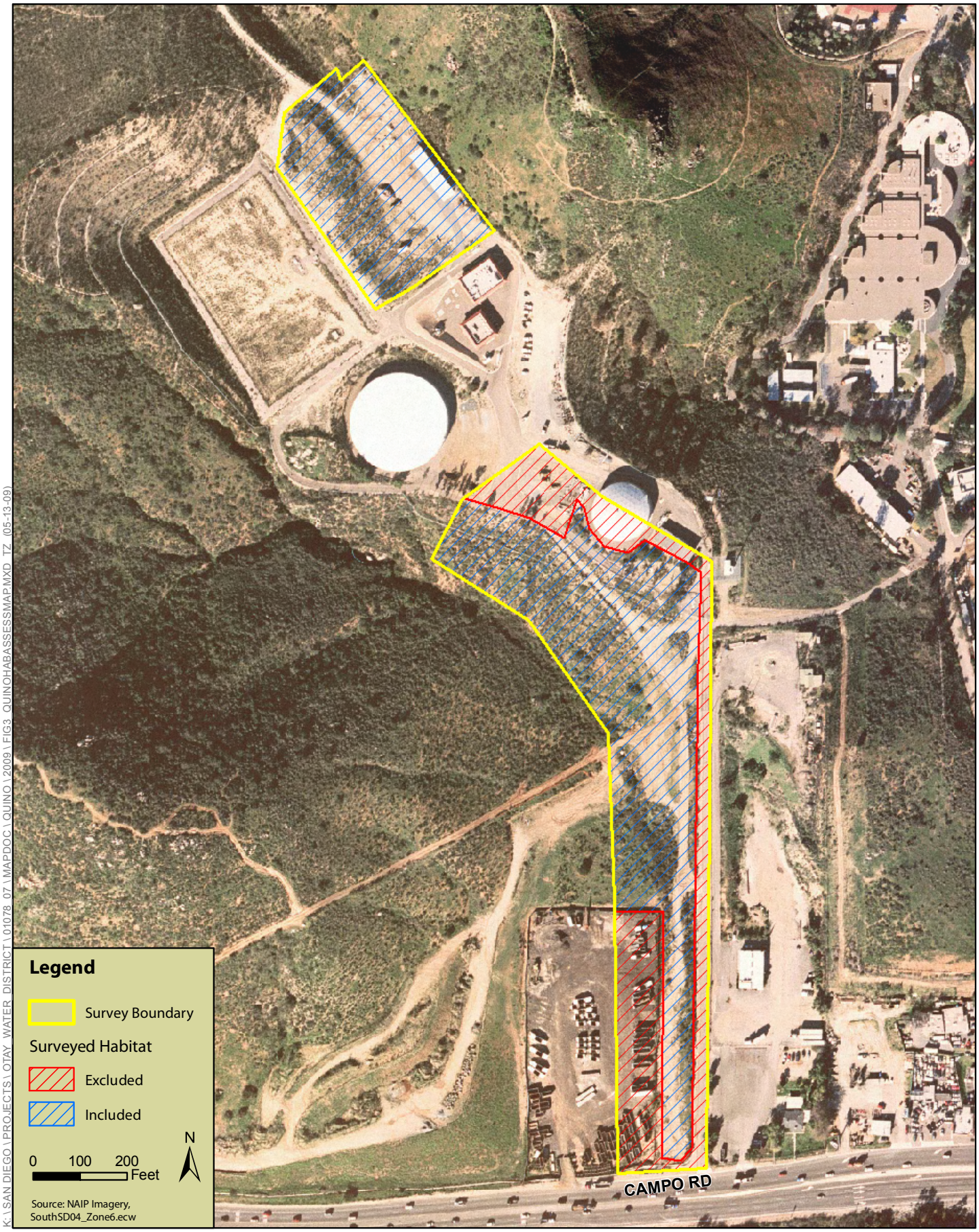

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Figure 3
Quino Habitat Assessment Map
San Miguel Fire Department Regional Training Facility

III. METHODS

K. Mozumder (Permit No. TE-168926-0), A. Borcher (Permit No. TE-092162-1), and E. Alfaro (Permit No. TE-051236-1) of ICF Jones & Stokes conducted surveys for adult Quino between March 1 and March 30, 2009. These surveys were conducted on a roughly weekly basis under acceptable weather conditions as defined in the USFWS protocol (Table 1) (USFWS 2002). Each survey involved slowly walking transects throughout all non-excluded portions of the survey area. The surveys were conducted at an average rate of no more than 5 acres per hour. The surveyor stopped periodically to scan adjacent areas for moving butterflies. All butterfly species observed were identified and recorded (Table 2). Copies of daily field notes are provided as an attachment to this report (Attachment 1).

Table 1. Survey Dates and Conditions

Date	Survey Number	Start-End Time	Temperature (Start/Stop, °F)	Wind Speed (mph)	% Cloud Cover	Name of Surveyor
3/5/09	1	0930–1100	65/68°F	0–2	30	K. Mozumder
3/11/09	2	1400–1600	68/67°F	2–5	0	K. Mozumder
3/20/09	3	1000–1200	62/65°F	0–3	0	K. Mozumder
3/23/09	4	1400–1600	65/65°F	2–5	0	E. Alfaro
3/31/09	5	0900–1030	68/70°F	0–2	0	A. Borcher

Table 2. Butterflies Observed Within the Survey Area

Scientific Name	Common Name
Papilio eurymedon	Pale swallowtail
Pontia protodice	Checkered white
Anthocharis sara	Sara's orangetip
Icaricia acmon	Acmon blue
Apodemia virgulti	Behr's metalmark
Vanessa cardui	Painted lady
Erynnis funeralis	Funereal duskywing

Reference Site Information

Quino reference information was obtained from the 2009 USFWS monitoring information web page and by visiting two known populations within proximity to the project site. ICF Jones & Stokes biologists visited the USFWS Rancho Jamul Quino reference site in Jamul and the Mother Miguel reference site within the San Diego National Wildlife Refuge south of Sweetwater Reservoir on several occasions during the 2009 flight season. Site visits documented weather conditions, all flying adult Quino observed, and general host plant and nectar source conditions. All information collected during the 2009 season from both reference sites is presented in this report and was provided to USFWS throughout the season to assist in determining the adult flight season.

The Rancho Jamul reference site is located approximately 7.5 miles southeast of the project site, and 2.5 miles east of State Route 94 between Jamul and Dulzura in southern San Diego County. The site was burned during the Otay Fire of October 2003 and again in the Harris Fire of October 2007. The hill-top habitat currently supports coastal sage scrub traversed by a dirt road and trails. The reference site was visited on several occasions from January 13 through April 2, 2009 (Table 3).

The Mother Miguel reference site is located approximately 3.5 miles south of the southern border of the project site, and 1.5 miles southeast of Sweetwater Reservoir within the San Diego National Wildlife Refuge in southern San Diego County. The reference site was burned during the Harris Fire of October 2007. The hill-top habitat currently supports coastal sage scrub traversed by dirt trails. The reference site was visited on several occasions from March 6 through April 2, 2009 (Table 3).

The majority of the surveys at the reference sites were conducted under acceptable weather conditions as defined in the USFWS protocol (USFWS 2002). Each visit involved slowly walking transects throughout the site. Surveyors stopped periodically to scan adjacent areas for moving butterflies. Adult and/or immature Quino were identified and recorded.

Table 3. Reference Site Dates, Conditions, and Observations

Date	Location	Start-End Time	Temperature (Start/Stop, °F)	Wind Speed (mph)	% Cloud Cover	Name of Surveyor	Quino Observations
1/13/09	Rancho Jamul	1130–1230	78°F	0–2	0	A. Borcher, K. Mozumder, K. Klutz	4 larvae
2/19/09	Rancho Jamul	1300–1430	70°F	2–8	0	A. Borcher, K. Mozumder, K. Klutz, D. Allen	None
2/28/09	Rancho Jamul	1300–1430	52/61°F	0–3	0	A. Borcher, K. Mozumder,	4 adults
3/16/09	Mother Miguel	1130–1200	64°F	0–5	0	K. Mozumder, E. Alfaro, C. Dunn	1 adult
3/19/09	Mother	1130–1200	68°F	0–1	30	K. Mozumder,	1 adult

Date	Location	Start-End Time	Temperature (Start/Stop, °F)	Wind Speed (mph)	% Cloud Cover	Name of Surveyor	Quino Observations
	Miguel					D. Allen	
3/24/09	Mother Miguel	1230–1300	64°F	1–4	0	K. Mozumder, E. Alfaro	None
4/02/09	Mother Miguel	1100–1130	60°F	2–5	25	K. Mozumder, A. Borcher, C. Dunn	None
4/02/09	Rancho Jamul	1430–1530	56°F	2–6	100	K. Mozumder, A. Borcher, C. Dunn	2 adults

Quino larvae were first observed in mid January at the Rancho Jamul Reference Site, but long periods of cool weather in January and February likely prolonged development until the observation of flying adults at the end of February. Subsequently, adult Quino were observed flying in March at the Mother Miguel Reference Site and assumed flying throughout March at the Rancho Jamul Site. Quino were no longer observed at the Mother Miguel Reference Site after March 19th. Two worn Quino adults were observed at the Rancho Jamul Reference Site on April 2, 2009. The results of the surveys are consistent with other reference sites in the area reported on the USFWS Quino monitoring website (USFWS 2009). Based on all information available, Quino began emerging at the end of February, and the flight season was over by the end of the first week of April, with the peak in abundance near the middle of March.

Although no Quino were observed during the surveys at San Miguel Regional Training Facility project site, the reference site visits confirm that Quino were actively flying during the survey dates.

IV. RESULTS

Seven butterfly species were observed during the five protocol surveys including acmon blue, Behr's metalmark, checkered white, funereal duskywing, pale swallowtail, Sara's orangetip, and painted lady (Table 2). No adult or immature Quino were detected. Furthermore, no potential host plants were observed within the survey area. Potential nectar sources present and in bloom during the surveys included deerweed (*Lotus scoparius*), short-pod mustard (*Hirschfeldia incana*), wishbone plant (*Mirabilis laevis*), red maids (*Calandrinia ciliata*), and popcorn flower (*Cryptantha* spp.).

Quino was not observed during the 2009 protocol surveys. Areas of coastal sage scrub were open as a result of disturbance and host plants were absent from the survey area. For these reasons the site was found to have low potential to support Quino. In addition, surveys conducted in 2008 by ICF Jones and Stokes and in 2005 by RC Biological Consulting Inc., for the Otay Water District's 640-1 Reservoir Projec, detected no adult or immature Quino within the survey areas.

V. CERTIFICATION

We certify that all relevant data have been accurately incorporated into the above document.

Erika Alfaro (Permit No. TE-051236-1)
author and field surveys

Kailash Mozumder (Permit No TE-161486-0)
field surveys

Andrew Borcher (Permit No. TE-092162-1)
primary reviewer and field surveys

VI. REFERENCES

Bowman, R. H. 1973. Soil Survey of the San Diego Area, California. United States Department of Agriculture.

Glassberg, J. 2001. *Butterflies through Binoculars: The West.* Oxford University Press.

RC Biological Consulting, Inc. 2005. Biological Technical Report for Otay Water District's 640-1 Water Reservoir Project. September.

USFWS. 2002. Quino Checkerspot Butterfly (*Euphydryas editha quino*) Year 2002 Survey Protocol.

USFWS. 2009. Carlsbad Fish & Wildlife Service Quino Checkerspot Butterfly Reference Information 2009. http://www.fws.gov/carlsbad/TEspecies/Documents/QuinoDocuments/2009MonRef/Quino_2009_Ref_Info.html.

ATTACHMENT 1

FIELD NOTES

Quino Checkerspot Butterfly Survey Form

Project/Location: Otay Training Facility Survey Segment: _____

Surveyor: KM Date: 3/5/09 Survey #: 1

Additional Surveyors: _____

	Time	% Cloud	Sky Condition			Wind (mph)	Temperature
Start	9:30	30	clear	(patchy)	cloudy	0-2	65°F
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	11:00	40	clear	(patchy)	cloudy	0-2	68°F

Habitat Onsite (circle): hilltop, veg openings, bare ground, ~~flat land~~, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): (Plantago), Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments: in very edge of graded area

Nectar Plants: Lot sco, Hos ing, Cry int, Calcil, Mir rue, Ero fas

Quino Observed (location, comments, coordinates, photo #):

No

Butterflies Observed

Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur		
Anise swallowtail			Painted lady	ll	2
Behr's metalmark	1	1	Pale swallowtail		
Brown elfin			Perplexing hairstreak		
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	ll	2
Cerranus blue			Southern blue		
Checkered white	ll	2	Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing	ll	2	West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: [illegible] Otay Training Facility Survey Segment: _____

Surveyor: KM Date: 3/4/09 Survey #: 2

Additional Surveyors: _____

Time		% Cloud	Sky Condition			Wind (mph)	Temperature
Start	2:00		clear	patchy	cloudy	2-4	68°F
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	4:00		clear	patchy	cloudy	3-5	67°F

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments:

Nectar Plants: Wt sco, cal cil, nev var, Erodium

Quino Observed (location, comments, coordinates, photo #):

No

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur		
Anise swallowtail			Painted lady	III	3
Behr's metalmark	I	1	Pale swallowtail		
Brown elfin			Perplexing hairstreak		
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	III	3
Cerranus blue			Southern blue		
Checkered white	II	2	Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: Otay Training Facility Survey Segment: _____

Surveyor: KM Date: 3/20/09 Survey #: 3

Additional Surveyors: _____

	Time	% Cloud	Sky Condition			Wind (mph)	Temperature
Start	10:00	0	(clear)	patchy	cloudy	1-3	62°F
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	12:00	0	(clear)	patchy	cloudy	0-1	65°F

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments:

Nectar Plants: Hir mc, Wtsc, Ca cil, pectenia

Quino Observed (location, comments, coordinates, photo #):

As

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur		
Anise swallowtail			Painted lady	IIII	4
Behr's metalmark	II	2	Pale swallowtail		
Brown elfin			Perplexing hairstreak		
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	II	2
Cerranus blue			Southern blue		
Checkered white	III	3	Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing	III	3	West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: Otay Training Facility Survey Segment: _____

Surveyor: EA Date: 3-23-09 Survey #: 4

Additional Surveyors: _____

Time		% Cloud	Sky Condition			Wind (mph)	Temperature
Start	2:00	0	(clear)	patchy	cloudy	2-5	65°
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	4:00	0	(clear)	patchy	cloudy	2-5	65°

Habitat Onsite (circle): hilltop, ~~veg openings~~, bare ground, flat land, steep slope, plateau, ridgeline, (~~rock outcrop~~), other

Veg Type Surveyed (circle): (~~CSS~~), SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments:

Nectar Plants: Hr inc Erocic Cry int
Cal cil Blazia

Quino Observed (location, comments, coordinates, photo #):

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue	1	1	Orange sulfur		1
Anise swallowtail			Painted lady	1	
Behr's metalmark			Pale swallowtail		
Brown elfin			Perplexing hairstreak		
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	1	1
Cerranus blue			Southern blue		
Checkered white	11	2	Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: SAN MIGUEL TRAINING FACILITY Survey Segment: _____

Surveyor: ANDREW BORCHER Date: 3/31/09 Survey #: 5

Additional Surveyors: _____

	Time	% Cloud	Sky Condition			Wind (mph)	Temperature
Start	9:00	0	clear	patchy	cloudy	0-1	68°
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	10:30	0	clear	patchy	cloudy	0-2	70°

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments:

Nectar Plants: LOT SCOP, MIR CAE, HIR INC, ERIOGIC, PELTOCARIA

Quino Observed (location, comments, coordinates, photo #):

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue	///	3	Orange sulfur		
Anise swallowtail			Painted lady	//	2
Behr's metalmark	/	1	Pale swallowtail	/	1
Brown elfin			Perplexing hairstreak		
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	//	2
Cerranus blue			Southern blue		
Checkered white	///	3	Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

ATTACHMENT E

Sensitive Plant Species and their Potential to Occur within the San Miguel Regional Training Facility Project Area

Attachment E. Sensitive Plant Species with Potential to Occur within the San Miguel Regional Training Facility Project Area

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/Requirements**	**Verified On-site (Yes/No)**	**Potential to Occur**	**Rationale**
San Diego Thornmint (*Acanthomintha ilicifolia*)	FT SE CNPS List 1B	Grassy openings in chaparral and coastal sage scrub, valley and foothill grassland, vernal pools. Prefers friable or broken clay soils. Below 900 m (2953 ft).	No	None	Appropriate habitat and soils do not exist on site.
California adolphia (*Adolphia californica*)	CNPS List 2	Chaparral, coastal scrub, valley and foothill grassland. Below 300 m (942 ft).	No	Low	Shrub is large and conspicuous and would have likely been observed if present.
Shaw's agave (*Agave shawii*)	CNPS List 2	Coastal sage scrub and maritime succulent scrub. Below 960 m (3150 ft)	No	None	Suitable habitat does not exist on site. Would have been detectable if present.
San Diego bur-sage (*Ambrosia chenopodiifolia*)	CNPS List 2	Typically, found with *Artemisia californica* and *Salvia mellifera* in a low-growing, fairly open coastal sage scrub. 55 -155 m (180-509 ft)	No	None	Suitable habitat does not exist on site. Would have been detectable if present.
Singlewort burrobush (*Ambrosia monogyra*)	CNPS List 2	Washes and dry river beds Chaparral. Below 500 m (1640 ft).	No	None	Appropriate habitat does not exist on site.
San Diego ambrosia (*Ambrosia pumila*)	FE CNPS List 1B	Chaparral, coastal sage scrub, valley and foothill grassland, vernal pools, often in disturbed areas. Can occur in creek beds, seasonally dry drainages, and floodplains; usually on the periphery of willow woodland without a protective tree canopy. Below 150 m (492 ft).	No	Low	Would have been detectable if present.
Del Mar Mazanita (*Arctostaphylos glandulosa ssp. crassifolia*)	FE CNPS List 1B	Low- growing chaparral with eroding sandstone as substrate. Below 365 m (1198 ft).	No	None	Appropriate habitat and soils do not exist on site
Otay manzanita (*Arctostaphylos otayensis*)	CNPS List 1B	Chaparral or woodlands on volcanic rock outcrops. 500-1700m (1640-5577 ft).	No	None	Appropriate habitat and soils do not exist on site
San Diego sagewort (*Artemisia palmeri*)	CNPS List 4	Occurs along creeks and drainages near the coast; but inland it occurs in mesic chaparral conditions. Below 600 m (1969 ft)	No	None	Appropriate habitat does not exist on site.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Dean's milkvetch (*Astragalus deanei*)	CNPS List 1B	Open shrubby slopes. Associated with coastal sage scrub, chaparral, and sandy washes. 250-300 m (820-984 ft).	No	None	Appropriate habitat does not exist on site.
San Diego milk-vetch (*Astragalus oocarpus*)	CNPS List 1B	Openings in chaparral and oak woodland. 600-1500m (1968-4921ft).	No	None	Appropriate habitat does not exist on site.
Coulter's saltbush (*Atriplex coulteri*)	CNPS List 1B	In San Diego, sea-bluff habitat is preferred by this rare species but it has been found in Otay Mesa (Reiser 1994). Alkaline or clay soils, open sites and, coastal scrub. Below 50 m (164 ft).	No	None	No coastal bluffs or sand dunes occur on site.
South Coast saltscale (*Atriplex pacifica*)	CNPS List 1B	Occurs in xeric, disturbed areas with coastal bluff scrub, coastal sage scrub, coastal dunes, coastal sage scrub and playas. Below 140 m (459 ft).	No	None	Appropriate habitat does not exist on site.
Encinitas baccharis (*Baccharis vanessae*)	FT SE CNPS List 1B	Coastal mixed chaparral, central coast and foothills. 60–335 m (197-1099 ft)	No	None	Appropriate habitat does not exist on site.
Goldenspined cereus (*Bergerocactus emoryi*)	CNPS List 2	Maritime succulent scrub along the coast. Below 395 m (1296 ft).	No	None	Appropriate habitat does not exist on site.
Orcutt's brodiaea (*Brodiaea orcuttii*)	CNPS List 1B	Moist grasslands, near streams and the periphery of vernal pools. Below 1600 m (5249ft).	No	None	Appropriate habitat does not exist on site.
Round-leaved filaree (*California macrophylla [Erodium macrophyllum]*)	CNPS List 1B	Cismontane woodland, valley and foothill grassland on clay soils. Below 1200 m (3937 ft)	No	None	Appropriate habitat does not exist on site.
Dunn's mariposa lily (*Calochortus dunnii*)	SR CNPS List 1B	Rocky openings in chaparral or grassland/chaparral ecotone. Seems to be restricted to metavolcanic and gabbroic soils. 500-1700m (4920-5577ft).	No	None	Appropriate habitat does not exist on site.
Lakeside ceanothus (*Ceanothus cyaneus*)	CNPS List 1B	Closed-cone coniferous forest, dense chaparral. Dry shrubby slopes. Below 400 m (1312 ft).	No	None	Appropriate habitat does not exist on site.
Otay Mountain ceanothus (*Ceanothus otayensis*)	CNPS List 1B	Chamise chaparral. In CA, only known from the San Miguel and Otay mountains (CNPS 2007). 600 and 1100 m (1969-3609 ft).	No	None	Appropriate habitat does not exist on site. Not within species' range

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Wart-stemmed ceanothus (*Ceanothus verrucosus*)	CNPS List 2	Coastal chaparral intermixed with chamise and mission manzanita. Below 380 m (1247 ft).	No	None	Appropriate habitat does not exist on site.
Smooth tarplant (*Centromadia pungens ssp. laevis*)	CNPS List 1B	Chenopod scrub, meadows and seeps, playas, riparian woodland, valley and foothill grassland. Below 400 m (1312 ft).	No	None	Appropriate habitat does not exist on site.
Orcutt's pincushion (*Chaenactis glabriuscula var. orcuttiana*)	CNPS List 1B	Coastal bluff scrub and coastal dunes. Below 100 m (328 ft).	No	None	No coastal bluffs or sand dunes occur on site.
Long spined-spine flower (*Chorizanthe polygonoides* var. *longispina*)	CNPS List 1B	Clay lenses, largely devoid of shrubs. Occasionally seen on the periphery of vernal pool habitat and the periphery of montane meadows near vernal seeps. Below 1400m (4593ft).	No	None	Appropriate habitat does not exist on site.
Delicate clarkia (*Clarkia delicata*)	CNPS List 1B	Oak woodlands and chaparral. 235-1000m (770-3280ft).	No	None	Appropriate habitat does not exist on site.
Summer holly (*Comarostaphylis diversifolia* var. *diversifolia*)	CNPS List 1B	Southern mixed chaparral, usually on mesic north-facing slopes. Almost the entire population occurs west of Interstate 15. 100-550m (328-1804ft).	No	None	Appropriate habitat does not exist on site. Shrub is large and conspicuous and would have been observed if present.
Salt marsh birds-beak (*Cordylanthus maritimus ssp. maritimus*)	FE SE CNPS List 1B	Salt marshes. Below 30 m (98 ft).	No	None	Appropriate habitat does not exist on site.
Orcutt's birds-beak (*Cordylanthus orcuttianus*)	CNPS List 2	Seasonally dry drainages and uplands adjacent to riparian habitats. Below 350 m (1148 ft).	No	None	Appropriate habitat does not exist on site.
Sea dahlia (*Coreopsis maritima*)	CNPS List 2	Sandstone cliffs near the ocean. Below 150 m (492 ft).	No	None	No sandstone cliffs occur on site.
San Diego sand aster (*Corethrogyne filaginifolia var. incana*)	CNPS List 1B	Coastal sandy areas. Coastal bluff scrub, chaparral, coastal sage scrub. Below 115 m (377 ft).	No	None	Appropriate habitat does not exist on site.
Tecate cypress (*Cupressus forbesii*)	CNPS List 1B	Coniferous forest and southern mixed chaparral. Tends to follow moist canyons and drainages downslope to relatively low elevations. 450-1500 m (1476-4921 ft).	No	None	Appropriate habitat does not exist on site. Shrub is large and conspicuous and would have been observed if present.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Snake cholla (*Cylindropuntia [Opuntia] californica var. californica*)	CNPS List 1B	Open coastal sage scrub on xeric hillsides. Below 1600 m (5249 ft).	No	Low	Would have been detectable if present.
Otay tarplant (*Deinandra conjugens*)	FT SE CNPS List 1B	Fractured clay soils or lightly vegetated coastal sage scrub. Below 300 m (984 ft).	No	Low	Habitat exists in the vicinity of the project area, but soils are not appropriate.
Tecate tarplant (*Deinandra floribunda*)	CNPS List 1B	Southern mixed chaparral of the interior valleys and arroyos. 300-700 m (984-2296 ft).	No	None	Appropriate habitat does not exist on site.
Orcutt's dudleya (*Dudleya attenuata ssp. orcuttii*)	CNPS List 2	Openings in coastal sage scrub near the coast. Coastal bluff scrub, chaparral, coastal scrub in rocky or gravelly. Below 50 m (164 ft). Only known in San Diego County from Borderfield State Park (CNPS).	No	None	Appropriate habitat does not exist on site.
Blochman's dudleya (*Dudleya blochmaniae ssp. blochmaniae*)	CNPS List 1B	Opening in coastal sage scrub near the coast. Coastal bluff scrub, chaparral, coastal sage scrub, valley and foothill grassland/rocky, often clay or serpentinite. Below 450 m (1476 ft).	No	Low	Minimal habitat exists in the vicinity of the project area, but soils are not appropriate and site may be at far extent of the species' range.
Variegated dudleya (*Dudleya variegata*)	CNPS List 1B	Openings in chaparral, cismontane woodland, and coastal sage scrub, isolated rocky substrates in open grasslands, and vernal pools and mima mounds. Below 300 m (984 ft).	No	Low	Minimal habitat exists in the vicinity of the project area, but species would have likely been observed if present.
Palmer's goldenbush (*Ericameria palmeri ssp. palmeri*)	CNPS List 2	Coastal drainages, in mesic chaparral sites, or rarely in coastal sage scrub. Below 600 m (1969 ft).	No	None	Appropriate habitat does not exist on site.
San Diego button-celery (*Eryngium aristulatum var. parishii*)	FE SE CNPS List 1B	Vernal pools or mima mound areas with vernally moist conditions coastal sage scrub, valley and foothill grassland. Below 150 m (492 ft).	No	None	Appropriate habitat does not exist on site.
Cliff spurge (*Euphorbia misera*)	CNPS List 2	Low growing maritime sage scrub. Below 500 m (1640 ft).	No	None	Appropriate habitat does not exist on site.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
San Diego barrel cactus (*Ferocactus viridescens*)	CNPS List 2	Coastal sage scrub with sandy or rocky areas. Below 150 m (492 ft).	No	None	Would have easily detectable if present.
Palmer's frankenia (*Frankenia palmeri*)	CNPS List 2	Periphery of salt marsh. Below 450 m (1476 ft).	No	None	Appropriate habitat does not exist on site.
Chaparral ash (*Fraxinus parryi*)	CNPS List 2	Arid, relatively open chaparral in northern Baja California. 213-620 m (699-2034 ft).	No	None	Appropriate habitat does not exist on site.
Mexican flannelbush (*Fremontodendron mexicanum*)	FE SR CNPS List 1B	Closed cone coniferous forest and southern mixed chaparral. 300-1000 m (984-3280 ft).	No	None	Appropriate habitat does not exist on site.
Ramona horkelia (*Horkelia truncata*)	CNPS List 1B	Open chamise chaparral. 400-1300 m (1312-4265 ft).	No	None	Appropriate habitat does not exist on site.
Decumbent goldenbush (*Isocoma menziesii var. decumbens*)	CNPS List 1B	Sandy areas in coastal sage scrub habitat intermixed with grassland. 10-135 m (33-443 ft)	No	Low	Minimal habitat exists in the vicinity of the project area but this species would have been detected.
San Diego marsh-elder (*Iva hayesiana*)	CNPS List 2	Marshes and swamps, playas, creeks or intermittent streambeds. Below 500 m (1640 ft).	No	None	Appropriate habitat does not exist on site.
Coulter's goldfields (*Lasthenia glabrata ssp. coulteri*)	CNPS List 1B	Saline places and vernal pools. Below 1000 m (3280 ft).	No	None	Appropriate habitat does not exist on site.
Gander's pitcher sage (*Lepechina ganderi*)	CNPS List 1B	Metavolcanic soils typically in chaparral dominated by chamise and black sage. 400-900 m (1312-2952 ft).	No	None	Appropriate habitat does not exist on site.
Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)	CNPS List 1B	Openings in chaparral and sage scrub, generally well away from the coast in Southern California in the foothill elevations. Below 500 m (1640 ft).	No	None	Appropriate habitat does not exist on site.
Otay mountain lotus (*Lotus crassifolius* var. *otayensis*)	CNPS List 1B	Chaparral dominated by chamise and *Ceanothus* sp. 900 m (2953 ft).	No	None	Appropriate habitat does not exist on site.
Nuttall's lotus (*Lotus nuttallianus*)	CNPS List 1B	Coastal dunes, coastal scrub. Below 10 m (33 ft).	No	None	Appropriate habitat does not exist on site.
Felt-leaved monardella (*Monardella hypoleuca* var. *lanata*)	CNPS List 1B	Chaparral understory. 300-1000 m (984-3280 ft).	No	None	Appropriate habitat does not exist on site.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Jennifer's monardella (*Monardella stoneana*)	CNPS List 1B	Closed coniferous forest, chaparral, coastal sage scrub, riparian scrub. Usually in rocky intermittent streambeds. Below 790 m (2592 ft). Only known to occur in California in the San Ysidro Mountains.	No	None	Appropriate habitat does not exist on site.
Willowy monardella (*Monardella viminea*)	FE SE CNPS List 1B	Riparian scrub, usually at sandy locales in seasonally dry washes. Below 400 m (1312 ft)	No	None	Appropriate habitat does not exist on site.
San Diego goldenstar (*Muilla clevelandii*)	CNPS List 1B	Grasslands typically near vernal pools. Below 50 m (164 ft).	No	None	Appropriate habitat does not exist on site.
Little mousetail (*Myosurus minimus ssp. apus*)	CNPS List 3	Vernal pools. Below 1500 m (4921 ft).	No	None	Appropriate habitat does not exist on site.
Mud nama (*Nama stenocarpum*)	CNPS List 2	Muddy embankments of ponds, lakes and rivers. Below 500 m (1640 ft).	No	None	Appropriate habitat does not exist on site.
Spreading navarretia (*Navarretia fossalis*)	FT CNPS List 1B	Vernal pools and vernal swales. 30-1300 m (98-4265 ft).	No	None	Appropriate habitat does not exist on site.
Prostrate navarretia (*Navarretia prostrata*)	CNPS List 1B	Vernal pools, coastal scrub, meadows and seeps, valley and foothill grassland. Below 700 m (2297 ft).	No	None	Appropriate habitat does not exist on site.
Coast woolly-heads (*Nemacaulis denudata var. denudata*)	CNPS List 1B	Coastal sand dunes below 100 m (328 ft).	No	None	Appropriate habitat does not exist on site.
Slender woolly-heads (*Nemacaulis denudata var. gracilis*)	CNPS List 2	Well-developed sand dunes. Coastal dunes, desert dunes, Sonoran desert scrub. 50-400 m (164-1312 ft).	No	None	Appropriate habitat does not exist on site.
Dehesa nolina (*Nolina interrata*)	SE CNPS List 1B	Open southern mixed chaparral and chamise chaparral. 200-700m (656-2296 ft).	No	None	Appropriate habitat does not exist on site.
California Orcutt grass (*Orcuttia californica*)	FE SE CNPS List 1B	Vernal pools. 15-660 m (49-2165 ft).	No	None	Appropriate habitat does not exist on site.
Baja California birdbush (*Ornithostaphylos oppositifolia*)	SE CNPS List 2	Coast chaparral with mission manzanita and chamise present. 55-800 m (180-2625 ft). Known from one location west of San Ysidro (CNPS 2007).	No	None	Appropriate habitat does not exist on site.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Gander's ragwort (*Packera [Senecio] ganderi*)	SR CNPS List 1B	Very rare plant usually found in the chaparral understory, often beneath chamise. 400-1200 m (1312-3937 ft)	No	None	Appropriate habitat does not exist on site.
Brand's phacelia (*Phacelia stellaris*)	CNPS List 1B	Sandy openings in coastal sage scrub, coastal dunes. Below 400 m (1312 ft).	No	None	Appropriate habitat does not exist on site.
San Diego mesa mint (*Pogogyne abramsii*)	FE SE CNPS List 1B	Vernal pools. 90-200 m (295-656 ft).	No	None	Appropriate habitat does not exist on site.
Otay mesa mint (*Pogogyne nudiuscula*)	FE SE CNPS List 1B	Vernal pools. 90-250 m (295-820 ft). Known from 6 locations in Otay mesa (CNPS 2007).	No	None	Appropriate habitat does not exist on site.
Cedros Island oak (*Quercus cedrosensis*)	CNPS List 2	Closed-cone coniferous forest, chaparral, coastal scrub. 225-488m (738-1469ft).	No	None	Appropriate habitat does not exist on site.
Nuttall's scrub oak (*Quercus dumosa*)	CNPS List 1B	Coastal chaparral with a generally open canopy cover. Below 200 m (656 ft).	No	None	Appropriate habitat does not exist on site.
Moreno currant (*Ribes canthariforme*)	CNPS List 1B	Chamise chaparral. 500-1200m (1640-3937ft).	No	None	Appropriate habitat does not exist on site.
Santa Catalina Island currant (*Ribes viburnifolium*)	CNPS List 1B	Sage scub and low-growing chaparral exposed to ocean breezes. 30-305 m (98-1001 ft).	No	None	Appropriate habitat does not exist on site.
Small-leaved rose (*Rosa minutifolia*)	SE CNPS List 2	Mesas, hiilsides and arroyos near the coast. 150-160 m (492-525 ft). Known from 1 location in Otay mesa (CNPS 2007).	No	None	Appropriate habitat does not exist on site.
Munz' sage (*Salvia munzii*)	CNPS List 2	Chaparral and coastal sage scrub. Below 800m (2624 ft).	No	Low	Minimal habitat exists in the vicinity of the project area, but would have likely been observed if present.
San Miguel savory (*Satureja chandleri*)	CNPS List 1B	Rocky slopes with chamise chaparral. 520-690m (1706-2263ft).	No	None	Appropriate habitat does not exist on site.
Rayless ragwort (*Senecio aphanactis*)	CNPS List 2	Dry alkaline flats in chaparral, cismontane woodlands and coastal sage scrub. Below 400 m (1312 ft).	No	None	Appropriate habitat does not exist on site.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Hammitt's clay-cress (*Sibaropsis hammittii*)	CNPS List 1B	Openings in chaparral valley and foothill grasslands. 720-1065 m (2362-3494 ft).	No	None	Appropriate habitat does not exist on site.
Purple stemodia (*Stemodia durantifolia*)	CNPS List 2	Sandy dry canyon bottoms or drainages. Below 300 m (984 ft)	No	None	Appropriate habitat does not exist on site.
Oil nestraw (*Stylocine citroleum*)	CNPS List 1B	Coastal scrub and clay soils in the vicinity of oilfields. 50-400 m (164-1312 ft).	No	None	Appropriate habitat and soils do not exist on site.
Parry's tetracoccus (*Tetracoccus dioicus*)	CNPS List 1B	Chamise chaparral. Below 1000 m (3280 ft).	No	None	Appropriate habitat does not exist on site.
San Diego sunflower (*Vigiera laciniata*)	CNPS List 4	Dry scrub habitats below 3000 ft.	Yes	Observed	Observed along the edge of the existing dirt road, immediately outside of the impact area.

Legend:

Status:

Federal

FE - listed as endangered under the federal Endangered Species Act.

FT - listed as threatened under the federal Endangered Species Act.

State

SE - listed as endangered under the California Endangered Species Act.

ST – listed as threatened under California Endangered Species Act.

SR – listed as rare under California Endangered Species Act.

CNPS List – California Native Plant Society

1B – Rare, threatened or endangered in California and elsewhere

2 – Rare, threatened or endangered in California but more common elsewhere

3 – May be rare but more research needed to determine true status

4 – Limited distribution and are uncommon but not presently rare or endangered

References

Special Status information from CDFG 2006a and San Diego County 2006. Nomenclature and plant descriptions from Abrams 1923 and 1944, Abrams and Ferris 1960, Beauchamp 1986, Hickman 1993, McAuley 1996, Munz 1974, Roberts 1989, Skinner and Pavlik 1994.

ATTACHMENT F

Sensitive Wildlife Species with Potential to Occur within the San Miguel Regional Training Facility Project Area

Attachment F. Sensitive Wildlife with Potential to Occur within the San Miguel Regional Training Facility Project Area

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/Requirements**	**Verified On-site (Yes/No)**	**Potential to Occur**	**Rationale**
INVERTEBRATES					
San Diego fairy shrimp (*Branchinecta sandiegoensis*)	FE	Vernal pools. All known localities are below 701m (2,300 ft) and are within 64km (40 miles) of the Pacific Ocean	N	None	No vernal pools were observed within the project survey area.
Quino checkerspot butterfly (*Euphydryas editha quino*)	FE	Inhabits openings on clay soils within or in the vicinity of shrublands, grasslands, meadows, vernal pools, and lake margins. Closely tied to its larval host plant, dwarf plantain *(Plantago erecta)* or owl's clover (*Orthocarpus purpurescens).*	N	Low	Focused surveys in 2005 (RC Bological 2005), 2008, and 2009 (ICF Jones & Stokes) identified no host plants or individuals on-site.
Riverside fairy shrimp (*Streptocephalus woottoni*)	FE	Vernal pools. It occurs from Los Angeles County to Baja California. In San Diego County, all populations are within 15 kilometers of the coast.	N	None	No vernal pools were observed within the project survey area.
AMPHIBIANS					
Large-blotched salamander (*Ensatina eschscholtzii klauberi*)	CSC	Inhabits moist shaded evergreen and deciduous forests and oak woodlands. Usually found under rocks, logs, other debris, especially bark that has peeled off and fallen beside logs and trees.	N	None	Suitable habitat is not found within the project site.
Arroyo toad (*Bufo microscaphus californicus*)	FE CSC	Exposed shallow pools with a sand or gravel base are used for breeding. Breeding pools must occur in the vicinity (ca. 10-100 m) of a braided sandy channel with shorelines or central bars made of stable, sandy terraces.	N	None	Suitable habitat is not found within the survey area.
Western spadefoot *Spea (=Scaphiopus) hammondii*	CSC	Temporary rainpools with water temperatures between 9°C and < 30°C that last at least 3 weeks.	Y	Observed	Species observed outside of the project footprint during surveys in 2005 (RC Biological 2005).
REPTILES					

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Southwestern pond turtle (*Actinemys marmorata pallida)*	CSC	Requires slack- or slow-water aquatic habitat as well as aerial and aquatic basking sites. Also requires an upland oviposition site on an unshaded slope with clay soils, in the vicinity of the aquatic site.	N	None	Suitable habitat is not found within the survey area.
Silvery legless lizard (*Anniella pulchra pulchra*)	CSC	Dry, loose sandy soils, from inland foothills to coastal sand dunes. Found in areas of accumulated leaf litter beneath shrubs and trees in moist areas.	N	Low	Minimal suitable habitat exists within the survey area but the site is located within the range of the species.
Orange-throated whiptail (*Cnemidophorus hyperythrus*)	CSC	The habitat characteristics are poorly understood, however historically it was found in floodplains or terraces along streams. Closely tied to coastal sage scrub plants and some chaparral plants.	N	Moderate	Suitable habitat exists adjacent to the survey area and this species has been detected in the project vicinity (CNDDB 2007).
Coronado skink (*Eumeces skiltonianus interparietalis*)	CSC	Forest, open woodland and grassy areas. Usually found under leaf litter, logs or rocks.	N	Moderate	Suitable habitat exists adjacent to the survey area and this species has been detected in the project vicinity (CNDDB 2007).
San Diego horned lizard (*Phrynosoma coronatum blainvillii*)	CSC	Grasslands, brushlands, woodlands, and open coniferous forest with sandy or loose soil; requires abundant ant colonies for foraging.	N	Moderate	Suitable habitat exists adjacent to the survey area and this species has been detected in the project vicinity (CNDDB 2007).
Red diamond rattlesnake (*Crotalus ruber ruber*)	CSC	Occurs from sea level to 914m (3000ft) in chaparral, woodland, and arid desert habitats with rocky areas and dense vegetation.	N	Moderate	Suitable habitat exists adjacent to the survey area and this species has been detected in the project vicinity (CNDDB 2007).
Coast patch-nosed snake (*Salvadora hexalepis virgultea*)	CSC	Inhabits semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains.	N	Moderate	Suitable habitat exists adjacent to the survey area and this species has been detected in the project vicinity (CNDDB 2007).

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Two-striped garter snake (*Thamnophis hammondii*)	CSC	Inhabits perennial and intermittent streams with rocky beds and bordered by willow thickets or other dense vegetation.	N	None	Suitable habitat is not found within the survey area.
BIRDS					
Least bittern (*Ixobrychus exilis*)	CSC	Tall emergent vegetation in marshes, primarily freshwater. Prefers marshes with scattered bushes or other woody growth.	N	None	Suitable habitat is not found within the survey area.
White-tailed kite (*Elanus caeruleus*)	FPS (nesting)	Open grasslands, agricultural areas, wetlands, and oak woodlands. Their primary source of food is the California vole. It typically forages in open undisturbed habitats and nests in the top of a dense oak, willow or other large tree.	N	Breeding – Low Foraging - Moderate	Suitable habitat is found within the survey area but project footprint provides little value. Large trees present adjacent to site, but no sign of nests.
Northern harrier (*Circus cyaneus*)	CSC (nesting)	Grasslands and marshes. Nests are on the ground and typically concealed within a marsh or other dense vegetation.	Y	Breeding – None Foraging - Observed	Observed foraging over survey area during surveys conducted in 2005 (RC Biological 2005). No potential for nesting in survey area.
Sharp-shinned hawk (*Accipiter striatus*)	CSC (nesting)	Found in San Diego County during the winter in a variety of habitats.	N	Breeding - None Migration/Wintering - Moderate	Widespread in lowlands outside breeding season but is a high montane breeder in southern California. Survey area lies outside of geographic breeding range of species.
Cooper's hawk (*Accipiter cooperii*)	CSC (nesting)	Oak groves and mature stands of riparian woodland. This species has adapted well to development and is abundant in urban canyons with eucalyptus trees.	N	Breeding – Low Foraging - Moderate	Suitable habitat is found within the survey area but project footprint provides little value. Large trees present adjacent to site, but no sign of nests.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Ferruginous hawk (*Buteo regalis*)	CSC (wintering)	Winter visitor to Ca., with the bulk of breeding range in the Great Basin to the east; small numbers breed in the northeast corner of the state; hunts in open country from low perches.	N	Breeding – None Migration/Wintering - Low	Survey area lies outside of geographic breeding range of species. Suitable foraging habitat during migration or winter is present within the survey area and individuals have been detected nearby (Unitt 2004).
Golden eagle (*Aquila chrysaetos*)	CSC (nesting and wintering)	Nest on cliff ledges or trees on steep slopes. Forage in grasslands, sage scrub or broken chaparral.	N	Breeding – None Foraging - Low	No suitable breeding habitat is present on site. Minimal suitable foraging habitat does occur in the survey area but project footprint provides little value.
Merlin (*Falco columbarius*)	CSC (wintering)	Will forage over a variety of habitats; however, species does not breed in California.	N	Breeding – None Migration/Wintering - Moderate	Survey area lies outside of geographic breeding range of species. Suitable foraging habitat is present within the survey area but project footprint provides little value
Peregrine falcon (*Falco peregrinus*)	SE (nesting)	Will forage over a variety of habitats however only breed near water, typically with the nest placed on a cliff ledge.	N	Breeding – None Migration/Wintering - Low	Appropriate nesting habitat is not found within the survey area. Suitable foraging habitat is present and low numbers of individuals have been detected nearby in winter (Unitt 2004). However, the project footprint provides little value.
Prairie falcon (*Falco mexicanus*)	CSC (nesting)	Nest on cliffs or bluffs and forage in open desert or grasslands. In San Diego County, nest at least 23 miles from the coast (Unitt 2004)	N	Breeding – None Migration/Wintering – Low	Appropriate nesting habitat is not found within the survey area. Suitable foraging habitat is present and individuals have been detected nearby in winter (Unitt 2004). However, the project footprint provides little value.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Burrowing Owl (*Athene cunicularia*)	CSC	Prairies, grasslands, lowland scrub, agricultural lands, coastal dunes, desert floors, and some artificial, open areas. They require large open expanses of sparsely vegetated areas on gently rolling or level terrain with an abundance of active small mammal burrows. They use rodent or other burrows for roosting and nesting cover and also known to use pipes, culverts, and nest boxes where burrows are scarce.	N	Breeding – Low Migration/Wintering - Low	Minimal suitable habitat exists within the survey area.
Southwestern willow flycatcher (*Empidonax trailii extimus*)	FE SE	Breeds in riparian woodlands along rivers, streams, or other wetlands. They usually nest within close proximity of water or very saturated soil.	N	None	Suitable habitat is not found within the survey area.
Loggerhead shrike (*Lanius ludovicianus*)	CSC	Found near grassland, open sage scrub and chaparral, and desert scrub. They nest in dense vegetation adjacent to their open foraging habitats.	N	Breeding - Low Foraging - moderate	Suitable foraging habitat and minimal breeding habitat exists within the survey area and individuals have been detected breeding in the vicinity (Unitt 2004). However, the project footprint provides little value.
Least Bell's vireo (*Vireo bellii pusillus*)	FE SE	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons.	N	None	Suitable habitat is not found within the survey area.
California horned lark (*Eremophila alpestris actia*)	CSC	Grasslands, recently disturbed habitat where seeds and insects are easy to find.	N	Breeding – Low Foraging - Moderate	Suitable habitat is located adjacent to the survey area and individuals have been detected in the vicinity (Unitt 2004). However, the project footprint provides little value.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*)	CSC	Cactus thickets	N	Breeding - None Foraging - None	Suitable habitat is not found within the survey area.
Coastal California gnatcatcher (*Polioptila californica californica*)	FT CSC	Prefer open scrubby habitats such as coastal sage scrub and some forms of chaparral.	Y	Breeding - low Foraging - Observed	Species confirmed in surrounding habitat during surveys conducted in 2005 (RC Biological 2005). However, suitable habitat for this species does not occur within the project footprint.
Yellow warbler (*Dendroica petechia brewsteri*)	CSC	Mature riparian woodlands.	N	None	Suitable habitat is not found within the survey area.
Yellow-breasted chat (*Ictera virens*)	CSC	Dense riparian woodland.	N	None	Suitable habitat is not found within the survey area.
Ashy (= Southern California) rufous-crowned sparrow (*Aimophila ruficeps canescens*)	CSC	Fairly common, widespread and generally fairly conspicuous resident of rocky grassland and patchy shrub habitats, often including areas with disturbance from fire, trash, soil compaction and non-native vegetation.	N	Breeding – None Foraging - Low	Appropriate habitat is not found within the survey area; however, breeding pairs are known to occur in immediate vicinity.
Western snowy plover (*Charadrius alexandrines nivosus*)	FT CSC	Sandy beaches and the shores of large alkali lakes with gravelly or friable soils for nesting	N	None	Suitable habitat is not found within the survey area.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FC SE	Nests in riparian forests.	N	None	Suitable habitat is not found within the survey area.
California black rail (*Laterallus jamaicensis coturniculus*)	ST	Occurs in freshwater marshes, wet meadows, and the shallow margins of saltwater marshes.	N	None	Suitable habitat is not found within the survey area.
Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)	SE	Inhabits coastal salt marshes.	N	None	Suitable habitat is not found within the survey area.
Light-footed clapper rail (*Rallus longirostris levipes*)	FE SE	Occurs in salt marshes where cordgrass and pickleweed are dominant	N	None	Suitable habitat is not found within the survey area.

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
California least tern (*Sternula antillarum browni*)	FE SE	Nests along the coast on sandy beaches.	N	None	Suitable habitat is not found within the survey area.
Bell's sage sparrow (*Amphispiza belli belli*)	CSC	Open chaparral and sage scrubs.	N	Breeding – Low Foraging - Low	Appropriate habitat is not found within the survey area; however, the species has been detected in the vicinity (Unitt 2004). However, the project footprint provides little value.
Tricolored blackbird (*Agelaius tricolor*)	CSC (nesting colony)	Breeds near fresh water, preferably in emergent wetland with tall, dense cattails or tules, but also in thickets of willow, blackberry, wild rose, tall herbs. Feeds in grassland and cropland habitats.	N	Breeding – None Foraging - None	Have been detected breeding just north of Sweetwater Reservoir but no suitable habitat on site (Unitt 2004).
MAMMALS					
Pallid bat (*Antrozous pallidus*)	CSC	Throughout So. Cal. from coast to mixed conifer forest; grasslands, shrublands, woodlands, & forest; most common in open, dry habitats w/ rocky areas for roosting; yearlong resident in most of range. Roosts in rock crevices, caves, mine shafts, under bridges, in buildings and tree hollows.	N	Roosting – None Foraging - Moderate	Suitable foraging habitat present within the project area. However, the project footprint provides little value.
Townsend's big-eared bat (*Corynorhinus townsendii*)	CSC	Throughout Cal. in all but sub-alpine & alpine habitats yearlong; most abundant in mesic habitats; Roosts – caves, mines, tunnels, buildings, or other man-made structures.	N	Roosting – None Foraging - Low	Suitable foraging habitat present within the project area. However, the project footprint provides little value.
Spotted bat (*Euderma maculatum*)	CSC	Mostly in foothills, mtns., & desert regions of So. Cal.; desert, grasslands, mixed conifer forest; Roosts – rock crevices, caves, cliffs.	N	Roosting – None Foraging - Low	Suitable foraging habitat present within the project area. However, the project footprint provides little value.

Common Name (*Scientific Name*)	**Sensitivity Code & Status**	**Habitat Preference/Requirements**	**Verified On-site (Yes/No)**	**Potential to Occur**	**Rationale**
Western mastiff bat (*Eumops perotis californicus*)	CSC	Primarily a cliff-dwelling species for breeding. Found foraging in a variety of habitats, from dry desert washes, flood plains, chaparral, oak woodland, open ponderosa pine forest, grassland, montane meadows, and agricultural areas.	N	Roosting – None Foraging - Moderate	Suitable foraging habitat present within the project area. However, the project footprint provides little value.
Pocketed free-tailed bat (*Nyctinomops (=Tadarida) femorosaccus*)	CSC	Lives in deserts and sage scrub, roosts in rocky crevices.	N	Moderate	Suitable foraging habitat present within the project area. However, the project footprint provides little value.
Big free-tailed bat (*Nyctinomops (=Tadarida) macrotis*)	CSC	Inhabits arid, rocky areas; roosts in crevices in cliffs. Has been recorded in urban locations in San Diego County (CDFG 2005).	N	Roosting – None Foraging – Very low	Suitable foraging habitat present within the project area; however, species is rare in California (CDFG 2005). The project footprint provides little value.
Mexican long-tongued bat (*Choeronycteris mexicana*)	CSC	Likes desert canyons, arid mountain ranges. Roosts by day in caves, mines or buildings.	N	Roosting – None Foraging – Very low	Records indicate only a summer resident in San Diego County (CDFG 2005).
San Diego black-tailed jackrabbit (*Lepus californicus bennettii*)	CSC	Mostly found on the coastal side of our local mountains in open habitats, usually avoiding dense stands of chaparral or woodlands.	Y	Observed	Individual observed during surveys in 2005 (RC Biological 2005).
Dulzura pocket mouse (*Chaetodipus californicus femoralis*)	CSC	Coastal and montane regions on grassland, sage scrub, and chaparral slopes.	N	Moderate	Suitable habitat present in the surrounding area.
Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)	CSC	Coastal sage scrub, sage scrub/grassland ecotones, and chaparral communities.	N	Moderate	Suitable habitat present within the project area.
San Diego desert woodrat (*Neotoma lepida intermedia*)	CSC	Variety of shrub and desert habitats, primarily associated with rock outcroppings, boulders, cacti, or areas of dense undergrowth.	Y	Observed	No middens within the project footprint; however, there are middens in the adjacent habitat. Species observed in 2005 (RC Biological 2005).

Common Name (*Scientific Name*)	Sensitivity Code & Status	Habitat Preference/Requirements	Verified On-site (Yes/No)	Potential to Occur	Rationale
Pacific pocket mouse (*Perognathus longimembris pacificus*)	SE	Inhabits coastal plains; prefers soils of fine alluvial sands near the ocean.	N	None	Suitable habitat is not found within the survey area.
Southern grasshopper mouse (*Onychomys torridus ramona*)	CSC	Grasslands and sparse coastal sage scrub habitats.	N	Moderate	Suitable habitat present within the project area
American badger (*Taxidea taxus*)	CSC	Inhabit a diversity of habitats with principal requirements of sufficient food, friable soils, and relatively open, uncultivated ground. Grasslands, savannas, and mountain meadows near timberline are preferred.	N	Very low	Area previously disturbed. Minimal suitable habitat exists within the survey area, which is located within the range of the species. Burrows would have been observable.

LEGEND:

STATUS:

Federal

FE - listed as endangered under the federal Endangered Species Act.

FT - listed as threatened under the federal Endangered Species Act.

State

SE - listed as endangered under the California Endangered Species Act.

FPS – fully protected species in California.

CSC - species of special concern in California.

References

Special Status information from CDFG 2008 and San Diego County 2006. Nomenclature and invertebrate descriptions from Hogan 2005, and USFWS 1997. Nomenclature and vertebrate descriptions from AOU 1998 and supplements (AOU 2000, 2002, 2003, 2004, 2005, 2006), CDFG 2005, Collins and Taggart 2002, Stephenson and Calcarone 1999, Baker *et al.* 2003, and Unitt 2004.

ATTACHMENT G

References

American Ornithologists' Union (AOU). 1998. Check-list of North American Birds, 7th ed. Washington, DC: American Ornithologists' Union.

———. 2006. Forty-seventh Supplement to the American Ornithologists' Union Checklist of North American Birds. Auk 123:926–936.

Baker, R. J., L. C. Bradley, R. D. Bradley, J. W. Dragoo, M. D. Engstrom, R. S. Hoffmann, C. A. Jones, F. Reid, D. W. Rice, and C. Jones. 2003. Revised Checklist of North American Mammals North of Mexico, 2003. Lubbock, TX: Occasional Papers, Museum of Texas Tech University, Number 229.

Beauchamp, R.M. 1986. A Flora of San Diego County, California. Sweetwater River Press.

Bond, M. and C. Bradley. 2003. Impacts of the 2003 Southern California Wildfires on Four Species Listed as Threatened or Endangered under the Federal Endangered Species Act: Quino checkerspot butterfly, Mountain yellow-legged frog, Coastal California gnatcatcher, Least Bell's vireo. Unpublished report prepared by the Center for Biological Diversity.

Bontrager, D.R. 1991. Habitat requirements, home range requirements, and breeding biology of the California Gnatcatcher (Polioptila californica) in south Orange County, California. Prepared for Santa Margarita Company, Ranch Santa Margarita, CA. April.

Browning, M. R. 1990. Taxa of North American Birds Described from 1957 to 1987. Proceedings of the Biological Society of Washington 103:432–451.

California Department of Fish and Game (CDFG). 2007. Special Plants List. Natural Diversity Data Base. July.

CDFG. 2006. Special Animals List. Natural Diversity Data Base. February.

CDFG. 2005. California Wildlife Habitat Relationships System (CWHR), version 8.1 personal computer program. Sacramento, CA: California Department of Fish and Game.

California Native Plant Society (CNPS). 2008. On-line Rare Plant Inventory. Accessed October 2008 (http://cnps.web.aplus.net/cgi-bin/inv/inventory.cgi)

California Natural Diversity Data Base (CNDDB). 2009. Database RareFind 3 Report.

Campbell, K.F., R.A. Erickson, W.E. Haas, and M.A. Patten. 1998. California Gnatcatcher use of habitats other than coastal sage scrub: conservation and management implications. Western Birds 29: 421-433.

Collins, J. T., and T. W. Taggart. 2002. Standard Common and Current Scientific Names for North American Amphibians, Turtles, Reptiles and Crocodilians. Center for North American Herpetology, Lawrence, Kansas. pp. 45.

Guinan, J. A., P. A. Gowaty, and E. K. Eltzroth. 2000. Western Bluebird (*Sialia mexicana*). *In* The Birds of North America, No. 510 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

HDR. 2006. Coastal Sage Scrub Revegetation Plan 640-1 and 640-2 Reservoirs. April 2006.

Hickman, J.C., ed. 1993. The Jepson Manual: Higher Plants of California. University of California Press. Berkeley, California. 1400 pp.

Hogan, D. 2005. Petition to List the Hermes Copper Butterfly (*Hermelycaena [Lycaena] hermes*) as Endangered Under the Endangered Species Act.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Nongame-Heritage Program, California Department of Fish and Game.

Jennings, M. R., and M. P. Hayes. 1994. Amphibian and reptile Species of Special Concern in California. Final report submitted to California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, under Contract 8023.

Mattoni, R., G. Pratt, T. Longcore, J. Emmel, and J. George. 1997. The endangered Quino checkerspot butterfly, *Euphydryas editha quino* (Lepidoptera: Nymphalidae). J. Res. Lep. 34:99-118.

Rebman, J. P., and M. G. Simpson. 2006. Checklist of the Vascular Plants of San Diego County, 4th edition. San Diego, CA: San Diego Natural History Museum and San Diego State University.

Reiser, C.H. 1994. Rare Plants of San Diego County. Aquafir Press. May.

San Diego County. 2006. San Diego County Sensitive Plant and Animal List. County of San Diego, Guidelines for Determining Significance, Biological Resources prepared by the Land Use and Environment Group, Department of Planning and Land Use, Department of Public Works.

Stebbins, R.C. 2003. *A Field Guide to Western Reptiles and Amphibians, Third Edition*. Houghton Mifflin Company, Boston, Massachusetts.

Stephenson, J.R. and G.M. Calcarone. 1999. Southern California mountains and foothills assessment: Habitat and species conservation issues. General Technical Report GTR-PSW-175. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture.

U.S. Army Coprs of Engineers (USACE). 1987. *Corps of Engineers Wetlands Delineation Manual*. Technical Report Y-87-1, Department of the Army. January.

U.S. Department of Agriculture (USDA). 1973. Soil Survey, San Diego Area. Soil Conservation Service and Forest Service. R. H. Bowman, ed. December.

U.S. Fish and Wildlife Service (USFWS). 1993. Endangered and threatened wildlife and plants: Special rule concerning take of the threatened coastal California Gnatcatcher. Final Rule. Federal Register 58: 65088-65096.

USFWS. 1997. Endangered and threatened wildlife and plants: determination of endangered status for the Laguna Mountain Skipper and Quino checkerspot butterfly. Federal Register 62 (11):2313-2322.

USFWS. 2004. Recovery Plan for *Deinandra conjugens* (Otay Tarplant). Portland, Oregon. vii + 65 pp.

Unitt, P. 2004. San Diego County Bird Atlas. Proceedings of the San Diego Society of Natural History 39: i–vii, 1–639.

Verts, B.J. and L.N. Carraway. 2002. *Neotoma lepida*. Mammalian Species. 699:1–12.

Whitaker, J.O. 1996. The Audubon Society Field Guide to North American Mammals. Revised and expanded. A.A. Knopf. New York.

CULTURAL RESOURCE SURVEY
FOR THE OTAY WATER DISTRICT 640-1 RESERVOIR PROJECT
SAN DIEGO COUNTY, CALIFORNIA

Prepared for:
HDR Engineering, Inc.

Prepared by:
Kyle Consulting

November 2004

Kyle Consulting

CULTURAL RESOURCE SURVEY
FOR THE OTAY WATER DISTRICT 640-1 RESERVOIR PROJECT
SAN DIEGO COUNTY, CALIFORNIA

Prepared for:
HDR Engineering, Inc.
9444 Farnham Street, Suite 300
San Diego, California 92123-1300
(858) 712-8400

Prepared by:
Kyle Consulting
2495 Bartel Place
San Diego, California 92123
(858) 569-0534

National Archaeological Data Base Information
Type of Study: Literature Review, Record Search, Field Survey
Area Covered: Approximately 10 acres
Site Previously Recorded: None
Isolates Previously Identified: None
Site Newly Identified: None
USGS Quadrangle: Jamul Mountain 7.5'
Key Words: Existing reservoir compound, project area disturbed, no cultural resources, no additional work recommended

Carolyn E. Kyle, RPA
Project Archaeologist

November 2004

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EXECUTIVE SUMMARY

TITLE: Cultural Resource Survey for the Otay Water District 640-1 Reservoir Project San Diego County, California

AUTHORS: Carolyn E. Kyle
Kyle Consulting
2495 Bartel Place
San Diego, California 92123

DATE: November 2004

SOURCE OF COPIES: South Coastal Information Center
San Diego State University
4283 El Cajon Boulevard, Suite 250
San Diego, California 92105

ABSTRACT:

This study included literature review, record search, and field survey of an approximately 10-acre parcel, and an associated pipeline alignment adjacent to an existing water storage compound. This study was conducted in compliance with state (CEQA) guidelines. The proposed project is to construct two water storage tanks and an associated pipeline. The location of the proposed water storage tanks was disturbed by construction of the existing water storage facilities. No cultural resources were identified by the literature review, record search, or field survey and no additional work is recommended.

SECTION 1
INTRODUCTION

1.1 PROJECT DESCRIPTION

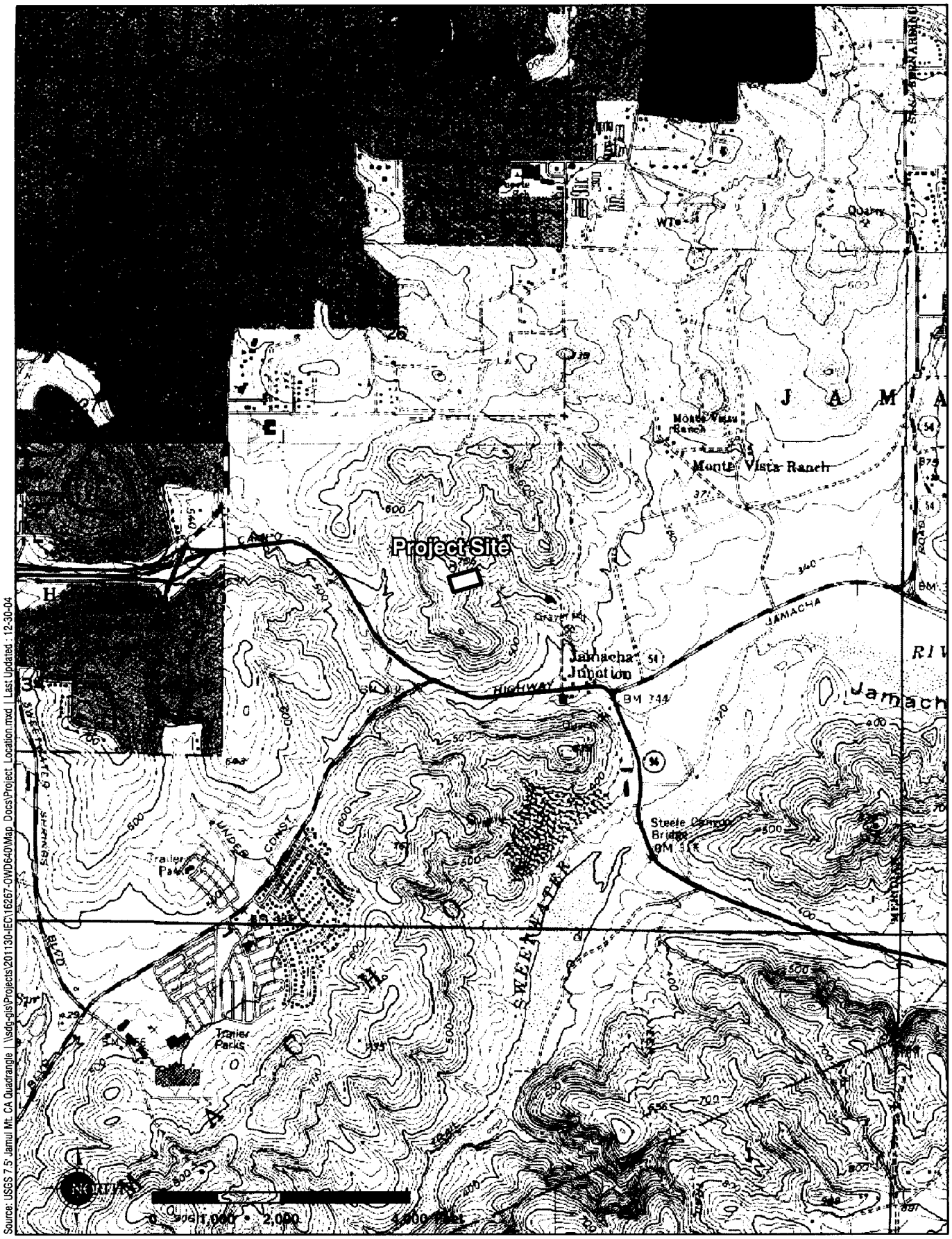
The current study, conducted in compliance with California Environmental Quality Act (CEQA) guidelines, included a literature review, record search, and field survey of an approximately 10-acre parcel and associated pipeline alignment. Literature information and site records on recorded cultural resources were obtained from data provided by the South Coastal Information Center at San Diego State University (Appendix A). The project area is located in the Rancho San Diego area of the County of San Diego (Figure 1-1). The parcel is located north of Campo Road/State Route 94. The study area is shown on the Jamul Mountain 7.5' USGS topographic map (Figure1-2). The resume of Ms. Kyle is included as Appendix B.

1.2 EXISTING CONDITIONS

The project area is located adjacent to an existing water storage compound. Most of the study area was disturbed during construction of the existing facility. Topography includes a relatively level area where the two new reservoirs will be constructed that is surrounded by steep slopes. Vegetation present within the study area is a disturbed sparse stand of Chaparral/coastal sage scrub. Soil within the study area consists of Friant rocky fine sandy loam (U.S. Department of Agriculture 1973). Friant series soils are fine well-drained sandy loams that have formed in material weathered from fine-grained metasedimentary rock. These soils have slopes of 9 to 70 percent.

1.3 Project Description

The Otay Water District proposes to construct two potable water reservoirs on District owned land in unincorporated San Diego County. Each reservoir is expected to have a capacity of 10 million gallons. The proposed site is northwest of the intersection of Campo Road (Highway 94) and Jamcaha Boulevard, and west of Cuyamaca College. The proposed site is adjacent to other facilities owned, and operated by the District. These adjacent facilities include; other water reservoirs (both above and below ground), and pump stations.



Source: USGS 7.5' Jamul Mt. CA Quadrangle | \\sdg-gis\Projects\201130-IEC\16267-OWD640\Map_Docs\Project_Location.mxd | Last Updated : 12-30-04

Project Location Map

FIGURE 2

HDR
ONE COMPANY | *Many Solutions*

1.4 BACKGROUND - PREHISTORY

San Diego County was occupied prehistorically by at least two major cultural groups. The San Dieguito are generally accepted as the first inhabitants of the region, occupying San Diego County as early as 9,000 years ago. The initial occupation (San Dieguito Complex) is believed to represent a people who entered San Diego County from the desert. These people hunted, fished, milled plant foods, and collected and processed shellfish. The continuation of this occupation, from at least 8,300 years ago to roughly 1,300 years ago, has been termed La Jolla Complex, Pauma Complex, and Encinitas Tradition. Archaeological sites reflecting this occupation are coastal shell habitation sites, inland hunting and milling camps, and quarry sites. Controversy surrounds the subsequent occupation post 9,000 years ago to 1,300 years ago (Early Period).

Occupation from 1,300 years ago (Late Period) to historic contact is well documented in San Diego County by the **numerous** Northern Diegueño/Ipai and Luiseño habitation sites. Artifacts and cultural patterns reflecting this Late Period occupation include small projectile points, pottery, obsidian from Obsidian Butte, and cremations. The project area falls within the Southern Diegueño/Ipai territory (Kroeber 1970).

1.5 RECORD SEARCH RESULTS

Cultural resources identified within a one-mile radius of the study area include: SDM-W-602; SDM-W-1310; SDM-W-1748; CA-SDI-2713/SDM-W-7440; CA-SDI-4648, Loci A through E; CA-SDI-4649/SDM-W-2753; CA-SDI-4654/SDM-W-2755; CA-SDI-4766; CA-SDI-4768; CA-SDI-4763/SDM-W-3485; CA-SDI-4763/H/SDM-W-1309; CA-SDI-4763, Locus 3/SDM-W-3485; CA-SDI-4765; CA-SDI-4775/SDM-W-3968; CA-SDI-4780/SDM-W-6513; CA-SDI-4781, CA-SDI-4782/CA-SDI-8326H/SDM-W-1146; CA-SDI-4783; CA-SDI-5064; CA-SDI-5065; CA-SDI-5066/SDM-W-1311; CA-SDI-8318; CA-SDI-8319H/SDM-W-2754; CA-SDI-8320H/SDM-W-2751; CA-SDI-8321H/SDM-W-1147, CA-SDI-8323H/SDM-W-2759; CA-SDI-8324/SDM-W-2749; CA-SDI-8325/SDM-W-2750; CA-SDI-12823/SDM-W-5231; CA-SDI-12824/SDM-W-5232; CA-SDI-14767; CA-SDI-15559; CA-SDI-15560/SDM-W-7439; and CA-SDI-15561/SDM-W582. These cultural resources include prehistoric habitation sites, camp sites, bedrock milling features, special use sites, isolates, and historic resources that reflect intensive use of

the resources provided by the resources available in the Sweetwater River Valley and the adjacent hills.

Previous studies conducted within a one-mile radius of the study area include: Gross (1972), Fink (1974), Gross (1974, 1975a, b), Barbolla (1977), Carrico (1974, 1977), Eckhardt and Carrico (1977), McManus (1977), Meacham (1977), Barbolla and Hedges (1978), PCR Toups (1979), Hueuett (1979, 1981), Rosen (1982), Crotteau (1983, 1984), Mooney-Lettieri and Associates, Inc. (1983, 1997), Barbolla-Rolan and Axford (1984), County of San Diego (1988, 1989), Gallegos et al. (1988), Smith (1990, 1992, 1993), Advanced Sciences, Inc. (1991), Clevenger (1994), Cook (1995), Glenn (1995), Kyle et al. (1995), Robbins-Wade and Whitehouse (1995a,b), Gallegos and Ni Ghablain (1998), Rosen (1998), and Ni Ghablain (2000).

No previous studies have been completed within the study area and no cultural resources have been identified.

SECTION 2

SURVEY METHODS, SURVEY RESULTS, AND RECOMMENDATIONS

2.1 SURVEY METHODS

A field survey was conducted for the proposed project on November 15, 2004 by Delman James, Stephen Briggs, and Carolyn Kyle. Ground visibility was good as the study area was covered with a sparse stand of chaparral/coastal sage scrub. The area was intensively surveyed using transects no wider that 10 meters between field personnel.

2.2 SURVEY RESULTS AND RECOMMENDATIONS

Much of the survey area was disturbed by construction of existing water storage compound the particularly in the portion of the survey area where the reservoirs will be constructed. The northern half of the pipeline alignment has been disturbed by grading for the installation of drainage ditches. The southern half is intact.

No cultural resources were identified by the literature review, record search, or the field survey. No additional work is recommended for the proposed project.

SECTION 3
REFERENCES CITED

Advanced Sciences, Inc.

1991 Cultural Resources Survey for a Proposed Water Line near Jamacha Junction. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Barbolla, Diane

1977 Proposed 20-2 Reservoir, Pipeline, and Road Easement: An Archaeological Survey. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Barbolla-Rolan, Diane and Michael L. Axford

1984 An Archaeological Survey: Proposed Willow Glen Drive Sewer Main. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Barbolla, Diane and Michael L. Axford

1978 An Archaeological Survey of the Jamacha Regulatory Reservoir Project. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Carrico, Richard

1974 Archaeological survey of Mount Helix 77 Acre Development. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1977 Archaeological-Historical Survey Report for Avocado Village Lot No. 4. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Clevenger, Joyce M.

1994 Historic Properties Survey Report for Proposed Improvements to Portions of State route 94, P.M. 14.1 to P.M. 16.7 and State Route 54, P.M. T-11.0 to P.M. 12.7. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Cook, John R.

1995 Appendix C: Cultural Resources Significance Evaluation Program for the Proposed Fairbanks Highlands Project, San Diego, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Crotteau, Karen L.

1983 First Addendum Archaeological Survey Report for the Proposed biological Mitigation Parcel for the Sweetwater River Bridge Replacement. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1984 Third Addendum Archaeological Survey Report for a Proposed Material Site and Biological Mitigation Parcel, Sweetwater Bridge Replacement Project. Unpublished report on file at the South Coastal Information Center, San Diego State University.

County of San Diego

1988 Extended Initial Study for the Monte Vista Borrow Pit. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1989 Draft Environmental impact Report for the Sweetwater Regional Park Revised Schematic Master Plan and Major Use Permit. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Eckhardt, William and Richard L. Carrico

1977 Archaeological-Historical Survey of the Rancho Ballena Project. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Fink, Gary R.

1974 Archaeological Survey for the Proposed Monte Vista Borrow Pit, Casa De Oro, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Gallegos, Dennis, Carolyn Kyle, and Richard Carrico

1988 Cultural Resource Survey and Testing for the Skyline Wesleyan Church Project, San Diego, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Gallegos, Dennis and Sinead Ni Ghablian

1998 Archaeological Data Recovery Program for Skyline Wesleyan Church, CA-SDI-4763, Locus I, County of San Diego, CA. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Glenn, Brian

1995 Cultural Resource Survey and National Register Eligibility Evaluation Program for the Rancho San Diego Equestrian Center, San Diego County, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Gross, Tim

1974 A Report of cultural Impact Survey Phase II Project: P.M. 1.9-16.3, 11-SD-54, Route 805 to Route 8. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1975a A Report of Cultural Impact Survey Phase I Project: P.M. 13.5-15.5, 11-SD-94, Avocado Boulevard to 0.5 Mile. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1975b A Report of Cultural Impact Survey Phase I Project: Steel Canyon Bridge Curve. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Gross, Tim and Paul Ezell

1972 An Archaeological Survey of Rancho San Diego. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Heuett, Mary Lou

1981 The Rancho San Diego Project I (Monte Vista Village) Archaeological Testing and Historic Research. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Kroeber, Alfred L.

1980 *Handbook of the Indians of California* (first edition). Bureau of American Ethnology Bulletin 78. Washington, D.C.

Kyle, Carolyn

2003 Cultural Resource Survey for Two Parcels Located on the Cuyamaca College Campus, County of San Diego, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Kyle, Carolyn and Dennis Gallegos

1993 Cultural Resource Extended Test and Survey Report for the Skyline Wesleyan Church Project, San Diego County, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

McManus, James A.

1977 Archaeological Survey Report 11-SD-94, P.M. 13.3 to P.M. 75.2, 11203-184211, Phase I. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Meacham, Charles M.

1977 An Archaeological Survey of Selected Portions of 11-SD-94 P.M. 13.3/15.1. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Mooney-Lettieri and Associates, Inc.

1983 Extended Initial Study for UEC Solar Energy Project. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1994 Draft Environmental Impact Report for Rancho San Diego Specific Plan. Unpublished report on file at the South Coastal Information Center, San Diego State University.

PRC Toups

1979 Environmental Impact Report: Rancho San Diego Specific Plan. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Robbins-Wade, Mary and John L. Whitehouse

1995a Archaeological Testing at CA-SDI-4760 for the Willow Glen Drive Road Widening Project, El Cajon, San Diego County, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1995b Archeological Testing CA-SDI-4763, Locus 2 for the Jamacha Boulevard Improvements Project, El Cajon, San Diego County, California. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Rosen, Martin D.

1981 Final Report of Archaeological Phase II Excavations at SDI-4763 (W-3485) and SDI-5066 (W-1311). Unpublished report on file at the South Coastal Information Center, San Diego State University.

1998 Third Supplemental/Historical Property Survey Report for Biological Mitigation Sites, Utility Relocation Sweetwater Road Realignment and the Evaluation of the Sweetwater Dam, Sweetwater Quarries and National City and Otay Railroad. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Smith, Brian F.

1995 Results of a Cultural Resource Survey of the 42 Inch Transmission Main and Regulatory Site Improvement Project for the Otay Water District. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1996 An Archaeological Survey of the Nawaz Lot Split Project. Unpublished report on file at the South Coastal Information Center, San Diego State University.

1989 Cultural Resource Study at Sites CA-SDI-684 and CA-SDI-9854. Unpublished report on file at the South Coastal Information Center, San Diego State University.

Tax Factor, Inc.

1928 Aerial Photograph. On file, County of San Diego, Department of Planning and Land Use, Cartographic Section.

United States Department of Agriculture

1997 *Soil Survey, San Diego Area, California.*

Van Wormer, Stephen Roger

1986 A History of the Jamacha Valley: Agricultural and Community Development in Southern California. Master's Degree Thesis on file at San Diego State University.

APPENDIX A

RECORD SEARCH RESULTS

SDSU
San Diego State University

South Coastal Information Center
College of Arts and Letters
4283 El Cajon Blvd., Suite 250
San Diego CA 92105
TEL: 619-594-5682

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

SITE FILES RECORD SEARCH

Source of Request: Kyle Consulting (Carolyn Kyle/Del James)

Date of Request: 12 November, 2004

Date Request Received: 12 November, 2004

Project Identification: Otay Water District Project

Search Radius: 1-Mile

() The South Coastal Information Center historical files DO NOT show recorded - prehistoric or historic site location(s) within the project boundaries, nor prehistoric site location(s) within the specified radius of the project area.

(X) The South Coastal Information Center historical files DO show recorded prehistoric or historic site location(s) within the project boundaries and/or prehistoric site location(s) within the specified radius of the project area.

Historical Site Location(s) check: Self **Date:** 12 November, 2004

Archaeological (CA-SDI) and Primary (P-37) site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Bibliographic Materials check: Self **Date:** 12 November, 2004

Project boundary maps have been reviewed. The bibliographic materials for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Map(s) check: Self **Date:** 12 November, 2004

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Historic Resources check: Self **Date:** 12 November, 2004

If there are historic resources within your project boundaries, information from the National Register of Historic Properties, California Register, California State Landmarks, California Points of Historic Interest, and other historic property lists, has been included. A map generated from Geofinder, a historic database and mapping program, has been included.

HOURS: 1 Hour(s) **COPIES:** 25 **RUSH:** No

This is not an invoice. Please pay from the monthly Billing Statement.

APPENDIX B

KEY PERSONNEL RESUME

CAROLYN E. KYLE

Kyle Consulting

Cultural Resource Management

2495 Bartel Place, San Diego, California 92123 (858) 569-0534

EDUCATION

M.A. Anthropology, San Diego State University, 1988
B.A. Anthropology, San Diego State University, 1983

PROFESSIONAL AFFILIATIONS

Register of Professional Archaeologists (formerly Society of Professional Archeologists)
Society for American Archaeology
Society for California Archaeology
San Diego County Archaeological Society

PROFESSIONAL EXPERIENCE

Kyle Consulting ***June 1998 to Present***

Ms. Kyle has completed cultural resource constraint studies for the Crossroads, Valley Center, North Bay, Escondido, Valley Center, and San Ysidro redevelopment areas, as well as constraint studies for the Otay River Valley and the San Diego River. Other projects include a cultural resource survey and archaeological monitoring for the Otay Water Treatment Plant; data recovery programs for a portion of CA-SDI-48, located within the Ballast Point Submarine Base, and for site CA-SDI-11424, located on Otay Mesa. These studies were completed in compliance with state, federal, County of San Diego, and City of San Diego guidelines.

Ms. Kyle has completed work numerous cellular antenna sites in San Diego, Orange, Los Angeles, Riverside, San Bernardino, and Ventura counties. Ms. Kyle completed work on portions of the Level 3 fiberoptics alignment located in the states of California, Arizona, and Nevada. The Level 3 fiberoptics study included record searches, field surveys, and preparation of required documents and reports for each alignment in compliance with Section 106 and local guidelines. Review agencies for the fiberoptics project included State Office of Historic Preservation, Caltrans, the Bureau of Land Management, and various Cities and Counties.

Gallegos & Associates ***October 1991 to June 1998***

Ms. Kyle, as senior archaeologist at Gallegos & Associates, completed a full range of cultural resource studies. Duties included preparation of research designs and supervision of projects with the authority to direct fieldwork and subcontract to appropriate research consultants, as well as preparation of a report of finding for each project.

Projects completed in compliance with federal Section 106 guidelines include: a test of one prehistoric and two historic cultural resources for the Rancho del Oro Road/Highway 78 interchange project, surveys and testing programs for Camp Pendleton Housing, Naval Weapons Station Seal Beach, North Torrey Pines Bridge, and State Route 905. The State Route 905 project included preparation of a testing program research design for a large habitation site and a management plan that set criteria for determination of Otay Mesa site types and provided recommendations for future work on Otay Mesa.

Ms. Kyle served as Project Archaeologist for the following projects that were completed for Caltrans: the State Route 905 survey and test; survey and test programs for the Rancho del

Oro/Highway 78 interchange project and the Twin Oaks Valley Road/Highway 78 interchange project; and surveys for the North Torrey Pines Bridge widening project; and the Leucadia Boulevard/Interstate 5 interchange project. The cultural resources located within the proposed impact area of the Rancho del Oro Road/Highway 78 interchange project include a standing adobe and the location of a melted adobe.

Projects completed in compliance with City of San Diego and CEQA guidelines include surveys for the San Diego Bikeways project, the Tijuana Trolley Transport Pedestrian Path and Border Gate project in San Ysidro; a data recovery program for the East Mission Gorge Pump Station, a monitoring program for construction of the East Mission Gorge Force Main, surveys for Pipelines 2A and 4, test of three sites for the Kumeyaay Lake Campground, and a data recovery program of a prehistoric habitation site for the Remington Hills project in Otay Mesa.

Ms. Kyle has served as Project Archaeologist for a number of projects completed in compliance with the County of San Diego and CEQA guidelines . These projects include surveys for the proposed Valley Center Sewerage and Water Reclamation Facilities, the Pomerado Reclamation Plant, and the Julian Water Control Facilities; a testing program of two prehistoric and two historic resources for the proposed widening of Valley Center Road; and a data recovery program for the proposed Skyline Church project.

Ms. Kyle served as Project Archaeologist for a significance testing program of a prehistoric site located on property owned by the University of California at San Diego (UCSD). Ms. Kyle also assisted historian Roxana Phillips with a significance assessment of buildings associated with historic Camp Matthews, located within the campus.

Additional projects completed include: a study with Ms. Phillips of the Spanish Landing area for the Port of San Diego, a survey for the Vista Irrigation District Potable Water and Water Reclamation project, overview studies for the cities of Escondido and Lemon Grove, and a field survey for the widening of Carlsbad Boulevard.

County of San Diego ***February 1989 to October 1991***

Environmental Analyst for the Department of Planning and Land Use/Archaeological Specialist. Duties included initial review of submitted projects, determination of required environmental studies, review of submitted studies, and presentation of determination and subsequent findings to the County Board. Reviewed archaeology reports submitted by consultants in response to County determinations. Responsible for report review and recommendations for cultural resource work necessary for the proposed 22,000-acre Otay Ranch project.

ERC Environmental and Energy Services Company ***1985 to February 1989***

Project Archaeologist responsible for direction of cultural resource surveys, test excavations, and data recovery programs. Major projects include the data recovery program for Ballast Point, Batiquitos Ridge, Kuebler Ranch - Otay Mesa, San Diego Mission, and Westwood Valley. Responsible for direction of field and laboratory crews, coordination of artifact analysis, and principle author of reports of findings.

Archaeological Consultant ***1983 to 1985***

Archaeological consultant with various firms including WESTEC, RECON, RBR & Associates, and Brian F. Mooney & Associates. Positions for these firms included both laboratory and field crew member for: Johnson-Taylor Adobe, under the supervision of Dr. Susan Hector, RECON; Fieldstone Northview, Unit 4, Encinitas, under the supervision of Dennis Gallegos, WESTEC; data recovery program for a large prehistoric village at Sabre Springs, Poway, under the direction of Sean Cardenas, RBR & Associates.

MAJOR REPORTS

2003 Cultural Resource Survey and Test for the Washington Hills Project. Prepared for the City of Escondido.

2003 Cultural Resource Monitoring and Analysis of Recovered Historic Material for the Market Manor Project. Prepared for the City of San Diego.

2003 Cultural Resource Survey and Test for the Viejas Bridge Replacement Project. Prepared with Dayle Cheever, RECON for the County of San Diego and Caltrans.

2002 Cultural Resource Survey and Significance Test for the 76-Acre Jiles Ranch Project. Prepared for the County of San Diego.

2001 Cultural Resource Constraint Analysis for the Wetlands and Sedimentation Basin Sites, New and Alamo Rivers. Prepared for Imperial County, California.

2001 Constraint Analysis for Sixteen Proposed Airport Sites. Prepared for the Airport Sites Review Board, San Diego, California.

2000 Constraint Analysis for the Crossroads Redevelopment Project. Prepared for the City of San Diego.

2001 A Cultural Resource Inventory Update and Recommendations for the University of California at San Diego and Scripps Institution of Oceanography. Prepared for the University of California at San Diego.

2001 Cultural Resource Survey and Testing Program for the Future State Route 11 and East Otay Mesa Port of Entry Project. Prepared for the San Diego, California.

2001 Cultural Resource Survey for the Chaffin Subdivisions Project. Prepared for the County of San Diego, California.

2000 Cultural Resource Constraint Study for the Escondido General Plan Update Project, Prepared for the City of Escondido, California.

2000 Cultural Resource Survey for the International Gateway of the Americas Project. Prepared for the City of San Diego, California.

1999 Cultural Resource Survey for the Sycamore Estates Project, Cities of San Diego and Poway, California. Prepared for the City of San Diego.

1998 Cultural Resource Constraint Study for the Valley Center Sewer Moratorium EIR Project County of San Diego, California. Prepared for the County of San Diego.

1998 Cultural Resource Constraint Study for the Valley Center Sewer Moratorium EIR Project.Prepared for the County of San Diego, California

1998 Cultural Resource Constraint Study for the North Bay Redevelopment Project. Prepared for the County of San Diego.

1998 SR 905 Cultural Resource Inventory and Evaluation. Overview and testing program to identify and evaluate properties to determine National Register status of cultural resources within the proposed APE. Prepared for the City of San Diego and Caltrans.

1996 Cultural Resource constraint Study for the Lemon Grove General Plan. Prepared for the City of Lemon Grove, California.

1996 Cultural Resource Constraint Level Analysis for the San Ysidro Redevelopment Project. Prepared for the City of San Ysidro.

1995 Archaeological Testing of Seven Sites for the Stardust Golf Course Realignment Project. A significance test of cultural resources located adjacent the San Diego River. Prepared for the City of San Diego.

1995 Otay Mesa Road Widening Project Cultural Resources Technical Report: Archaeological testing of nine cultural resources. Prepared for the City of San Diego.

1994 Remington Hills Project: Archaeological Testing of Seven Sites Otay Mesa, San Diego, California. Archaeological significance testing of seven prehistoric sites. Prepared for the City of San Diego.

1994 Historical/Archaeological Test for the Casa de Aguirre Adobe Site, City of San Diego, California. A test using mechanical and hand excavation to identify presence/absence of remains of the Casa de Aguirre adobe. Prepared for the City of San Diego.

1994 Cultural Resource Survey and Test for the California Department of Corrections, R. J. Donovan-II Correctional Facility Project, Otay Mesa, San Diego County, California. A literature review, record search, and 174-acre field survey that identified the presence of previously recorded site CA-SDI-8654. A subsequent significance test was completed for the portion of the site located within the project area. Prepared for the California Department of Corrections.

1993 Data Recovery Program for a Portion of Prehistoric Site CA-SDI-10148 East Mission Gorge Pump Station and Force Main, San Diego, California. A data recovery program to mitigate impacts to portions of CA-SDI-10148, identified as significant after construction was begun. Analysis of recovered artifacts identified a 2,000 year old milling tool kit. Prepared for the City of San Diego.

1993 Archaeological Evaluation of Prehistoric Sites CA-SDI-11606, CA-SDI-11057A, and CA-SDI-11057B Kumeyaay Lake Campground, San Diego, California. A significance test prepared for the City of San Diego.

1993 Cultural Resource Survey and Test of Five Sites for the Otay Water District Central Area and Otay Mesa Interconnection Pipeline Alignments. A significance test that identified one significant and four not significant cultural resources. Prepared for the Otay Water District.

1993 A Constraint Study for the Otay Valley Regional Park FPA. This study included a literature review, record search, identification of constraints and opportunities, and recommendations for the proposed Otay Valley Regional Park.

1993 Historical/Archaeological Test Report for Sites CA-SDI-9775, CA-SDI-9775, CA-SDI-13187, and CA-SDI-13188 East County Square Development San Diego County, California A significance test prepared for the County of San Diego.

1992 Historical/Archaeological Survey and Testing for CA-SDI-5352 and CA-SDI-12730, Otay Mesa, San Diego, California. A testing program for a 250-acre parcel on Otay Mesa.

1991 Six Thousand Years of Occupation at Batiquitos Ridge. Report involved excavation of a five percent phased sample inventory to provide mitigation of development impacts.

1990 Early Period Occupation at the Kuebler Ranch Site SDi-8654, Otay Mesa, San Diego County, California. A data recovery program for a 7,000 year old site on Otay Mesa prepared for the County of San Diego.

1989 Archaeological/Historical Survey and Test Report for One City Block, Downtown Oceanside Redevelopment Core Block Area, Oceanside, California. Prepared for the City of Oceanside, California.

1988 Cultural Resource Inventory and CEQA Test for Site Importance, Rancho Bernardo Lake Course. Inventory of 315 acres, identification and testing of ten prehistoric sites for the J. W. Colachis Company.

1988 Cultural Resource Survey and Testing Program for the East Mesa Detention Facility, San Diego California. Project involved the survey of 523 acres, the identification and testing of eight prehistoric and one historic site. Three of these sites were quarry localities on Otay Mesa. Report prepared for the County of San Diego.

1988 Five Thousand Years of Maritime Subsistence at Ballast Point Prehistoric Site SDi-48 (W-164), San Diego, California. Report involved the excavation of a 2.5 percent sample within a coastal shell midden site, dated from 6000 to 1500 years before present. Report prepared for the U.S. Navy.

1987 Cultural Resource Inventory for Rancho La Quinta. Inventory of 1272 acres identifying six prehistoric sites within Coachella Valley, Riverside County, California. Report prepared for the Landmark Land Company.

1986 Archaeological Investigation at Westwood Valley, San Diego, California. Ten sites located within the Westwood Valley, Rancho Bernardo in San Diego, County.

PUBLICATIONS

Five Thousand Years of Maritime Subsistence at Ballast Point Prehistoric Site SDi-48 (W-164), San Diego, California. In press.

A 2,000 Year Old Milling Tool Kit from CA-SDI-10148, San Diego, California. In: *Proceedings for California Archaeology*, Vol. 8, 1995

An Overview of the Late Prehistoric Village in the Westwood Valley, Rancho Bernardo, California in *Proceedings of the Society for California Archaeology.*

PROFESSIONAL PAPERS PRESENTED

"An Overview of the Ballast Point Data Recovery Program at Site SDi-48, San Diego, California." Paper presented at the Society for California Archaeology Meetings, City of Commerce, California.

"An Overview of the San Diego Mission Excavations." Paper presented at the San Diego County Archaeology Society.

"An Overview of the Late Prehistoric Village in Westwood Valley, Rancho Bernardo, California." Paper presented at the Society for California Archaeology Meetings, Fresno, California.

"An Overview of the Prehistoric Village in Westwood Valley, Rancho Bernardo, California." Paper presented at the San Diego County Archaeological Society.

"A 2,000 Year Old Tool Kit from CA-SDI-10148, San Diego California." Paper presented at the Society for California Archaeology Meetings, Ventura, California.

"A Prehistoric Milling Tool Kit from CA-SDI-10148, San Diego, California." Paper presented at the Society for California Archaeology Meetings, Ventura, California.

REFERENCES

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GEOTECHNICAL EVALUATION
640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PREPARED FOR:
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August 29, 2005
Project No. 105393002

Ninyo & Moore
Geotechnical and Environmental Sciences Consultants

August 29, 2005
Project No. 105393002

Mr. Skip Lewis
Infrastructure Engineering Corporation
14271 Danielson Street
Poway, California 92064

Subject: Geotechnical Evaluation
640-1 and 640-2 Reservoirs
Rancho San Diego, California

Dear Mr. Lewis:

In accordance with your authorization, we have performed a geotechnical evaluation for the proposed 640-1 and 640-2 Reservoirs at the Regulatory Site north of State Highway 94 in Rancho San Diego, California. This report presents our geotechnical findings, conclusions, and recommendations regarding the proposed project. Our report was prepared in accordance with our proposal dated July 1, 2005.

We appreciate the opportunity to be of service on this project. If you have any questions or comments regarding our report, please do not hesitate to contact our office.

Sincerely,
NINYO & MOORE

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1. INTRODUCTION

In accordance with your request and our proposal dated July 1, 2005, we have performed a geotechnical evaluation and geophysical survey for the proposed 640-1 and 640-2 Reservoirs project at the Regulatory Site located north of State Highway 94 in Rancho San Diego, California (Figure 1). This report presents our conclusions regarding the geotechnical conditions at the subject site and our recommendations for the design and earthwork construction of this project.

2. SCOPE OF SERVICES

Ninyo & Moore's scope of services for this phase of the project included review of pertinent background data, performance of a geologic reconnaissance and subsurface evaluation, and engineering analysis with regard to the proposed project. Specifically, we performed the following tasks:

- Review of background data listed in the Selected References section of this report. The data reviewed included geotechnical reports, topographic maps, geologic data, stereoscopic aerial photographs, fault maps, and a conceptual site plan for the project.
- Performance of a geologic reconnaissance of the proposed site, including the observation and mapping of geologic conditions and the evaluation of possible geologic hazards which may impact the proposed project.
- Coordination and mobilization for the subsurface exploration. Mark-out of existing underground utilities was conducted through Underground Service Alert (USA).
- Performing a subsurface evaluation consisting of the excavating, logging, and sampling of 12 exploratory borings to evaluate the subsurface soils.
- Performing eight seismic refraction traverses.
- Performing laboratory testing on selected samples.
- Compilation and engineering analysis of the data obtained.
- Preparation of this geotechnical design and data report presenting our findings and conclusions regarding the proposed site. The report also includes geotechnical recommendations for the design and earthwork construction of the subject project.

3. PROJECT DESCRIPTION

Based on current plans, the reservoir project will consist of two buried 10 MG circular tanks as well as associated 42-inch inlet and outlet pipelines, control valve structures, other minor structures, and site grading. The pad elevation of the proposed reservoirs is approximately 615 feet Mean Sea Level (MSL). Grading will entail cuts of up to approximately 65 feet and fills of up to approximately 20 feet.

4. SITE DESCRIPTION

The 640-1 and 640-2 Reservoirs project site is located to the north of the existing regulatory site facilities approximately 1/2 mile northwest of the intersection of State Route 94 (Campo Road) and Jamacha Road in the Rancho San Diego area of San Diego County. The site generally consists of a southeasterly trending drainage canyon (Figure 2). The site area was used as a dump site for materials excavated during construction of the 520 Reservoir and a large portion of the site is covered by these fills. Numerous boulders to over 10 feet in diameter are present on the lower portions of the site. Current site elevations range from a high of approximately 708 feet above MSL at the top of the western canyon slope, to a low of approximately 570 feet MSL at the bottom of the canyon near the southern site boundary. Vegetation consists of a moderate growth of brush and weeds.

5. FIELD EXPLORATION AND LABORATORY TESTING

Our field exploration of the subject site included a geologic reconnaissance and subsurface exploratory work conducted on July 27 through August 3, 2005. The subsurface evaluation consisted of drilling 12, 8-inch diameter continuous flight, hollow-stem auger borings and performing eight seismic refraction traverses. The boring and seismic traverse locations were selected based on the results of our background geotechnical review, field reconnaissance, and the currently proposed reservoir layout. Prior to commencing the subsurface exploration, USA was notified for mark-out of the existing utilities.

5.1. Exploratory Borings

Twelve exploratory borings were excavated at the site on July 27 through August 1, 2005 at the approximate locations indicated on Figure 2. The borings were drilled with truck mounted and all-terrain-vehicle mounted continuous flight hollow-stem auger drills. Air impact drilling was used in several borings. Boring depths ranged from approximately 4 to 74 feet. Detailed logs of the borings are presented in Appendix A.

5.2. Seismic Refraction Survey

Eight seismic refraction traverses were performed on proposed cut portions of the site on July 28, 29, and August 3, 2005 at the locations depicted on Figure 2. The survey was performed using a 12-channel, digital seismograph with a 10-pound hammer as the energy source. The results of our seismic refraction traverses are presented in Appendix B.

5.3. Laboratory Testing

Samples were obtained during our subsurface evaluation for laboratory analysis. Testing included in-situ dry density and moisture content, grain size analysis, shear strength, soil corrosivity tests, and R-value. The results of the in-situ dry density and moisture testing are presented on the boring logs presented in Appendix A. Other laboratory test results are presented in Appendix C.

6. GEOLOGIC CONDITIONS

Our findings regarding regional geology and geology of the site vicinity, including faulting and seismicity, landslides, rippability (excavatability), and groundwater conditions at the subject site are provided in the following sections.

6.1. Regional Geologic Setting

The project area is situated in the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the

Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California (Norris and Webb, 1990). The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the southern California batholith. The portion of the province in San Diego County that includes the project area consists generally of uplifted and dissected cretaceous granitic rock.

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending roughly northwest. Several of these faults, shown on Figure 3, are considered active faults. The Elsinore, San Jacinto, and San Andreas faults are active fault systems located northeast of the project area and the Rose Canyon, Agua Blanca–Coronado Bank, San Diego Trough, and San Clemente faults are active faults located west of the project area. Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement. Further discussion of faulting relative to the site is provided in the Faulting and Seismicity section of this report.

6.2. Site Geology

Geologic units observed during our geologic reconnaissance and subsurface evaluation include topsoil, fill, and granitic rock. Although not observed or encountered in our borings, slopewash/alluvium was reported by others on the site and may be present on portions of the site below the fill soils. Generalized descriptions of the earth units encountered are provided in the subsequent sections.

6.2.1. Topsoil

Topsoil was observed on the natural slopes on the upper portions of the site and encountered in boring B-8 to a depth of approximately 2 feet. As encountered, the topsoil generally consisted of loose to medium dense, dry to damp, silty fine to medium sand with scattered gravel and cobbles.

6.2.2. Fill

Fill deposits were observed in the lower elevation portions of the site associated with previous grading for the existing reservoirs and improvements at the site. These fill soils were placed as stockpiles to dispose of excavated materials, are undocumented, and likely placed without compactive effort. Fill was encountered in borings B-1 and B-6 through B-10 from the surface to the depths explored. In borings B-2 through B-5, B-11, and B-12, fill was encountered to depths of approximately 4.5, 3.0, 48, 29, 7, and 1 feet, respectively. As observed and encountered in our borings, the fill generally consisted of loose to dense, dry to damp, silty fine to coarse sand with numerous angular cobbles and boulders to 2.5 feet in diameter. Several of the borings also encountered caving which is indicative of loose dry soils. Based on a review of the referenced reports for the site, the fill soils may be up to 60 feet deep and contain boulders up to 3 feet in diameter.

6.2.3. Alluvium/Slopewash

Alluvium/slopewash was reported by others to underlie portions of the site covered by fill. Based on previous reports prepared by others, the alluvium/slopewash may be 30 or more feet deep in the pre-existing valley bottom but is likely to become shallower as it extends up the buried site slopes. As reported, the alluvium/slopewash materials generally consisted of loose, dry, silty fine to coarse sand.

6.2.4. Granitic Rock

Granitic rock was observed on higher portions of the site and encountered in our borings beneath fill soils on the remainder of the site. As encountered, the granitic rock generally consisted of decomposed to weathered granitic rock. Areas of slightly weathered to unweathered granitic rock were observed in the cut slope for the 520 Reservoir to the south of the site and are likely to be encountered within cuts in the granitic rock at the project site.

6.3. Rippability

Based on our site reconnaissance and seismic refraction survey, the on-site fill and alluvium/slopewash materials are expected to be rippable with normal heavy-duty earthmoving equipment. Granitic rock, as exposed in the cut slope to the south of the proposed reservoir site, will be generally rippable, however the results of our seismic refraction survey indicate that marginally rippable to unrippable material is likely to be encountered in cuts for the proposed reservoirs. Our seismic refraction survey also indicates that trenching may be difficult to the west and south of the existing 520-3 reservoir. The use of blasting or rock breaking equipment should be anticipated.

6.4. Groundwater

Groundwater was not encountered in our exploratory borings. Based on our experience in the vicinity of the site, we anticipate that groundwater at the subject site is at a depth of more than 100 feet. Fluctuations in the groundwater level may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, and other factors.

6.5. Faulting and Seismicity

The project area is considered to be seismically active. Based on our review of the referenced geologic maps and stereoscopic aerial photographs, as well as on our geologic field mapping, the subject site is not underlain by known active or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years and 2,000,000 years, respectively).

In general, hazards associated with seismic activity include; strong ground motion, ground surface rupture, liquefaction, seismically induced settlement, and tsunamis. These hazards are discussed in the following sections.

6.5.1. Strong Ground Motion and Ground Surface Rupture

Based on probabilistic seismic hazard analysis software developed by Thomas F. Blake (FRISKSP 4.00), the calculated peak horizontal ground acceleration having a 10 percent probability in 100 years (upper-bound earthquake) for the site is 0.21g and the calculated peak horizontal ground acceleration having a 10 percent probability in 50 years (design-basis earthquake) for the site is 0.16g. The requirements of the governing jurisdictions and applicable building codes should be considered in the project design.

The active Rose Canyon Fault is located approximately 11 miles west of the site. The Rose Canyon Fault is capable of generating an earthquake magnitude of 6.9 (California Division of Mines and Geology, 1998).

Based on our review of the referenced literature, no active faults have been mapped across the project site and the potential for ground rupture due to faulting is considered low. Lurching or cracking of the ground surface as a result of nearby seismic events, however, is possible.

6.5.2. Tsunamis

Tsunamis are long wavelength seismic sea waves (long compared to the ocean depth) generated by sudden movements of the ocean bottom during submarine earthquakes, landslides, or volcanic activity. Based on the inland location and elevation of the site, the potential for damage due to tsunami is not a design consideration.

6.5.3. Seismic Response Spectra

Seismic response spectra were constructed using the general empirical approach and amplification factors recommended by Newmark and Hall (1982). Median (50 percentile) structural amplification factors were used together with the peak ground motion parameters to evaluate spectral values of acceleration. The seismic response spectra for 0.5, 2, and 5 percent damping are graphically presented on Figures 4 and 5.

6.5.4. Liquefaction and Seismically Induced Settlement

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by a relatively shallow groundwater table are susceptible to liquefaction. Based on the lack of a shallow groundwater table and the dense nature of the granitic materials underlying the site, the potential for liquefaction is not a design consideration.

6.5.5. CBC Seismic Design Parameters

According to the 2001 California Building Code (CBC), the proposed project site is in Seismic Zone 4. The site is not within a near source zone. Tables 1 and 2 include the seismic design parameters for the site as defined in, and for use with, the 2001 edition of the CBC.

Table 1 – Seismic Design Parameters - Reservoirs Founded on Rock/Slurry

Parameter	Value	2001 CBC Reference
Seismic Zone Factor, Z	0.40	Table 16A – I
Soil Profile Type	S_B	Table 16A – J
Seismic Coefficient C_a	0.40	Table 16A – Q
Seismic Coefficient C_v	0.40	Table 16A – R
Near-Source Factor, N_a	1.0	Table 16A – S
Near-Source Factor, N_v	1.0	Table 16A – T
Seismic Source Type	B	Table 16A – U

Table 2 – Seismic Design Parameters - Structures Founded on Fill

Parameter	Value	2001 CBC Reference
Seismic Zone Factor, Z	0.40	Table 16A – I
Soil Profile Type	S_c	Table 16A – J
Seismic Coefficient C_a	0.40	Table 16A – Q
Seismic Coefficient C_v	0.56	Table 16A – R
Near-Source Factor, N_a	1.0	Table 16A – S
Near-Source Factor, N_v	1.0	Table 16A – T
Seismic Source Type	B	Table 16A – U

6.6. Landsliding

Based on our review of published geologic literature and aerial photographs, and our geologic reconnaissance, no landslides or related features underlie the subject site.

7. CONCLUSIONS

Based on our review of the referenced background data and geologic field reconnaissance, it is our opinion that construction of the proposed project is feasible from a geotechnical standpoint. The preliminary conclusions and recommendations in this report may change as the result of a subsurface evaluation to be performed at the site. Based on our review of published geologic maps and our field evaluation, the project site is not underlain by active faults or landslides. Geotechnical considerations include the following:

- Based on the soils observed in our reconnaissance and our subsurface evaluation, the project site is underlain by fill and granitic rock. In addition, based on our review of reports prepared by others, alluvium/slopewash up to approximately 30 feet deep is likely to underlie the fill. It is our understanding that the fill is undocumented and placed without compactive effort. Due to the possible potential for differential settlement, fill and alluvium/slopewash encountered during rough grading operations should be removed prior to placing new fill.

- Based on current plans, the proposed 640-2 Reservoir will be underlain by a cut/fill transition. In order to reduce the potential for differential settlement, the cut portion of the pad should be undercut an amount equal to one-third or more of the deepest fill depth beneath the structure or 3 feet, whichever is greater, and replaced with compacted fill. As an alternative, either the ringwall foundation can be deepened to bear on formational material and the fill removed within the ringwall and replaced with slurry, or the fill can be removed and replaced with slurry such that the slurry extends beyond a 1:1 (horizontal:vertical) plane extending downward and outward from the base of the ringwall foundation.

- The on-site fill and any slopewash/alluvium should be generally excavatable with conventional earth moving construction equipment. Where cuts are planned in granitic rock, difficult ripping, the use of rock breakers, or blasting should be anticipated.

- A large amount of oversize rock is likely to be generated from excavations in both fill and granitic rock on the site. These materials are not suitable for reuse as structural fill and will need to be crushed or disposed of in non-structural portions of the site.

- Groundwater is not expected to be a constraint during construction.

8. RECOMMENDATIONS

Based on our understanding of the project, the following recommendations are provided for the design and construction of the proposed 640-1 and 640-2 Reservoirs.

8.1. Earthwork

The following sections present our recommendations regarding earthwork for the project. In addition, Typical Earthwork Guidelines for the project are included as Appendix D. In the event of a conflict in recommendations, the recommendations presented in the text of this report supersede those in Appendix D.

8.1.1. Site Preparation

The project site should be cleared and grubbed prior to grading. Clearing and grubbing should consist of the substantial removal of vegetation and other deleterious materials from the areas to be graded. Clearing and grubbing should extend to the outside of the proposed excavation and fill areas. The debris generated during clearing and grubbing should be removed from areas to be graded and disposed of off site at a legal dumpsite.

8.1.2. Excavation Characteristics

The results of our geologic reconnaissance indicate that the project site, as presently proposed, is underlain by fill, alluvium/slopewash, and granitic rock. The on-site fill and alluvium/slopewash materials should generally be excavatable by heavy-duty earthmoving equipment in good working condition. Granitic rock, as exposed in the cut slope to the south of the proposed reservoir site, appears to be generally rippable, however slightly weathered to unweathered granitic rock is likely to be encountered within the rippable granitic rock and in the deeper excavations for the reservoirs. The use of blasting or rock breaking equipment should be anticipated.

8.1.3. Treatment of Existing Fill Soils and Alluvium/Slopewash

To reduce the potential for differential settlement of foundations, we recommend that the existing fill materials and any underlying alluvium/slopewash in structural areas of the site be removed and replaced with compacted fill. The exposed surface of the remedial excavation should be scarified, moisture conditioned, and compacted, prior to placing new compacted fill. The removal bottoms should be evaluated by the geotechnical consultant's representative in the field prior to scarifying the bottom and placing new fill. Any unsuitable materials such as organic matter or oversized material should be selectively removed and disposed of off site.

8.1.4. Treatment of Cut/Fill Transitions Beneath Structures

We anticipate that the future 640-2 reservoir may be underlain by a cut/fill transition. In order to mitigate the potential for differential settlement, we recommend that where a cut/fill transition line extends beneath a proposed tank or structure location, the cut portion of the pad should be undercut an amount one-third or more of the deepest fill depth beneath the structure or 3 feet, whichever is more, and replaced with compacted fill. The undercut should be extended outward from the structure footprint a distance of 5 feet plus the depth of undercut. As an alternative, either the ringwall foundation can be deepened to bear on formational material and the fill removed within the ringwall and replaced with slurry, or a conventional foundation design can be used if the fill is removed and replaced with slurry such that the slurry extends beyond a 1:1 (horizontal:vertical) plane extending downward and outward from the base of the ringwall foundation (see Figure 6).

8.1.5. Materials for Fill

On-site soils with an organic content of less than 3 percent by volume (or 1 percent by weight) are suitable for use as fill. Trash or construction debris should be selectively removed prior to use as fill. Fill material should not contain rocks or lumps over 6 inches in largest dimension, and not more than 40 percent larger than 3/4 inch. Materials derived from the existing fill or granitic rock may contain abundant rock over

6 inches in diameter which will not be suitable for use as fill. Utility trench backfill material should not contain rocks or lumps over 3 inches in largest dimension and not more than 40 percent larger than 3/4 inch. Larger chunks, if generated during excavation, may be broken into acceptably sized pieces or disposed of off site. Any imported fill material should be a low or very low expansion potential (UBC Expansion Index of 50 or less) granular soil. Import material should also have low corrosion potential (electrical resistivity more than 2,000 ohm-cm, chloride content less than 200 parts per million [ppm], and soluble sulfate content of less than 0.1 percent). Materials for use as fill should be evaluated by the geotechnical consultant's representative prior to filling or importing.

8.1.6. Compacted Fill

Prior to scarification and placement of compacted fill, the contractor should request an evaluation of the exposed ground surface by the geotechnical consultant. Unless otherwise recommended, the exposed ground surface should then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve generally consistent moisture contents at or near the optimum moisture content. The scarified materials should then be compacted to 90 percent or more relative compaction in accordance with the American Society for Testing and Materials (ASTM) Test Method D 1557-02. For proposed pavement areas, the upper 12 inches of subgrade should be compacted to 95 percent or more relative compaction. The evaluation of compaction by the geotechnical consultant should not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify the geotechnical consultant and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

Fill materials should be moisture conditioned to near optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils should be generally consistent.

Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill should be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

Compacted fill should be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift should be watered or dried as needed to achieve near optimum moisture condition, mixed, and then compacted by mechanical methods, using sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other appropriate compacting rollers, to a relative compaction of 90 percent or more. Successive lifts should be treated in a like manner until the desired finished grades are achieved.

8.1.7. Slopes

Unless otherwise recommended by the geotechnical consultant and approved by the regulating agencies, cut and fill slopes should not be steeper than 2:1 (horizontal:vertical).

Compaction of the face of fill slopes should be performed by backrolling at intervals of 4 feet or less in vertical slope height, or as dictated by the capability of the available equipment, whichever is less. Fill slopes should be backrolled utilizing a conventional sheepsfoot-type roller. Care should be taken to maintain the desired moisture conditions and/or reestablish them, as needed, prior to backrolling. The placement, moisture conditioning, and compaction of fill slope materials should be done in accordance with the recommendations presented in the Compacted Fill section of this report.

Site runoff should not be permitted to flow over the tops of slopes. Positive drainage should be established away from the top of slopes. This may be accomplished by utilizing brow ditches placed at the top of slopes to divert surface runoff away from the slope face where drainage devices are not otherwise available.

The on-site soils are likely to be susceptible to erosion; therefore, the project plans and specifications should contain design features and construction requirements to mitigate

erosion of on-site soils during and after construction. Slopes and other exposed ground surfaces should be appropriately planted with protective ground cover.

8.1.8. Temporary Slope Stability

We recommend that trenches and excavations be designed and constructed in accordance with the Occupational Safety and Health Administration (OSHA) regulations. These regulations provide trench sloping and shoring design parameters for trenches up to 20 feet deep based on a description of the soil types encountered. Trenches over 20 feet deep should be designed by the Contractor's engineer based on site-specific geotechnical analyses. For planning purposes, we recommend that the following OSHA soil classifications be used:

Fill and Alluvium/Slopewash	*Type C*
Weathered Granitic Rock	*Type B*
Unweathered Granitic Rock	*Stable Rock*

Upon making the excavations, the soil/rock classifications and excavation performance should be evaluated in the field by the geotechnical consultant in accordance with OSHA regulations. Recommendations for temporary shoring can be provided, if requested. Lateral earth pressures for shoring design are presented on Figure 7.

In general, temporary slopes above the water table and excavated in fill or alluvium/slopewash should be inclined no steeper than 1.5:1. Temporary slopes above the water table and excavated in weathered granitic rock should be inclined no steeper than 1:1. Unweathered granitic rock may be excavated with vertical sides provided that there is no adverse jointing and the excavation is scaled of loose blocks. Temporary excavations that encounter seepage may need shoring or may be stabilized by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis.

8.1.9. Trench Backfill

Backfill for utility trenches should be compacted to 90 percent or more relative compaction as evaluated by ASTM D 1557-02. Lifts should be of appropriate thickness to allow compaction to be achieved with the equipment used.

8.1.10. Drainage

Roof, pad, and slope drainage should be diverted away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.).

Positive drainage adjacent to structures should be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of structures at a gradient of 2 percent or steeper for a distance of 5 feet or more outside the building perimeter, and further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

Surface drainage on the site should be provided so that water is not permitted to pond. A gradient of 2 percent or steeper should be maintained over the pad area and drainage patterns should be established to divert and remove water from the site to appropriate outlets.

Care should be taken by the contractor during final grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices on or adjacent to the property. Drainage patterns established at the time of final grading should be maintained for the life of the project. The property operators should be made very clearly aware that altering drainage patterns might be detrimental to slope stability and foundation performance.

8.1.11. Pipe Bedding and Modulus of Soil Reaction (*E'*)

It is our recommendation that the new pipelines be supported on 4 or more inches of granular bedding material. Granular pipe bedding should be provided to distribute vertical loads around the pipe. Bedding material and compaction requirements should be in accordance with this report, and the Standard Specifications for Public Works Construction (Public Works Standards, Inc., 2000), known as the "Greenbook." Section 306-1.2.1 in the Greenbook defines bedding requirements for the installation of pipe. The trench excavation should provide 6 to 8 inches of lateral clearance between the trench wall and the side of the pipe. Pipe bedding typically consists of graded aggregate. The pipe bedding and pipe zone backfill should conform to the following gradation limits:

Sieve Sizes	Percentage Passing Sieves
1"	100%
3/4"	90-100%
No. 4	50-100%
No. 30	25-45%
No. 200	3-12%

Pipe bedding and pipe zone backfill should have a Sand Equivalent (SE) of 30 or more, and be placed around the sides and top of the pipe. In addition, the pipe zone backfill should extend 1 foot or more above the top of the pipe.

The modulus of soil reaction (*E'*) is used to characterize the stiffness of soil backfill placed at the sides of buried flexible pipes for the purpose of evaluating deflection caused by the weight of the backfill over the pipe. A soil reaction modulus of 1,000 pounds per square inch (psi) may be used for a 0- to 5-foot deep excavation backfilled with granular soil compacted to 90 percent based on ASTM Test Method D 1557-02. A soil reaction modulus of 1,400 psi may be used for trenches 5 to 10 feet deep and a soil reaction modulus of 1,600 psi may be used for trenches 10 to 15 feet deep.

8.1.12. Thrust Blocks

Thrust blocks (if needed) should be designed for the support of pipelines in accordance with the pressure diagram on Figure 8. Thrust block excavations should be backfilled with compacted granular material.

8.2. Reservoir Foundations

We recommend that continuous and/or spread footings be founded in compacted fill, bedrock, or cement slurry. The foundations for the proposed reservoirs may be comprised of a circumferential footing. Design parameters utilized in our analysis of the foundations were based on our review of the subsurface conditions and our experience with similar materials. Foundations should be designed in accordance with structural considerations and the following recommendations.

The continuous perimeter footing should be founded 24 or more inches below adjacent grade to bear on the compacted fill, bedrock, or cement slurry. Footings should be 24 or more inches wide and may be designed using an allowable bearing capacity of 5,000 pounds per square foot (psf). This allowable bearing pressure may be increased by up to one-third when considering loads of short duration, such as wind or seismic forces.

Lateral loads may be resisted by soil friction and passive resistance. A friction coefficient of 0.35 may be used between the bases of the footings and formational material. The passive resistance of the formational material may be assumed to be equivalent to the pressure developed by an equivalent fluid weight of 400 pounds per cubic foot (pcf). The lateral bearing may be increased by 400 psf for each additional foot of depth not to exceed 4,000 psf. The total resistance may be taken as the sum of friction and the passive resistance, provided that passive resistance does not exceed one-half of the total.

The foundations should be designed for their specific loads and usage. We recommend that a structural engineer experienced with such structures be consulted.

8.2.1. Static Settlement

We estimate that the proposed structure, designed and constructed as recommended herein, will undergo total settlements of less than approximately 1 inch. Differential settlements are typically about one-half of the total settlement.

8.3. Retaining Walls

Retaining walls may be proposed at the subject site. For the design of a retaining wall that is not restrained against movement by rigid corners or structural connections, an active pressure represented by an equivalent fluid weight of 40 pcf may be assumed. Restrained walls (non-yielding) may be designed for an at-rest pressure represented by an equivalent fluid weight of 60 pcf. This pressure assumes low-expansive, level backfill and free draining conditions. Yielding and restrained walls retaining sloping backfill inclined at 2:1 may be designed using equivalent fluid weights of 60 pcf and 90 pcf, respectively. A drain should be provided behind the retaining wall as shown on Figure 9. The drain should be connected to an appropriate outlet.

The soil resistance against sliding consists of friction or adhesion at the base of the foundation and passive resistance against the embedded portion of the structure. Concrete foundations placed on compacted fill or bedrock may be designed using a coefficient of friction of 0.35. In lateral resistance applications, a passive resistance of 400 psf per foot of depth with a value of up to 4,000 psf can be assumed.

The allowable lateral resistance can be taken as the sum of the frictional resistance and the passive resistance provided the passive resistance does not exceed one-half of the total allowable lateral resistance. The coefficient of friction and passive resistance values can be increased by one-third when considering loads of short duration such as wind or seismic loading.

The retaining wall may be founded on a continuous footing based in compacted fill or bedrock. An allowable bearing capacity of 3,500 psf may be used for the design of retaining wall

foundations. The allowable bearing capacity should be increased by one-third when considering loads of short duration, such as wind or seismic forces.

8.4. Pavements

Based on the results of our subsurface evaluation, laboratory tests, and our experience with soils similar to those encountered at and near the site, we have assumed an R-value of 40 for the preliminary design of flexible pavements at the project site. Actual pavement recommendations should be based on R-value tests performed on bulk samples of the soils that are exposed at the finished subgrade elevations across the site at the end of the mass grading operations.

We understand that traffic will consist primarily of automobiles, light trucks, and occasional heavy trucks. For design we have used Traffic Indices (TI) of 5.0. We recommend that the geotechnical consultant re-evaluate the pavement design, based on the R-value of the subgrade material exposed at the time of construction. The preliminary recommended pavement sections are as follows:

Table 3 – Recommended Pavement Sections

Area	R-Value	Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
Access Drives	40	5.0	3.0	4.0

As indicated, these values assume traffic indices of 5.0 for site access drives. In addition, we recommend that the upper 12 inches of the subgrade be compacted to a relative compaction of 95 percent. The above pavement section should provide an approximate pavement life of 20 years. If traffic loads are different from those assumed, the pavement design should be re-evaluated.

We suggest that consideration be given to using portland cement concrete pavements in areas where dumpsters will be stored and where refuse trucks will stop and load. Experience indicates that refuse truck traffic can significantly shorten the useful life of asphalt concrete

sections. We recommend that in these areas, 6 inches of 600 psi flexural strength portland cement concrete reinforced with No. 3 bars, 18-inches on center, be placed over 3 or more feet of very low to low expansive formational material or compacted fill.

8.5. Corrosion

Laboratory testing was performed on a sample of the on-site soils to evaluate pH and electrical resistivity, as well as chloride and sulfate contents. The pH and electrical resistivity tests were performed in accordance with California Test 643, and the sulfate and chloride tests were performed in accordance with California Tests 416 and 422, respectively. These laboratory test results are presented in Appendix C.

The results of the corrosivity testing indicated an electrical resistivity of the sample tested of 2,900 ohm-cm. The soil pH of the sample was 6.0, which is near neutral. The sulfate and chloride content of the sample was 0.01 percent and 40 ppm, respectively. Based on Caltrans criteria, the site would not be classified as a corrosive site, which is defined as soil with more than 500 ppm chlorides or more than 0.2 percent sulfates.

Concrete in contact with soil or water that contains high concentrations of soluble sulfates can be subject to chemical deterioration. Laboratory testing indicated a sulfate content of the sample tested of less than 0.01 percent, which is considered negligible for sulfate attack. We recommend that concrete cover be provided over reinforcing steel in accordance with Section 1907.7 of the CBC for structures in contact with the soil. Although the results of the sulfate tests were not significantly high, due to the variability in the on-site soils and the potential for import soils, we recommend that Type V cement be used for concrete structures in contact with soil and that the water to cement ratio not exceed 0.45.

8.6. Pre-Construction Conference

We recommend that a pre-construction conference be held. Owner representatives, the civil engineer, geotechnical consultant, and contractor should be in attendance to discuss the plans and the project.

8.7. Construction Observation

The conclusions and recommendations presented in this report are based on analysis of observed conditions in widely spaced exploratory borings. If conditions are found to vary from those described in this report, Ninyo & Moore should be notified, and additional recommendations will be provided upon request. Ninyo & Moore should review the final project drawings and specifications prior to the commencement of construction. Ninyo & Moore should perform the needed observation and testing services during construction operations.

The recommendations provided in this report are based on the assumption that Ninyo & Moore will provide geotechnical observation and testing services during construction. In the event that it is decided not to utilize the services of Ninyo & Moore during construction, we request that the selected consultant provide the client with a letter (with a copy to Ninyo & Moore) indicating that they fully understand Ninyo & Moore's recommendations, and that they are in full agreement with the design parameters and recommendations contained in this report. Construction of proposed improvements should be performed by qualified subcontractors utilizing appropriate techniques and construction materials.

9. LIMITATIONS

The field evaluation and geotechnical analyses presented in this geotechnical report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construc-

tion. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

10. SELECTED REFERENCES

California Building Standards Commission, 2001, California Building Code, Title 24, Part 2, Volumes 1 and 2.

California Department of Conservation Division of Mines and Geology, 1998, Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada: dated February.

California Department of Conservation Division of Mines and Geology, 1999, Seismic Shaking Hazards Maps of California: Map Sheet 48.

Caterpillar, Inc., 2000, Caterpillar Performance Handbook, Caterpillar, Inc., Peoria, Illinois.

Corps of Engineers, 1990, Evaluation of Settlement For Dynamic and Transient Loads, Engineer Manual 1110-1-1904, Chapter 4.

Dames & Moore, 1992, Preliminary Report of Geologic and Geotechnical Investigation for Proposed Reservoirs and Appurtenant Facilities at the Regulatory Site, Jamul, California: dated June 1.

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, Scale 1:750,000.

Ninyo & Moore, 2004, Geologic Reconnaissance, 640-1 Reservoir, Rancho San Diego, California: dated November 24.

Norris, R. M. and Webb, R. W., 1990, Geology of California, Second Edition: John Wiley & Sons, Inc.

Public Works Standards, Inc., 2000, "Greenbook," Standard Specifications for Public Works Construction.

United States Department of the Interior, Bureau of Reclamation, 1998, Engineering Geology Field Manual.

United States Geological Survey/California Geological Survey, 2003, Probabilistic Seismic Hazards Assessment Model for California.

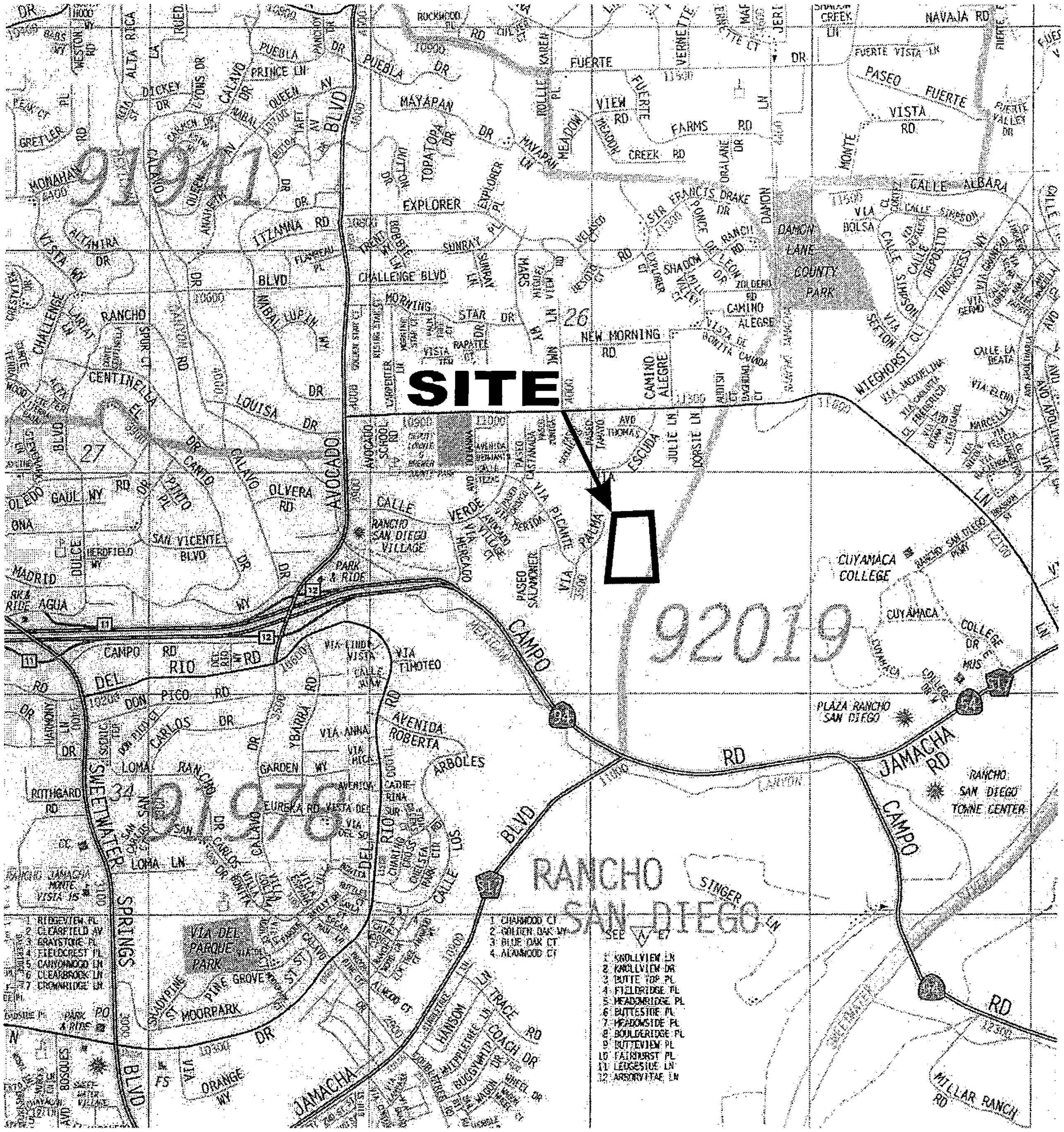
United States Geological Survey, 1955 (photo-revised 1975), Jamul Mountains Quadrangle, California, San Diego County, 7.5-Minute Series (Topographic): Scale 1:24,000.

Woodward Clyde Consultants, 1986, Geotechnical Investigation for the Proposed Otay Municipal Water District Regulatory Reservoirs, San Diego County, California: dated November 6.

Zucker Systems, 1992, Regulatory Site and 42" Water Transmission Main, Final Environmental Impact Report, SCH #92011006: dated July 31.

AERIAL PHOTOGRAPHS

Source	Date	Flight	Numbers	Scale
USDA	4-14-53	AXN-9M	64 and 65	1:20,000



0 1900 3800

Approximate Scale in Feet

N

REFERENCE: 2004 THOMAS GUIDE FOR SAN DIEGO COUNTY, STREET GUIDE AND DIRECTORY

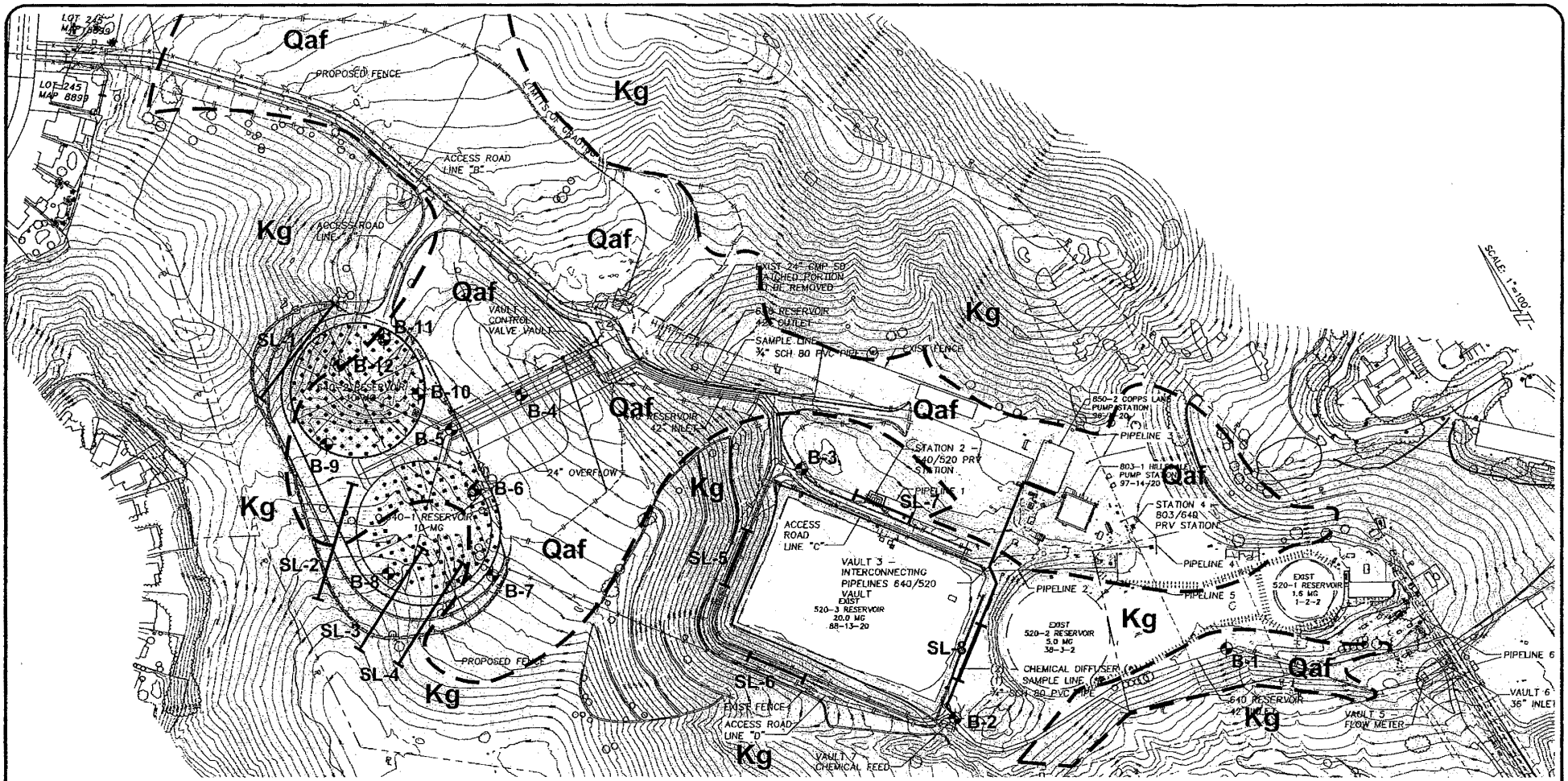
105393002 SLM Fig 1

Ninyo & Moore

SITE LOCATION MAP

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	1



LEGEND

Qaf	Fill
Kg	Granitic Rock
B-12	Approximate location of exploratory boring
SL-8	Approximate location of seismic refraction traverse
?	Approximate location of geologic contact, queried where questionable

0 200 400
Approximate Scale in Feet

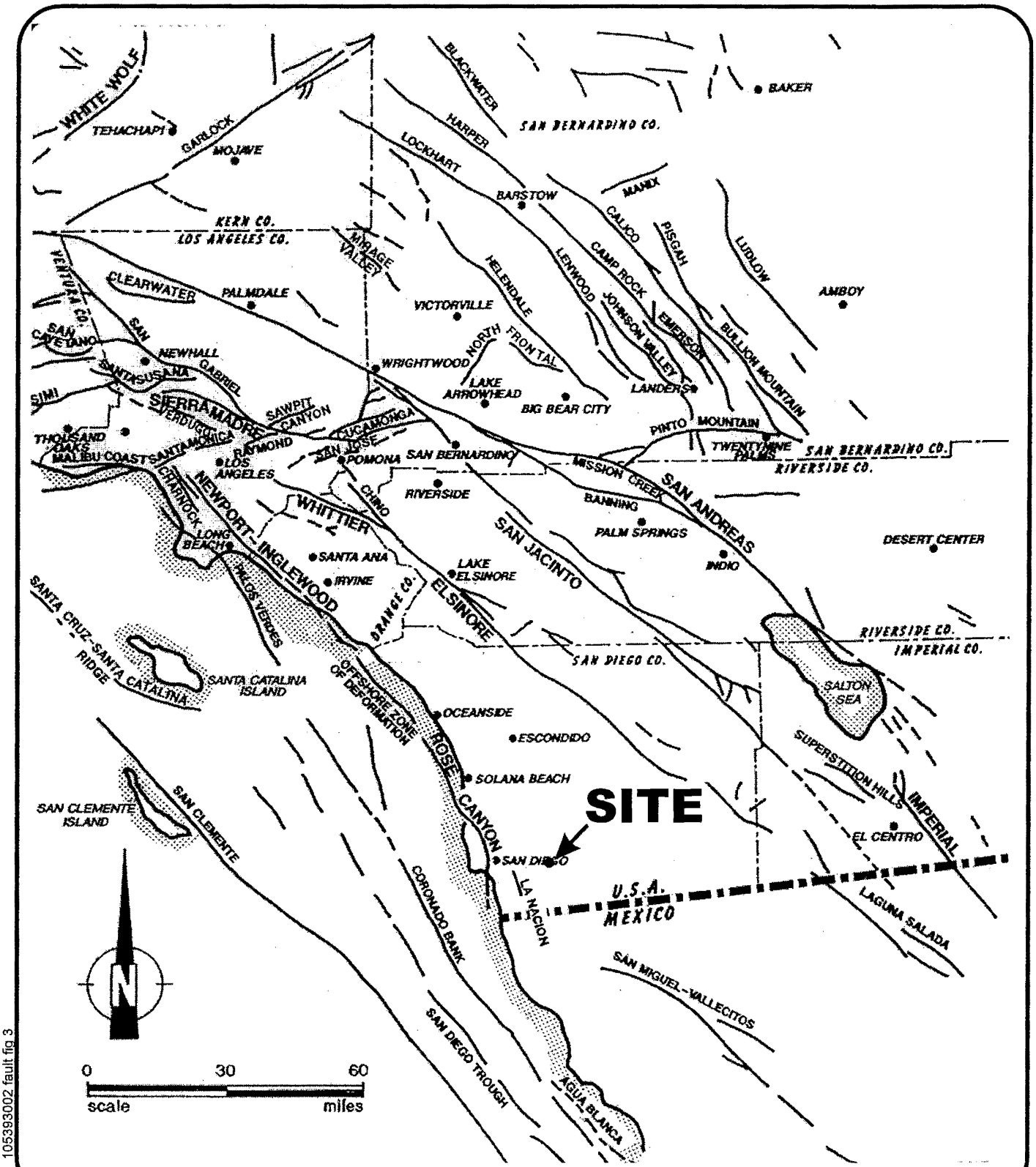
Ninyo & Moore

GEOTECHNICAL MAP

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	2

105393002



After Norris and Webb, 1990.

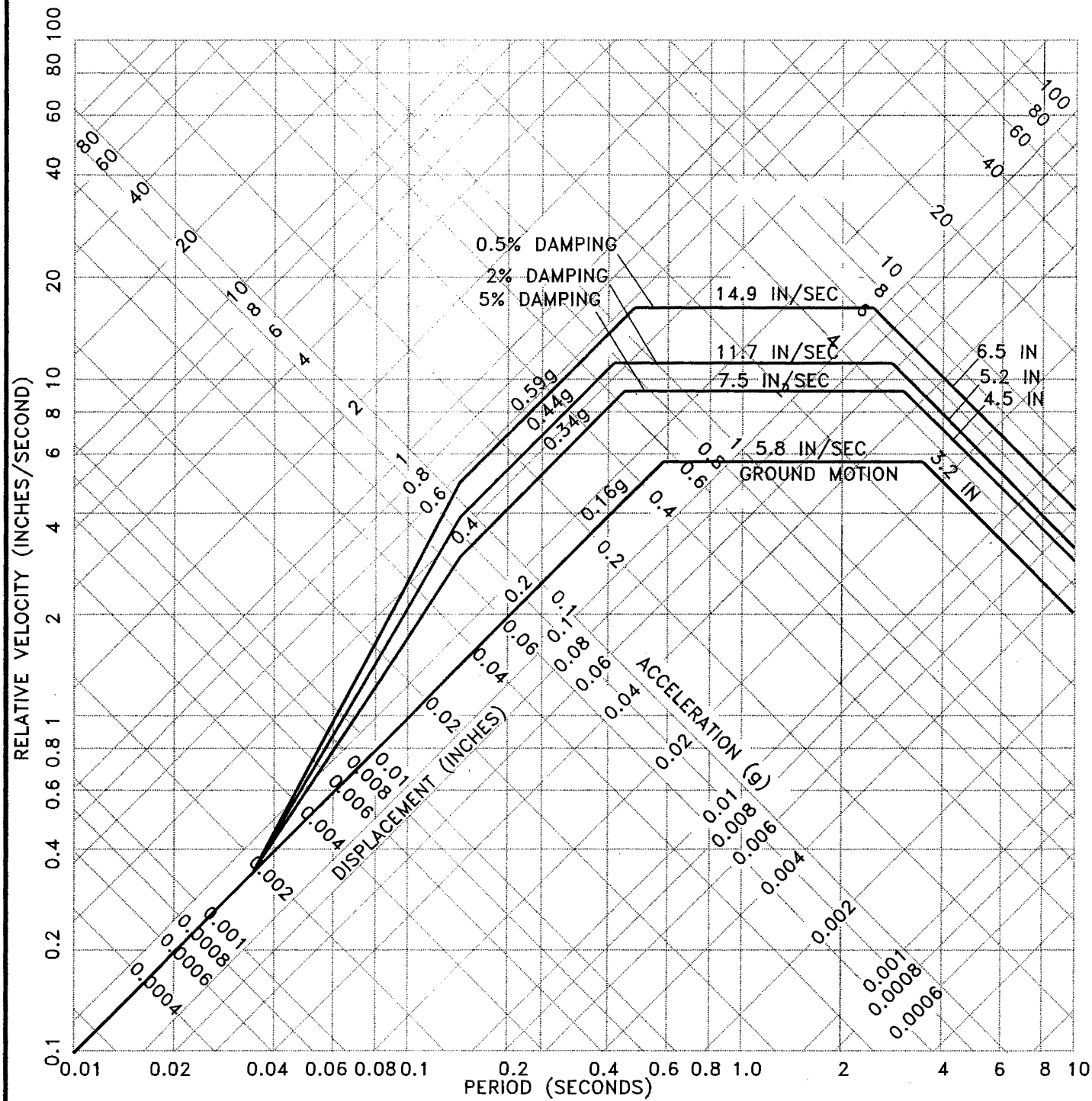
105393002 fault fig 3

Ninyo & Moore

FAULT LOCATION MAP

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	3



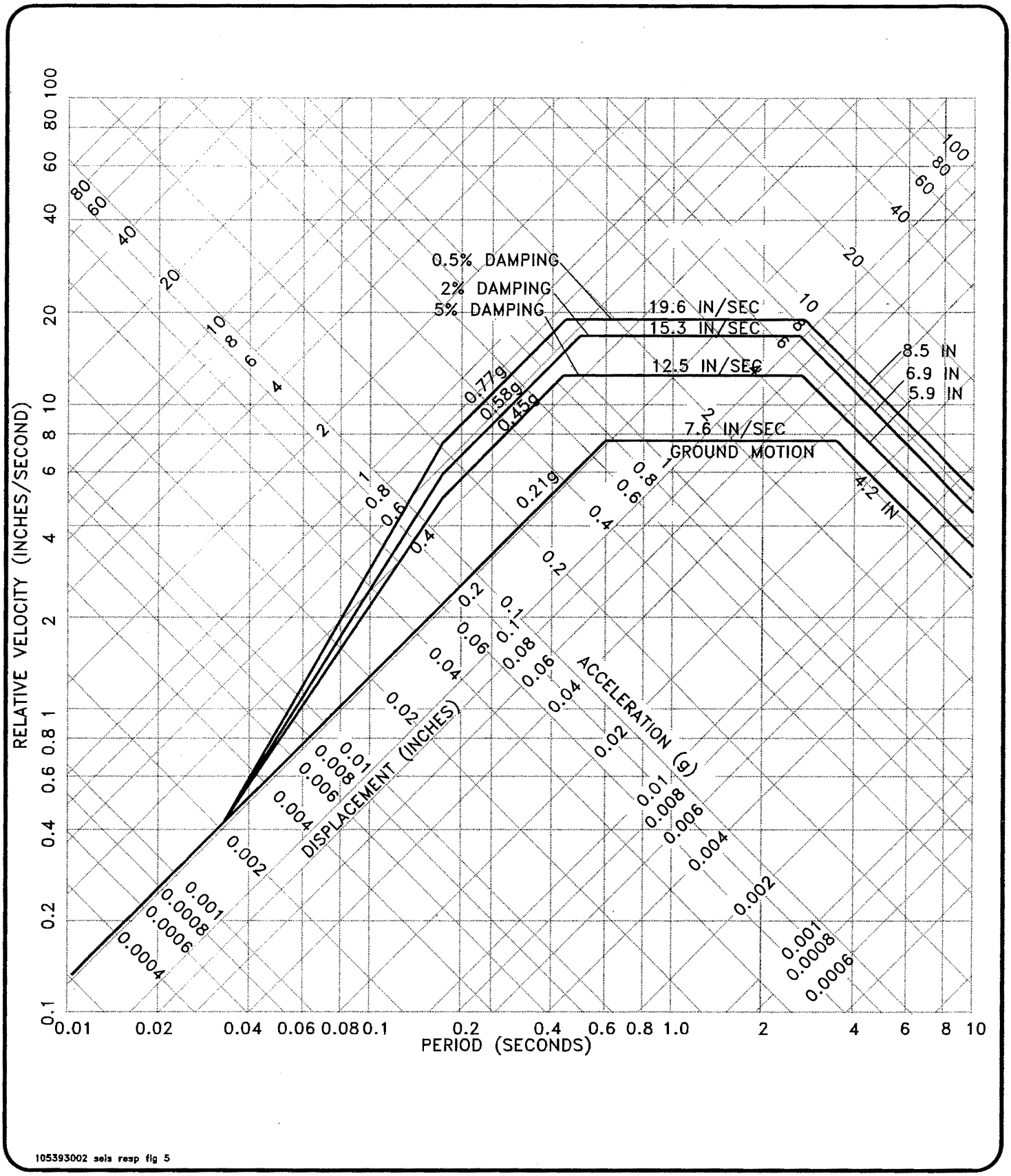
105393002 seis resp fig 4

Ninyo & Moore

SEISMIC RESPONSE SPECTRA
0.16g PEAK GROUND ACCELERATION

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	4



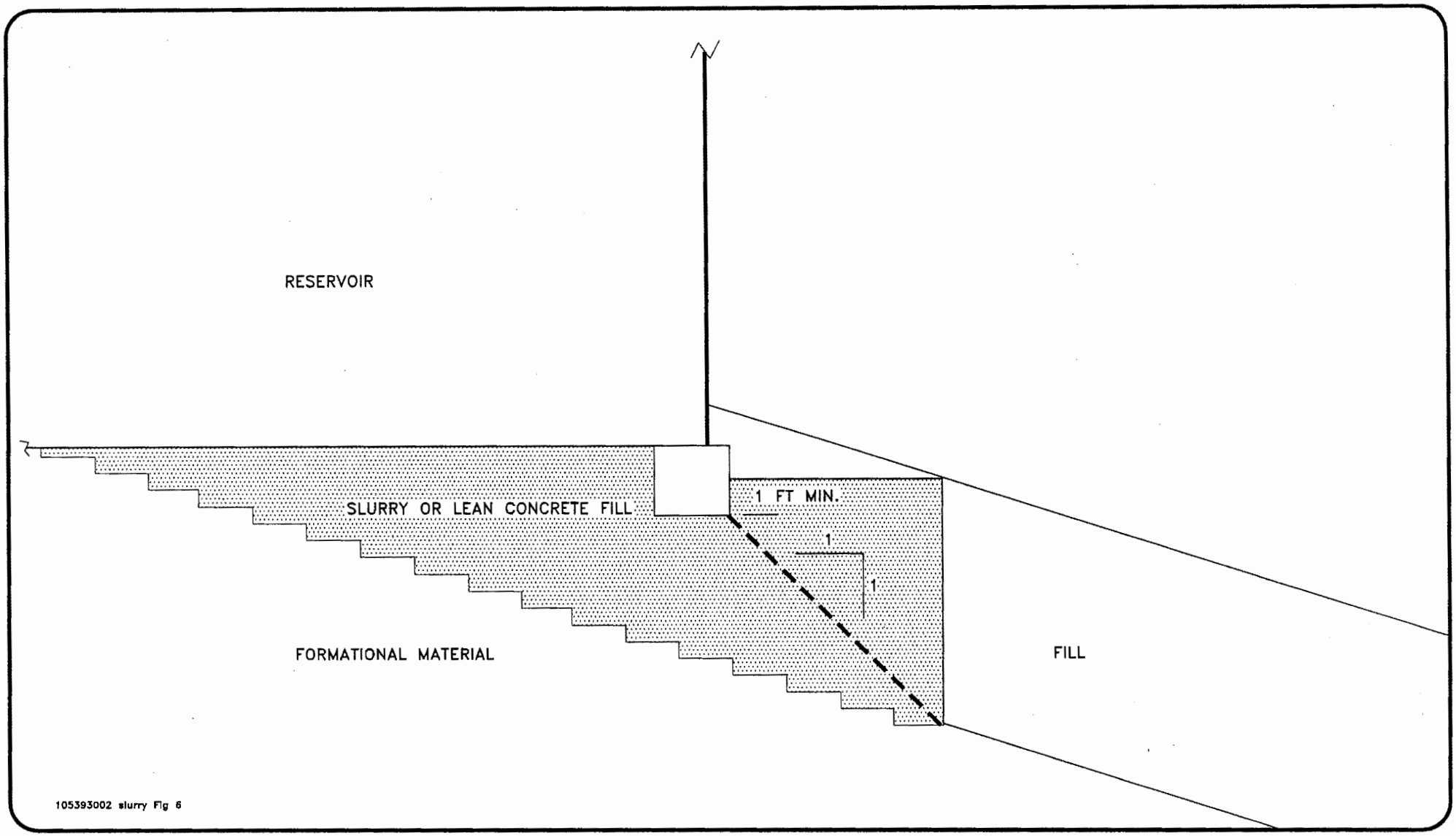
105393002 seis resp fig 5

Ninyo & Moore

SEISMIC RESPONSE SPECTRA
0.21g PEAK GROUND ACCELERATION

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	5



Ninyo & Moore

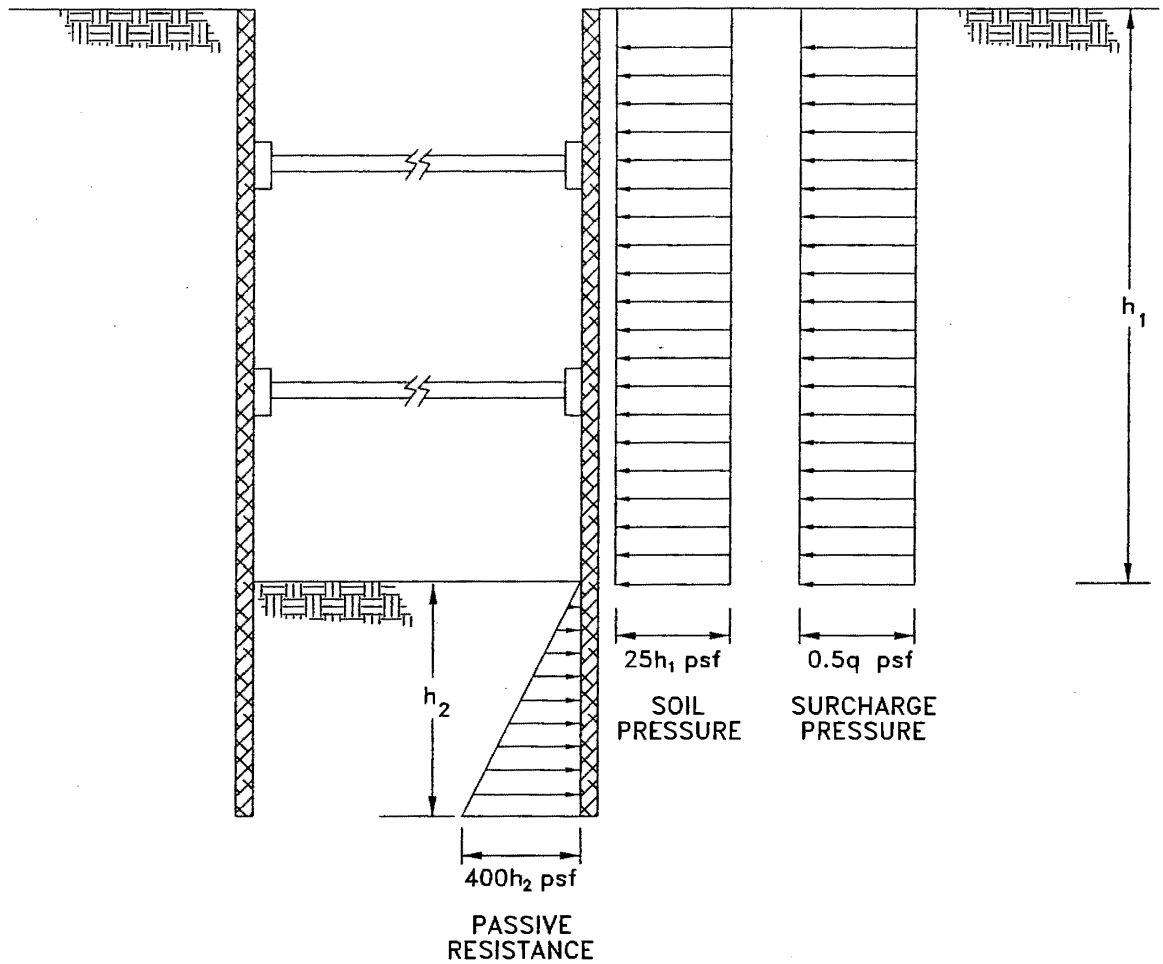
NOT TO SCALE

RECOMMENDED SLURRY FILL

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE
105393002	8/05

FIGURE 6



ASSUMPTIONS AND NOTES

1. $\Phi = 32°$, $\gamma_t = 125$ pcf
2. $K_A = 0.31$
3. $K_P = 3.2$
4. h_1 and h_2 vary
5. No groundwater
6. q = Traffic surcharge, (240 psf or greater)
7. psf = Pounds per square foot
8. Passive resistance may be increased the designated value for each additional foot of depth to a maximum value of 4,000 psf

NOT TO SCALE

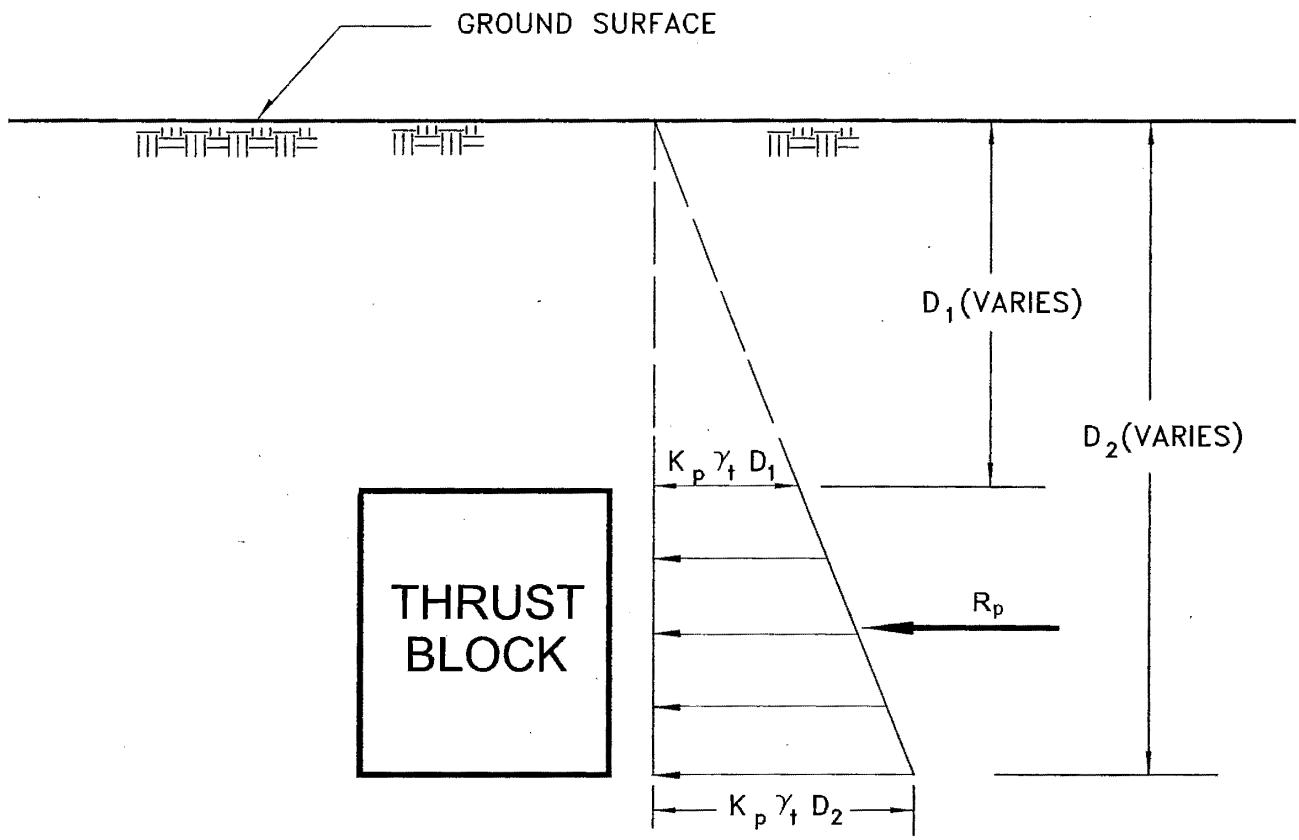
105393002 shoring fig 7

Ninyo & Moore

SHORING LATERAL EARTH PRESSURE

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	7



ASSUMPTIONS AND NOTES

1. $\Phi = 32^0$
2. $K_p = 3.2$
3. $\gamma_t = 125$ pcf
4. No groundwater
5. $R_p = (1/2) K_p \gamma_t (D_2^2 - D_1^2)$
   $R_p = 200 (D_2^2 - D_1^2)$ plf

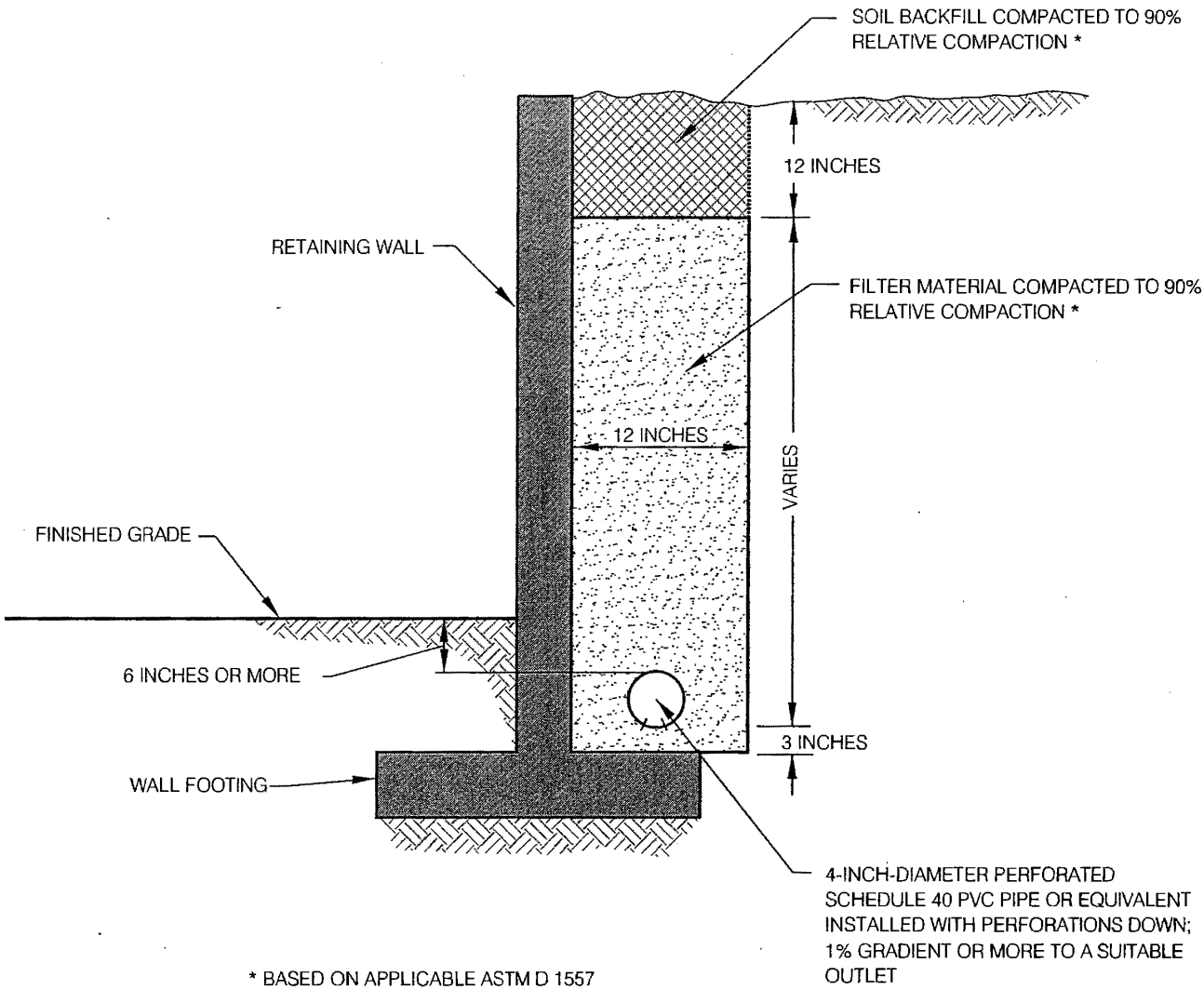
105393002 thrust Fig 8

Ninyo & Moore

THRUST BLOCK LATERAL EARTH PRESSURE

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	8



* BASED ON APPLICABLE ASTM D 1557

FILTER MATERIAL

FILTER MATERIAL SHALL BE CLASS II PERMEABLE MATERIAL PER STATE OF CALIFORNIA STANDARD SPECIFICATIONS.

SIEVE SIZE	PERCENT PASSING
1 INCH	100
3/4 INCH	90–100
3/8 INCH	40–100
No. 4	25–40
No. 8	18–33
No. 30	5–15
No. 50	0–7
No. 200	0–3

NOTE: AS AN ALTERNATIVE, THE FILTER MATERIAL MAY CONSIST OF 3/4-INCH OPEN-GRADED GRAVEL WRAPPED IN AN APPROVED GEOFABRIC.

NOT TO SCALE

Ninyo & Moore

TYPICAL
RETAINING WALL DRAIN DETAIL

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	8/05	9

APPENDIX A

BORING LOGS

Field Procedure for the Collection of Disturbed Samples

Disturbed soil samples were obtained in the field using the following methods.

Bulk Samples

Bulk samples of representative earth materials were obtained from the exploratory excavations. The samples were bagged and transported to the laboratory for testing.

The Standard Penetration Test (SPT) Spoon

Disturbed drive samples of earth materials were obtained by means of a Standard Penetration Test spoon sampler. The sampler is composed of a split barrel with an external diameter of 2 inches and an unlined internal diameter of 1-3/8 inches. The spoon was driven into the ground 12 to 18 inches with a 140-pound hammer free-falling from a height of 30 inches in general accordance with ASTM D 1586-99. The blow counts were recorded for every 6 inches of penetration; the blow counts reported on the logs are those for the last 12 inches of penetration. Soil samples were observed and removed from the spoon, bagged, sealed and transported to the laboratory for testing.

Field Procedure for the Collection of Relatively Undisturbed Samples

Relatively undisturbed soil samples were obtained in the field using the following method.

The Modified Split-Barrel Drive Sampler

The sampler, with an external diameter of 3.0 inches, was lined with 1-inch long, thin brass rings with inside diameters of approximately 2.4 inches. The sample barrel was driven into the ground with the weight of a 140-pound hammer, in general accordance with ASTM D 3550-84 (1995). The driving weight was permitted to fall freely. The approximate length of the fall, the weight of the hammer, and the number of blows per foot of driving are presented on the boring logs as an index to the relative resistance of the materials sampled. The samples were removed from the sample barrel in the brass rings, sealed, and transported to the laboratory for testing.

BORING LOG EXPLANATION SHEET

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	
0	■							Bulk sample.
		■						Modified split-barrel drive sampler.
		☒						No recovery with modified split-barrel drive sampler.
		▬						Sample retained by others.
		◥						Standard Penetration Test (SPT).
5		◥						No recovery with a SPT.
		▭	XX/XX					Shelby tube sample. Distance pushed in inches/length of sample recovered in inches.
		◥						No recovery with Shelby tube sampler.
		▭						Continuous Push Sample.
				♀				Seepage.
10				▽				Groundwater encountered during drilling.
				▼				Groundwater measured after drilling.
						▦	SM	ALLUVIUM: Solid line denotes unit change.
						▦		Dashed line denotes material change.
15								Attitudes: Strike/Dip b: Bedding c: Contact j: Joint f: Fracture F: Fault cs: Clay Seam s: Shear bss: Basal Slide Surface sf: Shear Fracture sz: Shear Zone sbs: Sheared Bedding Surface
20								The total depth line is a solid line that is drawn at the bottom of the boring.

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BORING LOG		
EXPLANATION OF BORING LOG SYMBOLS		
PROJECT NO.	DATE Rev. 01/03	FIGURE

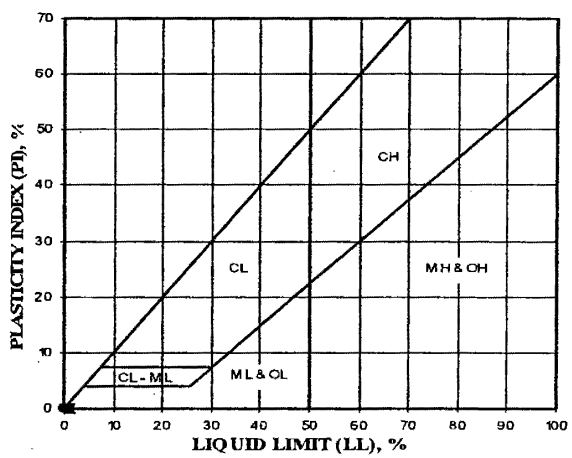
U.S.C.S. METHOD OF SOIL CLASSIFICATION

MAJOR DIVISIONS		SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (More than 1/2 of soil >No. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > No. 4 sieve size)	GW	Well graded gravels or gravel-sand mixtures, little or no fines
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM	Silty gravels, gravel-sand-silt mixtures
		GC	Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction <No. 4 sieve size)	SW	Well graded sands or gravelly sands, little or no fines
		SP	Poorly graded sands or gravelly sands, little or no fines
		SM	Silty sands, sand-silt mixtures
		SC	Clayey sands, sand-clay mixtures
FINE-GRAINED SOILS (More than 1/2 of soil <No. 200 sieve size)	SILTS & CLAYS Liquid Limit <50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with
		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean
		OL	Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS Liquid Limit >50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH	Inorganic clays of high plasticity, fat clays
		OH	Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils

GRAIN SIZE CHART

CLASSIFICATION	RANGE OF GRAIN SIZE	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL Coarse Fine	3" to No. 4 3" to 3/4" 3/4" to No. 4	76.2 to 4.76 76.2 to 19.1 19.1 to 4.76
SAND Coarse Medium Fine	No. 4 to No. 200 No. 4 to No. 10 No. 10 to No. 40 No. 40 to No. 200	4.76 to 0.075 4.76 to 2.00 2.00 to 0.420 0.420 to 0.075
SILT & CLAY	Below No. 200	Below 0.075

PLASTICITY CHART



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U.S.C.S. METHOD OF SOIL CLASSIFICATION

DATE DRILLED	08/01/05	BORING NO.	B-1
GROUND ELEVATION	497' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger		
DRIVE WEIGHT	140 lbs.	DROP	30"
SAMPLED BY	RUB	LOGGED BY RUB	REVIEWED BY FOM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Yellowish brown, dry to damp, loose, silty fine to coarse SAND.
	■							
								Light brown, damp, medium dense.
5		■	19					
10		■	50/5"					Some 1/4" pieces of asphalt.
								Total Depth = 10.5 feet. Groundwater not encountered during drilling. Backfilled on 08/01/05.
15								
20								

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-1

DATE DRILLED	08/01/05	BORING NO.	B-2
GROUND ELEVATION	576' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger		
DRIVE WEIGHT	140 lbs.	DROP	30"
SAMPLED BY	RUB	LOGGED BY RUB	REVIEWED BY FOM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Light brown, damp, loose, silty fine to coarse SAND.
5			50/3"					GRANITIC ROCK: Light brown, damp, weathered, GRANITIC ROCK.
								Total Depth = 5.3 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 08/01/05.
10								
15								
20								

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-2

DATE DRILLED 08/01/05 BORING NO. B-3

GROUND ELEVATION 523' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RUB LOGGED BY RUB REVIEWED BY FOM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0	■						SM	FILL: Light brown, damp, loose, silty fine to coarse SAND.
5								GRANITIC ROCK: Light brown, damp, weathered, GRANITIC ROCK.
10		◥	50/4"					
15								Total Depth = 13 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 08/01/05.
20								

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-3

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							GM	FILL: Light brown, dry to damp, dense, silty, fine to medium sandy GRAVEL; gravel size up to approximately 1".
5								Total Depth = 4 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 07/27/05.
10								
15								
20								

DATE DRILLED 07/27/05 BORING NO. B-4

GROUND ELEVATION 615' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. (Auto Trip Hammmer) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-4

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							GM	FILL: Light brown, dry to damp, dense, silty, fine to medium sandy GRAVEL; up to approximately 3" diameter.
5								
								@ 7': Abundant cobbles; started 4" air percussion. Drilling rate approximately 1' per 1 minute.
10								
15								
20								

DATE DRILLED 07/28/05 BORING NO. B-4A

GROUND ELEVATION 615' ± (MSL) SHEET 1 OF 4

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion SME-75

DRIVE WEIGHT 140 lbs. (Spooling Cable) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-5

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20							GM	FILL: (Continued) Light brown, dry to damp, dense, silty, fine to medium sandy, GRAVEL; up to approximately 3" diameter.
25								@ 25-27': Boulder approximately 2 to 2.5' in diameter.
30								
35								
40								

DATE DRILLED 07/28/05 BORING NO. B-4A

GROUND ELEVATION 615' ± (MSL) SHEET 2 OF 4

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion SME-75

DRIVE WEIGHT 140 lbs. (Spooling Cable) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-6

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
40							GM	FILL: (Continued) Light brown, dry to damp, dense, silty, fine to medium sandy, GRAVEL; up to approximately 3" diameter.
45								
								GRANITIC ROCK: Light yellowish brown, damp, weathered, GRANITIC ROCK.
50								
55								
60								

DATE DRILLED 07/28/05 BORING NO. B-4A

GROUND ELEVATION 615' ± (MSL) SHEET 3 OF 4

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion SME-75

DRIVE WEIGHT 140 lbs. (Spooling Cable) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-7

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
60								GRANITIC ROCK: (Continued) Light yellowish brown, damp, weathered, GRANITIC ROCK.
65								
70								
75			0/50"					Total Depth = 74 feet. Groundwater not encountered during drilling. Backfilled on 07/29/05.
80								

DATE DRILLED 07/28/05 BORING NO. B-4A

GROUND ELEVATION 615' ± (MSL) SHEET 4 OF 4

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion SME-75

DRIVE WEIGHT 140 lbs. (Spooling Cable) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-8

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							GM	FILL: Light brown, dry to damp, medium dense to dense, silty, fine to medium sandy GRAVEL; with cobbles up to 4".
5								
10								
15								
20								

DATE DRILLED 07/28/05 BORING NO. B-5

GROUND ELEVATION 633' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion SME-75

DRIVE WEIGHT 140 lbs. (Spooling Cable) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-9

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20								FILL: (Continued) Light brown, dry to damp, medium dense to dense, silty, fine to medium sandy GRAVEL.
25								
								GRANITIC ROCK: Light yellowish brown, damp, weathered, GRANITIC ROCK.
30								
								Total Depth = 31 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 07/28/05.
35								
40								

DATE DRILLED 07/28/05 BORING NO. B-5

GROUND ELEVATION 633' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion SME-75

DRIVE WEIGHT 140 lbs. (Spooling Cable) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

Ninyo & Moore

BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-10

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							GM	FILL: Light brown, dry to damp, dense, silty, fine to medium sandy GRAVEL; with cobbles up to 3.5".
5								
10								Caving.
								Total Depth = 12 feet. Groundwater not encountered during drilling. Backfilled on 07/28/05.
15								
20								

DATE DRILLED 07/28/05 BORING NO. B-6

GROUND ELEVATION 635' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 6" Percussion ATU-550

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-11

DATE DRILLED	07/27/05	BORING NO.	B-7
GROUND ELEVATION	650' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger		
DRIVE WEIGHT	140 lbs. (Auto Trip Hammer)	DROP	30"
SAMPLED BY BTM	LOGGED BY BTM	REVIEWED BY FOM	

DEPTH (feet)	SAMPLES (Bulk / Driven)	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0						SM	FILL: Light brown, dry to damp, medium dense to dense, silty fine to coarse SAND; scattered gravel to approximately 2".
5		46					Scattered gravel up to approximately 3/4".
10		80				GM	Light brown, dry to damp, dense, silty, fine to medium sandy GRAVEL; gravel up to approximately 2".
15							Total Depth = 13 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 07/27/05.
20							

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-12

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	TOPSOIL: Reddish brown, dry to damp, loose to medium dense, silty, fine to medium SAND; scattered gravel and cobbles.
	■							GRANITIC ROCK: Light brown, dry to damp, weathered GRANITIC ROCK.
5								
10								
								Total Depth = 10.5 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 07/27/05.
15								
20								

DATE DRILLED 07/27/05 BORING NO. B-8

GROUND ELEVATION 675' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. (Auto Trip Hammer) DROP 30"

SAMPLED BY BTM LOGGED BY BTM REVIEWED BY FOM

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-13

DATE DRILLED 08/01/05 BORING NO. B-9

GROUND ELEVATION 646' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RUB LOGGED BY RUB REVIEWED BY FOM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Light brown, damp, medium dense, silty SAND; with gravel up to 1" diameter.
5								
								@ 7-8': Gravel up to 2" diameter.
10			78					
15								Caving. Total Depth = 15 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 08/01/05.
20								

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-14

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SP-SM	FILL: Light brown, dry to damp, medium dense, slightly silty gravelly SAND.
5								
								@ 7': 1/2" to 2" gravel.
10								
15								
20								

DATE DRILLED 08/01/05 BORING NO. B-10

GROUND ELEVATION 635' ± (MSL) SHEET 1 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RUB LOGGED BY RUB REVIEWED BY FOM

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-15

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
20							SP-SM	FILL: (Continued) Light brown, dry to damp, medium dense, slightly silty gravelly SAND.
25								Caving. Total Depth = 25 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 08/01/05.
30								
35								
40								

DATE DRILLED 08/01/05 BORING NO. B-10

GROUND ELEVATION 635' ± (MSL) SHEET 2 OF 2

METHOD OF DRILLING 8" Diameter Hollow Stem Auger with 4" Percussion

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RUB LOGGED BY RUB REVIEWED BY FOM

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-16

DATE DRILLED 08/01/05 BORING NO. B-11

GROUND ELEVATION 611' ± (MSL) SHEET 1 OF 1

METHOD OF DRILLING 8" Diameter Hollow Stem Auger

DRIVE WEIGHT 140 lbs. DROP 30"

SAMPLED BY RUB LOGGED BY RUB REVIEWED BY FOM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Light brown, damp, loose, silty fine to coarse SAND.
	■							
	■							
	■							
								Light yellowish brown; medium dense.
5		■	21					
		■						
								GRANITIC ROCK: Light yellowish brown, damp, weathered, GRANITIC ROCK.
10		■	50/4"					
								Total Depth = 11.5 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 08/01/05.
15								
20								

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-17

DATE DRILLED	08/01/05	BORING NO.	B-12
GROUND ELEVATION	625' ± (MSL)	SHEET 1 OF 1	
METHOD OF DRILLING	8" Diameter Hollow Stem Auger		
DRIVE WEIGHT	140 lbs.	DROP	30"
SAMPLED BY	RUB	LOGGED BY RUB	REVIEWED BY FOM

DEPTH (feet)	SAMPLES Bulk	SAMPLES Driven	BLOWS/FOOT	MOISTURE (%)	DRY DENSITY (PCF)	SYMBOL	CLASSIFICATION U.S.C.S.	DESCRIPTION/INTERPRETATION
0							SM	FILL: Yellowish brown, dry to damp, loose to medium dense, silty SAND; with gravel.
	■							GRANITIC ROCK: Light yellowish brown, damp, weathered, GRANITIC ROCK.
		■	50					
5								Total Depth = 4.8 feet (Refusal). Groundwater not encountered during drilling. Backfilled on 08/01/05.
10								
15								
20								

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BORING LOG

640-1 AND 640-2 RESERVOIRS
RANCHO SAN DIEGO, CALIFORNIA

PROJECT NO.	DATE	FIGURE
105393002	08/05	A-18

APPENDIX B

RIPPABILITY

A seismic refraction survey was conducted at the site to evaluate the rippability characteristics of the subsurface materials. The seismic refraction data were collected with a SmartSeis S12, high performance exploration seismograph and 12 vertical component geophones. A 10-pound hammer and plate were used as the seismic wave source.

The seismic refraction method uses first-arrival times of refracted seismic waves to determine the thicknesses and seismic velocities of subsurface layers. Seismic waves generated at the surface are refracted at boundaries separating materials of contrasting velocities. The seismic waves refracted back to the surface are then detected by a series of surface geophones and recorded with a seismograph. The travel times of the seismic waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

The refraction method requires that subsurface velocities (and therefore material density) increase with depth. A layer having a velocity lower than that of the layer above will not be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity can also result in the misinterpretation of the subsurface conditions.

In general, seismic wave velocities can be correlated to material density and/or rock hardness. The relationship between rippability and seismic velocity is empirical and assumes a homogenous mass. Some areas of differing composition, texture, or structure may affect both the measured data and the actual rippability of the mass. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

The following rippability chart (Table B-1) is based on our experience with similar materials. It assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristics, such as frac-

ture spacing and orientation, play a significant role in determining rock rippability. These characteristics may also vary with location and depth.

Table B-1 Rippability Classification

0 to 2000 ft/s	Easy Ripping
2000 to 4000 ft/s	Moderate Ripping
4000 to 5500 ft/s	Difficult Ripping, Possible Blasting
5500 to 7000 ft/s	Very Difficult Ripping, Probable Blasting
Greater than 7000 ft/s	Blasting Generally Required

For trenching operations, the rippability figures should be scaled downward. For example, velocities as low as 3,500 feet per second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in a narrow trench, should be anticipated. The above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

Table B-2 lists the average velocities and depths calculated from the seismic refraction traverses conducted during this evaluation. The approximate locations of the seismic refraction traverses are shown on Figure 2. Layer profiles are also included in this appendix. Please note the vertical scale changes for the profiles.

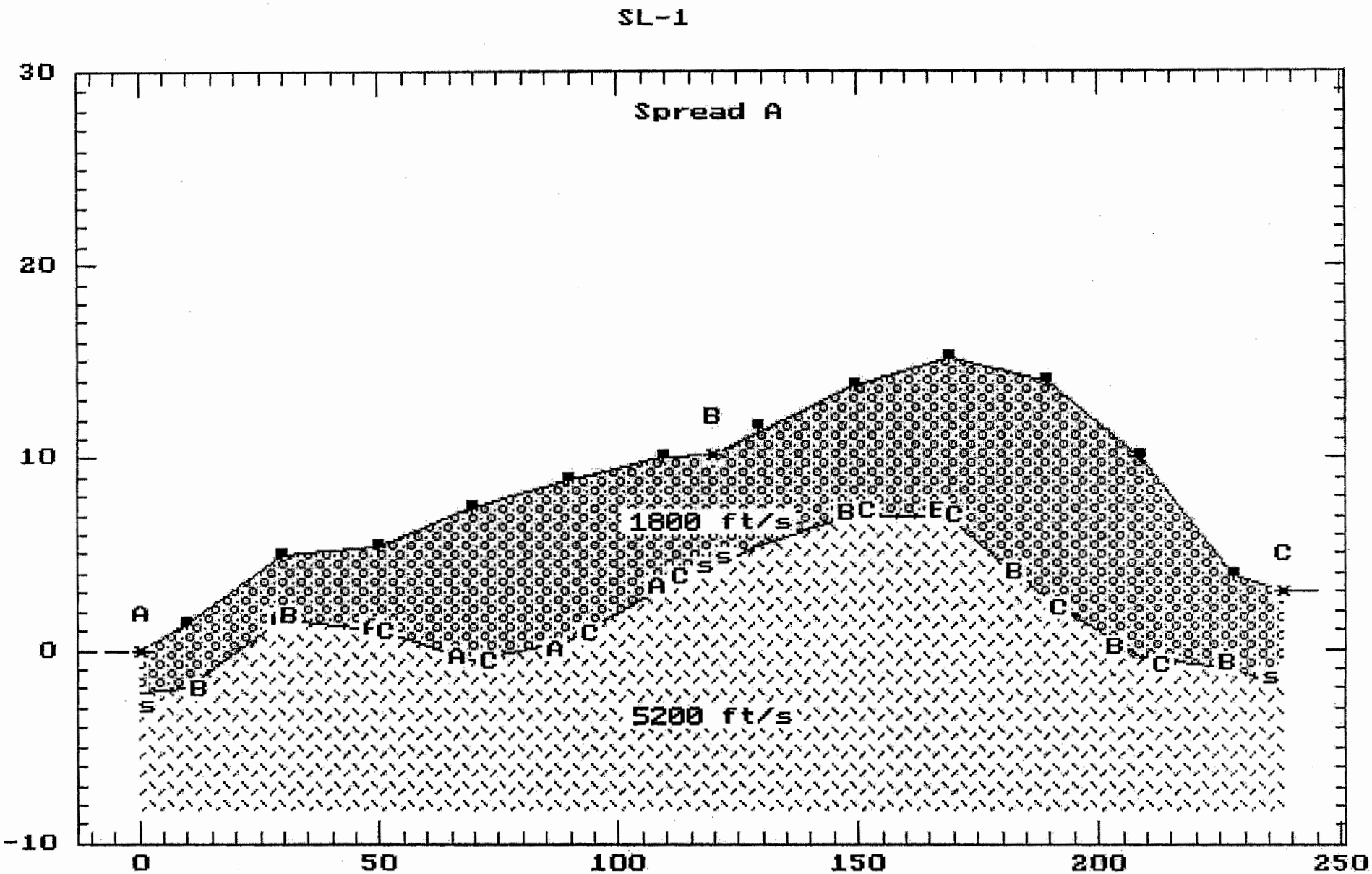
It should also be noted that, as a general rule of thumb, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the refraction line. The lengths of the seismic refraction lines are listed with their interpretations.

Table B- 2 – Seismic Traverse Results

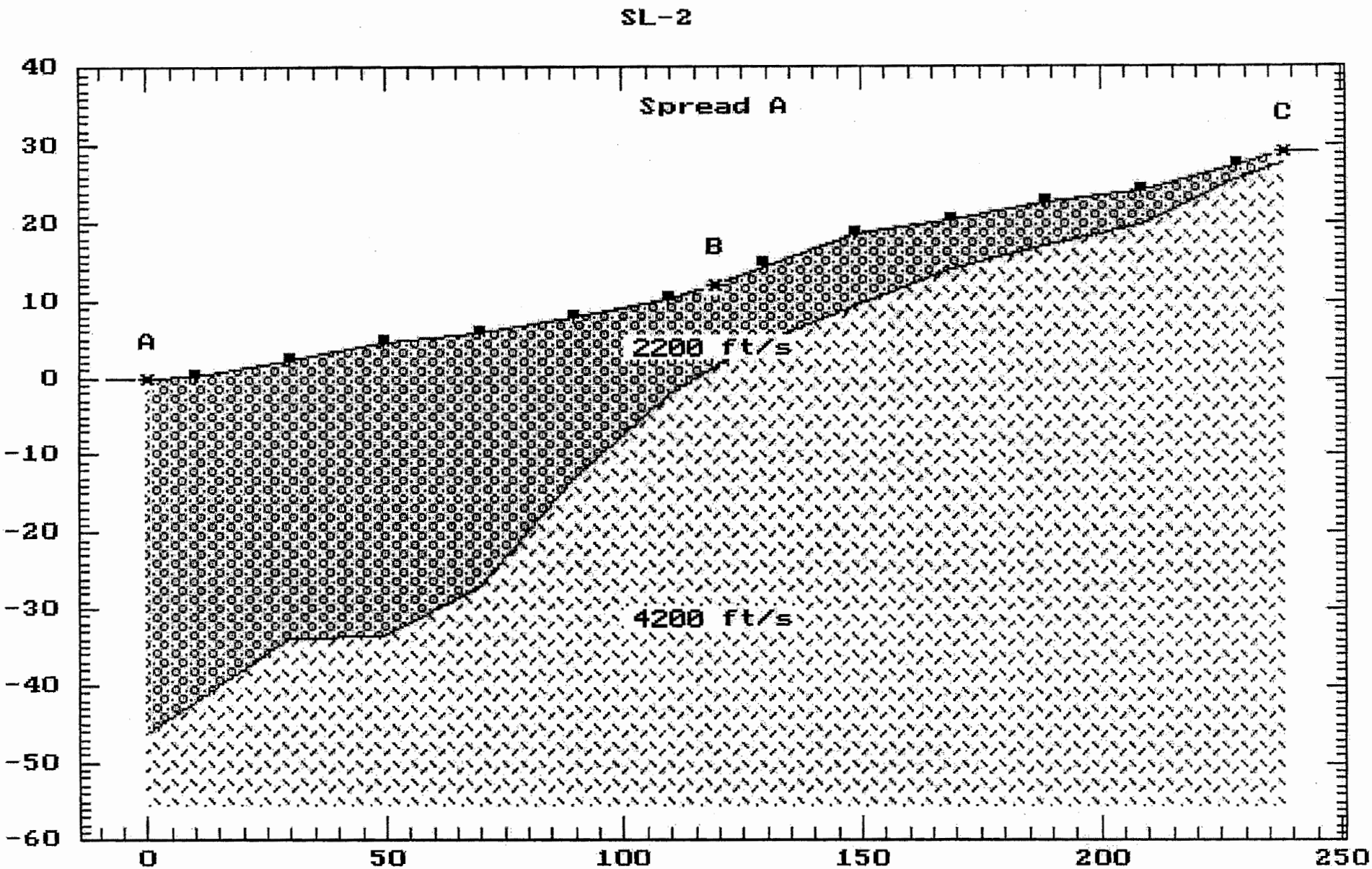
Traverse No. And Length	Velocity Feet/Second	Approximate Depth to Bottom of Layer (feet)	Rippability*
SL-1 240 feet	V1 = 1,800 V2 = 5,200	2-10 ---	Easy Difficult, possible blasting
SL-2 240 feet	V1 = 2,200 V2 = 4,200	2-45 ---	Moderate Difficult, possible blasting
SL-3 240 feet	V1 = 2,000 V2 = 6,000	5-7 ---	Easy Very difficult, probable blasting

Table B- 2 – Seismic Traverse Results

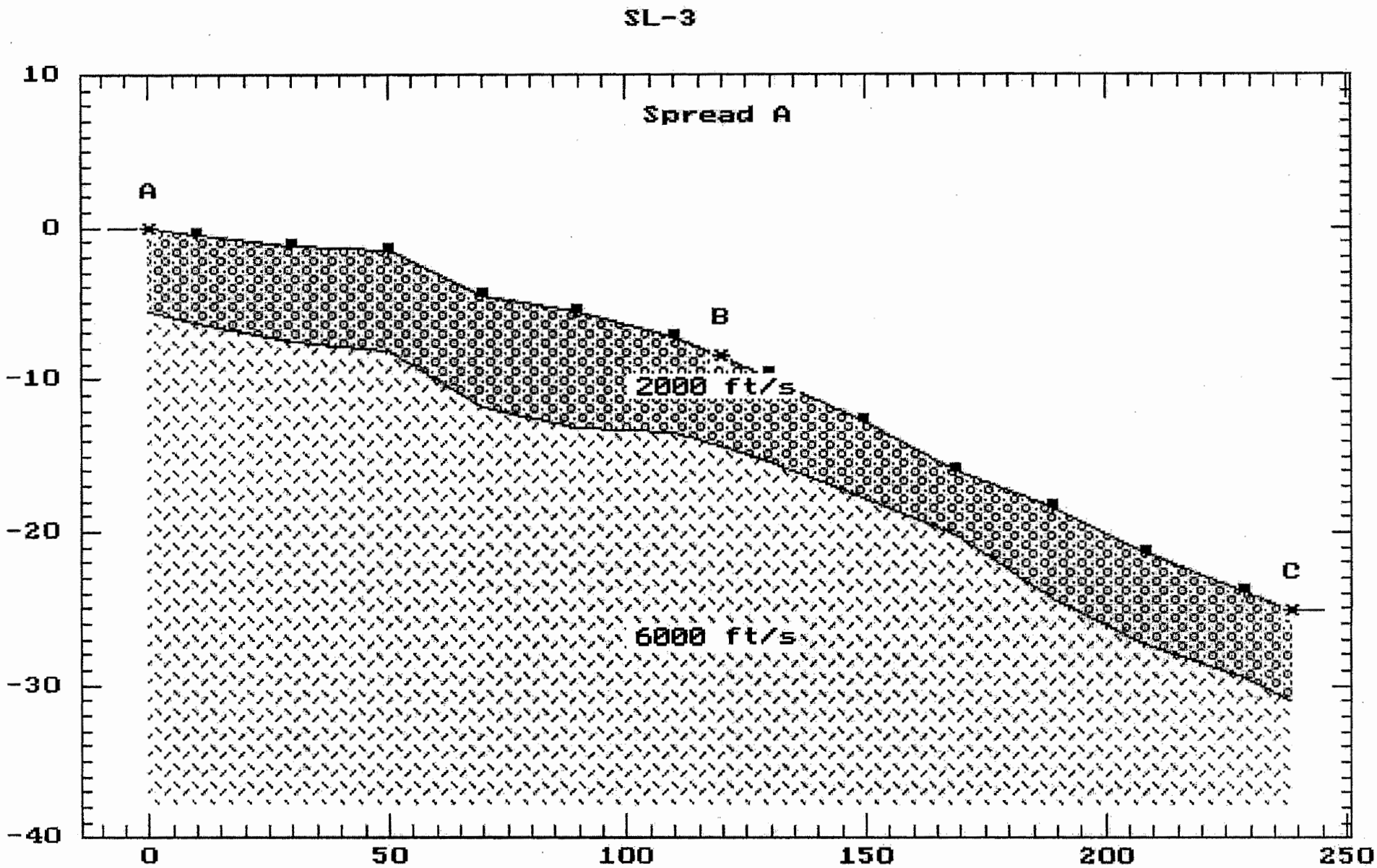
Traverse No. And Length	Velocity Feet/Second	Approximate Depth to Bottom of Layer (feet)	Rippability*
SL-4 240 feet	V1 = 1,800 V2 = 6,600	2-22 ---	Easy Very difficult, probable blasting
SL-5 130 feet	V1 = 2,100 V2 = 5,000	1-6 ---	Moderate Difficult, possible blasting
SL-6 130 feet	V1 = 1,500 V2 = 5,600	2-11 ---	Easy Very difficult, probable blasting
SL-7 130 feet	V1 = 2,400 V2 = 3,800	3-5 ---	Moderate Moderate
SL-8 130 feet	V1 = 2,600 V2 = 3,200	2-8 ---	Moderate Moderate
Note: *Rippability criteria based on the use of a Caterpillar D-9 dozer ripping with a single shank.			



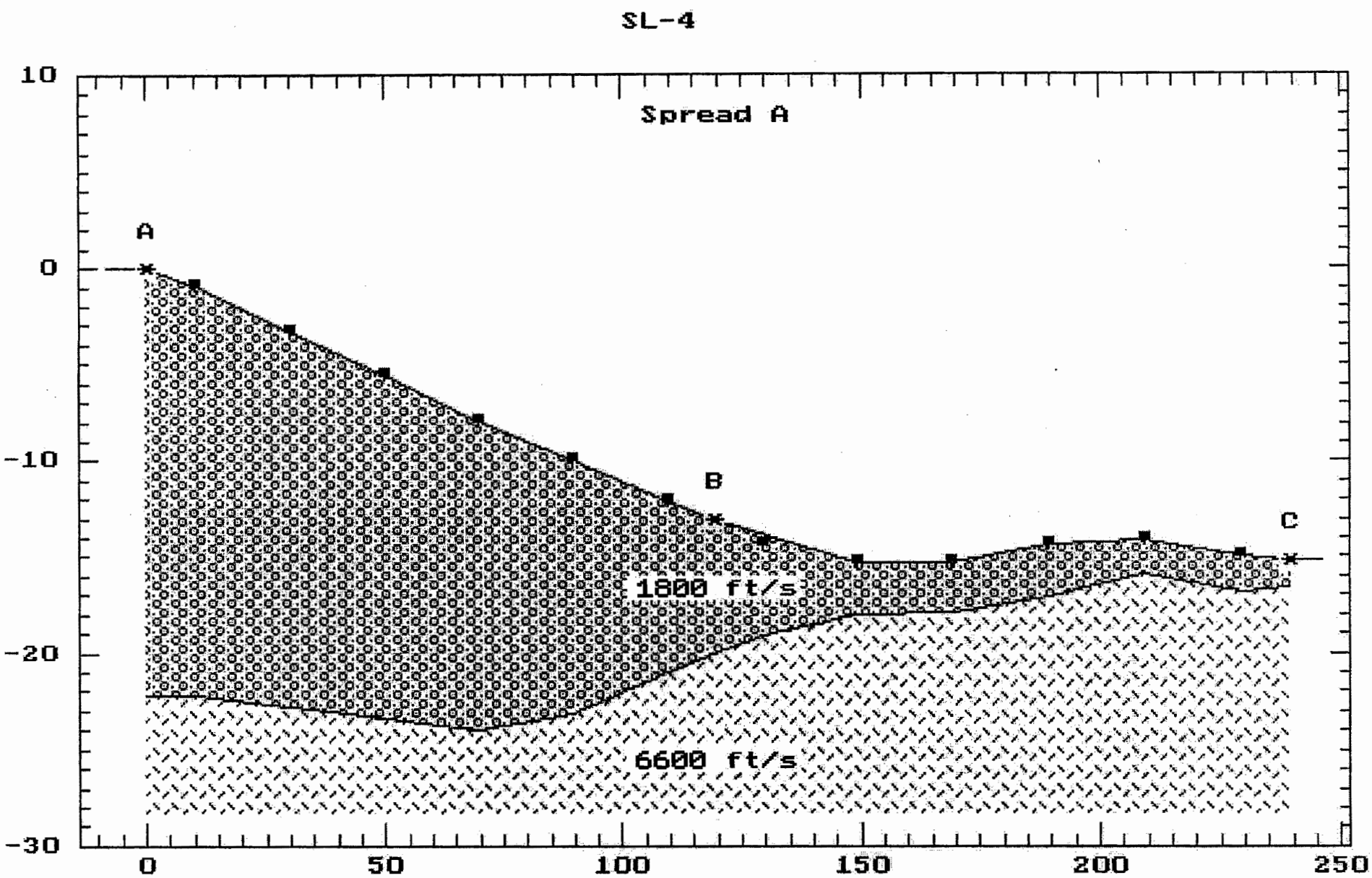
SEISMIC PROFILE LINE 1	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA	Ninyo & Moore
	PROJECT NO.: 105393002 / DATE: 8/05	FIGURE B-1



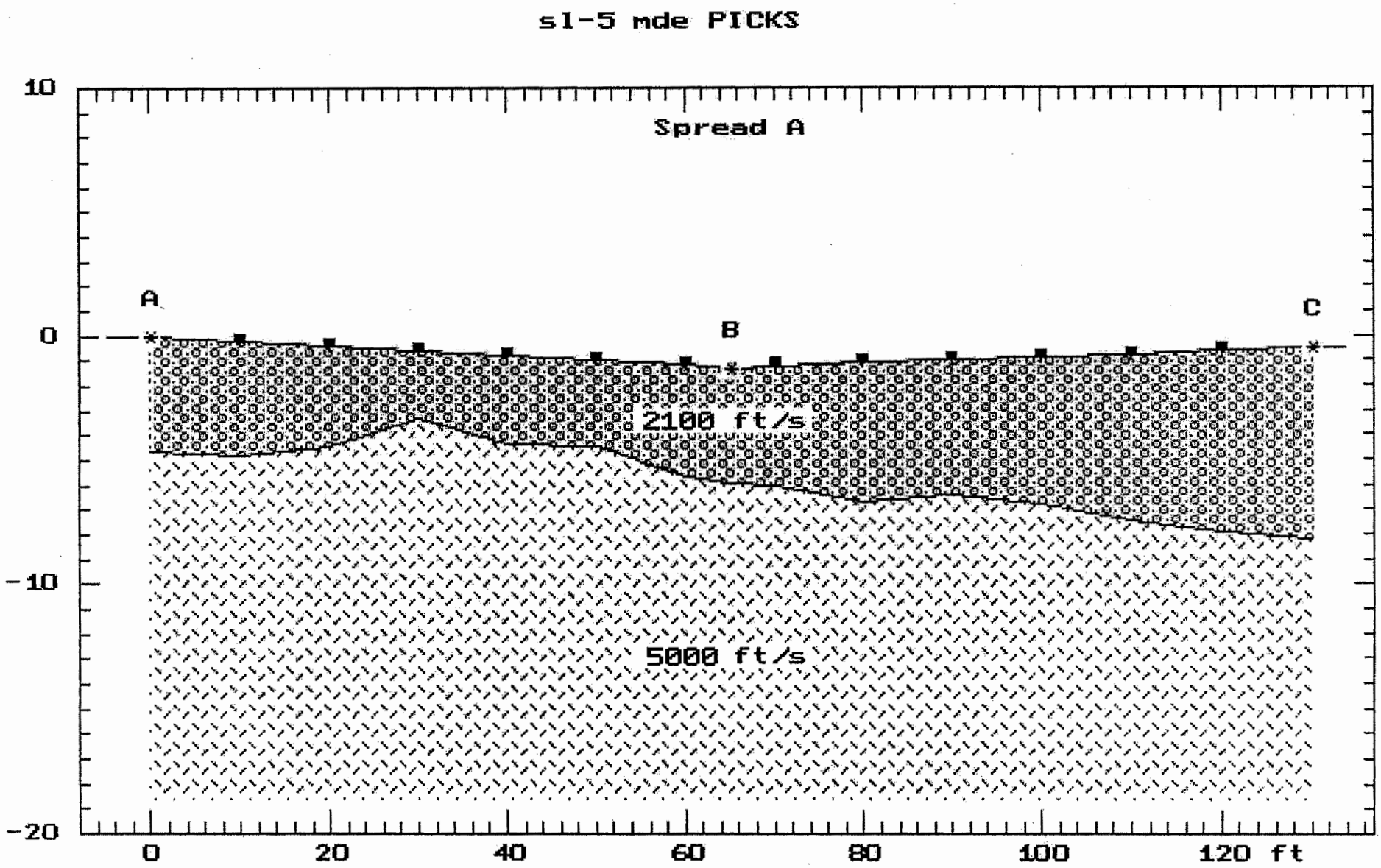
SEISMIC PROFILE LINE 2	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA		Ninyo & Moore FIGURE B-2
	PROJECT NO.: 105393002	DATE: 8/05	



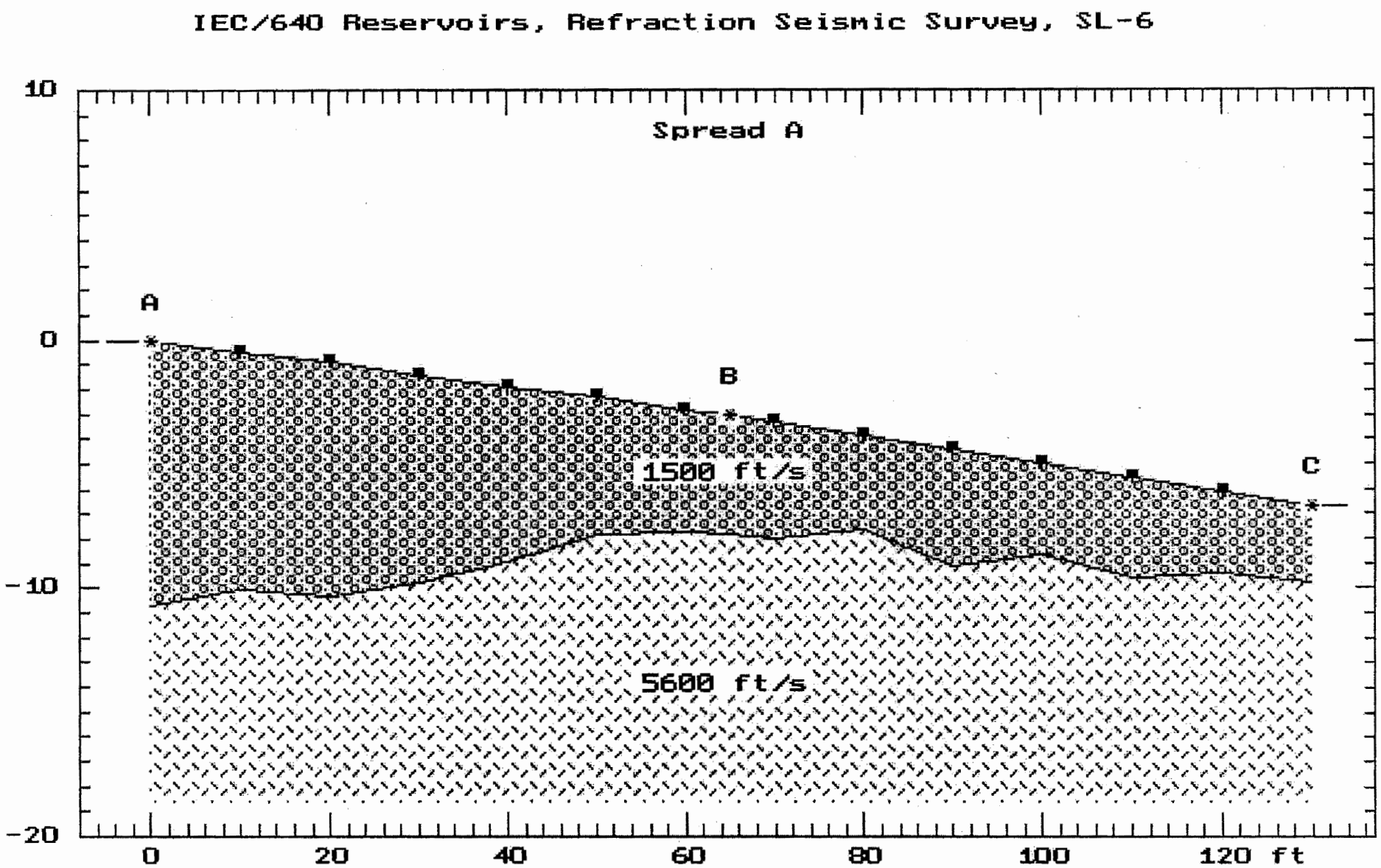
SEISMIC PROFILE LINE 3	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA	Ninyo & Moore
	PROJECT NO.: 105393002 / DATE: 8/05	FIGURE B-3



SEISMIC PROFILE LINE 4	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA	Ninyo & Moore
	PROJECT NO.: 105393002 / DATE: 8/05	FIGURE B-4

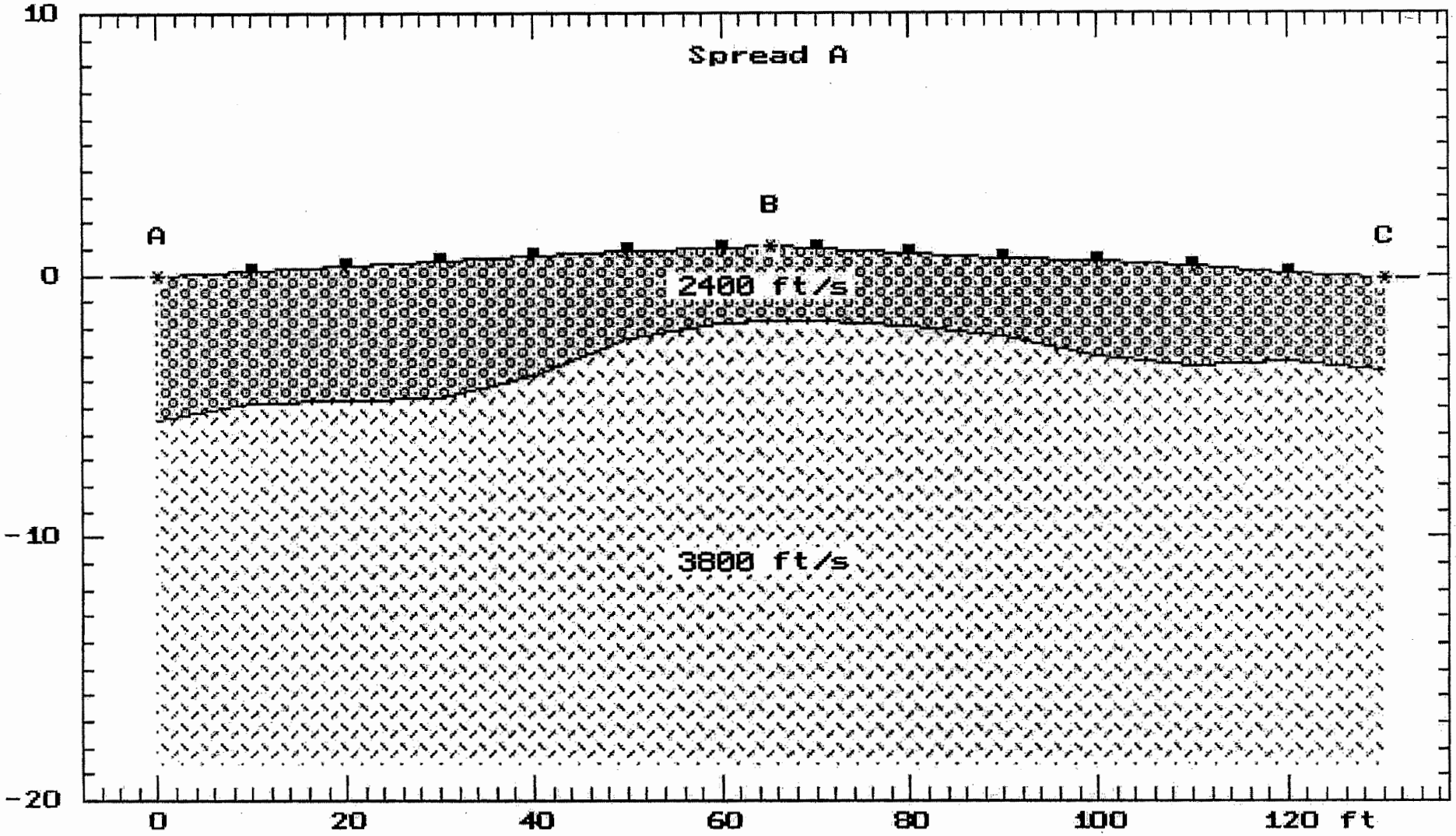


SEISMIC PROFILE LINE 5	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA		Ninyo & Moore FIGURE B-5
	PROJECT NO.: 105393002	DATE: 8/05	



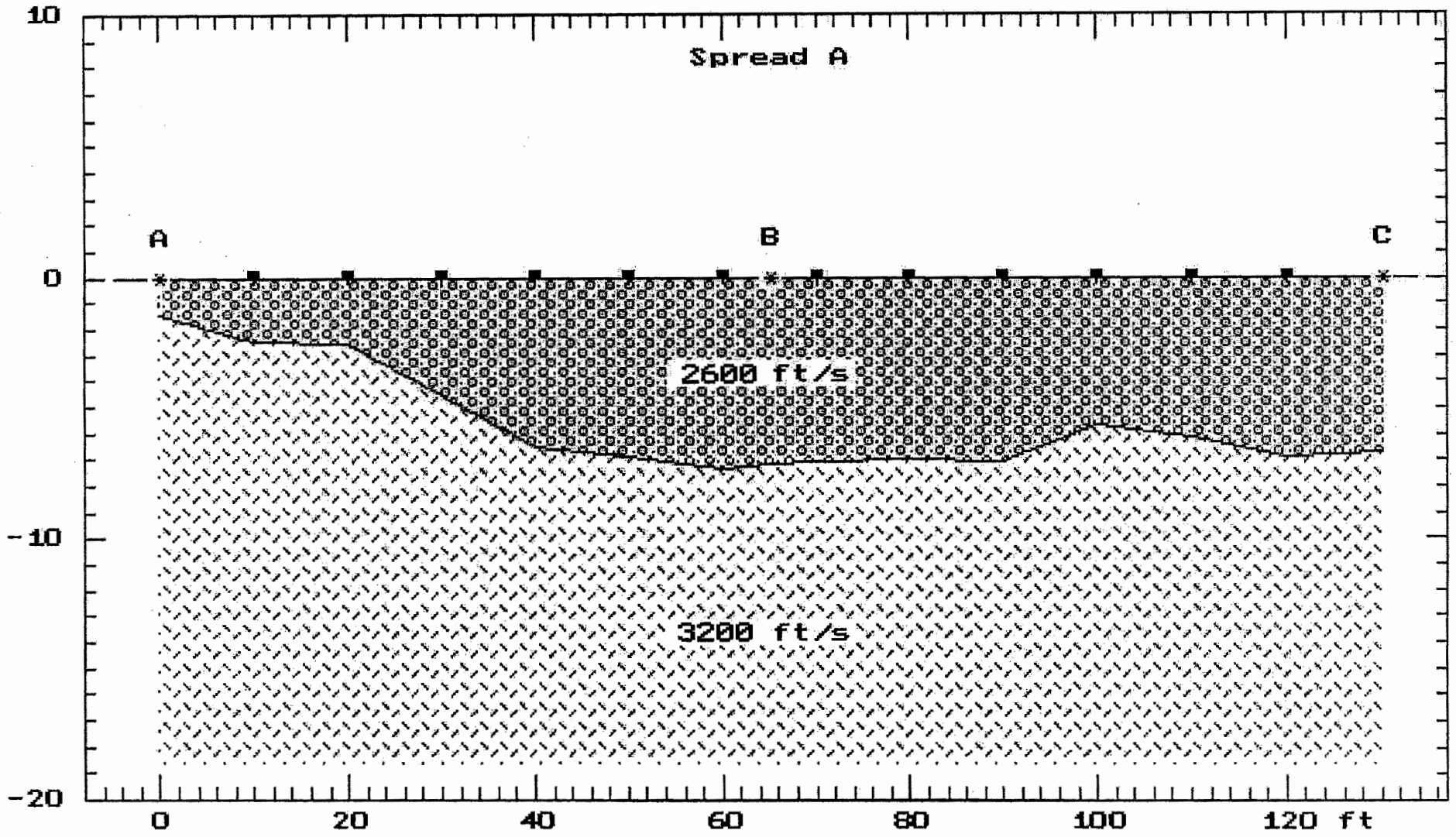
SEISMIC PROFILE LINE 6	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA		Ninyo & Moore
	PROJECT NO.: 105393002	DATE: 8/05	FIGURE B-6

IEC/640 Reservoirs, Seismic Refraction Survey, SL-7



SEISMIC PROFILE LINE 7	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA	Ninyo & Moore
	PROJECT NO.: 105393002 / DATE: 8/05	FIGURE B-7

IEC/640 Reservoirs, Siesmic Refraction Survey, SL-8



SEISMIC PROFILE LINE 8	640-1 AND 640-2 RESERVOIRS RANCHO SAN DIEGO, CALIFORNIA	Ninyo & Moore
	PROJECT NO.: 105393002 / DATE: 8/05	FIGURE B-8

APPENDIX C

LABORATORY TESTING

Classification

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488-00. Soil classifications are indicated on the logs of the exploratory excavations in Appendix A.

In-Place Moisture and Density Tests

The moisture content and dry density of relatively undisturbed samples obtained from the exploratory excavations were evaluated in general accordance with ASTM D 2937-00. The test results are presented on the logs of the exploratory excavations in Appendix A.

Gradation Analysis

Gradation analysis tests were performed on selected representative soil samples in general accordance with ASTM D 422-63. The grain-size distribution curves are shown on Figures C-1 through C-7. These test results were utilized in evaluating the soil classifications in accordance with the Unified Soil Classification System.

Shear Strength Test

A shear strength test was performed on a remolded sample in general accordance with ASTM D 3080-98 to evaluate the shear strength characteristics of selected material. The sample was inundated during shearing to represent adverse field conditions. The results are shown on Figure C-8.

Maximum Dry Density and Optimum Moisture Content Test

The maximum dry density and optimum moisture content of a selected representative soil sample was evaluated in general accordance with ASTM D 1557-02. The results of the test are summarized on Figure C-9.

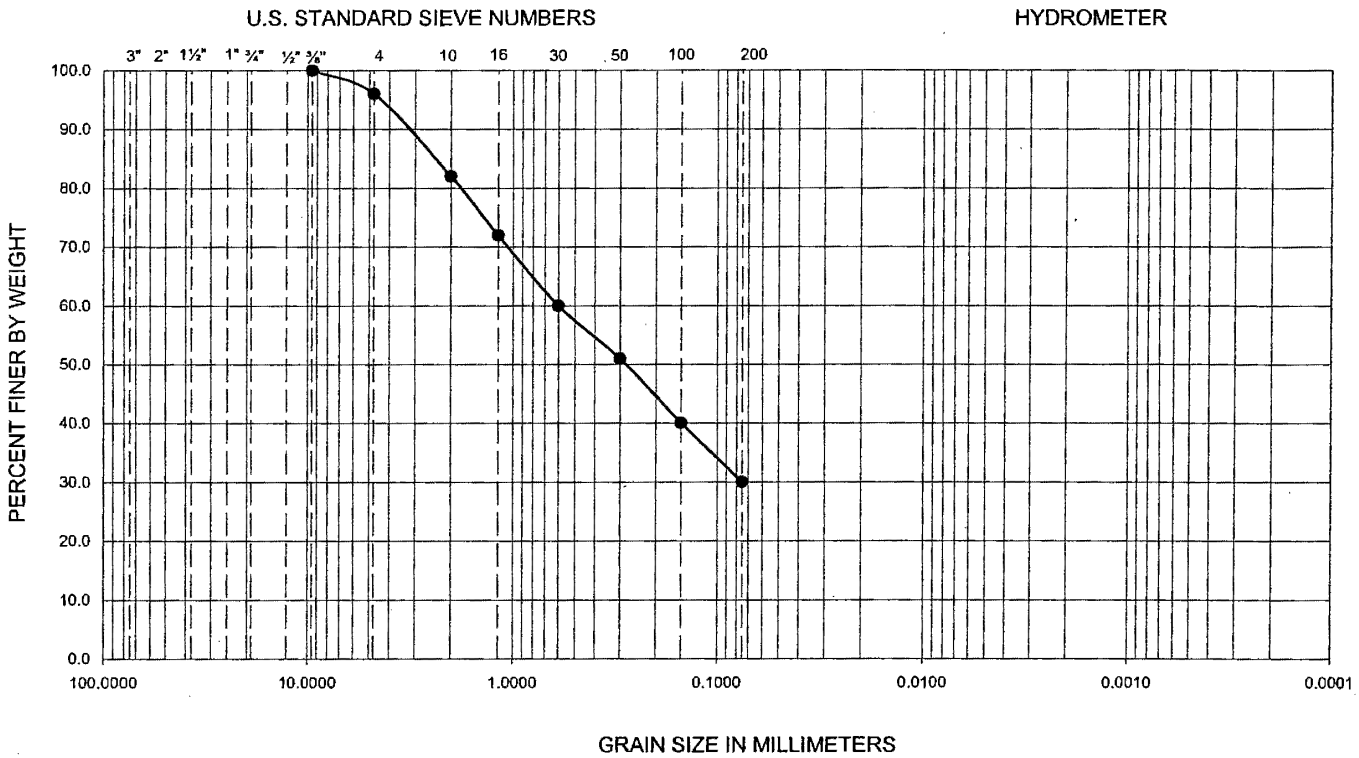
Soil Corrosivity Test

Soil pH, and electrical resistivity tests were performed on a representative sample in general accordance with California Test (CT) 643. The chloride content was evaluated in general accordance with CT 422. The sulfate content was evaluated in general accordance with CT 417. The test results are presented on Figure C-10.

R-Value

The resistance value, or R-value, for subgrade soils was evaluated in general accordance with ASTM D 2844-94. Samples were prepared and tested for exudation pressure and R-value. The graphically evaluated R-value at an exudation pressure of 300 pounds per square inch is reported. The test results are shown on Figure C-11.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-1	2.0-3.0	--	--	--	--	--	--	--	--	30	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

Ninyo & Moore

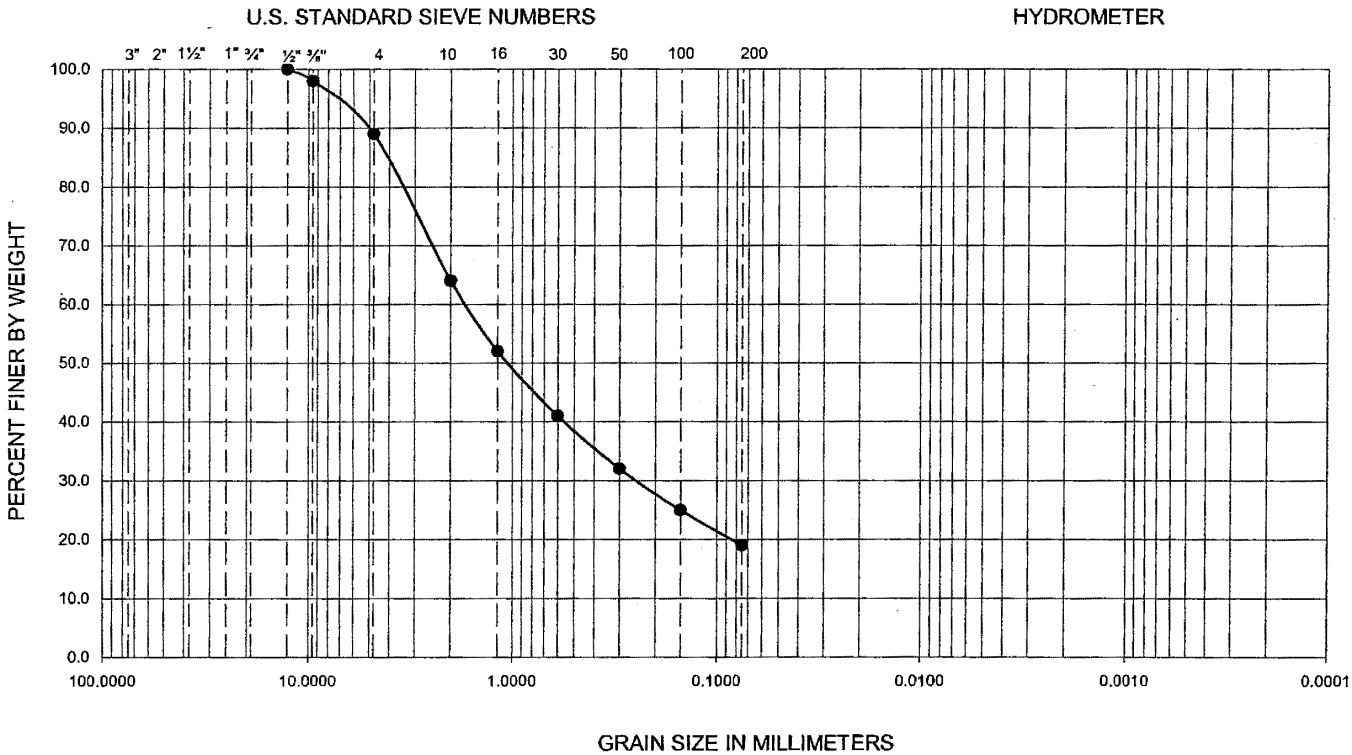
GRADATION TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-1

105393002 SIEVE- B-1 @ 2.0-3.0.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-2	1.5-2.5	--	--	--	--	--	--	--	--	19	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

Ninyo & Moore

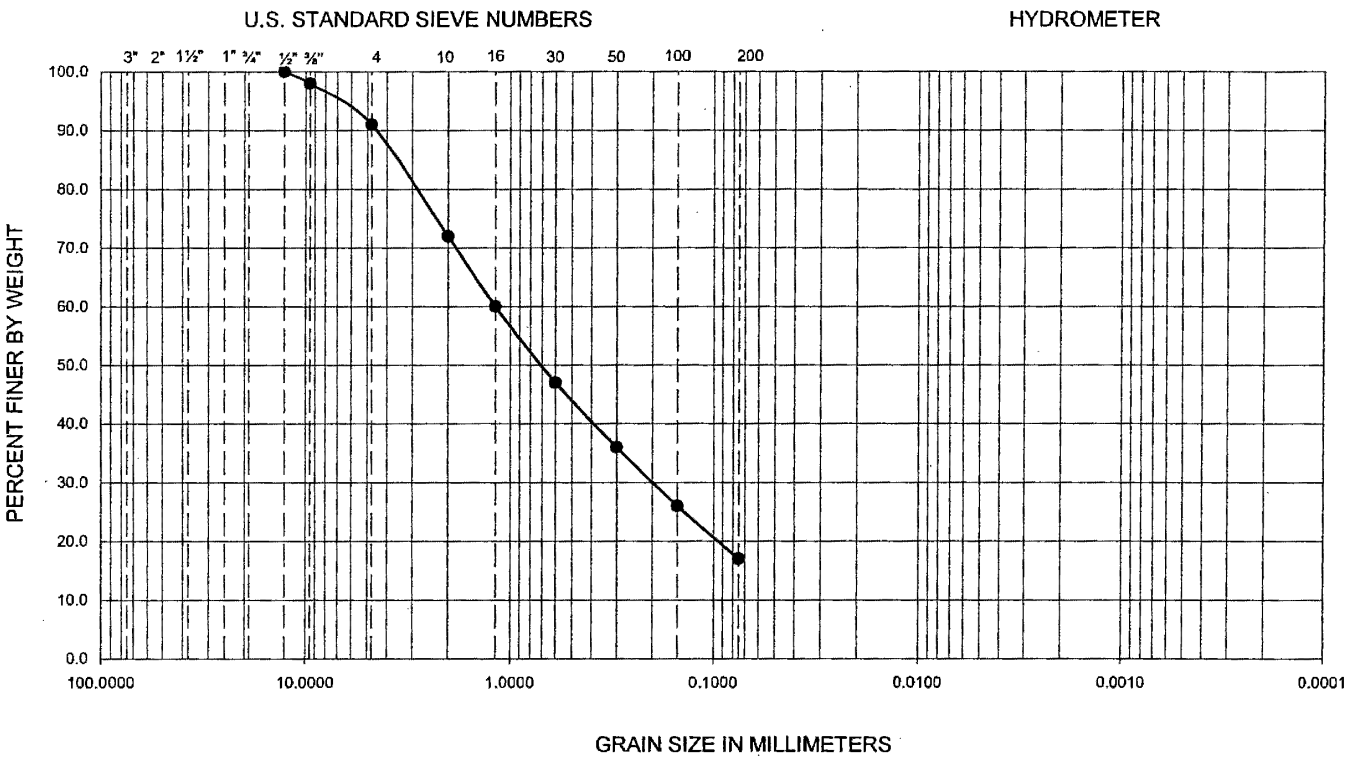
GRADATION TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-2

105393002 SIEVE-B-2 @ 1.5-2.5.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-3	10.0-10.8	--	--	--	--	--	--	--	--	17	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

Ninyo & Moore

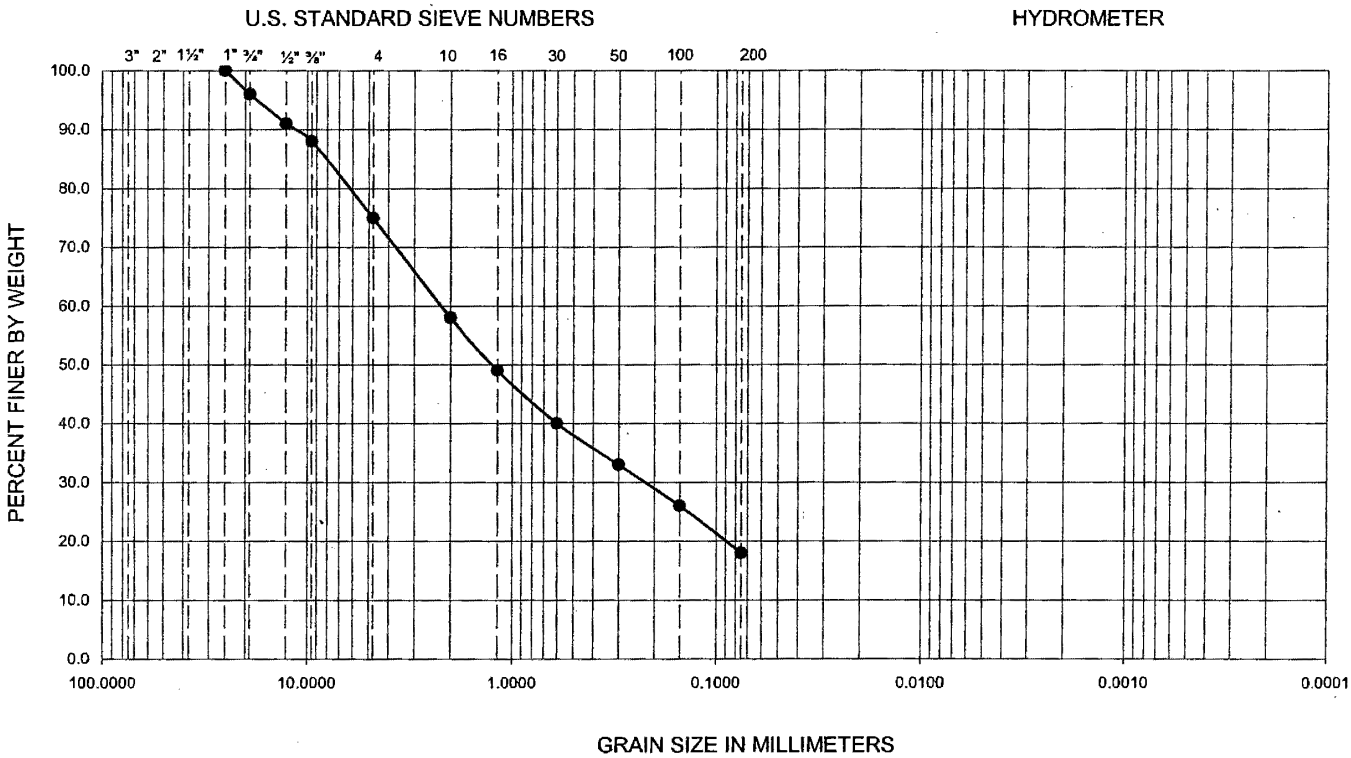
GRADATION TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-3

105393002 SIEVE-B-3 @ 10.0-10.8.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-7	1.0-3.0	--	--	--	--	--	--	--	--	18	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

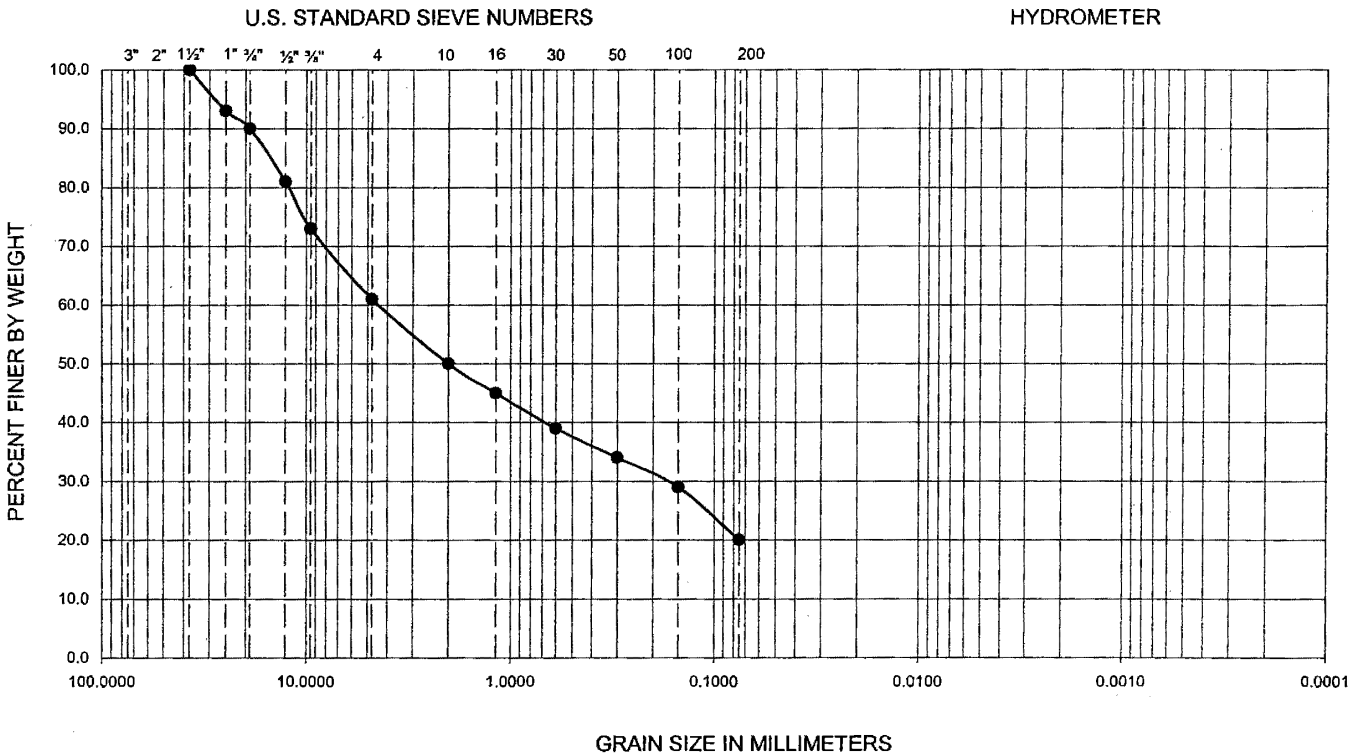
Ninyo & Moore

GRADATION TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-4

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-8	2.0-4.0	--	--	--	--	--	--	--	--	20	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

Ninyo & Moore

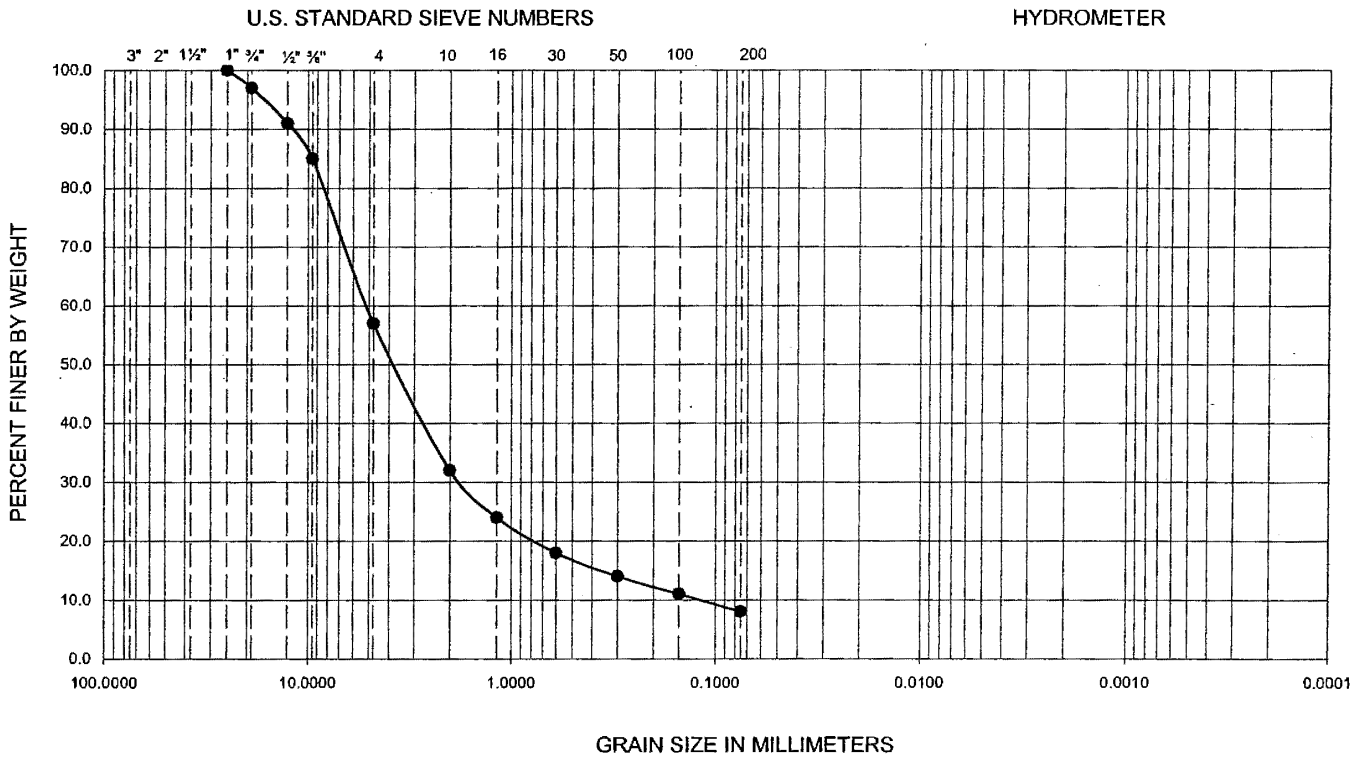
GRADATION TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-5

105393002 SIEVE-B-8 @ 2.0- 4.0.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-10	2.0-4.0	--	--	--	0.13	1.85	5.22	40.2	5.0	8	SP-SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

Ninyo & Moore

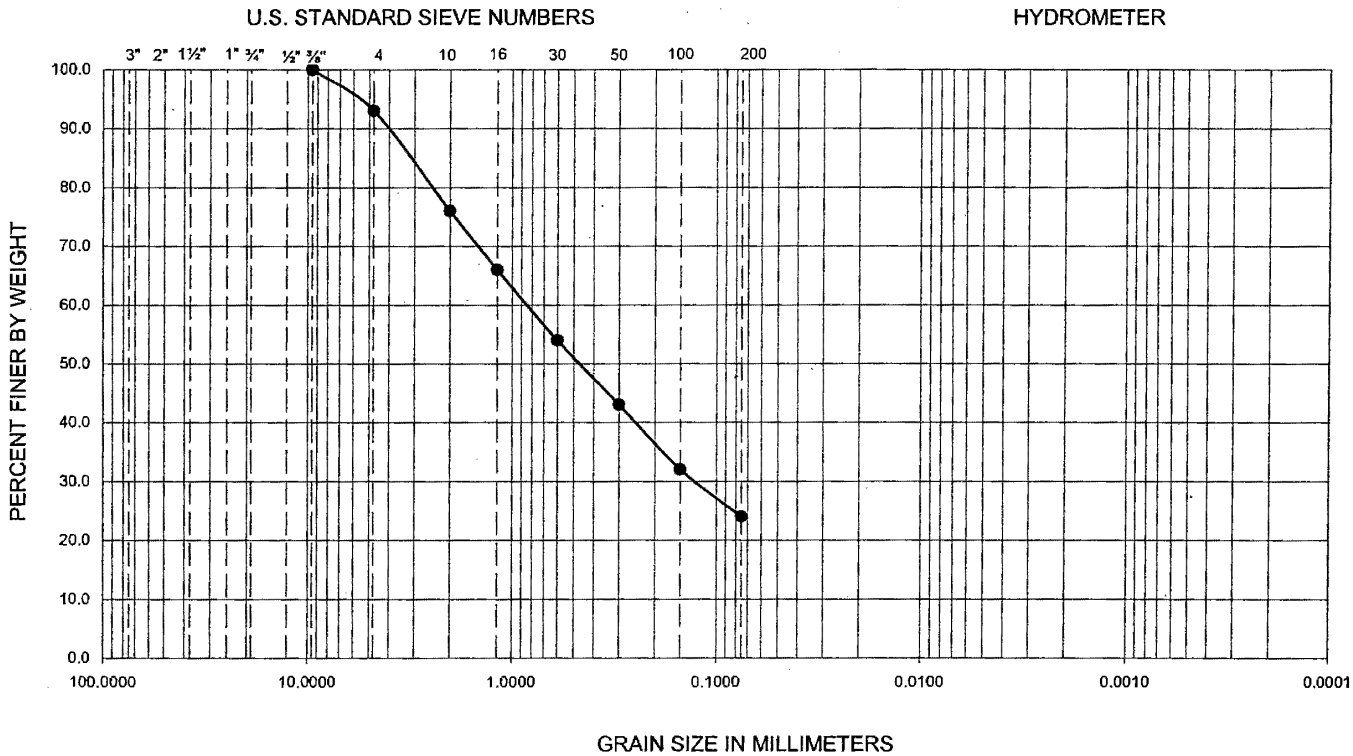
GRADATION TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-6

105393002 SIEVE- B-10 @ 2.0-4.0.xls

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	SILT	CLAY



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D_{10}	D_{30}	D_{60}	C_u	C_c	Passing No. 200 (%)	U.S.C.S
●	B-11	2.0-4.0	--	--	--	--	--	--	--	--	24	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422-63 (02)

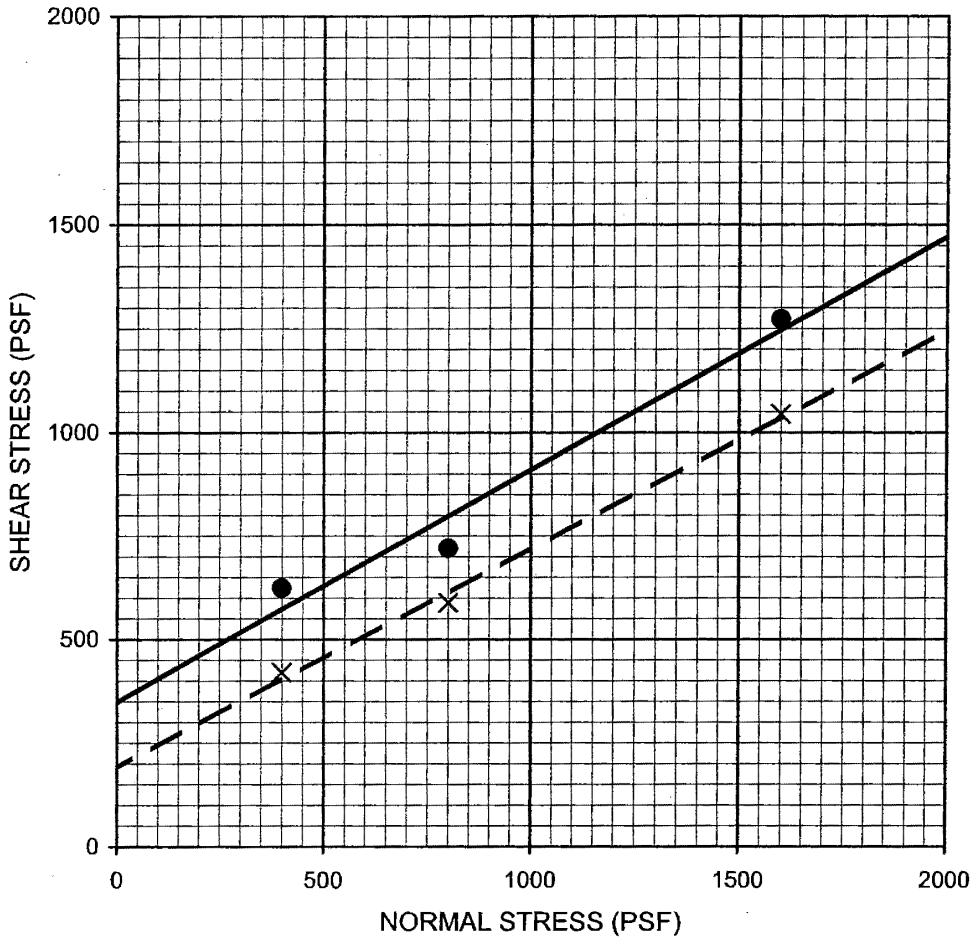
Ninyo & Moore

GRADATION TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-7

105393002 SIEVE-B-11 @ 2.0-4.0.xls



Description	Symbol	Sample Location	Depth (ft)	Shear Strength	Cohesion, c (psf)	Friction Angle, ϕ (degrees)	Soil Type
Remolded @ 90% Relative Compaction	—●—	B-12	2.0-4.0	Peak	350	29	SM
	- - X - -	B-12	2.0-4.0	Ultimate	190	28	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 3080-03

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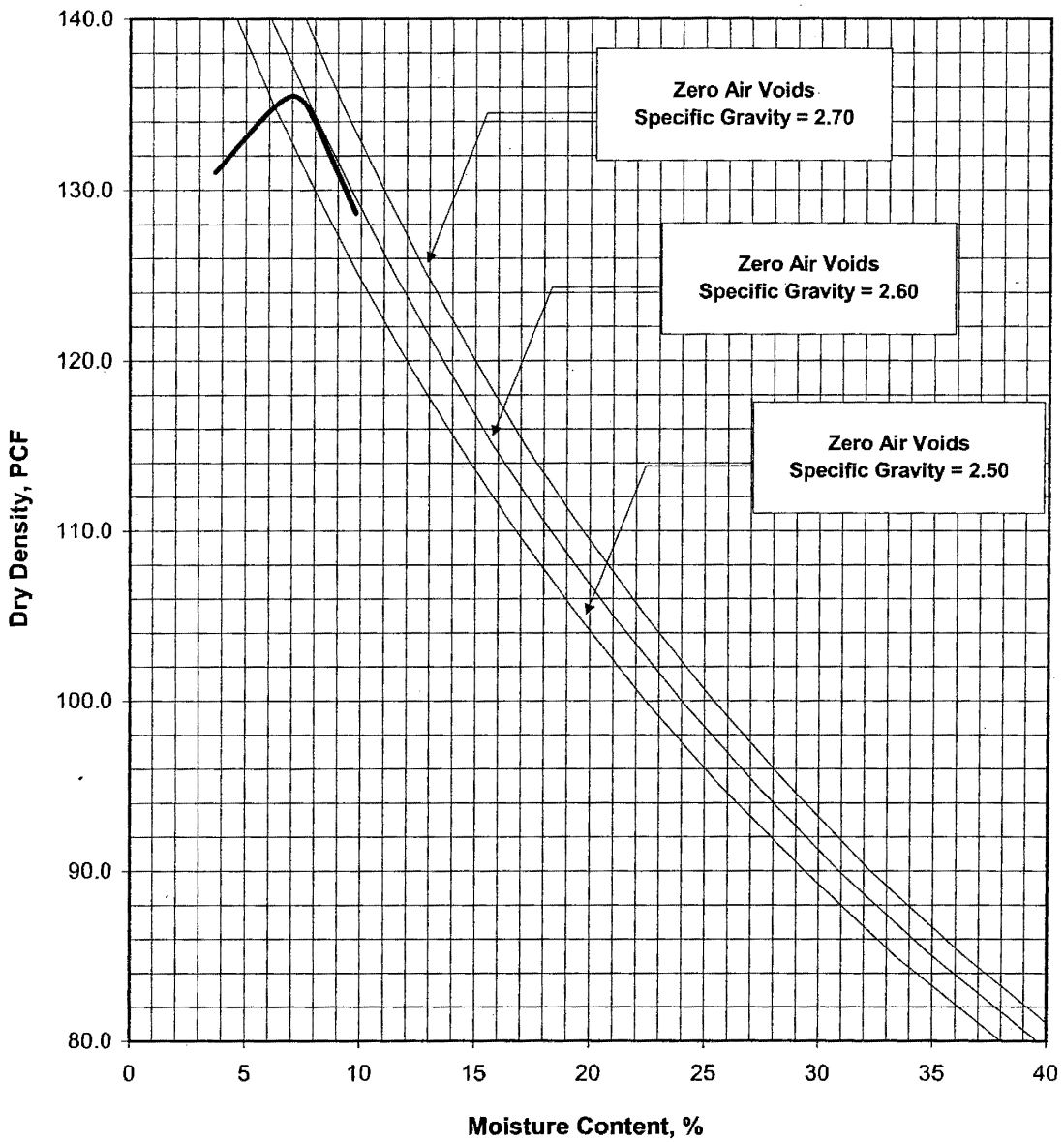
DIRECT SHEAR TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-8



SAMPLE LOCATION	DEPTH (FT)	SOIL DESCRIPTION	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE CONTENT (%)
B-12	2.0-4.0	Light yellowish brown silty SAND with gravel	135.5	7.0
	7.1% Plus No. 4 Sieve Material, Oversize Corrected Values		137.5	6.5

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 1557-02

Ninyo & Moore

PROCTOR DENSITY TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-9

105393002 Proctor, B-12 @ 2.0-4.0.xls

CORROSIVITY TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH *	RESISTIVITY * (ohm-cm)	WATER-SOLUBLE SULFATE CONTENT IN SOIL ** (%)	CHLORIDE CONTENT *** (ppm)
B-8	2.0-4.0	6.0	2,950	< 0.01	40

* PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643
** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417
*** PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

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CORROSIVITY TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-10

R-VALUE TEST RESULTS

SAMPLE LOCATION	SAMPLE DEPTH (FT)	SOIL TYPE	R-VALUE
B-9	2.0-4.0	SM	43
B-11	2.0-4.0	SM	74

PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 301

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R-VALUE TEST RESULTS

640-1 and 640-2 Reservoirs
Rancho San Diego, California

PROJECT NO.	DATE	FIGURE
105393002	8/05	C-11

APPENDIX D

TYPICAL EARTHWORK GUIDELINES FOR SLOPES

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Figure A – Fill Slope Over Natural Ground or Cut
Figure B – Transition and Undercut Lot Details
Figure C – Canyon Subdrain Detail
Figure D – Oversized Rock Placement Detail
Figure E – Slope Drainage Detail
Figure F – Shear Key Detail
Figure G – Drain Detail

TYPICAL EARTHWORK GUIDELINES FOR SLOPES

GENERAL

These guidelines and the standard details attached hereto are presented as general procedures for earthwork construction. They are to be utilized in conjunction with the project grading plans. These guidelines are considered a part of the geotechnical report, but are superseded by recommendations in the geotechnical report in the case of conflict. Evaluations performed by the consultant during the course of grading may result in new recommendations which could supersede these specifications and/or the recommendations of the geotechnical report. It is the responsibility of the contractor to read and understand these guidelines as well as the geotechnical report and project grading plans.

The contractor shall not vary from these guidelines without prior recommendations by the geotechnical consultant and the approval of the client or the client's authorized representative. Recommendations by the geotechnical consultant and/or client shall not be considered to preclude requirements for approval by the jurisdictional agency prior to the execution of any changes.

The contractor shall perform the grading operations in accordance with these specifications, and shall be responsible for the quality of the finished product notwithstanding the fact that grading work will be observed and tested by the geotechnical consultant.

It is the responsibility of the grading contractor to notify the geotechnical consultant and the jurisdictional agencies, as needed, prior to the start of work at the site and at any time that grading resumes after interruption. Each step of the grading operations shall be observed and documented by the geotechnical consultant and, where necessary, reviewed by the appropriate jurisdictional agency prior to proceeding with subsequent work.

If, during the grading operations, geotechnical conditions are encountered which were not anticipated or described in the geotechnical report, the geotechnical consultant shall be notified immediately and additional recommendations, if applicable, may be provided.

An as-graded report shall be prepared by the geotechnical consultant and signed by a registered engineer and registered engineering geologist. The report documents the geotechnical consultants' observations, and field and laboratory test results, and provides conclusions regarding whether or not earthwork construction was per-

formed in accordance with the geotechnical recommendations and the grading plans. Recommendations for foundation design, pavement design, subgrade treatment, etc., may also be included in the as-graded report.

For the purpose of evaluating quantities of materials excavated during grading and/or locating the limits of excavations, a licensed land surveyor or civil engineer shall be retained.

Definitions of terms utilized in the remainder of these specifications have been provided in Section 11.

OBLIGATIONS OF PARTIES

The parties involved in the projects earthwork activities shall be responsible as outlined in the following sections.

The client is ultimately responsible for the aspects of the project. The client or the client's authorized representative has a responsibility to review the findings and recommendations of the geotechnical consultant. The client shall authorize the contractor and/or other consultants to perform work and/or provide services. During grading the client or the client's authorized representative shall remain on site or remain reasonably accessible to the concerned parties to make the decisions that may be needed to maintain the flow of the project.

The contractor is responsible for the safety of the project and satisfactory completion of grading and other associated operations, including, but not limited to, earthwork in accordance with the project plans, specifications, and jurisdictional agency requirements. During grading, the contractor or the contractor's authorized representative shall remain on site. The contractor shall further remain accessible during non-working hours times, including at night and during days off.

The geotechnical consultant shall provide observation and testing services and shall make evaluations to advise the client on geotechnical matters. The geotechnical consultant shall report findings and recommendations to the client or the client's authorized representative.

Prior to proceeding with any grading operations, the geotechnical consultant shall be notified two working days in advance to schedule the needed observation and testing services.

Prior to any significant expansion or reduction in the grading operation, the geotechnical consultant shall be provided with two working days notice to make appropriate adjustments in scheduling of on-site personnel.

Between phases of grading operations, the geotechnical consultant shall be provided with two working days notice in advance of commencement of additional grading operations.

SITE PREPARATION

Site preparation shall be performed in accordance with the recommendations presented in the following sections.

The client, prior to any site preparation or grading, shall arrange and attend a pre-grading meeting between the grading contractor, the design engineer, the geotechnical consultant, and representatives of appropriate governing authorities, as well as any other involved parties. The parties shall be given two working days notice.

Clearing and grubbing shall consist of the substantial removal of vegetation, brush, grass, wood, stumps, trees, tree roots greater than 1/2-inch in diameter, and other deleterious materials from the areas to be graded. Clearing and grubbing shall extend to the outside of the proposed excavation and fill areas.

Demolition in the areas to be graded shall include removal of building structures, foundations, reservoirs, utilities (including underground pipelines, septic tanks, leach fields, seepage pits, cisterns, etc.), and other manmade surface and subsurface improvements, and the backfilling of mining shafts, tunnels and surface depressions. Demolition of utilities shall include capping or rerouting of pipelines at the project perimeter, and abandonment of wells in accordance with the requirements of the governing authorities and the recommendations of the geotechnical consultant at the time of demolition.

The debris generated during clearing, grubbing and/or demolition operations shall be removed from areas to be graded and disposed of off site at a legal dump site. Clearing, grubbing, and demolition operations shall be performed under the observation of the geotechnical consultant.

The ground surface beneath proposed fill areas shall be stripped of loose or unsuitable soil. These soils may be used as compacted fill provided they are generally free of organic or other deleterious materials and evaluated for use by the geotechnical consultant. The resulting surface shall be evaluated by the geotechnical consultant prior to proceeding. The cleared, natural ground surface shall be scarified to a depth of approximately 8 inches, moisture conditioned, and compacted in accordance with the specifications presented in Section 5. of these guidelines.

Where fills are to be constructed on hillsides or slopes, topsoil, slope wash, colluvium, and other materials deemed unsuitable shall be removed. Where the exposed slope is steeper than 5 horizontal units to 1 vertical unit, or where recommended by the geo-

technical consultant, the slope of the original ground on which the fill is to be placed shall be benched and a key as shown on Figure A of this document shall be provided by the contractor in accordance with the specifications presented in Section 7. of this document. The benches shall extend into the underlying bedrock or, where bedrock is not present, into suitable compacted fill as evaluated by the geotechnical consultant.

REMOVALS AND EXCAVATIONS

Removals and excavations shall be performed as recommended in the following sections.

Removals

Materials which are considered unsuitable shall be excavated under the observation of the geotechnical consultant in accordance with the recommendations contained herein. Unsuitable materials include, but may not be limited to, dry, loose, soft, wet, organic, compressible natural soils, fractured, weathered, soft bedrock, and undocumented or otherwise deleterious fill materials.

Materials deemed by the geotechnical consultant to be unsatisfactory due to moisture conditions shall be excavated in accordance with the recommendations of the geotechnical consultant, watered or dried as needed, and mixed to a generally uniform moisture content in accordance with the specifications presented in Section 5. of this document.

Excavations

Temporary excavations no deeper than 5 feet in firm fill or natural materials may be made with vertical side slopes. To satisfy CAL OSHA requirements, any excavation deeper than 5 feet shall be shored or laid back at a 1:1 (horizontal:vertical) inclination or flatter, depending on material type, if construction workers are to enter the excavation.

COMPACTED FILL

Fill shall be constructed as specified below or by other methods recommended by the geotechnical consultant. Unless otherwise specified, fill soils shall be compacted to 90 percent or greater relative compaction, as evaluated in accordance with ASTM Test Method D 1557-02.

Prior to placement of compacted fill, the contractor shall request an evaluation of the exposed ground surface by the geotechnical consultant. Unless otherwise

recommended, the exposed ground surface shall then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve a generally uniform moisture content at or near the optimum moisture content. The scarified materials shall then be compacted to 90 percent or greater relative compaction. The evaluation of compaction by the geotechnical consultant shall not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify the geotechnical consultant and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

Excavated on-site materials which are in general compliance with the recommendations of the geotechnical consultant may be utilized as compacted fill provided they are generally free of organic or other deleterious materials and do not contain rock fragments greater than 6 inches in dimension. During grading, the contractor may encounter soil types other than those analyzed during the preliminary geotechnical study. The geotechnical consultant shall be consulted to evaluate the suitability of any such soils for use as compacted fill.

Where imported materials are to be used on site, the geotechnical consultant shall be notified three working days in advance of importation in order that it may sample and test the materials from the proposed borrow sites. No imported materials shall be delivered for use on site without prior sampling, testing, and evaluation by the geotechnical consultant.

Soils imported for on-site use shall preferably have very low to low expansion potential (based on UBC Standard 18-2 test procedures). Lots on which expansive soils may be exposed at grade shall be undercut 3 feet or more and capped with very low to low expansion potential fill. Details of the undercutting are provided in the Transition and Undercut Lot Details, Figure B of these guidelines. In the event expansive soils are present near the ground surface, special design and construction considerations shall be utilized in general accordance with the recommendations of the geotechnical consultant.

Fill materials shall be moisture conditioned to near optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils shall be generally uniform in the soil mass.

Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill shall be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

Compacted fill shall be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift shall be watered or dried as needed to achieve

near optimum moisture condition, mixed, and then compacted by mechanical methods, using sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other appropriate compacting rollers, to the specified relative compaction. Successive lifts shall be treated in a like manner until the desired finished grades are achieved.

Fill shall be tested in the field by the geotechnical consultant for evaluation of general compliance with the recommended relative compaction and moisture conditions. Field density testing shall conform to ASTM D 1556-00 (Sand Cone method), D 2937-00 (Drive-Cylinder method), and/or D 2922-96 and D 3017-96 (Nuclear Gauge method). Generally, one test shall be provided for approximately every 2 vertical feet of fill placed, or for approximately every 1000 cubic yards of fill placed. In addition, on slope faces one or more tests shall be taken for approximately every 10,000 square feet of slope face and/or approximately every 10 vertical feet of slope height. Actual test intervals may vary as field conditions dictate. Fill found to be out of conformance with the grading recommendations shall be removed, moisture conditioned, and compacted or otherwise handled to accomplish general compliance with the grading recommendations.

The contractor shall assist the geotechnical consultant by excavating suitable test pits for removal evaluation and/or for testing of compacted fill.

At the request of the geotechnical consultant, the contractor shall "shut down" or restrict grading equipment from operating in the area being tested to provide adequate testing time and safety for the field technician.

The geotechnical consultant shall maintain a map with the approximate locations of field density tests. Unless the client provides for surveying of the test locations, the locations shown by the geotechnical consultant will be estimated. The geotechnical consultant shall not be held responsible for the accuracy of the horizontal or vertical location or elevations.

Grading operations shall be performed under the observation of the geotechnical consultant. Testing and evaluation by the geotechnical consultant does not preclude the need for approval by or other requirements of the jurisdictional agencies.

Fill materials shall not be placed, spread or compacted during unfavorable weather conditions. When work is interrupted by heavy rains, the filling operation shall not be resumed until tests indicate that moisture content and density of the fill meet the project specifications. Regrading of the near-surface soil may be needed to achieve the specified moisture content and density.

Upon completion of grading and termination of observation by the geotechnical consultant, no further filling or excavating, including that planned for footings, foundations, retaining walls or other features, shall be performed without the involvement of the geotechnical consultant.

Fill placed in areas not previously viewed and evaluated by the geotechnical consultant may have to be removed and recompacted at the contractor's expense. The depth and extent of removal of the unobserved and undocumented fill will be decided based upon review of the field conditions by the geotechnical consultant.

Off-site fill shall be treated in the same manner as recommended in these specifications for on-site fills. Off-site fill subdrains temporarily terminated (up gradient) shall be surveyed for future locating and connection.

Prior to placement of a canyon fill, a subdrain shall be installed in bedrock or compacted fill along the approximate alignment of the canyon bottom if recommended by the geotechnical consultant. Details of subdrain placement and configuration have been provided in the Canyon Subdrain Detail, Figure C, of these guidelines.

Transition (cut/fill) lots shall generally be undercut 3 feet or more below finished grade to provide a generally uniform thickness of fill soil in the pad area. Where the depth of fill on a transition lot greatly exceeds 3 feet, overexcavation may be increased at the discretion of the geotechnical consultant. Details of the undercut for transition lots are provided in the Transition and Undercut Lot Detail, Figure B, of these guidelines.

OVERSIZED MATERIAL

Oversized material shall be placed in accordance with the following recommendations.

During the course of grading operations, rocks or similar irreducible materials greater than 6 inches in dimension (oversized material) may be generated. These materials shall not be placed within the compacted fill unless placed in general accordance with the recommendations of the geotechnical consultant.

Where oversized rock (greater than 6 inches in dimension) or similar irreducible material is generated during grading, it is recommended, where practical, to waste such material off site, or on site in areas designated as "nonstructural rock disposal areas." Rock designated for disposal areas shall be placed with sufficient sandy soil to generally fill voids. The disposal area shall be capped with a 5-foot thickness of fill which is generally free of oversized material.

Rocks 6 inches in dimension and smaller may be utilized within the compacted fill, provided they are placed in such a manner that nesting of rock is not permitted. Fill shall be placed and compacted over and around the rock. The amount of rock greater than 3/4-inch in dimension shall generally not exceed 40 percent of the total dry weight of the fill mass, unless the fill is specially designed and constructed as a "rock fill."

Rocks or similar irreducible materials greater than 6 inches but less than 4 feet in dimension generated during grading may be placed in windrows and capped with finer materials in accordance with the recommendations of the geotechnical consultant, the approval of the governing agencies, and the Oversized Rock Placement Detail, Figure D, of these guidelines. Selected native or imported granular soil (Sand Equivalent of 30 or higher) shall be placed and flooded over and around the windrowed rock such that voids are filled. Windrows of oversized materials shall be staggered so that successive windrows of oversized materials are not in the same vertical plane. Rocks greater than 4 feet in dimension shall be broken down to 4 feet or smaller before placement, or they shall be disposed of off site.

SLOPES

The following sections provide recommendations for cut and fill slopes.

Cut Slopes

Unless otherwise recommended by the geotechnical consultant and accepted by the building official, permanent cut slopes shall not be steeper than 2:1 (horizontal:vertical). The recommended height of a cut slope shall be evaluated by the geotechnical consultant. Slopes in excess of 30 feet high shall be provided with terrace drains (swales) in accordance with the recommendations presented in the Uniform Building Code, Section 3315 and the details provided in Figure E of these guidelines.

The geotechnical consultant shall observe cut slopes during excavation. The geotechnical consultant shall be notified by the contractor prior to beginning slope excavations.

If excavations for cut slopes expose loose, cohesionless, significantly fractured, or otherwise unsuitable materials, overexcavation of the unsuitable material and replacement with a compacted stabilization fill shall be evaluated and may be recommended by the geotechnical consultant. Unless otherwise specified by the geotechnical consultant, stabilization fill construction shall be in general accordance with the details provided on Figure F of these guidelines.

If, during the course of grading, adverse or potentially adverse geotechnical conditions are encountered in the slope which were not anticipated in the preliminary evaluation report, the geotechnical consultant shall evaluate the conditions and provide appropriate recommendations.

Fill Slopes

When placing fill on slopes steeper than 5:1 (horizontal:vertical), topsoil, slope wash, colluvium, and other materials deemed unsuitable shall be removed. Near-horizontal keys and near-vertical benches shall be excavated into sound bedrock or firm fill material, in accordance with the recommendation of the geotechnical consultant. Keying and benching shall be accomplished in general accordance with the details provided on Figure A of these guidelines. Compacted fill shall not be placed in an area subsequent to keying and benching until the area has been observed by the geotechnical consultant. Where the natural gradient of a slope is less than 5:1, benching is generally not recommended. However, fill shall not be placed on compressible or otherwise unsuitable materials left on the slope face.

Within a single fill area where grading procedures dictate two or more separate fills, temporary slopes (false slopes) may be created. When placing fill adjacent to a temporary slope, benching shall be conducted in the manner described in Section 7.2.1. A 3-foot or higher near-vertical bench shall be excavated into the documented fill prior to placement of additional fill.

Unless otherwise recommended by the geotechnical consultant and by the building official, permanent fill slopes shall not be steeper than 2:1 (horizontal:vertical). The height of a fill slope shall be evaluated by the geotechnical consultant. Slopes in excess of 30 feet high shall be provided with terrace drains (swales) and backdrains in accordance with the recommendations presented in the Uniform Building Code, Section 3315 and the details provided in Figure E of these guidelines.

Unless specifically recommended otherwise, compacted fill slopes shall be overbuilt and cut back to grade, exposing firm compacted fill. The actual amount of overbuilding may vary as field conditions dictate. If the desired results are not achieved, the existing slopes shall be overexcavated and reconstructed in accordance with the recommendations of the geotechnical consultant. The degree of overbuilding may be increased until the desired compacted slope face condition is achieved. Care shall be taken by the contractor to provide mechanical compaction as close to the outer edge of the overbuilt slope surface as practical.

If access restrictions, property line location, or other constraints limit overbuilding and cutting back of the slope face, an alternative method for compaction of the slope face may be attempted by conventional construction procedures including backrolling at intervals of 4 feet or less in vertical slope height, or as dictated by the capability of the available equipment, whichever is less. Fill slopes shall be backrolled utilizing a conventional sheeps foot-type roller.

Care shall be taken to maintain the specified moisture conditions and/or reestablish the same, as needed, prior to backrolling. .

The placement, moisture conditioning and compaction of fill slope materials shall be done in accordance with the recommendations presented in Section 5. of these guidelines.

The contractor shall be ultimately responsible for placing and compacting the soil out to the slope face to obtain a relative compaction of 90 percent or greater as evaluated by ASTM D 1557-02 and a moisture content in accordance with Section 5. The geotechnical consultant shall perform field moisture and density tests at intervals of one test for approximately every 10,000 square feet of slope face and/or approximately every 10 feet of vertical height of slope.

Backdrains shall be provided in fill slopes in accordance with the details presented on Figure A of these guidelines, or as recommended by the geotechnical consultant.

Top-of-Slope Drainage

For pad areas above slopes, positive drainage shall be established away from the top of slope. This may be accomplished utilizing a berm and pad gradient of 2 percent or steeper at the top-of-slope areas. Site runoff shall not be permitted to flow over the tops of slopes.

Gunite-lined brow ditches shall be placed at the top of cut slopes to redirect surface runoff away from the slope face where drainage devices are not otherwise provided.

Slope Maintenance

In order to enhance surficial slope stability, slope planting shall be accomplished at the completion of grading. Slope plants shall consist of deep-rooting, variable root depth, drought-tolerant vegetation. Native vegetation is generally desirable. Plants native to semiarid and arid areas may also be appropriate. Large-leafed ice plant should not be used on slopes. A landscape architect shall be consulted regarding the actual types of plants and planting configuration to be used.

Irrigation pipes shall be anchored to slope faces and not placed in trenches excavated into slope faces. Slope irrigation shall be maintained at a level just sufficient to support plant growth. Property owners shall be made aware that over watering of slopes is detrimental to slope stability. Slopes shall be monitored regularly and broken sprinkler heads and/or pipes shall be repaired immediately.

Periodic observation of landscaped slope areas shall be planned and appropriate measures taken to enhance growth of landscape plants.

Graded swales at the top of slopes and terrace drains shall be installed and the property owners notified that the drains shall be periodically checked so that they may be kept clear. Damage to drainage improvements shall be repaired immediately. To reduce siltation, terrace drains shall be constructed at a gradient of 3 percent or steeper, in accordance with the recommendations of the project civil engineer.

If slope failures occur, the geotechnical consultant shall be contacted immediately for field review of site conditions and development of recommendations for evaluation and repair.

TRENCH BACKFILL

The following sections provide recommendations for backfilling of trenches.

Trench backfill shall consist of granular soils (bedding) extending from the trench bottom to 1 or more feet above the pipe. On-site or imported fill which has been evaluated by the geotechnical consultant may be used above the granular backfill. The cover soils directly in contact with the pipe shall be classified as having a very low expansion potential, in accordance with UBC Standard 18-2, and shall contain no rocks or chunks of hard soil larger than 3/4-inch in diameter.

Trench backfill shall, unless otherwise recommended, be compacted by mechanical means to 90 percent or greater relative compaction as evaluated in accordance with ASTM D 1557-02. Backfill soils shall be placed in loose lifts 8-inches thick or thinner, moisture conditioned, and compacted in accordance with the recommendations of Section 5. of these guidelines. The backfill shall be tested by the geotechnical consultant at vertical intervals of approximately 2 feet of backfill placed and at spacings along the trench of approximately 100 feet in the same lift.

Jetting of trench backfill materials is generally not a recommended method of densification, unless the on-site soils are sufficiently free-draining and provisions have been made for adequate dissipation of the water utilized in the jetting process.

If it is decided that jetting may be utilized, granular material with a sand equivalent greater than 30 shall be used for backfilling in the areas to be jetted. Jetting shall generally be considered for trenches 2 feet or narrower in width and 4 feet or shallower in depth. Following jetting operations, trench backfill shall be mechanically compacted to the specified compaction to finish grade.

Trench backfill which underlies the zone of influence of foundations shall be mechanically compacted to 90 percent or greater relative compaction, as evaluated in accordance with ASTM D 1557-02. The zone of influence of the foundations is generally defined as the roughly triangular area within the limits of a 1:1 projection from the inner and outer edges of the foundation, projected down and out from both edges.

Trench backfill within slab areas shall be compacted by mechanical means to a relative compaction of 90 percent or greater relative compaction, as evaluated in accordance with ASTM D 1557-02. For minor interior trenches, density testing may be omitted or spot testing may be performed, as deemed appropriate by the geotechnical consultant.

When compacting soil in close proximity to utilities, care shall be taken by the grading contractor so that mechanical methods used to compact the soils do not damage the utilities. If the utility contractors indicate that it is undesirable to use compaction equipment in close proximity to a buried conduit, then the grading contractor may elect to use light mechanical compaction equipment or, with the approval of the geotechnical consultant, cover the conduit with clean granular material. These granular materials shall be jetted in place to the top of the conduit in accordance with the recommendations of Section 8.4 prior to initiating mechanical compaction procedures. Other methods of utility trench compaction may also be appropriate, upon review by the geotechnical consultant and the utility contractor, at the time of construction.

Clean granular backfill and/or bedding materials are not recommended for use in slope areas unless provisions are made for a drainage system to mitigate the potential for buildup of seepage forces or piping of backfill materials.

The contractor shall exercise the specified safety precautions, in accordance with OSHA Trench Safety Regulations, while conducting trenching operations. Such precautions include shoring or laying back trench excavations at 1:1 or flatter, depending on material type, for trenches in excess of 5 feet in depth. The geotechnical consultant is not responsible for the safety of trench operations or stability of the trenches.

DRAINAGE

The following sections provide recommendations pertaining to site drainage.

Canyon subdrain systems recommended by the geotechnical consultant shall be installed in accordance with the Canyon Subdrain Detail, Figure C, provided in these guidelines. Canyon subdrains shall be installed to conform to the approximate alignment and details shown on project plans. The actual subdrain location shall be evaluated

by the geotechnical consultant in the field during grading. Materials specified in the attached Canyon Subdrain Detail shall not be changed or modified unless so recommended by the geotechnical consultant. Subdrains shall be surveyed by a licensed land surveyor/civil engineer for line and grade after installation. Sufficient time shall be allowed for the surveys prior to commencement of filling over the subdrains.

Typical backdrains for stability, side hill, and shear key fills shall be installed in accordance with the details provided on Figure A, Figure F, and Figure G of these guidelines.

Roof, pad, and slope drainage shall be such that it is away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.).

Positive drainage adjacent to structures shall be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of the structure at a gradient of 2 percent or steeper for a distance of 5 feet or more outside the building perimeter, further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

Surface drainage on the site shall be provided so that water is not permitted to pond. A gradient of 2 percent or steeper shall be maintained over the pad area and drainage patterns shall be established to remove water from the site to an appropriate outlet.

Care shall be taken by the contractor during finish grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices of a permanent nature on or adjacent to the property. Drainage patterns established at the time of finish grading shall be maintained for the life of the project. Property owners shall be made very clearly aware that altering drainage patterns may be detrimental to slope stability and foundation performance.

SITE PROTECTION

The site shall be protected as outlined in the following sections.

Protection of the site during the period of grading shall be the responsibility of the contractor unless other provisions are made in writing and agreed upon among the concerned parties. Completion of a portion of the project shall not be considered to preclude that portion or adjacent areas from the need for site protection, until such time as the project is finished as agreed upon by the geotechnical consultant, the client, and the regulatory agency.

The contractor is responsible for the stability of temporary excavations. Recommendations by the geotechnical consultant pertaining to temporary excavations are made in consideration of stability of the finished project and, therefore, shall not be considered to preclude the responsibilities of the contractor. Recommendations by the geotechnical consultant shall also not be considered to preclude more restrictive requirements by the applicable regulatory agencies.

Precautions shall be taken during the performance of site clearing, excavation, and grading to protect the site from flooding, ponding, or inundation by surface runoff. Temporary provisions shall be made during the rainy season so that surface runoff is away from and off the working site. Where low areas cannot be avoided, pumps shall be provided to remove water as needed during periods of rainfall.

During periods of rainfall, plastic sheeting shall be used as needed to reduce the potential for unprotected slopes to become saturated. Where needed, the contractor shall install check dams, desilting basins, riprap, sandbags or other appropriate devices or methods to reduce erosion and provide the recommended conditions during inclement weather.

During periods of rainfall, the geotechnical consultant shall be kept informed by the contractor of the nature of remedial or precautionary work being performed on site (e.g., pumping, placement of sandbags or plastic sheeting, other labor, dozing, etc.).

Following periods of rainfall, the contractor shall contact the geotechnical consultant and arrange a walk-over of the site in order to visually assess rain-related damage. The geotechnical consultant may also recommend excavation and testing in order to aid in the evaluation. At the request of the geotechnical consultant, the contractor shall make excavations in order to aid in evaluation of the extent of rain-related damage.

Rain- or irrigation-related damage shall be considered to include, but may not be limited to, erosion, silting, saturation, swelling, structural distress, and other adverse conditions noted by the geotechnical consultant. Soil adversely affected shall be classified as "Unsuitable Material" and shall be subject to overexcavation and replacement with compacted fill or to other remedial grading as recommended by the geotechnical consultant.

Relatively level areas where saturated soils and/or erosion gullies exist to depths greater than 1 foot shall be overexcavated to competent materials as evaluated by the geotechnical consultant. Where adverse conditions extend to less than 1 foot in depth, saturated and/or eroded materials may be processed in-place. Overexcavated or in-place processed materials shall be moisture conditioned and compacted in accordance with the recommendations provided in Section 5. If the desired results are not achieved, the affected materials shall be overexcavated, moisture conditioned, and compacted until the specifications are met.

Slope areas where saturated soil and/or erosion gullies exist to depths greater than 1 foot shall be overexcavated and replaced as compacted fill in accordance with the applicable specifications. Where adversely affected materials exist to depths of 1 foot or less below proposed finished grade, remedial grading by moisture conditioning in-place and compaction in accordance with the appropriate specifications may be attempted. If the desired results are not achieved, the affected materials shall be overexcavated, moisture conditioned, and compacted until the specifications are met. As conditions dictate, other slope repair procedures may also be recommended by the geotechnical consultant.

During construction, the contractor shall grade the site to provide positive drainage away from structures and to keep water from ponding adjacent to structures. Water shall not be allowed to damage adjacent properties. Positive drainage shall be maintained by the contractor until permanent drainage and erosion reducing devices are installed in accordance with project plans.

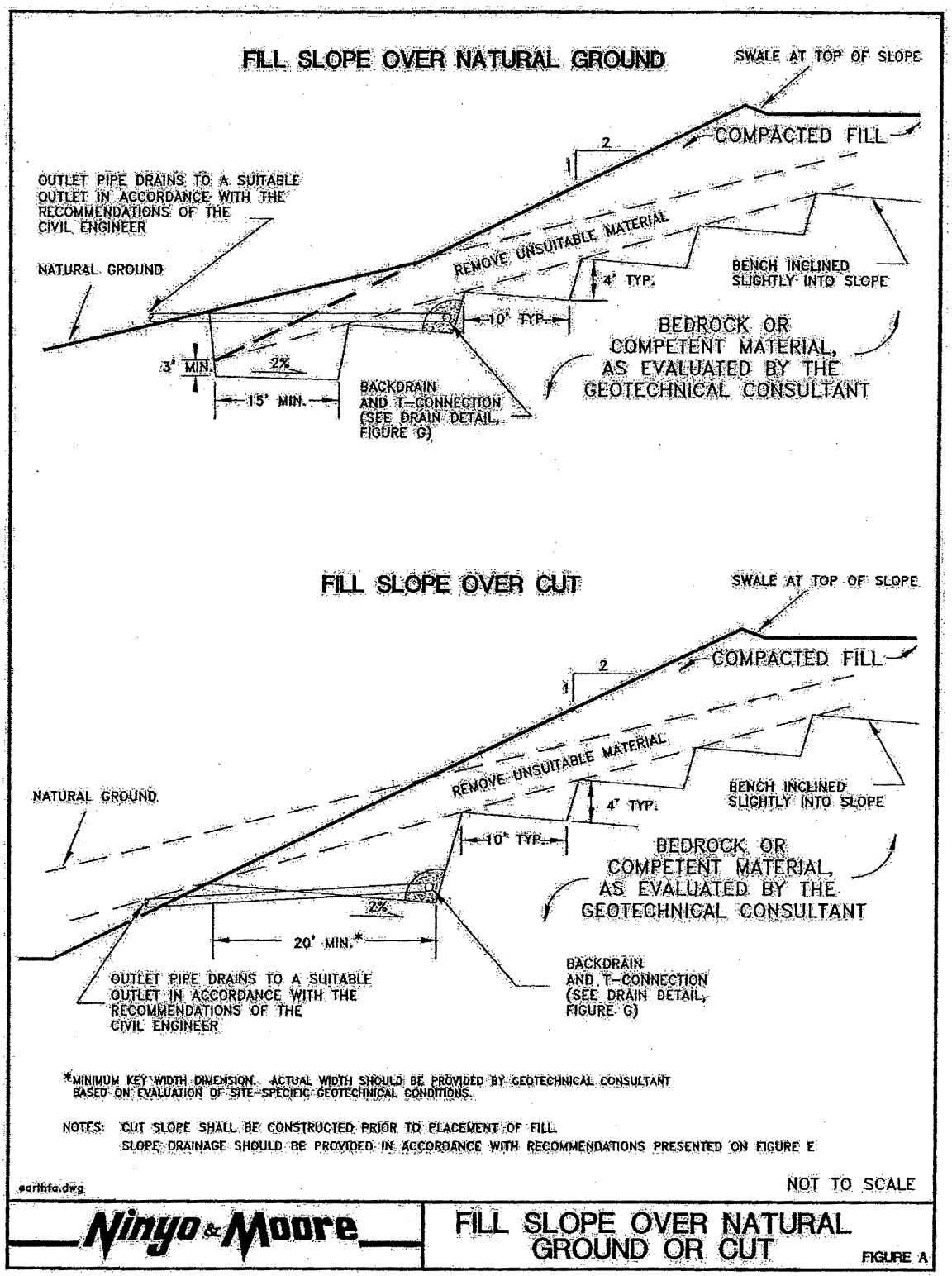
DEFINITIONS OF TERMS

ALLUVIUM:	Unconsolidated detrital deposits deposited by flowing water; includes sediments deposited in river beds, canyons, flood plains, lakes, fans at the foot of slopes, and in estuaries.
AS-GRADED (AS-BUILT):	The site conditions upon completion of grading.
BACKCUT:	A temporary construction slope at the rear of earth-retaining structures such as buttresses, shear keys, stabilization fills, or retaining walls.
BACKDRAIN:	Generally a pipe-and-gravel or similar drainage system placed behind earth-retaining structures such as buttresses, stabilization fills, and retaining walls.
BEDROCK:	Relatively undisturbed in-place rock, either at the surface or beneath surficial deposits of soil.
BENCH:	A relatively level step and near-vertical riser excavated into sloping ground on which fill is to be placed.
BORROW (IMPORT):	Any fill material hauled to the project site from off-site areas.
BUTTRESS FILL:	A fill mass, the configuration of which is designed by engineering calculations, to retain slopes containing adverse geologic features. A buttress is generally specified by a key width and depth and by a backcut angle. A buttress normally contains a back drainage system.
CIVIL ENGINEER:	The Registered Civil Engineer or consulting firm responsible for preparation of the grading plans and surveying, and evaluating as-graded topographic conditions.
CLIENT:	The developer or a project-responsible authorized representative. The client has the responsibility of reviewing the findings and recommendations made by the geotechnical consultant and authorizing the contractor and/or other consultants to perform work and/or provide services.
COLLUVIUM:	Generally loose deposits, usually found on the face or near the base of slopes and brought there chiefly by gravity through slow continuous downhill creep (see also Slope Wash).
COMPACTION:	The densification of a fill by mechanical means.

CONTRACTOR:	A person or company under contract or otherwise retained by the client to perform demolition, grading, and other site improvements.
DEBRIS:	The products of clearing, grubbing, and/or demolition, or contaminated soil material unsuitable for reuse as compacted fill, and/or any other material so designated by the geotechnical consultant.
ENGINEERED FILL:	A fill which the geotechnical consultant or the consultant's representative has observed and/or tested during placement, enabling the consultant to conclude that the fill has been placed in substantial compliance with the recommendations of the geotechnical consultant and the governing agency requirements.
ENGINEERING GEOLOGIST:	A geologist registered by the state licensing agency who applies geologic knowledge and principles to the exploration and evaluation of naturally occurring rock and soil, as related to the design of civil works.
EROSION:	The wearing away of the ground surface as a result of the movement of wind, water, and/or ice.
EXCAVATION:	The mechanical removal of earth materials.
EXISTING GRADE:	The ground surface configuration prior to grading; original grade.
FILL:	Any deposit of soil, rock, soil-rock blends, or other similar materials placed by man.
FINISH GRADE:	The as-graded ground surface elevation that conforms to the grading plan.
GEOFABRIC:	An engineering textile utilized in geotechnical applications such as subgrade stabilization and filtering.
GEOTECHNICAL CONSULTANT:	The geotechnical engineering and engineering geology consulting firm retained to provide technical services for the project. For the purpose of these specifications, observations by the geotechnical consultant include observations by the geotechnical engineer, engineering geologist and other persons employed by and responsible to the geotechnical consultant.

GEOTECHNICAL ENGINEER:	A licensed civil engineer and geotechnical engineer, registered by the state licensing agency, who applies scientific methods, engineering principles, and professional experience to the acquisition, interpretation, and use of knowledge of materials of the earth's crust to the resolution of engineering problems. Geotechnical engineering encompasses many of the engineering aspects of soil mechanics, rock mechanics, geology, geophysics, hydrology, and related sciences.
GRADING:	Any operation consisting of excavation, filling, or combinations thereof and associated operations.
LANDSLIDE DEPOSITS:	Material, often porous and of low density, produced from instability of natural or manmade slopes.
OPTIMUM MOISTURE:	The moisture content that is considered optimum to compaction operations.
RELATIVE COMPACTION:	The degree of compaction (expressed as a percentage) of a material as compared to the dry density obtained from ASTM test method D 1557-02.
ROUGH GRADE:	The ground surface configuration at which time the surface elevations approximately conform to the approved plan.
SHEAR KEY:	Similar to a subsurface buttress; however, it is generally constructed by excavating a slot within a natural slope in order to stabilize the upper portion of the slope without encroaching into the lower portion of the slope.
SITE:	The particular parcel of land where grading is being performed.
SLOPE:	An inclined ground surface, the steepness of which is generally specified as a ratio of horizontal units to vertical units.
SLOPE WASH:	Soil and/or rock material that has been transported down a slope by gravity assisted by the action of water not confined to channels (see also Colluvium).
SLOUGH:	Loose, uncompacted fill material generated during grading operations.
SOIL:	Naturally occurring deposits of sand, silt, clay, etc., or combinations thereof.

STABILIZATION FILL:	A fill mass, the configuration of which is typically related to slope height and is specified by the standards of practice for enhancing the stability of locally adverse conditions. A stabilization fill is normally specified by a key width and depth and by a backcut angle. A stabilization fill may or may not have a back drainage system specified.
SUBDRAIN:	Generally a pipe-and-gravel or similar drainage system placed beneath a fill along the alignment of buried canyons or former drainage channels.
TAILINGS:	Non-engineered fill which accumulates on or adjacent to equipment haul roads.
TERRACE:	A relatively level bench constructed on the face of a graded slope surface for drainage and maintenance purposes.
TOPSOIL:	The upper zone of soil or bedrock materials, which is usually dark in color, loose, and contains organic materials.
WINDROW:	A row of large rocks buried within engineered fill in accordance with guidelines set forth by the geotechnical consultant.


FILL SLOPE OVER NATURAL GROUND
SWALE AT TOP OF SLOPE
COMPACTED FILL
2
1
OUTLET PIPE DRAINS TO A SUITABLE OUTLET IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE CIVIL ENGINEER
NATURAL GROUND
REMOVE UNSUITABLE MATERIAL
4' TYP.
BENCH INCLINED SLIGHTLY INTO SLOPE
10' TYP.
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
3' MIN.
2%
15' MIN.
BACKDRAIN AND T-CONNECTION (SEE DRAIN DETAIL, FIGURE G)
FILL SLOPE OVER CUT
SWALE AT TOP OF SLOPE
COMPACTED FILL
2
1
REMOVE UNSUITABLE MATERIAL
NATURAL GROUND
4' TYP.
BENCH INCLINED SLIGHTLY INTO SLOPE
10' TYP.
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
2%
20' MIN.*
OUTLET PIPE DRAINS TO A SUITABLE OUTLET IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE CIVIL ENGINEER
BACKDRAIN AND T-CONNECTION (SEE DRAIN DETAIL, FIGURE G)
*MINIMUM KEY WIDTH DIMENSION. ACTUAL WIDTH SHOULD BE PROVIDED BY GEOTECHNICAL CONSULTANT BASED ON EVALUATION OF SITE-SPECIFIC GEOTECHNICAL CONDITIONS.
NOTES: CUT SLOPE SHALL BE CONSTRUCTED PRIOR TO PLACEMENT OF FILL.
SLOPE DRAINAGE SHOULD BE PROVIDED IN ACCORDANCE WITH RECOMMENDATIONS PRESENTED ON FIGURE E.
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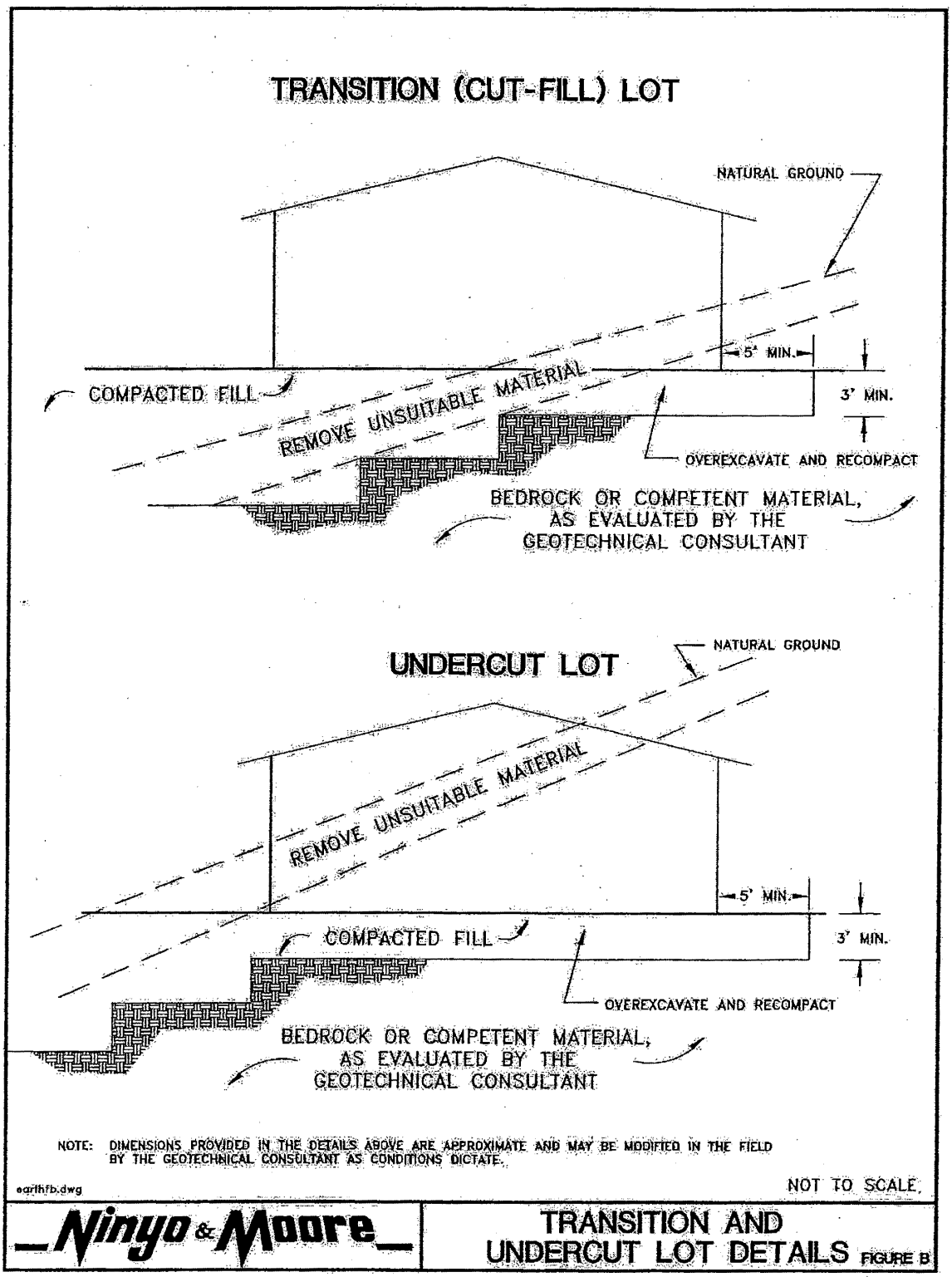
NOT TO SCALE
Ninyo & Moore
FILL SLOPE OVER NATURAL GROUND OR CUT
FIGURE A


TRANSITION (CUT-FILL) LOT
NATURAL GROUND
5' MIN.
3' MIN.
COMPACTED FILL
REMOVE UNSUITABLE MATERIAL
OVEREXCAVATE AND RECOMPACT
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
UNDERCUT LOT
NATURAL GROUND
REMOVE UNSUITABLE MATERIAL
5' MIN.
3' MIN.
COMPACTED FILL
OVEREXCAVATE AND RECOMPACT
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
NOTE: DIMENSIONS PROVIDED IN THE DETAILS ABOVE ARE APPROXIMATE AND MAY BE MODIFIED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT AS CONDITIONS DICTATE.
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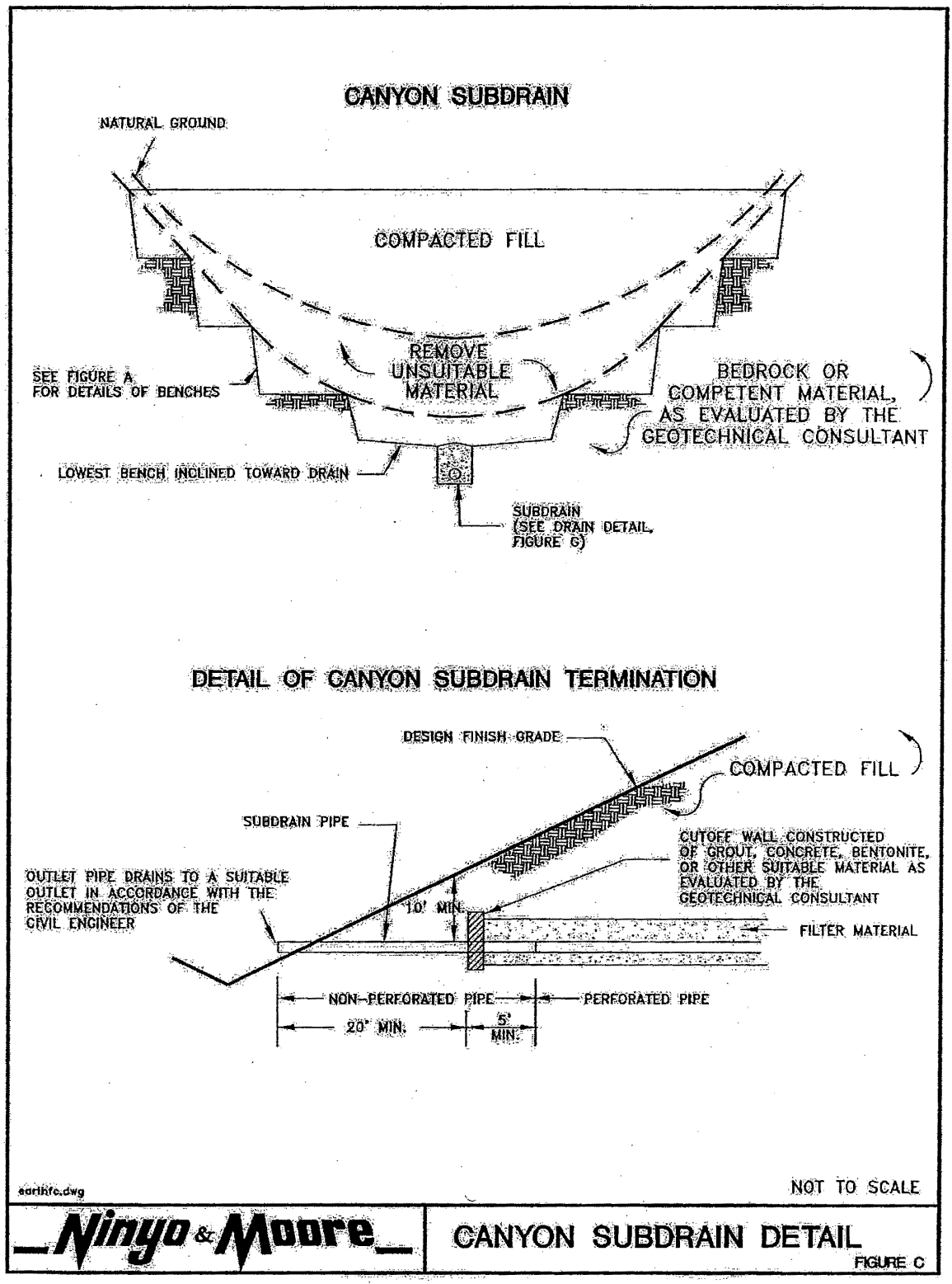
NOT TO SCALE
Ninyo & Moore
TRANSITION AND UNDERCUT LOT DETAILS
FIGURE B


CANYON SUBDRAIN
NATURAL GROUND
COMPACTED FILL
REMOVE UNSUITABLE MATERIAL
SEE FIGURE A FOR DETAILS OF BENCHES
BEDROCK OR COMPETENT MATERIAL, AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
LOWEST BENCH INCLINED TOWARD DRAIN
SUBDRAIN (SEE DRAIN DETAIL, FIGURE G)
DETAIL OF CANYON SUBDRAIN TERMINATION
DESIGN FINISH GRADE
COMPACTED FILL
SUBDRAIN PIPE
CUTOFF WALL CONSTRUCTED OF GROUT, CONCRETE, BENTONITE, OR OTHER SUITABLE MATERIAL AS EVALUATED BY THE GEOTECHNICAL CONSULTANT
OUTLET PIPE DRAINS TO A SUITABLE OUTLET IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE CIVIL ENGINEER
10' MIN.
FILTER MATERIAL
NON-PERFORATED PIPE
PERFORATED PIPE
20' MIN.
5' MIN.
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NOT TO SCALE
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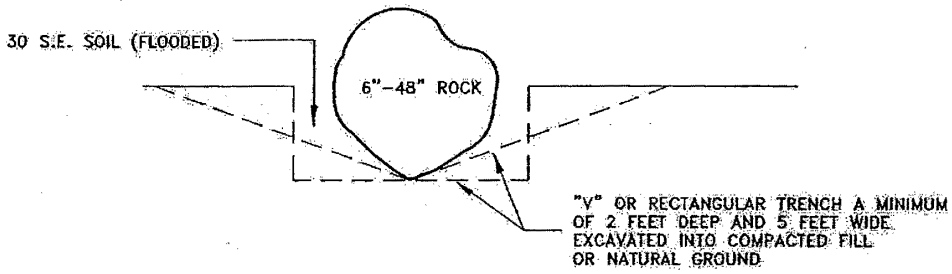
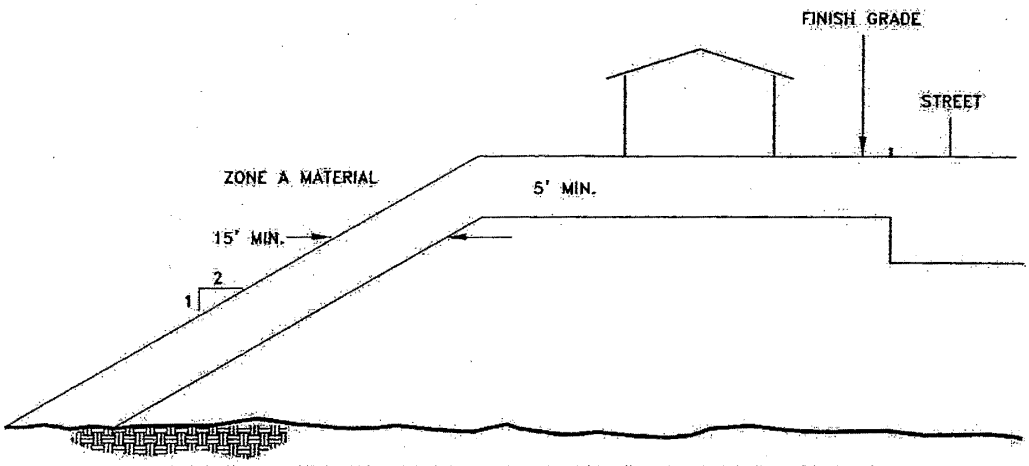
CANYON SUBDRAIN DETAIL
FIGURE C

WINDROW SECTION



PAD SECTION



ZONE A: COMPACTED FILL WITH ROCK FRAGMENTS NO GREATER THAN 6 INCHES IN DIAMETER.

ZONE B: COMPACTED FILL WITH ROCK FRAGMENTS BETWEEN 6 AND 48 INCHES IN DIAMETER MAY BE PLACED IN STAGGERED WINDROWS UP TO 100' LONG IN THIS ZONE AND SURROUNDED BY GRANULAR SOIL (50 SAND EQUIVALENT) DENSIFIED BY FLOODING. ROCK FRAGMENTS LESS THAN 6 INCHES IN DIAMETER MAY BE PLACED IN COMPACTED FILL SOIL.

NOTE: SLOPE DRAINAGE SHOULD BE PROVIDED IN ACCORDANCE WITH RECOMMENDATIONS PRESENTED ON FIGURE E.

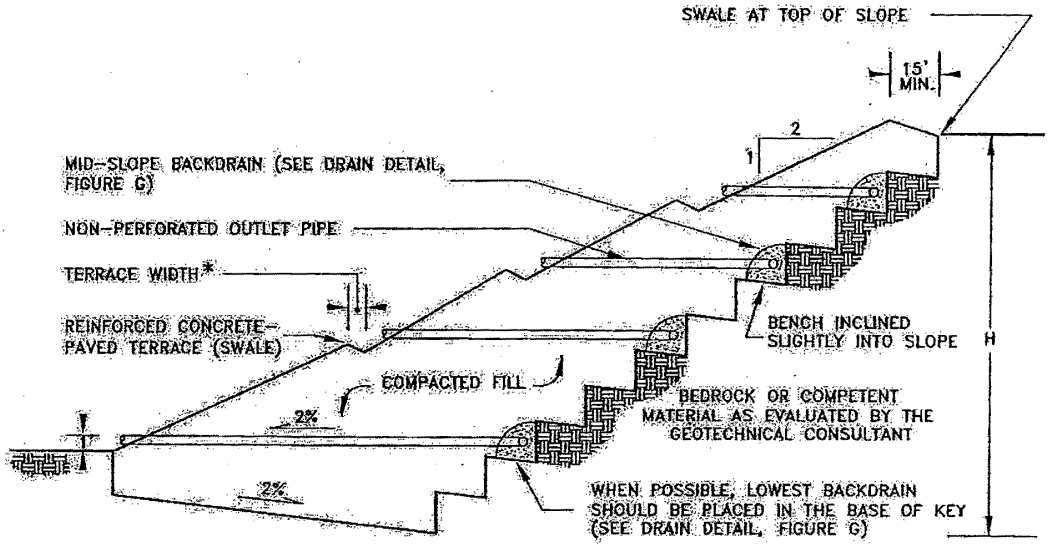
earthfd slope.dwg

NOT TO SCALE

Ninyo & Moore

OVERSIZED ROCK PLACEMENT DETAIL

FIGURE D



MAXIMUM VERTICAL SLOPE HEIGHT, H (FEET)	* TERRACE WIDTH AND LOCATION
LESS THAN 30	NO TERRACE REQUIRED
60	ONE TERRACE AT LEAST 6 FEET WIDE AT MIDHEIGHT
120	ONE TERRACE AT LEAST 12 FEET WIDE AT APPROXIMATELY MIDHEIGHT AND 6-FOOT WIDE TERRACES CENTERED IN REMAINING SLOPES
GREATER THAN 120	DESIGNED BY CIVIL ENGINEER WITH APPROVAL OF GOVERNING AUTHORITIES

NOTES:
1. MID-SLOPE BACKDRAINS SHOULD BE PLACED IN FILL SLOPES IN CONJUNCTION WITH EACH TERRACE.
2. TERRACES SHOULD HAVE AT LEAST A 5-PERCENT GRADIENT, AND RUN OFF SHOULD BE DIRECTED TO AN APPROPRIATE SURFACE DRAINAGE COLLECTOR.
3. TERRACES SHOULD BE CLEANED OF DEBRIS AND VEGETATION TO ALLOW UNRESTRICTED FLOW OF WATER.
4. TERRACES SHOULD BE KEPT IN GOOD REPAIR.
5. REFER TO UBC CHAPTER 70 FOR ADDITIONAL REQUIREMENTS.

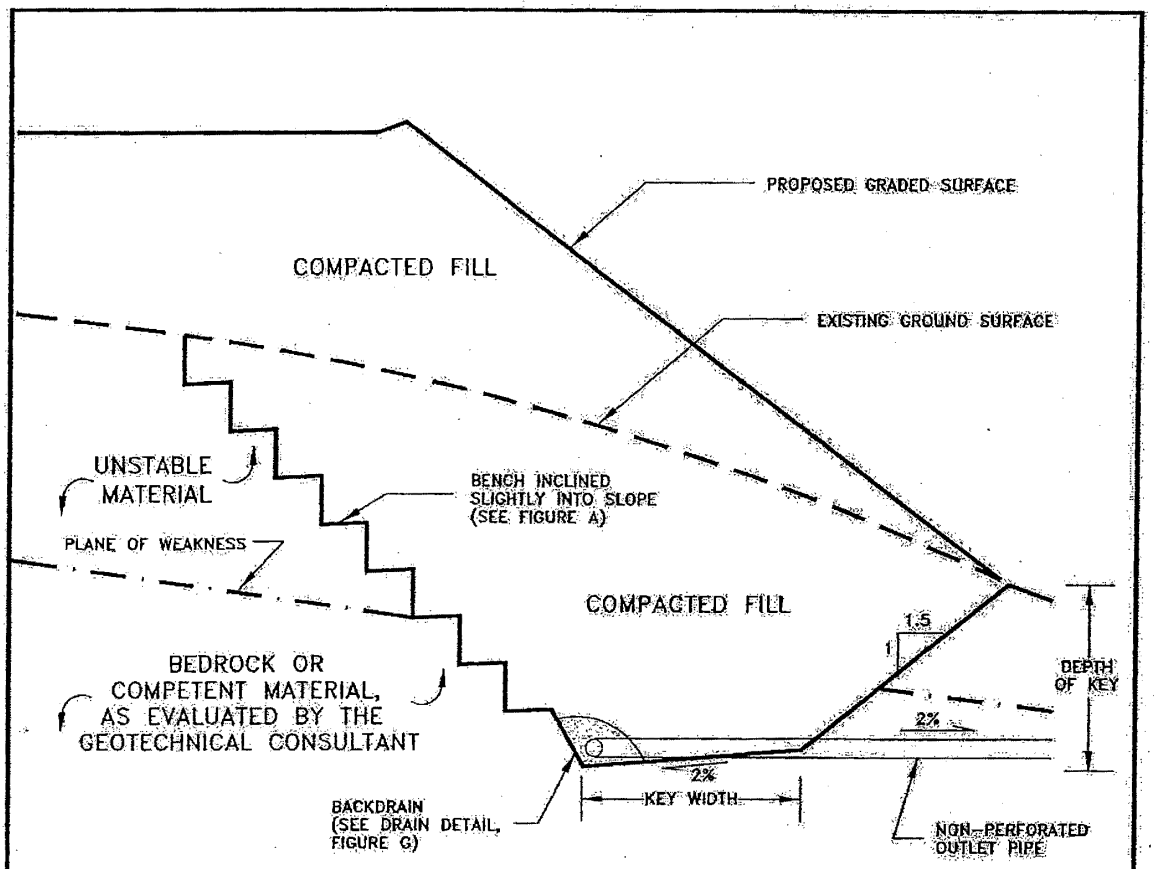
NOT TO SCALE

earthfe.dwg

Ninyo & Moore

SLOPE DRAINAGE DETAIL

FIGURE E



NOTES:
1. THE DEPTH AND WIDTH OF KEY WILL BE PROVIDED BY THE GEOTECHNICAL CONSULTANT BASED ON ANALYSIS OF SITE-SPECIFIC GEOTECHNICAL CONDITIONS.
2. AN ADDITIONAL MID-SLOPE BACKDRAIN AND TERRACE DRAIN MAY BE RECOMMENDED FOR SLOPES OVER 30 FEET HIGH, SEE SLOPE DRAINAGE DETAIL, FIGURE E.
3. SLOPE DRAINAGE SHOULD BE PROVIDED IN ACCORDANCE WITH RECOMMENDATIONS PRESENTED ON FIGURE E.

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NOT TO SCALE

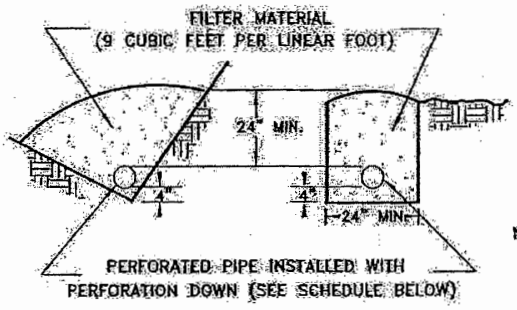
Ninyo & Moore

SHEAR KEY DETAIL

FIGURE F

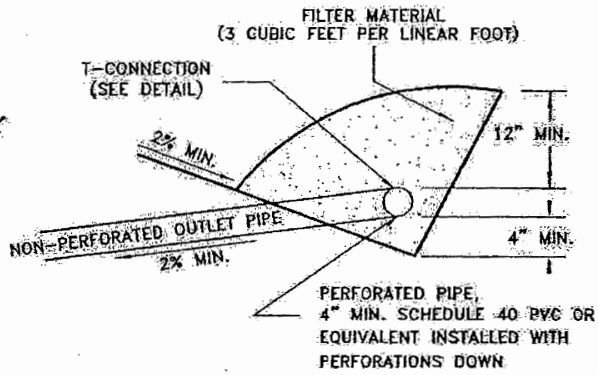
SUBDRAIN CONFIGURATION

ALTERNATIVE A* ALTERNATIVE B

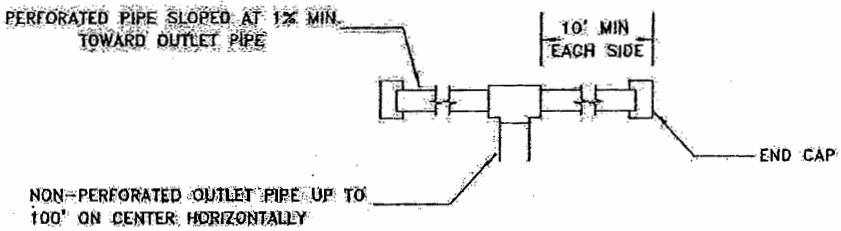


* ALTERNATIVE A SUBDRAIN CONFIGURATION MAY BE USED IN FILLS LESS THAN 25 FEET DEEP

BACKDRAIN CONFIGURATION



T-CONNECTION DETAIL



FILTER MATERIAL

FILTER MATERIAL SHALL BE CLASS II PERMEABLE MATERIAL PER STATE OF CALIFORNIA STANDARD SPECIFICATIONS OR APPROVED ALTERNATE GEOFABRIC DRAIN SYSTEM.

CLASS II GRADATIONS

SIEVE SIZE	PERCENT PASSING
1"	100
3/4"	90–100
3/8"	40–100
No. 4	25–40
No. 8	18–33
No. 30	5–15
No. 50	0–7
No. 200	0–3

NOTE: AS AN ALTERNATIVE THE FILTER MATERIAL MAY CONSIST OF UP TO 1" DIAMETER OPEN-GRADED GRAVEL WRAPPED IN AN APPROVED GEOFABRIC WITH 6-INCH OR MORE OVERLAP.

PIPE SCHEDULE

PERFORATED AND NON-PERFORATED PIPE SHALL BE SCHEDULE 40 POLYVINYL CHLORIDE (PVC) OR ACRYLONITRILE BUTADIENE STYRENE (ABS) OR EQUIVALENT, AND WILL HAVE A MINIMUM CRUSHING STRENGTH OF 1000 PSI FOR DEPTHS OF FILL UP TO 50 FEET. FOR DEEPER FILLS, PERFORATED AND NON-PERFORATED PIPE SHOULD BE DESIGNED WITH ADEQUATE CRUSHING STRENGTH.

THE PIPE DIAMETER WILL GENERALLY MEET THE FOLLOWING CRITERIA, BUT MAY BE MODIFIED IN THE FIELD BY THE GEOTECHNICAL CONSULTANT AS CONDITIONS DICTATE. THE LENGTH OF RUN IS MEASURED FROM THE HIGHEST ELEVATION.

LENGTH OF RUN	PIPE DIAMETER
0–500'	4"
500–1500'	6"
> 1500'	8"

NOT TO SCALE

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Ninyo & Moore

DRAIN DETAIL

FIGURE G

SOUTHERN CALIFORNIA SOIL & TESTING, INC.

San Diego Office
PHONE (619) 280-4321
TOLL FREE (877) 215-4321
FAX (619) 280-4717
P.O. Box 600627
San Diego, CA 92160-0627
6280 Riverdale Street
San Diego, CA 92120
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Indio Office
PHONE (760) 775-5983
TOLL FREE (877) 215-4321
FAX (760) 775-8362
83-740 Citrus Avenue
Suite G
Indio, CA 92201-3438
www.scst.com

August 31, 2009

Proposal 0911117p
Report #1

Lisa Coburn-Boyd
Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, CA 91978-2004

Subject: TASK ORDER #17
UPDATE OF GEOTECHNICAL REPORT
640-1 AND 640-2 RESERVOIRS
OTAY WATER DISTRICT

Dear Ms. Lisa Coburn-Boyd:

In accordance with your request, Southern California Soil & Testing prepared an update of the geotechnical report prepared by Ninyo & Moore for the project (Reference 1). The site is located north of the intersection of Campo Road and Jamacha Boulevard in the Rancho San Diego area of San Diego County. We understand that a portion of the site will be developed as an emergency training facility in conjunction with the San Miguel Consolidated Fire Protection District.

The scope of work consisted of:

- Review of the Ninyo & Moore report (Reference 1).
- A site reconnaissance on August to compare existing surface conditions with the conditions reported in Reference 1.
- Preparation of updated seismic design parameters in accordance with the 2007 California Building Code.

A site visit was made on August 28, 2009. No changes in site conditions have occurred since the 2005 Ninyo & Moore geotechnical report. It is our opinion that the conclusions and recommendations in the Ninyo & Moore report (Reference 1) remain applicable to the currently planned project, except for the earthquake design considerations noted below.

Significant changes were made to seismic design procedures in the 2007 California Building Code that was adopted January 1, 2008. The site coefficients and adjusted maximum considered earthquake spectral response acceleration parameters in accordance with the 2007 CBC are presented below:

Site Coordinates: Latitude 32.7452°
Longitude 116.9472°
Site Class: B
Site Coefficient $F_a = 1.0$
Site Coefficient $F_v = 1.0$
Spectral Response Acceleration at Short Periods $S_s = 0.962$
Spectral Response Acceleration at 1-Second Period $S_1 = 0.341$
$S_{MS}=F_aS_s=0.962$
$S_{M1}=F_vS_1=0.341$
$S_{DS}=2/3^* S_{MS}=0.641$
$S_{D1}=2/3^* S_{M1}=0.227$

As noted above, no changes are apparent on or in the vicinity of the site since the Ninyo & Moore 2005 geotechnical report. On this basis, it is our opinion that no changes have occurred in environmental conditions since 2005 that would have an adverse impact on the site or planned development.

If you have any questions, please call me at (619) 280-4321.

Respectfully submitted,
SOUTHERN CALIFORNIA SOIL AND TESTING, INC.

James J. Stone
Principal Geotechnical Engineer

JJS:js
(1) Addressee

REFERENCE

1. "Geotechnical Evaluation, 640-1 and 640-2 Reservoirs, Rancho San Diego, California," by Ninyo & Moore, dated August 29, 2005 (Project No. 105393002).
2. Overall Site Plan, San Miguel Consolidated Fire Protection District Joint Emergency Training Facility, by Jeff Katz Architecture, undated (Project No. 061001).

The EDR Radius Map
with GeoCheck®

Otay Water District
Campo/Jamacha Road
Spring Valley, CA 92019

Inquiry Number: 1377911.2s

March 15, 2005

EDR™ Environmental Data Resources Inc

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06460

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

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GEOCHECK ADDENDUM

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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

CAMPO/JAMACHA ROAD
SPRING VALLEY, CA 92019

COORDINATES

Latitude (North):	32.747400 - 32˚ 44' 50.6''
Longitude (West):	116.948100 - 116˚ 56' 53.2''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	504862.2
UTM Y (Meters):	3623095.2
Elevation:	598 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property:	32116-F8 JAMUL MOUNTAINS, CA
Source:	USGS 7.5 min quad index

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following government records. For more information on this property see page 6 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
OTAY WATER DISTRICT AMACHA 11901 SINGER LN SPRING VALLEY, CA 91978	LUST San Diego Co. HMMD EMI	N/A
OTAY WATER DISTRICT 11901 SINGER LN SPRING VALLEY, CA 91978	LUST	N/A
AMACHA BASIN WATER REC. PLANT 11901 SINGER LN SPRING VALLEY, CA 91978	LUST	N/A

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

EXECUTIVE SUMMARY

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
RCRA-TSDF ..... Resource Conservation and Recovery Act Information
RCRA-LQG ..... Resource Conservation and Recovery Act Information

STATE ASTM STANDARD

AWP ..... Annual Workplan Sites
Cal-Sites ..... Calsites Database
CHMIRS ..... California Hazardous Material Incident Report System
Notify 65 ..... Proposition 65 Records
Toxic Pits ..... Toxic Pits Cleanup Act Sites
WMUDS/SWAT ..... Waste Management Unit Database
CA BOND EXP. PLAN ..... Bond Expenditure Plan
VCP ..... Voluntary Cleanup Program Properties
INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land
INDIAN UST ..... Underground Storage Tanks on Indian Land
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
ODI ..... Open Dump Inventory
DOD ..... Department of Defense Sites
INDIAN RESERV ..... Indian Reservations
UMTRA ..... Uranium Mill Tailings Sites
FUDS ..... Formerly Used 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 INSP ..... 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 ..... Deed Restriction Listing
NFA ..... No Further Action Determination
REF ..... Unconfirmed Properties Referred to Another Agency
SCH ..... School Property Evaluation Program

EXECUTIVE SUMMARY

NFE ..... Properties Needing Further Evaluation
CA SLIC ..... Statewide SLIC Cases
HAZNET ..... Facility and Manifest Data

BROWNFIELDS DATABASES

US BROWNFIELDS ..... A Listing of Brownfields Sites
VCP ..... Voluntary Cleanup Program Properties

EDR PROPRIETARY HISTORICAL DATABASES

See the EDR Proprietary Historical Database Section for details

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. 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.
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.

FEDERAL ASTM STANDARD

RCRAInfo: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System(RCRIS). The database 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). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month Large quantity generators generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

A review of the RCRA-SQG list, as provided by EDR, and dated 11/23/2004 has revealed that there are 5 RCRA-SQG sites within approximately 0.75 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
CUYAMACA COLLEGE	***900 RANCHO SAN DIEGO PK***	***1/4 - 1/2 ESE***	***B6***	***15***
RANCHO SAN DIEGO UNOCAL 76	***11906 CAMPO ROAD***	***1/2 - 1 SSE***	***D10***	***18***
SAN DIEGO COUNTY DEPT OF PUBLI	***11937 CAMPO ROAD***	***1/2 - 1 SSE***	***D11***	***18***
RANCHO AUTOMOTIVE	***2946 JAMACHA RD***	***1/2 - 1 SE***	***E13***	***22***
SCRIPPS CLINIC RANCHO SAN DIEG	***10862 CALLE VERDE***	***1/2 - 1 W***	***14***	***23***

EXECUTIVE SUMMARY

ERNS: The Emergency Response Notification System records and stores information on reported releases of oil and hazardous substances. The source of this database is the U.S. EPA.

A review of the ERNS list, as provided by EDR, and dated 12/31/2003 has revealed that there is 1 ERNS site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
3776 VIA PICANTE	3776 VIA PICANTE	1/4 - 1/2 WNW	4	12

STATE ASTM STANDARD

CORTESE: This database identifies public drinking water wells with detectable levels of contamination, hazardous substance sites selected for remedial action, sites with known toxic material identified through the abandoned site assessment program, sites with USTs having a reportable release and all solid waste disposal facilities from which there is known migration. The source is the California Environmental Protection Agency/Office of Emergency Information.

A review of the Cortese list, as provided by EDR, has revealed that there are 3 Cortese sites within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
ATLAS RENTS	***11928 CAMPO RD***	***1/2 - 1 SSE***	***16***	***26***
COUNTY OF SD-DPW DIVISION	***11970 SINGER***	***1/2 - 1 SSE***	***F18***	***29***
OTAY WATER DISTRICT AMAC	***11901 SINGER***	***1/2 - 1 SSE***	***20***	***32***

SWF/LF: The Solid Waste Facilities/Landfill Sites records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. The data come from the Integrated Waste Management Board's Solid Waste Information System (SWIS) database.

A review of the SWF/LF list, as provided by EDR, has revealed that there is 1 SWF/LF site within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
JAMACHA SLF	11900 BLK. SINGER LANE	1/2 - 1 S	19	31

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 01/10/2005 has revealed that there are 5 LUST sites within approximately 1 mile of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
GROSSMONT CUYAMACA COMM COLLEG	***900 RANCHO SAN DIEGO PK***	***1/4 - 1/2 ESE***	***B5***	***12***
COUNTY SD SPRING VALLEY RD STA	11900 HWY 94	1/2 - 1 SSE	C7	17
ADVANTAGE DRY CLEANERS	2522 JAMACHA RD	1/2 - 1 ESE	15	24
ATLAS RENTS	***11928 CAMPO RD***	***1/2 - 1 SSE***	***16***	***26***
COUNTY OF SD-DPW DIVISION I HQ	11970 SINGER LN	1/2 - 1 SSE	F17	27

EXECUTIVE SUMMARY

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the State Water Resources Control Board's Hazardous Substance Storage Container Database.

A review of the UST list, as provided by EDR, and dated 01/10/2005 has revealed that there is 1 UST site within approximately 0.75 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
PACIFIC BELL	***2966 JAMACHA RD***	***1/2 - 1 SE***	***E12***	***19***

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there are 2 HIST UST sites within approximately 0.75 miles of the target property.

Lower Elevation	Address	Dist / Dir	Map ID	Page
TAMACHA RD STATION	11900 HIGHWAY 94	1/2 - 1 SSE	C8	17
AMACHA ROAD STATION	11900 HIGHWAY 94	1/2 - 1 SSE	C9	17

EDR PROPRIETARY HISTORICAL DATABASES

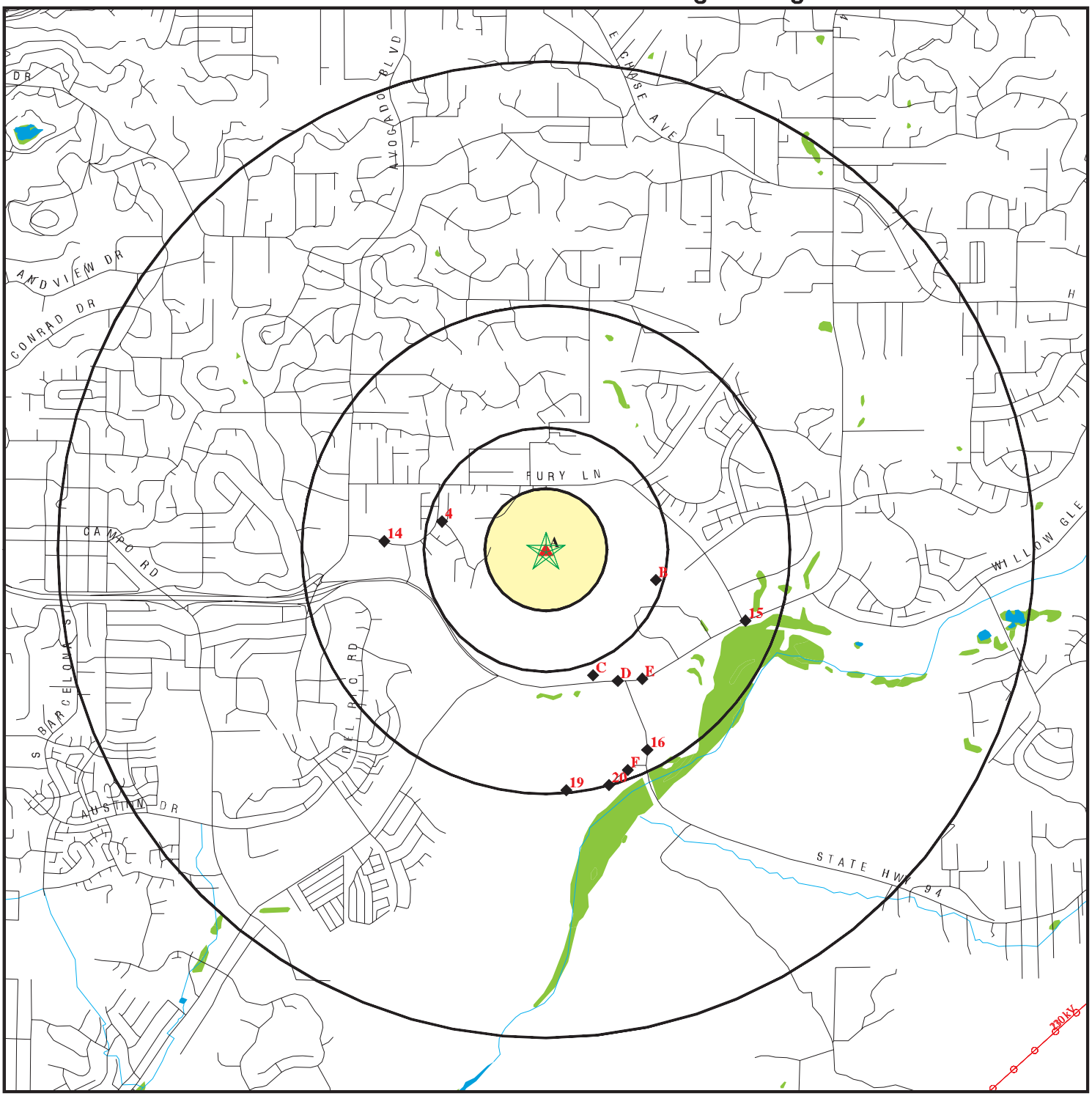
See the EDR Proprietary Historical Database Section for details

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
USA CLEANERS AND SHIRT LAUNDRY	CLEANERS
CORONADO BRIDGEAND NORTH ISLAND	CHMIRS, CA WDS
EL CAJON MOUNTAIN MILL SITE	LUST, San Diego Co. HMMD
ERNEST F MILLER	LUST, San Diego Co. HMMD
COUNTY OF SD-JAMACHA PUMP STA	LUST
OTAY WATER DISTRICT MAIN YARD	LUST, San Diego Co. HMMD
CA ON VALLEY UNION SCHOOL DISTRICT	HAZNET
STATE OF CA DEPT OF FORESTRY	RCRA-SQG

OVERVIEW MAP - 1377911.2s - HDR Engineering Inc.



- 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 1/2 1 2 Miles

- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- Federal Wetlands
- Areas of Concern

N

TARGET PROPERTY:	Otay Water District	CUSTOMER:	HDR Engineering Inc.
ADDRESS:	Campo/Jamacha Road	CONTACT:	Chuck Cleeves
CITY/STATE/ZIP:	Spring Valley CA 92019	INQUIRY #:	1377911.2s
LAT/LONG:	32.7474 / 116.9481	DATE:	March 15, 2005 7:12 am

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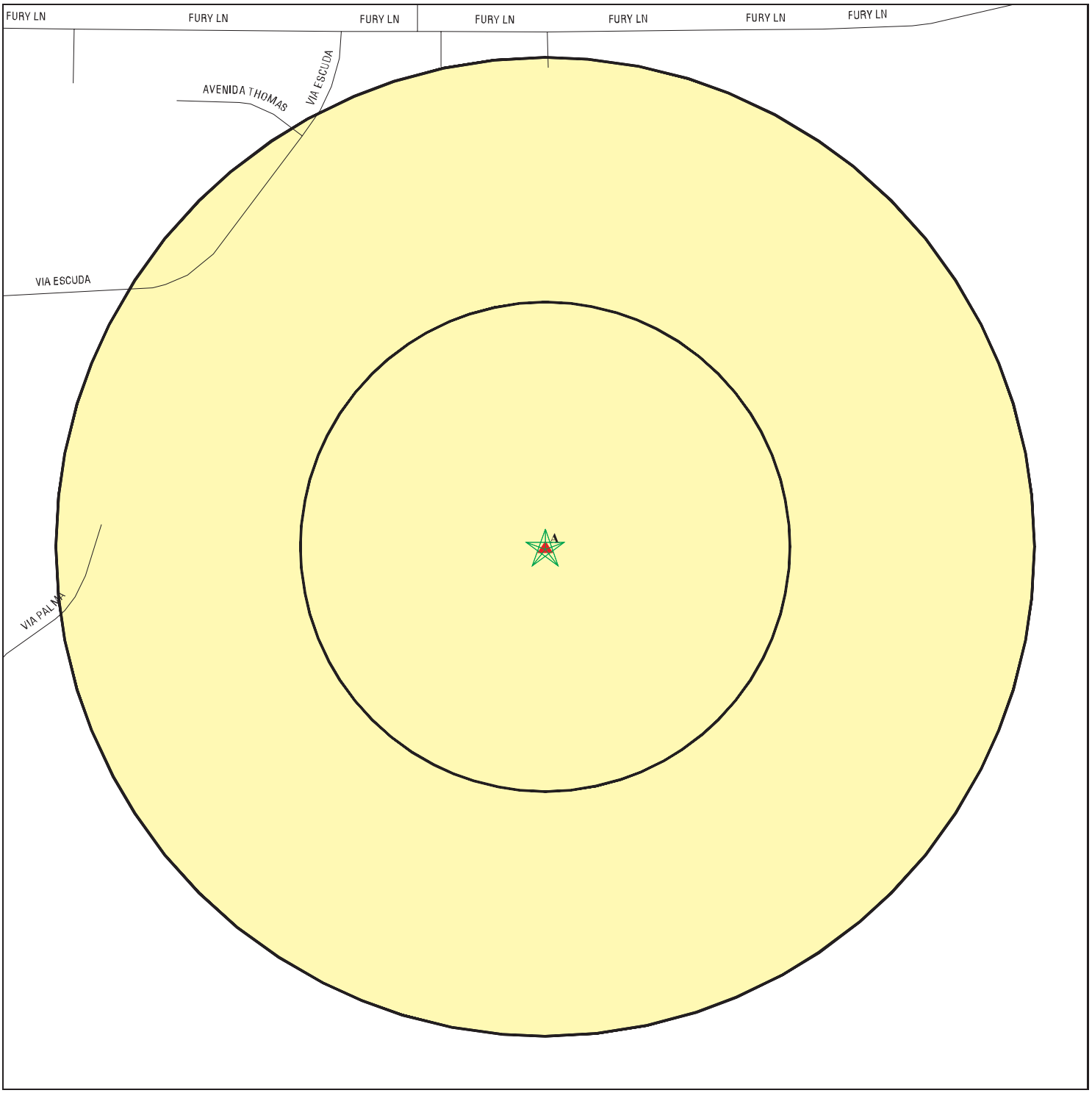
DETAIL MAP - 1377911.2s - HDR Engineering Inc.



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- Historical Gas Stations / Historical Dry Cleaners See the EDR Proprietary Historical Map Findings
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites

0 1/16 1/8 1/4 Miles

- Indian Reservations BIA
- Oil & Gas pipelines
- Areas of Concern

TARGET PROPERTY:	Otay Water District	CUSTOMER:	HDR Engineering Inc.
ADDRESS:	Campo/Jamacha Road	CONTACT:	Chuck Cleeves
CITY/STATE/ZIP:	Spring Valley CA 92019	INQUIRY #:	1377911.2s
LAT/LONG:	32.7474 / 116.9481	DATE:	March 15, 2005 7:12 am

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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		1.500	0	0	0	0	0	0
Proposed NPL		1.500	0	0	0	0	0	0
CERCLIS		1.000	0	0	0	0	NR	0
CERC-NFRAP		0.750	0	0	0	0	NR	0
CORRACTS		1.500	0	0	0	0	0	0
RCRA TSD		1.000	0	0	0	0	NR	0
RCRA Lg. Quan. Gen.		0.750	0	0	0	0	NR	0
RCRA Sm. Quan. Gen.		0.750	0	0	1	4	NR	5
ERNS		0.500	0	0	1	NR	NR	1
STATE ASTM STANDARD								
AWP		1.500	0	0	0	0	0	0
Cal-Sites		1.500	0	0	0	0	0	0
CHMIRS		0.500	0	0	0	NR	NR	0
Cortese		1.000	0	0	0	3	NR	3
Notify 65		1.500	0	0	0	0	0	0
Toxic Pits		1.500	0	0	0	0	0	0
State Landfill		1.000	0	0	0	1	NR	1
WMUDS/SWAT		1.000	0	0	0	0	NR	0
LUST	X	1.000	0	0	1	4	NR	5
CA Bond Exp. Plan		1.500	0	0	0	0	0	0
UST		0.750	0	0	0	1	NR	1
VCP		1.000	0	0	0	0	NR	0
INDIAN LUST		1.000	0	0	0	0	NR	0
INDIAN UST		0.750	0	0	0	0	NR	0
CA FID UST		0.750	0	0	0	0	NR	0
HIST UST		0.750	0	0	0	2	NR	2
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
ODI		1.000	0	0	0	0	NR	0
DOD		1.000	0	0	0	0	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
UMTRA		1.000	0	0	0	0	NR	0
FUDS		1.500	0	0	0	0	0	0
RAATS		TP	NR	NR	NR	NR	NR	0
TRIS		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
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
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
NFA		0.250	0	0	NR	NR	NR	0
EMI	X	TP	NR	NR	NR	NR	NR	0
REF		0.250	0	0	NR	NR	NR	0
SCH		0.250	0	0	NR	NR	NR	0
NFE		0.250	0	0	NR	NR	NR	0
SLIC		0.500	0	0	0	NR	NR	0
HAZNET		TP	NR	NR	NR	NR	NR	0
San Diego Co. HMMD	X	TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY HISTORICAL DATABASES								
Gas Stations/Dry Cleaners		0.250	0	0	NR	NR	NR	0
Coal Gas		1.000	0	0	0	0	NR	0
BROWNFIELDS DATABASES								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
VCP		1.000	0	0	0	0	NR	0

NOTES:

See the EDR Proprietary Historical Database Section for details

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

A1 Target Property — **OTAY WATER DISTRICT AMACHA**, **11901 SINGER LN**, **SPRING VALLEY, CA 91978**

LUST — **San Diego Co. HMMD** — **EMI**

S102434742 — **N/A**

Site 1 of 3 in cluster A

Actual: 611 ft.

LUST Region 9:

Case Number:	9UT2432	Release Date:	09/17/1987
Local Agency:	37000		
Substance:	12034	Qty Leaked:	Not reported
Date Found:	09/03/1987	How Found:	Tank Closure
Date Stopped:	09/03/1987	How Stopped:	Close Tank
Source:	Tank	Cause:	Unknown
Lead Agency:	Local Agency		
Status:	Case Closed		
Case Type:	Soil only		
Abate Method:	No Action Taken - no action has as yet been taken at the site		
Confirm Date:	9/17/87	Submit Workplan:	9/17/87
Prelim Assess:	Not reported	Desc Pollution:	Not reported
Remed Plan:	Not reported	Remed Action:	Not reported
Began Monitor:	4/20/93	Closed Date:	4/20/93
Enforce Type:	Not reported		
Enforce Date:	Not reported		
Pilot Program:	LOP	Local Case:	H20891-002
Basin Number:	909.12	Gwater Depth:	Not reported
File Dispn:	File discarded, case closed		

Interim Remedial Actions:	Yes
Beneficial Use:	Not reported
Cleanup and Abatement order Number:	Not reported
Waste Discharge Requirement Number:	Not reported
NPDES Number:	Not reported

HMMD:

Facility ID:	120891		
Inactive Indicator:	Active	Business Code:	6HK52
SIC:	Not reported	Permit Expiration:	Not reported
Owner:	OTAY WATER DISTRICT	2nd Name:	Not reported
Mailing Address:	SPRING VALLEY CA 91977		
Corporate Code:	Not reported	Fire Dept District:	Grossmont/Mount Helix
Census Tract #:	135.0	EPA ID:	Not reported
Inspection Date:	02/01/01	Reinspection Date:	Not reported
Inspector Name:	LEGACY	Gas Station:	Not reported
Facility Contact:	DAVE BURPEAU	Delinquent Flag:	Not Delinquent
Property Owner:	SPRING VALLEY SANITATION DISTR		
PO Address:	00000		
Tank Owner:	OTAY WATER DISTRICT	Facility Phone :	619-670-2295
TO Address:	San Marcos CA 92078		
Last Update:	06/29/04		

Last Delinquent Letter:	Not reported
Last Letter Type:	Not reported
Violation Notice Issued:	Not reported
Map Code/Business Plan on File:	Not reported
Business Plan Acceptance Date:	Not reported
Reinspection Date Y2K Compatible:	04/02/02

HMMD DISCLOSURE INVENTORY:

OTAY WATER DISTRICT AMACHA (Continued) **S102434742**

Chemical Name: CHLORINE
Item Number: CH96
Stored at 1 Time: Not reported
Measurement Units: Not reported
Last Update: 06/29/04
Carcinogen: No Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
1st Hazard Category: Not reported
2nd Hazard Category: EXTREMELY HAZARDOUS

Chemical Name: DIESEL FUEL
Item Number: DI97
Stored at 1 Time: Not reported
Measurement Units: Not reported
Last Update: 06/29/04
Carcinogen: No Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
1st Hazard Category: FIRE
2nd Hazard Category: ACUTE

Chemical Name: POLY ALUM C2005
Item Number: PO98
Stored at 1 Time: Not reported
Measurement Units: Not reported
Last Update: 06/29/04
Carcinogen: No Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
1st Hazard Category: ACUTE
2nd Hazard Category: Not reported

HMMD UNDERGROUND TANKS:

Tank Number: T001 Tank ID Number: 5
Capacity (Gal): 575.00 Tank Exempt: Not reported
Waste or Product: Not reported Tank Contents: DIESEL

Tank Number: T002 Tank ID Number: 10
Capacity (Gal): 12000.00 Tank Exempt: Not reported
Waste or Product: Not reported Tank Contents: DIESEL

Tank Number: T003 Tank ID Number: 11
Capacity (Gal): 12000.00 Tank Exempt: Not reported
Waste or Product: Not reported Tank Contents: DIESEL

Tank Number: T004 Tank ID Number: 12
Capacity (Gal): 12000.00 Tank Exempt: Not reported
Waste or Product: Not reported Tank Contents: DIESEL

Tank Number: T005 Tank ID Number: 13
Capacity (Gal): 12000.00 Tank Exempt: Not reported
Waste or Product: Not reported Tank Contents: DIESEL

HMMD WASTE STREAMS:

Inspection Date: Not reported Waste Item #: Not reported
Waste Code: Not reported Waste Name: Not reported
Qnty at Inspection: Not reported Annual Quantity: Not reported

OTAY WATER DISTRICT AMACHA (Continued) **S102434742**

Measurement Unit: Not reported
Treatment Method: Not reported
Storage Method: Not reported
Waste Description: Not reported
Haz Waste Hauler: Not reported
Last Update: Not reported
Carcinogen: No
Annual Qty String: Not reported
Quantity String: Not reported

HMMD VIOLATIONS:
Inspection Date: 02/25/98
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV1003
Violation Description: HMBP NOT AMENDED W/IN 30 DAYS
Last Update: 06/29/04

Click this hyperlink while viewing on your computer to access additional CA HMMD detail in the EDR Site Report.

Facility ID: 132129
Inactive Indicator: Inactive
Business Code: 6HK52
SIC: Not reported
Permit Expiration: Not reported
Owner: OTAY WATER DISTRICT
2nd Name: Not reported
Mailing Address: SPRING VALLEY
CA
91978
Corporate Code: Not reported
Fire Dept District: Not reported
Census Tract #: 135.0
EPA ID: Not reported
Inspection Date: 03/04/93
Reinspection Date: Not reported
Inspector Name: LEGACY
Gas Station: Not reported
Facility Contact: DAVE BURPEAU
Delinquent Flag: Not Delinquent
Property Owner: SPRING VALLEY SANITATION DISTR
PO Address: 00000
Tank Owner: Not reported
Facility Phone : 619-670-2222
TO Address: Not reported
Last Update: 06/29/04
Last Delinquent Letter: Not reported
Last Letter Type: Not reported
Violation Notice Issued: Not reported
Map Code/Business Plan on File: Not reported
Business Plan Acceptance Date: Not reported
Reinspection Date Y2K Compatible: Not reported

HMMD DISCLOSURE INVENTORY:
Chemical Name: Not reported
Item Number: Not reported
Stored at 1 Time: Not reported
Measurement Units: Not reported
Last Update: Not reported
Carcinogen: No
Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
1st Hazard Category: Not reported
2nd Hazard Category: Not reported

HMMD UNDERGROUND TANKS:
Tank Number: Not reported
Tank ID Number: Not reported
Capacity (Gal): Not reported
Tank Exempt: Not reported
Waste or Product: Not reported
Tank Contents: Not reported

HMMD WASTE STREAMS:

OTAY WATER DISTRICT AMACHA (Continued) **S102434742**

Inspection Date:	Not reported	Waste Item #:	Not reported
Waste Code:	Not reported	Waste Name:	Not reported
Qnty at Inspection:	Not reported	Annual Quantity:	Not reported
Measurement Unit:	Not reported		
Treatment Method:	Not reported	Storage Method:	Not reported
Waste Description:	Not reported	Haz Waste Hauler:	Not reported
Last Update:	Not reported		
Carcinogen:	No	Annual Qty String:	Not reported
Quantity String:	Not reported		

HMMD VIOLATIONS:

Inspection Date:	Not reported	Occurrences:	Not reported
Waste Code:	Not reported		
Type of Violation:	Not reported		
Violation Description:			
Last Update:	Not reported		

Click this hyperlink while viewing on your computer to access additional CA HMMD detail in the EDR Site Report.

EMISSIONS :

Facility ID :	95214
Air District Code :	SD
SIC Code :	4952
Total Priority Score :	Not reported
Health Risk Assessment :	Not reported
Non-cancer Chronic Haz Index :	Not reported
Non-cancer Acute Haz Index :	Not reported
Air Basin :	SD
Air District Name :	SAN DIEGO COUNTY APCD
Community Health Air Pollution Info System :	Not reported
Consolidated Emission Reporting Rule :	Not reported
County Code :	37
County ID :	37

A2 Target Property **OTAY WATER DISTRICT** **LUST** **S105692370**
11901 SINGER LN **N/A**
SPRING VALLEY, CA 91978

Site 2 of 3 in cluster A

Actual: 611 ft.

State LUST:

Cross Street:	Not reported		
Qty Leaked:	Not reported		
Case Number	9UT2432		
Reg Board:	9		
Chemical:	Diesel		
Lead Agency:	Local Agency		
Local Agency :	37000L		
Case Type:	Soil only		
Status:	Case Closed		
Review Date:	Not reported	Confirm Leak:	Not reported
Workplan:	1987-09-03 00:00:00	Prelim Assess:	1987-09-03 00:00:00
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	1965-01-03 00:00:00		
Monitoring:	Not reported		
Close Date:	1993-07-14 00:00:00		
Release Date:	Not reported		
Cleanup Fund Id :	Not reported		
Discover Date :	Not reported		

OTAY WATER DISTRICT (Continued) **S105692370**

Enforcement Dt : Not reported
Enf Type: Warning/notice of violation to uncooperative responsible parties (includes CDO and CAO)
Enter Date : Not reported
Funding: Not reported
Staff Initials: SLA
How Discovered: Not reported
How Stopped: Not reported
Interim : Not reported
Leak Cause: Not reported
Leak Source: Not reported
MTBE Date : Not reported
Max MTBE GW : Not reported
MTBE Tested: Not Required to be Tested.
Priority: Low priority. Priority ranking can change over time.
Local Case # : Not reported
Beneficial: Not reported
Staff : UNK
GW Qualifier : Not reported
Max MTBE Soil : Not reported
Soil Qualifier : Not reported
Hydr Basin #: UNNAMED BASIN
Operator : Not reported
Oversight Prgm: LUST
Review Date : Not reported
Stop Date : Not reported
Work Suspended :Not reported
Responsible PartyNot reported
RP Address: Not reported
Global Id: T0607301194
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 0
Mtbe Fuel: 0
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported
Summary : 11/14 EDR;12/12WP; MTBE DATE 4/20/98.
11/14 EDR;12/12WP; MTBE DATE 4/20/98.

Cross Street: Not reported
Qty Leaked: Not reported
Case Number 9UT382
Reg Board: 9
Chemical: Regular Gasoline
Lead Agency: Local Agency
Local Agency : 37000L
Case Type: Soil only
Status: Case Closed
Review Date: Not reported
Confirm Leak: Not reported
Workplan: 1965-01-03 00:00:00
Prelim Assess: 1965-01-03 00:00:00
Pollution Char: Not reported
Remed Plan: Not reported
Remed Action: 1965-01-03 00:00:00
Monitoring: Not reported
Close Date: 1987-09-28 00:00:00
Release Date: Not reported

OTAY WATER DISTRICT (Continued) **S105692370**

Cleanup Fund Id :	Not reported
Discover Date :	Not reported
Enforcement Dt :	Not reported
Enf Type:	Not reported
Enter Date :	Not reported
Funding:	Not reported
Staff Initials:	NAL
How Discovered:	Not reported
How Stopped:	Not reported
Interim :	Not reported
Leak Cause:	Not reported
Leak Source:	Not reported
MTBE Date :	Not reported
Max MTBE GW :	Not reported
MTBE Tested:	Site NOT Tested for MTBE.Includes Unknown and Not Analyzed.
Priority:	Low priority. Priority ranking can change over time.
Local Case # :	Not reported
Beneficial:	Not reported
Staff :	UNK
GW Qualifier :	Not reported
Max MTBE Soil :	Not reported
Soil Qualifier :	Not reported
Hydr Basin #:	UNNAMED BASIN
Operator :	Not reported
Oversight Prgm:	LUST
Review Date :	Not reported
Stop Date :	Not reported
Work Suspended :	Not reported
Responsible Party	Not reported
RP Address:	Not reported
Global Id:	T0607302582
Org Name:	Not reported
Contact Person:	Not reported
MTBE Conc:	0
Mtbe Fuel:	1
Water System Name:	Not reported
Well Name:	Not reported
Distance To Lust:	0
Waste Discharge Global ID:	Not reported
Waste Disch Assigned Name:	Not reported
Summary :	11/14 EDR;12/12WP; MTBE DATE 4/20/98. 11/14 EDR;12/12WP; MTBE DATE 4/20/98.

A3 **AMACHA BASIN WATER REC. PLANT** **LUST** **S102431850**
Target **11901 SINGER LN** **N/A**
Property **SPRING VALLEY, CA 91978**

Site 3 of 3 in cluster A

Actual:
611 ft.

AMACHA BASIN WATER REC. PLANT (Continued) **S102431850**

LUST Region 9:

Case Number:	9UT382	Release Date:	01/20/1987
Local Agency:	37000		
Substance:	8006619	Qty Leaked:	0
Date Found:	01/15/1987	How Found:	Tank Closure
Date Stopped:	09/03/1987	How Stopped:	Close Tank
Source:	Other Source	Cause:	Overfill
Lead Agency:	Local Agency		
Status:	Case Closed		
Case Type:	Soil only		
Confirm Date:	Not reported	Submit Workplan:	Not reported
Prelim Assess:	Not reported	Desc Pollution:	Not reported
Remed Plan:	9/18/87	Remed Action:	9/18/87
Began Monitor:	10/30/87	Closed Date:	10/30/87
Enforce Type:	Not reported		
Enforce Date:	Not reported		
Pilot Program:	LOP	Local Case:	H20891-001
Basin Number:	909.12	Gwater Depth:	8-15
File Dispn:	File discarded, case closed		

Interim Remedial Actions:	Yes
Beneficial Use:	Not reported
Cleanup and Abatement order Number:	Not reported
Waste Discharge Requirement Number:	Not reported
NPDES Number:	Not reported

4
WNW
1/4-1/2
2329 ft.

3776 VIA PICANTE **ERNS** **92256344**
3776 VIA PICANTE **N/A**
LA MESA, CA 92041

Relative:
Lower

Actual:
593 ft.

Click this hyperlink while viewing on your computer to access additional ERNS detail in the EDR Site Report.

B5
ESE
1/4-1/2
2472 ft.

GROSSMONT CUYAMACA COMM COLLEGE DIST **HAZNET** **S103675528**
900 RANCHO SAN DIEGO PKWY **LUST** **N/A**
EL CAJON, CA 92019

Site 1 of 2 in cluster B

Relative:
Lower

Actual:
387 ft.

State LUST:

Cross Street:	Not reported		
Qty Leaked:	Not reported		
Case Number	Not reported		
Reg Board:	9		
Chemical:	Waste Oil		
Lead Agency:	Local Agency		
Local Agency :	37000L		
Case Type:	FT		
Status:	Case Closed		
Review Date:	Not reported	Confirm Leak:	Not reported
Workplan:	1965-01-03 00:00:00	Prelim Assess:	1965-01-03 00:00:00
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	1965-01-03 00:00:00		
Monitoring:	Not reported		

GROSSMONT CUYAMACA COMM COLLEGE DIST (Continued) **S103675528**

Close Date: 1992-10-15 00:00:00
Release Date: Not reported
Cleanup Fund Id : Not reported
Discover Date : Not reported
Enforcement Dt : Not reported
Enf Type: Not reported
Enter Date : Not reported
Funding: Not reported
Staff Initials: PMA
How Discovered: Not reported
How Stopped: Not reported
Interim : Not reported
Leak Cause: Not reported
Leak Source: Not reported
MTBE Date : Not reported
Max MTBE GW : Not reported
MTBE Tested: Not Required to be Tested.
Priority: 10
Local Case # : Not reported
Beneficial: Not reported
Staff : UNK
GW Qualifier : Not reported
Max MTBE Soil : Not reported
Soil Qualifier : Not reported
Hydr Basin #: Not reported
Operator : Not reported
Oversight Prgm: LOCNL
Review Date : Not reported
Stop Date : Not reported
Work Suspended :Not reported
Responsible PartyNot reported
RP Address: Not reported
Global Id: T0608151587
Org Name: Not reported
Contact Person: Not reported
MTBE Conc: 0
Mtbe Fuel: 0
Water System Name: Not reported
Well Name: Not reported
Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported
Summary : Not reported

HAZNET:
Gepaid: CAL000020035
TSD EPA ID: CAD008364432
Gen County: San Diego
Tsd County: Los Angeles
Tons: .0208
Waste Category: Laboratory waste chemicals
Disposal Method: Disposal, Other
Contact: GCCCD
Telephone: (619) 644-7711
Mailing Address: 8800 GROOSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County San Diego

GROSSMONT CUYAMACA COMM COLLEGE DIST (Continued) **S103675528**

Gepaid: CAL000020035
TSD EPA ID: WAD991281767
Gen County: San Diego
Tsd County: 99
Tons: .0208
Waste Category: Laboratory waste chemicals
Disposal Method: Not reported
Contact: GCCCD
Telephone: (619) 644-7711
Mailing Address: 8800 GROOSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County San Diego

Gepaid: CAL000020035
TSD EPA ID: CAD000088252
Gen County: San Diego
Tsd County: Los Angeles
Tons: .2917
Waste Category: Laboratory waste chemicals
Disposal Method: Transfer Station
Contact: GCCCD
Telephone: (619) 644-7711
Mailing Address: 8800 GROOSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County San Diego

Gepaid: CAL000020035
TSD EPA ID: CAT080013352
Gen County: San Diego
Tsd County: Los Angeles
Tons: .2460
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Recycler
Contact: GCCCD
Telephone: (619) 644-7711
Mailing Address: 8800 GROOSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County San Diego

Gepaid: CAL000020035
TSD EPA ID: CAT080010101
Gen County: San Diego
Tsd County: San Diego
Tons: .2085
Waste Category: Paint sludge
Disposal Method: Transfer Station
Contact: GCCCD
Telephone: (619) 644-7711
Mailing Address: 8800 GROOSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County San Diego

Click this hyperlink while viewing on your computer to access
16 additional CA HAZNET record(s) in the EDR Site Report.

Map ID / Direction / Distance / Distance (ft.) / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
B6 ESE 1/4-1/2 2472 ft.	**CUYAMACA COLLEGE 900 RANCHO SAN DIEGO PKWY EL CAJON, CA 92019**	**RCRA-SQG FINDS HAZNET**	**1004675752 CAR000076729**

Site 2 of 2 in cluster B

Relative: Lower

Actual: 387 ft.

RCRAInfo:

Owner: CUYAMACA COM COL DIST
(619) 644-7712
EPA ID: CAR000076729

Contact: RONALD KNIGHT
(619) 644-7712

Classification: Small Quantity Generator
TSDF Activities: Not reported

Violation Status: Violations exist

Regulation Violated: Not reported
Area of Violation: GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined: 06/02/2004
Actual Date Achieved Compliance: Not reported

Regulation Violated: Not reported
Area of Violation: GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined: 06/02/2004
Actual Date Achieved Compliance: Not reported

Regulation Violated: Not reported
Area of Violation: GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined: 06/02/2004
Actual Date Achieved Compliance: Not reported

Regulation Violated: Not reported
Area of Violation: GENERATOR-GENERAL REQUIREMENTS
Date Violation Determined: 06/02/2004
Actual Date Achieved Compliance: Not reported

There are 4 violation record(s) reported at this site:

Evaluation	Area of Violation	Date of Compliance
Compliance Evaluation Inspection	GENERATOR-GENERAL REQUIREMENTS	
	GENERATOR-GENERAL REQUIREMENTS	
	GENERATOR-GENERAL REQUIREMENTS	
	GENERATOR-GENERAL REQUIREMENTS	

FINDS:

Other Pertinent Environmental Activity Identified at Site:
Resource Conservation and Recovery Act Information system

HAZNET:

Gepaid: CAR000076729
TSD EPA ID: Not reported
Gen County: San Diego
Tsd County: Los Angeles
Tons: 0.00
Waste Category: Off-specification, aged, or surplus inorganics
Disposal Method: Transfer Station
Contact: R W KNIGHT/ENVT'L HLTH & SFTY
Telephone: (619) 644-7712
Mailing Address: 8800 GROSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799

CUYAMACA COLLEGE (Continued) **1004675752**

County Not reported

Gepaid: CAR000076729
TSD EPA ID: Not reported
Gen County: San Diego
Tsd County: Los Angeles
Tons: 0.10
Waste Category: Oxygenated solvents (acetone, butanol, ethyl acetate, etc.)
Disposal Method: Transfer Station
Contact: R W KNIGHT/ENVT'L HLTH & SFTY
Telephone: (619) 644-7712
Mailing Address: 8800 GROSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County Not reported

Gepaid: CAR000076729
TSD EPA ID: Not reported
Gen County: San Diego
Tsd County: Los Angeles
Tons: 0.00
Waste Category: Off-specification, aged, or surplus organics
Disposal Method: Transfer Station
Contact: R W KNIGHT/ENVT'L HLTH & SFTY
Telephone: (619) 644-7712
Mailing Address: 8800 GROSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County Not reported

Gepaid: CAR000076729
TSD EPA ID: Not reported
Gen County: San Diego
Tsd County: Los Angeles
Tons: 0.04
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Contact: R W KNIGHT/ENVT'L HLTH & SFTY
Telephone: (619) 644-7712
Mailing Address: 8800 GROSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County Not reported

Gepaid: CAR000076729
TSD EPA ID: Not reported
Gen County: San Diego
Tsd County: Los Angeles
Tons: 0.00
Waste Category: Other inorganic solid waste
Disposal Method: Disposal, Land Fill
Contact: R W KNIGHT/ENVT'L HLTH & SFTY
Telephone: (619) 644-7712
Mailing Address: 8800 GROSSMONT COLLEGE DR
EL CAJON, CA 92020 - 1799
County Not reported

Click this hyperlink while viewing on your computer to access
8 additional CA HAZNET record(s) in the EDR Site Report.

C7 SSE 1/2-1 2899 ft. — **COUNTY SD SPRING VALLEY RD STA** — **LUST** — **S103296831** / **N/A**

11900 HWY 94
SPRING VALLEY, CA 91978

Site 1 of 3 in cluster C

Relative: Lower
Actual: 375 ft.

LUST Region 9:

Case Number:	9UT3632	Release Date:	03/24/1998
Local Agency:	37000		
Substance:	8006619	Qty Leaked:	0
Date Found:	02/03/1998	How Found:	Tank Closure
Date Stopped:	02/03/1998	How Stopped:	Close Tank
Source:	Tank	Cause:	Corrosion
Lead Agency:	Local Agency		
Status:	Preliminary site assessment underway		
Case Type:	Soil only		
Confirm Date:	Not reported	Submit Workplan:	Not reported
Prelim Assess:	Not reported	Desc Pollution:	Not reported
Remed Plan:	Not reported	Remed Action:	Not reported
Began Monitor:	Not reported	Closed Date:	Not reported
Enforce Type:	Not reported		
Enforce Date:	Not reported		
Pilot Program:	LOP	Local Case:	H20876-001
Basin Number:	909.21	Gwater Depth:	>12’
File Dispn:	Administratively opened on database, however no file physically exists		

Interim Remedial Actions:	Not reported
Beneficial Use:	MUNBU
Cleanup and Abatement order Number:	Not reported
Waste Discharge Requirement Number:	Not reported
NPDES Number:	Not reported

C8 SSE 1/2-1 2903 ft. — **TAMACHA RD STATION** — **HIST UST** — **U001572353** / **N/A**

11900 HIGHWAY 94
SPRING VALLEY, CA 92077

Site 2 of 3 in cluster C

Relative: Lower
Actual: 375 ft.

UST HIST:

Facility ID:	44121	Owner Name:	COUNTY OF SAN DIEGO-DEPT. OF P
Total Tanks:	1	Region:	STATE
Owner Address:	5555 OVERLAND AVE. SAN DIEGO, CA 92123		
Tank Used for:	PRODUCT		
Tank Num:	1	Container Num:	PWO 97
Tank Capacity:	00001500	Year Installed:	Not reported
Type of Fuel:	DIESEL	Tank Construction:	Not Reported
Leak Detection:	Stock Inventor		
Contact Name:	DON LIBBEN	Telephone:	(619) 565-5251
Facility Type:	Other	Other Type:	Not reported

C9 SSE 1/2-1 2903 ft. — **AMACHA ROAD STATION** — **HIST UST** — **U001572336** / **N/A**

11900 HIGHWAY 94
SPRING VALLEY, CA 92077

Site 3 of 3 in cluster C

Relative: Lower
Actual: 375 ft.

UST HIST:

Facility ID:	44138	Owner Name:	COUNTY OF SAN DIEGO - DEPARTME
Total Tanks:	2	Region:	STATE
Owner Address:	5555 OVERLAND AVE. BLDG 6 RM 1		

AMACHA ROAD STATION (Continued) **U001572336**

SAN DIEGO, CA 92123
Tank Used for: PRODUCT
Tank Num: 1 Container Num: PWO 82
Tank Capacity: 00010000 Year Installed: 1974
Type of Fuel: DIESEL Tank Construction: Not Reported
Leak Detection: Stock Inventor
Contact Name: DON UBBEN Telephone: (619) 565-5251
Facility Type: Gas Station Other Type: Not reported

Facility ID: 44138 Owner Name: COUNTY OF SAN DIEGO - DEPARTME
Total Tanks: 2 Region: STATE
Owner Address: 5555 OVERLAND AVE. BLDG 6 RM 1
SAN DIEGO, CA 92123
Tank Used for: PRODUCT
Tank Num: 2 Container Num: PWO83
Tank Capacity: 00010000 Year Installed: Not reported
Type of Fuel: UNLEADED Tank Construction: Not Reported
Leak Detection: Stock Inventor
Contact Name: DON UBBEN Telephone: (619) 565-5251
Facility Type: Gas Station Other Type: Not reported

D10 **RANCHO SAN DIEGO UNOCAL 76** **RCRA-SQG** **1000171032**
SSE **11906 CAMPO ROAD** **FINDS** **CAD982371981**
1/2-1 **SPRING VALLEY, CA 91976**
3235 ft.

Site 1 of 2 in cluster D

Relative: Lower

Actual: 360 ft.

RCRAInfo:
Owner: CLIFF TABOR INC ENT.
(415) 555-1212
EPA ID: CAD982371981

Contact: ENVIRONMENTAL MANAGER
(619) 697-7070

Classification: Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
HWTS-DATAMART
National Emissions Inventory
Resource Conservation and Recovery Act Information system

D11 **SAN DIEGO COUNTY DEPT OF PUBLIC WORKS** **RCRA-SQG** **1000110658**
SSE **11937 CAMPO ROAD** **FINDS** **CAD981375918**
1/2-1 **SPRING VALLEY, CA 91976**
3345 ft.

Site 2 of 2 in cluster D

Relative: Lower

Actual: 362 ft.

SAN DIEGO COUNTY DEPT OF PUBLIC WORKS (Continued) **1000110658**

RCRAInfo:
Owner: SAN DIEGO COUNTY
(415) 555-1212
EPA ID: CAD981375918

Contact: ENVIRONMENTAL MANAGER
(619) 565-5309

Classification: Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
HWTS-DATAMART
Resource Conservation and Recovery Act Information system

E12 **PACIFIC BELL** **UST** **U003789901**
SE **2966 JAMACHA RD** **San Diego Co. HMMD** **N/A**
1/2-1 **EL CAJON, CA 92019**
3427 ft.

Site 1 of 2 in cluster E

Relative:
Lower

Actual:
360 ft.

HMMD:
Facility ID: 129824
Inactive Indicator: Active — Business Code: 6HK52
SIC: Not reported — Permit Expiration: Not reported
Owner: PACIFC BELL/D3 171 — 2nd Name: C/O ENV. MGMT. RM 3E000T
Mailing Address: SAN RAMON
CA
94583
Corporate Code: Not reported — Fire Dept District: Grossmont/Mount Helix
Census Tract #: 136.0 — EPA ID: CAD982471278
Inspection Date: 08/08/03 — Reinspection Date: Not reported
Inspector Name: CMOSSE — Gas Station: Not reported
Facility Contact: NANCY CLANCY 415 331-0924 — Delinquent Flag: Not Delinquent
Property Owner: PACIFIC BELL
PO Address: 00000
Tank Owner: PACIFIC BELL — Facility Phone : 619-696-0967
TO Address: San Ramon
CA
94583
Last Update: 06/29/04
Last Delinquent Letter: Not reported
Last Letter Type: Not reported
Violation Notice Issued: Not reported
Map Code/Business Plan on File: Not reported
Business Plan Acceptance Date: Not reported
Reinspection Date Y2K Compatible: 08/08/04

HMMD DISCLOSURE INVENTORY:
Chemical Name: BATTERY ELECTROLYTE- (SULFURIC
Item Number: BA93
Stored at 1 Time: Not reported
Measurement Units: Not reported
Last Update: 06/29/04
Carcinogen: No — Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported

PACIFIC BELL (Continued) **U003789901**

1st Hazard Category: REACTIVE
2nd Hazard Category: EXTREMELY HAZARDOUS

Chemical Name: DIESEL
Item Number: DI00
Stored at 1 Time: Not reported
Measurement Units: Not reported
Last Update: 06/29/04
Carcinogen: No Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
1st Hazard Category: FIRE
2nd Hazard Category: Not reported

Chemical Name: FREON-RACON-22 (REFRIGERANT)
Item Number: FR94
Stored at 1 Time: Not reported
Measurement Units: Not reported
Last Update: 06/29/04
Carcinogen: No Annual Qty String: Not reported
Quantity Stored At One Time: Not reported
Annual Quantity String: Not reported
1st Hazard Category: ACUTE
2nd Hazard Category: Not reported

HMMD UNDERGROUND TANKS:

Tank Number: T001 Tank ID Number: 00001
Capacity (Gal): 2000.00 Tank Exempt: Not reported
Waste or Product: Not reported Tank Contents: DIESEL

Tank Number: T002 Tank ID Number: NT2421 (PO
Capacity (Gal): 2000.00 Tank Exempt: Not reported
Waste or Product: Not reported Tank Contents: DIESEL

HMMD WASTE STREAMS:

Inspection Date: 08/08/03 Waste Item #: 221
Waste Code: 221 Waste Name: WASTE OIL & MIXED OI
Qnty at Inspection: 5 Annual Quantity: 5
Measurement Unit: GAL
Treatment Method: 001 RECYCLE Storage Method: PROCESSING EQUIPMENT
Waste Description: GENERATOR USED OIL Haz Waste Hauler: 9998 UNKNOWN HAZ WST HAUL
Last Update: 06/29/04
Carcinogen: No Annual Qty String: 5
Quantity String: 5

Inspection Date: 08/08/03 Waste Item #: 342
Waste Code: 342 Waste Name: ORGANIC LIQUIDS W/ME
Qnty at Inspection: 30 Annual Quantity: 30
Measurement Unit: GAL
Treatment Method: 001 RECYCLE Storage Method: PROCESSING EQUIPMENT
Waste Description: GENERATOR WASTE ANTIFREEZ Haz Waste Hauler: 9998 UNKNOWN HAZ WST HAUL
Last Update: 06/29/04
Carcinogen: No Annual Qty String: 30
Quantity String: 30

Inspection Date: 08/08/03 Waste Item #: 888
Waste Code: 888 Waste Name: USED OIL FILTERS
Qnty at Inspection: 1 Annual Quantity: 1

PACIFIC BELL (Continued) **U003789901**

Measurement Unit: LBS
Treatment Method: 001 RECYCLE
Storage Method: PROCESSING EQUIPMENT
Waste Description: GENERATOR USED FILTERS
Haz Waste Hauler: 9998 UNKNOWN HAZ WST HAUL
Last Update: 06/29/04
Carcinogen: No
Annual Qty String: 1
Quantity String: 1

HMMD VIOLATIONS:

Inspection Date: 04/17/01
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV0398
Violation Description: WASTE TO UNREGIST. TRANSPORTER
Last Update: 06/29/04

Inspection Date: 04/17/01
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV0303
Violation Description: WASTE TRANSPORT W/O MANIFEST
Last Update: 06/29/04

Inspection Date: 04/17/01
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV0401
Violation Description: TRAINING RECORDS UNAVAILABLE
Last Update: 06/29/04

Inspection Date: 04/17/01
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV1096
Violation Description: NO EMPLOYEE TRAINING RECORDS
Last Update: 06/29/04

Inspection Date: 04/17/01
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV0135
Violation Description: MANIFESTS/RECEIPTS NO ONSITE
Last Update: 06/29/04

Inspection Date: 04/17/01
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV0202
Violation Description: WASTE CONTAINER W/O LABELS
Last Update: 06/29/04

Inspection Date: 08/08/03
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV3112
Violation Description: 2NDRY CONT TEST NOT DONE (6/36 MOS.)
Last Update: 06/29/04

Inspection Date: 08/08/03
Occurrences: Not reported
Waste Code: Not reported
Type of Violation: 6HV3158
Violation Description: OPERATING CONDITIONS VIOLATED
Last Update: 06/29/04

Click this hyperlink while viewing on your computer to access additional CA HMMD detail in the EDR Site Report.

PACIFIC BELL (Continued) **U003789901**

State UST:
Facility ID: H29824
Total Tanks: 1
Region: STATE
Local Agency: 37000

E13
SE
1/2-1
3484 ft.

Relative:
Lower

Actual:
356 ft.

RANCHO AUTOMOTIVE **RCRA-SQG** **1004675471**
2946 JAMACHA RD **FINDS** **CAR000073288**
EL CAJON, CA 92019 **HAZNET**

Site 2 of 2 in cluster E

RCRAInfo:
Owner: ISSA FAKOURI
(619) 660-5797
EPA ID: CAR000073288

Contact: JAMES CALDON
(619) 660-5797

Classification: Small Quantity Generator
TSDF Activities: Not reported

Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
Resource Conservation and Recovery Act Information system

HAZNET:
Gepaid: CAR000073288
TSD EPA ID: CAT000613893
Gen County: 0
Tsd County: Los Angeles
Tons: .2335
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Contact: Not reported
Telephone: (000) 000-0000
Mailing Address: 2946 JAMACHA RD
EL CAJON, CA 92019
County 0

Gepaid: CAR000073288
TSD EPA ID: CAT000613893
Gen County: 0
Tsd County: Los Angeles
Tons: .0000
Waste Category:
Disposal Method: Transfer Station
Contact: Not reported
Telephone: (000) 000-0000
Mailing Address: 2946 JAMACHA RD
EL CAJON, CA 92019
County 0

RANCHO AUTOMOTIVE (Continued) **1004675471**

Gepaid: CAR000073288
TSD EPA ID: CAD981696420
Gen County: 0
Tsd County: Los Angeles
Tons: .2293
Waste Category: Aqueous solution with less than 10% total organic residues
Disposal Method: Transfer Station
Contact: Not reported
Telephone: (000) 000-0000
Mailing Address: 2946 JAMACHA RD
EL CAJON, CA 92019
County 0

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14 West 1/2-1 3503 ft. | **SCRIPPS CLINIC RANCHO SAN DIEGO**
10862 CALLE VERDE
LA MESA, CA 91941 | **RCRA-SQG FINDS HAZNET** | **1000597874 CAD983619099**

Relative: Lower

Actual: 535 ft.

RCRAInfo:
Owner: SCRIPPS CLINIC AND RESEARCH FOUND
(619) 455-9100
EPA ID: CAD983619099
Contact: YVONNE MARKOVITZ
(619) 660-1801
Classification: Small Quantity Generator
TSDF Activities: Not reported
Violation Status: No violations found

FINDS:
Other Pertinent Environmental Activity Identified at Site:
HWTS-DATAMART
Resource Conservation and Recovery Act Information system

HAZNET:
Gepaid: CAD983619099
TSD EPA ID: CAD981402522
Gen County: San Diego
Tsd County: Kern
Tons: .0223
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: SCRIPPS CLINIC MSO
Telephone: (619) 455-9100
Mailing Address: 10862 CALLE VERDE
LA MESA, CA 91941 - 7340
County San Diego

Gepaid: CAD983619099
TSD EPA ID: CAD981402522
Gen County: San Diego
Tsd County: Kern
Tons: .1306
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: SCRIPPS CLINIC MSO
Telephone: (619) 455-9100
Mailing Address: 10862 CALLE VERDE

SCRIPPS CLINIC RANCHO SAN DIEGO (Continued) **1000597874**

LA MESA, CA 91941 - 7340
County San Diego

Gepaid: CAD983619099
TSD EPA ID: CAD981402522
Gen County: San Diego
Tsd County: Kern
Tons: .0624
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: SCRIPPS CLINIC MSO
Telephone: (619) 455-9100
Mailing Address: 10862 CALLE VERDE
LA MESA, CA 91941 - 7340
County San Diego

Gepaid: CAD983619099
TSD EPA ID: CAD981402522
Gen County: San Diego
Tsd County: Kern
Tons: .0674
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: SCRIPPS CLINIC MSO
Telephone: (619) 455-9100
Mailing Address: 10862 CALLE VERDE
LA MESA, CA 91941 - 7340
County San Diego

Gepaid: CAD983619099
TSD EPA ID: CAD981402522
Gen County: San Diego
Tsd County: Kern
Tons: .1291
Waste Category: Photochemicals/photoprocessing waste
Disposal Method: Recycler
Contact: SCRIPPS CLINIC MSO
Telephone: (619) 455-9100
Mailing Address: 10862 CALLE VERDE
LA MESA, CA 91941 - 7340
County San Diego

Click this hyperlink while viewing on your computer to access
1 additional CA HAZNET record(s) in the EDR Site Report.

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15 **ADVANTAGE DRY CLEANERS** **LUST** **S105694678**
ESE **2522 JAMACHA RD** **N/A**
1/2-1 **EL CAJON, CA 92019**
4583 ft.

Relative:
Lower

Actual:
335 ft.

State LUST:
Cross Street: Not reported
Qty Leaked: Not reported
Case Number Not reported
Reg Board: 9
Chemical: Chlorinated Hydrocarbons
Lead Agency: Local Agency
Local Agency : 37000L
Case Type: Other ground water affected
Status: Case Closed

ADVANTAGE DRY CLEANERS (Continued) **S105694678**

Review Date:	Not reported	Confirm Leak:	Not reported
Workplan:	1965-01-03 00:00:00	Prelim Assess:	1965-01-03 00:00:00
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	1965-01-03 00:00:00		
Monitoring:	Not reported		
Close Date:	1998-11-20 00:00:00		
Release Date:	Not reported		
Cleanup Fund Id :	Not reported		
Discover Date :	Not reported		
Enforcement Dt :	Not reported		
Enf Type:	Not reported		
Enter Date :	Not reported		
Funding:	Not reported		
Staff Initials:	SJA		
How Discovered:	Not reported		
How Stopped:	Not reported		
Interim :	Not reported		
Leak Cause:	Not reported		
Leak Source:	Not reported		
MTBE Date :	Not reported		
Max MTBE GW :	Not reported		
MTBE Tested:	Not Required to be Tested.		
Priority:	3A		
Local Case # :	Not reported		
Beneficial:	Not reported		
Staff :	UNK		
GW Qualifier :	Not reported		
Max MTBE Soil :	Not reported		
Soil Qualifier :	Not reported		
Hydr Basin #:	Not reported		
Operator :	Not reported		
Oversight Prgm:	LOCNL		
Review Date :	Not reported		
Stop Date :	Not reported		
Work Suspended :	Not reported		
Responsible Party	Not reported		
RP Address:	Not reported		
Global Id:	T0608161212		
Org Name:	Not reported		
Contact Person:	Not reported		
MTBE Conc:	0		
Mtbe Fuel:	0		
Water System Name:	Not reported		
Well Name:	Not reported		
Distance To Lust:	0		
Waste Discharge Global ID:	Not reported		
Waste Disch Assigned Name:	Not reported		
Summary :	Not reported		

16 SSE 1/2-1 4850 ft. | **ATLAS RENTS 11928 CAMPO RD SPRING VALLEY, CA 91977** | **HAZNET LUST Cortese** | **S100732295 N/A**

Relative: Lower

Actual: 334 ft.

State LUST:

Cross Street:	Not reported		
Qty Leaked:	Not reported		
Case Number	9UT3086		
Reg Board:	9		
Chemical:	Regular Gasoline		
Lead Agency:	Local Agency		
Local Agency :	37000L		
Case Type:	Soil only		
Status:	Case Closed		
Review Date:	Not reported	Confirm Leak:	Not reported
Workplan:	1965-01-03 00:00:00	Prelim Assess:	1965-01-03 00:00:00
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	1965-01-03 00:00:00		
Monitoring:	Not reported		
Close Date:	1997-07-17 00:00:00		
Release Date:	Not reported		
Cleanup Fund Id :	Not reported		
Discover Date :	Not reported		
Enforcement Dt :	Not reported		
Enf Type:	Not reported		
Enter Date :	Not reported		
Funding:	Not reported		
Staff Initials:	OMA		
How Discovered:	Not reported		
How Stopped:	Not reported		
Interim :	Not reported		
Leak Cause:	Not reported		
Leak Source:	Not reported		
MTBE Date :	1965-01-01 00:00:00		
Max MTBE GW :	0.00 Parts per Billion		
MTBE Tested:	MTBE Detected. Site tested for MTBE & MTBE detected		
Priority:	Low priority. Priority ranking can change over time.		
Local Case # :	Not reported		
Beneficial:	Not reported		
Staff :	UNK		
GW Qualifier :	<		
Max MTBE Soil :	Not reported		
Soil Qualifier :	Not reported		
Hydr Basin #:	UNNAMED BASIN		
Operator :	Not reported		
Oversight Prgm:	LUST		
Review Date :	Not reported		
Stop Date :	Not reported		
Work Suspended :	Not reported		
Responsible Party	Not reported		
RP Address:	Not reported		
Global Id:	T0607301850		
Org Name:	Not reported		
Contact Person:	Not reported		
MTBE Conc:	2		
Mtbe Fuel:	1		
Water System Name:	Not reported		
Well Name:	Not reported		

ATLAS RENTS (Continued) **S100732295**

Distance To Lust: 0
Waste Discharge Global ID: Not reported
Waste Disch Assigned Name: Not reported
Summary : 11/14 EDR;12/12WP; MTBE DATE 4/20/98.

LUST Region 9:

Case Number:	9UT3086	Release Date:	06/09/1995
Local Agency:	37000		
Substance:	8006619	Qty Leaked:	0
Date Found:	06/09/1995	How Found:	Tank Closure
Date Stopped:	06/09/1995	How Stopped:	Close Tank
Source:	Tank	Cause:	Other Cause
Lead Agency:	Local Agency		
Status:	Case Closed		
Case Type:	Soil only		
Confirm Date:	Not reported	Submit Workplan:	Not reported
Prelim Assess:	Not reported	Desc Pollution:	Not reported
Remed Plan:	Not reported	Remed Action:	Not reported
Began Monitor:	7/16/97	Closed Date:	7/16/97
Enforce Type:	Not reported		
Enforce Date:	Not reported		
Pilot Program:	LOP	Local Case:	H22555-001
Basin Number:	909.21	Gwater Depth:	10’
File Dispn:	File discarded, case closed		

Interim Remedial Actions: Yes
Beneficial Use: MUN
Cleanup and Abatement order Number: Not reported
Waste Discharge Requirement Number: Not reported
NPDES Number: Not reported

HAZNET:

Gepaid: CAC000910984
TSD EPA ID: CAD028409019
Gen County: San Diego
Tsd County: Los Angeles
Tons: .4170
Waste Category: Hydrocarbon solvents (benzene, hexane, Stoddard, etc.)
Disposal Method: Treatment, Tank
Contact: CHUCK RAMSDEN (CONTACT)
Telephone: (619) 440-4501
Mailing Address: PO BOX 19100
SAN DIEGO, CA 92159
County San Diego

CORTESE:

Region: CORTESE
Fac Address 2: 11928 CAMPO RD

F17 **COUNTY OF SD-DPW DIVISION I HQ** **LUST** **S100944146**
SSE **11970 SINGER LN** **N/A**
1/2-1 **SPRING VALLEY, CA 91978**
5086 ft.

Site 1 of 2 in cluster F

Relative:
Lower

State LUST:

Cross Street: Not reported
Qty Leaked: Not reported
Case Number 9UT3159
Reg Board: 9
Chemical: Not reported

Actual:
334 ft.

COUNTY OF SD-DPW DIVISION I HQ (Continued) **S100944146**

Lead Agency:	Local Agency		
Local Agency :	37000L		
Case Type:	Drinking Water Aquifer affected		
Status:	Preliminary site assessment underway		
Review Date:	Not reported	Confirm Leak:	Not reported
Workplan:	1996-04-25 00:00:00	Prelim Assess:	1996-04-25 00:00:00
Pollution Char:	Not reported	Remed Plan:	Not reported
Remed Action:	1965-01-03 00:00:00		
Monitoring:	Not reported		
Close Date:	Not reported		
Release Date:	Not reported		
Cleanup Fund Id :	Not reported		
Discover Date :	Not reported		
Enforcement Dt :	Not reported		
Enf Type:	Not reported		
Enter Date :	Not reported		
Funding:	Not reported		
Staff Initials:	HKE		
How Discovered:	Not reported		
How Stopped:	Not reported		
Interim :	Not reported		
Leak Cause:	Not reported		
Leak Source:	Not reported		
MTBE Date :	2000-06-19 00:00:00		
Max MTBE GW :	300.00 Parts per Billion		
MTBE Tested:	MTBE Detected. Site tested for MTBE & MTBE detected		
Priority:	2A		
Local Case # :	Not reported		
Beneficial:	Not reported		
Staff :	UNK		
GW Qualifier :	=		
Max MTBE Soil :	Not reported		
Soil Qualifier :	Not reported		
Hydr Basin #:	UNNAMED BASIN		
Operator :	Not reported		
Oversight Prgm:	LUST		
Review Date :	Not reported		
Stop Date :	Not reported		
Work Suspended :	Not reported		
Responsible Party	Not reported		
RP Address:	Not reported		
Global Id:	T0607301927		
Org Name:	Not reported		
Contact Person:	Not reported		
MTBE Conc:	4		
Mtbe Fuel:	0		
Water System Name:	Not reported		
Well Name:	Not reported		
Distance To Lust:	0		
Waste Discharge Global ID:	Not reported		
Waste Disch Assigned Name:	Not reported		
Summary :	11/14 EDR;12/12WP; MTBE DATE 4/20/98.		

COUNTY OF SD-DPW DIVISION I HQ (Continued) **S100944146**

LUST Region 9:

Case Number:	9UT3159	Release Date:	04/25/1996
Local Agency:	37000		
Substance:	8006619	Qty Leaked:	0
Date Found:	04/25/1996	How Found:	Not reported
Date Stopped:	04/25/1996	How Stopped:	Not reported
Source:	Tank	Cause:	Corrosion
Lead Agency:	Local Agency		
Status:	Preliminary site assessment underway		
Case Type:	Soil only		
Confirm Date:	4/25/96	Submit Workplan:	4/25/96
Prelim Assess:	Not reported	Desc Pollution:	Not reported
Remed Plan:	Not reported	Remed Action:	Not reported
Began Monitor:	Not reported	Closed Date:	Not reported
Enforce Type:	Not reported		
Enforce Date:	Not reported		
Pilot Program:	LOP	Local Case:	H04802-001
Basin Number:	909.21	Gwater Depth:	Not reported
File Dispn:	Administratively opened on database, however no file physically exists		

Interim Remedial Actions:	Not reported
Beneficial Use:	MUNBU
Cleanup and Abatement order Number:	Not reported
Waste Discharge Requirement Number:	Not reported
NPDES Number:	Not reported

F18 **COUNTY OF SD-DPW DIVISION** **CHMIRS** **S100217796**
SSE **11970 SINGER** **Cortese** **N/A**
1/2-1 **SPRING VALLEY, CA 92077**
5086 ft.

Site 2 of 2 in cluster F

Relative: Lower

CORTESE:

Region:	CORTESE
Fac Address 2:	Not reported

Actual: 334 ft.

CHMIRS:

OES Control Number:	8908191
Chemical Name:	Not reported
Extent of Release:	Not reported
Property Use:	Industrial, Utility
Incident Date:	20-SEP-89
Date Completed:	20-SEP-89
Time Completed :	1600
Agency Id Number :	37717
Agency Incident Number :	89-423A
OES Incident Number :	8908191
Time Notified :	900
Surrounding Area :	600
Estimated Temperature :	75
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 :	0
Responding Agency Personel # Of Fatalities :	0

COUNTY OF SD-DPW DIVISION (Continued) **S100217796**

Resp Agncy Personel # Of Decontaminated :	0
Others Number Of Decontaminated :	0
Others Number Of Injuries :	0
Others Number Of Fatalities :	0
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 :	NICK VENT
Report Date :	20-SEP-89
Comments :	Not reported
Facility Telephone Number :	619 338-2222
Waterway Involved :	Not reported
Waterway :	Not reported
Spill Site :	Not reported
Cleanup By :	Not reported
Containment :	Not reported
What Happened :	Not reported
Type :	Not reported
Other :	Not reported
Chemical 1 :	Not Reported
Chemical 2 :	Not Reported
Chemical 3 :	Not Reported
Date/Time :	Not reported
Evacuations :	Not reported
True date :	Not reported
Year :	88-92
Agency :	Not reported
BBLS :	Not reported
Cups :	Not reported
CUFT :	Not reported
Gallons :	Not reported
Grams :	Not reported
Pounds :	Not reported
Liters :	Not reported
Ounces :	Not reported
Pints :	Not reported
Quarts :	Not reported
Sheen :	Not reported
Tons :	Not reported
Unknown :	Not reported
Description :	Not reported
Incident date :	Not reported
Admin Agency :	Not reported
OES date :	Not reported
OES time :	Not reported
Amount :	Not reported

19 South 1/2-1 5217 ft. | **JAMACHA SLF** | **SWF/LF** | **S103340518** / **N/A**
11900 BLK. SINGER LANE
SPRING VALLEY, CA

Relative: Lower

Actual: 423 ft.

LF:
Facility ID: Not reported
Operator: COUNTY OF SAN DIEGO-DPW
Operator Addr:
Activity: Not reported
Operator's Status: Not reported
Owner: COUNTY OF SAN DIEGO
Owner Address: Not reported
Not reported
Operator Phone: Not reported
Owner Telephone: Not reported
Regulation Status: Not reported
Region: SAN DIEGO
Location: Not reported
Parcel Num: Not reported
Land Use: Not reported
Sig. Change Since Last Visit: Not reported
Site Size: Not reported
Other Observations: Not reported
Issue And Observations: Not reported
Recommendations / Follow Up: Not reported
Lat/Long: Not reported
Permit Date: Not reported
Accepted Waste:
Restrictions:
Status : Not reported
Swisnumber : Not reported
Site Type : Not reported
Aka : Not reported
Type Of Waste : Not reported
Disposal Area : Not reported
SWFP Date : Not reported
WDR Number : Not reported
Dates Operation : Not reported
Closure Approve : Not reported
Dt Of Field Units : Not reported
Surface Condition : Not reported
Lea Date : Not reported
Reassess Site : Not reported
Leachate : Not reported
Emrgncy Response: Not reported
Landfill Gas : Not reported
Priority For Site Assessment : Not reported
Other Recommendation : Not reported
Explanation: Not Reported
No Further Action: Not Reported
Permitted Throughput with Units: Not reported
Actual Throughput with Units: Not reported
Actual Capacity with Units: Not reported
Permitted Capacity with Units: Not reported
Remaining Capacity with Units: Not reported
Permitted Total Acreage: Not reported
Remaining Capacity : Not reported
Fill Area: Not reported
Inspec Frequency : Not reported
Landuse Name: Not reported
GIS Source: Not reported
Permit Status: Not reported
Category: Not reported
Unit Number: Not reported
Closure Date: / /
Closure Type: Not reported
Disposal Acreage: Not reported
Year Opened: Not reported
Year Closed: Not reported
Last Waste Tire Inspection Count : Not reported
Last Waste Tire Inspection Date: Not reported
Original Waste Tire Count: Not reported
Original Waste Tire Count Date: Not reported
Type Of Refuse: Not reported
Avg Depth Of Fill: Not reported
Addtl Expansion Area: Not reported

JAMACHA SLF (Continued) **S103340518**

Site Description: Not Reported

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20 SSE 1/2-1 5271 ft. **OTAY WATER DISTRICT AMAC** **Cortese** **S102006472**
11901 SINGER **CA WDS** **N/A**
SPRING VALLEY, CA 91978

Relative: Lower

Actual: 329 ft.

CORTESE:
Region: CORTESE
Fac Address 2: Not reported

Region: CORTESE
Fac Address 2: Not reported

WDS:
Facility ID: San Diego 000000559
Facility Contact JOHN M STEWART Facility Telephone Not reported
SIC Code: 4952 SIC Code 2: Not reported
Agency Name: HIDDEN VALLEY ESTATES, INC
Agency Address: 1536 BROOKHOLLOW DR., STE 13
SANTA ANA 92705
Agency Contact: JOHN M STEWART Agency Phone: Not reported
Design Flow: 0 Million Gal/Day Baseline Flow: 0 Million Gal/Day
Facility Type: Municipal/Domestic - Facility that treats sewage or a mixture of predominantly sewage and other waste from districts, municipalities, communities, hospitals, schools, and publicly or privately owned systems (excluding individual subsurface leaching systems disposing of less than 1,000 gallons per day).
Facility Status: Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements.
Agency Type: Special District (Includes districts established under general acts, sanitary districts, water districts irrigation districts, etc.)
Waste Type: Domestic Sewage - Designated/Influent or Solid Wastes that pose a significant threat to water quality because of their high concentrations (E.G., BOD, Hardness, TRF, Chloride). 'Manageable' hazardous wastes (E.G., inorganic salts and heavy metals) are included in this category.
Threat to Water: Moderate Threat to Water Quality. A violation could have a major adverse impact on receiving biota, can cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply. Awsthetic impairment would include nuisance from a waste treatment facility.
Complexity: Category B - Any facility having a physical, chemical, or biological waste treatment system (except for septic systems with subsurface disposal), or any Class II or III disposal site, or facilities without treatment systems that are complex, such as marinas with petroleum products, solid wastes, and sewage pump out facilities.
Reclamation: Producer: Reclamation requirements that have been issued to a producer of reclaimed water that does not use the product.
POTW: The facility is not a POTW.
NPDES Number: Not reported
Subregion: 9

MAP FINDINGS - EDR PROPRIETARY HISTORICAL DATABASES

YEAR	NAME	ADDRESS	CITY	ST	DIR.	DIST.	ELEV.	TYPE

Coal Gas Site Search: No site was found in a search of Real Property Scan's ENVIROHAZ database.

EDR Historical Gas Station & Dry Cleaner Search: No mapped sites were found in EDR's search of the EDR Historical Gas Station & Dry Cleaner Database within 0.250 mile of the Target Property.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
EL CAJON	1007370081	STATE OF CA DEPT OF FORESTRY	2249 JAMACHA	92020	RCRA-SQG
EL CAJON	S106167099	USA CLEANERS AND SHIRT LAUNDRY	2441 JAMACHA ROAD SUITE 103	92019	CLEANERS
EL CAJON	S100732814	EL CAJON MOUNTAIN MILL SITE	EL MONTE RD	92020	LUST, San Diego Co. HMMD
EL CAJON	S103679867	CA ON VALLEY UNION SCHOOL DISTRICT	SEVICK SCHOOL	92019	HAZNET
EL CAJON	S105691387	ERNEST F MILLER	2124 VISTA DEL VALLE BL	92019	LUST, San Diego Co. HMMD
SAN DIEGO COUNTY	S105634870		CORONADO BRIDGEAND NORTH ISLAND		CHMIRS, CA WDS
SPRING VALLEY	S105694626	COUNTY OF SD-JAMACHA PUMP STA	9903 HY 94 CAMPO RD	91977	LUST
SPRING VALLEY	S104746057	OTAY WATER DISTRICT MAIN YARD	2554 SWEETWATER SPRINGS B	91978	LUST, San Diego Co. HMMD

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: 12/14/04
Date Made Active at EDR: 02/03/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 02/01/05
Elapsed ASTM days: 2
Date of Last EDR Contact: 02/01/05

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 8
Telephone: 303-312-6774

EPA Region 4
Telephone 404-562-8033

Proposed NPL: Proposed National Priority List Sites
Source: EPA
Telephone: N/A

Date of Government Version: 12/14/04
Date Made Active at EDR: 02/03/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 02/01/05
Elapsed ASTM days: 2
Date of Last EDR Contact: 02/01/05

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: 12/14/04
Date Made Active at EDR: 02/08/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/21/04
Elapsed ASTM days: 49
Date of Last EDR Contact: 12/21/04

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: 12/14/04
Date Made Active at EDR: 02/08/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/21/04
Elapsed ASTM days: 49
Date of Last EDR Contact: 12/21/04

CORRACTS: Corrective Action Report
Source: EPA
Telephone: 800-424-9346
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 12/15/04
Date Made Active at EDR: 02/25/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 01/07/05
Elapsed ASTM days: 49
Date of Last EDR Contact: 12/07/04

RCRA: Resource Conservation and Recovery Act Information
Source: EPA
Telephone: 800-424-9346
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. RCRAInfo replaces the data recording and reporting abilities of the Resource Conservation and Recovery Information System (RCRIS). The database 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). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month. Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month. Transporters are individuals or entities that move hazardous waste from the generator off-site to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 11/23/04
Date Made Active at EDR: 01/18/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 11/24/04
Elapsed ASTM days: 55
Date of Last EDR Contact: 11/24/04

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: 12/31/03
Date Made Active at EDR: 03/12/04
Database Release Frequency: Annually
Date of Data Arrival at EDR: 01/26/04
Elapsed ASTM days: 46
Date of Last EDR Contact: 01/27/05

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: 12/01/01
Database Release Frequency: Biennially
Date of Last EDR Contact: 12/13/04
Date of Next Scheduled EDR Contact: 03/14/05

CONSENT: Superfund (CERCLA) Consent Decrees
Source: Department of Justice, Consent Decree Library
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: 03/05/04 Date of Last EDR Contact: 10/25/04
Database Release Frequency: Varies Date of Next Scheduled EDR Contact: 01/24/05

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: 09/09/04 Date of Last EDR Contact: 01/05/05
Database Release Frequency: Annually Date of Next Scheduled EDR Contact: 04/04/05

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: 12/14/04 Date of Last EDR Contact: 02/01/05
Database Release Frequency: Quarterly Date of Next Scheduled EDR Contact: 05/02/05

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: 01/12/05 Date of Last EDR Contact: 01/03/05
Database Release Frequency: Quarterly Date of Next Scheduled EDR Contact: 04/04/05

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: 09/08/04 Date of Last EDR Contact: 01/19/05
Database Release Frequency: Annually Date of Next Scheduled EDR Contact: 04/18/05

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: 11/30/04 Date of Last EDR Contact: 01/03/05
Database Release Frequency: Quarterly Date of Next Scheduled EDR Contact: 04/04/05

MINES: Mines Master Index File
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/15/05 | Date of Last EDR Contact: 12/28/04
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 03/28/05

NPL LIENS: Federal Superfund Liens
Source: EPA
Telephone: 202-564-4267
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 | Date of Last EDR Contact: 02/22/05
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 05/23/05

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: 09/30/04 | Date of Last EDR Contact: 02/23/05
Database Release Frequency: Annually | Date of Next Scheduled EDR Contact: 05/09/05

DOD: Department of Defense Sites
Source: USGS
Telephone: 703-692-8801
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: 10/01/03 | Date of Last EDR Contact: 02/08/05
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 05/09/05

UMTRA: Uranium Mill Tailings Sites
Source: Department of Energy
Telephone: 505-845-0011
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized. In 1978, 24 inactive uranium mill tailings sites in Oregon, Idaho, Wyoming, Utah, Colorado, New Mexico, Texas, North Dakota, South Dakota, Pennsylvania, and on Navajo and Hopi tribal lands, were targeted for cleanup by the Department of Energy.

Date of Government Version: 12/29/04 | Date of Last EDR Contact: 12/21/04
Database Release Frequency: Varies | Date of Next Scheduled EDR Contact: 03/21/05

ODI: Open Dump Inventory
Source: Environmental Protection Agency
Telephone: 800-424-9346
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/85 | Date of Last EDR Contact: 05/23/95
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: N/A

FUDS: Formerly Used Defense Sites
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/03
Database Release Frequency: Varies
Date of Last EDR Contact: 01/03/05
Date of Next Scheduled EDR Contact: 04/04/05

INDIAN RESERV: Indian Reservations
Source: USGS
Telephone: 202-208-3710
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 10/01/03
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/08/05
Date of Next Scheduled EDR Contact: 05/09/05

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: 12/06/04
Date of Next Scheduled EDR Contact: 03/07/05

TRIS: Toxic Chemical Release Inventory System
Source: EPA
Telephone: 202-566-0250
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: 12/31/02
Database Release Frequency: Annually
Date of Last EDR Contact: 12/20/04
Date of Next Scheduled EDR Contact: 03/21/05

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: 12/31/02
Database Release Frequency: Every 4 Years
Date of Last EDR Contact: 12/06/04
Date of Next Scheduled EDR Contact: 03/07/05

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: 04/13/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/01/04
Date of Next Scheduled EDR Contact: 03/21/05

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: 12/31/03
Database Release Frequency: Annually
Date of Last EDR Contact: 11/29/04
Date of Next Scheduled EDR Contact: 04/18/05

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: 09/13/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/01/04
Date of Next Scheduled EDR Contact: 03/21/05

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: 11/09/04
Date Made Active at EDR: 01/04/05
Database Release Frequency: Annually
Date of Data Arrival at EDR: 12/02/04
Elapsed ASTM days: 33
Date of Last EDR Contact: 03/01/05

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: 11/09/04
Date Made Active at EDR: 01/04/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/02/04
Elapsed ASTM days: 33
Date of Last EDR Contact: 03/01/05

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: 12/31/03
Date Made Active at EDR: 06/25/04
Database Release Frequency: Varies
Date of Data Arrival at EDR: 05/18/04
Elapsed ASTM days: 38
Date of Last EDR Contact: 02/23/05

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). This listing is no longer updated by the state agency.

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: 01/25/05

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: 01/17/05

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: 02/01/05

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: 12/13/04
Date Made Active at EDR: 01/24/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/14/04
Elapsed ASTM days: 41
Date of Last EDR Contact: 12/14/04

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: 12/06/04

LUST: Leaking Underground Storage Tank Information System
Source: State Water Resources Control Board
Telephone: 916-341-5752
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: 01/10/05
Date Made Active at EDR: 02/21/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 01/10/05
Elapsed ASTM days: 42
Date of Last EDR Contact: 01/10/05

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: 916-341-5752
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 01/10/05
Date Made Active at EDR: 02/21/05
Database Release Frequency: Semi-Annually
Date of Data Arrival at EDR: 01/10/05
Elapsed ASTM days: 42
Date of Last EDR Contact: 01/10/05

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: 11/09/04
Date Made Active at EDR: 01/24/05
Database Release Frequency: Quarterly
Date of Data Arrival at EDR: 12/02/04
Elapsed ASTM days: 53
Date of Last EDR Contact: 03/01/05

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land
Source: Environmental Protection Agency
Telephone: 415-972-3372
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/14/05
Date Made Active at EDR: 03/03/05
Database Release Frequency: Varies
Date of Data Arrival at EDR: 01/14/05
Elapsed ASTM days: 48
Date of Last EDR Contact: 02/22/05

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land
Source: EPA Region 10
Telephone: 206-553-2857
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 12/21/04
Date Made Active at EDR: 02/03/05
Database Release Frequency: Varies
Date of Data Arrival at EDR: 12/21/04
Elapsed ASTM days: 44
Date of Last EDR Contact: 01/31/05

INDIAN UST: Underground Storage Tanks on Indian Land
Source: EPA Region 9
Telephone: 415-972-3368

Date of Government Version: 11/02/04
Date Made Active at EDR: 12/13/04
Database Release Frequency: Varies
Date of Data Arrival at EDR: 11/03/04
Elapsed ASTM days: 40
Date of Last EDR Contact: 02/22/05

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: 12/01/03
Database Release Frequency: Quarterly
Date of Last EDR Contact: 02/24/05
Date of Next Scheduled EDR Contact: 05/02/05

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: 11/29/04
Database Release Frequency: Annually
Date of Last EDR Contact: 01/04/05
Date of Next Scheduled EDR Contact: 04/04/05

CA WDS: Waste Discharge System
Source: State Water Resources Control Board
Telephone: 916-341-5227
Sites which have been issued waste discharge requirements.

Date of Government Version: 12/20/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/21/04
Date of Next Scheduled EDR Contact: 03/21/05

DEED: Deed Restriction Listing
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 10/04/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/04/05
Date of Next Scheduled EDR Contact: 04/04/05

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: 11/09/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

EMI: Emissions Inventory Data
Source: California Air Resources Board
Telephone: 916-322-2990
Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/02
Database Release Frequency: Varies
Date of Last EDR Contact: 01/21/05
Date of Next Scheduled EDR Contact: 04/18/05

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: 11/09/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

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: 11/09/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

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: 11/09/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

SLIC: Statewide SLIC Cases
Source: State Water Resources Control Board
Telephone: 916-341-5752
The Spills, Leaks, Investigations, and Cleanups (SLIC) listings includes unauthorized discharges from spills and leaks, other than from underground storage tanks or other regulated sites.

Date of Government Version: 01/10/05
Database Release Frequency: Varies
Date of Last EDR Contact: 01/10/05
Date of Next Scheduled EDR Contact: 04/11/05

HAZNET: Facility and Manifest Data
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: 12/31/02
Database Release Frequency: Annually
Date of Last EDR Contact: 02/17/05
Date of Next Scheduled EDR Contact: 05/09/05

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 11/24/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/24/05
Date of Next Scheduled EDR Contact: 04/25/05

Underground Tanks
Source: Alameda County Environmental Health Services
Telephone: 510-567-6700

Date of Government Version: 11/24/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/24/05
Date of Next Scheduled EDR Contact: 04/25/05

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: 12/13/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/28/05
Date of Next Scheduled EDR Contact: 05/30/05

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: 01/19/05
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 01/19/05
Date of Next Scheduled EDR Contact: 05/09/05

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: 12/13/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/06/04
Date of Next Scheduled EDR Contact: 03/07/05

LOS ANGELES COUNTY:

List of Solid Waste Facilities
Source: La County Department of Public Works
Telephone: 818-458-5185

Date of Government Version: 06/03/03
Database Release Frequency: Varies
Date of Last EDR Contact: 02/18/05
Date of Next Scheduled EDR Contact: 05/16/05

City of El Segundo Underground Storage Tank
Source: City of El Segundo Fire Department
Telephone: 310-524-2236

Date of Government Version: 11/29/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/14/05
Date of Next Scheduled EDR Contact: 05/16/05

City of Long Beach Underground Storage Tank
Source: City of Long Beach Fire Department
Telephone: 562-570-2543

Date of Government Version: 03/28/03
Database Release Frequency: Annually
Date of Last EDR Contact: 02/23/05
Date of Next Scheduled EDR Contact: 05/23/05

City of Torrance Underground Storage Tank
Source: City of Torrance Fire Department
Telephone: 310-618-2973

Date of Government Version: 12/03/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/28/05
Date of Next Scheduled EDR Contact: 05/16/05

City of Los Angeles Landfills
Source: Engineering & Construction Division
Telephone: 213-473-7869

Date of Government Version: 03/01/04
Database Release Frequency: Varies
Date of Last EDR Contact: 12/13/04
Date of Next Scheduled EDR Contact: 03/14/05

HMS: Street Number List
Source: Department of Public Works
Telephone: 626-458-3517
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 09/30/04
Database Release Frequency: Semi-Annually
Date of Last EDR Contact: 02/14/05
Date of Next Scheduled EDR Contact: 05/16/05

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: 02/26/04
Database Release Frequency: Annually
Date of Last EDR Contact: 02/14/05
Date of Next Scheduled EDR Contact: 05/16/05

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: 11/16/04 | Date of Last EDR Contact: 01/31/05
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 05/02/05

NAPA COUNTY:

Sites With Reported Contamination
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 12/27/04 | Date of Last EDR Contact: 12/28/04
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 03/28/05

Closed and Operating Underground Storage Tank Sites
Source: Napa County Department of Environmental Management
Telephone: 707-253-4269

Date of Government Version: 12/27/04 | Date of Last EDR Contact: 12/27/04
Database Release Frequency: Annually | Date of Next Scheduled EDR Contact: 03/28/05

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: 12/01/04 | Date of Last EDR Contact: 12/10/04
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 03/07/05

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: 12/01/04 | Date of Last EDR Contact: 12/10/04
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 03/07/05

List of Industrial Site Cleanups
Source: Health Care Agency
Telephone: 714-834-3446
Petroleum and non-petroleum spills.

Date of Government Version: 12/01/04 | Date of Last EDR Contact: 12/10/04
Database Release Frequency: Annually | Date of Next Scheduled EDR Contact: 03/07/05

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: 01/13/05 | Date of Last EDR Contact: 12/20/04
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 03/21/05

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: 12/06/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 01/17/05
Date of Next Scheduled EDR Contact: 04/18/05

Underground Storage Tank Tank List
Source: Health Services Agency
Telephone: 909-358-5055

Date of Government Version: 12/06/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 01/17/04
Date of Next Scheduled EDR Contact: 04/18/05

SACRAMENTO COUNTY:

CS - Contaminated Sites
Source: Sacramento County Environmental Management
Telephone: 916-875-8406

Date of Government Version: 08/28/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 02/04/05
Date of Next Scheduled EDR Contact: 05/02/05

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: 10/15/04
Database Release Frequency: Quarterly
Date of Last EDR Contact: 02/04/05
Date of Next Scheduled EDR Contact: 05/02/05

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: 01/07/05
Database Release Frequency: Quarterly
Date of Last EDR Contact: 12/06/04
Date of Next Scheduled EDR Contact: 03/07/05

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: 02/22/05
Date of Next Scheduled EDR Contact: 05/23/05

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: 06/29/04 — Date of Last EDR Contact: 01/10/05
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 04/04/05

SAN FRANCISCO COUNTY:

Local Oversite Facilities
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920

Date of Government Version: 12/09/04 — Date of Last EDR Contact: 12/06/04
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 03/07/05

Underground Storage Tank Information
Source: Department of Public Health
Telephone: 415-252-3920

Date of Government Version: 12/09/04 — Date of Last EDR Contact: 12/06/04
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 03/07/05

SAN MATEO COUNTY:

Fuel Leak List
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921

Date of Government Version: 10/27/04 — Date of Last EDR Contact: 01/10/05
Database Release Frequency: Semi-Annually — Date of Next Scheduled EDR Contact: 04/11/05

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: 08/19/04 — Date of Last EDR Contact: 01/10/05
Database Release Frequency: Annually — Date of Next Scheduled EDR Contact: 04/11/05

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report
Source: Santa Clara Valley Water District
Telephone: 408-265-2600

Date of Government Version: 06/30/04 — Date of Last EDR Contact: 12/28/04
Database Release Frequency: Semi-Annually — Date of Next Scheduled EDR Contact: 03/28/05

Hazardous Material Facilities
Source: City of San Jose Fire Department
Telephone: 408-277-4659

Date of Government Version: 10/01/03
Database Release Frequency: Annually

Date of Last EDR Contact: 12/06/04
Date of Next Scheduled EDR Contact: 03/07/05

SOLANO COUNTY:

Leaking Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 12/14/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/13/04
Date of Next Scheduled EDR Contact: 03/14/05

Underground Storage Tanks
Source: Solano County Department of Environmental Management
Telephone: 707-421-6770

Date of Government Version: 12/14/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 12/13/04
Date of Next Scheduled EDR Contact: 03/14/05

SONOMA COUNTY:

Leaking Underground Storage Tank Sites
Source: Department of Health Services
Telephone: 707-565-6565

Date of Government Version: 01/27/05
Database Release Frequency: Quarterly

Date of Last EDR Contact: 01/24/05
Date of Next Scheduled EDR Contact: 04/25/05

SUTTER COUNTY:

Underground Storage Tanks
Source: Sutter County Department of Agriculture
Telephone: 530-822-7500

Date of Government Version: 01/29/04
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: 01/03/05
Date of Next Scheduled EDR Contact: 04/04/05

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: 08/01/04
Database Release Frequency: Annually

Date of Last EDR Contact: 02/23/05
Date of Next Scheduled EDR Contact: 05/23/05

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: 11/30/04 Date of Last EDR Contact: 12/17/04
Database Release Frequency: Quarterly Date of Next Scheduled EDR Contact: 03/14/05

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: 12/01/04 Date of Last EDR Contact: 01/14/05
Database Release Frequency: Quarterly Date of Next Scheduled EDR Contact: 04/11/05

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: 12/01/04 Date of Last EDR Contact: 12/17/04
Database Release Frequency: Quarterly Date of Next Scheduled EDR Contact: 03/14/05

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Source: Yolo County Department of Health
Telephone: 530-666-8646

Date of Government Version: 11/23/04 Date of Last EDR Contact: 01/17/05
Database Release Frequency: Annually Date of Next Scheduled EDR Contact: 04/18/05

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 Date of Last EDR Contact: 02/23/05
Database Release Frequency: No Update Planned Date of Next Scheduled EDR Contact: 05/23/05

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: 09/30/04 Date of Last EDR Contact: 01/10/05
Database Release Frequency: Quarterly Date of Next Scheduled EDR Contact: 04/11/05

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 Date of Last EDR Contact: 02/14/05
Database Release Frequency: No Update Planned Date of Next Scheduled EDR Contact: 05/16/05

LUST REG 4: Underground Storage Tank Leak List
Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/04 | Date of Last EDR Contact: 12/27/04
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 03/28/05

LUST REG 5: Leaking Underground Storage Tank Database
Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291

Date of Government Version: 01/01/05 | Date of Last EDR Contact: 01/07/05
Database Release Frequency: Quarterly | Date of Next Scheduled EDR Contact: 04/04/05

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: 09/09/03 | Date of Last EDR Contact: 12/06/04
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 03/07/05

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: 08/09/04 | Date of Last EDR Contact: 01/03/05
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 04/04/05

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: 02/26/04 | Date of Last EDR Contact: 12/27/04
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 03/28/05

LUST REG 8: Leaking Underground Storage Tanks
Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-4130
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: 11/01/04 | Date of Last EDR Contact: 02/08/05
Database Release Frequency: Varies | Date of Next Scheduled EDR Contact: 05/09/05

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 | Date of Last EDR Contact: 01/17/05
Database Release Frequency: No Update Planned | Date of Next Scheduled EDR Contact: 04/18/05

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 | Date of Last EDR Contact: 02/23/05
Database Release Frequency: Semi-Annually | Date of Next Scheduled EDR Contact: 05/23/05

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: 09/30/04 — Date of Last EDR Contact: 01/10/05
Database Release Frequency: Quarterly — Date of Next Scheduled EDR Contact: 04/11/05

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: 11/18/04 — Date of Last EDR Contact: 02/14/05
Database Release Frequency: Semi-Annually — Date of Next Scheduled EDR Contact: 05/23/05

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: 11/17/04 — Date of Last EDR Contact: 01/24/05
Database Release Frequency: Varies — Date of Next Scheduled EDR Contact: 04/25/05

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 10/01/04 — Date of Last EDR Contact: 01/04/05
Database Release Frequency: Semi-Annually — Date of Next Scheduled EDR Contact: 04/04/05

SLIC REG 6L: SLIC Sites
Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574

Date of Government Version: 09/07/04 — Date of Last EDR Contact: 12/06/04
Database Release Frequency: Varies — Date of Next Scheduled EDR Contact: 03/07/05

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: 04/01/04 — Date of Last EDR Contact: 12/17/04
Database Release Frequency: Semi-Annually — Date of Next Scheduled EDR Contact: 04/04/05

SLIC REG 7: SLIC List
Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491

Date of Government Version: 11/24/04 — Date of Last EDR Contact: 02/22/05
Database Release Frequency: Varies — Date of Next Scheduled EDR Contact: 05/23/05

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298

Date of Government Version: 07/01/04 — Date of Last EDR Contact: 01/07/05
Database Release Frequency: Semi-Annually — Date of Next Scheduled EDR Contact: 04/04/05

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: 09/10/04
Database Release Frequency: Annually

Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

EDR PROPRIETARY HISTORICAL DATABASES

EDR Historical Gas Station and Dry Cleaners: EDR has searched select national collections of business directories and has collected listings of potential dry cleaner and gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning and gas station/filling station/service station establishments. The categories reviewed included, but were not limited to: *gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, dry cleaner, cleaners, laundry, laundromat, cleaning/laundry, wash & dry, etc.*

This information is meant to assist and complement environmental professionals in their conduct of environmental site assessments, and is not meant to be a substitute for a full historical investigation as defined in ASTM E1527. The information provided in this proprietary database may or may not be complete; i.e., the absence of a dry cleaner or gas station/filling station/service station site does not necessarily mean that such a site did not exist in the area covered by this report.

(A note on "dry cleaning" sites: it is not possible for EDR to differentiate between establishments that use PERC on-site as a cleaning solvent and sites that function simply as drop-off and pick-up locations or that are traditional wet cleaning/laundry facilities. Therefore, it is essential for environmental professionals to incorporate professional judgment in the evaluation of each site.)

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.

BROWNFIELDS DATABASES

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: 11/09/04
Database Release Frequency: Quarterly

Date of Last EDR Contact: 03/01/05
Date of Next Scheduled EDR Contact: 05/30/05

US BROWNFIELDS: A Listing of Brownfields Sites
Source: Environmental Protection Agency
Telephone: 202-566-2777
Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: N/A
Database Release Frequency: Semi-Annually

Date of Last EDR Contact: N/A
Date of Next Scheduled EDR Contact: N/A

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

OTAY WATER DISTRICT
CAMPO/JAMACHA ROAD
SPRING VALLEY, CA 92019

TARGET PROPERTY COORDINATES

Latitude (North):	32.747398 - 32˚ 44' 50.6''
Longitude (West):	116.948097 - 116˚ 56' 53.2''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	504862.2
UTM Y (Meters):	3623095.2
Elevation:	598 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).

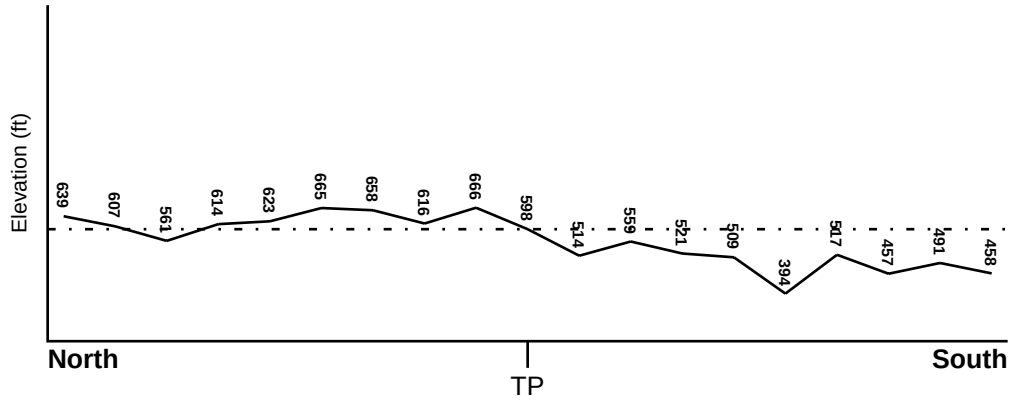
TOPOGRAPHIC INFORMATION

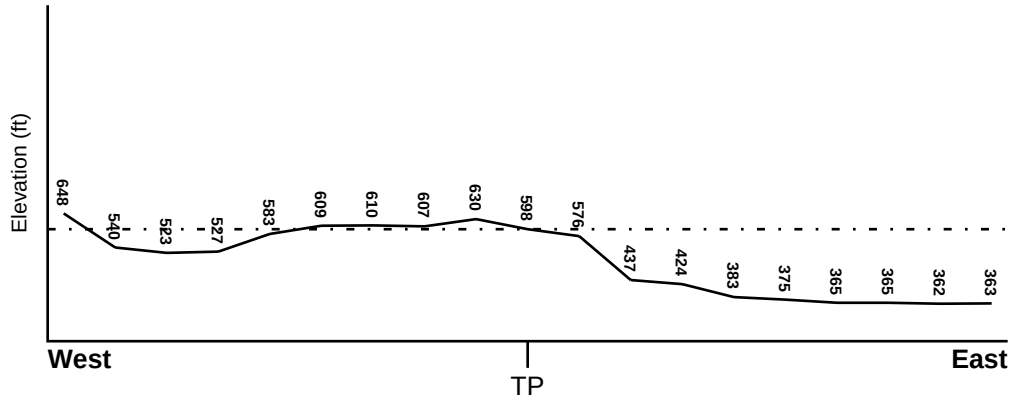
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

USGS Topographic Map:	32116-F8 JAMUL MOUNTAINS, CA
General Topographic Gradient:	General ESE
Source:	USGS 7.5 min quad index

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 598 ft.

0 1/2 1 Miles

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
SAN DIEGO, CA	Not Available

Flood Plain Panel at Target Property: Not Reported

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
JAMUL MOUNTAINS	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:	Mesozoic
System:	Cretaceous
Series:	Cretaceous granitic rocks
Code:	Kg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

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:	EXCHEQUER
Soil Surface Texture:	silt 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:	Somewhat excessive. Soils have high hydraulic conductivity and low 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:	MODERATE
Depth to Bedrock Min:	> 4 inches
Depth to Bedrock Max:	> 20 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	10 inches	silt 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: 6.50 Min: 5.60
2	10 inches	14 inches	unweathered 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: fine sandy loam
unweathered bedrock
very fine sandy loam
sandy loam

Surficial Soil Types: fine sandy loam
unweathered bedrock
very fine sandy loam
sandy loam

Shallow Soil Types: gravelly - sandy loam
clay
fine sandy loam
gravelly - loam

Deeper Soil Types: gravelly - sandy loam

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.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

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
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

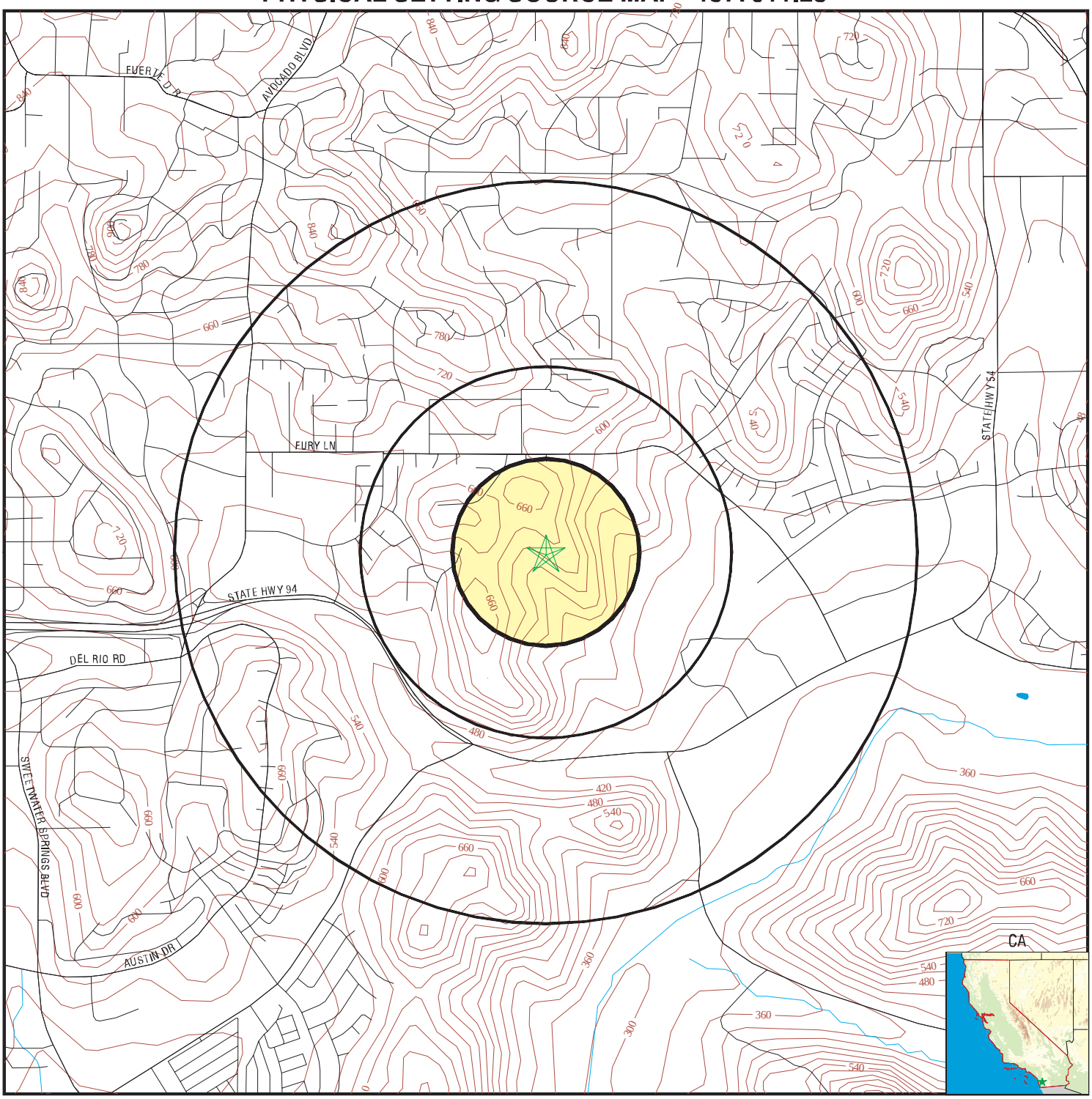
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

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 - 1377911.2s



County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
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:	Otay Water District	CUSTOMER:	HDR Engineering Inc.
ADDRESS:	Campo/Jamacha Road	CONTACT:	Chuck Cleeves
CITY/STATE/ZIP:	Spring Valley CA 92019	INQUIRY #:	1377911.2s
LAT/LONG:	32.7474 / 116.9481	DATE:	March 15, 2005 7:12 am

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zip	Total Sites	> 4 Pci/L	Pct. > 4 Pci/L
92019	16	0	0.00

Federal EPA Radon Zone for SAN DIEGO County: 3

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 SAN DIEGO COUNTY, CA

Number of sites tested: 30

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.677 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.400 pCi/L	100%	0%	0%
Basement	Not Reported	Not Reported	Not Reported	Not Reported

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) Natural Resources Conservation Service (NRCS) leads the national Conservation 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

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

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.

July 15, 2009

County of San Diego
Department of Planning and Land Use
5201 Ruffin Road, Suite B
San Diego, CA 92123

San Miguel Fire Protection District
2850 Via Orange Way
Spring Valley, CA 91978

Subject: Fire Protection Plan – Letter Report
Training Facility – San Miguel Fire Protection District
MUP09-007
APN 605-010-10 & 502-030-51

The Fire Protection Plan (FPP) – Letter Report is being submitted as an evaluation, pursuant to Chapter 47 of the County Fire Code, of the adverse environmental effects that the proposed project may have from wildland fire and as mitigation of those impacts to ensure that the above referenced project does not unnecessarily expose people or structures to a significant risk of loss, injury or death involving wildland fires.

PROJECT DESCRIPTION

The project is a Major Use Permit for regional emergency services and public utilities training center (RESTVC) in partnership with the Otay Water District, San Miguel Fire Protection District, and Heartland Training Facility Authority. The RESTC will provide emergency services training to fire and public utilities entities to meet modern day training standards and requirements. The project consists of a pre-engineered 5 story (60 foot) training tower prop; a simulated hazardous materials prop; search and rescue props: trench rescue, confined space rescue, Rescue Systems 1 and 2 certified site prop; vehicle extraction area; water recovery system; fire attack and control simulations; rappelling; ROW-construction prop; propane driven fire simulation system; 1-portable office building; 2-portable classrooms; 1-pre-engineered apparatus and equipment storage building with shower/bathroom facilities; and the site will serve as an alternative Emergency Operations Center.

ENVIRONMENTAL SETTING

1. **Location:** The project is located at 11880 Campo Road, Spring Valley, in the Valle De Oro Community Planning area, within the unincorporated San Diego County. The project is located within the San Miguel Fire Protection District, and is in Local Responsibility Area.

2. **Topography:** The project site is located approximately ½ mile northwest of intersection of State Route 94 (Campo Road) and Jamacha Road in the Rancho San Diego area of San Diego County. Current site elevations range from a high of approximately 708 feet above MSL at the top of the western canyon slope, to a low of approximately 570 feet MSL at the bottom of the canyon near the southern property line. The site of the project is relatively flat.

3. **Geology:** The construction of the proposed project is feasible from a geotechnical standpoint. Geologic units observed include topsoil, fill and granitic rock. The project site is not underlain by active faults or landslides. Soils is underlain by fill and granitic rock. Alluvium/slopewash up to approximately 30 feet deep is likely to underlie the fill.

4. **On Site Flammable Vegetation:** The site is completely clear of all vegetation and will be hardscape.

5. **Off Site Flammable Vegetation:** Off-site open space is located to the North and East of the project and has a continuous fuel bed of natural and native vegetation of costal sage scrub consisting of sage, buckwheat and scattered sumac. To the South and West the site is developed by Otay Water and consist of very limited vegetation and will be managed as per San Miguel Fire Protection weed abatement ordinance.

6. **Climate:** The San Miguel Regional Training Facility is located within a San Diego DPLU Transitional Climate Zone. The general characteristic of this climate consists of mild, wet winters; the bulk of the annual precipitation (average of 8-10 inches per year) falls between January and March. Following the mild wet winter months are frequent periods of extended drought, and long hot and dry spring, summer and fall seasons.

PROJECT EXPOSURE TO WILDLAND FIRES

1. **Water Supply:** Water supply to the proposed San Miguel Regional Training Facility will be supplied from the Otay Municipal Water District. Water pressures at the highest point of the project area will meet or exceed the County of San Diego Fire Code requirements of a continuous flow of 2,500 gpm at 20 psi. There will be a total of five (5) hydrants on the 3.5 acre site and an additional of two (2) hydrants within 50’ of site.

2. **Fire Access Roads:**

   Location The San Miguel Regional Training Facility is located within San Miguel Fire Protection District. The district operates eight (8) fire stations. The project is located within acceptable response time(s). The closest two (2) stations are: Fire Station # 22; 11501 Via Rancho San Diego with a distance of 1.59 miles and travel time of 2 minutes. Fire Station # 15; 2850 Via Orange Way with a distance of 2.53 miles and travel time of 3 minutes. In addition, when the training Facility is occupied additional firefighters will be at the site.

   The project meets the emergency response objectives identified in the Public Facilities Element of the County General Plan.

   Access to Multiple evacuation Routes: Primary route is to Campo Road and secondary route is to Via Escuda.

   Secondary Access Improved road exists to Via Escuda and meets all the requirements for secondary access with regards to width, vertical clearance, grade, and surface.

   Width: A 20 foot improved road is provided.

   Vertical Clearance: All access roads shall have a vertical unobstructed clearance in excess of 13 ft. 6 in.

   Grade: All road grades shall be 20% or less.

   Surface: All roads shall be all-weather paved with the capability to support fire apparatus weighing up to 75,000 pounds.

3. **Setback from Property Lines:** The site is set back from the property line to the East by Three Hundred Four feet (304') to the South by Four Hundred Sixty One feet (461') to the West Seven Hundred Seventy Six feet (776') and to the North the setback in over Seven Hundred Seventy Six feet (+776').

4. **Building Construction:** The building will meet San Diego County Building Code Chapter 7A.

5. **Fire Protection Systems:** The Fire Protection Systems will meet all the San Diego County Consolidated Fire Code.

6. **Defensible Space:** All the buildings on the site will have a minimum of 95' defensible space with the exception of the reserve apparatus building. This building will be setback from the fence line by 5 feet and is set back from the

property line in excess of 300 feet. Adjacent to the fence is a biological open space easement that Otay Water District wishes to remain undisturbed. To protect the open space the Fire District will exceed County of San Diego Building Code, Chapter 7A as follows. The reserve apparatus building's east wall will have a one hour rated assembly floor-to-ceiling. The support members in the building will be protected with either gypsum wrapped or spray–applied fire-resistant materials. There will be no openings or vents on the East side of the building.

7. **Vegetation Management:** The vegetation will remain un-touched on the East open space area. The rest of the site is hardscap and will not contain any vegetation.

8. **Fire Behavior Computer Modeling:** Based on preliminary evaluation by the County Fire Marshal, and Marsha Larsen, Fire Marshal, San Miguel Fire Protection District, Computer Fire Behavior Modeling is not required for the FPP Letter Report.

Prepared By:	Lessee:
Pat Sumrow	August F. Ghio, Fire Chief San Miguel Consolidated Fire District

SAN MIGUEL TRAINING FACILITY

11880 CAMPO RD.
SPRING VALLEY, CA

PRELIMINARY HYDROLOGY AND HYDRAULICS REPORT

1ST Submittal: March 3, 2009
2ND Submittal: March 30, 2010

BDS ENGINEERING, INC.
CIVIL ENGINEERS
6859 Federal Boulevard
Lemon Grove, CA 91945
(619) 582-4992
Project: 06-58

E.O.W. R.C.E. 34867 DATE

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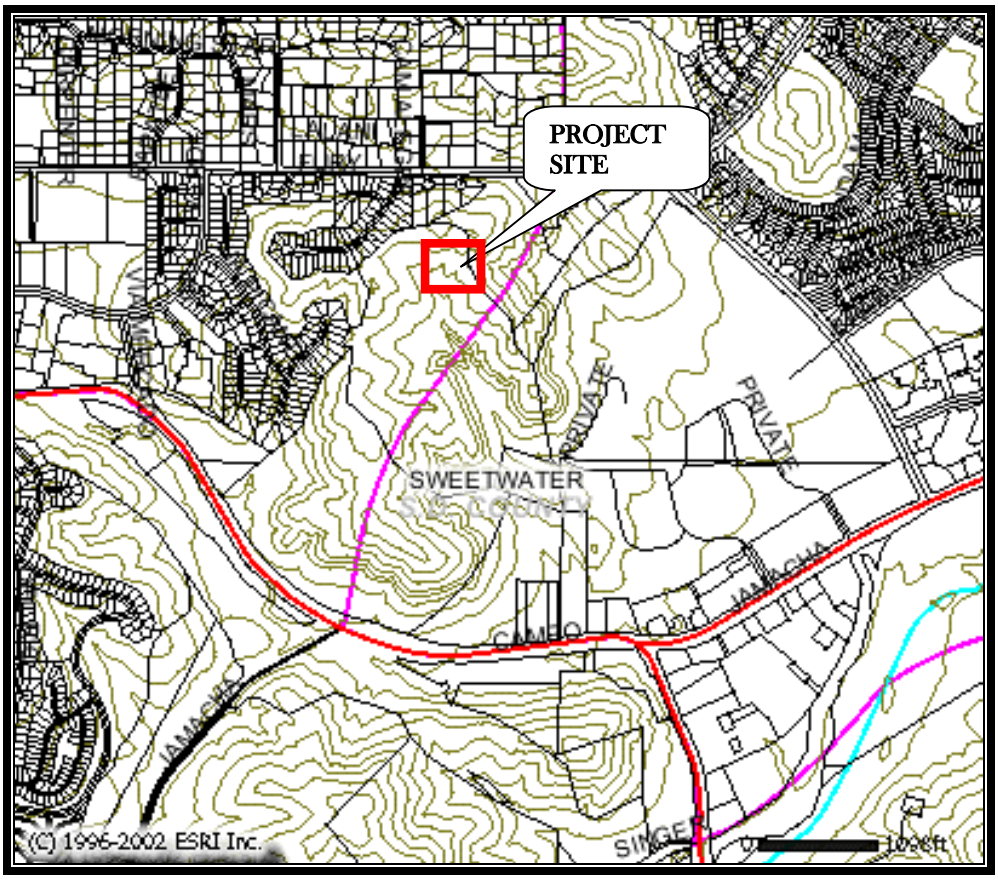
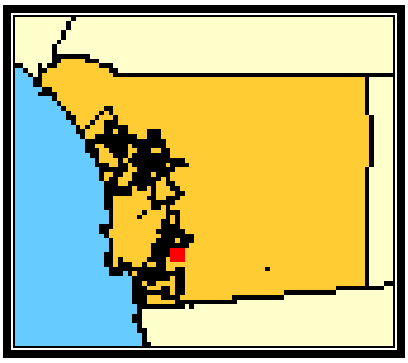
I. VICINITY MAP





Freeways
Highways
Ramps
Major Roads
Collectors Roads
All Roads
Parcels
40 foot topo
303 d Listed Rivers and Beaches
303 d Bays Estuaries and Lakes
Rivers
City Water Quality Sensitive Areas
County Env Sensitive Areas
Yes
Watershed Management Areas
ANZA-BORREGO
CARLSBAD
CLARK
IMPERIAL
MISSION BAY
PEÑASQUITOS
SAN DIEGO BAY
SAN DIEGO RIVER
SAN DIEGUITO RIV
SAN JUAN
SAN LUIS REY
SANTA MARGARITA
TIJUANA RIVER
WEST SALTON
WHITEWATER
Zip Codes
Municipal
County Boundary
Vicinity
Baja California, Mexico
Imperial County
Los Angeles County
Orange County
Pacific Ocean
Riverside County

II. ENGINEERING QUALIFICATIONS

BDS Engineering Inc. (BDS) has over 35 years experience in water resources management including:

- Hydrology / Hydraulic Studies and Reports
- Storm Drain Design
- Drainage feasibility Studies and Reports

III. SCOPE OF WORK & PROJECT DESCRIPTION

The scope of this study is to provide the hydrology and hydraulic calculations for the San Miguel Training Facility project. The site is located south of Fury Lane and north of the Campo Rd. and Jamacha Rd. junction, in the County of San Diego. The project will include demolition of the existing concrete pads and clear & grubbing within the project limits and construction of a new training facility including a new building, retaining walls, paving, and associated utilities.

IV. HYDROLOGIC METHODOLOGY

A hydrologic analysis was made to estimate peak flood flows with return periods of 100 years.

This hydrologic analysis was made by the use of an aerial topographic survey by a topographic survey by BDS Engineering, Inc. dated November 20, 2006 and the proposed grading plan.

The rational method of runoff computation was used to determine the quantity of storm water runoff.

The basic rational formula is Q=CIA where:

"Q" is the peak rate of flow in cubic feet per second (CFS).
"C" is a runoff coefficient expressed as that percentage of rainfall, which becomes surface runoff. We are using soil group 'D'.
"I" is the average rainfall intensity in inches per hour for a storm duration equal to the time of concentration (t_c) of the contributing drainage area.
"A" is the drainage area in acres tributary to design point.
"t_c" is the time of concentration required for runoff to flow from the most remote part of the watershed to the outlet point under consideration.

V. EXISTING HYDROLOGIC CONDITIONS

The existing project site area will disturb approx 2.64 acres (Total property area is 69.59 acres) that is mostly undeveloped with small concrete pads to be demolished and an existing 24" CMP storm drain line running from northwest to southeast. The existing average runoff coefficient for the site is 0.42 and the discharge calculated for the existing storm drain system is approx. 83.14 cfs for a 100-year storm. (See overall hydrology map and StormCAD Calculations). The existing CMP storm drain continues southeasterly and eventually discharges through a concrete energy dissipater and riprap to a vegetated channel. (See Figure 1 & 2)

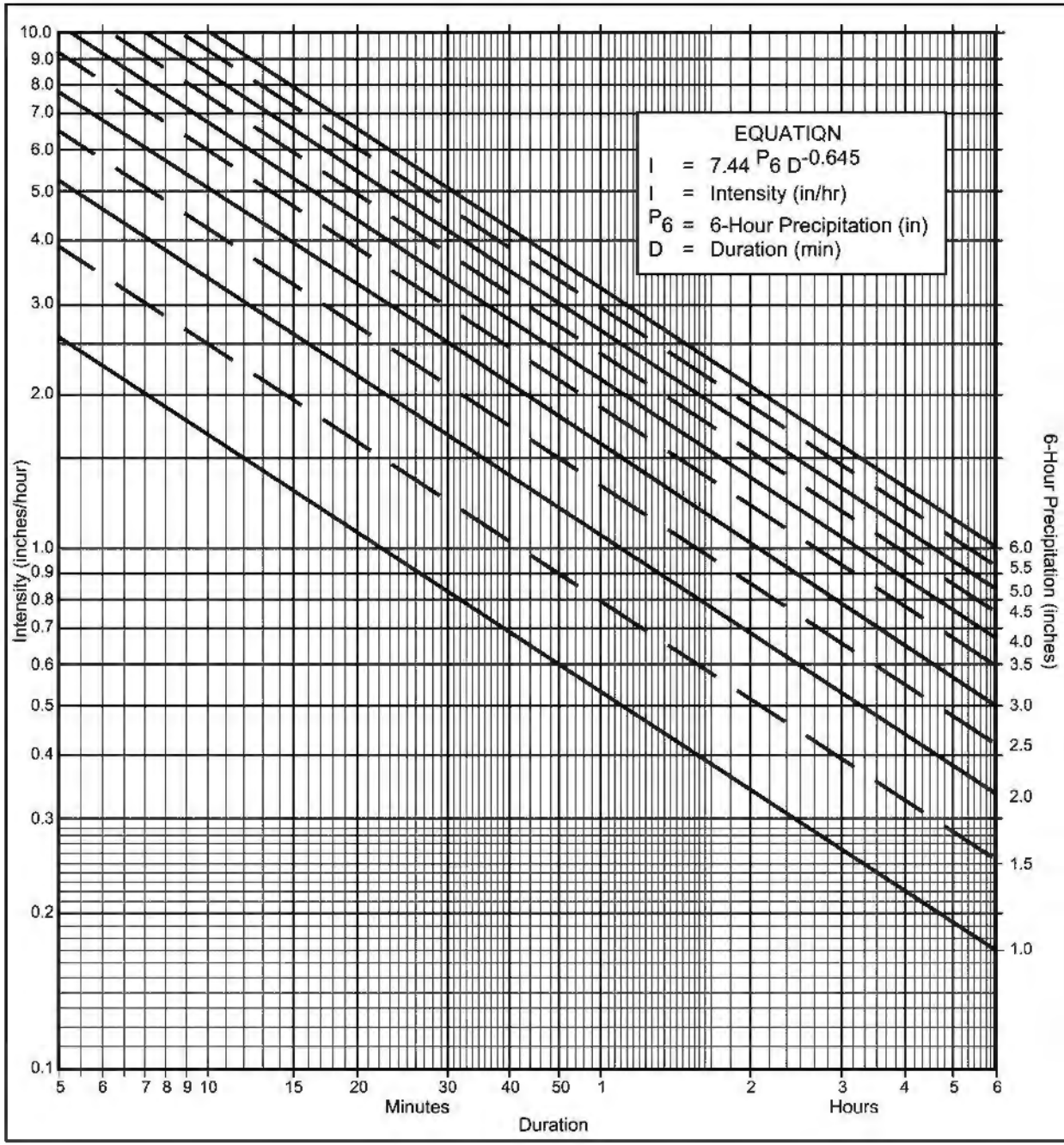
Figure 1: Existing Energy Dissipater Downstream

Figure 2: Looking Southerly Downstream of Energy Dissipater

VI. PROPOSED HYDROLOGIC CONDITIONS

The proposed site shall involve construction of a new building, modular buildings, retaining walls, paving, water recycling system and associated utilities. The proposed site's drainage will generally continue to discharge from northwest to southeast however, the northerly portion of the site will be utilized for training which will require recycling of water used during training and from a storm event. Stormwater runoff will be routed to the storage reservoir until it is full. The total storage reservoir volume is 25,000 gallons. Once the reservoir is full, it will bypass to the regular storm drain system. The new project site storm drain system shall connect into the existing storm drain system down stream of the project area. Other portions of the existing 24" CMP storm drain system will be removed and rerouted as it is located under the proposed building's footprint. The average runoff coefficient for the entire watershed is 0.44 and has a calculated runoff of approx. 80.42 cfs for a 100-year storm. (All calculations assume the storage reservoir is full and all runoff will be bypassed). Although the project will increase impervious area within the watershed, the additional pipe routing and junction headlosses will decrease the overall discharge from the watershed. (See StormCAD Calculations)

Appendix A: 2003 County of San Diego Hydrology Graphs & Tables



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form: SEE ATTACHED CHART

(a) Selected frequency _____ year

(b) P_6 = _____ in., P_{24} = _____, $\frac{P_6}{P_{24}}$ = _____ %(2)

(c) Adjusted P_6(2) = _____ in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

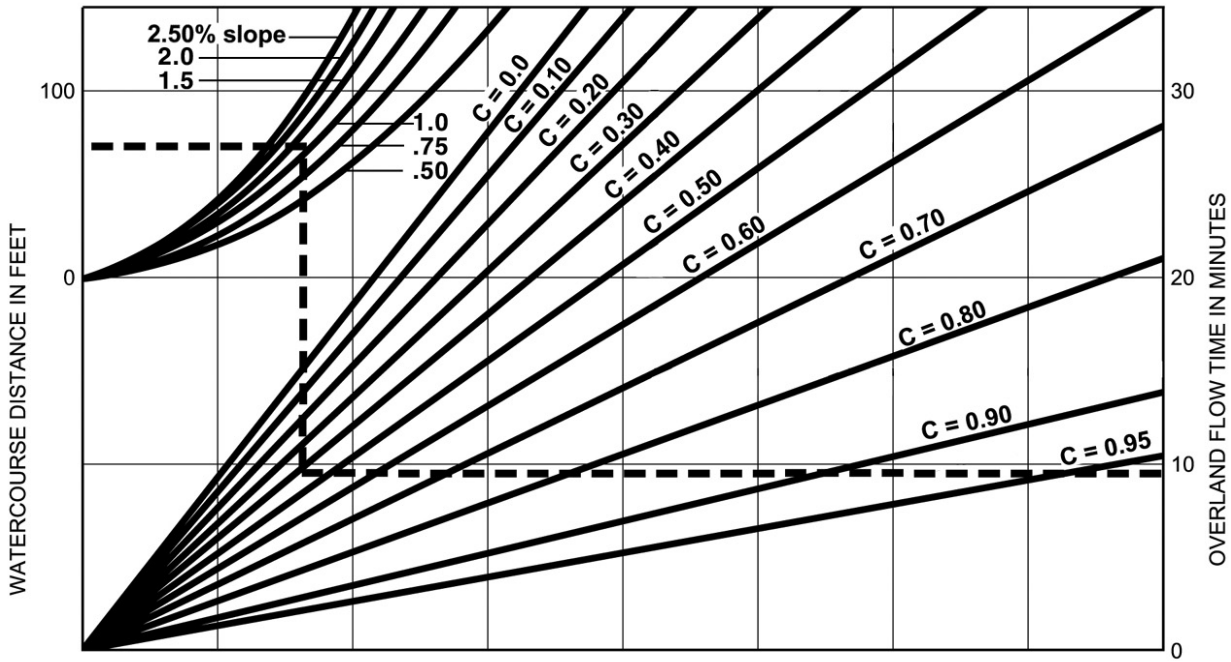
FIGURE

3-1

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE

3-3

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

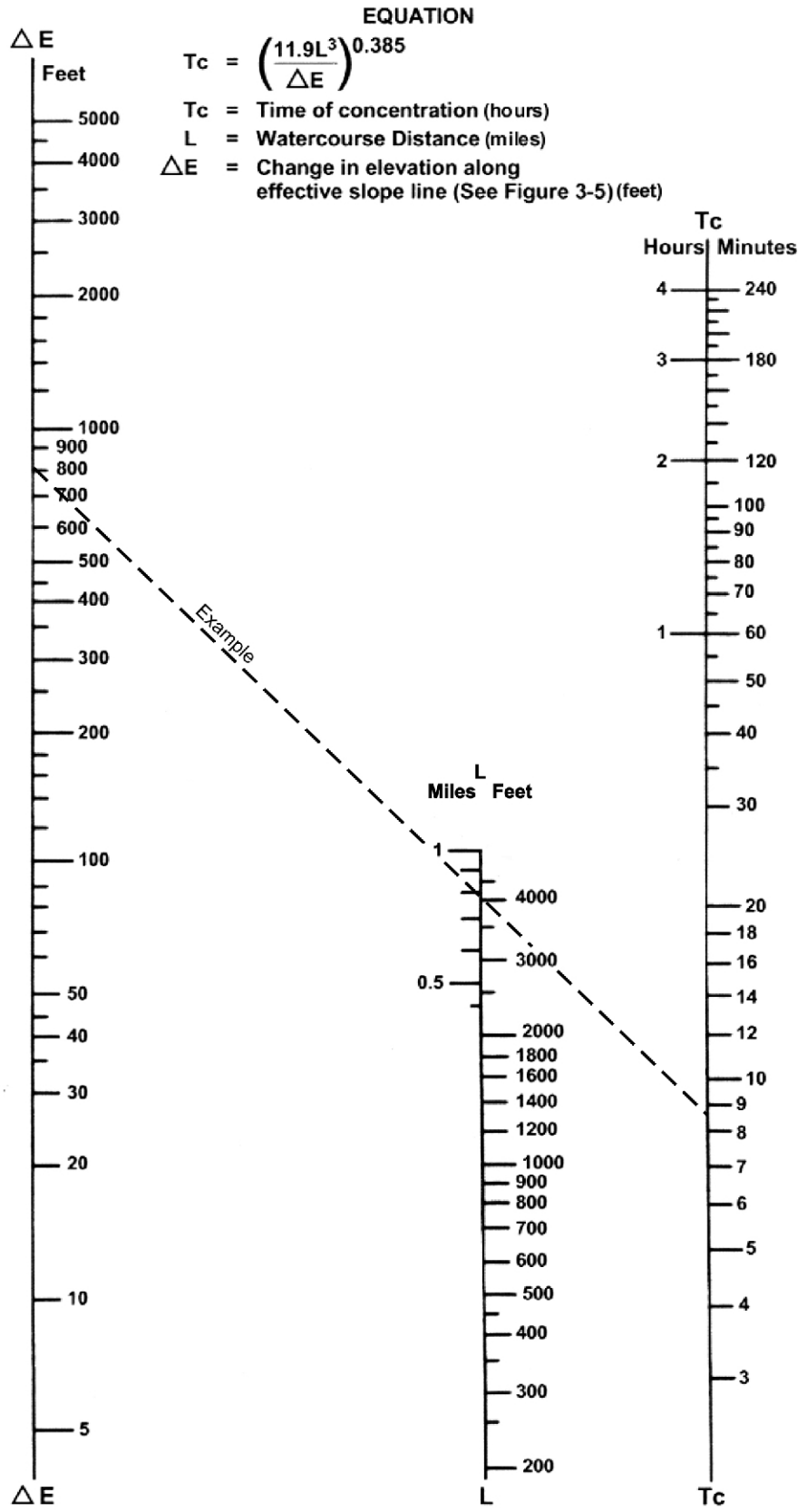
Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M) & INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/	.5%		1%		2%		3%		5%		10%	
	Acre	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description



SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds

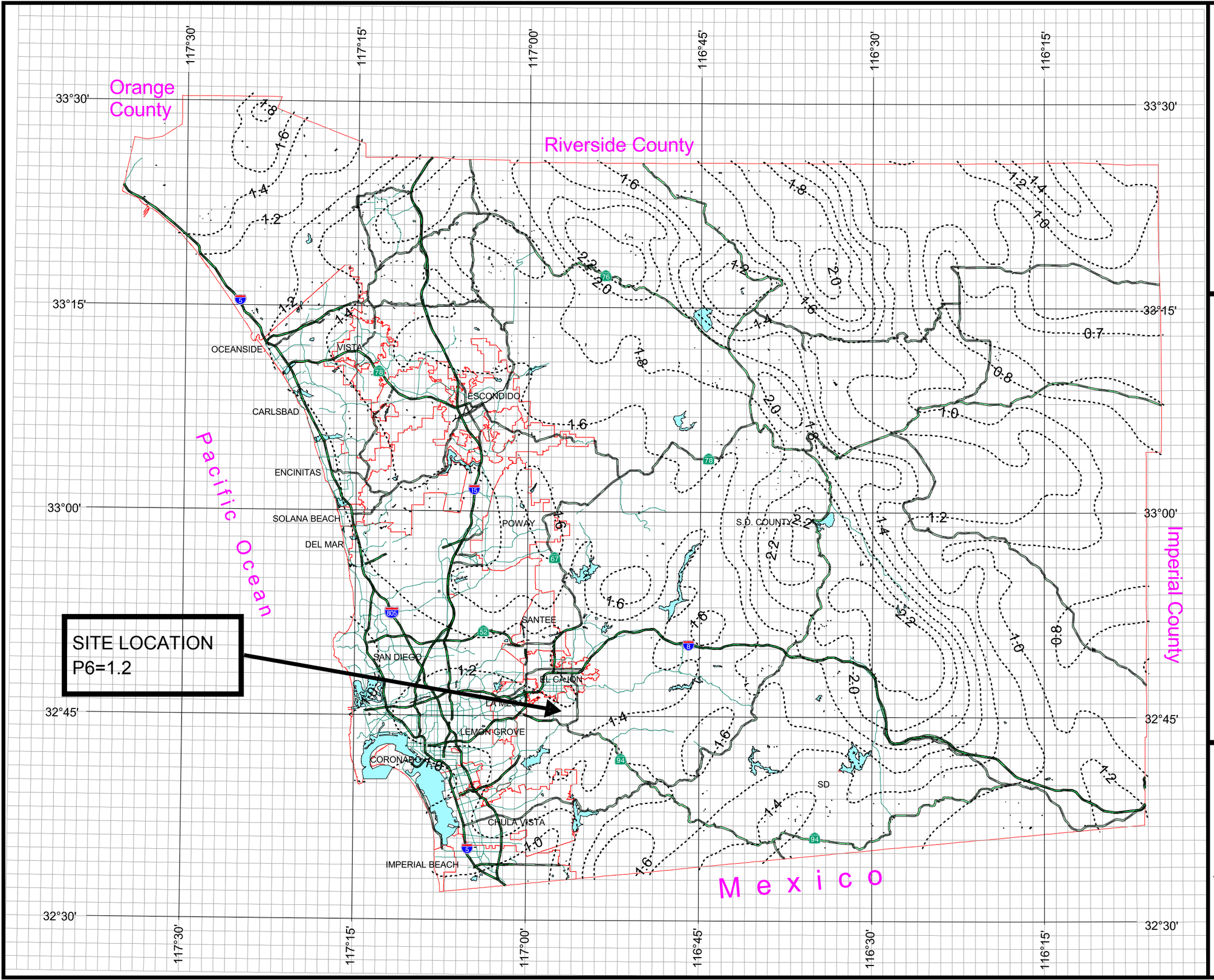
3-4

County of San Diego Hydrology Manual

Rainfall Isopluvials

2 Year Rainfall Event - 6 Hours

Isopluvial (inches)



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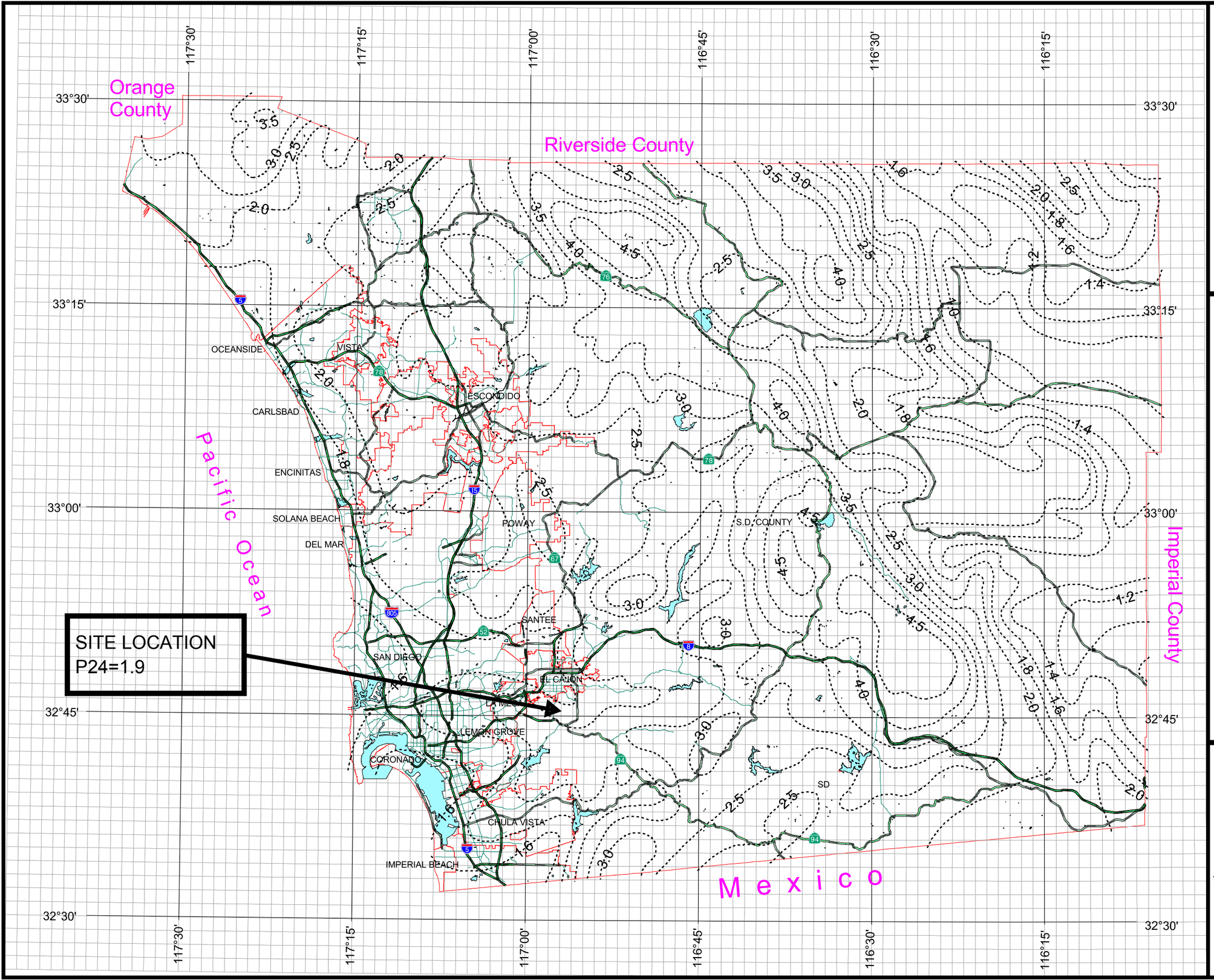
Rainfall Isopluvials

2 Year Rainfall Event - 24 Hours

Isopluvial (inches)



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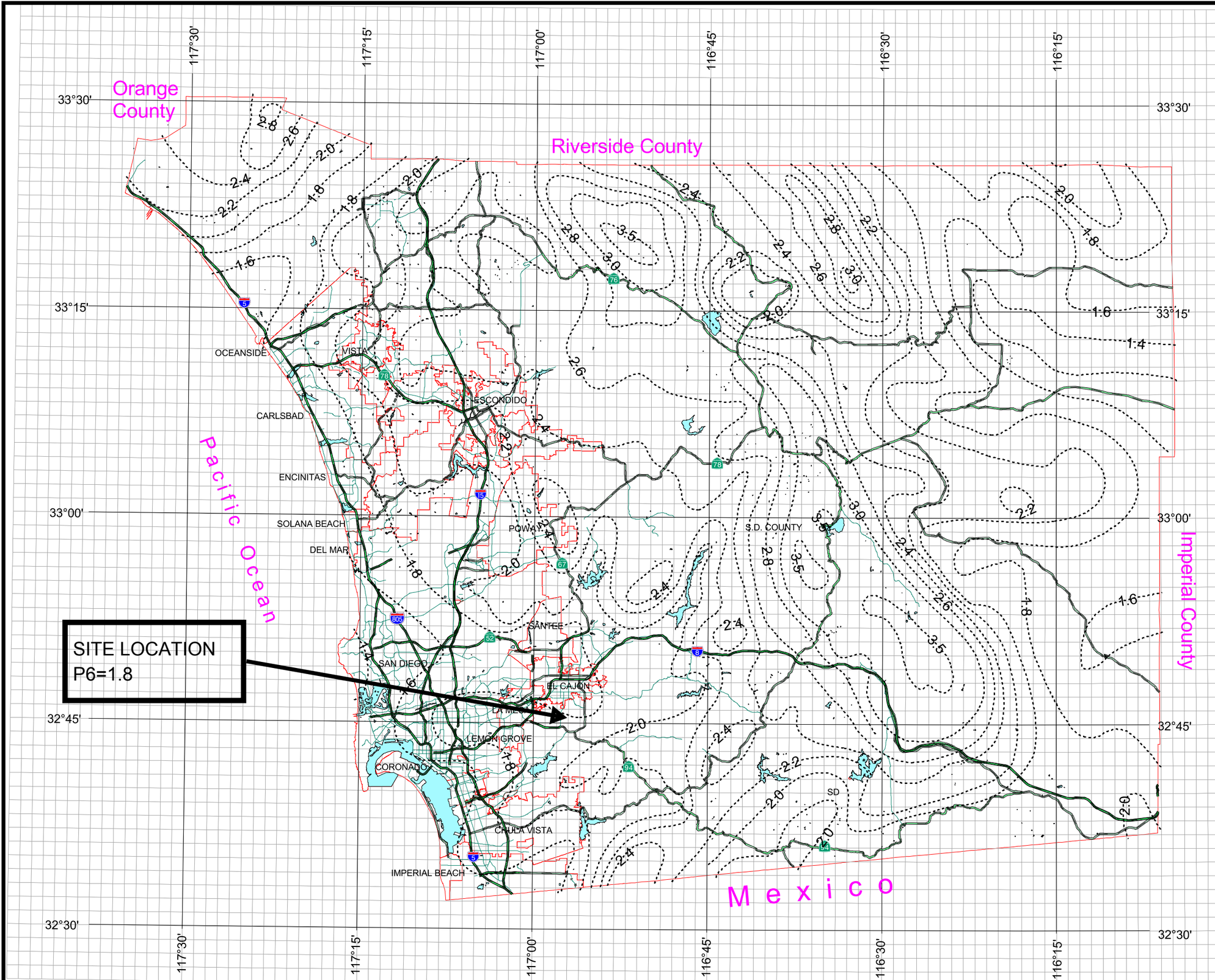
County of San Diego Hydrology Manual

Rainfall Isopluvials



10 Year Rainfall Event - 6 Hours

Isopluvial (inches)

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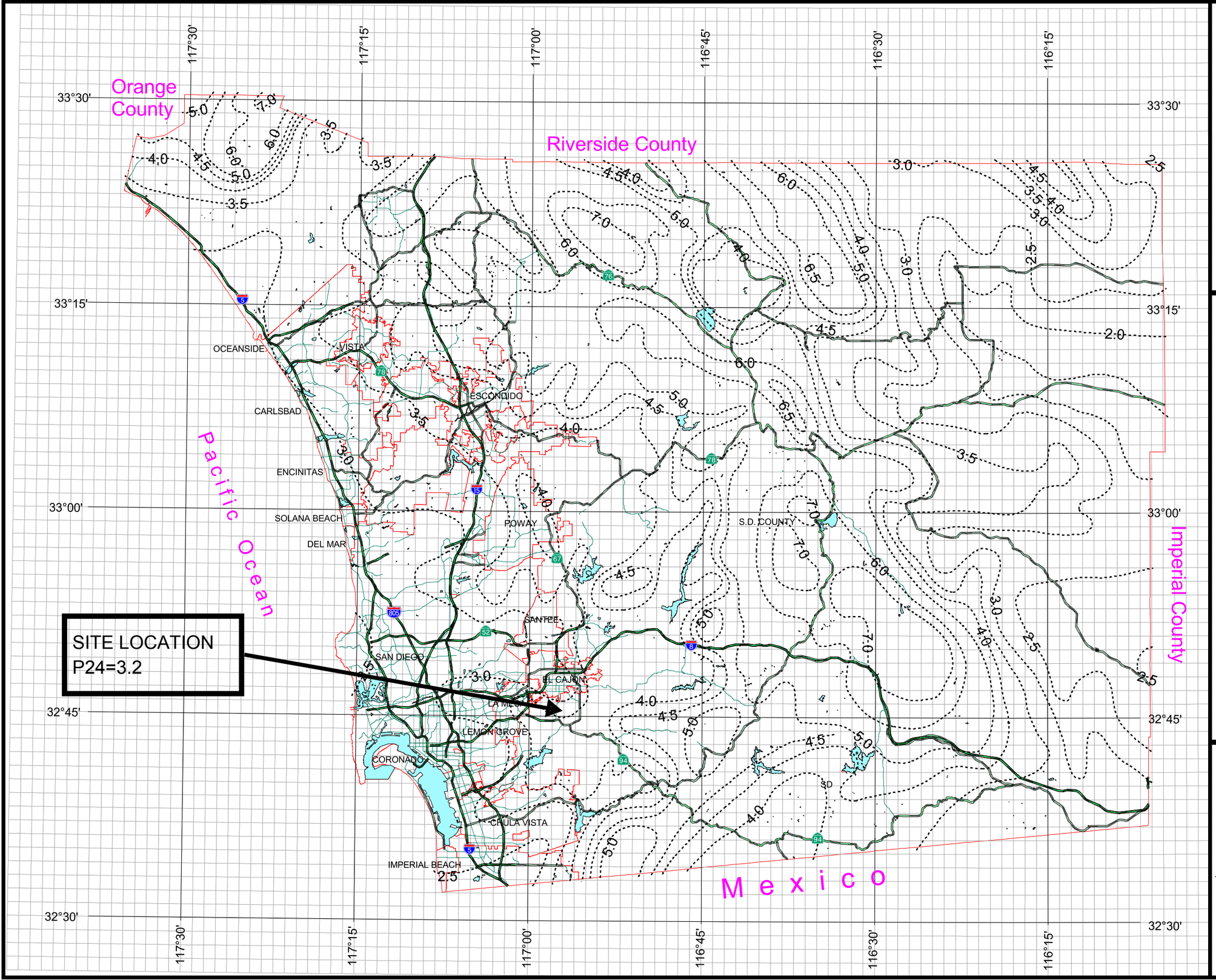
Rainfall Isopluvials

10 Year Rainfall Event - 24 Hours

Isopluvial (inches)



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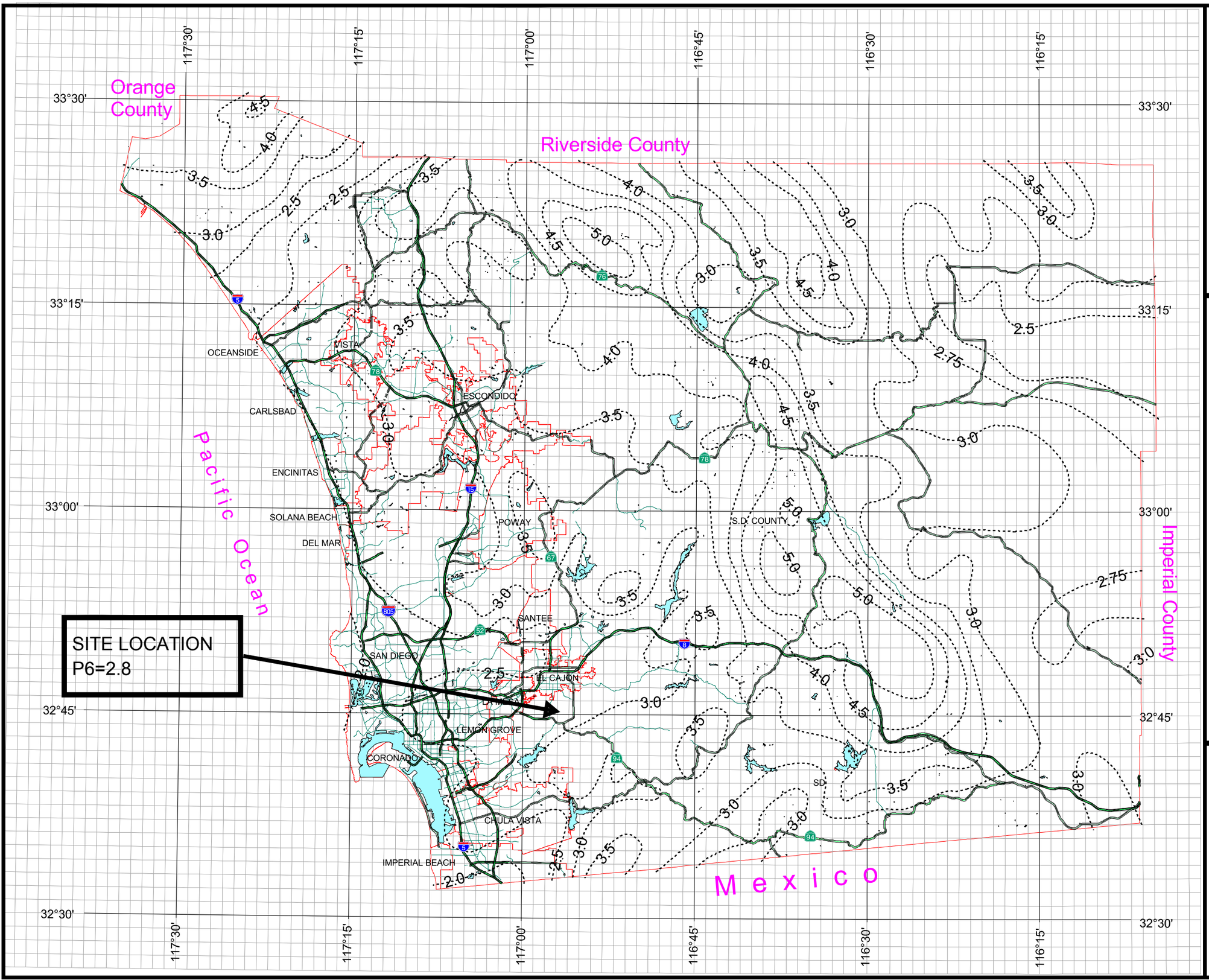
County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

-------- Isopluvial (inches)



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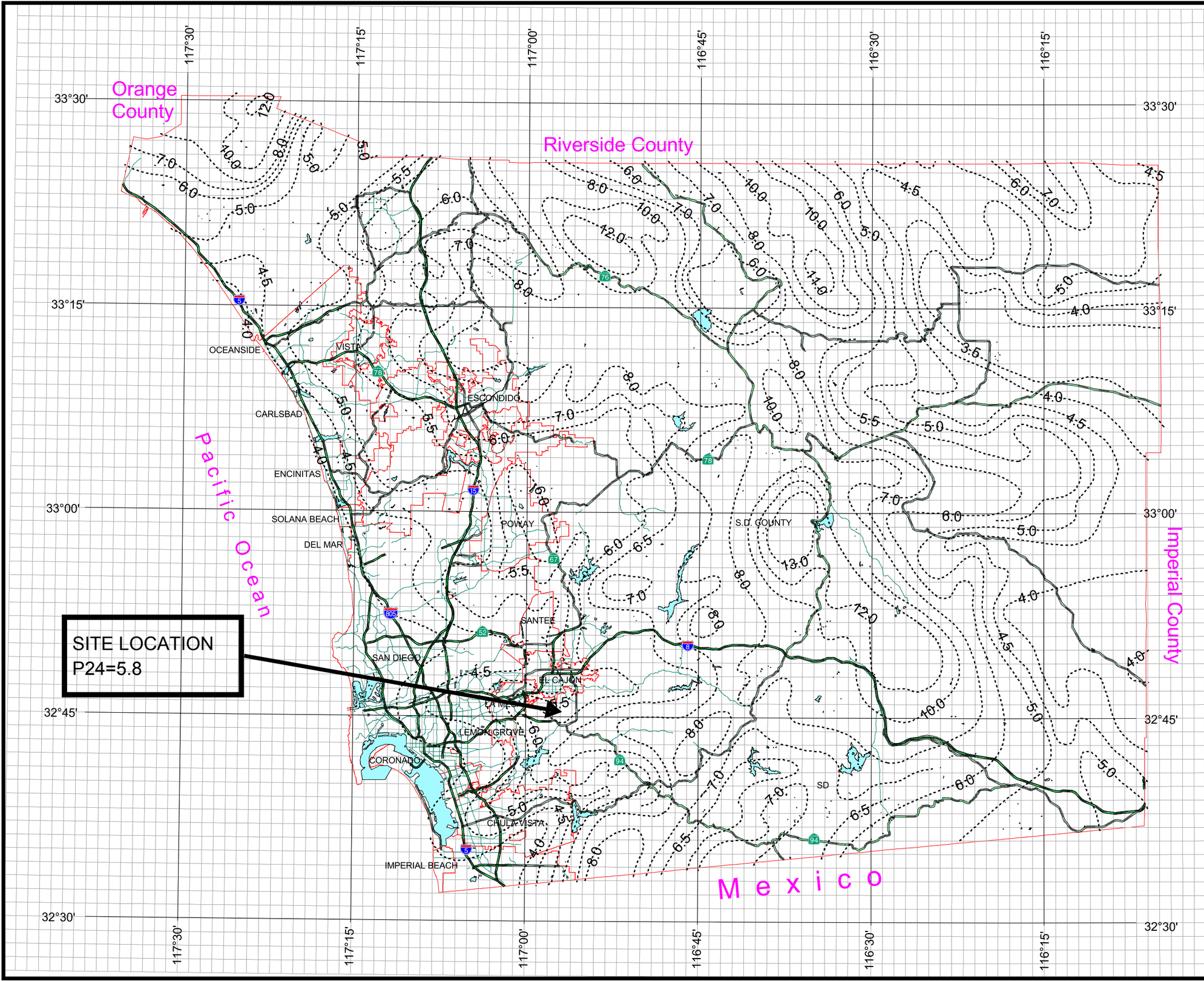
Rainfall Isopluvials



100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

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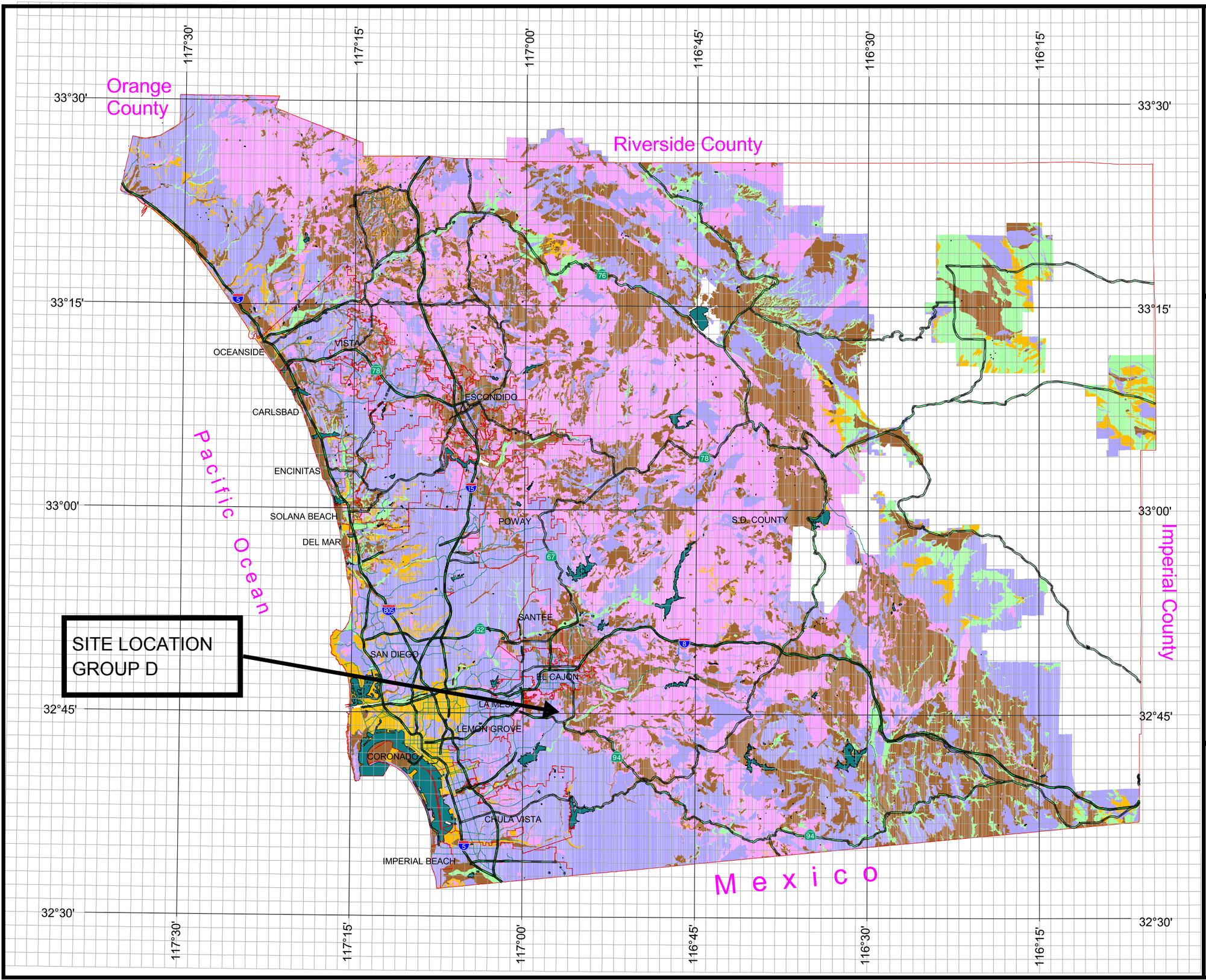
County of San Diego Hydrology Manual

Soil Hydrologic Groups



Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

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Appendix B: Flow Data Spreadsheet

BDS Engineering, Inc.

CIVIL ENGINEERS

PROJECT: PROJECT NO.:

ENGINEER: R. KUNISHIGE DATE:

R.C.E. NO.: 73628

Year Storm	P_6	P_{24}	P_6 / P_{24}
2	1.2	1.9	63.2%
10	1.8	3.2	56.3%
100	2.8	5.8	48.3%

Note: Initial and Travel Times are calculated based on Fig 3-3 and 3-4 of the County Hydrology Manual

$T_{c,\ MINIMUM}$ = 5 minutes

DRAINAGE AREA NO.	AREA (AC.)	LENGTH OF FLOW (FT.)	SLOPE (%)	% IMPER-VIOUS	C	Initial Li	Initial Ti	Travel Lt	Travel Tt	Tc (per att. chart)	I (per att. chart) 2	I 10	I 100	Q (CFS) 2	Q 10	Q 100
PRE - DEVELOPMENT																
EX-A	0.14	330	8.8%	100.0%	0.90	100	1.7	230	1.3	5	3.16	4.74	7.38	0.4	0.6	0.9
EX-B	8.40	1470	9.6%	1.0%	0.36	100	6.3	1370	5.0	11	1.87	2.80	4.36	5.6	8.4	13.0
EX-C	0.13	315	10.0%	100.0%	0.90	100	1.7	215	1.2	5	3.16	4.74	7.38	0.4	0.6	0.9
EX-D	5.14	830	11.9%	1.0%	0.36	100	5.9	730	2.8	9	2.21	3.32	5.16	4.0	6.1	9.4
EX-E	0.12	270	6.3%	100.0%	0.90	100	1.9	170	1.2	5	3.16	4.74	7.38	0.3	0.5	0.8
EX-F	3.61	1215	12.3%	1.0%	0.36	100	5.8	1115	3.9	10	2.06	3.09	4.81	2.6	4.0	6.2
EX-G	0.46	615	9.6%	43.0%	0.59	100	4.3	515	2.4	7	2.62	3.92	6.10	0.7	1.1	1.6
EX-H	3.21	1025	8.7%	28.0%	0.50	100	5.2	925	3.8	9	2.15	3.23	5.03	3.5	5.2	8.1
EX-I	0.14	150	2.0%	86.0%	0.82	100	4.0	50	0.7	5	3.16	4.74	7.38	0.4	0.5	0.9
EX-J	0.91	620	8.9%	6.0%	0.38	100	6.2	520	2.4	9	2.22	3.32	5.17	0.8	1.2	1.8
EX-K	2.20	450	5.0%	100.0%	0.90	100	2.1	350	2.3	5	3.16	4.74	7.38	6.3	9.4	14.6
EX-L	2.29	490	15.5%	41.0%	0.58	100	3.8	390	1.6	5	3.02	4.53	7.05	4.0	6.0	9.3
EX-M	3.57	940	10.2%	1.0%	0.36	100	6.2	840	3.4	10	2.08	3.13	4.86	2.6	4.0	6.2
EX-N	2.60	830	18.8%	1.0%	0.36	100	5.0	730	2.4	7	2.45	3.68	5.72	2.3	3.4	5.3
EX-O	9.37	1210	13.5%	4.0%	0.37	100	5.5	1110	3.7	9	2.13	3.19	4.96	7.4	11.1	17.3
EX-P	1.54	470	28.9%	0.0%	0.35	100	4.4	370	1.2	6	2.94	4.41	6.86	1.6	2.4	3.7
EX-Q	2.53	570	18.1%	0.0%	0.35	100	5.1	470	1.7	7	2.58	3.87	6.01	2.3	3.4	5.3
EX-R	0.15	300	7.7%	100.0%	0.90	100	1.8	200	1.2	5	3.16	4.74	7.38	0.4	0.6	1.0

BDS Engineering, Inc.

CIVIL ENGINEERS

PROJECT: PROJECT NO.:

ENGINEER: R. KUNISHIGE DATE:

R.C.E. NO.: 73628

Year Storm	P_6	P_{24}	P_6 / P_{24}
2	1.2	1.9	63.2%
10	1.8	3.2	56.3%
100	2.8	5.8	48.3%

Note: Initial and Travel Times are calculated based on Fig 3-3 and 3-4 of the County Hydrology Manual

$T_{c,\ MINIMUM}$ = 5 minutes

DRAINAGE AREA NO.	AREA (AC.)	LENGTH OF FLOW (FT.)	SLOPE (%)	% IMPER-VIOUS	C	Initial Li	Initial Ti	Travel Lt	Travel Tt	Tc (per att. chart)	I (per att. chart) 2	I 10	I 100	Q (CFS) 2	Q 10	Q 100
POST - DEVELOPMENT																
EX-A	0.14	330	8.8%	100.0%	0.90	100	1.7	230	1.3	5	3.16	4.74	7.38	0.4	0.6	0.9
EX-B	8.40	1470	9.6%	1.0%	0.36	100	6.3	1370	5.0	11	1.87	2.80	4.36	5.6	8.4	13.0
EX-C	0.13	315	10.0%	100.0%	0.90	100	1.7	215	1.2	5	3.16	4.74	7.38	0.4	0.6	0.9
EX-D	5.14	830	11.9%	1.0%	0.36	100	5.9	730	2.8	9	2.21	3.32	5.16	4.0	6.1	9.4
EX-E	0.12	270	6.3%	100.0%	0.90	100	1.9	170	1.2	5	3.16	4.74	7.38	0.3	0.5	0.8
EX-F	3.61	1215	12.3%	1.0%	0.36	100	5.8	1115	3.9	10	2.06	3.09	4.81	2.6	4.0	6.2
EX-G	0.46	615	9.6%	43.0%	0.59	100	4.3	515	2.4	7	2.62	3.92	6.10	0.7	1.1	1.6
EX-H	3.21	1025	8.7%	28.0%	0.50	100	5.2	925	3.8	9	2.15	3.23	5.03	3.5	5.2	8.1
EX-I	0.14	150	2.0%	86.0%	0.82	100	4.0	50	0.7	5	3.16	4.74	7.38	0.4	0.5	0.9
EX-J	0.91	620	8.9%	6.0%	0.38	100	6.2	520	2.4	9	2.22	3.32	5.17	0.8	1.2	1.8
EX-K	2.20	450	5.0%	100.0%	0.90	100	2.1	350	2.3	5	3.16	4.74	7.38	6.3	9.4	14.6
EX-L	2.29	490	15.5%	41.0%	0.58	100	3.8	390	1.6	5	3.02	4.53	7.05	4.0	6.0	9.3
EX-M	3.57	940	10.2%	1.0%	0.36	100	6.2	840	3.4	10	2.08	3.13	4.86	2.6	4.0	6.2
EX-N	2.60	830	18.8%	1.0%	0.36	100	5.0	730	2.4	7	2.45	3.68	5.72	2.3	3.4	5.3
EX-O	THIS WATERSHED AREA IS MODIFIED DURING DEVELOPMENT															
EX-P	1.54	470	28.9%	0.0%	0.35	100	4.4	370	1.2	6	2.94	4.41	6.86	1.6	2.4	3.7
EX-Q	THIS WATERSHED AREA IS MODIFIED DURING DEVELOPMENT															
A	0.27	440	9.3%	100.0%	0.90	100	1.7	340	1.7	5	3.16	4.74	7.38	0.8	1.2	1.8
B	6.43	950	17.0%	0.0%	0.35	100	5.3	850	2.8	8	2.33	3.49	5.43	5.2	7.9	12.2
C	1.38	610	22.8%	0.0%	0.35	100	4.8	510	1.7	6	2.69	4.03	6.27	1.3	1.9	3.0
D	0.23	170	2.5%	100.0%	0.90	100	2.7	70	0.9	5	3.16	4.74	7.38	0.7	1.0	1.5
E	0.38	240	1.8%	100.0%	0.90	100	3.0	140	1.6	5	3.16	4.74	7.38	1.1	1.6	2.5
F	0.17	125	1.1%	100.0%	0.90	100	3.5	25	0.5	5	3.16	4.74	7.38	0.5	0.7	1.1

BDS Engineering, Inc.

CIVIL ENGINEERS

PROJECT: _____ PROJECT NO.: _____

ENGINEER: R. KUNISHIGE DATE: _____

R.C.E. NO.: 73628

Year Storm	P_6	P_{24}	P_6 / P_{24}
2	1.2	1.9	63.2%
10	1.8	3.2	56.3%
100	2.8	5.8	48.3%

Note: Initial and Travel Times are calculated based on Fig 3-3 and 3-4 of the County Hydrology Manual

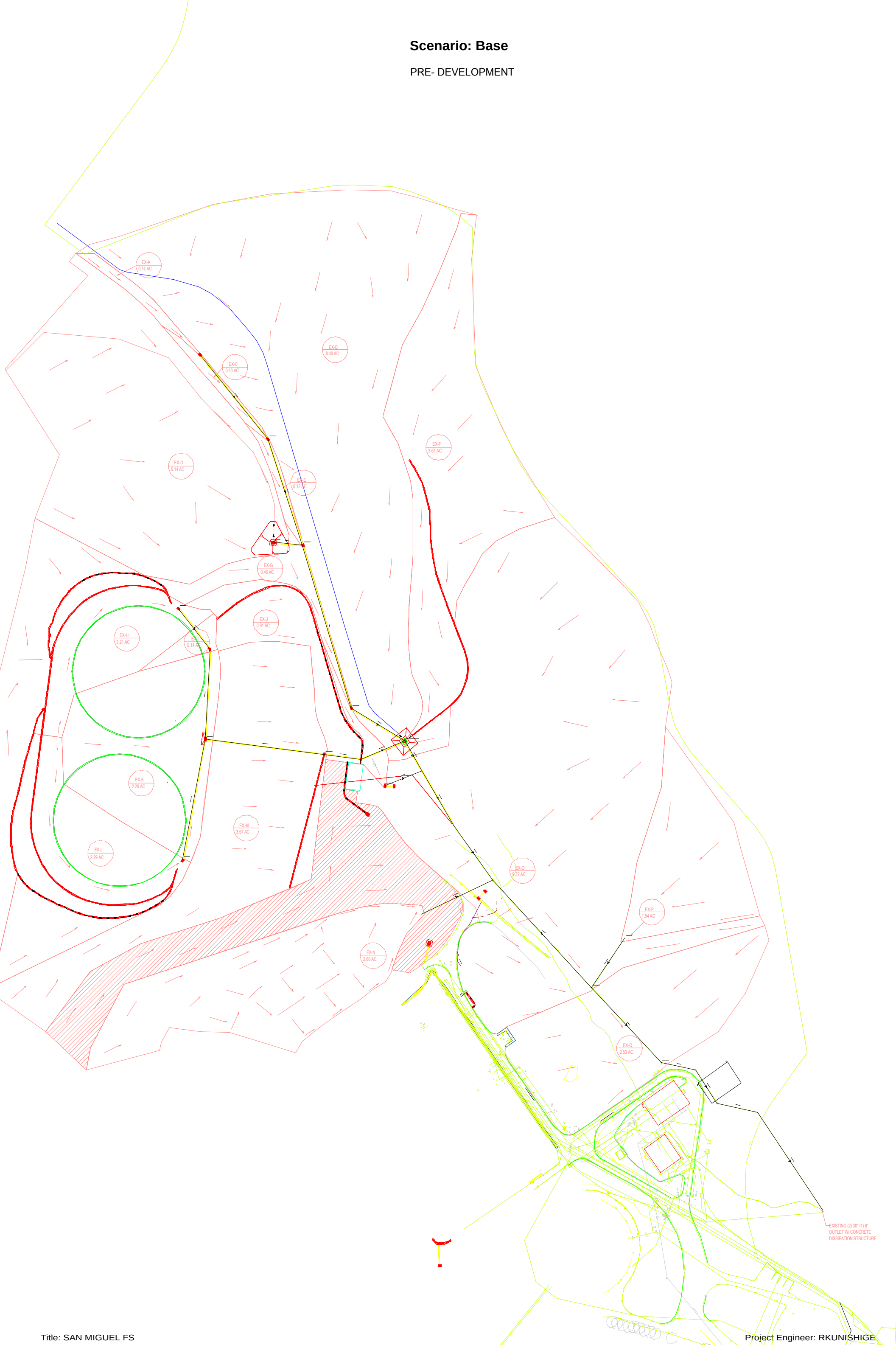
$T_{c,\ MINIMUM}$ = 5 minutes

DRAINAGE AREA NO.	AREA (AC.)	LENGTH OF FLOW (FT.)	SLOPE (%)	% IMPER-VIOUS	C	Initial		Travel		Tc (per att. chart)	I (per att. chart)			Q (CFS)		
						Li	Ti	Lt	Tt		2	10	100	2	10	100
G	0.27	400	3.4%	0.0%	0.35	100	9.0	300	2.3	11	1.87	2.80	4.36	0.2	0.3	0.4
H	0.04	50	3.9%	0.0%	0.35	50	6.1	0	0.0	6	2.79	4.18	6.50	0.0	0.1	0.1
I	0.41	155	2.2%	100.0%	0.90	100	2.8	55	0.7	5	3.16	4.74	7.38	1.2	1.7	2.7
J	0.10	-	-	100.0%	0.90	-	-	-	-	5	3.16	4.74	7.38	0.3	0.4	0.7
K	0.02	40	4.3%	0.0%	0.35	40	5.3	0	0.0	5	3.06	4.60	7.15	0.0	0.0	0.1
L	1.05	535	19.1%	0.0%	0.35	100	5.1	435	1.6	7	2.63	3.95	6.14	1.0	1.5	2.3
M	0.14	170	2.8%	86.0%	0.82	100	3.5	70	0.8	5	3.16	4.74	7.38	0.4	0.5	0.9
N	0.04	70	1.5%	95.0%	0.87	70	3.0	0	0.0	5	3.16	4.74	7.38	0.1	0.2	0.3
O	0.77	175	1.3%	100.0%	0.90	100	3.3	75	1.2	5	3.16	4.74	7.38	2.2	3.3	5.1
P	0.03	40	1.0%	0.0%	0.35	40	8.5	0	0.0	9	2.24	3.36	5.22	0.0	0.0	0.1
Q	0.14	195	3.8%	0.0%	0.35	100	8.7	95	0.9	10	2.08	3.12	4.85	0.1	0.2	0.2
R	0.07	85	1.3%	0.0%	0.35	85	11.4	0	0.0	11	1.86	2.79	4.33	0.0	0.1	0.1

Appendix C: StormCAD Calculations

Scenario: Base

PRE- DEVELOPMENT



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PRE-DEVELOPMENT
100-YEAR STORM

Node Report

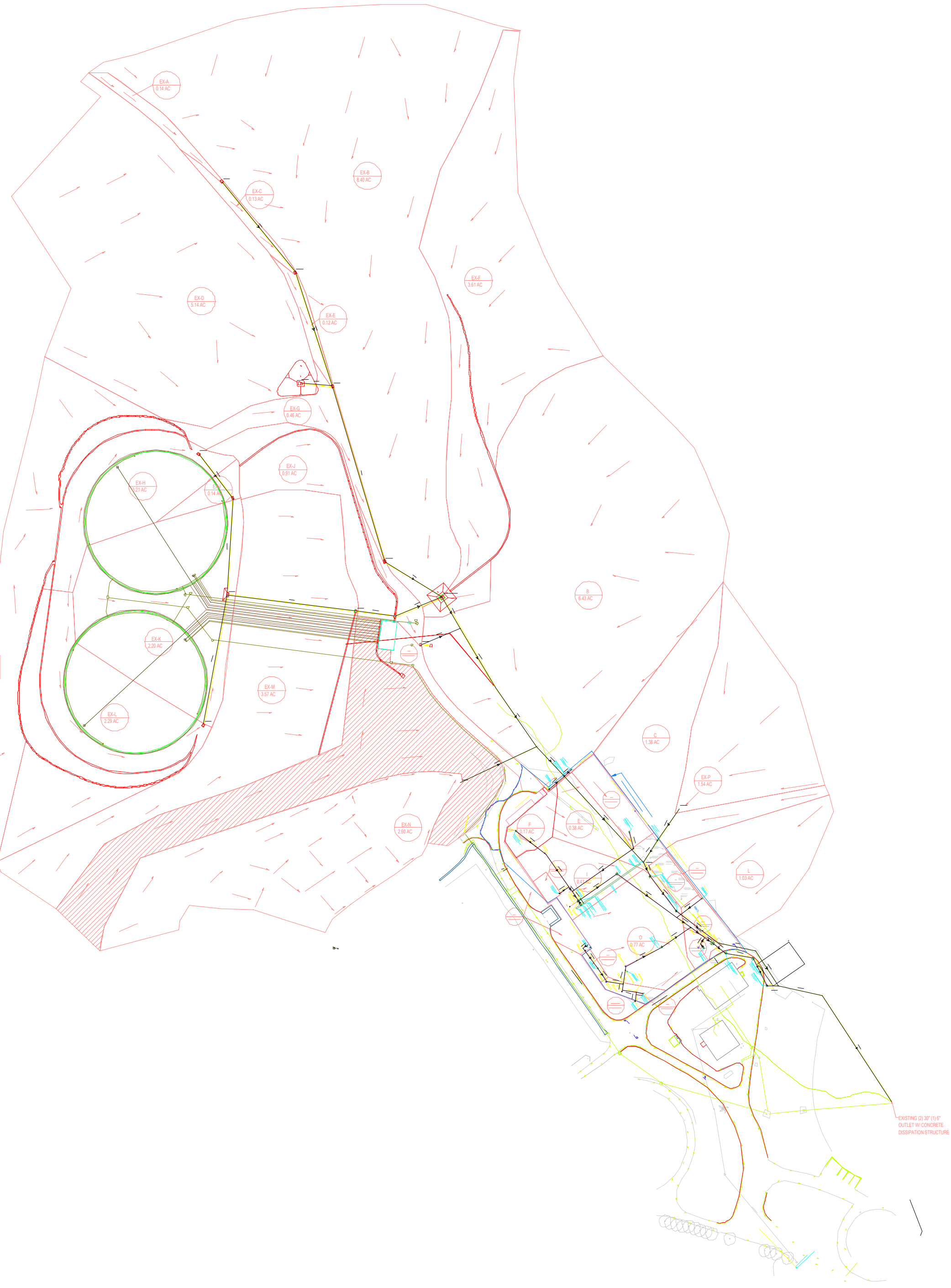
Label	Area (acres)	Inlet C	Inlet CA (acres)	External CA (acres)	System CA (acres)	Time of Concentration (min)	External Time of Concentration (min)	Upstream Time Of Concentration (min)	System Flow Time (min)	System Intensity (in/hr)	System Rational Flow (cfs)	Additional Flow (cfs)	Additional Carryover (cfs)	Known Flow (cfs)	Upstream Additional Flow (cfs)	Total System Flow (cfs)	Ground Elevation (ft)	Rim Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
O-1					19.42				11.89	4.22	82.61					82.61	450.00	450.00	441.75	441.75
J-5					19.42				11.77	4.25	83.14					83.14	502.00	502.00	488.61	485.92
J-4					19.42				11.69	4.27	83.52					83.52	507.45	507.45	503.32	500.62
J-3					19.42				11.64	4.28	83.75					83.75	508.61	508.61	515.24	508.61
EX-Q	2.53	0.35	0.89	0.00	19.42	7.00	0.00	11.59	11.59	4.29	83.96	0.00	0.00	0.00	0.00	83.96	505.91	505.91	512.57	505.91
EX-O	9.37	0.37	3.47	0.00	18.53	9.00	0.00	11.45	11.45	4.32	80.75	0.00	0.00	0.00	0.00	80.75	507.30	507.30	514.49	507.30
J-2					14.53				11.21	4.38	64.19					64.19	518.00	518.00	522.54	518.00
J-1					13.59				11.09	4.41	60.47					60.47	518.00	518.00	518.00	518.00
EX-N	2.60	0.36	0.94	0.00	0.94	7.00	0.00	0.00	7.00	5.94	5.60	0.00	0.00	0.00	0.00	5.60	550.00	550.00	545.91	545.91
EX-P	1.54	0.35	0.54	0.00	0.54	6.00	0.00	0.00	6.00	6.56	3.56	0.00	0.00	0.00	0.00	3.56	511.00	511.00	511.00	511.00
J-6					13.59				11.04	4.43	60.65					60.65	562.00	562.00	562.05	558.57
EX-B,	12.01	0.36	4.32	0.00	13.46	11.00	0.00	10.45	11.00	4.44	60.18	0.00	0.00	0.00	0.00	60.18	579.00	579.00	578.41	572.70
EX-G	0.46	0.59	0.27	0.00	2.47	7.00	0.00	9.43	9.43	4.90	12.22	0.00	0.00	0.00	0.00	12.22	588.31	588.31	581.83	581.32
EX-E	0.12	0.90	0.11	0.00	2.20	5.00	0.00	9.08	9.08	5.02	11.14	0.00	0.00	0.00	0.00	11.14	642.38	642.38	620.84	620.39
EX-C	0.13	0.90	0.12	0.00	0.24	5.00	0.00	5.44	5.44	6.99	1.71	0.00	0.00	0.00	0.00	1.71	648.36	648.36	644.20	644.09
EX-A	0.14	0.90	0.13	0.00	0.13	5.00	0.00	0.00	5.00	7.38	0.94	0.00	0.00	0.00	0.00	0.94	672.47	672.47	668.06	668.06
EX-D	5.14	0.36	1.85	0.00	1.85	9.00	0.00	0.00	9.00	5.05	9.42	0.00	0.00	0.00	0.00	9.42	625.00	625.00	624.19	624.19
EX-J	0.91	0.38	0.35	0.00	6.66	9.00	0.00	10.29	10.29	4.63	31.10	0.00	0.00	0.00	0.00	31.10	580.00	580.00	580.91	580.00
EX-M	3.57	0.36	1.29	0.00	6.31	10.00	0.00	10.25	10.25	4.64	29.55	0.00	0.00	0.00	0.00	29.55	610.00	610.00	605.61	604.88
EX-K	2.20	0.90	1.98	0.00	5.03	5.00	0.00	10.03	10.03	4.71	23.87	0.00	0.00	0.00	0.00	23.87	628.88	628.88	626.19	625.23
EX-I	0.14	0.82	0.11	0.00	1.72	5.00	0.00	9.39	9.39	4.91	8.52	0.00	0.00	0.00	0.00	8.52	630.15	630.15	627.62	627.40
EX-H	3.21	0.50	1.60	0.00	1.60	9.00	0.00	0.00	9.00	5.05	8.17	0.00	0.00	0.00	0.00	8.17	630.30	630.30	628.27	628.27
EX-L	2.29	0.58	1.33	0.00	1.33	5.00	0.00	0.00	5.00	7.38	9.88	0.00	0.00	0.00	0.00	9.88	630.15	630.15	627.50	627.50
EX-R	0.15	0.90	0.14	0.00	0.14	5.00	0.00	0.00	5.00	7.38	1.00	0.00	0.00	0.00	0.00	1.00	578.82	578.82	574.69	574.69

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Area (acres)	Upstream Inlet Rational Coefficient	Upstream Inlet CA (acres)	Upstream Calculated System CA (acres)	System Intensity (in/hr)	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Velocity Out (ft/s)
P-6	J-1	J-2	N/A	N/A	N/A	13.59	4.41	60.47	138.00	0.067536	24 inch	0.024	31.84	513.00	503.68	518.00	518.00	3.00	12.32	551.61	518.00	19.25
P-7	J-2	EX-O	N/A	N/A	N/A	14.53	4.38	64.19	301.00	0.010930	24 inch	0.024	12.81	503.68	500.39	518.00	507.30	12.32	4.91	589.90	507.30	20.43
P-8	EX-O	EX-Q	9.37	0.37	3.47	18.53	4.32	80.75	210.00	0.009524	24 inch	0.024	11.96	500.39	498.39	507.30	505.91	4.91	5.52	597.11	505.91	25.70
P-9	EX-Q	J-3	2.53	0.35	0.89	19.42	4.29	83.96	73.00	0.010274	24 inch	0.024	12.42	498.14	497.39	505.91	508.61	5.77	9.22	542.89	508.61	26.73
P-10	J-3	J-4	N/A	N/A	N/A	19.42	4.28	83.75	81.00	0.010000	24 inch	0.024	12.25	497.06	496.25	508.61	507.45	9.55	9.20	541.16	503.32	26.66
P-11	J-4	J-5	N/A	N/A	N/A	19.42	4.27	83.52	85.00	0.146706	30 inch	0.024	85.09	495.92	483.45	507.45	502.00	9.03	16.05	500.62	488.61	17.01
P-12	J-5	O-1	N/A	N/A	N/A	19.42	4.25	83.14	242.00	0.172314	30 inch	0.013	170.26	483.45	441.75	502.00	450.00	16.05	5.75	485.92	442.98	34.48
P-20	EX-N	J-2	2.60	0.36	0.94	0.94	5.94	5.60	162.00	0.255062	18 inch	0.024	28.73	545.00	503.68	550.00	518.00	3.50	12.82	545.91	518.00	3.17
P-21	EX-P	EX-O	1.54	0.35	0.54	0.54	6.56	3.56	123.00	0.036585	12 inch	0.024	3.69	506.00	501.50	511.00	507.30	4.00	4.80	511.49	507.30	4.54
P-1	EX-A	EX-C	0.14	0.90	0.13	0.13	7.38	0.94	222.00	0.106171	18 inch	0.013	34.23	667.70	644.13	672.47	648.36	3.27	2.73	668.06	644.30	8.43
P-2	EX-C	EX-E	0.13	0.90	0.12	0.24	6.99	1.71	229.00	0.102926	18 inch	0.013	33.70	643.60	620.03	648.36	642.38	3.26	20.85	644.09	620.84	1.77
P-3	EX-E	EX-G	0.12	0.90	0.11	2.20	5.02	11.14	351.00	0.100313	18 inch	0.013	33.27	619.11	583.90	642.38	588.31	21.77	2.91	620.39	584.50	16.95
P-4	EX-G	EX-B, EX-F	0.46	0.59	0.27	2.47	4.90	12.22	129.00	0.068140	18 inch	0.013	27.42	580.00	571.21	588.31	579.00	6.81	6.29	581.32	578.41	6.91
P-13	EX-D	EX-E	5.14	0.36	1.85	1.85	5.05	9.42	61.00	0.048689	18 inch	0.013	23.18	623.00	620.03	625.00	642.38	0.50	20.85	624.19	620.72	11.92
P-14	EX-H	EX-I	3.21	0.50	1.60	1.60	5.05	8.17	108.00	0.004907	18 inch	0.013	7.36	625.80	625.27	630.30	630.15	3.00	3.38	628.27	627.62	4.62
P-15	EX-I	EX-K	0.14	0.82	0.11	1.72	4.91	8.52	185.00	0.005027	18 inch	0.013	7.45	624.85	623.92	630.15	628.88	3.80	3.46	627.40	626.19	4.82
P-16	EX-K	EX-M	2.20	0.90	1.98	5.03	4.71	23.87	248.00	0.077379	24 inch	0.013	62.93	623.50	604.31	628.88	610.00	3.38	3.69	625.23	605.16	18.65
P-17	EX-M	EX-J	3.57	0.36	1.29	6.31	4.64	29.55	76.00	0.398289	24 inch	0.013	142.76	603.02	572.75	610.00	580.00	4.98	5.25	604.88	580.00	9.40
P-18	EX-J	EX-B, EX-F	0.91	0.38	0.35	6.66	4.63	31.10	97.00	0.011546	24 inch	0.013	24.31	572.33	571.21	580.00	579.00	5.67	5.79	580.24	578.41	9.90
P-19	EX-L	EX-K	2.29	0.58	1.33	1.33	7.38	9.88	252.00	0.007460	18 inch	0.010	11.79	625.80	623.92	630.15	628.88	2.85	3.46	627.50	626.19	5.59
P-22	EX-B, EX-F	J-6	12.01	0.36	4.32	13.46	4.44	60.18	71.00	0.193099	24 inch	0.013	99.40	570.71	557.00	579.00	562.00	6.29	3.00	572.70	562.00	19.16
P-23	J-6	J-1	N/A	N/A	N/A	13.59	4.43	60.65	130.00	0.335231	24 inch	0.013	130.97	556.58	513.00	562.00	518.00	3.42	3.00	558.57	518.00	19.31
P-24	EX-R	J-6	0.15	0.90	0.14	0.14	7.38	1.00	81.00	0.207654	18 inch	0.013	47.86	574.32	557.50	578.82	562.00	3.00	3.00	574.69	562.00	0.57

Scenario: Base

POST DEVELOPMENT



Node Report

Label	Area (acres)	Inlet C	Inlet CA (acres)	External CA (acres)	System CA (acres)	Time of Concentration (min)	External Time of Concentration (min)	Upstream Time Of Concentration (min)	System Flow Time (min)	System Intensity (in/hr)	System Rational Flow (cfs)	Additional Flow (cfs)	Additional Carryover (cfs)	Known Flow (cfs)	Upstream Additional Flow (cfs)	Total System Flow (cfs)	Ground Elevation (ft)	Rim Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
O-1					20.07				13.16	3.95	79.95					79.95	450.00	450.00	441.75	441.75
J-5					20.07				13.04	3.98	80.42					80.42	502.00	502.00	488.43	485.92
J-4					20.07				12.95	3.99	80.76					80.76	507.45	507.45	502.19	499.66
J-3					18.41				11.62	4.28	79.49					79.49	508.61	508.61	514.58	508.61
J-25					18.41				11.57	4.29	79.70					79.70	505.91	505.91	511.91	505.91
J-15					18.41				11.50	4.31	79.99					79.99	510.57	510.57	516.62	510.57
J-14					18.41				11.45	4.32	80.24					80.24	510.60	510.60	519.72	510.60
J-7					17.02				11.27	4.37	74.93					74.93	513.00	513.00	518.30	513.00
J-2					14.53				11.21	4.38	64.19					64.19	518.00	518.00	522.54	518.00
J-1					13.59				11.09	4.41	60.47					60.47	518.00	518.00	518.00	518.00
EX-N	2.60	0.36	0.94	0.00	0.94	7.00	0.00	0.00	7.00	5.94	5.60	0.00	0.00	0.00	0.00	5.60	550.00	550.00	545.91	545.91
J-6					13.59				11.04	4.43	60.65					60.65	562.00	562.00	562.05	558.57
EX-B,	12.01	0.36	4.32	0.00	13.46	11.00	0.00	10.45	11.00	4.44	60.18	0.00	0.00	0.00	0.00	60.18	579.00	579.00	578.41	572.70
EX-G	0.46	0.59	0.27	0.00	2.47	7.00	0.00	9.43	9.43	4.90	12.22	0.00	0.00	0.00	0.00	12.22	588.31	588.31	581.83	581.32
EX-E	0.12	0.90	0.11	0.00	2.20	5.00	0.00	9.08	9.08	5.02	11.14	0.00	0.00	0.00	0.00	11.14	642.38	642.38	620.84	620.39
EX-C	0.13	0.90	0.12	0.00	0.24	5.00	0.00	5.44	5.44	6.99	1.71	0.00	0.00	0.00	0.00	1.71	648.36	648.36	644.20	644.09
EX-A	0.14	0.90	0.13	0.00	0.13	5.00	0.00	0.00	5.00	7.38	0.94	0.00	0.00	0.00	0.00	0.94	672.47	672.47	668.06	668.06
EX-D	5.14	0.36	1.85	0.00	1.85	9.00	0.00	0.00	9.00	5.05	9.42	0.00	0.00	0.00	0.00	9.42	625.00	625.00	624.19	624.19
EX-J	0.91	0.38	0.35	0.00	6.66	9.00	0.00	10.29	10.29	4.63	31.10	0.00	0.00	0.00	0.00	31.10	580.00	580.00	580.91	580.00
EX-M	3.57	0.36	1.29	0.00	6.31	10.00	0.00	10.25	10.25	4.64	29.55	0.00	0.00	0.00	0.00	29.55	610.00	610.00	605.61	604.88
EX-K	2.20	0.90	1.98	0.00	5.03	5.00	0.00	10.03	10.03	4.71	23.87	0.00	0.00	0.00	0.00	23.87	628.88	628.88	626.19	625.23
EX-I	0.14	0.82	0.11	0.00	1.72	5.00	0.00	9.39	9.39	4.91	8.52	0.00	0.00	0.00	0.00	8.52	630.15	630.15	627.62	627.40
EX-H	3.21	0.50	1.60	0.00	1.60	9.00	0.00	0.00	9.00	5.05	8.17	0.00	0.00	0.00	0.00	8.17	630.30	630.30	628.27	628.27
EX-L	2.29	0.58	1.33	0.00	1.33	5.00	0.00	0.00	5.00	7.38	9.88	0.00	0.00	0.00	0.00	9.88	630.15	630.15	627.50	627.50
EX-R	0.15	0.90	0.14	0.00	0.14	5.00	0.00	0.00	5.00	7.38	1.00	0.00	0.00	0.00	0.00	1.00	578.82	578.82	574.69	574.69
A	0.27	0.90	0.24	0.00	0.24	5.00	0.00	0.00	5.00	7.38	1.81	0.00	0.00	0.00	0.00	1.81	534.00	534.00	531.50	531.50
J-30					1.66				12.86	4.01	6.70					6.70	505.60	505.60	502.24	502.24
J-29					1.66				12.60	4.06	6.79					6.79	505.50	505.50	502.39	502.39
J-28					1.66				12.37	4.11	6.87					6.87	506.00	506.00	502.52	502.52
J-27					1.66				12.34	4.12	6.88					6.88	507.50	507.50	503.52	503.52
J-26					1.66				12.30	4.13	6.89					6.89	507.00	507.00	504.00	504.00
J-24					0.03				5.04	7.34	0.26					0.26	509.00	509.00	506.25	506.21
N	0.04	0.85	0.03	0.00	0.03	5.00	0.00	0.00	5.00	7.38	0.26	0.00	0.00	0.00	0.00	0.26	508.76	508.76	506.51	506.51
B	6.43	0.35	2.25	0.00	2.25	8.00	0.00	0.00	8.00	5.45	12.36	0.00	0.00	0.00	0.00	12.36	510.40	510.40	510.40	510.40
C,L	2.43	0.35	0.85	0.00	1.39	7.00	0.00	6.27	7.00	5.94	8.32	0.00	0.00	0.00	0.00	8.32	508.00	508.00	508.00	508.00
EX-P	1.54	0.35	0.54	0.00	0.54	6.00	0.00	0.00	6.00	6.56	3.56	0.00	0.00	0.00	0.00	3.56	511.00	511.00	510.49	510.49
J-32					18.41				11.43	4.33	80.33					80.33	510.50	510.50	518.63	510.50

Node Report

Label	Area (acres)	Inlet C	Inlet CA (acres)	External CA (acres)	System CA (acres)	Time of Concentration (min)	External Time of Concentration (min)	Upstream Time Of Concentration (min)	System Flow Time (min)	System Intensity (in/hr)	System Rational Flow (cfs)	Additional Flow (cfs)	Additional Carryover (cfs)	Known Flow (cfs)	Upstream Additional Flow (cfs)	Total System Flow (cfs)	Ground Elevation (ft)	Rim Elevation (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)
J-33					1.62				12.24	4.14	6.77					6.77	510.00	510.00	504.46	504.46
J-31					0.75				6.81	6.04	4.57					4.57	510.00	510.00	504.41	504.41
J-12					0.74				6.48	6.24	4.68					4.68	510.00	510.00	506.03	505.83
J-11					0.74				6.26	6.38	4.78					4.78	510.44	510.44	507.05	506.74
J-10					0.37				6.20	6.42	2.42					2.42	510.50	510.50	507.69	507.09
J-9					0.17				6.07	6.51	1.10					1.10	511.00	511.00	507.71	507.69
J-8					0.15				5.20	7.20	1.11					1.11	512.00	512.00	507.76	507.73
F	0.17	0.90	0.15	0.00	0.15	5.00	0.00	0.00	5.00	7.38	1.14	0.00	0.00	0.00	0.00	1.14	512.69	512.69	508.98	508.98
H	0.04	0.35	0.01	0.00	0.01	6.00	0.00	0.00	6.00	6.56	0.09	0.00	0.00	0.00	0.00	0.09	511.00	511.00	508.48	508.48
I	0.41	0.90	0.37	0.00	0.37	5.00	0.00	0.00	5.00	7.38	2.74	0.00	0.00	0.00	0.00	2.74	510.25	510.25	509.14	509.14
J-23					0.21				5.10	7.28	1.52					1.52	510.00	510.00	508.30	508.15
D	0.23	0.90	0.21	0.00	0.21	5.00	0.00	0.00	5.00	7.38	1.54	0.00	0.00	0.00	0.00	1.54	510.31	510.31	508.48	508.48
K	0.02	0.35	0.01	0.00	0.01	5.00	0.00	0.00	5.00	7.38	0.05	0.00	0.00	0.00	0.00	0.05	510.17	510.17	507.97	507.97
O	0.77	0.90	0.69	0.00	0.87	5.00	0.00	12.08	12.08	4.18	3.67	0.00	0.00	0.00	0.00	3.67	508.40	508.40	506.46	505.87
J-20					0.18				11.50	4.31	0.78					0.78	509.65	509.65	506.69	506.65
J-19					0.18				11.42	4.33	0.78					0.78	510.00	510.00	507.60	507.50
J-18					0.11				11.27	4.37	0.46					0.46	510.00	510.00	507.72	507.65
P	0.03	0.35	0.01	0.00	0.11	9.00	0.00	11.17	11.17	4.39	0.46	0.00	0.00	0.00	0.00	0.46	510.25	510.25	508.46	508.40
J-17					0.09				11.01	4.43	0.42					0.42	520.40	520.40	509.40	509.30
G	0.27	0.35	0.09	0.00	0.09	11.00	0.00	0.00	11.00	4.44	0.42	0.00	0.00	0.00	0.00	0.42	520.40	520.40	515.30	515.30
J-22					0.07				11.22	4.38	0.32					0.32	510.00	510.00	507.87	507.79
J-21					0.07				11.09	4.41	0.33					0.33	510.00	510.00	508.11	508.06
R	0.07	0.35	0.02	0.00	0.02	11.00	0.00	0.00	11.00	4.44	0.11	0.00	0.00	0.00	0.00	0.11	509.50	509.50	508.11	508.11
Q	0.14	0.35	0.05	0.00	0.05	10.00	0.00	0.00	10.00	4.72	0.23	0.00	0.00	0.00	0.00	0.23	514.50	514.50	508.22	508.22

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Area (acres)	Upstream Inlet Rational Coefficient	Upstream Inlet CA (acres)	Upstream Calculated System CA (acres)	System Intensity (in/hr)	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Velocity Out (ft/s)
P-9	J-25	J-3	N/A	N/A	N/A	18.41	4.29	79.70	72.00	0.010417	24 inch	0.024	12.51	498.14	497.39	505.91	508.61	5.77	9.22	539.07	508.61	25.37
P-10	J-3	J-4	N/A	N/A	N/A	18.41	4.28	79.49	81.00	0.010000	24 inch	0.024	12.25	497.06	496.25	508.61	507.45	9.55	9.20	536.28	502.19	25.30
P-11	J-4	J-5	N/A	N/A	N/A	20.07	3.99	80.76	85.00	0.146706	30 inch	0.024	85.09	495.92	483.45	507.45	502.00	9.03	16.05	499.66	488.43	16.45
P-12	J-5	O-1	N/A	N/A	N/A	20.07	3.98	80.42	242.00	0.172314	30 inch	0.013	170.26	483.45	441.75	502.00	450.00	16.05	5.75	485.92	442.96	34.19
P-35	J-14	J-15	N/A	N/A	N/A	18.41	4.32	80.24	84.00	0.009524	24 inch	0.010	28.70	500.67	499.87	510.60	510.57	7.93	8.70	516.82	510.57	25.54
P-6	J-1	J-2	N/A	N/A	N/A	13.59	4.41	60.47	138.00	0.067536	24 inch	0.024	31.84	513.00	503.68	518.00	518.00	3.00	12.32	551.61	518.00	19.25
P-20	EX-N	J-2	2.60	0.36	0.94	0.94	5.94	5.60	163.00	0.253497	18 inch	0.024	28.65	545.00	503.68	550.00	518.00	3.50	12.82	545.91	518.00	3.17
P-1	EX-A	EX-C	0.14	0.90	0.13	0.13	7.38	0.94	222.00	0.106171	18 inch	0.013	34.23	667.70	644.13	672.47	648.36	3.27	2.73	668.06	644.30	8.43
P-2	EX-C	EX-E	0.13	0.90	0.12	0.24	6.99	1.71	229.00	0.102926	18 inch	0.013	33.70	643.60	620.03	648.36	642.38	3.26	20.85	644.09	620.84	1.77
P-3	EX-E	EX-G	0.12	0.90	0.11	2.20	5.02	11.14	351.00	0.100313	18 inch	0.013	33.27	619.11	583.90	642.38	588.31	21.77	2.91	620.39	584.50	16.95
P-4	EX-G	EX-B, EX-F	0.46	0.59	0.27	2.47	4.90	12.22	129.00	0.068140	18 inch	0.013	27.42	580.00	571.21	588.31	579.00	6.81	6.29	581.32	578.41	6.91
P-13	EX-D	EX-E	5.14	0.36	1.85	1.85	5.05	9.42	61.00	0.048689	18 inch	0.013	23.18	623.00	620.03	625.00	642.38	0.50	20.85	624.19	620.72	11.92
P-14	EX-H	EX-I	3.21	0.50	1.60	1.60	5.05	8.17	108.00	0.004907	18 inch	0.013	7.36	625.80	625.27	630.30	630.15	3.00	3.38	628.27	627.62	4.62
P-15	EX-I	EX-K	0.14	0.82	0.11	1.72	4.91	8.52	185.00	0.005027	18 inch	0.013	7.45	624.85	623.92	630.15	628.88	3.80	3.46	627.40	626.19	4.82
P-16	EX-K	EX-M	2.20	0.90	1.98	5.03	4.71	23.87	248.00	0.077379	24 inch	0.013	62.93	623.50	604.31	628.88	610.00	3.38	3.69	625.23	605.16	18.65
P-17	EX-M	EX-J	3.57	0.36	1.29	6.31	4.64	29.55	76.00	0.398289	24 inch	0.013	142.76	603.02	572.75	610.00	580.00	4.98	5.25	604.88	580.00	9.40
P-18	EX-J	EX-B, EX-F	0.91	0.38	0.35	6.66	4.63	31.10	97.00	0.011546	24 inch	0.013	24.31	572.33	571.21	580.00	579.00	5.67	5.79	580.24	578.41	9.90
P-19	EX-L	EX-K	2.29	0.58	1.33	1.33	7.38	9.88	252.00	0.007460	18 inch	0.010	11.79	625.80	623.92	630.15	628.88	2.85	3.46	627.50	626.19	5.59
P-22	EX-B, EX-F	J-6	12.01	0.36	4.32	13.46	4.44	60.18	71.00	0.193099	24 inch	0.013	99.40	570.71	557.00	579.00	562.00	6.29	3.00	572.70	562.00	19.16
P-23	J-6	J-1	N/A	N/A	N/A	13.59	4.43	60.65	130.00	0.335231	24 inch	0.013	130.97	556.58	513.00	562.00	518.00	3.42	3.00	558.57	518.00	19.31
P-24	EX-R	J-6	0.15	0.90	0.14	0.14	7.38	1.00	81.00	0.207654	18 inch	0.013	47.86	574.32	557.50	578.82	562.00	3.00	3.00	574.69	562.00	0.57
P-25	J-2	J-7	N/A	N/A	N/A	14.53	4.38	64.19	78.00	0.000641	24 inch	0.024	3.10	503.68	503.63	518.00	513.00	12.32	7.37	534.40	513.00	20.43
P-26	J-7	J-32	N/A	N/A	N/A	17.02	4.37	74.93	224.00	0.011964	24 inch	0.024	13.40	503.63	500.95	513.00	510.50	7.37	7.55	594.26	510.50	23.85
P-27	A	J-7	0.27	0.90	0.24	0.24	7.38	1.81	38.00	0.680789	6 inch	0.010	6.02	531.00	505.13	534.00	513.00	2.50	7.37	531.50	513.00	9.20
P-38	J-32	J-14	N/A	N/A	N/A	18.41	4.33	80.33	30.00	0.009333	24 inch	0.010	28.41	500.95	500.67	510.50	510.60	7.55	7.93	512.84	510.60	25.57
P-57	J-15	J-25	N/A	N/A	N/A	18.41	4.31	79.99	100.00	0.017300	24 inch	0.010	38.68	499.87	498.14	510.57	505.91	8.70	5.77	513.31	505.91	25.46
P-59	J-26	J-27	N/A	N/A	N/A	1.66	4.13	6.89	18.00	0.010000	18 inch	0.010	13.65	502.98	502.80	507.00	507.50	2.52	3.20	504.00	503.65	6.71
P-60	J-27	J-28	N/A	N/A	N/A	1.66	4.12	6.88	32.00	0.078125	18 inch	0.010	38.17	502.50	500.00	507.50	506.00	3.50	4.50	503.52	502.52	3.89
P-61	J-28	J-29	N/A	N/A	N/A	1.66	4.11	6.87	53.00	0.037736	18 inch	0.010	26.53	500.00	498.00	506.00	505.50	4.50	6.00	502.52	502.39	3.89
P-62	J-29	J-30	N/A	N/A	N/A	1.66	4.06	6.79	59.00	0.028475	18 inch	0.010	23.04	498.00	496.32	505.50	505.60	6.00	7.78	502.39	502.24	3.84
P-63	J-30	J-4	N/A	N/A	N/A	1.66	4.01	6.70	22.00	0.018182	18 inch	0.010	18.41	496.32	495.92	505.60	507.45	7.78	10.03	502.24	502.19	3.79
P-56	N	J-24	0.04	0.85	0.03	0.03	7.38	0.26	10.00	0.025000	6 inch	0.010	1.15	506.25	506.00	508.76	509.00	2.01	2.50	506.51	506.17	4.34
P-64	J-24	J-26	N/A	N/A	N/A	0.03	7.34	0.26	13.00	0.232308	12 inch	0.010	22.32	506.00	502.98	509.00	507.00	2.00	3.02	506.21	504.00	0.33
P-68	B	J-7	6.43	0.35	2.25	2.25	5.45	12.36	19.00	0.151053	18 inch	0.010	53.07	507.00	504.13	510.40	513.00	1.90	7.37	513.16	513.00	6.99
P-69	EX-P	C,L	1.54	0.35	0.54	0.54	6.56	3.56	73.00	0.027397	12 inch	0.024	3.19	506.00	504.00	511.00	508.00	4.00	3.00	510.49	508.00	4.54
P-70	C,L	J-32	2.43	0.35	0.85	1.39	5.94	8.32	50.00	0.050000	12 inch	0.024	4.32	504.00	501.50	508.00	510.50	3.00	8.00	519.79	510.50	10.59
P-28	F	J-8	0.17	0.90	0.15	0.15	7.38	1.14	74.00	0.019459	10 inch	0.010	3.97	508.50	507.06	512.69	512.00	3.36	4.11	508.98	507.76	2.32
P-29	J-8	J-9	N/A	N/A	N/A	0.15	7.20	1.11	76.00	0.009737	12 inch	0.010	4.57	507.06	506.32	512.00	511.00	3.94	3.68	507.73	507.71	1.41
P-30	J-9	J-10	N/A	N/A	N/A	0.17	6.51	1.10	11.00	0.012727	12 inch	0.010	5.22	506.32	506.18	511.00	510.50	3.68	3.32	507.69	507.69	1.40
P-31	J-10	J-11	N/A	N/A	N/A	0.37	6.42	2.42	21.00	0.008571	12 inch	0.010	4.29	506.18	506.00	510.50	510.44	3.32	3.44	507.09	507.05	3.08
P-32	J-11	J-12	N/A	N/A	N/A	0.74	6.38	4.78	90.00	0.010000	18 inch	0.010	13.65	505.90	505.00	510.44	510.00	3.04	3.50	506.74	506.03	3.68
P-40	H	J-9	0.04	0.35	0.01	0.01	6.56	0.09	22.00	0.076364	6 inch	0.010	2.02	508.33	506.65	511.00	511.00	2.17	3.85	508.48	507.71	0.47
P-41	I	J-11	0.41	0.90	0.37	0.37	7.38	2.74	9.00	0.270000	12 inch	0.010	24.07	508.43	506.00	510.25	510.44	0.82	3.44	509.14	507.05	3.49
P-54	D	J-23	0.23	0.90	0.21	0.21	7.38	1.54	32.00	0.010000	10 inch	0.010	2.85	507.92	507.60	510.31	510.00	1.56	1.57	508.48	508.30	3.15
P-55	J-23	J-10	N/A	N/A	N/A	0.21	7.28	1.52	144.00	0.009861	10 inch	0.010	2.83	507.60	506.18	510.00	510.50	1.57	3.49	508.15	507.69	2.79
P-65	J-12	J-31	N/A	N/A	N/A	0.74	6.24	4.68	141.00	0.010000	18 inch	0.010	13.65	505.00	503.59	510.00	510.00	3.50	4.91	505.83	504.20	7.00
P-67	K	J-31	0.02	0.35	0.01	0.01	7.38	0.05	61.00	0.070000	6 inch	0.010	1.93	507.86	503.59	510.17	510.00	1.81	5.91	507.97	504.41	0.27
P-71	J-31	J-33	N/A	N/A	N/A	0.75	6.04	4.57	32.00	0.004375	18 inch	0.010	9.03	503.59	503.45	510.00	510.00	4.91	5.05	504.41	504.46	3.62
P-72	J-33	J-26	N/A	N/A	N/A	1.62	4.14	6.77	34.00	0.013824	18 inch	0.010	16.05	503.45	502.98	510.00	507.00	5.05	2.52	504.46	504.00	5.31
P-42	G	J-17	0.27	0.35	0.09	0.09	4.44	0.42	11.00	0.545455	8 inch	0.010	11.60	515.00	509.00	520.40	520.40	4.73	10.73	515.30	509.40	1.96
P-43	J-17	P	N/A	N/A	N/A	0.09	4.43	0.42	47.00	0.019574	8 inch	0.010	2.20	509.00	508.08	520.40	510.25	10.73	1.50	509.30	508.46	2.05
P-44	P	J-18	0.03	0.35	0.01	0.11	4.39	0.46	32.00	0.023438	8 inch	0.010	2.40	508.08	507.33	510.25	510.00	1.50	2.00	508.40	507.72	2.18
P-45	J-18	J-19	N/A	N/A	N/A	0.11	4.37	0.46	31.00	0.008065	8 inch	0.010	1.41	507.33	507.08	510.00	510.00	2.00	2.25	507.65	507.60	1.57

Pipe Report

Label	Upstream Node	Downstream Node	Upstream Inlet Area (acres)	Upstream Inlet Rational Coefficient	Upstream Inlet CA (acres)	Upstream Calculated System CA (acres)	System Intensity (in/hr)	Total System Flow (cfs)	Length (ft)	Constructed Slope (ft/ft)	Section Size	Mannings n	Full Capacity (cfs)	Upstream Invert Elevation (ft)	Downstream Invert Elevation (ft)	Upstream Ground Elevation (ft)	Downstream Ground Elevation (ft)	Upstream Cover (ft)	Downstream Cover (ft)	Hydraulic Grade Line In (ft)	Hydraulic Grade Line Out (ft)	Velocity Out (ft/s)
P-46	J-19	J-20	N/A	N/A	N/A	0.18	4.33	0.78	34.00	0.035000	8 inch	0.010	2.94	507.08	505.89	510.00	509.65	2.25	3.09	507.50	506.69	2.23
P-47	J-20	O	N/A	N/A	N/A	0.18	4.31	0.78	78.00	0.010385	8 inch	0.010	1.60	505.89	505.08	509.65	508.40	3.09	2.65	506.65	506.46	2.22
P-50	R	J-21	0.07	0.35	0.02	0.02	4.44	0.11	14.00	0.010000	8 inch	0.010	1.57	507.96	507.82	509.50	510.00	0.87	1.51	508.11	508.11	0.77
P-51	J-21	J-22	N/A	N/A	N/A	0.07	4.41	0.33	27.00	0.010741	12 inch	0.010	4.80	507.82	507.53	510.00	510.00	1.18	1.47	508.06	507.87	1.37
P-52	J-22	J-19	N/A	N/A	N/A	0.07	4.38	0.32	12.00	0.037500	8 inch	0.010	3.04	507.53	507.08	510.00	510.00	1.80	2.25	507.79	507.60	1.10
P-53	Q	J-21	0.14	0.35	0.05	0.05	4.72	0.23	17.00	0.009412	6 inch	0.010	0.71	507.98	507.82	514.50	510.00	6.02	1.68	508.22	508.11	2.01
P-73	O	J-33	0.77	0.90	0.69	0.87	4.18	3.67	66.00	0.014545	10 inch	0.010	3.43	505.08	504.12	508.40	510.00	2.49	5.05	505.87	504.88	7.05

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Major Stormwater Management Plan
(Major SWMP)
For

SAN MIGUEL TRAINING FACILITY

Preparation/Revision Date:

1st Submittal: March 3, 2009
2nd Submittal: March 26, 2010
3rd Submittal: July 13, 2010

Prepared for:

San Miguel Fire Department
2850 Via Orange Way
Spring Valley, CA 91978
(619) 670-0500

Prepared by:

BDS Engineering Inc.
6859 Federal Blvd.
Lemon Grove, CA 91945
(619) 582-4992
BDS Job # 06-58

The selection, sizing, and preliminary design of stormwater treatment and other control measures in this plan have been prepared under the direction of the following Registered Civil Engineer and meet the requirements of Regional Water Quality Control Board Order R9-2007-0001 and subsequent amendments.

THOMAS A. JONES, RCE # 34867 Date

OWNER'S CERTIFICATION

This project-specific Major Stormwater Management Plan (Major SWMP) has been prepared for (Owner/Developer) by (Engineering Firm Name) for the project known as (Project Name) at (Project Location).

This Major SWMP is intended to comply with the requirements of The County of San Diego for (Permit Number), which includes the requirement for the preparation and implementation of a project-specific Major SWMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation of this Major SWMP and will ensure that this Major SWMP is amended as appropriate to reflect up-to-date conditions on the site. This Major SWMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this Major SWMP. At least one copy of this Major SWMP will be maintained at the project site or project office in perpetuity.

The undersigned is authorized to certify and to approve implementation of this Major SWMP. The undersigned is aware that implementation of this Major SWMP is enforceable under the County of San Diego Watershed Protection Ordinance (Municipal Ordinance No. 9926).

If the undersigned transfers its interest in the subject property/project, the undersigned shall notify the successor in interest in writing of its responsibility to implement this SWMP and maintain post-construction Best Management Practices (BMPs) in perpetuity. The undersigned shall provide the Department of Public Works, Watershed Protection Program with a copy of the signed notification, including the name, address, and contact information of the successor.

"I, the undersigned, certify under penalty of law that the provisions of this Major SWMP have been reviewed and accepted and that the Major SWMP and BMP maintenance requirements will be transferred to future successors in interest."

Owner's Signature	Date
Owner's Printed Name	Owner's Title/Position

Otay Water District
2554 Sweetwater Springs Rd.
Spring Valley, CA 91978
(619) 671-2279

The Major Stormwater Management Plan (Major SWMP) must be completed in its entirety and accompany applications to the County for a permit or approval associated with certain types of development projects. To determine whether your project is required to submit a Major or Minor SWMP, please reference the County's Stormwater Intake Form for Development Projects.

Project Name:	San Miguel Training Facility
Project Location:	11880 Campo Rd., Spring Valley, CA
Permit Number (Land Development Projects):	L-15514
Work Authorization Number (**CIP only**):	
Applicant:	Jeff Katz Architecture
Applicant's Address:	6353 Del Cerro Blvd, San Diego, CA
Plan Prepared By (*Leave blank if same as applicant*):	BDS Engineering, Inc.
Preparer's Address:	6859 Federal Blvd., Lemon Grove, CA
Date:	March 26, 2010

The County of San Diego Watershed Protection, Storm Water Management, and Discharge Control Ordinance (WPO) (Ordinance No. 9926) requires all applications for a permit or approval associated with a Land Disturbance Activity to be accompanied by a Storm Water Management Plan (SWMP) (section 67.806.b). The purpose of the SWMP is to describe how the project will minimize the short and long-term impacts on receiving water quality. Projects that meet the criteria for a priority development project are required to prepare a Major SWMP.

Since the SWMP is a living document, revisions may be necessary during various stages of approval by the County. Please provide the approval information requested below.

Project Stages	Does the SWMP need revisions?		If YES, Provide Revision Date
	YES	NO	

Instructions for a Major SWMP can be downloaded at
http://www.sdcounty.ca.gov/dpw/watersheds/susmp/susmp.html

Completion of the following checklists and attachments will fulfill the requirements of a Major SWMP for the project listed above.

STEP 1

PRIORITY DEVELOPMENT PROJECT DETERMINATION

TABLE 1: IS THE PROJECT IN ANY OF THESE CATEGORIES?

Yes ☐	No ☑	A	**Housing subdivisions of 10 or more dwelling units.** Examples: single-family homes, multi-family homes, condominiums, and apartments.
Yes ☑	No ☐	B	**Commercial—greater than one acre.** Any development other than heavy industry or residential. Examples: hospitals; laboratories and other medical facilities; educational institutions; recreational facilities; municipal facilities; commercial nurseries; multi-apartment buildings; car wash facilities; mini-malls and other business complexes; shopping malls; hotels; office buildings; public warehouses; automotive dealerships; airfields; and other light industrial facilities.
Yes ☐	No ☑	C	**Heavy industry—greater than one acre.** Examples: manufacturing plants, food processing plants, metal working facilities, printing plants, and fleet storage areas (bus, truck, etc.).
Yes ☐	No ☑	D	**Automotive repair shops.** A facility categorized in any one of Standard Industrial Classification (SIC) codes 5013, 5014, 5541, 7532-7534, or 7536-7539.
Yes ☐	No ☑	E	**Restaurants.** Any facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption (SIC code 5812), where the land area for development is greater than 5,000 square feet. Restaurants where land development is less than 5,000 square feet shall meet all SUSMP requirements except for structural treatment BMP and numeric sizing criteria requirements and hydromodification requirements.
Yes ☐	No ☑	F	**Hillside development greater than 5,000 square feet.** Any development that creates 5,000 square feet of impervious surface and is located in an area with known erosive soil conditions, where the development will grade on any natural slope that is twenty-five percent or greater.
Yes ☐	No ☑	G	**Environmentally Sensitive Areas (ESAs).** All development located within or directly adjacent to or discharging directly to an ESA (where discharges from the development or redevelopment will enter receiving waters within the ESA), which either creates 2,500 square feet of impervious surface on a proposed project site or increases the area of imperviousness of a proposed project site to 10% or more of its naturally occurring condition. "Directly adjacent" means situated within 200 feet of the ESA. "Discharging directly to" means outflow from a drainage conveyance system that is composed entirely of flows from the subject development or redevelopment site, and not commingled with flows from adjacent lands.
Yes ☐	No ☑	H	**Parking lots 5,000 square feet or more** or with 15 or more parking spaces and potentially exposed to urban runoff.
Yes ☐	No ☑	I	**Street, roads, highways, and freeways.** Any paved surface that is 5,000 square feet or greater used for the transportation of automobiles, trucks, motorcycles, and other vehicles.
Yes ☐	No ☑	J	**Retail Gasoline Outlets (RGOs)** that are: (a) 5,000 square feet or more or (b) a projected Average Daily Traffic (ADT) of 100 or more vehicles per day.

To use the table, review each definition A through K. If any of the definitions match, the project is a Priority Development Project. Note some thresholds are defined by square footage of impervious area created; others by the total area of the development. Please see special requirements for previously developed sites and project exemptions on page 6 of the County SUSMP.

STEP 2

PROJECT STORMWATER QUALITY DETERMINATION

Total Project Site Area 69.59 ac (Acres or ft^2)

Estimated amount of disturbed acreage: 2.64 ac (Acres or ft^2)
(If >1 acre, you must also provide a WDID number from the SWRCB) WDID: _____

Complete A through C and the calculations below to determine the amount of impervious surface on your project before and after construction.

A. Total Construction Site : 2.64 (Acres or ft^2)

B. Total impervious area (including roof tops) before construction 0.12 (Acres or ft^2)

C. Total impervious area (including roof tops) after construction 2.33 (Acres or ft^2)

Calculate percent impervious before construction: B/A = 4.5 %
Calculate percent impervious after construction: C/A = 88.3 %

Please provide detailed descriptions regarding the following questions:

TABLE 2: PROJECT SPECIFIC STORMWATER ANALYSIS

1.	Please provide a brief description of the project.
The proposed training facility will consist of 2 modular classrooms, 1 office modular, one reserve apparatus building, a 5-story traing tower, a simulated hazardous materials prop, search and rescue props, vehicle extrication area, water recovery system, fire attack and control simulations, rappelling etc.	
2.	Describe the current and proposed zoning and land use designation.
The site is currently owned and used by Otay Water District for Municipal water services, the proposed project will serve as a training facility for the San Miguel Fire District, however the site will continue its current land use.	
3.	Describe the pre-project and post-project topography of the project. (Show on Plan)
The existing site is currently rough graded and generally sheet flows from north to south. The proposed project's topography will generally be the same as existing conditions.	
4.	Describe the soil classification, permeability, erodibility, and depth to groundwater for LID and Treatment BMP consideration. (Show on Plan) If infiltration BMPs are proposed, a Geotechnical Engineer must certify infiltration BMPs in Attachment E.
According to the geotechnical report by Southern California Soil & Testing, Inc. the underlying soil is clean dense fill soil. It is described as USCS type SM, brown, moist, dense SILTY SAND, with some GRAVEL. The erodibility factor is 0.17 according to the USGS soil survey and no ground water was encountered. Infiltration BMPs are not proposed for this site.	
5.	Describe if contaminated or hazardous soils are within the project area. (Show on Plan)
No contaminated or hazardous soils were found on site.	
6.	Describe the existing site drainage and natural hydrologic features. (Show on Plan).
The existing site is currently rough graded and generally sheet flows from north to south. The proposed project's topography will generally be the same as existing conditions.	
7.	Describe site features and conditions that constrain, or provide opportunities for stormwater control, such as LID features.
The intended site use prohibits use of infiltration BMPs as it will be used for training facility and is required to be mostly paved with heavy pavement loading anticipated. The project is also limited to construction within the northerly and easterly wall boundary for environmental purposes. The project is also prohibited from having landscape, therefore all non paved areas will be hydroseeded.	
8.	Is this project within the environmentally sensitive areas as defined on the maps in Appendix A of the *County of San Diego Standard Urban Storm Water Mitigation Plan for Land Development and Public Improvement Projects?*
Yes	No
9.	Is this an emergency project?
Yes	No

CHANNELS & DRAINAGES

Complete the following checklist to determine if the project includes work in channels.

TABLE 3: PROJECT SPECIFIC STORMWATER ANALYSIS

No.	CRITERIA	YES	NO	N/A	COMMENTS
1.	Will the project include work in channels?		✔		If YES go to 2 If NO go to 13.
2.	Will the project increase velocity or volume of downstream flow?	✔			If YES go to 6.
3.	Will the project discharge to unlined channels?	✔			If YES go to. 6.
4.	Will the project increase potential sediment load of downstream flow?				If YES go to 6.
5.	Will the project encroach, cross, realign, or cause other hydraulic changes to a stream that may affect downstream channel stability?				If YES go to 8.
6.	Review channel lining materials and design for stream bank erosion.				Continue to 7.
7.	Consider channel erosion control measures within the project limits as well as downstream. Consider scour velocity.	✔			Continue to 8.
8.	Include, where appropriate, energy dissipation devices at culverts.				Continue to 9.
9.	Ensure all transitions between culvert outlets/headwalls/wingwalls and channels are smooth to reduce turbulence and scour.			✔	Continue to 10.
10.	Include, if appropriate, detention facilities to reduce peak discharges.			✔	Continue to 11.
11.	"Hardening" natural downstream areas to prevent erosion is not an acceptable technique for protecting channel slopes, unless pre-development conditions are determined to be so erosive that hardening would be required even in the absence of the proposed development.			✔	Continue to 12.
12.	Provide other design principles that are comparable and equally effective.			✔	Continue to 13.
13.	End				

TEMPORARY CONSTRUCTION BMPS

Please check the construction BMPs that may be implemented during construction of the project. The applicant will be responsible for the placement and maintenance of the BMPs incorporated into the final project design.

- ☑ Silt Fence
- ☑ Fiber Rolls
- ☑ Street Sweeping and Vacuuming
- ☑ Storm Drain Inlet Protection
- ☑ Stockpile Management
- ☑ Solid Waste Management
- ☑ Stabilized Construction Entrance/Exit
- ☐ Dewatering Operations
- ☑ Vehicle and Equipment Maintenance
- ☐ Desilting Basin
- ☐ Gravel Bag Berm
- ☐ Sandbag Barrier
- ☑ Material Delivery and Storage
- ☑ Spill Prevention and Control
- ☑ Concrete Waste Management
- ☑ Water Conservation Practices
- ☑ Paving and Grinding Operations
- ☑ Any minor slopes created incidental to construction and not subject to a major or minor grading permit shall be protected by covering with plastic or tarp prior to a rain event, and shall have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

Complete the checklist below to determine if a proposed project will pose an "exceptional threat to water quality," and therefore require Advanced Treatment Best Management Practices during the construction phase.

TABLE 4: EXCEPTIONAL THREAT TO WATER QUALITY DETERMINATION

No.	CRITERIA	YES	NO	INFORMATION
1.	Is all or part of the proposed project site within 200 feet of waters named on the Clean Water Act (CWA) Section 303(d) list of Water Quality Limited Segments as impaired for sedimentation and/or turbidity? Current 303d list may be obtained from the following site: http://www.swrcb.ca.gov/tmdl/docs/303dlists2006/approved/r9_06_303d_reqtmdls.pdf		✔	If YES, continue to 2. If NO, go to 5.
2.	Will the project disturb more than 5 acres, including all phases of the development?			If YES, continue to 3. If NO, go to 5.
3.	Will the project disturb slopes that are steeper than 4:1 (horizontal: vertical) with at least 10 feet of relief, and that drain toward the 303(d) listed receiving water for sedimentation and/or turbidity?			If YES, continue to 4. If NO, go to 5.
4.	Will the project disturb soils with a predominance of USDA-NRCS Erosion factors k_f greater than or equal to 0.4? Kf = 0.17			If YES, continue to 6. If NO, go to 5.
5.	Project is not required to use Advanced Treatment BMPs.	✔		Document for Project Files by referencing this checklist.
6.	Project poses an "exceptional threat to water quality" and is required to use Advanced Treatment BMPs.			Advanced Treatment BMPs must be consistent with WPO section 67.811(b)(20)(D) performance criteria

Exemption potentially available for projects that require advanced treatment: Project proponent may perform a Revised Universal Soil Loss Equation, Version 2 (RUSLE 2), Modified Universal Soil Loss Equation (MUSLE), or similar analysis that shows to the County official's satisfaction that advanced treatment is not required

STEP 3

HYDROMODIFICATION DETERMINATION

The following questions provide a guide to collecting information relevant to hydromodification management issues.

TABLE 5: HYDROMODIFICATION DETERMINATION

	QUESTIONS	YES	NO	Information
1.	Will the proposed project disturb 50 or more acres of land? (Including all phases of development)		✔	If YES, continue to 2. If NO, go to 6.
2.	Would the project site discharge directly into channels that are concrete-lined or significantly hardened such as with rip-rap, sackcrete, etc, downstream to their outfall into bays or the ocean?			If NO, continue to 3. If YES, go to 6.
3.	Would the project site discharge directly into underground storm drains discharging directly to bays or the ocean?			If NO, continue to 4. If YES, go to 6.
4.	Would the project site discharge directly to a channel (lined or un-lined) and the combined impervious surfaces downstream from the project site to discharge at the ocean or bay are 70% or greater?			If NO, continue to 5. If YES, go to 6.
5.	Project is required to manage hydromodification impacts.			Hydromodification Management Required as described in Section 67.812 b(4) of the WPO.
6.	Project is not required to manage hydromodification impacts.	✔		Hydromodification Exempt. Keep on file.

An exemption is potentially available for projects that are required (No. 5. in Table 5 above) to manage hydromodification impacts: The project proponent may conduct an independent geomorphic study to determine the project's full hydromodification impact. The study must incorporate sediment transport modeling across the range of geomorphically-significant flows and demonstrate to the County's satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water to qualify for the exemption.

STEP 4

POLLUTANTS OF CONCERN DETERMINATION

WATERSHED

Please check the watershed(s) for the project.

☐ San Juan 901	☐ Santa Margarita 902	☐ San Luis Rey 903	☐ Carlsbad 904
☐ San Dieguito 905	☐ Penasquitos 906	☐ San Diego 907	☑ Sweetwater 909
☐ Otay 910	☐ Tijuana 911	☐ Whitewater 719	☐ Clark 720
☐ West Salton 721	☐ Anza Borrego 722	☐ Imperial 723	

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

HYDROLOGIC SUB-AREA NAME AND NUMBER(S)

Number	Name
909.21	Jamacha Hydrologic Sub Area

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

SURFACE WATERS that each project discharge point proposes to discharge to. List the impairments identified in Table 7.

SURFACE WATERS (river, creek, stream, etc.)	Hydrologic Unit Basin Number	Impairment(s) listed [303(d) listed waters or waters with established TMDLs]	Distance to Project
Sweetwater Reservoir	909.21	Dissolved Oxygen	3.6 MILES

http://www.waterboards.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/epa/r9_06_303d_reqtmdls.pdf

GROUND WATERS

Ground Waters	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRESH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN

http://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/index.shtml

+ Excepted from Municipal ● Existing Beneficial Use ○ Potential Beneficial Use

PROJECT ANTICIPATED AND POTENTIAL POLLUTANTS

Using Table 6, identify pollutants that are anticipated to be generated from the proposed priority project categories. Pollutants associated with any hazardous material sites that have been remediated or are not threatened by the proposed project are not considered a pollutant of concern.

TABLE 6: ANTICIPATED AND POTENTIAL POLLUTANTS GENERATED BY LAND USE TYPE

	General Pollutant Categories								
PDP Categories	Sediments	Nutrients	Heavy Metals	Organic Compounds	Trash & Debris	Oxygen Demanding Substances	Oil & Grease	Bacteria & Viruses	Pesticides
Detached Residential Development	X	X			X	X	X	X	X
Attached Residential Development	X	X			X	P(1)	P(2)	P	X
Commercial Development 1 acre or greater	P(1)	P(1)		P(2)	X	P(5)	X	P(3)	P(5)
Heavy industry /industrial development	X		X	X	X	X	X		
Automotive Repair Shops			X	X(4)(5)	X		X		
Restaurants					X	X	X	X	
Hillside Development >5,000 ft^2	X	X			X	X	X		X
Parking Lots	P(1)	P(1)	X		X	P(1)	X		P(1)
Retail Gasoline Outlets			X	X	X	X	X		
Streets, Highways & Freeways	X	P(1)	X	X(4)	X	P(5)	X		

X = anticipated
P = potential
(1) A potential pollutant if landscaping exists on-site.
(2) A potential pollutant if the project includes uncovered parking areas.
(3) A potential pollutant if land use involves food or animal waste products.
(4) Including petroleum hydrocarbons.
(5) Including solvents.

PROJECT POLLUTANTS OF CONCERN SUMMARY TABLE

Please summarize the identified project pollutant of concern by checking the appropriate boxes in the table below and list any surface water impairments identified. Pollutants anticipated to be generated by the project, which are also causing impairment of receiving waters, shall be considered the primary pollutants of concern. For projects where no primary pollutants of concern exist, those pollutants identified as anticipated shall be considered secondary pollutants of concern.

TABLE 7: PROJECT POLLUTANTS OF CONCERN

Pollutant Category	Anticipated (X)	Potential (P)	Surface Water Impairments
Sediments		✔	
Nutrients		✔	✔
Heavy Metals			
Organic Compounds		✔	✔
Trash & Debris	✔		✔
Oxygen Demanding Substances		✔	✔
Oil & Grease	✔		
Bacteria & Viruses			
Pesticides		✔	

STEP 5

LID AND SITE DESIGN STRATEGIES

Each numbered item below is a Low Impact Development (LID) requirement of the WPO. Please check the box(s) under each number that best describes the LID BMP(s) and Site Design Strategies selected for this project.

TABLE 8: LID AND SITE DESIGN

1.	Conserve natural Areas, Soils, and Vegetation
☐	Preserve well draining soils (Type A or B)
☐	Preserve Significant Trees
☐	Preserve critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions
☑	Other. Description: All areas within the property but not within the limits of work shall remain undisturbed.
2.	Minimize Disturbance to Natural Drainages
☐	Set-back development envelope from drainages
☐	Restrict heavy construction equipment access to planned green/open space areas
☑	Other. Description: Due to the site characteristics and limit of space req., the easterly retaining wall is located within a natural drainage areas.
3.	Minimize and Disconnect Impervious Surfaces (see 5)
☐	Clustered Lot Design
☐	Items checked in 5?
☑	Other. Description: By virtue of the site's land use, the only pervious areas are located at the northeasterly and southwesterly corner and a small pervious area at the front entrance.
4.	Minimize Soil Compaction
☐	Restrict heavy construction equipment access to planned green/open space areas
☐	Re-till soils compacted by construction vehicles/equipment
☐	Collect & re-use upper soil layers of development site containing organic Materials
☑	Other. Description: The majority of the site is paved, therefore compaction is required. However, in non paved areas, it shall be hydroseeded
5.	Drain Runoff from Impervious Surfaces to Pervious Areas
	<u>LID Street & Road Design</u>
☐	Curb-cuts to landscaping
☐	Rural Swales
☐	Concave Median
☐	Cul-de-sac Landscaping Design
☑	Other. Description: N/A no new streets or roads are proposed.
	<u>LID Parking Lot Design</u>
☐	Permeable Pavements

☐	Curb-cuts to landscaping
☑	Other. Description: N/A permeable pavements are not suitable for the site use or soil type and there is no suitable landscape to drain into.
LID Driveway, Sidewalk, Bike-path Design	
☐	Permeable Pavements
☐	Pitch pavements toward landscaping
☑	Other. Description: N/A there is no sidewalk or bike path proposed
LID Building Design	
☐	Cisterns & Rain Barrels
☐	Downspout to swale
☐	Vegetated Roofs
☑	Other. Description: N/A there is no downspouts proposed
LID Landscaping Design	
☐	Soil Amendments
☐	Reuse of Native Soils
☐	Smart Irrigation Systems
☐	Street Trees
☑	Other. Description: N/A the project shall be zero scape therefore, the non paved areas will be hydroseeded.
6. Minimize erosion from slopes	
☑	Disturb existing slopes only when necessary
☑	Minimize cut and fill areas to reduce slope lengths
☑	Incorporate retaining walls to reduce steepness of slopes or to shorten slopes
☐	Provide benches or terraces on high cut and fill slopes to reduce concentration of flows
☐	Rounding and shaping slopes to reduce concentrated flow
☑	Collect concentrated flows in stabilized drains and channels
☐	Other. Description:

STEP 6

SOURCE CONTROL

Please complete the checklist on the following pages to determine Source Control BMPs. Below is instruction on how to use the checklist. (Also see instructions on page 40 of the *SUSMP)*

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.

2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your Source Control Exhibit in Attachment B.

3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in a table in your Project-Specific SUSMP.

Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternatives.

This project proposes Source Control BMPs such as the use of inlet markings and regular sweeping and collection of trash and debris. Items B through O are not applicable to this project and therefore were not used.

Use the format in Table 9 below to summarize the project Source Control BMPs. Incorporate all identified Source Control BMPs in your Source Control Exhibit in Attachment B.

TABLE 9: PROJECT SOURCE CONTROL BMPS

Potential source of runoff pollutants	*Permanent source control BMPs*	*Operational source control BMPs*
On-site Storm Drain Inlets	Mark all inlets with "No Dumping! Flows to Bay" or similar	See page 16, Row A, Column 4.
Plazas, sidewalks, and parking lots	N/A	See Page 27, Row P, Column 4.

	IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
	1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
	☑ A. **On-site storm drain inlets**	☑ **Locations of inlets.**	☑ **Mark all inlets with the words "No Dumping! Flows to Bay" or similar.**	☑ **Maintain and periodically repaint or replace inlet markings.** ☑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
N/A	☐ B. **Interior floor drains and elevator shaft sump pumps**		☐ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**
N/A	☐ C. **Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to prevent blockages and overflow.**

	IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
	1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
N/A	❑ D1. **Need for future indoor & structural pest control**		❑ **Note building design features that discourage entry of pests.**	❑ **Provide Integrated Pest Management information to owners, lessees, and operators.**

	IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
	1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
N/A	❑ D2. **Landscape/ Outdoor Pesticide Use** **<u>Note: Should be consistent with project landscape plan (if applicable).</u>**	❑ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ❑ **Show self-retaining landscape areas, if any.** ❑ **Show stormwater treatment facilities.**	**State that final landscape plans will accomplish all of the following:** ❑ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ❑ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ❑ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ❑ **Consider using pest-resistant plants, especially adjacent to hardscape.** ❑ **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	❑ **Maintain landscaping using minimum or no pesticides.** ❑ **See applicable operational BMPs in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at <u>www.cabmphandbooks.com</u>** ❑ **Provide IPM information to new owners, lessees and operators.**

	IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
	1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
N/A	❑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	❑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet.**	❑ **If the local municipality requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	❑ **See applicable operational BMPs in Fact Sheet SC-72, "Fountain and Pool Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
N/A	❑ F. **Food service**	❑ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ❑ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	❑ **Describe the location and features of the designated cleaning area.** ❑ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	❑

	IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
	1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
N/A	❑ G. **Refuse areas**	❑ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ❑ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ❑ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	❑ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ❑ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	❑ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
N/A	❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

	IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR STORMWATER CONTROL PLAN SHOULD INCLUDE THESE SOURCE CONTROL BMPs		
	1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on Source Control Exhibit, Attachment B	3 Permanent Controls—List in SUSMP Table and Narrative	4 Operational BMPs—Include in SUSMP Table and Narrative
N/A	❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	❑ **Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of local Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank**	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

N/A	❑ J. Vehicle and Equipment Cleaning	❑ Show on drawings as appropriate: (1) Commercial/industrial facilities having vehicle /equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses. (2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use). (3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer. (4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.	❑ If a car wash area is not provided, describe measures taken to discourage on-site car washing and explain how these will be enforced.	Describe operational measures to implement the following (if applicable): ❑ Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system. ❑ Car dealerships and similar may rinse cars with water only. ❑ See Fact Sheet SC-21, "Vehicle and Equipment Cleaning," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

N/A	❑ K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the SUSMP report, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.**

N/A	❑ L. **Fuel Dispensing Areas**	❑ **Fueling areas[1] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Business Guide Sheet, "Automotive Service—Service Stations" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[1] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

N/A	❑ M. Loading Docks	❑ Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas should be drained to the sanitary sewer where feasible. Direct connections to storm drains from depressed loading docks are prohibited. ❑ Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation. ❑ Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.		❑ Move loaded and unloaded items indoors as soon as possible. ❑ See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
N/A	❑ N. Fire Sprinkler Test Water		❑ Provide a means to drain fire sprinkler test water to the sanitary sewer.	❑ See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com

N/A	O. **Miscellaneous Drain or Wash Water** ☐ **Boiler drain lines** ☐ **Condensate drain lines** ☐ **Rooftop equipment** ☐ **Drainage sumps** ☐ **Roofing, gutters, and trim.**		☐ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ☐ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ☐ **Rooftop mounted equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ☐ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ☐ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.**	
	☑ P. **Plazas, sidewalks, and parking lots.**			☑ **Plazas, sidewalks, and parking lots shall be swept regularly to prevent the accumulation of litter and debris. Debris from pressure washing shall be collected to prevent entry into the storm drain system. Washwater containing any cleaning agent or degreaser shall be collected and discharged to the sanitary sewer and not discharged to a storm drain.**

STEP 7

LID AND TREATMENT CONTROL SELECTION

A treatment control BMP and/or LID facility must be selected to treat the project pollutants of concern identified in Table 7 "Project Pollutants of Concern". A treatment control facility with a high or medium pollutant removal efficiency for the project's most significant pollutant of concern shall be selected. It is recommended to use the design procedure in Chapter 4 of the SUSMP to meet NPDES permit LID requirements, treatment requirements, and flow control requirements. If your project does not utilize this approach, the project will need to demonstrate compliance with LID, treatment and flow control requirements. Review Chapter 2 "Selection of Stormwater Treatment Facilities" in the SUSMP to assist in determining the appropriate treatment facility for your project.

Will this project be utilizing the unified LID design procedure as described in Chapter 4 of the Local SUSMP? *(If yes, please document in Attachment D following the steps in Chapter 4 of the County SUSMP)*	
Yes	No
If this project is not utilizing the unified LID design procedure, please describe how the alternative treatment facilities will comply with applicable LID criteria, stormwater treatment criteria, and hydromodification management criteria.	
The proposed project area is a small percentage of the total drainage watershed area and will NOT have a significant increase in stormwater runoff or velocities, therefore hydromodification criteria is not required. The project's POC is trash and debris, which is associated to coarse sediment and trash. Therefore a CDS Unit or Hydrodynamic separator is proposed for the site which has proven to handle these pollutants at a high treatment efficiency. The site also incorporates small self treating hydroseeded areas which will slow down velocity of stormwater and allow for treatment during small storms. The training areas water recycling system will be used to detain approx 2,349 CF or 0.58" of rainfall from the drainage area.	

- Indicate the project pollutants of concern (POCs) from Table 7 in Column 2 below.

TABLE 10: GROUPING OF POTENTIAL POLLUTANTS of Concern (POCs) by fate during stormwater treatment

Pollutant	Check Project Specific POCs	Coarse Sediment and Trash	Pollutants that tend to associate with fine particles during treatment	Pollutants that tend to be dissolved following treatment
Sediment		X	X	
Nutrients			X	X
Heavy Metals			X	
Organic Compounds			X	
Trash & Debris	✔	X		
Oxygen Demanding			X	
Bacteria			X	
Oil & Grease			X	
Pesticides			X	

- Indicate the treatment facility(s) chosen for this project in the following table.

TABLE 11: GROUPS OF POLLUTANTS and relative effectiveness of treatment facilities

Pollutants of Concern	Bioretention Facilities (LID)	Settling Basins (Dry Ponds)	Wet Ponds and Constructed Wetlands	Infiltration Facilities or Practices (LID)	Media Filters	Higher-rate biofilters*	Higher-rate media filters*	Trash Racks & Hydro-dynamic Devices	Vegetated Swales
Coarse Sediment and Trash	High	High	High	High	High	High	High	High	High
Pollutants that tend to associate with fine particles during treatment	High	High	High	High	High	Medium	Medium	Low	Medium
Pollutants that tend to be dissolved following treatment	Medium	Low	Medium	High	Low	Low	Low	Low	Low

- Please check the box(s) that best describes the Treatment BMP(s) and/or LID BMP selected for this project.

TABLE 12: PROJECT LID AND TC-BMPS

Bioretention Facilites (LID)
☐ Bioretention area
☐ Flow-through Planter
☐ Cistern with Bioretention Facility
Settling Basins (Dry Ponds)
☐ Extended/dry detention basin with grass/vegetated lining
☑ Extended/dry detention basin with impervious lining
Infiltration Facilities or Practices (LID)
☐ Infiltration basin
☐ Dry well
☐ Infiltration trench
Wet Ponds and Constructed Wetlands
☐ Wet pond/basin (permanent pool)
☐ Constructed wetland
Vegetated Swales (LID[1])
☐ Vegetated Swale

The holding tanks for the water recycling system will be used as a detention facility as it will allow for approx. 2,349 cf of storage which equivilates to 0.58 inches of rainfall from the drainage area. (See summary on page 31)

Media Filters
☐ Austin Sand Filter
☐ Delaware Sand Filter
☐ Multi-Chambered Treatment Train (MCTT)
Higher-rate Biofilters
☐ Tree-pit-style unit
☐ Other_____
Higher-rate Media Filters
☐ Vault-based filtration unit with replaceable cartridges
☐ Other_____
Hydrodynamic Separator Systems
☑ Swirl Concentrator
☐ Cyclone Separator
Trash Racks
☐ Catch Basin Insert
☐ Catch Basin Insert w/ Hydrocarbon boom
☐ Other_____
Self-Treating or Self-Retaining Areas (LID)
☐ Pervious Pavements
☐ Vegetated Roofs
☑ Other An area at the NE corner will be DG and areas in the SW corners will be hydroseeded.

(1) Must be designed per SUSMP "Vegetated Swales" design criteria for LID credit (p. 65).

For design guidelines and calculations refer to Chapter 4 "Low Impact Development Design Guide" in the SUSMP. Please show all calculations and design sheets for all treatment facilities proposed in Attachment D.

- Create a Construction Plan SWMP Checklist for your project.

Instructions on how to fill out table

1. Number and list each measure or BMP you have specified in your SWMP in Columns 1 and Maintenance Category in Column 3 of the table. Leave Column 2 blank.

2. When you submit construction plans, duplicate the table (by photocopy or electronically). Now fill in Column 2, identifying the plan sheets where the BMPs are shown. List all plan sheets on which the BMP appears. This table must be shown on the front sheet of the grading and improvement plans.

Stormwater Treatment Control and LID BMP's			
Description / Type	Sheet	Maintenance Category	Revisions
CDS Unit / TC- Hydrodynamic Separator	4 & 5	Category 2	
(3) Self Treating Areas / LID	4		
Water Recycling System / LID	5		

* BMP's approved as part of Stormwater Management Plan (SWMP) dated xx/xx/xx on file with DPW. Any changes to the above BMP's will require SWMP revision and Plan Change approvals.

- Please describe why the chosen treatment BMP(s) was selected for this project. For projects utilizing a low performing BMP, please provide a feasibility analysis that demonstrates utilization of a treatment facility with a high or medium removal efficiency ranking is infeasible.

The proposed hydrodynamic separator was chosen for this project for its HIGH efficiency in removing the pollutants of concern (trash and debris).

Due to the purpose of the site, the majority is paved for fire training exercises. The project conditions prohibit landscape, therefore the site is proposing zero scape (e.g. hydroseeding). Areas to the northeast will be DG and an area south/southwest of the proposed trailers shall be hydroseeded creating a self treating (LID) and a small area at the front entrance will also be hydro-seeded and self treating. The hydroseed will stabilize the area and help in vegetative growth.

The water recycling system will be primarily used for capturing and pumping training water. The system is designed to fill water into the vault up to elevation 502.75, therefore between 502.75 and the top of the vault (Elev. = 505.84) will leave a volume of approx. 2,349 CF for rainfall flow. This allows for approx. 0.58 inches of rainfall from the drainage area (48,468 SF) to be captured and held in the storage vaults and kept from flowing offsite.

A Treatment BMP must address runoff from developed areas. Please provide the post-construction water quality treatment volume or flow values for the selected project Treatment BMP(s). Guidelines for design calculations are located in Chapter 4 of the County SUSMP. Label outfalls on the BMP map. The Water Quality peak rate of discharge flow (Q_{WQ}) and the Water Quality storage volume (V_{WQ}) is dependent on the type of treatment BMP selected for the project.

Outfall	**Tributary Area (acres)**	**Q_{WQ} (cfs)**	**V_{WQ} (ft^3)**
Outfall 1	2.64	0.44	N/A

STEP 8

OPERATION AND MAINTENANCE

- Please check the box that best describes the maintenance mechanism(s) for this project.

TABLE 13: PROJECT BMP CATEGORY

CATEGORY	SELECTED		BMP Description
	YES	NO	
First			CDS Unit - Hydrodynamic Separator
Second[1]	✔		
Third[2]			
Fourth			

Note:

1. A recorded maintenance agreement will be required.
2. Project will be required to establish or be included in a Stormwater Maintenance Assessment District for the long-term maintenance of treatment BMPs.

- Please list all individual LID and Treatment Control BMPs (TC-BMPs) incorporated into project. Please ensure the "BMP Identifier" is consistent with the legend in Attachment C "LID and/or TC-BMP Exhibit". Please attach the record plan sheets upon completion of project and amend the Major SWMP where appropriate. For each type of LID or TC-BMP provide an inspection sheet in Attachment F "Maintenance Plan".

TABLE 14: PROJECT SPECIFIC LID AND TC-BMPS

BMP Identifier*	LID or TC-BMP Type	BMP Pollutant of Concern Efficiency (H,M,L) – Table 11	Final Construction Date *(to be completed by County inspector)*	Final Construction Inspector Name *(to be completed by County inspector)*
CDS UNIT	TC-BMP	HIGH		
Self Treating	LID BMP	LOW		
Water Recycling / Detention	TC- BMP	HIGH		

* For location of BMP's, see approved Record Plan dated GRADING PLAN sheet 4 & 5

- Responsible Party for Long-term Maintenance:

Identify the parties responsible for long-term maintenance of the BMPs identified above and Source Controls specified in Attachment B. Include the appropriate written agreement with the entities responsible for O&M in Attachment F. Please see Chapter 5 "Private Ownership and Maintenance" on page 94 of the County SUSMP for appropriate maintenance mechanisms.

Name:	August Ghio, Fire Chief
Company Name:	San Miguel Fire Department
Phone Number:	(619) 670-0500
Street Address:	2850 Via Orange Way
City/State/Zip:	Spring Valley, CA 91978
Email Address:	

- Funding Source:

Provide the funding source or sources for long-term operation and maintenance of each BMP identified above. By certifying the Major SWMP the applicant is certifying that the funding responsibilities have been addressed and will be transferred to future owners.

Funding shall be provided by the San Miguel Fire Department.

ATTACHMENTS

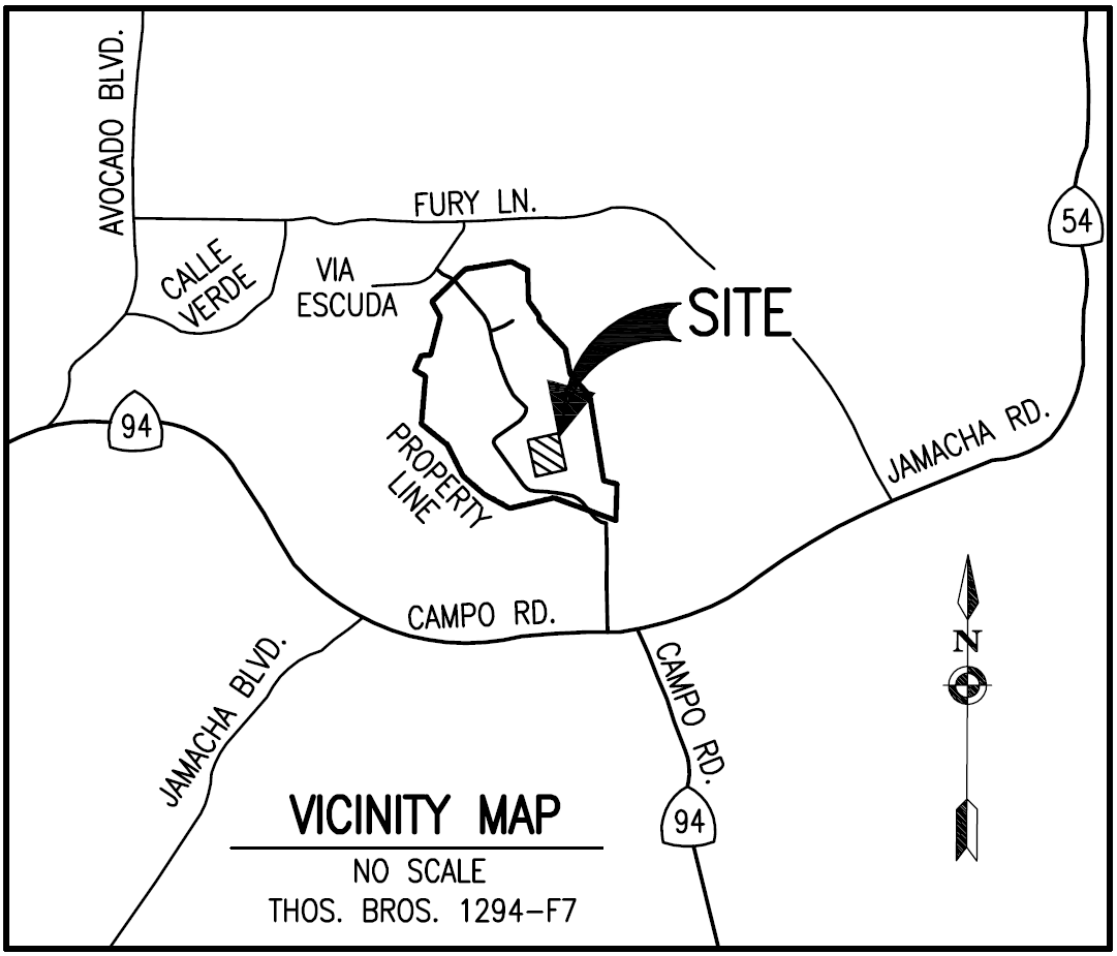
Please include the following attachments.

ATTACHMENT		COMPLETED	N/A
A	Project Location Map	✔	
B	Source Control Exhibit	✔	
C	LID and/or TC-BMP Exhibit	✔	
D	Drainage Management Area (DMA) Maps, Sizing Design Calculations and BMP/IMP Design Details	✔	
E	Geotechnical Certification Sheet		✔
F	Maintenance Plan	✔	
G	Tracking Report		✔
H	Addendum		

Note: Attachments B and C may be combined.

ATTACHMENT A

Project Location Map



ATTACHMENT B

Source Control Exhibit

SEE ATTACHMENT C

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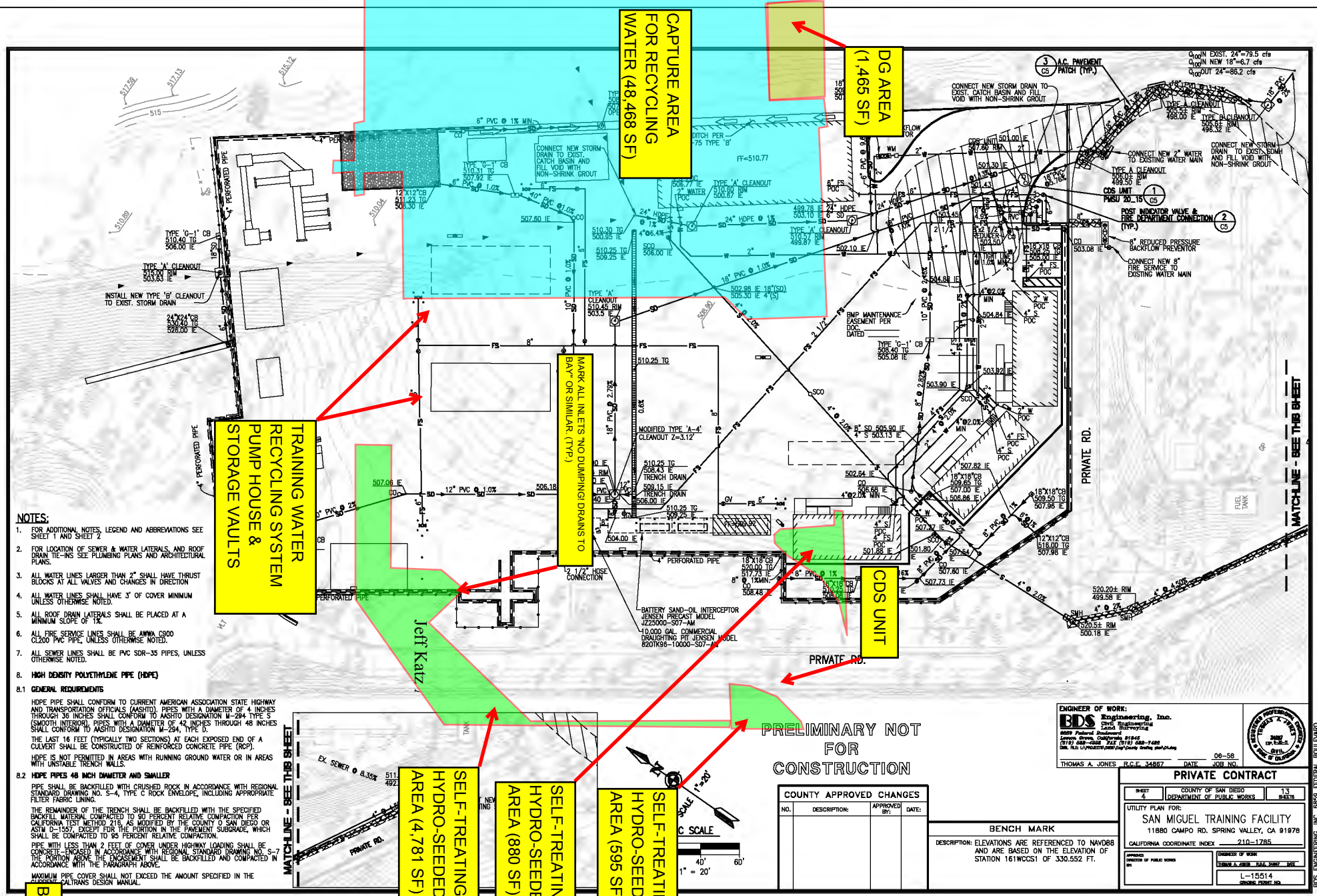
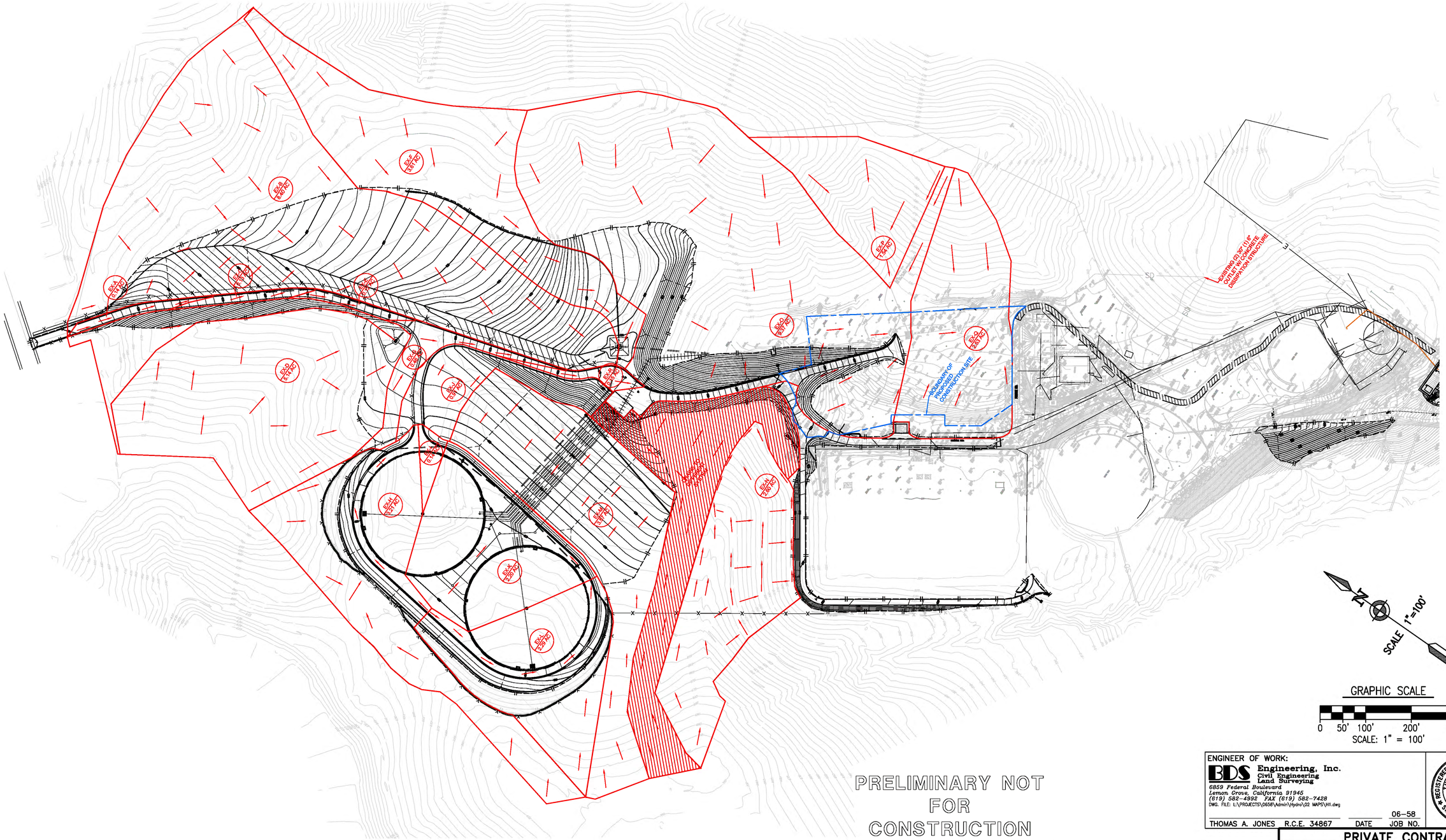


ATTACHMENT D

Drainage Management Area (DMA) Maps, Sizing Design Calculations and TC-BMP/LID Design Details



PRELIMINARY NOT FOR CONSTRUCTION

ENGINEER OF WORK:

BDS Engineering, Inc.
Civil Engineering
Land Surveying
6859 Federal Boulevard
Lemon Grove, California 91945
(619) 582-4992 FAX (619) 582-7428
DWG. FILE: L:\PROJECTS\0658\Admin\Hydro\02 MAPS\H1.dwg

THOMAS A. JONES R.C.E. 34867 DATE 06-58 JOB NO.

REGISTERED PROFESSIONAL ENGINEER THOMAS A. JONES 34867 EXP. 12-31-11 CIVIL STATE OF CALIFORNIA

COUNTY APPROVED CHANGES			
NO.	DESCRIPTION:	APPROVED BY:	DATE:

BENCH MARK

DESCRIPTION: ELEVATIONS ARE REFERENCED TO NAVD88 AND ARE BASED ON THE ELEVATION OF STATION 161WCCS1 OF 330.552 FT.

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	13 SHEETS

SAN MIGUEL TRAINING FACILITY
11880 CAMPO RD. SPRING VALLEY, CA 91978

CALIFORNIA COORDINATE INDEX 210-1785

APPROVED
DIRECTOR OF PUBLIC WORKS
BY:

ENGINEER OF WORK
THOMAS A. JONES R.C.E. 34867 DATE

L-15514
GRADING PERMIT NO:

BDS ENGINEERING, INC. 6859 FEDERAL BOULEVARD
LEMON GROVE, CALIFORNIA 91945
(619) 582-4992

OVERALL PRE DEVELOPMENT HYDROLOGY MAP

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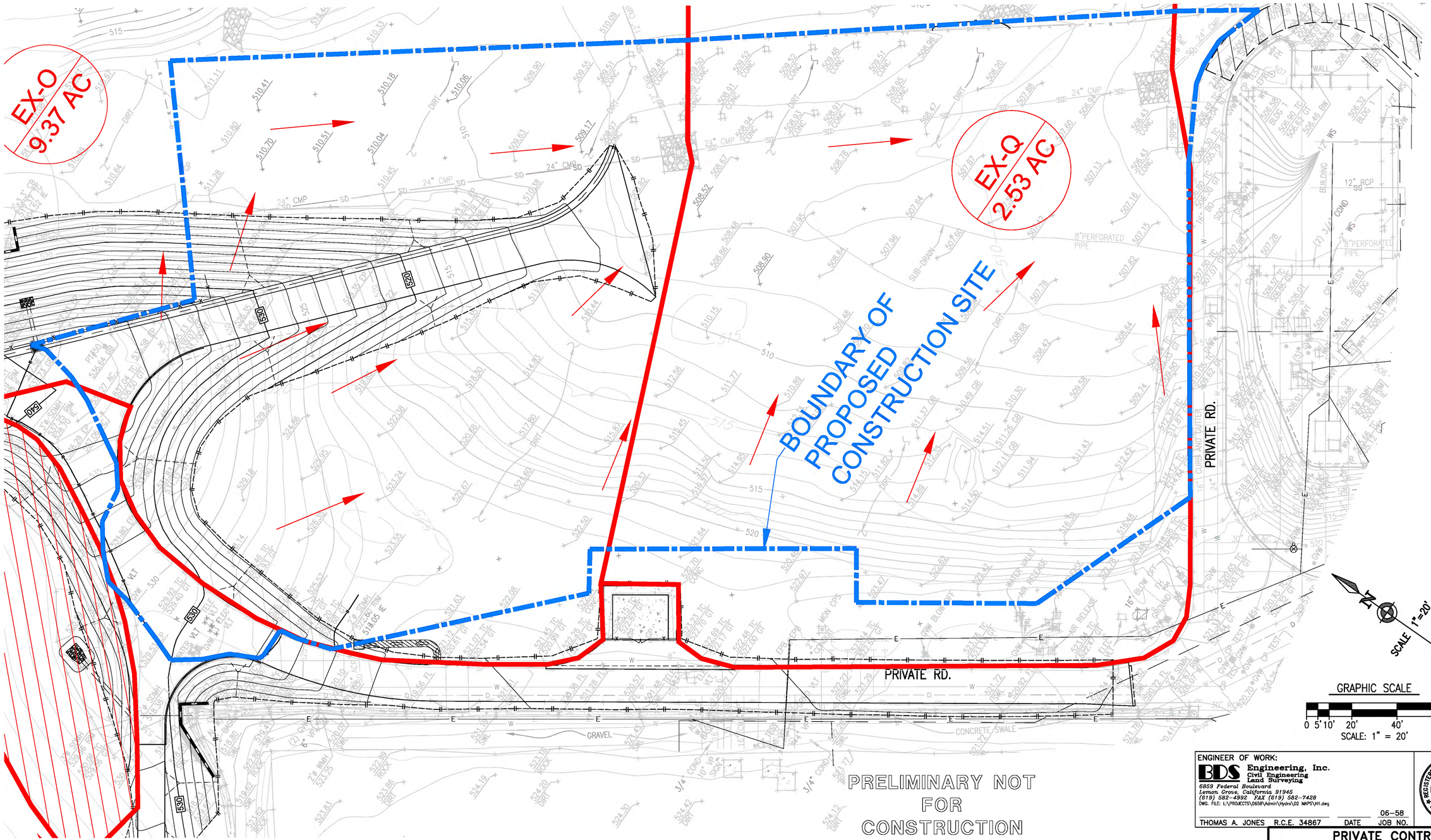

ENGINEER OF WORK:
BDS Engineering, Inc.
Civil Engineering
Land Surveying
6859 Federal Boulevard
Lemon Grove, California 91945
(619) 582-4992 FAX (619) 582-7428
DWG. FILE: L:\PROJECTS\0658\Admin\Hydro\02 MAPS\H1.dwg

THOMAS A. JONES R.C.E. 34867 DATE 06-58 JOB NO.

REGISTERED PROFESSIONAL ENGINEER THOMAS A. JONES 34867 EXP. 6-30-11 CIVIL STATE OF CALIFORNIA

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	13 SHEETS

SAN MIGUEL TRAINING FACILITY
11880 CAMPO RD. SPRING VALLEY, CA 91978
CALIFORNIA COORDINATE INDEX 210-1785

APPROVED
DIRECTOR OF PUBLIC WORKS
BY:

ENGINEER OF WORK
THOMAS A. JONES R.C.E. 34867 DATE

L-15514
GRADING PERMIT NO:

COUNTY APPROVED CHANGES

NO.	DESCRIPTION:	APPROVED BY:	DATE:

BENCH MARK

DESCRIPTION: ELEVATIONS ARE REFERENCED TO NAVD88 AND ARE BASED ON THE ELEVATION OF STATION 161WCCS1 OF 330.552 FT.

BDS ENGINEERING, INC. 6859 FEDERAL BOULEVARD
LEMON GROVE, CALIFORNIA 91945
(619) 582-4992

PRE DEVELOPMENT HYDROLOGY MAP

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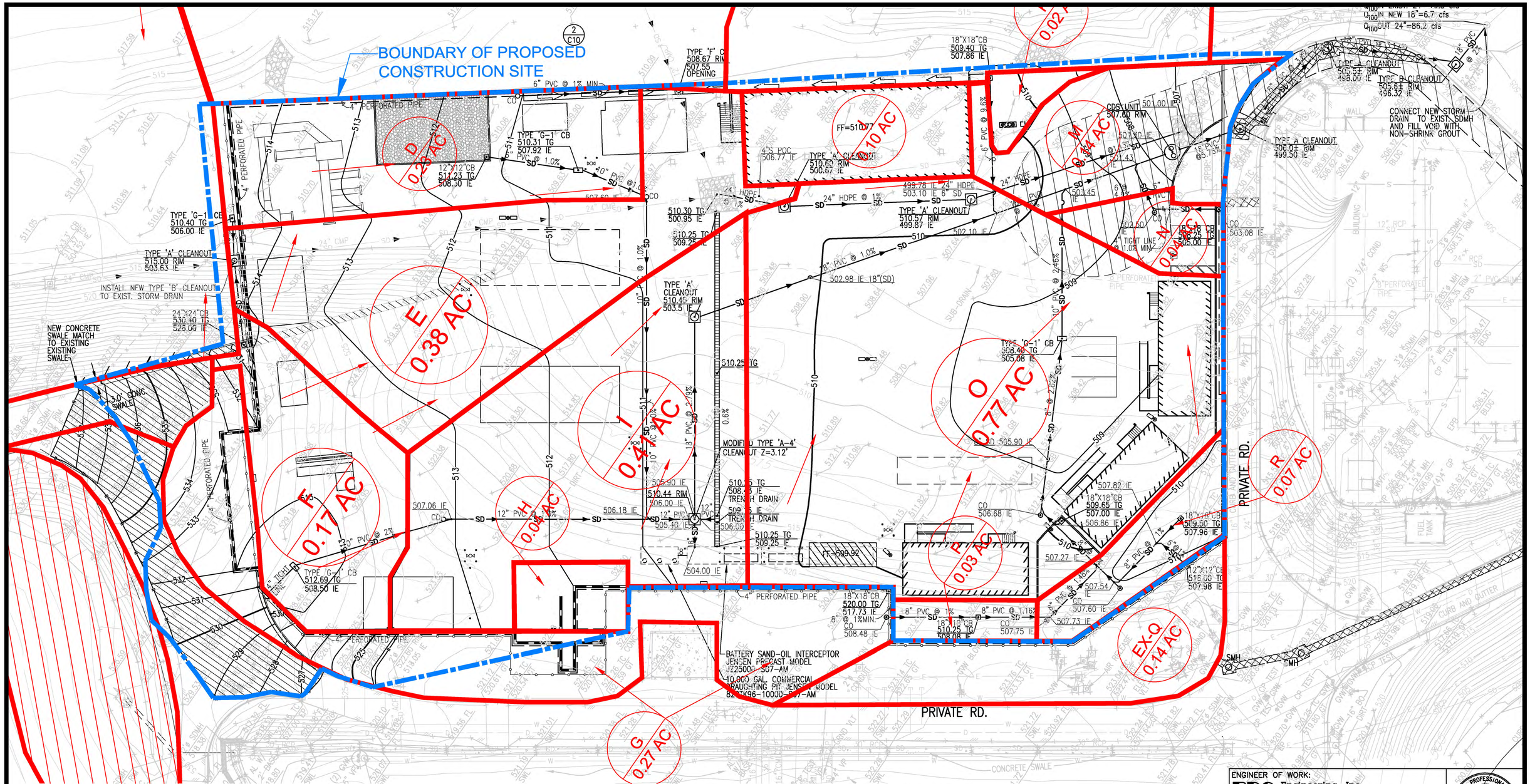

PRELIMINARY NOT FOR CONSTRUCTION

GRAPHIC SCALE

0 5' 10' 20' 40' 60'

SCALE: 1" = 20'

N

SCALE 1"=20'

COUNTY APPROVED CHANGES			
NO.	DESCRIPTION:	APPROVED BY:	DATE:

BENCH MARK

DESCRIPTION: ELEVATIONS ARE REFERENCED TO NAVD88 AND ARE BASED ON THE ELEVATION OF STATION 161WCCS1 OF 330.552 FT.

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Civil Engineering
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6859 Federal Boulevard
Lemon Grove, California 91945
(619) 582-4992 FAX (619) 582-7428
DWG. FILE: L:\PROJECTS\0658\Admin\Hydro\02 MAPS\H2.dwg

REGISTERED PROFESSIONAL ENGINEER THOMAS A. JONES 34867 Exp. 12-30-11 CIVIL STATE OF CALIFORNIA

THOMAS A. JONES R.C.E. 34867 DATE JOB NO. 06-58

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	13 SHEETS

SAN MIGUEL TRAINING FACILITY
11880 CAMPO RD. SPRING VALLEY, CA 91978

CALIFORNIA COORDINATE INDEX 210-1785

APPROVED DIRECTOR OF PUBLIC WORKS BY:

ENGINEER OF WORK THOMAS A. JONES R.C.E. 34867 DATE

L-15514
GRADING PERMIT NO:

BDS ENGINEERING, INC. 6859 FEDERAL BOULEVARD
LEMON GROVE, CALIFORNIA 91945
(619) 582-4992

POST DEVELOPMENT HYDROLOGY MAP

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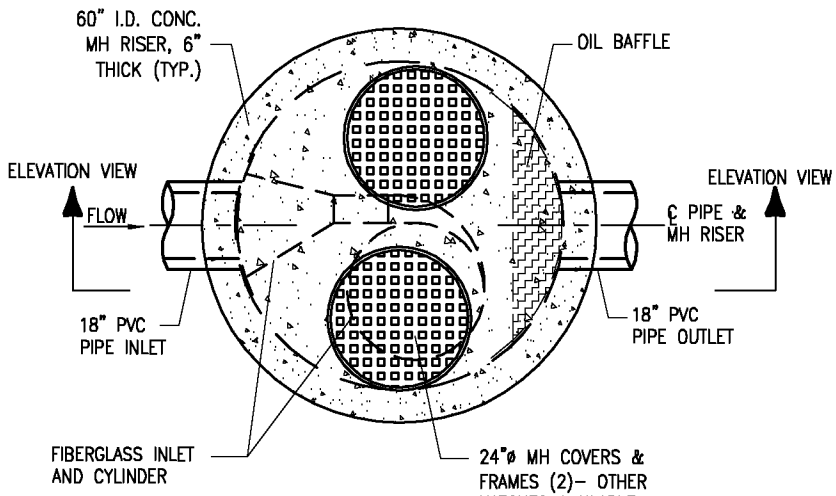
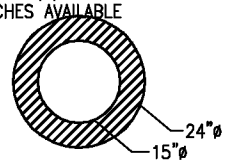
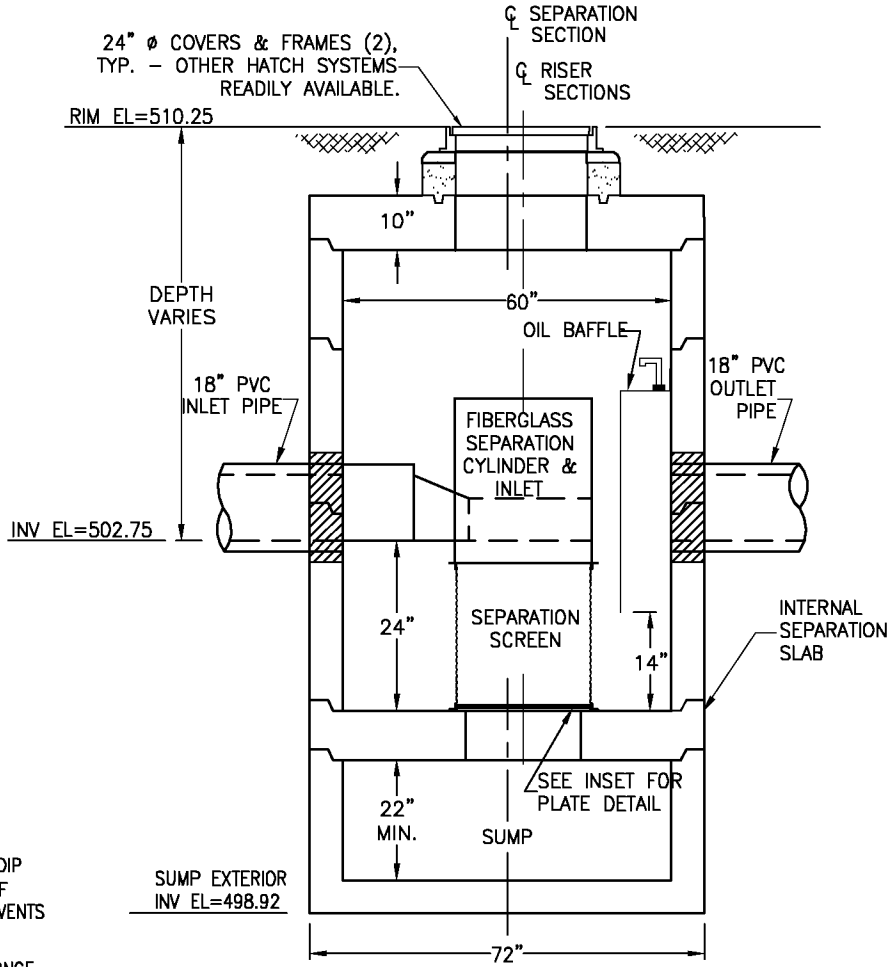


PLAN VIEW



11 GA. STAINLESS STEEL SEPARATION PLATE



ELEVATION VIEW

MAINTENANCE NOTES

NEW INSTALLATION – CHECK THE CONDITION OF THE UNIT AFTER EVERY RUNOFF FOR THE FIRST 30 DAYS. CHECKING INCLUDES A VISUAL INSPECTION TO ASCERTAIN THAT THE UNIT IS FUNCTIONING PROPERLY AND MEASURING THE AMOUNT OF DEPOSITION THAT HAS OCCURRED IN THE UNIT. THIS CAN BE DONE WITH A "DIP STICK" THAT IS CALIBRATED SO THE DEPTH OF DEPOSITION CAN BE TRACKED. BASED ON THE BEHAVIOR OF THE UNIT RELATIVE TO STORM EVENTS, INSPECTIONS CAN BE SCHEDULED ON PROJECTIONS USING STORM EVENTS VS. POLLUTANT BUILDUP.

ONGOING OPERATION BY OWNER – DURING THE WET SEASON, THE UNIT SHOULD BE INSPECTED AT LEAST ONCE EVERY THIRTY DAYS. THE FLOATABLES SHOULD BE REMOVED AND THE SUMP CLEANED WHEN THE SUMP IS ABOVE 85% FULL. AT LEAST ONCE A YEAR, THE UNIT SHOULD BE PUMPED DOWN AND THE SCREEN CAREFULLY INSPECTED FOR DAMAGE AND TO ENSURE THAT IT IS PROPERLY FASTENED. IDEALLY, THE SCREEN SHOULD BE POWER WASHED FOR THE INSPECTION.

MAINTENANCE CYCLE BY OWNER – THE STANDARD MAINTENANCE CYCLE FOR A CDS DEVICE IS A MINIMUM OF ONCE A YEAR. MAINTENANCE MAY BE REQUIRED MORE FREQUENTLY DEPENDING ON THE POLLUTANT LOAD IN THE DRAINAGE. HOWEVER, IF THE ACTUAL POLLUTANT LOAD IS PROPERLY ESTIMATED, THE SUMP CAPACITY CAN BE ADJUSTED TO HOLD AN ANNUAL POLLUTANT LOAD.

THE CDS UNIT IS A CONFINED SPACE. PROPERLY TRAINED PEOPLE EQUIPPED WITH REQUIRED SAFETY GEAR WILL BE REQUIRED TO ENTER THE UNIT TO PERFORM THE DETAILED INSPECTION.

NOTES

UNIT SHALL HAVE OIL SORBENTS INSTALLED PER MANUFACTURERS SPECIFICATIONS.

1 / C5 CDS MODEL PMSU20_15, STORM WATER TREATMENT UNIT

NO SCALE

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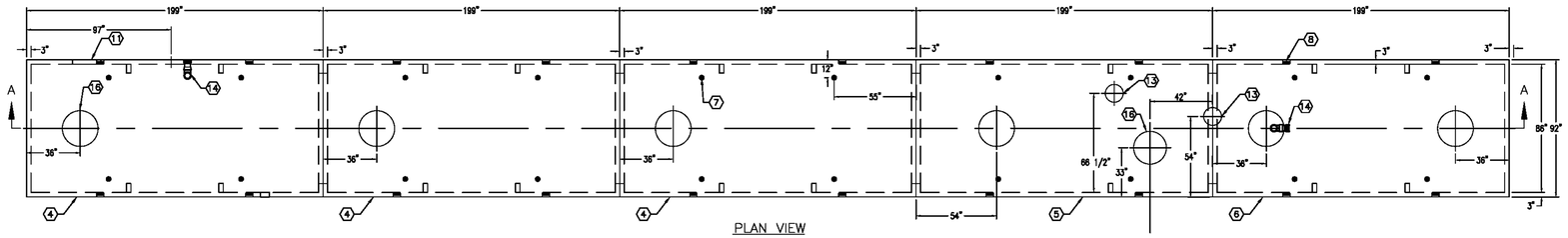
25,000 GALLON COMMERCIAL HOLDING TANK

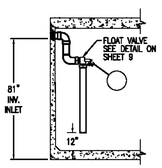
NOTES:

- DESIGNED IN ACCORDANCE WITH AASHTO H-20 TRAFFIC BRIDGE LOADING USING 4,000 PSI COMPRESSIVE STRENGTH CONCRETE AND 60,000 PSI YIELD STRENGTH GRADE 60 A-706 REINFORCEMENT.
- HOLDING TANK TO BE PLACED ON A 6" BASE OF CRUSHER RUN AND ADEQUATE FOUNDATION FOR EVEN LOAD DISTRIBUTION AND EASE OF INSTALLATION.
- 1'-0" MIN TO 4'-0" MAXIMUM EARTH COVER.
- LIQUID CAPACITY DOES NOT INCLUDE 9" OF AIR SPACE ABOVE FLOWLINES.
- PRODUCT TO BE MARKED "JENSEN PRECAST", "UPC", AND "5000 GA.", IMBED AS SHOWN ON INLET END WALL.

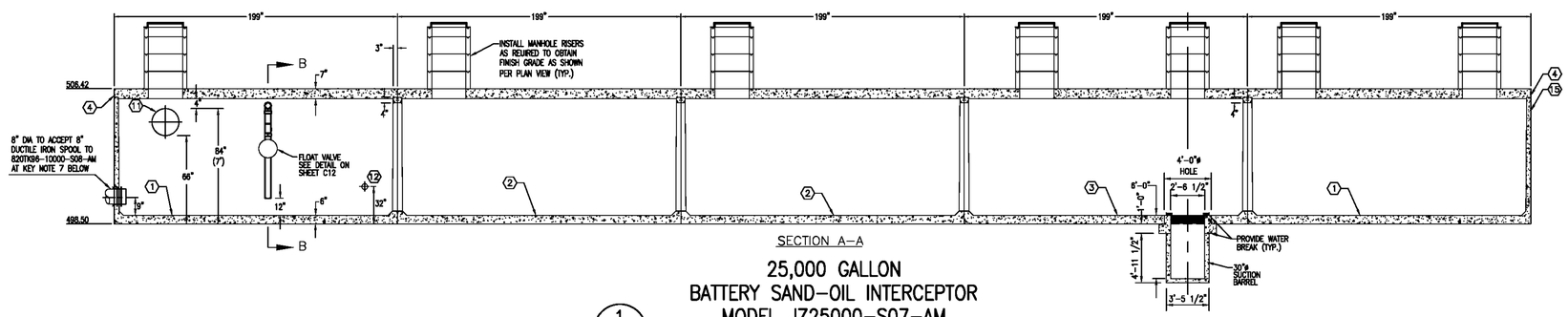
1. TKJZ5000-B-XOOO, 5000 GAL. BATTERY SECTION-XOOO, (CG-JT5000-BX) WT. 20,100 lbs. (2) REQ'D.
2. TKJZ5000-B-OOOO, 5000 GAL. BATTERY SECTION-OOOO, (CG-JT5000-BM-OOOO) WT. 18,500 lbs. (2) REQ'D.
3. TKJZ5000-B-OOXO, 5000 GAL. BATTERY SECTION-OOXO, (CG-JT5000-BM-OOXO) WT. 19,950 lbs.
4. CSJX2345-S07-AM-A, 5000 GALLON COVER SLAB (CG-CSJX2345-S07-AM-A) WT. 10,100 lbs. (3) REQ'D.
5. CSJX2345-S07-AM-B, 5000 GALLON COVER SLAB (CG-CSJX2345-S07-AM-B) WT. 10,100 lbs.
6. CSJX2345-S07-AM-C, 5000 GALLON COVER SLAB (CG-CSJX2345-S07-AM-C) WT. 10,100 lbs.
7. 4 TON SL ANCHORS x 4 3/4" FOR LIFTING. LOCATE AS FOLLOWS: TOP SLAB (4) SURFACE MTD.
8. 3/4" DIA. ROUND BAR FOR LIFTING. LOCATE AS FOLLOWS: BOTTOM SECTION (4) SURFACE MTD.
9. 5/8" DIA. x 2 3/8" FERRULE WING INSERT. LOCATE AS FOLLOWS: BOTTOM SECTION (8) SHELL MTD.
10. 5/8" DIA. FERRULE LOOP INSERT. LOCATE AS FOLLOWS: BOTTOM SECTION (8) SHELL MTD.
11. 22" DIA. HOLE FOR 18" DIAMETER PIPE. LOCATE AS FOLLOWS: BOTTOM SECTION (1) CORE MTD.
12. 6" DIA. HOLE FOR 4" DIAMETER PIPE. LOCATE AS FOLLOWS: BOTTOM SECTION (1) CORE MTD.
13. 12" DIA. HOLE. LOCATE AS FOLLOWS: COVER SLABS B & C.
14. 4" C3540M TERM (55-30-46). LOCATE AS FOLLOWS: BOTTOM SECTION (1) CORE MTD.; BAFFLE WALL (1) CORE MTD.
15. 8" C3580M TERM (55-30-46). LOCATE AS FOLLOWS: BOTTOM SECTION (1) CORE MTD.
16. 22" DIA. HOLE. LOCATE AS FOLLOWS: COVER SLABS B (1) CORE MTD.
17. 24" DIA. OPENING (10) REQUIRED WITH GROOVE.



PLAN VIEW



SECTION B-B



SECTION A-A

25,000 GALLON BATTERY SAND-OIL INTERCEPTOR MODEL JZ25000-S07-AM

1 / C11

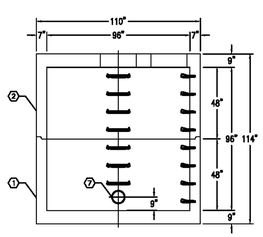
NO SCALE

10,000 GALLON COMMERCIAL DRAUGHTING PIT

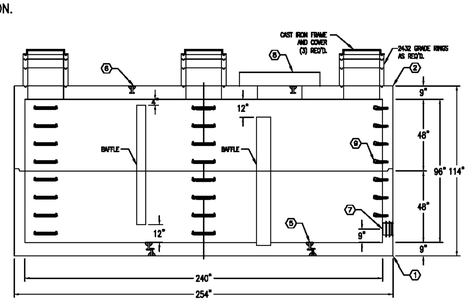
NOTES:

- DESIGNED IN ACCORDANCE WITH AASHTO H-20 TRAFFIC BRIDGE LOADING USING 4,000 PSI COMPRESSIVE STRENGTH CONCRETE AND 60,000 PSI YIELD STRENGTH GRADE 60 A-706 REINFORCEMENT.
- HOLDING TANK TO BE PLACED ON A 6" BASE OF CRUSHER RUN AND ADEQUATE FOUNDATION FOR EVEN LOAD DISTRIBUTION AND EASE OF INSTALLATION.
- 1'-0" MIN TO 4'-0" MAXIMUM EARTH COVER.
- LIQUID CAPACITY DOES NOT INCLUDE 9" OF AIR SPACE ABOVE FLOWLINES.
- PRODUCT TO BE MARKED "JENSEN PRECAST", "UPC", AND "5000 GA.", IMBED AS SHOWN ON INLET END WALL.

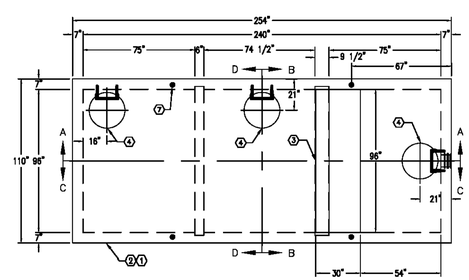
1. UVB20-B48-S07-AM 48" BOTTOM SECTION (RB20-B48-S07-AM), WT. 42,3000 lbs.
2. UVB20-T48-S07-AM, 48" TOP SECTION (RB20-T48-S07-AM), WT. 42,900 lbs.
3. 30" x 96" CLR. OPEN'G. LOCATE AS FOLLOWS: TOP SECTION (1) CORE MTD.
4. 24" DIA. CLR. OPEN'G. LOCATE AS FOLLOWS: TOP SECTION (3) CORE MTD.
5. 8 TON x 6 3/4" GALV. RISS LIFTER. LOCATE AS FOLLOWS: BOTTOM SECTION (4) CORE MTD.
6. 8 TON x 13 3/8" GALV. RISS LIFTER. LOCATE AS FOLLOWS: BOTTOM SECTION (4) SURFACE; TOP SECTION (4) SURFACE MTD.
7. 8" DIA. TERM. LOCATE AS FOLLOWS: BOTTOM SECTION (1) CORE MTD.
8. 54" x 96" x 9" THICK TRAFFIC RATED SLAB SET ON WATERPROOF GASKET.
9. POLYPROPYLENE STEPS CAST-IN.



SECTION B-B



SECTION A-A



PLAN VIEW

10,000 GALLON COMMERCIAL DRAUGHTING PIT MODEL 820TK96-10000-S07-AM

2 / C11

NO SCALE

LICENSED ARCHITECT JEFFREY A. KATZ C018233 REN. 09/10/08 STATE OF CALIFORNIA

jeff katz ARCHITECTURE
6353 Del Cerro Boulevard San Diego, CA 92120
tel (619) 598-9177
www.jeffkatzarchitecture.com

PROJECT:

SAN MIGUEL FIRE DISTRICT REGIONAL TRAINING FACILITY

DESCRIPTION:	DATE:
BUILDING DEPT. SUBMITTAL	05/10/10

PROJECT NO:	06-58
APPROVED BY:	T.A.J.
CHECKED BY:	R.A.
DRAWN BY:	D.A.

SHEET TITLE: CIVIL DETAILS

SHEETS:

SHEET NUMBER: C11

ENGINEER OF WORK:
BDS Engineering, Inc.
Civil Engineering
Land Surveying
6859 Federal Boulevard
Lemon Grove, California 91945
(619) 582-4692 FAX (619) 582-7428
DWG. FILE: L:\PROJECTS\0658\Eng\Details\C11.dwg

THOMAS A. JONES R.C.E. 34867 DATE JOB NO. 06-58

REGISTERED PROFESSIONAL ENGINEER THOMAS A. JONES 34867 EXP. 6-30-11 CIVIL STATE OF CALIFORNIA

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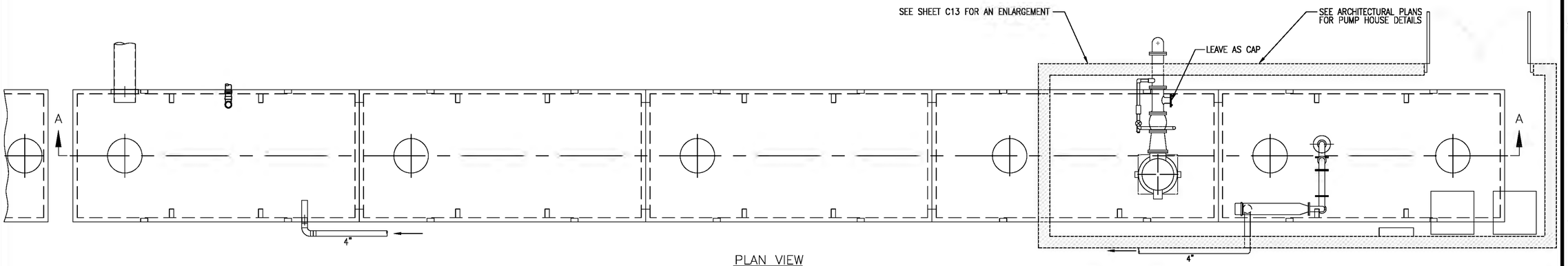
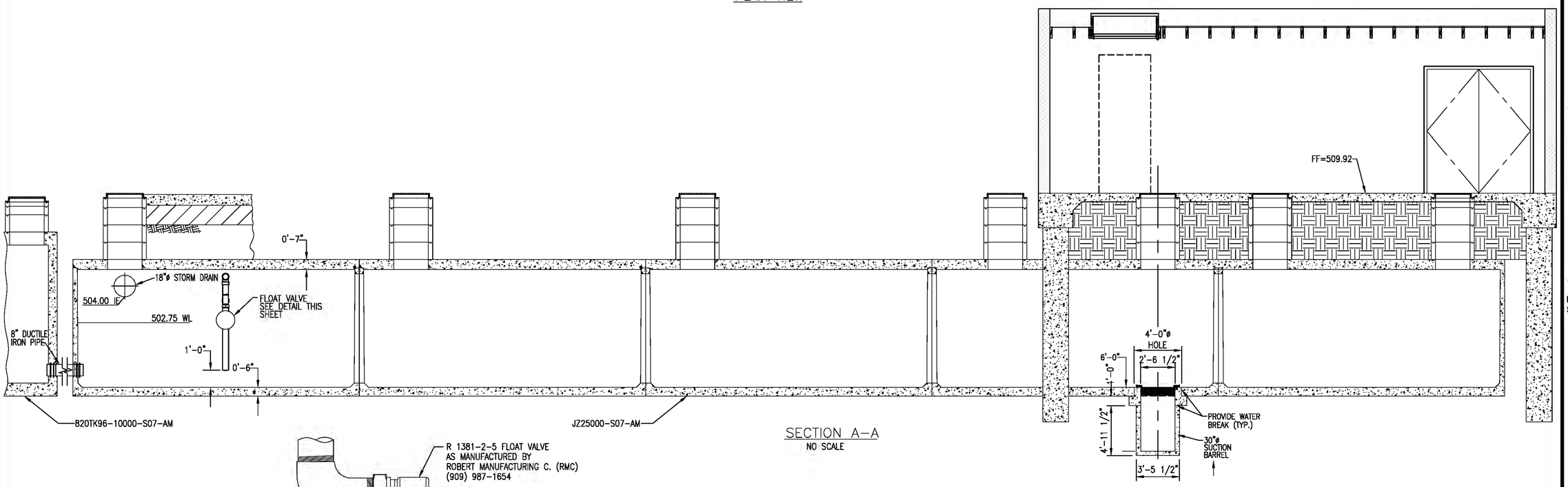


PLAN VIEW



SECTION A–A

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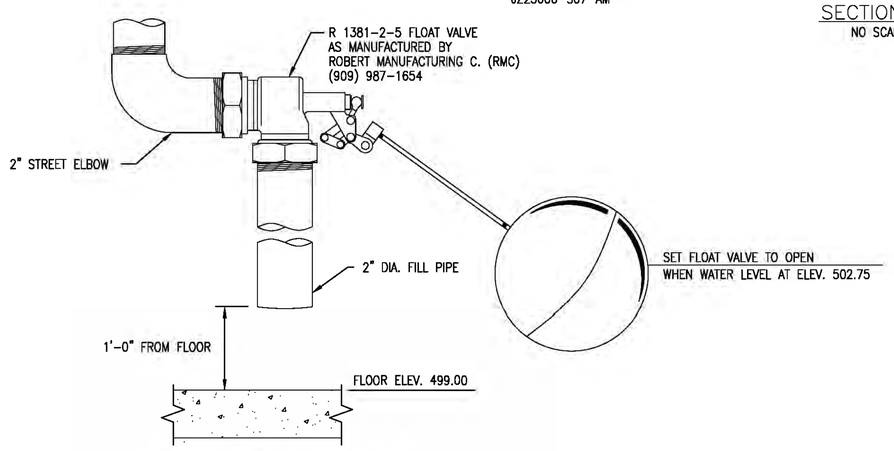

R 1381-2-5 FLOAT VALVE

NO SCALE

ENGINEER OF WORK:

BDS Engineering, Inc.
Civil Engineering
Land Surveying
6859 Federal Boulevard
Lemon Grove, California 91945
(619) 582-4992 FAX (619) 582-7428
DWG. FILE: L:\PROJECTS\0658\Eng\Onsite\C12.dwg

THOMAS A. JONES R.C.E. 34867 | DATE | 06-58 JOB NO.

REGISTERED PROFESSIONAL ENGINEER THOMAS A. JONES 34867 EXP. 6-30-11 CIVIL STATE OF CALIFORNIA

LICENSED ARCHITECT JEFFREY A. KATZ C018223 REN. 09/10/08 STATE OF CALIFORNIA

jeff katz ARCHITECTURE
6353 Del Cerro Boulevard San Diego, CA 92120
tel (619) 698-9177
www.jeffkatzarchitecture.com

CONSOLIDATED FIRE PROTECTION DISTRICT

PROJECT:

SAN MIGUEL FIRE DISTRICT REGIONAL TRAINING FACILITY

DESCRIPTION:	DATE:
BUILDING DEPT. SUBMITTAL	05/10/10

PROJECT NO:	06-58
APPROVED BY:	T.A.J.
CHECKED BY:	R.A.
DRAWN BY:	D.A.

SHEET TITLE: CIVIL DETAILS

SHEETS:

SHEET NUMBER: C12

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7/13/10

Storage Tank Volume

1) (5) 5,000 Gallon Tanks

Length $= \frac{199'' \times 5}{12} = 82.92'$

Width $= \frac{86''}{12} = 7.17'$

Depth $= 505.34 - 502.75 = 3.09'$

Volume$_1$ $= 82.92' \times 7.17' \times 3.09'$

Volume$_1$ $= 1837.12$ CF

2) 10,000 Gallon Tank

Length $= \frac{240''}{12} = 20'$

Width $= \frac{96''}{12} = 8'$

Depth $= 3.09'$

Volume$_2$ $= 20' \times 8' \times 3.09'$

Volume$_2$ $= 494.4$ CF

3) 10' of 18" Pipe

$R = 0.75'$

Area$_3$ $= \pi R^2 = \pi (0.75^2) = 1.767$ SF

Volume$_3$ $= 10' \times 1.767$ SF $= 17.67$ CF

4) Total Volume

Volume$_{Total}$ $= 1837.12 + 494.4 + 17.67 = \boxed{2349.19 \text{ CF}}$

5) Rainfall Treatment

Drainage Area $= 48,468$ SF

Rainfall $= \frac{2349.19 \text{ CF}}{48468 \text{ SF}} = .0485 \times \frac{12''}{1'} = \boxed{0.58''}$

7/13/10

Self Treating Areas - Hydroseed

Area 1 = 4781 SF

Area 2 = 880 SF

Area 3 = 595 SF

Total AREA = $\boxed{6,256 \text{ SF}}$

CDS UNIT

A = 2.64 AC
I = 0.2 INCH/HR
C = 0.83

$Q_{WQ} = CIA$

$= 0.83 \times 0.2 \times 2.64$

$\boxed{Q_{WQ} = 0.44 \text{ CFS}}$

The specified CDS UNIT can treat a maximum flow of 0.7 CFS which is less than the anticipated WQ flow.

NOT APPLICABLE

ATTACHMENT E

Geotechnical Certification Sheet

The design of stormwater treatment and other control measures proposed in this plan requiring specific soil infiltration characteristics and/or geological conditions has been reviewed and approved by a registered Civil Engineer, Geotechnical Engineer, or Geologist in the State of California.

_____ _____

Name Date

ATTACHMENT F

PERMANENT BMP MAINTENANCE PLAN FOR THE SAN MIGUEL TRAINING FACILITY

Designated Responsible Individual

The individual with direct responsibility for the maintenance of stormwater controls. This person shall be the designated contact with municipal inspectors and should sign self-inspection reports and any correspondence with the municipality regarding verification of inspections.

Name: _____

Phone: _____

Hydrodynamic Separator – CDS Unit

Maintenance, cleaning and removal of pollutants for the hydrodynamic separator are required on a routine and corrective basis to promote effective stormwater pollutant removal efficiencies and to keep pollutants from being re-suspended within the system. Maintenance shall be per the manufacturer's recommendations. A brief summary of maintenance frequencies and activities is provided in the table below.

Frequency	Activity
(2 per Year) Semiannual - at the beginning and end of the wet season	Floatables and sump should be cleaned when the sump is above 85% full.
(12+ per Year) Monthly or as needed	Inspect for sediment accumulation, trash and debris.
(1+ per Year) Annually or as needed needed	The unit should be pumped down and the screen carefully inspected for damage and to ensure that it is properly fastened.

ATTACHMENT G

Tracking Report

COUNTY OF SAN DIEGO
DEPARTMENT OF PUBLIC WORKS
POST-CONSTRUCTION TRACKING AND
INVENTORY REPORT

General Project Information

Permit Number L-15514 SWMP Category (Major/Minor) Major
Location / Address 11880 Campo Rd., Spring Valley, CA
Engineer of Work: Thomas A. Jones State Registration Number: 34867
Company Name: BDS Engineering, Inc.
Address: 6859 Federal Blvd., Lemon Grove, CA
Email Address: tjones@bdsengineering.com
Phone Number: 619-582-4992

Priority Development Project – Step 1: Commercial - Greater than 1 Acre

Percent Impervious Before Construction: % 4.5
Percent Impervious After Construction: % 88.3

Project Disturbed Area: 2.64 Acres

Hydromodification Management – Step 3:
Yes ☐ or No ☑

Primary or Secondary Pollutants of Concerns – Step 4 *(check all that apply)*

- ☐ Sediment
- ☐ Nutrients
- ☐ Organic Compounds
- ☐ Bacteria and Viruses
- ☑ Trash and Debris
- ☐ Oxygen Demanding Substances
- ☐ Oil and Grease
- ☐ Pesticides

Project Specific Site Design, LID and Source Control BMPs

All selected Site Layout Strategies, LID, and Source Control BMPs must be shown on the Plan.

Site Layout Strategies – Step 5 *(check all that apply)*

- ☑ Limitation of Development Envelope
- ☐ Minimization of imperviousness
- ☐ Setbacks from creeks, wetlands, and riparian habitats
- ☑ Preservation of Natural Drainages
- ☐ Using drainage as a design element

Disperse Runoff from Impervious Surfaces to Pervious – Step 5 *(check all that apply)*

- ☐ Street and Road Design
- ☐ Driveway, Sidewalk, Bikepath Design
- ☐ Landscape Design
- ☐ Parking Lot Design
- ☐ Building Design
- ☑ Direct Runoff to Treatment BMP(s)

Source BMPs – Step 6 *(check all that apply)*

- ☑ Stormdrain Signage and Stenciling
- ☐ Trash Storage Areas
- ☐ Private Road Drainage System
- ☐ Dock Areas
- ☐ Vehicle Wash Areas
- ☐ Equipment Wash Areas
- ☐ Fueling Areas
- ☐ Outdoor Storage Areas
- ☐ Efficient Landscape Irrigation Design
- ☐ Residential Driveways & Guest Parking
- ☐ Maintenance Bays
- ☐ Outdoor Processing Areas
- ☐ Parking Areas

Post-construction Treatment Control BMP Information

Responsible Party for Maintenance – Step 8:
Name _____Phone Number (___) _____
Street Number _____Street Name _____
City _____ State _____Zip_____
Email Address: _____

Project Maintenance Category (1, 2, 3 or 4): 2__

Project Specific Treatment Control BMPs

BMP Identifier*	BMP Type	BMP Pollutant of Concern Efficiency (H,M,L) – Table 11	Final Construction Date *(to be completed by County inspector)*	Final Construction Inspector Name *(to be completed by County inspector)*
CDS Unit	TC - BMP	High		

* For location of BMP's, see approved Record Plan dated _____, plan sheet ____.

Record Plan Certification

I certify that the above items for this project are in substantial conformance with the approved plans. Yes ☐ or No ☐

Please sign your name and seal. [SEAL]

Print Name: _____

Sign Name: _____

ATTACHMENT H

Addendum

NOISE LETTER FOR SAN MIGUEL CONSOLIDATED FIRE PROTECTION DISTRICT REGIONAL EMERGENCY TRAINING FACILITY

Prepared for:

Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, California 91978-2096
(619) 670-2222

Prepared by:

ICF Jones & Stokes
1 Ada, Suite 100
Irvine, CA 92618
(949) 333-6600

Mike Greene, INCE Bd. Cert.

~~October 7~~January 19, ~~2009~~2010

GLOSSARY OF TERMS AND ACRONYMS

dBA	A-weighted sound level
District	San Miguel Consolidated Fire Protection District
HTFA	Heartland Training Facility Authority
HVAC	Heating, Ventilation, Air Conditioning
L_{eq}	equivalent sound level
mph	miles per hour
NSLU	Noise-Sensitive Land Use
OWD	Otay Water District
project	San Miguel Regional Emergency Training Facility
RESTC	Regional Emergency Services Training Center

EXECUTIVE SUMMARY

This Noise Letter summarizes the results of a focused noise analysis conducted for the San Miguel Regional Emergency Training Facility (project). The project will be a Regional Emergency Services Training Center (RESTC) established in partnership with the Otay Water District (OWD), the San Miguel Consolidated Fire Protection District (District), and the Heartland Training Facility Authority (HTFA). The RESTC has secured a long-term lease from the OWD for a 3.5-acre portion of the 70-acre OWD Regulatory Reservoir property on which the facility will be located. This existing site will be co-used and cohabitated by the Otay Water District. The location of the proposed site within the Regulatory Reservoir site and the proposed site plan are attached in the Exhibits section of this document. The project is located east of Campo Road, and north of Jamacha Road within an unincorporated area of San Diego County.

The noise analysis was conducted in response to a request from San Diego County Department of Planning and Land Use specialist comments (Noise Letter Request, P09-007: Ghio MUP Training Facility, July 10, 2009). As requested, the noise analysis was conducted by an approved County noise consultant and focused on determining compliance with the County Noise Ordinance Section 36.404. The analysis utilized information provided by project sponsors, topographical and aerial maps, the manufacturer's spec sheet, and available data from the literature to evaluate the worst-case 1-hour noise generating operations and activities associated with the training facility.

Based upon the noise analysis conducted, the proposed training operations/activities (operations of fire trucks, ventilator, chainsaws, rescue tools, power equipment, air compressors, noise generating mechanical units, etc) will comply with the 1-hour average daytime sound level limit of 50 A-weighted decibels (dBA) and nighttime 45 dBA at the property line per County noise standards.

1.0 COUNTY NOISE ORDINANCE

The project is located in the County of San Diego. The San Diego County Code of Regulatory Ordinances (Title 3, Division 6, Chapter 4, Section 36.404, General Sound Level Limits) has established maximum noise levels at the boundary of various land uses for noise sources within its purview, such as stationary and other non-transportation–related noise sources (Table 1). Hourly sound levels in rural residential and agricultural zones are not to exceed 50 dBA between 7 a.m. and 10 p.m. or 45 dBA between 10 p.m. and 7 a.m.

Table 1. Sound Level Limits in Decibels (dBA)

Zone	Time	1-Hour Average Sound Level Limits (dBA)
1 RS, RD, RR, RMH, A70, A72, S80, S81, S87, S90, S92, and RV and RU with a density of less than 11 dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	50 45
2 RRO, RC, RM, S86, V5, and RV and RU with a density of 11 or more dwelling units per acre.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	55 50
3 S94, V4, and all commercial zones.	7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55
4 V1, V2 V1, V2 V1 V2 V3	7 a.m. to 7 p.m. 7 p.m. to 10 p.m. 10 p.m. to 7 a.m. 10 p.m. to 7 a.m. 7 a.m. to 10 p.m. 10 p.m. to 7 a.m.	60 55 55 50 70 65
5 M50, M52, and M54	Anytime	70
6 S82, M56, and M58.	Anytime	75
7 S88 (see subsection (c) below)		

Section 36.404, Sound Level Limits, states in part:

> (a) Except as provided in section 36.409 of this chapter, it shall be unlawful for any person to cause or allow the creation of any noise, which exceeds the one-hour average sound level limits in Table 36.404, when the one-hour average sound level is measured at the property line of the property on which the noise is produced or at any location on a property that is receiving the noise.

2.0 NOISE ANALYSIS METHODOLOGY

The following describes the methods used to assess noise levels from the project.

2.1 Information Gathering

In order to evaluate the noise from the worst-case 1-hour noise generating operations and activities associated with the training facility, Chief Augie Ghio was interviewed over the phone (Ghio 2009).

According to the information provided by Chief Ghio, because of the relatively small area of the training grounds, non-driver fire equipment training and driver training would not take place simultaneously.

Fire Equipment Training

Under the worst-case 1-hour scenario, three fire engines (pumping units) would be in a stationary position but under power (low idle and medium idle approximately 50 percent of the time for each) for 10 to 15 minutes at a time, while fire department crew are laying lines and other response scenarios. During this time, there could be as many as three pieces of power equipment (such as a rescue saw, a chain saw, and a jaws of life tool). The rescue saw and chain saw would operate for a maximum time of 1 minute or less, and the jaws of life tool would operate for a maximum time of 5 minutes (typically 3 to 5 minutes). These would be powered by portable Honda-powered generators.

The 10 to 15-minute session described above would take place two to three times during the 1-hour scenario, with intervals in between for critique and discussion, during which time no equipment would be operating.

Because of the fluid nature of the training and the relatively small size of the grounds, these activities could take place anywhere on site. At the tower location, up to two engines could be pumping (medium-idle). Similarly, at the backsplash wall, up to two engines could be pumping (medium-idle).

The worst-case 1-hour scenario described above would take place two to three times in the morning hours and two to three times in the afternoon hours.

Driver Training

Because of the relatively small size of the training grounds, driver training would not take place during the same hours as fire equipment training. Also because of the size of the training grounds, all driver training would take place in a slow-speed regime (i.e., 5 to 15 miles per hour [mph]). The training exercises would take place using a course set up with rubber cones or other markers, and would include a skills sequence such as driving a slow-speed serpentine path, backing practice, and executing a 3-point turn. Each of the skills sequences would take a maximum of 3 minutes (typically 2 to 3 minutes).

In the worst-case hour, a maximum of 6 such skills sequences (each 2 to 3 minutes in duration) would take place during the hour, with time in between for classroom-based training, critique, and discussion.

The worst-case 1-hour scenario described above would take place two to three times in the morning hours and two to three times in the afternoon hours.

In the case of both the driver training and the equipment training, no sirens or horns would be used during training exercises. Horns (short bursts) would only be utilized in case of an actual emergency in which personnel were injured.

Heating, Ventilation, Air Conditioning (HVAC) Equipment

HVAC equipment would be used for adequate comfort and ventilation of the classroom and office structures. These structures would be prefabricated units and would be smaller than a typical home. The HVAC equipment would be comparable to that used for standard residential units.

2.2 Noise Calculations

Utilizing the information provided above, a spreadsheet model (Microsoft Excel-based) was created, in which the major activity / noise-generating activities (fire equipment training, driver training, HVAC equipment) were grouped accordingly.

The spreadsheet data and resultant calculated noise levels are shown in Attachment A. The reference noise levels corresponding to the noise-generating equipment was obtained from manufacturer's specification data provided by San Miguel Fire District staff, as available. For equipment for which manufacturer's data was not available, noise emissions data was obtained from the noise reference literature. The source references are shown in the Attachment A spreadsheets, and the manufacturer's noise data is included as Attachment C.

The reference noise levels at the particular location of interest were calculated using standard propagation rates for "point sources" (i.e., 6 decibels per doubling of distance) (Harris 1991), as follows:

$L_A = L_{Aref} – 20*Log(r/r_{ref})$

In which L_A is the noise level at the location of interest, L_{Aref} is the reference emission level, r is the distance from the source to the location of interest, and r_{ref} is the reference distance. Modeled noise source locations and distances to the Project property line are shown in the figure contained in the Exhibits section of this noise letter.

The effects of molecular air absorption and anomalous excess attenuation would reduce the noise level from the noise sources at the rates of 0.7 dBA and 1.0 dBA per 1,000 feet, respectively.

Attenuation (insertion loss) from topographical shielding provided by the local terrain and the project's planned retaining walls was accounted for using the Fresnel Equation (Beranek 1971). The equation used and the input and output data are shown in Attachment B. The distances and elevations used for these calculations were derived from aerial images, site plans, grading plans, and topographical contours of the project site and vicinity.

The attenuation effects of molecular air absorption and anomalous excess attenuation would reduce the noise level from construction activities at more distant locations at the rates of 0.7 dBA and 1.0 dBA per 1,000 feet, respectively; thus, these were accounted for in the spreadsheet.

The maximum estimated duration and maximum number of occurrences of the individual noise sources during the worst-case hour was used to convert the (steady-state) noise level to an energy-averaged, 1-hour L_{eq} (equivalent sound level), which is the same noise metric used in the County noise ordinance. The 1-hour L_{eq} for the individual noise sources was then summed in the energy domain (logarithmically), to obtain the total 1-hour L_{eq} for each activity category (fire equipment training, driver training, HVAC equipment).

The combined noise levels of activity categories occurring concurrently (i.e., fire equipment training and HVAC equipment, and driver training and HVAC equipment) were also summed logarithmically.

2.3 Noise Analysis Locations

The noise spreadsheet calculations as described above were performed for five separate analysis locations. The five locations of interest were:

Case 1: Nearest Property Line, East of Project Site;

Case 2: Second-Nearest Property Line, South of Project;

Case 3: Nearest Noise-Sensitive Land Use (NSLU) (College, to Southeast);

Case 4: Second-Nearest NSLU (Residences, to Northwest); and

Case 5: Third-Nearest NSLU (Residences, to North)

According to Chief Ghio, the various training activities could take place at almost any particular portion of the project site (except for those areas at which permanent structures would be placed or constructed). Because of this, the analysis conservatively assumed that the noise sources would be located near the closest adjacent project limit line for each of the offsite analysis locations of interest. For example, for Case 1 it was assumed that the various training equipment would be located near the eastern edge of the project site, whereas for Case 5 it was assumed that the training equipment would located near the northern edge of the project site. The exception to this was the HVAC equipment, which would be located adjacent to the office/classroom area in the southern portion of the project site.

2.4 Potential Noise Impacts

The project could result in the exposure of existing or future NSLUs to increased noise levels from project operations. Adherence to the County's noise ordinance standards will ensure that noise impacts do not occur during site development. No new NSLUs are known or anticipated in the project vicinity.

Table 2 summarizes the noise analysis results, and compares them to the relevant noise standard. As shown in Table 2, none of the noise measurements

exceeded the applicable noise standards. For Case 1 (the nearest property line location), the combined noise level from fire equipment training activities and office/classroom HVAC was predicted to be 49 dBA L_{eq} during the worst-case hour for fire equipment training, and 45 dBA L_{eq} during driver training. At locations with exiting NSLUs, predicted worst-case, combined project noise levels range from 47 dBA L_{eq} at the college located to the southeast to 29 dBA L_{eq} at residences to the northwest.

Table 2. Data Summary: Fire Equipment Training, Driver Training, and HVAC Noise (Leq 1H dBA)

Case :	Fire Equipment Training Noise	Driver Training Noise	HVAC Noise	Combined (Fire Equipment plus HVAC) Noise	Combined (Driver Training plus HVAC) Noise	DPLU Daytime Noise Ordinance Standard Exceeded ?
1: Nearest Property Line, East of Project	49	45	27	49	45	No
2: 2nd-Nearest Property Line, South of Project	42	37	15	42	37	No
3: Nearest Noise-Sensitive Land Use (College, to Southeast)	47	43	10	47	43	No
4: 2nd-Nearest Noise-Sensitive Land Use (Residences, to Northwest)	29	25	4	29	25	No
5: 3rd-Nearest Noise-Sensitive Land Use (Residences, to North)	41	37	16	41	37	No

2.5 Mitigated Noise Impacts

No exceedances of the applicable noise limits are predicted based upon the noise modeling. Thus, no mitigation measures are required or proposed.

2.6 Conclusions

No significant noise impacts, either directly project related or cumulative, are anticipated as a result of the proposed project.

3.0 CERTIFICATION

I certify that I have conducted/supervised the calculations for this report. I concur with its methodologies, modeling results, conclusions, and recommendations.

Mike Greene, INCE Bd. Cert.
Jones & Stokes
1 Ada, Suite 100
Irvine, CA 92618

949/333-6617
mgreene@jsanet.com

4.0 REFERENCES

Beranek, Leo L., ed. 1971. Noise and Vibration Control. McGraw-Hill, Inc. New York, NY
Harris, Cyril M., ed. 1991. *Handbook of Acoustical Measurements and Noise Control.* Third Edition. New York: McGraw-Hill, Inc.

Telephone ,contact: Ghio, Chief Augie. September 1, 2009. Discussion of worst-case scenario equipment types, duration, locations.

San Diego County. 2009. Report Format and Content Guidelines, Noise. Land Use and Environment Group, Department of Planning and Land Use. San Diego, CA. Rev. January 27.

San Diego County. 2009. Noise Ordinance, Chapter 4, Noise Abatement and Control. (Ordinance Update No. 9962). Department of Planning and Land Use. San Diego, CA. Rev. January 7.

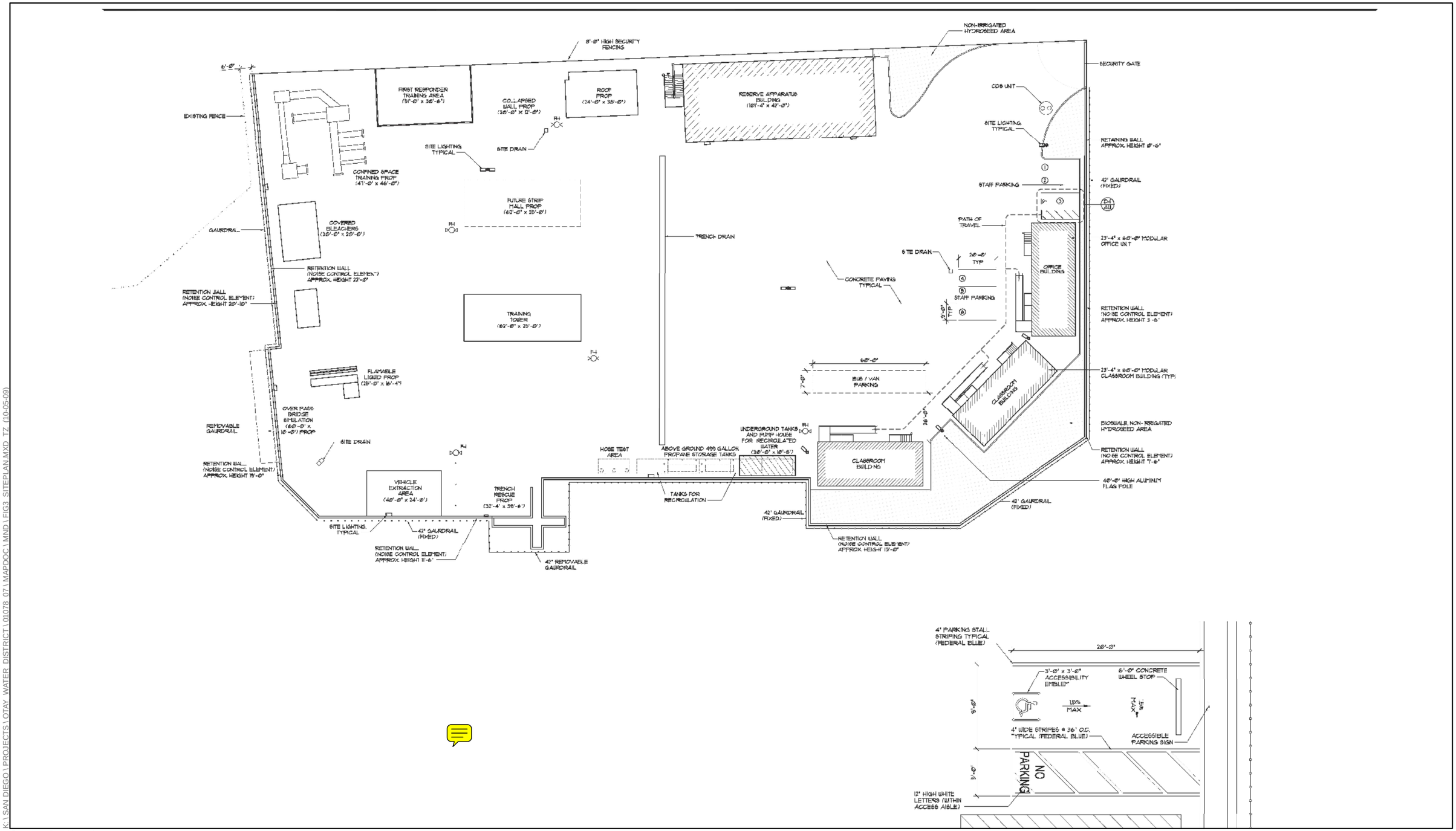
Harris, Cyril M., ed. 1991. *Handbook of Acoustical Measurements and Noise Control.* Third Edition. McGraw-Hill, Inc. New York, NY.

EXHIBITS (VICINITY MAP AERIAL PHOTO AND SITE PLAN)

K:\SAN DIEGO\PROJECTS\OTAY WATER DISTRICT\01078 07\MAPDOC\MND\FIG2 SITELOCATION.MXD TZ (10-07-09)

ICF INTERNATIONAL

Site Location
San Miguel Regional Training Facility



K:\SAN DIEGO\PROJECTS\OTAY WATER DISTRICT\01078 07\MAPDOC\MND\FIG3 SITEPLAN.MXD TZ (10-05-09)

Source: Jeff Katz Architecture

ICF INTERNATIONAL

Site Plan
San Miguel Regional Training Facility

K:\ SAN DIEGO \ PROJECTS \ OTAY WATER DISTRICT \ 01078 07 \ MAPDOC \ NOISE \ FIG5 NOISE.MXD TZ (01-04-10)

ICF Jones & Stokes
an ICF International Company

Modeled Noise Source Locations and Distances to Project Property Line
OWD Otay Mesa Recycled Water System

ATTACHMENT A: ONSITE NOISE CALCULATIONS

Case 1: Noise Levels at Nearest Property Line, East of Project

Fire Equipment Training													
Noise Source	Reference Noise Level (dBA)	Reference distance (ft)	Reference Noise Level Source	Distance to Receiver	Noise Level at Receiver (dBA)	Shielding Atten (dBA)	Excess Attenuation (dBA)	Mitigated Noise Level (dBA)	Level of Activity	Duration of Activity (Fraction of Hour)	Occurences / Hr.	Duration (min.s / hour) Total	L_{eq} Calculation (t/60)10^(L/10)*n
Fire Engine - Pumper (low/med idle)	80.0	25	a	475	54.4	10.6	0.8	43.0	50 % of time in 15-minute training, occu	0.13	3	22.50	38.8
Fire Engine - Pumper (high idle)	86.0	25	a	475	60.4	10.6	0.8	49.0	50 % of time in 15-minute training, occu	0.13	3	22.50	44.8
Fire Engine - Pumper (low/med idle)	80.0	25	a	475	54.4	10.6	0.8	43.0	50 % of time in 15-minute training, occu	0.13	3	22.50	38.8
Fire Engine - Pumper (high idle)	86.0	25	a	475	60.4	10.6	0.8	49.0	50 % of time in 15-minute training, occu	0.13	3	22.50	44.8
Fire Engine - Pumper (low/med idle)	80.0	25	a	475	54.4	10.6	0.8	43.0	50 % of time in 15-minute training, occu	0.13	3	22.50	38.8
Fire Engine - Pumper (high idle)	86.0	25	a	475	60.4	10.6	0.8	49.0	50 % of time in 15-minute training, occu	0.13	3	22.50	44.8
Saw	81.5	50	b	475	61.9	10.6	0.8	50.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	37.5
Generator	73.5	50	c	475	53.9	10.6	0.8	42.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	29.5
Power Equipment - Chain Saw	82.5	50	c	475	62.9	10.6	0.8	51.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	38.5
Generator	73.5	50	c	475	53.9	10.6	0.8	42.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	29.5
Power Equipment - Jaws of Life	68.0	3.28	c	475	24.8	10.6	0.8	13.4	5 minutes, occurs 3 times in 1-hour inte	0.08	3	15.00	7.4
Generator	73.5	50	c	475	53.9	10.6	0.8	42.5	5 minutes, occurs 3 times in 1-hour inte	0.08	3	15.00	36.5
										Calc'd L_{eq} (dBA)			**49.0**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**49.1**

Driver Training													
Fire Engine	87.0	25	a	475	61.4	10.6	0.8	50.0	1 vehicle, 3-min skills sequence, 6 time	0.05	6	3.00	44.8
										Calc'd L_{eq} (dBA)			**44.8**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**44.9**

HVAC Equipment													
Conventional home-style HVAC Unit	48.5	50	d	480	28.9	5.4	0.8	22.6	Continuous	1.00	1	60.00	22.6
Conventional home-style HVAC Unit	48.5	50	d	480	28.9	5.4	0.8	22.6	Continuous	1.00	1	60.00	22.6
Conventional home-style HVAC Unit	48.5	50	d	480	28.9	5.4	0.8	22.6	Continuous	1.00	1	60.00	22.6
										Calc'd L_{eq} (dBA)			**27.4**

Notes:
Primary Criteria - 50 dBA Leq 1-hour (daytime standard) at the property line
Information on types of equipment, level of activity and duration provided by Chief August Ghio on September 1, 2009 and reflect his estimation of what a worst-case loudest hour scenario would consist of.
References:
a - Harris, Cyril M. 1979. Handbook of Noise Control, Second Edition. Pg. 32-5. McGraw-Hill Book Company, NY

Case 2: Noise Levels at 2nd-Nearest Property Line, South of Project

Fire Equipment Training													
Noise Source	Reference Noise Level (dBA)	Reference distance (ft)	Reference Noise Level Source	Distance to Receiver	Noise Level at Receiver (dBA)	Shielding Atten (dBA)	Excess Attenuation (dBA)	Mitigated Noise Level (dBA)	Level of Activity	Duration of Activity (Fraction of Hour)	Occurences / Hr.	Duration (min.s / hour) Total	L_{eq} Calculation (t/60)10^(L/10)*n
Fire Engine - Pumper (low/med idle)	80.0	25	a	525	53.6	18	0.9	35.6	50 % of time in 15-minute training, occ	0.13	3	22.50	31.3
Fire Engine - Pumper (high idle)	86.0	25	a	525	59.6	18	0.9	41.6	50 % of time in 15-minute training, occ	0.13	3	22.50	37.3
Fire Engine - Pumper (low/med idle)	80.0	25	a	525	53.6	18	0.9	35.6	50 % of time in 15-minute training, occ	0.13	3	22.50	31.3
Fire Engine - Pumper (high idle)	86.0	25	a	525	59.6	18	0.9	41.6	50 % of time in 15-minute training, occ	0.13	3	22.50	37.3
Fire Engine - Pumper (low/med idle)	80.0	25	a	525	53.6	18	0.9	35.6	50 % of time in 15-minute training, occ	0.13	3	22.50	31.3
Fire Engine - Pumper (high idle)	86.0	25	a	525	59.6	18	0.9	41.6	50 % of time in 15-minute training, occ	0.13	3	22.50	37.3
Saw	81.5	50	b	525	61.1	18	0.9	43.1	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	30.1
Generator	73.5	50	c	525	53.1	18	0.9	35.1	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	22.1
Power Equipment - Chain Saw	82.5	50	c	525	62.1	18	0.9	44.1	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	31.1
Generator	73.5	50	c	525	53.1	18	0.9	35.1	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	22.1
Life	68.0	3.28	c	525	23.9	18	0.9	5.9	5 minutes, occurs 3 times in 1-hour int	0.08	3	15.00	-0.1
Generator	73.5	50	c	525	53.1	18	0.9	35.1	5 minutes, occurs 3 times in 1-hour int	0.08	3	15.00	29.1
										Calc'd L_{eq} (dBA)			**41.6**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**41.6**

Driver Training													
Fire Engine	87.0	25	a	525	60.6	18	0.9	42.6	1 vehicle, 3-min skills sequence, 6 time	0.05	6	3.00	37.3
										Calc'd L_{eq} (dBA)			**37.3**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**37.4**

HVAC Equipment													
Conventional home-style HVAC Unit	48.5	50	d	525	28.1	18.1	0.9	10.0	Continuous	1.00	1	60.00	10.0
Conventional home-style HVAC Unit	48.5	50	d	525	28.1	18.1	0.9	10.0	Continuous	1.00	1	60.00	10.0
Conventional home-style HVAC Unit	48.5	50	d	525	28.1	18.1	0.9	10.0	Continuous	1.00	1	60.00	10.0
										Calc'd L_{eq} (dBA)			**14.9**

Notes:
Primary Criteria - 50 dBA Leq 1-hour (daytime standard) at the property line
Information on types of equipment, level of activity and duration provided by Chief August Ghio on September 1, 2009 and reflect his estimation of what a worst-case loudest hour scenario would consist of.
References:
a - Harris, Cyril M. 1979. Handbook of Noise Control, Second Edition. Pg. 32-5. McGraw-Hill Book Company, NY
b - Manufacturer's equipment data provided by Pat Sumrow, San Miguel Fire District, July 30, 2009

Case 3: Noise Levels at Nearest Noise-Sensitive Land Use (College, to Southeast)

Fire Equipment Training													
Noise Source	Reference Noise Level (dBA)	Reference distance (ft)	Reference Noise Level Source	Distance to Receiver	Noise Level at Receiver (dBA)	Shielding Atten (dBA)	Excess Attenuation (dBA)	Mitigated Noise Level (dBA)	Level of Activity	Duration of Activity (Fraction of Hour)	Occurences / Hr.	Duration (min.s / hour) Total	L_{eq} Calculation (t/60)10^(L/10)*n
Fire Engine - Pumper (low/med idle)	80.0	25	a	805	49.8	8.9	1.4	40.9	50 % of time in 15-minute training, occu	0.13	3	22.50	36.7
Fire Engine - Pumper (high idle)	86.0	25	a	805	55.8	8.9	1.4	46.9	50 % of time in 15-minute training, occu	0.13	3	22.50	42.7
Fire Engine - Pumper (low/med idle)	80.0	25	a	805	49.8	8.9	1.4	40.9	50 % of time in 15-minute training, occu	0.13	3	22.50	36.7
Fire Engine - Pumper (high idle)	86.0	25	a	805	55.8	8.9	1.4	46.9	50 % of time in 15-minute training, occu	0.13	3	22.50	42.7
Fire Engine - Pumper (low/med idle)	80.0	25	a	805	49.8	8.9	1.4	40.9	50 % of time in 15-minute training, occu	0.13	3	22.50	36.7
Fire Engine - Pumper (high idle)	86.0	25	a	805	55.8	8.9	1.4	46.9	50 % of time in 15-minute training, occu	0.13	3	22.50	42.7
Saw	81.5	50	b	805	57.4	8.9	1.4	48.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	35.5
Generator	73.5	50	c	805	49.4	8.9	1.4	40.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	27.5
Power Equipment - Chain Saw	82.5	50	c	805	58.4	8.9	1.4	49.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	36.5
Generator	73.5	50	c	805	49.4	8.9	1.4	40.5	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	27.5
Power Equipment - Jaws of Life	68.0	3.28	c	805	20.2	8.9	1.4	11.3	5 minutes, occurs 3 times in 1-hour inte	0.08	3	15.00	5.3
Generator	73.5	50	c	805	49.4	8.9	1.4	40.5	5 minutes, occurs 3 times in 1-hour inte	0.08	3	15.00	34.4
										Calc'd L_{eq} (dBA)			**47.0**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**47.0**

Driver Training													
Fire Engine	87.0	25	a	805	56.8	8.9	1.4	47.9	1 vehicle, 3-min skills sequence, 6 time	0.05	6	3.00	42.7
										Calc'd L_{eq} (dBA)			**42.7**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**42.7**

HVAC Equipment													
Conventional home-style HVAC Unit	48.5	50	d	760	24.9	19.9	1.3	5.0	Continuous	1.00	1	60.00	5.0
Conventional home-style HVAC Unit	48.5	50	d	760	24.9	19.9	1.3	5.0	Continuous	1.00	1	60.00	5.0
Conventional home-style HVAC Unit	48.5	50	d	760	24.9	19.9	1.3	5.0	Continuous	1.00	1	60.00	5.0
										Calc'd L_{eq} (dBA)			**10.2**

Notes:
Primary Criteria - 50 dBA Leq 1-hour (daytime standard) at the property line
Information on types of equipment, level of activity and duration provided by Chief August Ghio on September 1, 2009 and reflect his estimation of what a worst-case loudest hour scenario would consist of.
References:
a - Harris, Cyril M. 1979. Handbook of Noise Control, Second Edition. Pg. 32-5. McGraw-Hill Book Company, NY

Case 4: Noise Levels at 2nd-Nearest Noise-Sensitive Land Use (Residences, to Northwest)

Fire Equipment Training

Noise Source	Reference Noise Level (dBA)	Reference distance (ft)	Reference Noise Level Source	Distance to Receiver	Noise Level at Receiver (dBA)	Shielding Atten (dBA)	Excess Attenuation (dBA)	Mitigated Noise Level (dBA)	Level of Activity	Duration of Activity (Fraction of Hour)	Occurences / Hr.	Duration (min.s / hour) Total	L_{eq} Calculation (t/60)10^(L/10)*n
Fire Engine - Pumper (low/med idle)	80.0	25	a	1425	44.9	21.6	2.4	23.3	50 % of time in 15-minute training, occ	0.13	3	22.50	19.0
Fire Engine - Pumper (high idle)	86.0	25	a	1425	50.9	21.6	2.4	29.3	50 % of time in 15-minute training, occ	0.13	3	22.50	25.0
Fire Engine - Pumper (low/med idle)	80.0	25	a	1425	44.9	21.6	2.4	23.3	50 % of time in 15-minute training, occ	0.13	3	22.50	19.0
Fire Engine - Pumper (high idle)	86.0	25	a	1425	50.9	21.6	2.4	29.3	50 % of time in 15-minute training, occ	0.13	3	22.50	25.0
Fire Engine - Pumper (low/med idle)	80.0	25	a	1425	44.9	21.6	2.4	23.3	50 % of time in 15-minute training, occ	0.13	3	22.50	19.0
Fire Engine - Pumper (high idle)	86.0	25	a	1425	50.9	21.6	2.4	29.3	50 % of time in 15-minute training, occ	0.13	3	22.50	25.0
Saw	81.5	50	b	1425	52.4	21.6	2.4	30.8	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	17.8
Generator	73.5	50	c	1425	44.4	21.6	2.4	22.8	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	9.8
Power Equipment - Chain Saw	82.5	50	c	1425	53.4	21.6	2.4	31.8	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	18.8
Generator	73.5	50	c	1425	44.4	21.6	2.4	22.8	1 minute, occurs 3 times in 1-hour inte	0.02	3	3.00	9.8
Life	68.0	3.28	c	1425	15.2	21.6	2.4	-6.4	5 minutes, occurs 3 times in 1-hour int	0.08	3	15.00	-12.4
Generator	73.5	50	c	1425	44.4	21.6	2.4	22.8	5 minutes, occurs 3 times in 1-hour int	0.08	3	15.00	16.8
										Calc'd L_{eq} (dBA)			**29.3**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**29.3**

Driver Training

Fire Engine	87.0	25	a	1425	51.9	21.6	2.4	30.3	1 vehicle, 3-min skills sequence, 6 time	0.05	6	3.00	25.1
										Calc'd L_{eq} (dBA)			**25.1**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**25.1**

HVAC Equipment

Conventional home-style HVAC Unit	48.5	50	d	1600	18.4	21.5	2.7	-3.1	Continuous	1.00	1	60.00	-3.1
Conventional home-style HVAC Unit	48.5	50	d	1600	18.4	21.5	2.7	-3.1	Continuous	1.00	1	60.00	-3.1
Conventional home-style HVAC Unit	48.5	50	d	1600	18.4	21.5	2.7	-3.1	Continuous	1.00	1	60.00	-3.1
										Calc'd L_{eq} (dBA)			**3.9**

Notes:
Primary Criteria - 50 dBA Leq 1-hour (daytime standard) at the property line
Information on types of equipment, level of activity and duration provided by Chief August Ghio on September 1, 2009 and reflect his estimation of what a worst-case loudest hour scenario would consist of.
References:
a - Harris, Cyril M. 1979. Handbook of Noise Control, Second Edition. Pg. 32-5. McGraw-Hill Book Company, NY
b - Manufacturer's equipment data provided by Pat Sumrow, San Miguel Fire District, July 30, 2009
c - Technical Memorandum on Noise from Contruction Work Other Than Percussive Pile Driving, Hong Kong Environmental Protction Department, accessed on 9/16/09: http://www.epd.gov.hk/epd/english/environmentinhk/nois
d - Manufacturer's equipment information, Carrier.

Case 5: Noise Levels at 3rd-Nearest Noise-Sensitive Land Use (Residences, to North)

Fire Equipment Training													
Noise Source	Reference Noise Level (dBA)	Reference distance (ft)	Reference Noise Level Source	Distance to Receiver	Noise Level at Receiver (dBA)	Shielding Atten (dBA)	Excess Attenuation (dBA)	Mitigated Noise Level (dBA)	Level of Activity	Duration of Activity (Fraction of Hour)	Occurences / Hr.	Duration (min.s / hour) Total	L_{eq} Calculation (t/60)10^(L/10)*n
Fire Engine - Pumper (low/med idle)	80.0	25	a	1800	42.9	8.1	3.1	34.8	50 % of time in 15-minute training, occu	0.13	3	22.50	30.5
Fire Engine - Pumper (high idle)	86.0	25	a	1800	48.9	8.1	3.1	40.8	50 % of time in 15-minute training, occu	0.13	3	22.50	36.5
Fire Engine - Pumper (low/med idle)	80.0	25	a	1800	42.9	8.1	3.1	34.8	50 % of time in 15-minute training, occu	0.13	3	22.50	30.5
Fire Engine - Pumper (high idle)	86.0	25	a	1800	48.9	8.1	3.1	40.8	50 % of time in 15-minute training, occu	0.13	3	22.50	36.5
Fire Engine - Pumper (low/med idle)	80.0	25	a	1800	42.9	8.1	3.1	34.8	50 % of time in 15-minute training, occu	0.13	3	22.50	30.5
Fire Engine - Pumper (high idle)	86.0	25	a	1800	48.9	8.1	3.1	40.8	50 % of time in 15-minute training, occu	0.13	3	22.50	36.5
Saw	81.5	50	b	1800	50.4	8.1	3.1	42.3	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	29.3
Generator	73.5	50	c	1800	42.4	8.1	3.1	34.3	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	21.3
Power Equipment - Chain Saw	82.5	50	c	1800	51.4	8.1	3.1	43.3	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	30.3
Generator	73.5	50	c	1800	42.4	8.1	3.1	34.3	1 minute, occurs 3 times in 1-hour inter	0.02	3	3.00	21.3
Power Equipment - Jaws of Life	68.0	3.28	c	1800	13.2	8.1	3.1	5.1	5 minutes, occurs 3 times in 1-hour inte	0.08	3	15.00	-0.9
Generator	73.5	50	c	1800	42.4	8.1	3.1	34.3	5 minutes, occurs 3 times in 1-hour inte	0.08	3	15.00	28.3
										Calc'd L_{eq} (dBA)			**40.8**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**40.8**

Driver Training													
Fire Engine	87.0	25	a	1800	49.9	8.1	3.1	41.8	1 vehicle, 3-min skills sequence, 6 time	0.05	6	3.00	36.5
										Calc'd L_{eq} (dBA)			**36.5**
Combined Noise Level (Including HVAC equipment)										**Combined Leq (dBA)**			**36.6**

HVAC Equipment													
Conventional home-style HVAC Unit	48.5	50	d	1850	17.1	6.5	3.1	10.6	Continuous	1.00	1	60.00	10.6
Conventional home-style HVAC Unit	48.5	50	d	1850	17.1	6.5	3.1	10.6	Continuous	1.00	1	60.00	10.6
Conventional home-style HVAC Unit	48.5	50	d	1850	17.1	6.5	3.1	10.6	Continuous	1.00	1	60.00	10.6
										Calc'd L_{eq} (dBA)			**15.5**

Notes:
Primary Criteria - 50 dBA Leq 1-hour (daytime standard) at the property line
Information on types of equipment, level of activity and duration provided by Chief August Ghio on September 1, 2009 and reflect his estimation of what a worst-case loudest hour scenario would consist of.
References:
a - Harris, Cyril M. 1979. Handbook of Noise Control, Second Edition. Pg. 32-5. McGraw-Hill Book Company, NY

ATTACHMENT B: BARRIER SHIELDING CALCULATIONS

SHIELDING ATTENUATION CALCULATIONS: RAY-TRACE PROGRAM (FOR A POINT-SOURCE)

Uses the Equation: $(A_{s4})_{point}$=20*log[(2*pi*N)$^{1/2}$/tanh(2*pi*N)$^{1/2}$]+5dB
(Ref. Pg.174, Noise and Vibration Control, L.L. Beranek Editor, 1971 Ed.

Project: San Miguel Training Facility
Date: 9/23/09
By: MGG

Please Enter: Using English (E) units or Metric (M) units ? **E**

Ray Trace Number/Description	Source-Receiver Distance (ft. or m)	Source Base Elev. (ft. or m)	Source Height above Ground (ft. or m)	Receiver Base Elev. (ft. or m)	Receiver Height above Ground (ft. or m)	Horizontal Barrier Dist. (in ref. to source) (ft. or m)	Barrier Base Elev. (ft. or m)	Barrier Height (ft. or m)	Dominant Freq.(Hz)	Source-Rcvr Straight-Line Dist. (ft. or m)	Source-Top-of-Barrier Dist. (ft. or m)	Receiver-Top-of-Barrier Dist. (ft. or m)	Lambda	N_{max}	$AE_{(barriers)}$ (dB)
1. Source (nearest training noise centroid) to nearest property line (east side)	475.0	510.0	8.0	565.0	5.0	330.0	565.0	**0.0**	500.0	477.8	333.3	145.1	2.3	0.5	**10.6**
2. Source (nearest training noise centroid) to 2nd-nearest property line location (south)	525.0	509.0	8.0	510.0	5.0	50.0	535.0	**0.0**	500.0	525.0	53.1	475.4	2.3	3.2	**18.0**
3. Source (nearest training noise centroid) to nearest noise-sensitive land use (college, to the southeast)	805.0	510.0	8.0	430.0	5.0	285.0	500.0	**0.0**	500.0	809.3	285.6	524.0	2.3	0.3	**8.9**
4. Source (nearest training noise centroid) to 3rd-nearest noise-sensitive land use (residences, to the northwest)	1425.0	513.0	8.0	600.0	5.0	1040.0	650.0	**0.0**	500.0	1427.5	1048.0	387.6	2.3	7.2	**21.6**
5. Source (nearest training noise centroid) to 4th-nearest noise-sensitive land use (residences, to the north)	1800.0	513.0	8.0	685.0	5.0	1660.0	685.0	**0.0**	500.0	1807.9	1668.1	140.1	2.3	0.2	**8.1**
1A. Source (HVAC noise centroid) to nearest property line (east side)	480.0	509.0	3.0	565.0	5.0	380.0	560.0	**0.0**	500.0	483.5	383.0	100.5	2.3	0.0	**5.4**
2A. Source (nearest HVAC noise centroid) to 2nd-nearest property line location (south)	522.0	509.0	3.0	510.0	5.0	350.0	535.0	**0.0**	500.0	522.0	350.8	173.2	2.3	1.7	**15.3**
3A. Source (nearest HVAC noise centroid) to nearest noise-sensitive land use (college, to the southeast)	760.0	509.0	3.0	430.0	5.0	380.0	520.0	**0.0**	500.0	763.9	380.1	389.4	2.3	5.0	**19.9**
4A. Source (nearest HVAC noise centroid) to 3rd-nearest noise-sensitive land use (residences, to the northwest)	1600.0	511.0	3.0	600.0	5.0	1330.0	650.0	**0.0**	500.0	1602.6	1336.9	273.7	2.3	7.2	**21.5**
5A. Source (nearest HVAC noise centroid) to 4th-nearest noise-sensitive land use (residences, to the north)	1850.0	511.0	3.0	685.0	5.0	1750.0	685.0	**0.0**	500.0	1858.4	1758.3	100.1	2.3	0.1	**6.5**

500.0

MANUFACTURER'S NOISE SPECIFICATIONS / NOISE EMISSIONS DATA

(GENERATOR)

Premium YG6600DE

Type	Brushless, AVR AC Generator
Rated Voltage	120V / 240V
AC Frequency	60 hz
Maximum AC Output	6600 watts
Rated AC Output	6000 watts
Rated / Maximum AC Current	50.0 / 55.0 amps @ 120V - 25.0 / 27.: 240V
Engine	OHV, Air-Cooled, Four-Stroke, Singl
Displacement / HP	357cc / 12 hp
Ignition System	T.C.I
Starting Method	Electric w/Auto Decompression
Overall Length	35.2"
Overall Width	20.5"
Overall Height	22.0"
Dry Weight	198 lbs.
Fuel Tank Capacity	5.5 gallons
Continuous Operation at 1/2 Rated Load	8.3 hrs.
Noise Level	73.5 dBA
Warranty	1 Years Limited Warranty

*Price and specifications subject to change without notice.
Please read your Owner's Manual and all labels before operation.

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Starter, enclosed transmission.

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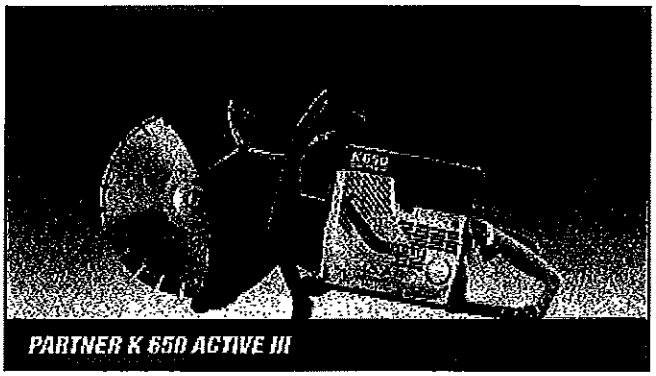

Features:
K 750 has our exclusive motor technology, DualCharge, which provides an extremely powerful motor producing 3.7 kW with low emissions and impressive fuel economy. In short, a cleaner and more efficient motor. The K 750 is also fitted with a large, effective muffler, and a newly developed vibration dampening system that provides an extremely quiet and easy-to-use machine
\

DualCharge
Motor with DualCharge provides better power, higher torque and 70% less emissions

DuraStarter™
Dust sealed starter with durable starter cord reduces the risk of downtime and increases reliability and service life.

SmartCarb™
Built-in automatic filter compensation, maintains high power and lowers fuel consumption

Active Air Filtration™
Centrifugal air cleaning in three stages increases service life and extends the intervals between services.

PARTNER K-750-30T

This lightweight saw only weighs 21.5 lbs. with a 5 hp engine. This is a great saw for forcible entry and has the power of the old K-12. Includes a 14" x 30tip carbide blade.

$1050.00

Specifications:

Engine	
Engine	Air-cooled 2 stroke engine
Power	5 hp
Cylinder displacement	4,5 cu.inch
Sound and noise	

Sound level 97 dB(A)
Sound power level, LWA113 dB(A)

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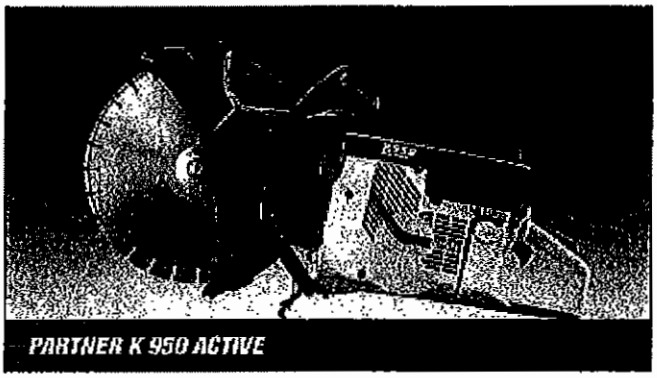

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Features: When you work with a Partner, you have all the benefits of the latest technology in your grasp. With the K960 Active, they have combined 40 years of experience with the latest advances, while always focusing on user ergonomics, safety and reliability.

The K-960 is the new replacement to the old K-1200 with added horse power from 4 to 6 hp. Weight without blade 21.8 lbs. Includes a 12" x 24tip carbide blade.

Specifications: 6.1 hp 2 cycle engine, blade diameter 12", Active Air Filtration, SmartCarb carburetor, Decompression relief valve, Dura Starter, enclosed transmission.

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(FOR JAWS OF LIFE)

Duo Pump Personal Power®

Developed to meet the demand for a compact and lightweight duo pump that is also capable of powering two rescue tools simultaneously. With a weight of only 25 kg (so it can be carried by one person), a low noise level of 68 dB(A) and LED lighting above the valve block, the DPU 31 PC

(THE ACTUAL "JAWS" DO NOT GENERATE SUBSTANTIAL NOISE)

Read more

equipped with	CORE™
connection	2 tools
operation	2 tools, simultaneous
pump	2-stage axial pump
motor	petrol engine, 3.5 hp, 4-stroke, 2.6 kW
effective capacity oil tank	2490 cc
capacity fuel tank	1250 cc
output 1st stage up to 190 bar	2x 2800-3000 cc/min
output 2nd stage up to 720 bar	2 x 550-600 cc/min
hours of continuous operation	4 hrs
sound level at 1m distance	68 dB(A)
weight, ready for use	24.9 kg
working pressure	720 / 72 bar / MPa
temperature range	-20° – +55° °C
EN 13204	MTO
article number	150.152.180

http://www.epd.gov.hk/epd/english/environmentinhk/noise/guide_ref/tm_nonpp_4_3.html

Technical Memorandum on Noise from Construction Work Other (SEE NEXT PG)

[illegible]	[illegible]	[illegible]
CNP 001	Air compressor, air flow <= 10m^3/min	100
CNP 002	Air compressor, air flow > 10m^3/min and <= 30m^3/min	102
CNP 003	Air compressor, air flow > 30m^3/min	104
CNP 004	Asphalt paver	109
CNP 021	Bar bender and cutter (electric)	90
CNP 022	Batching plant	108
CNP 023	Breaker, hand-held, mass <= 10kg	108
CNP 024	Breaker, hand-held, mass > 10kg and < 20kg	108
CNP 025	Breaker, hand-held, mass >= 20kg and <= 35kg	111
CNP 026	Breaker, hand-held, mass > 35kg	114
CNP 027	Breaker, excavator mounted (pneumatic)	122
CNP 028	Breaker, excavator mounted (hydraulic)	122
CNP 029	Ballast tamper, hand-held (electric)	105
CNP 030	Bulldozer	115
CNP 041	Conveyor belt	90
CNP 042	Concrete corer	117
CNP 043	Chipper, hand-held (pneumatic)	112
CNP 044	Concrete lorry mixer	109
CNP 045	Concrete mixer (electric)	96
CNP 046	Concrete mixer (petrol)	96
CNP 047	Concrete pump, stationary/lorry mounted	109
CNP 048	Crane, mobile/barge mounted (diesel)	112
CNP 049	Crane, tower (electric)	95
CNP 050	Compactor, vibratory	105
CNP 061	Derrick barge	104
CNP 062	Dredger, chain bucket	118
CNP 063	Dredger, grab	112
CNP 064	Drill, percussive, hand-held (electric)	103
CNP 065	Drill/grinder, hand-held (electric)	98
CNP 066	Dumper	106
CNP 067	Dump truck	117
CNP 081	Excavator/loader, wheeled/tracked	112
CNP 101	Generator, standard	108
CNP 102	Generator, silenced, 75 dB(A) at 7 m	100
CNP 103	Generator, super silenced, 70 dB(A) at 7 m	95
CNP 104	Grader	113
CNP 121	Hoist, passenger/material (pneumatic)	108
CNP 122	Hoist, passenger/material (electric)	95
CNP 123	Hoist, passenger/material (petrol)	104
CNP 141	Lorry	112
CNP 161	Paint line marker	90
CNP 162	Piling, diaphragm wall, bentonite filtering plant	105
CNP 163	Piling, diaphragm wall, hydraulic extractor	90

CNP 164	Piling, large diameter bored, grab and chisel	115
CNP 165	Piling, large diameter bored, oscillator	115
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CNP 170	Poker, vibratory, hand-held	113
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CNP 281	Water pump (electric)	88
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Sound Power Level, Sound Pressure Level

Per pg.1.12, Harris, Handbook of Acoustical Noise Measurements and Noise Control:

Lp=Lw-20*Log(R)-10.9+C, in meters - true for spherical spreading

Per Diehl, pg. 80:

Lp=Ld=Lw-20*Log(R)+2.5, in feet - true for a free field above a reflecting plane.

Lp =Lw-20*Log(R)-0.5, in feet - in a free field without a reflecting plane

Per Black and Veatch spreadsheet:

Lp=Lw-10*Log(2PiR^2)

	Test Lw (dBA)	Test R (Ft)	Harris (Spherical Spreading): Lp (dBA)	Diehl (Reflecting Plane): Lp (dBA)	Diehl (without Reflecting Plane): Lp (dBA)	Black and Veatch: Lp (dBA)
Partner Rescue Saw	113.0	50.0	78.4	81.5	78.5	81.4
Chain Saw	114.0	50.0	79.4	82.5	79.5	82.4
Typical Standard HVAC	80.0	50.0	45.4	48.5	45.5	48.4
Carrier Quieter Unit	74.0	50.0	39.4	42.5	39.5	42.4
Ventilation Fan	108	50.0	73.4	76.5	73.5	76.4

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Handbook of Noise Control

SECOND EDITION

Edited by

CYRIL M. HARRIS, Ph.D.

Charles Batchelor Professor of Electrical Engineering
and
Professor of Architecture
Columbia University

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as Naomi Auerbach, and the production supervisor
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Graphics, Inc.
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ARNOLD P. G. PETERSON, SC.D., *Senior Principal Engineer; GenRad, AVA Division, Bolton, MA 01740*

the time of day, among other factors. In the assessment of highway noise by calculation, it is acceptable and convenient to assume that there are two main categories of vehicles, i.e., heavy trucks (including buses) and automobiles (including light trucks). The errors resulting from this assumption are generally less than those inherent in the calculation process. The noise characteristics of these two classes of vehicles are required to calculate highway noise levels.

TABLE 32.2 Determination of Day-Night Average Sound Level L_{dn} from the 24-Hour Average Sound Level L_{24h}

If the percentage of 24-hour traffic passing during daytime hours is	Then add this number to L_{24h} to determine L_{dn}
100%	0 dB
95	1.5
90	3
85	3.5
80	4.5
70	5.5
60	6.5
50	7.5
40	8

Trucks The noise produced by a truck on the highway is a function of its mode of operation. Therefore, a complete description of truck noise requires a knowledge of the typical truck duty-cycle and the sound levels produced by the truck in each part of the cycle. With this information, a method for estimating truck noise emission can be established.

Truck noise can be considered as being produced by two major, mutually independent sources—the propulsion system and the tires. Here the propulsion system includes the engine, exhaust, intake, fan, and other auxiliary equipment in the engine compartment. Propulsion system noise depends on the engine speed for the operation of the truck in each gear. Figure 32.4a shows the relationship between the A-weighted sound level and the engine speed; this relationship is independent of vehicle speed. The overall range of the sound level throughout the acceleration in a given gear can be 20 dB or more, but under typical road conditions the range will be much less then this—more on the order of 10 dB. The maximum sound level in each case is associated with maximum engine rpm.

Figure 32.4b shows the variation in the A-weighted sound level produced by an accelerating vehicle as a function of vehicle speed. There is no relationship between the sound level and the vehicle speed except indirectly via the gear ratio, with the result that the sound level produced by the propulsion system is effectively independent of the vehicle speed.

Tire noise results from the interaction of the tires with the road surface. It is due to a

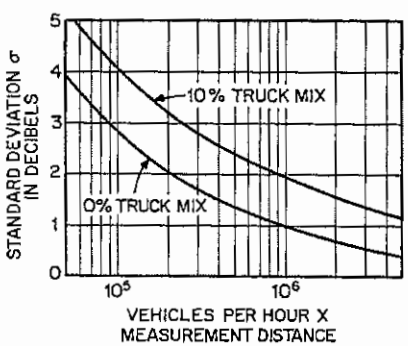

Fig. 32.2 Standard deviation of highway noise levels for a vehicle speed of 80 km/hr (50 mph).

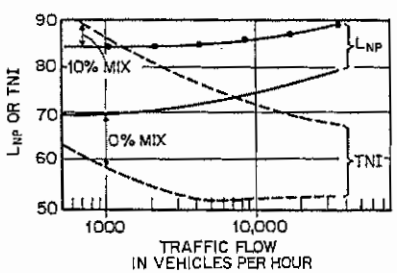

Fig. 32.3 The variation of noise pollution level L_{NP} and traffic noise index TNI with traffic flow.

combination of carcass vibration and the entrapment and subsequent release of air from the tread cavities. Therefore, the sound levels are related to the vehicle speed. The rate of increase of the A-weighted sound level with vehicle speed is approximately the same for most types and designs of tires, and is approximately 10 to 12 dB(A) per doubling of speed.

Since the maximum noise from the propulsion system is constant with vehicle speed, but tire noise increases with vehicle speed, there is a speed above which the tire noise becomes predominant. The sound level produced by the tires at any given speed is a function of the tire construction; this critical speed therefore varies from truck to truck according to the type and number of tires on the vehicle, including the trailer. Usually, however, the critical speed is greater than about 48 km/hr (30 mph), so that at lower speeds the overall sound level of truck noise is dominated by the contribution from the propulsion system.

In addition to parameters such as vehicle speed and rpm of the engine, the noise produced by a truck also depends on the rated load it is designated to haul. A truck designed to haul large loads requires a more powerful engine than one designed for smaller loads, if it is to maintain flexibility in its operation on the highway. There is no exact relationship between maximum engine horsepower and the associated sound level because of the complex relationship of both quantities with the engine size and the engine speed, and the effects of adding turbochargers, etc. For example, a more powerful engine may (under some circumstances) produce less noise than one of its less powerful

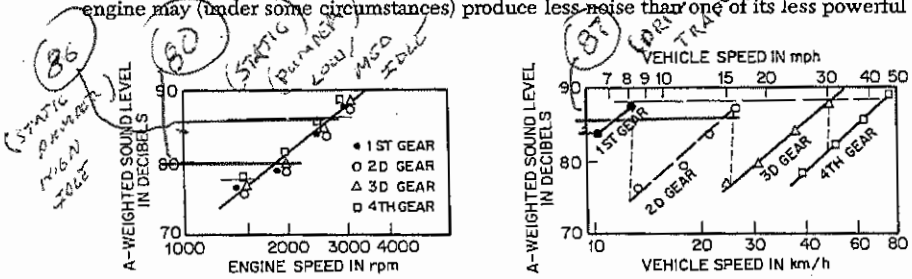

Fig. 32.4 (a) Diesel truck noise as a function of vehicle engine speed in rpm. (b) Diesel truck noise level as a function of vehicle speed. All measurements at a distance of 7.5 m (25 ft).[1]

counterparts. The sound level produced by a truck also depends, to some extent, on its maintenance—particularly with regard to its exhaust system—which further complicates the relationship with horsepower. There is a general changeover from the quieter gasoline engines to the noisier diesel engines with increasing load-carrying capability, so that the overall effect is a trend toward higher noise levels with higher rated loads.

For a given truck, the effect of different payloads on the noise produced depends upon the mode of operation. Under full acceleration, the engine is working under load; an increase in the payload simply lengthens the time taken for the truck to reach a given road speed, but does not affect the maximum sound level significantly. At a constant speed on a level road, the sound level varies slightly with payload, because the load on the engine under this condition is provided (to a large extent) by the rolling resistance which depends upon the axle loading. The only condition where a major change in sound level may be expected due to an increase in payload is on an uphill grade where an increased torque is required to counteract the increased component of the truck weight. However, it is usual for truck drivers to operate at maximum horsepower, i.e., at the rated engine speed, whenever possible, so that an increase in payload normally results in a lower vehicle speed and not necessarily a higher sound level. This typical driving characteristic thus significantly reduces the effect of payload on the sound levels of trucks.

Truck Noise Levels The Society of Automotive Engineers SAE Standard J366b[2] is used in the U.S.A. for measuring the noise emission levels of trucks. This test procedure is described in Appendix 42.1. The sound levels measured during typical operation on a highway are generally slightly lower than those produced by this standard test procedure. The results of many noise measurements[3,4] show the following approximate relationships for the mean A-weighted sound level (averaged on a power basis over the population of trucks) as a function of truck speed:

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Performance Cooling BTUH①	23000	23000
Indoor Airflow (CFM)	725	725
Power Input (KW)	2.162	2.162
EER/SEER (BTU/Watt-Hr.)	11.0 / 13.0	11.0 / 13.0
Sound Power Rating (dB(A))⑦	74	74
Performance Heating②		
Input BTUH (Natural Gas)③	40000	64000
AFUE	80.0	80.0
Temp. Rise — Min/Max (°F)	25 / 55	35 / 65
Orifice Qty / Drill Size (Natural Gas)	1 / #32	2 / #37
POWER CONN.—V/PH/HZ	208-230/1/60	208-230/1/60
Min. Brch. Cir. Ampacity	13.3	13.3
Fuse Size — Max. (amps)	20	20
Fuse Size — Recmd. (amps)	20	20
COMPRESSOR	RECIPROCATING	RECIPROCATING
Volts/Ph/Hz	208-230/1/60	208-230/1/60
R.L. Amps — L.R. Amps	9.0 / 59.5	9.0 / 59.5
OUTDOOR COIL — TYPE	SPINE-FIN	SPINE-FIN
Rows/F.P.I.	2 / 24	2 / 24
Face Area (sq.ft.)	13.32	13.32
Tube Size (in.)	3/8	3/8
INDOOR COIL — TYPE	PLATE FIN	PLATE FIN
Rows/F.P.I.	3 / 15	3 / 15
Face Area (sq.ft.)	3.54	3.54
Tube Size (in.)	3/8	3/8
Refrigerant Control	EXPANSION VALVE	EXPANSION VALVE
Drain Conn. Size (in.)	3/4 FEMALE NPT	3/4 FEMALE NPT
OUTDOOR FAN — TYPE	PROPELLER	PROPELLER
Dia. (in.)	23	23
Drive/No. Speeds	DIRECT / 1	DIRECT / 1
Motor — HP/R.P.M.	1/12 / 810	1/12 / 810
Volts/Ph/Hz	208-230/1/60	208-230/1/60
F.L. Amps/L.R. Amps	0.54 / 0.95	0.54 / 0.95
INDOOR FAN — TYPE	CENTRIFUGAL	CENTRIFUGAL
Dia x Width (in.)	11 X 10	11 X 10
Drive/No. Speeds	DIRECT / 2	DIRECT / 2
CFM @ 0.0 in. w.g.⑤	SEE FAN PERF TABLE	SEE FAN PERF TABLE
Motor — HP/R.P.M.	1/4 / 825	1/4 / 825
Volts/Ph/Hz	200-230/1/60	200-230/1/60
F.L. Amps/L.R. Amps	1.5 / 2.85	1.5 / 2.85
COMBUSTION FAN — TYPE	CENTRIFUGAL	CENTRIFUGAL
Drive/No. Speeds	DIRECT / 1	DIRECT / 1
Motor — HP/R.P.M.	1/35 / 3480	1/35 / 3480
Volts/Ph/Hz	208-230/1/60	208-230/1/60
FLA	0.53	0.53
FILTER / FURNISHED	NO	NO
Type Recommended	THROWAWAY	THROWAWAY
Recmd. Face Area (sq. ft.)⑥	2.7	2.7
REFRIGERANT	R22	R22
Charge (lbs.)④	4.5	4.5
GAS PIPE SIZE (in.)	1/2	1/2
DIMENSIONS	H X W X L	H X W X L
Crated (in.)	45.86 / 44.5 / 52.03	45.86 / 44.5 / 52.03
WEIGHT		
Shipping (lbs.) / Net (lbs.)	470 / 374	481 / 385

①Rated in accordance with A.R.I. Standard 210/240. A.R.I. standard rating conditions are: 80 D.B. 67 W.B. entering air to indoor coil. 95 D.B. entering air to outdoor coil.
② All models are U L Listed. Ratings shown are for elevations up to 2000 ft. For higher elevations reduce ratings at a rate of 4% per 1000 ft. elevation.
③ Convertible to LPG.
④ This value is approximate. For more precise value, see Unit Nameplate.
⑤ Based on U.S. Government Standard Tests.
⑥ Filters must be installed in return air stream. Square footages listed are based on 300 f.p.m. face velocity. If permanent filters are used size per manufacturer's recommendation with a clean resistance of 0.05" W.C. 0.05" W.C.
⑦ Sound Power values are not adjusted for ARI270-95 tonal corrections.

NOTE: USED 80 dB PWL (SOUND POWER) TO CONSERVATIVELY ASSUME A "NORMAL" (RATHER THAN A "QUIETER" UNIT.

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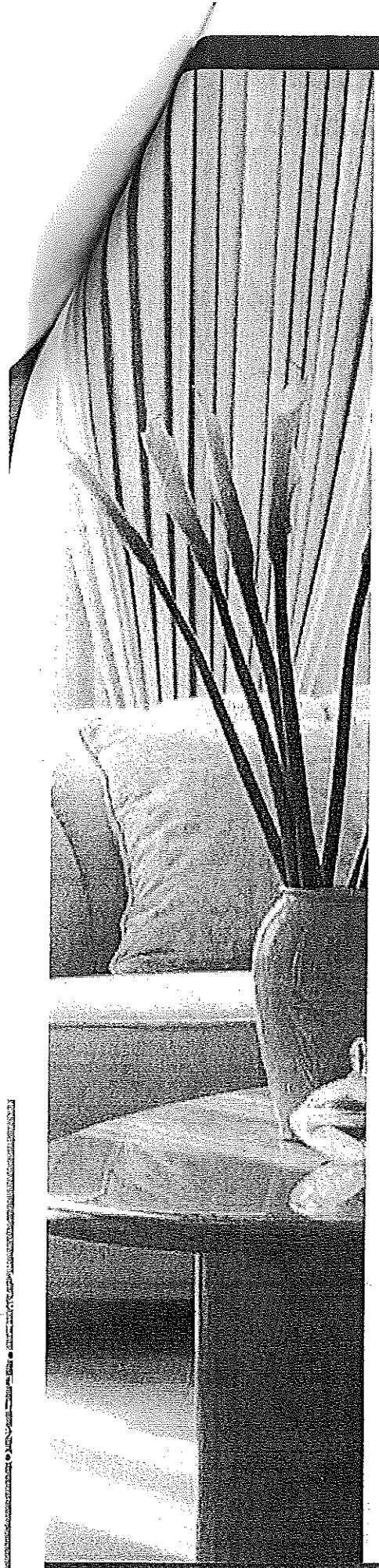

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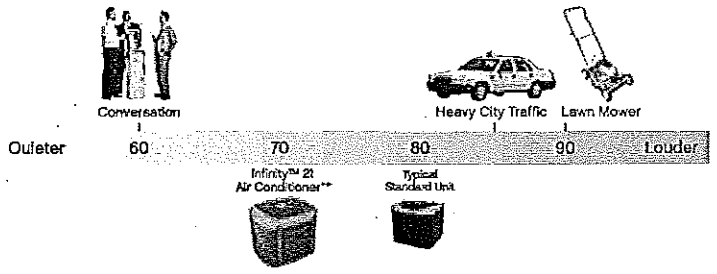

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† Ideal Humidity System technology continually monitors indoor humidity, indoor temperature and outdoor temperature, and has the ability to turn on your comfort system just for dehumidification.

** Per standard testing as described by ARI 270-95. Other sound levels, mentioned for comparison, as published at http://www.nidcd.nih.gov/health/hearing.ruler.asp.

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September 10, 2009

Ms. Lisa Coburn-Boyd
Otay Water District
2554 Sweetwater Spring Boulevard
Spring Valley, CA. 91978-2096

LLG Reference: 3-08-1805

SUBJECT: San Miguel Regional Training Facility – Traffic Letter Report

Dear Ms. Coburn-Boyd:

Per your request, Linscott, Law & Greenspan, Engineers (LLG) has completed this traffic letter report for the San Miguel Regional Training Facility. The San Miguel Regional Training Facility is a Regional Emergency Services Training Center (RESTC) in partnership with the Otay Water District, the San Miguel Consolidated Fire Protection District (the District) and the Heartland Training Facility Authority (HTFA). The RESTC has secured a long-term lease for 3.5 acres of property from the Otay Water District for the facility. This existing site will be co-used and cohabitated with the working pump site and training location for the Otay Water District. Access to the site is via an existing right-turn-in right-turn-out only driveway on SR-94. ***Figure 1*** shows the project vicinity and ***Figure 2*** shows the project area.

Included in this traffic assessment is the following:

- Existing Traffic Conditions;
- Project Trip Generation/Distribution;
- Existing Plus Project Capacity Analysis;
- Existing Plus Project Plus Cumulative Capacity Analysis;
- Site Access Recommendations; and
- Conclusions.

EXISTING TRAFFIC CONDITIONS

LLG conducted weekday intersection counts during the AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak hours in January 2008 at the Campo Road (SR-94) intersections at Jamacha Boulevard and Jamacha Road. ***Figure 3*** shows the existing lane configurations at the study intersections. ***Figure 4*** shows the existing traffic volumes. ***Appendix A*** contains the manual turning movement count sheets.

PROJECT TRIP GENERATION

As previously mentioned, the site will be used by the Otay Water District and the San Miguel Fire Department. Based on information provided by the client, it is anticipated that the Otay Water District will generate 5 vehicles of one ton or less and approximately 2 vehicles larger than the one-ton rating per day. Similarly, the San Miguel Fire Department is expected to generate 3 vehicles of one ton or less and approximately 3 vehicles larger than the one-ton rating. Multi-passenger vehicles, such as vans or buses, will be utilized to shuttle fire fighters and other training personnel.

Since vehicles larger than one-ton (trucks) tend to have a more significant effect on roadway operations when compared to passenger vehicles, passenger car equivalency factors (PCE's) were applied to convert truck traffic to passenger vehicle equivalents. As specified by the *Highway Capacity Manual*, three-axle trucks should use a PCE factor of 2.0. Therefore, all vehicles larger than one-ton (truck) trips calculated in this analysis were multiplied by 2.0 to derive traffic levels in PCE's. In addition, 10 extra miscellaneous vehicles were assumed to account for other potential trips to the site (i.e. deliveries, trash collection, etc). ***Table 1*** shows the daily and peak hour truck trip generation for the proposed project. The San Miguel Regional Training Facility is projected to generate a total of approximately 46 trip-ends per day with 19 (13 inbound/ 6 outbound) vehicles during the AM peak hour and 19 (6 inbound/ 13 outbound) vehicles hour during the PM peak hour.

It should be noted that special events including Countywide fire training or use of the site as a staging/meeting area during fires could occur infrequently, likely one to two times per year. These special events would involve more trips to and from the site but since they will occur so infrequently, do not require analysis.

LINSCOTT LAW & GREENSPAN engineers

TABLE 1
PROJECT TRIP GENERATION

Land Use	Total Trips (one-way)	ADT	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
Otay Water District Vehicles								
≤ 1 Ton	5	10	2	2	4	2	2	4
> 1 Ton [a]	2	8	2	2	4	2	2	4
Subtotal Otay Water District Vehicles		*18*	*4*	*4*	*8*	*4*	*4*	*8*
San Miguel Fire Department Vehicles								
≤ 1 Ton	3	6	2	1	3	1	2	3
> 1 Ton [a]	3	12	6	0	6	0	6	6
Subtotal Fire Department Vehicles		*18*	*8*	*1*	*9*	*1*	*8*	*9*
Miscellaneous Trips [b]	—	10	1	1	2	1	1	2
TOTAL		**46**	**13**	**6**	**19**	**6**	**13**	**19**

Footnotes:
a. Average Daily Traffic volumes have been adjusted to reflect a 2.0 PCE for vehicles greater than one ton.
b. Miscellaneous trips have been assumed to account for delivery trucks, meeting, or other vehicles that might use the facility.

PROJECT TRIP DISTRIBUTION

The generated project traffic was distributed to the street system based on information provided by the client. The Otay Water District vehicles are expected to originate from the Utility and Maintenance facility (2553 Sweetwater Springs Boulevard, Spring Valley, 91978) with a smaller number of trips coming from other locations. Similarly, the majority of the San Miguel Fire Department vehicle trips will originate from the San Miguel Headquarters (2850 Via Orange Way, Spring Valley, 91978) with a smaller number of trips from surrounding fire districts. ***Figure 5*** represents the estimated Otay Water District vehicle trip distribution and the estimated San Miguel Fire Department vehicle trip distribution.

As mentioned previously the project driveway is restricted to right-turn-in right-turn-out movements only. Therefore, the following maneuvers will need to be performed for vehicles departing from or arriving to the site:

1. Departing to the East: These vehicles will first need to make a southbound right-turn at the project driveway, continue on SR-94, travel just over 1 mile, exit at the Avocado Boulevard/ Calavo Drive interchange, make a left-turn onto Calavo Drive, and make a southbound left-turn to proceed back eastbound to their destination. ***Figure 5a*** shows the route departing to the east. Adequate turning radii are provided at each of these intersections for large vehicles to make these left-turn movements.

2. Departing to the West: These vehicles will only need to make the southbound right-turn at the project driveway onto westbound SR-94 to reach their point of destination. ***Figure 5b*** shows the route departing to the west.

3. Arriving from the East: These vehicles will just need to make a right-turn into the project site from SR-94. ***Figure 5c*** shows the route arriving from the east.

4. Arriving from the West: The vehicles traveling eastbound on SR-94 will need to make a u-turn at the Jamacha Road/ Campo Road (SR-94) intersection and proceed westbound ultimately making a right-turn into the site. ***Figure 5d*** shows the route arriving from the west. ***Figure 6*** shows that adequate turning radius is provided at this intersection for fire trucks to make this u-turn movement.

PROJECT TRIP ASSIGNMENT

Figure 7 presents the assignment of project traffic to the surrounding circulation system based on the estimated distribution (illustrated in *Figure 4*). ***Figure 8*** shows the existing + project traffic assignment.

SIGNIFICANCE CRITERIA

The following criterion was utilized to evaluate potential significant impacts, based on the County's documents "Guidelines for Determining Significance", adopted September 26, 2006 and revised effective December 5, 2007.

This section provides guidance for evaluating adverse environmental effects a project may have on signalized and unsignalized intersections.

Signalized Intersections—Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on a signalized intersection:

- The additional or redistributed ADT generated by the proposed project will significantly increase congestion on a signalized intersection currently operating at LOS E or LOS F, or will cause a signalized intersection to operate at a LOS E or LOS F as identified in ***Table 2***.

Unsignalized Intersections—The operating parameters and conditions for unsignalized intersections differ dramatically from those of signalized intersections. Very small volume increases on one leg or turn and/or through movement of an unsignalized intersection can substantially affect the calculated delay for the entire intersection. Significance criteria for unsignalized intersections are based upon a minimum number of trips added to a critical movement at an unsignalized intersection.

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on an unsignalized intersection:

- The additional or redistributed ADT generated by the proposed project will add 20 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or

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- The additional or redistributed ADT generated by the proposed project will add 20 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
- The additional or redistributed ADT generated by the proposed project will add 5 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
- The additional or redistributed ADT generated by the proposed project will add 5 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
- Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, it is found that the generation rate is less than those specified above, and would significantly impact the operations of the intersection.

TABLE 2
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON INTERSECTIONS
ALLOWABLE INCREASES ON CONGESTED INTERSECTIONS

Level of service	Signalized	Unsignalized
LOS E	Delay of 2 seconds	20 peak hour trips on a critical movement
LOS F	Delay of 1 second, or 5 peak hour trips on a critical movement	5 peak hour trips on a critical movement

General Notes:

1. A critical movement is one that is experiencing excessive queues.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes any trips must mitigate a share of the cumulative impacts.
3. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.

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CAPACITY ANALYSIS

Existing

The intersection operation analysis was conducted to assess any potential impacts that could result from the development of the project. ***Table 3*** shows that the study area intersections are currently operating at LOS D or better during the AM and PM peak hours.

Existing + Project

Also shown in *Table 3*, with the addition of the project traffic, the study area intersections are calculated to operate at acceptable LOS D or better during both the AM and PM peak hours.

Existing + Project + Cumulative Projects

Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future that would need to be accounted for in the cumulative scenario. As a result, a conservative analysis was conducted assuming 15% ambient growth in addition to one known cumulative project. ***Figure 9*** shows the existing + project traffic + cumulative assignments.

Also shown in *Table 3*, with the addition of the project traffic, the study area intersections are calculated to operate at acceptable LOS D or better during both the AM and PM peak hours, with the exception of the Jamacha Boulevard/ Campo Road intersection during the PM peak hour (LOS F).

Appendix B contains the intersection analysis worksheets.

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TABLE 3
INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ [c]	Existing + Project + Cumulative Projects		Impact Type
			Delay [a]	LOS [b]	Delay	LOS		Delay	LOS	
1. Jamacha Blvd/ Campo Rd (SR-94)	Signal	AM	32.2	C	32.6	C	0.4	39.6	D	**Cumulative**
		PM	43.7	D	44.4	D	0.7	**82.4**	**F**	
2. Campo Rd/ Jamacha Rd	Signal	AM	38.6	D	38.8	D	0.2	53.9	D	None
		PM	33.7	C	33.8	C	0.1	50.0	D	
3. Jamacha Rd/ Site Driveway	Signal	AM	—	—	15.6	C	—	17.8	C	None
		PM	—	—	14.6	B	—	16.4	C	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service. See table at right for delay thresholds.
c. **Δ** Denotes change in delay.

General Notes:

Shading and **bold** typeface indicates significant impact.

SIGNALIZED DELAY/LOS THRESHOLDS		UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

SITE ACCESS RECOMMENDATIONS

The proposed development is calculated to generate 46 ADT with 13 inbound / 6 outbound trips during the AM peak hour and 6 inbound / 13 outbound trips during the PM peak hour.

Access to the site is via an existing right-turn-in right-turn-out only driveway on SR-94. The following access-related improvements are recommended:

1. The southbound approach should be placed under stop-sign control.
2. County of San Diego/CALTRANS sight distance standards for outbound vehicles turning right onto Westbound SR-94 should be met at the project driveway.
3. Based on the high speed and high traffic volumes on SR-94, coupled with the need to serve slow moving trucks, a dedicated westbound right-turn lane should be provided on SR-94 at the project driveway. Due to the access's proximity to the adjacent driveway, the construction of the right-turn lane will need to be coordinated with the adjoining parcel.

Figure 10 shows a conceptual striping plan for the proposed right-turn lane on SR-94 at the site access point. A Caltrans encroachment permit will be required and the proposed lane will be possible to construct within the current 132 feet of right-of-way on SR-94.

CONCLUSIONS

Based on the County of San Diego significance criteria, no significant direct traffic impacts were calculated due to the project traffic. Therefore, direct mitigation measures are not necessary. However, the project would result in a significant cumulative impact to the Campo Road/ Jamacha Road intersection as outlined in *Table 3.* The land uses associated with the Otay Water District and San Miguel Fire Department do require the payment of a County Traffic Impact Fee (TIF) to mitigate this impact to below a level of significance.

It should be noted that an acceleration lane is not recommended since the project generates only 6 outbound trips during the AM peak hour and 13 outbound trips during the PM peak hour and since the signalized intersection at Jamacha Road (SR-94) and Campo Road (SR-54) provides sufficient gaps in the traffic flow. In addition, SR-94 currently provides three westbound lanes and adequate corner sight distance currently exists.

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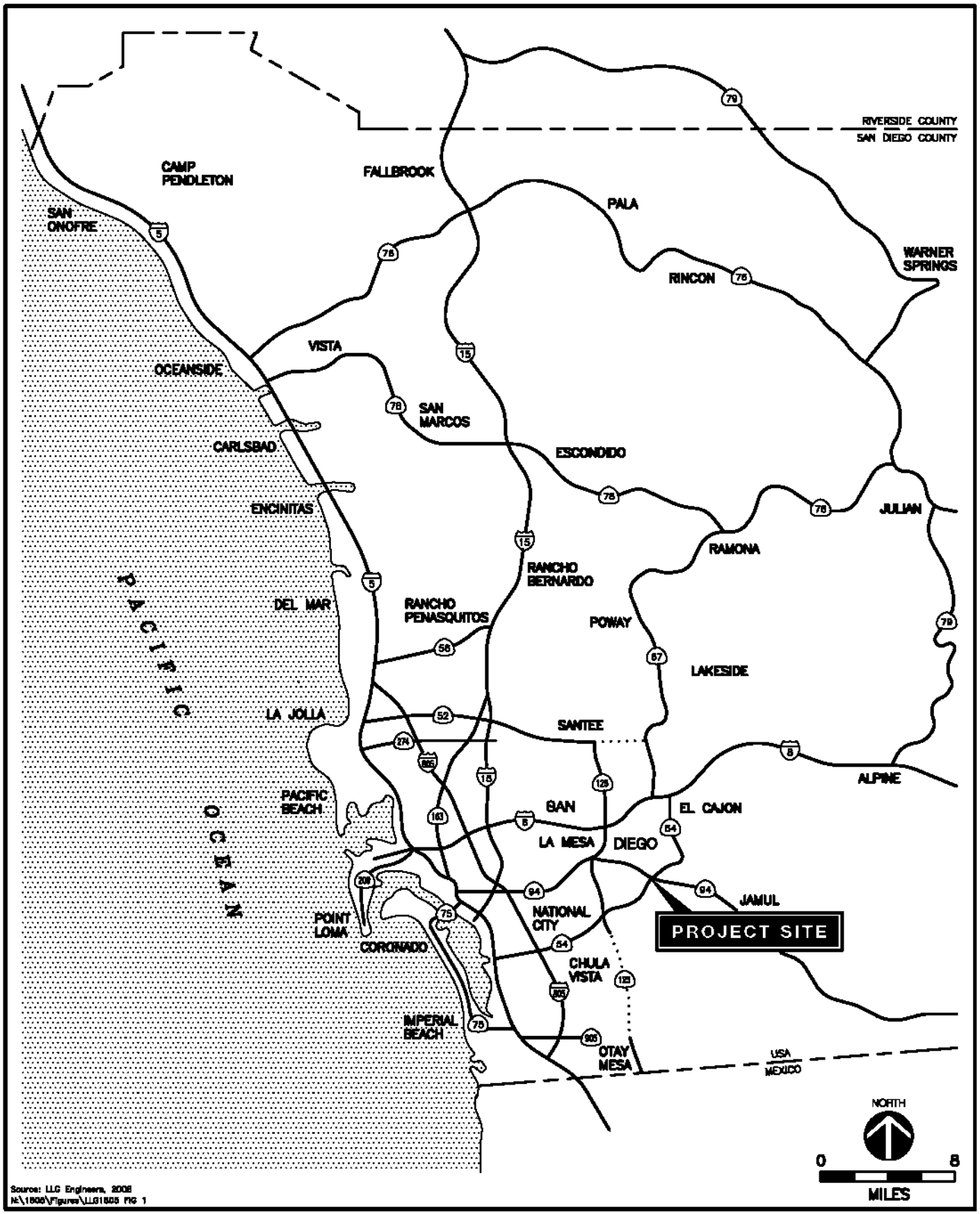
Please call us at 858-300-8800 if you would like to discuss.

Sincerely,
Linscott, Law & Greenspan, Engineers

John Boarman, P.E.
Principal

Raul Armenta
Transportation Engineer III



Source: LLG Engineers, 2008
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Figure 1

Vicinity Map

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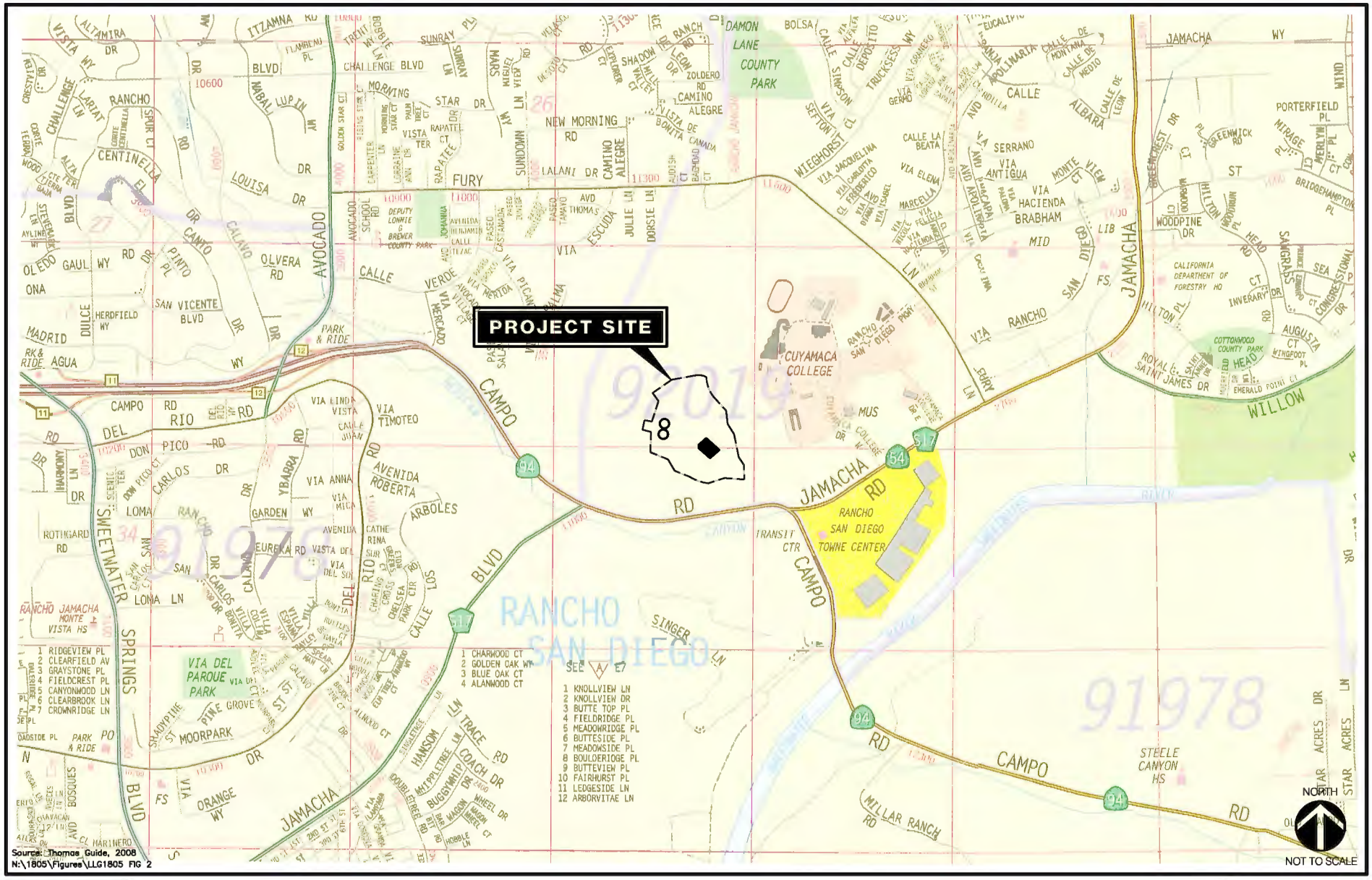

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Figure 2

Project Area Map

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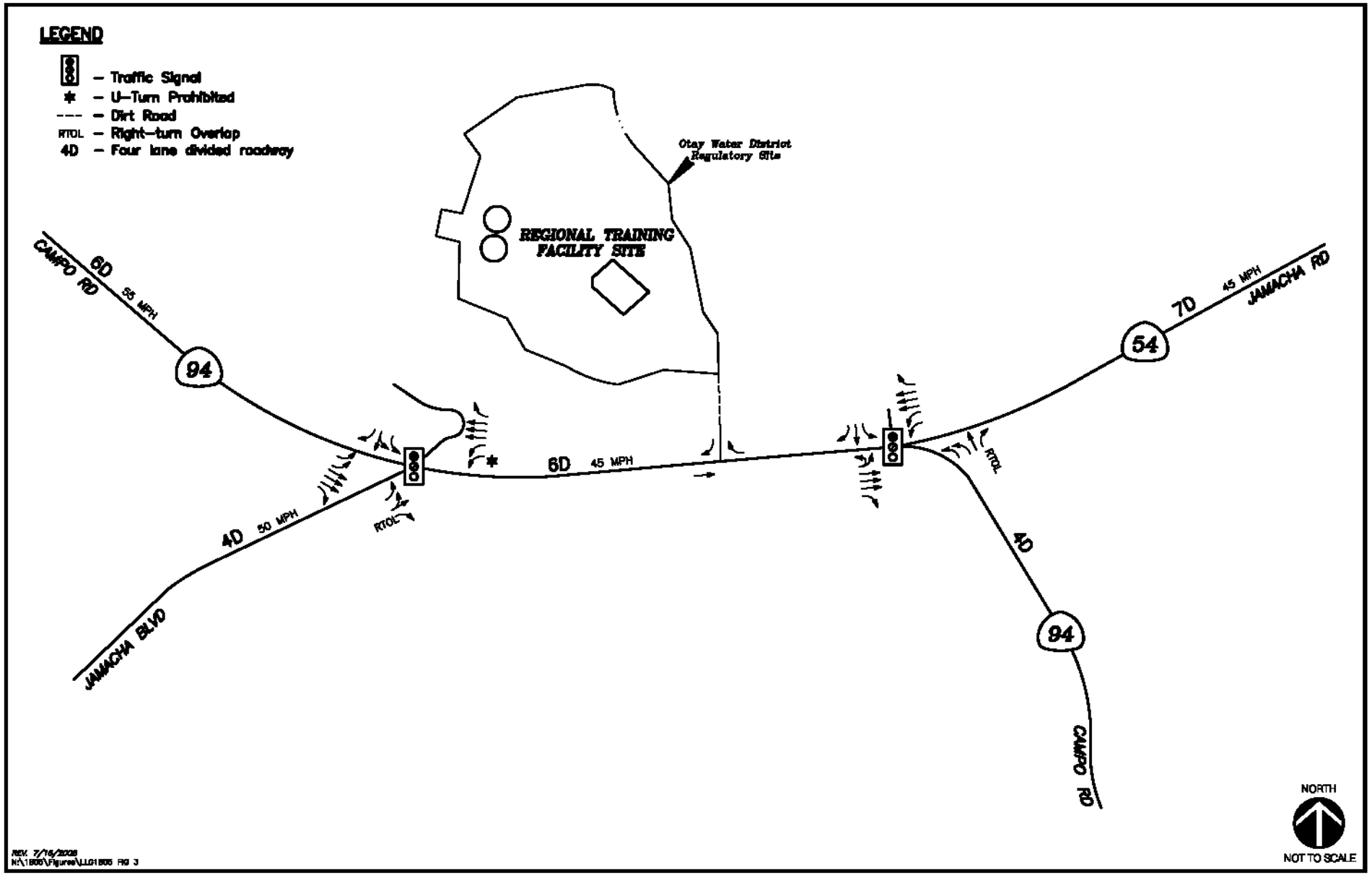

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Figure 3

Existing Conditions Diagram

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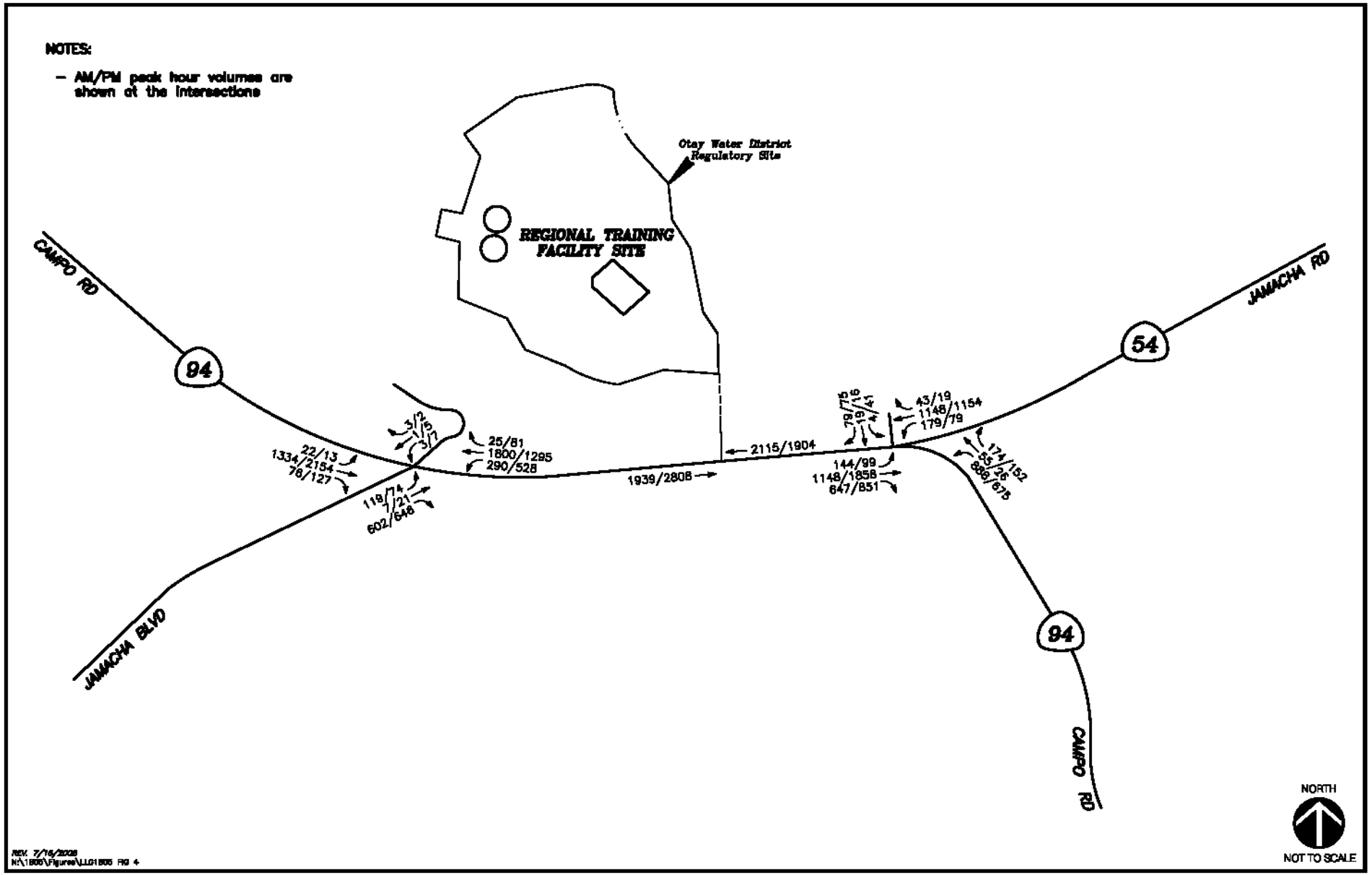

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Figure 4

Existing Traffic Volumes AM/PM Peak Hours

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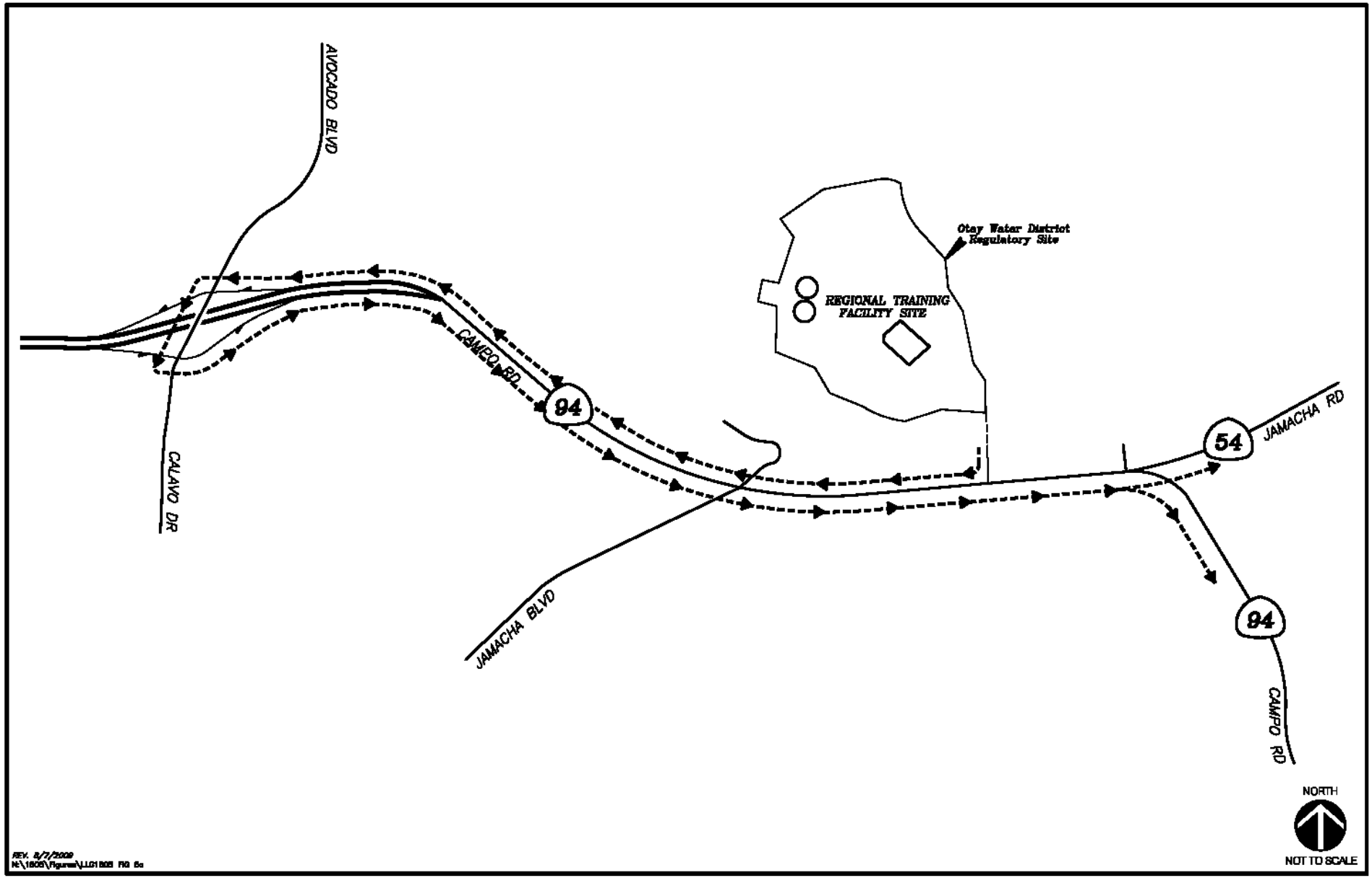

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Figure 5a

Vehicle Route Departing to the East

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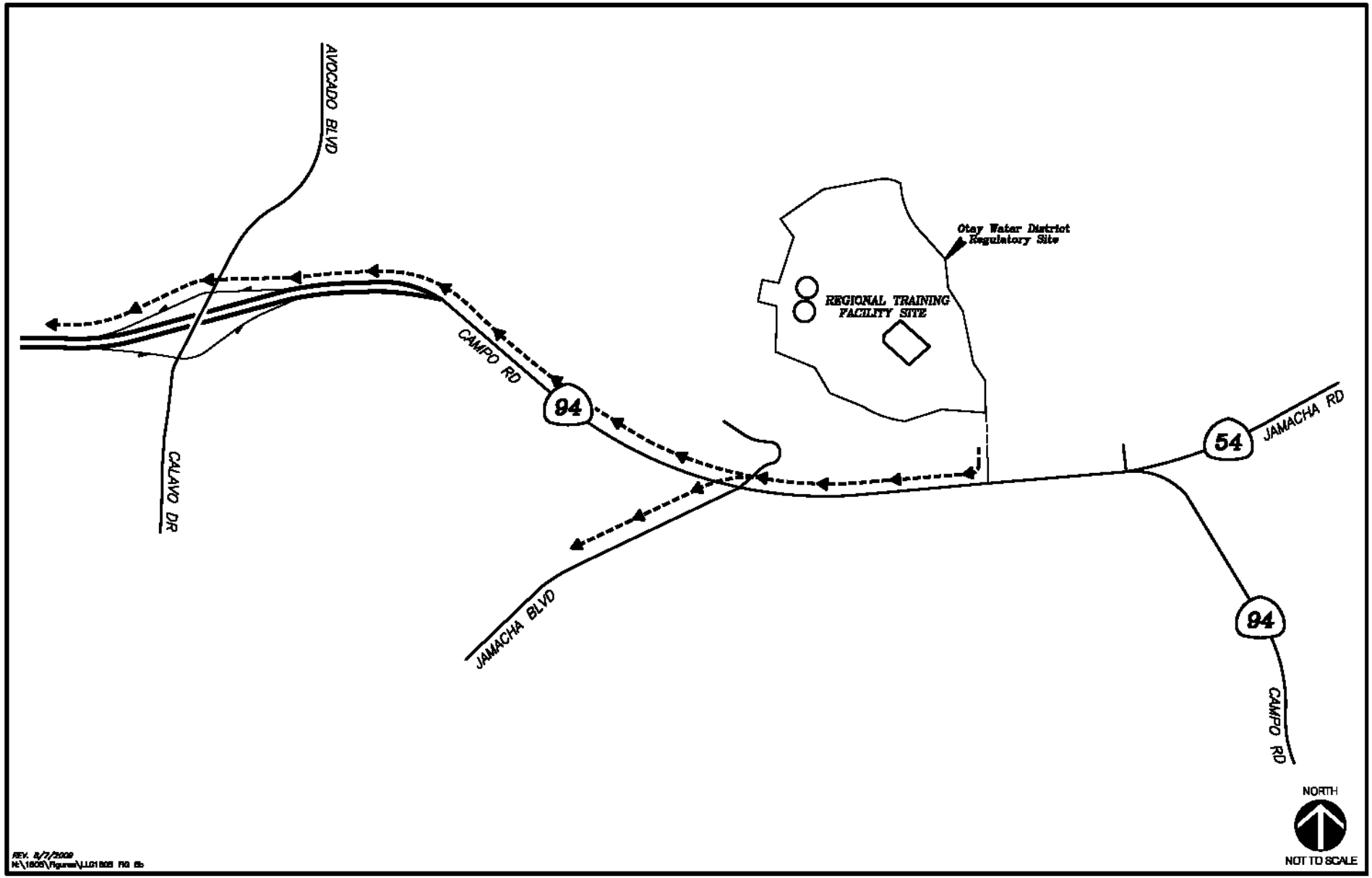

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Figure 5b

Vehicle Route Departing to the West

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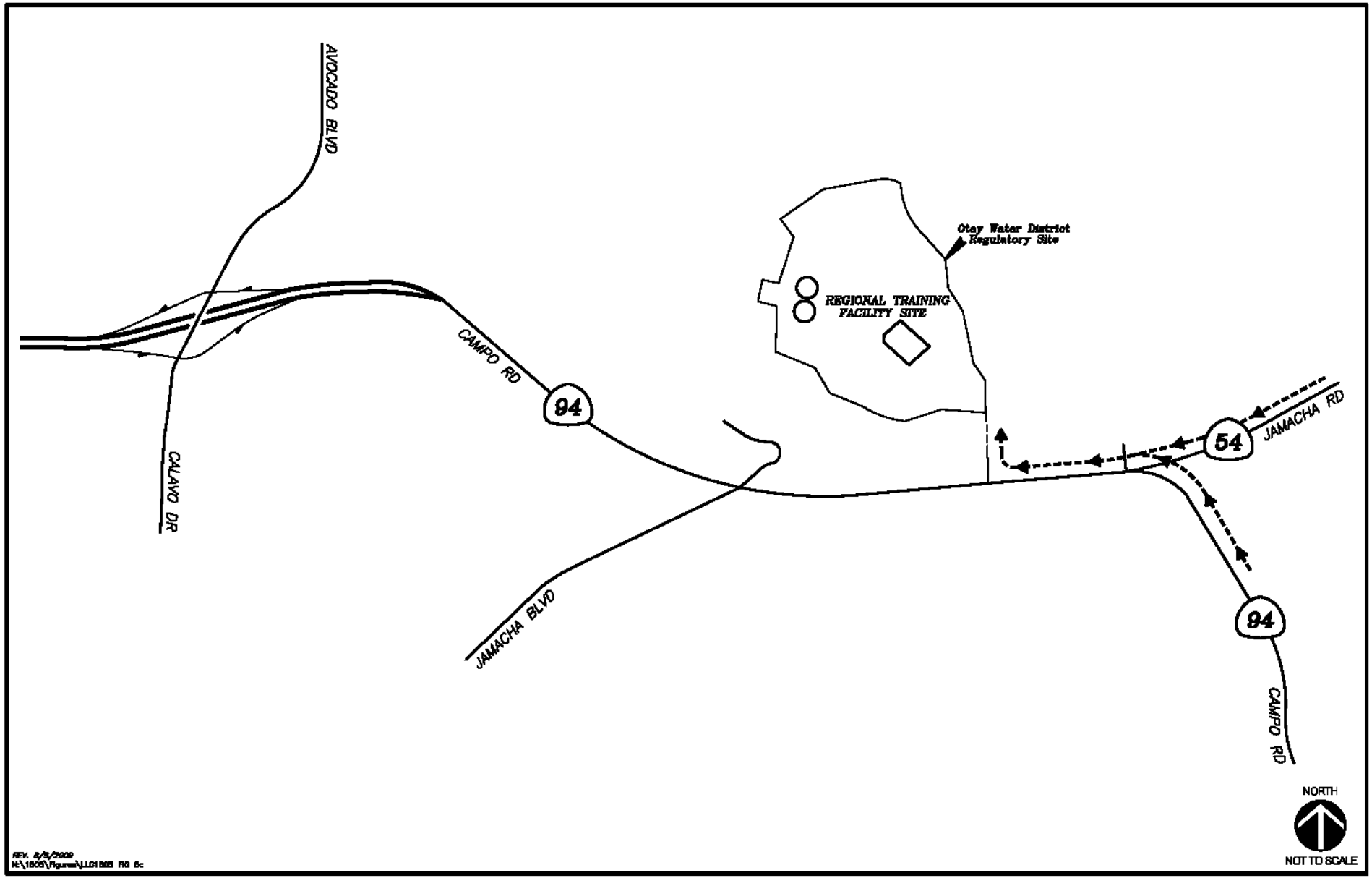

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Figure 5c

Vehicle Route Arriving from the East

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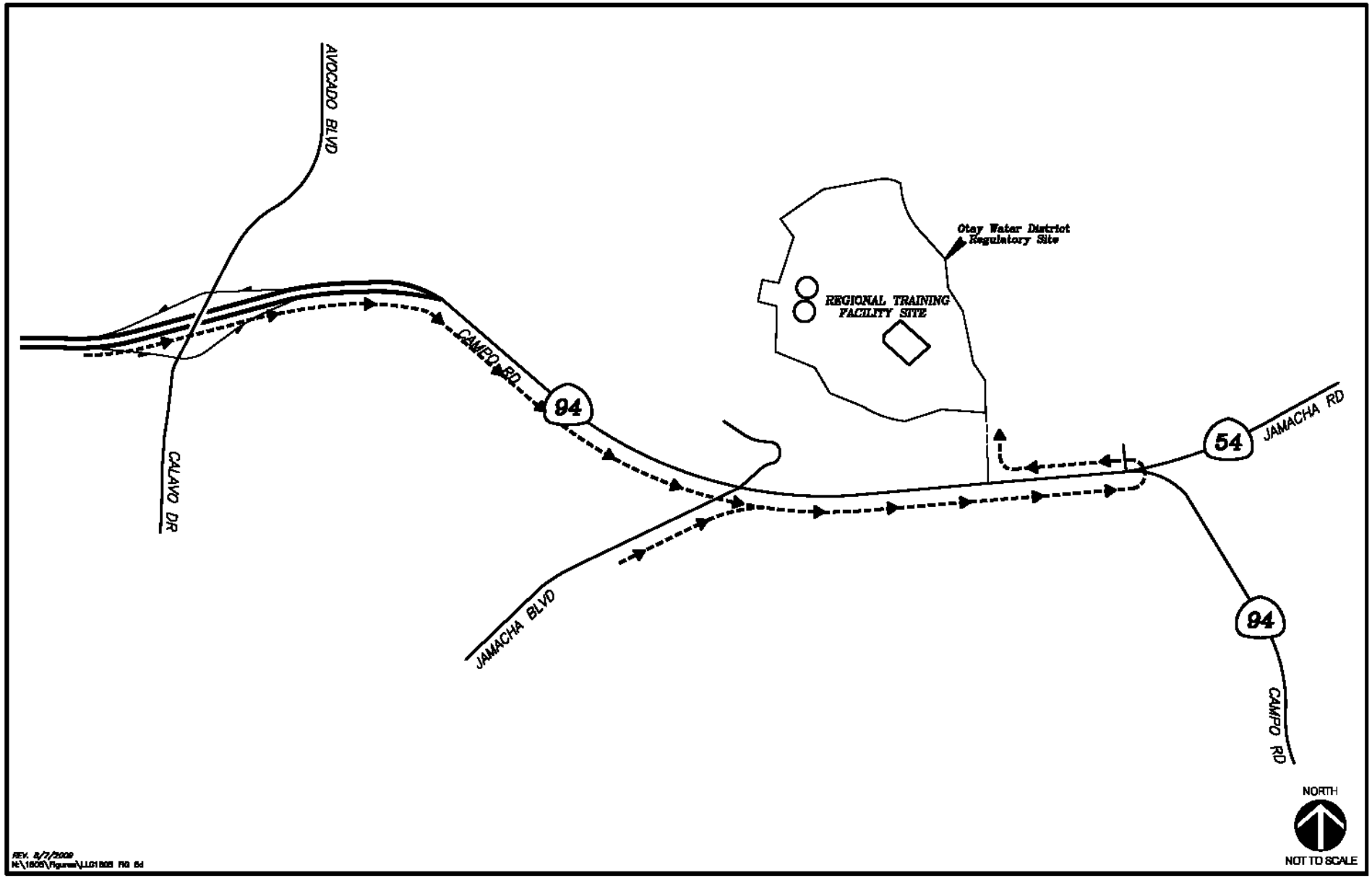

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Figure 5d

Vehicle Route Arriving from the West

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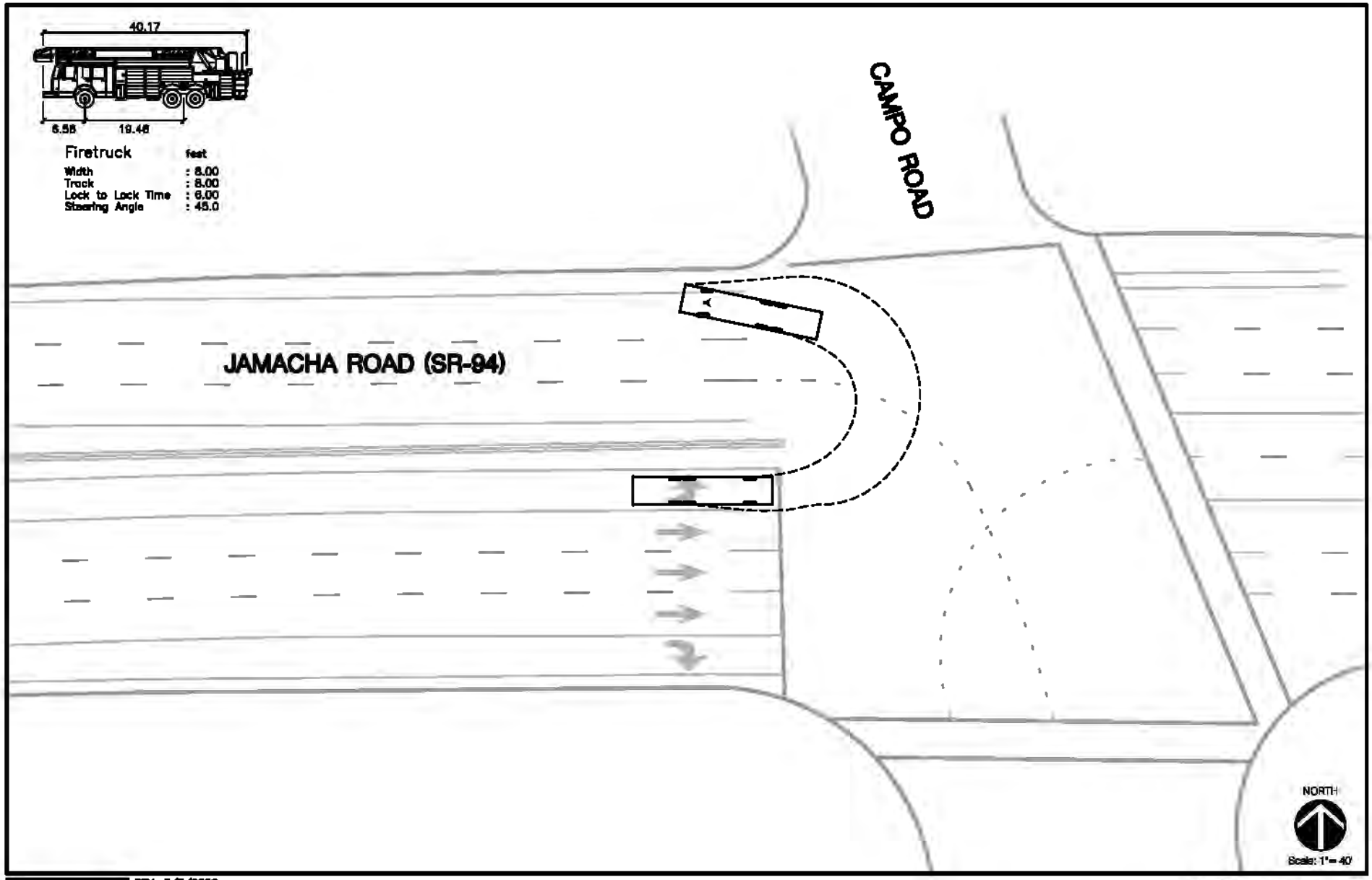

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Figure 6

Fire Tuck U-turn Movement
Jamacha Road/ Campo Road Intersection

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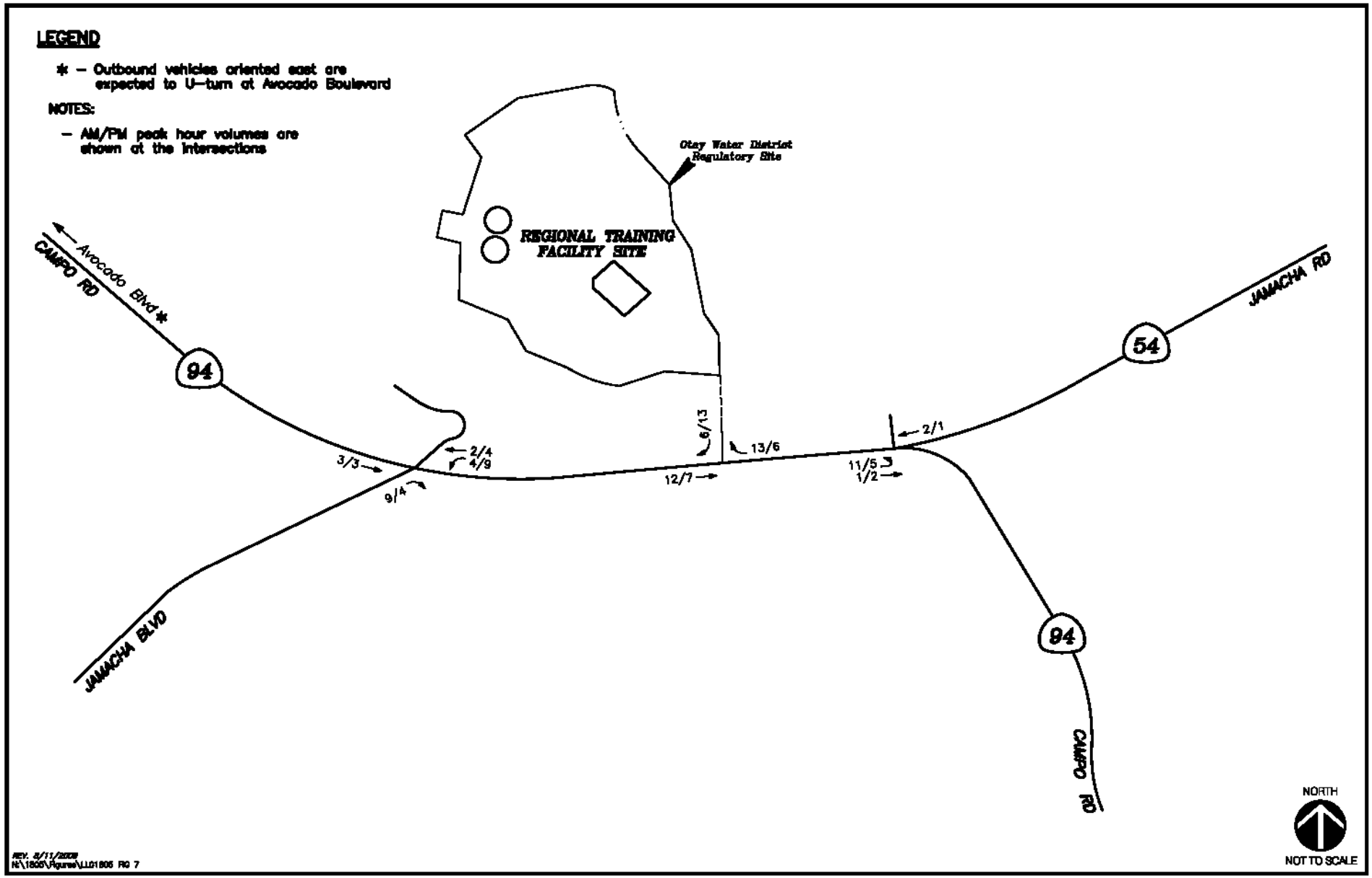

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Figure 7

Project Traffic Volumes AM/PM Peak Hours

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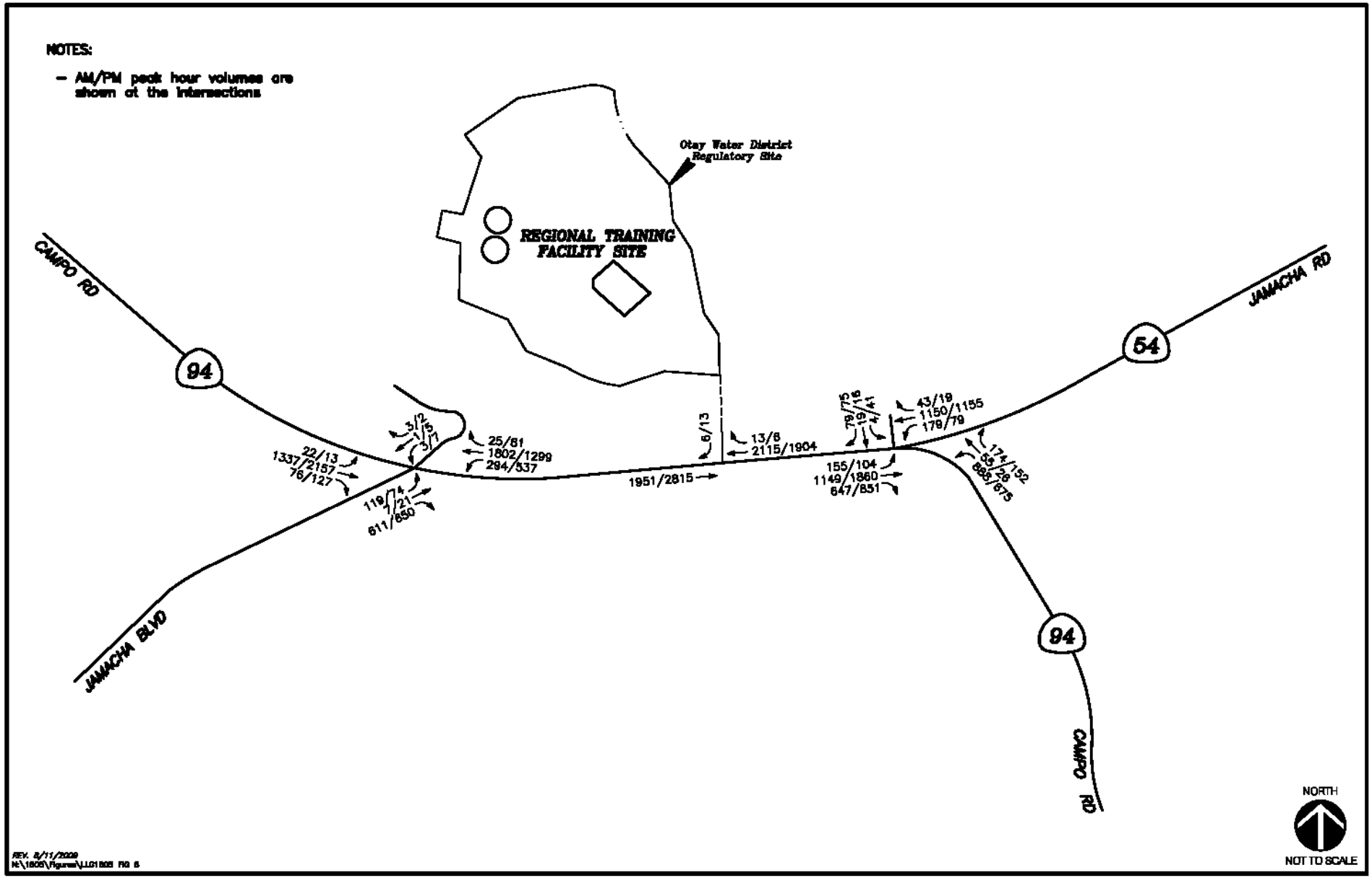

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Figure 8

Existing + Project Traffic Volumes AM/PM Peak Hours

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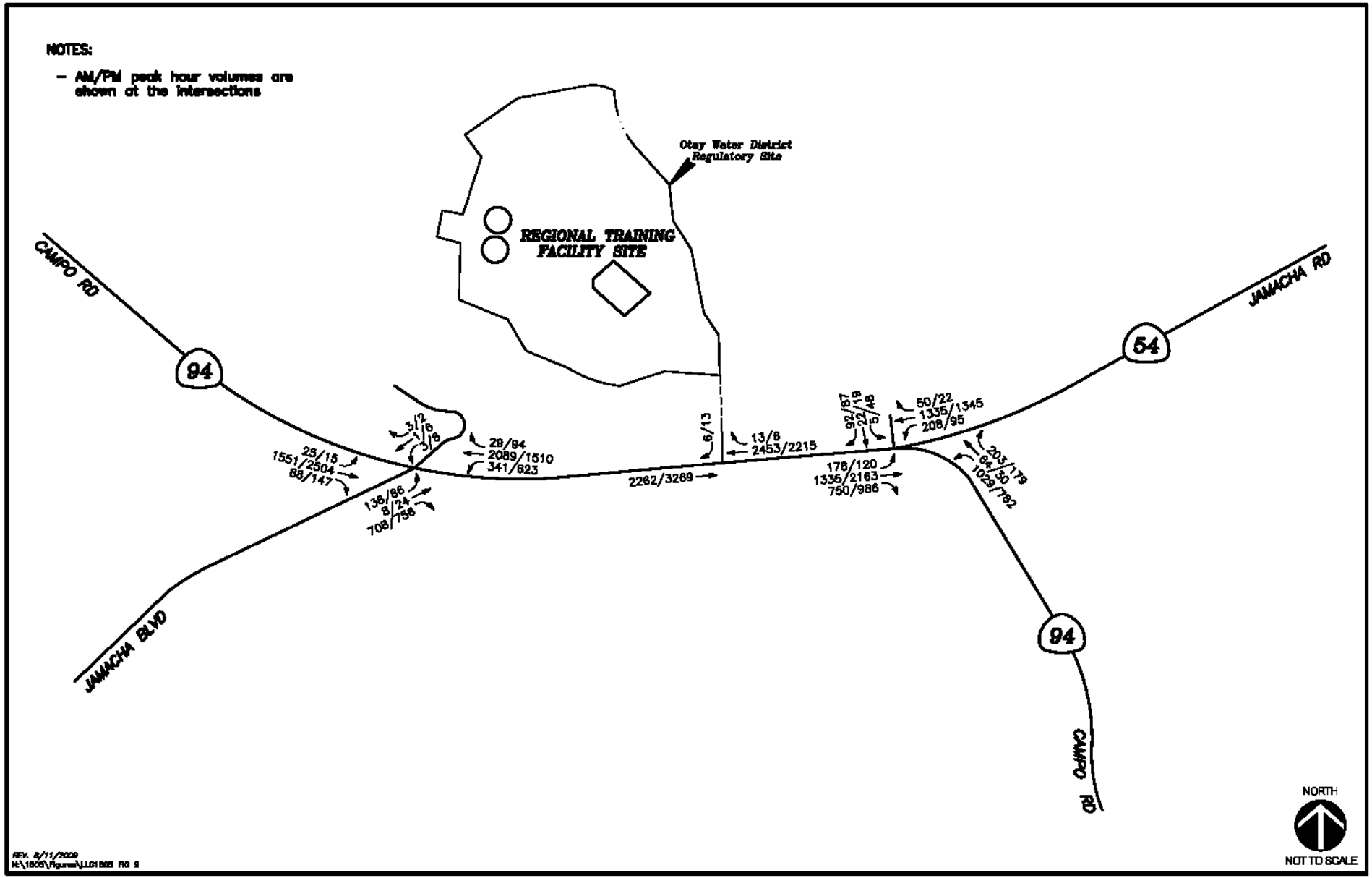

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Figure 9

Existing + Project + Cumulative Projects Traffic Volumes AM/PM Peak Hours

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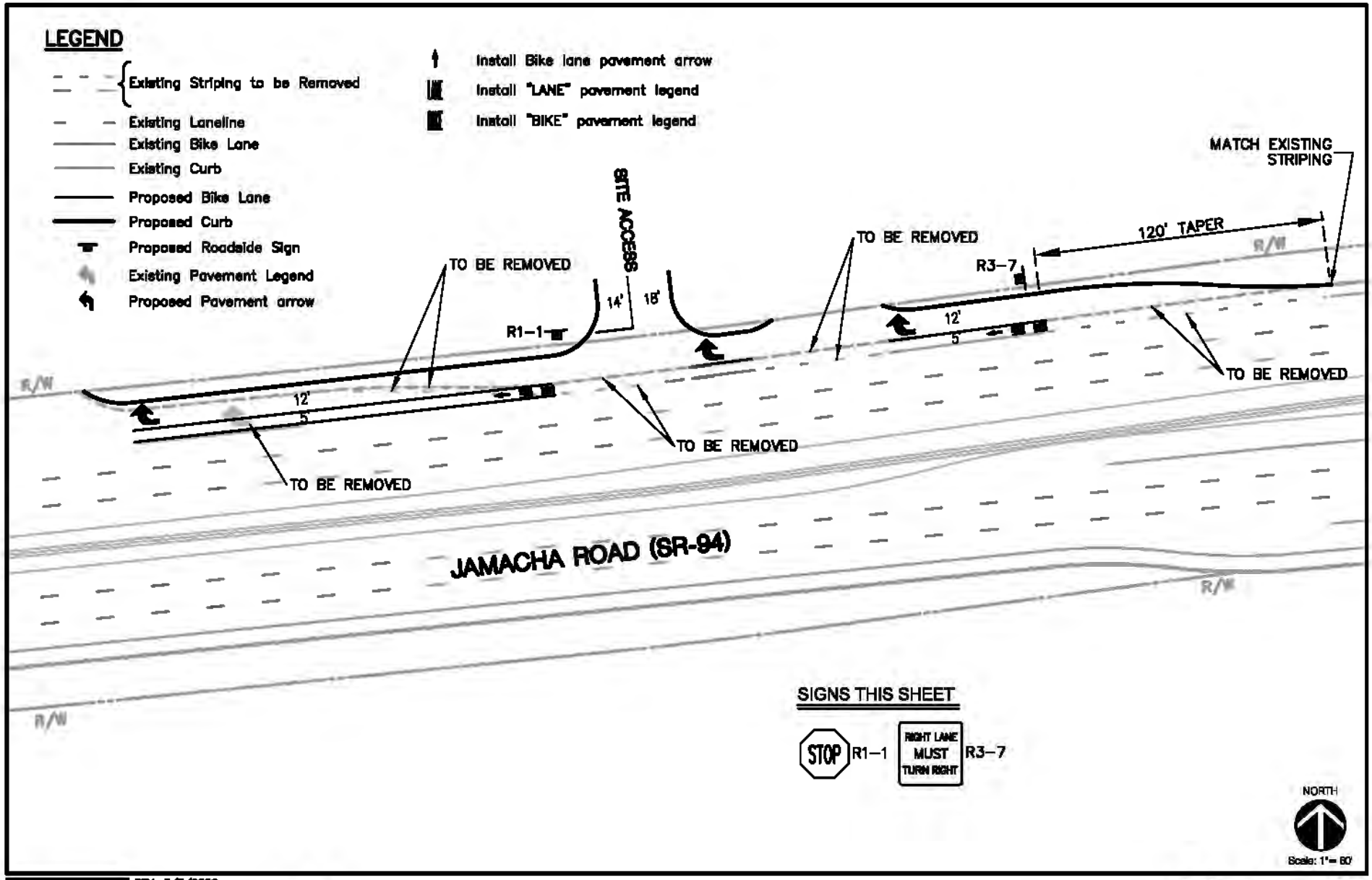

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Figure 10

Conceptual Striping Plan SR-94/ Site Access

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