VOLUME 2
APPLICATION FOR CERTIFICATION APPENDICES
Starwood Power-Midway, LLC Peaking Project

SUBMITTED TO THE
California Energy Commiission
November 2006

SUBMITTED BY

Starwood Power-Midway, LLC

WITH SUPPORT FROM

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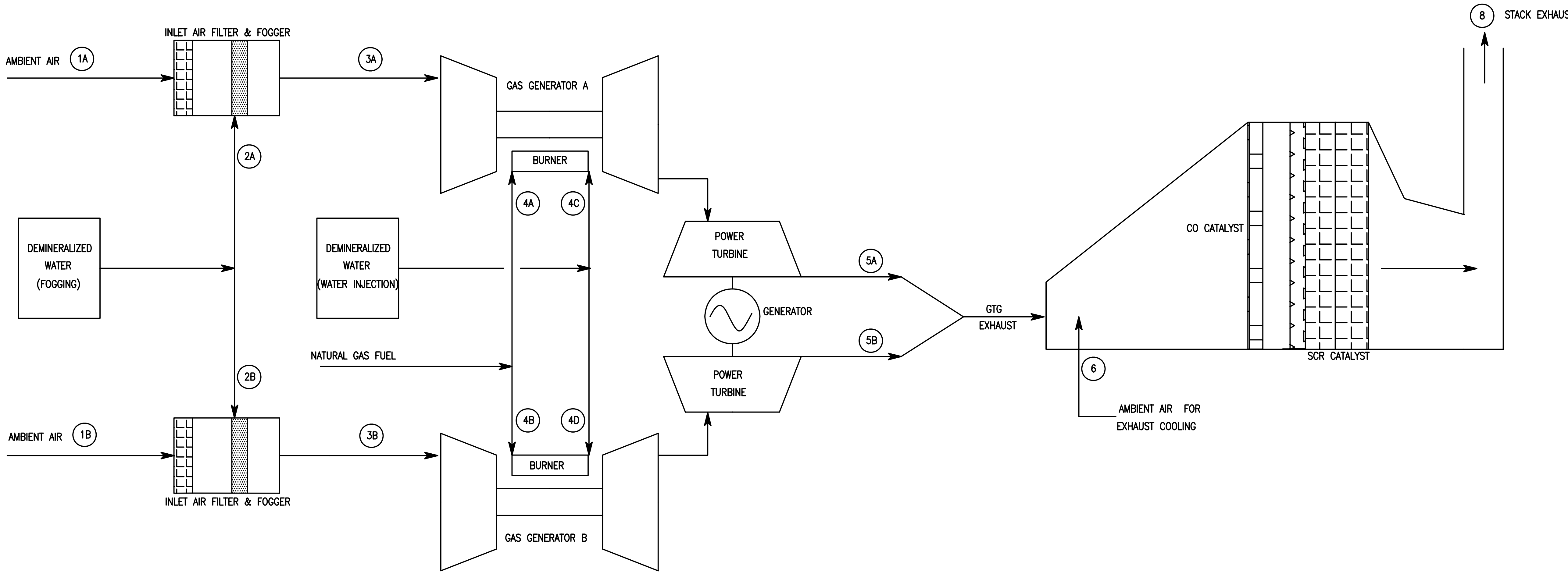
HEAT AND MASS BALANCES

REV	DATE	DESCRIPTION	BY	APP
A	8/24/06	INITIAL ISSUE	RAR	DAT



CONDITIONS: ISO, 100% POWER, 410 FT ALTITUDE
GROSS POWER (PER UNIT): 60,020 KW
GROSS HEAT RATE (HHV): 10,357 BTU/KW-HR
GROSS HEAT INPUT (HHV)- PER GT: 310.8 MMBTU/HR

PARAMETER	UNITS	1A Intake Air Unit A	1B Intake Air Unit B	2A Fog Water Unit A	2B Fog Water Unit B	3A Inlet Air Unit A	3B Inlet Air Unit B	4A Gas Fuel Unit A	4B Gas Fuel Unit B	4C Water Inj Unit A	4D Water Inj Unit B	5A Exhaust Unit A	5B Exhaust Unit B	6 Cooling Air to Exh	8 Stack Exhaust
TEMP DB	DEG F	59	59			51.8	51.8					905	905	59	750
TEMP WB	DEG F	51.8	51.8			51.8	51.8							51.8	
PRESSURE	PSIA	14.48	14.48			14.69	14.69							14.69	14.69
FLOW	PPH	695,450	695,450	1,150	1,150	696,600	696,600	13,620	13,620	12,185	12,185	722,405	722,405	401,760	1,846,570

MIDWAY

ENERGY SERVICES INC.
A CONNECTICUT CORP.
FARMINGTON, CONNECTICUT 06032

SCALE NONE
DATE 08/24/06
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FT8-3
MASS/HEAT BALANCE

NO FIGURE 3.4-1
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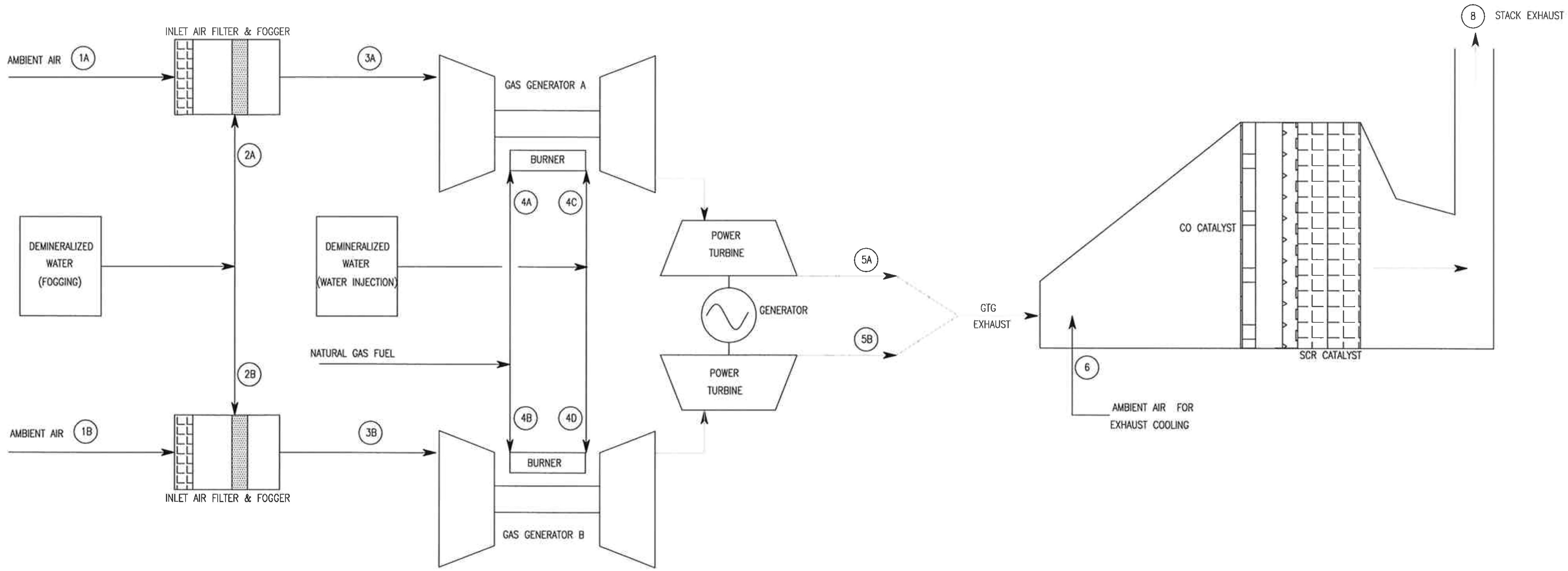
REV A

REV	DATE	DESCRIPTION	BY	APP
A	8/24/06	INITIAL ISSUE	RAR	DAT



Conditions: 114F/22% RH, 100% POWER, 410 FT ALTITUDE
GROSS POWER (PER UNIT): 54,867 KW
GROSS HEAT RATE (HHV): 10,600 BTU/KW-HR
GROSS HEAT INPUT (HHV) PER GT: 290.8 MMBTU/HR

PARAMETER	UNITS	1A Intake Air Unit A	1B Intake Air Unit B	2A Fog Water Unit A	2B Fog Water Unit B	3A Inlet Air Unit A	3B Inlet Air Unit B	4A Gas Fuel Unit A	4B Gas Fuel Unit B	4C Water Inj Unit A	4D Water Inj Unit B	5A Exhaust Unit A	5B Exhaust Unit B	6 Cooling Air to Exh	8 Stack Exhaust
TEMP DB	DEG F	114	114			80.8	80.8					933	933	114	750
TEMP WB	DEG F	80.8	80.8			80.8	80.8							80.8	
PRESSURE	PSIA	14.48	14.48			14.48	14.48							14.48	14.48
FLOW	PPH	644,940	644,940	4,860	4,860	649,800	649,800	12,743	12,743	11,490	11,490	670,680	670,680	430,920	1,772,280

NOTES:

1. THE HEAT/MASS BALANCE SHOWN IS FOR ONE SWIFT PAC UNIT. THE MIDWAY SITE WILL HAVE TWO SWIFT PAC UNITS. THEREFORE, THE FLOW RATES AND POWER OUTPUTS INDICATED IN THE TABLE ARE ACTUALLY 2x HIGHER FOR THE SITE.

MIDWAY

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SCALE NONE
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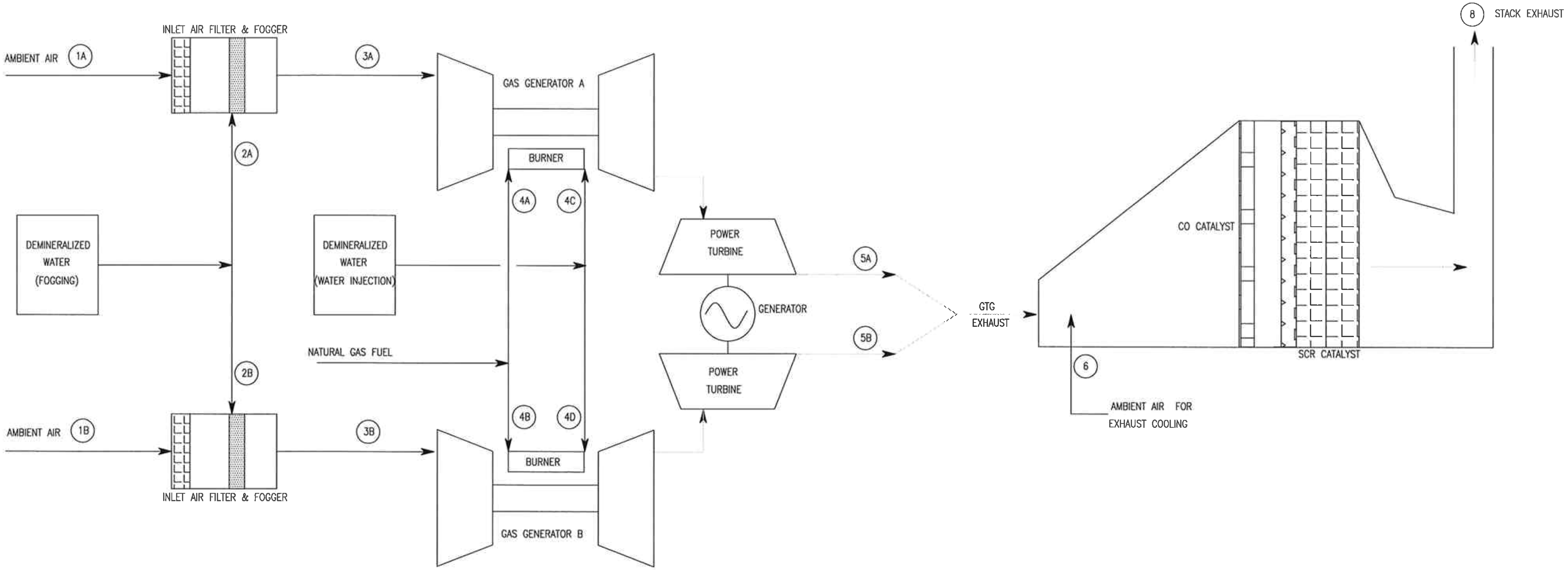
FT8-3
MASS/HEAT BALANCE
(HIGH TEMP)

NO FIGURE 3.4-1A SH REV A

REV	DATE	DESCRIPTION	BY	APP
A	8/24/06	INITIAL ISSUE	RAR	DAT



Conditions: 18F/91% RH, 100% POWER, 410 FT ALTITUDE
GROSS POWER (PER UNIT): 60,889 KW
GROSS HEAT RATE (HHV): 10,165 BTU/KW-HR
GROSS HEAT INPUT (HHV) PER GT: 309.5 MMBTU/HR

PARAMETER	UNITS	1A Intake Air Unit A	1B Intake Air Unit B	2A Fog Water Unit A	2B Fog Water Unit B	3A Inlet Air Unit A	3B Inlet Air Unit B	4A Gas Fuel Unit A	4B Gas Fuel Unit B	4C Water Inj Unit A	4D Water Inj Unit B	5A Exhaust Unit A	5B Exhaust Unit B	6 Cooling Air to Exh	8 Stack Exhaust
TEMP DB	DEG F	18	18			18	18					839	839	18	750
TEMP WB	DEG F	N/A	N/A			N/A	N/A							N/A	
PRESSURE	PSIA	14.48	14.48			14.48	14.48							14.48	14.48
FLOW	PPH	730,080	730,080	0	0	730,080	730,080	13,561	13,561	11,390	11,390	751,320	751,320	201,600	1,704,600

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ENERGY SERVICES INC.
FARMINGTON, CONNECTICUT 06032

MIDWAY

SCALE NONE
DATE 08/24/06
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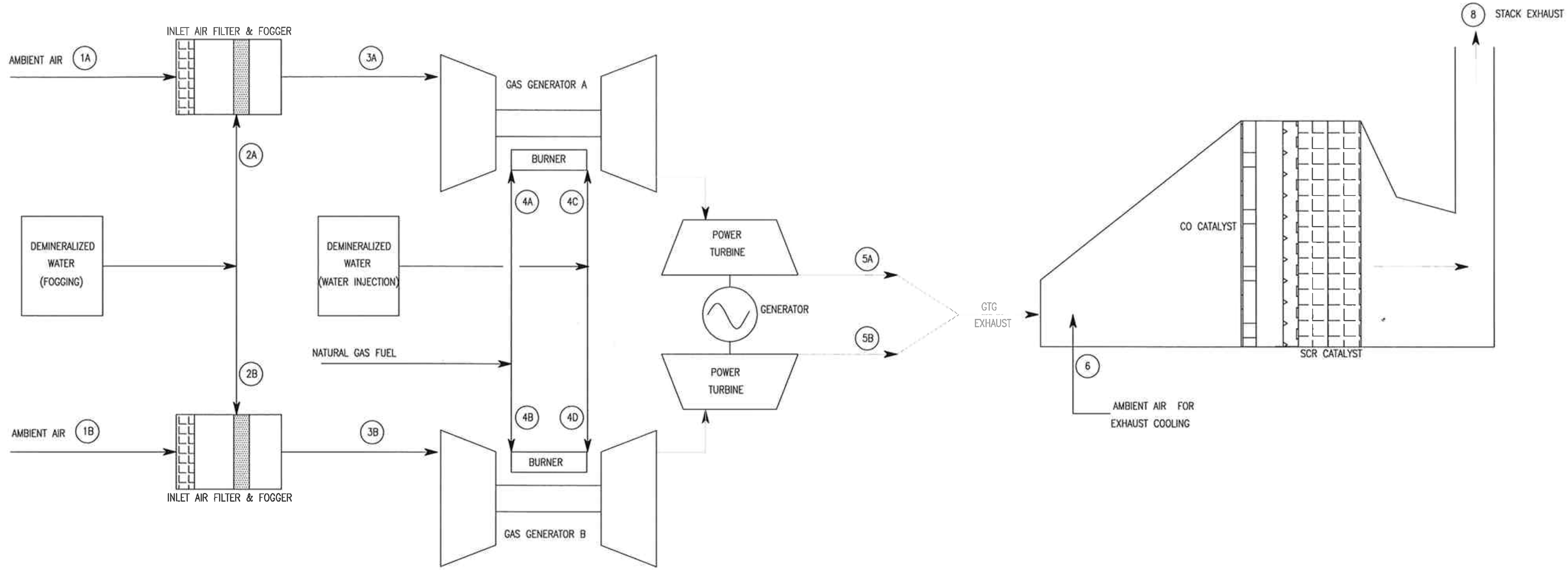
FT8-3
MASS/HEAT BALANCE
(LOW TEMP)

NO FIGURE 3.4-1B SH REV A

REV	DATE	DESCRIPTION	BY	APP
A	8/24/06	INITIAL ISSUE	RAR	DAT



NOTES:

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Conditions: ISO, 100% POWER, 410 FT ALTITUDE
GROSS POWER (PER UNIT): 60,020 KW
GROSS HEAT RATE (HHV): 10,357 BTU/KW-HR
GROSS HEAT INPUT (HHV) PER GT: 310.8 MMBTU/HR

PARAMETER	UNITS	1A Intake Air Unit A	1B Intake Air Unit B	2A Fog Water Unit A	2B Fog Water Unit B	3A Inlet Air Unit A	3B Inlet Air Unit B	4A Gas Fuel Unit A	4B Gas Fuel Unit B	4C Water Inj Unit A	4D Water Inj Unit B	5A Exhaust Unit A	5B Exhaust Unit B	6 Cooling Air to Exh	8 Stack Exhaust
TEMP DB	DEG F	59	59			51.8	51.8					905	905	59	750
TEMP WB	DEG F	51.8	51.8			51.8	51.8							51.8	
PRESSURE	PSIA	14.48	14.48			14.48	14.48							14.48	14.48
FLOW	PPH	695,450	695,450	1,150	1,150	696,600	696,600	13,620	13,620	12,185	12,185	718,560	718,560	357,480	1,794,600

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A CONNECTICUT CORP.
FARMINGTON, CONNECTICUT 06032

MIDWAY

SCALE NONE
DATE 08/24/06
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FT8–3
MASS/HEAT BALANCE
(ISO CONDITIONS)

NO FIGURE 3.4–1C
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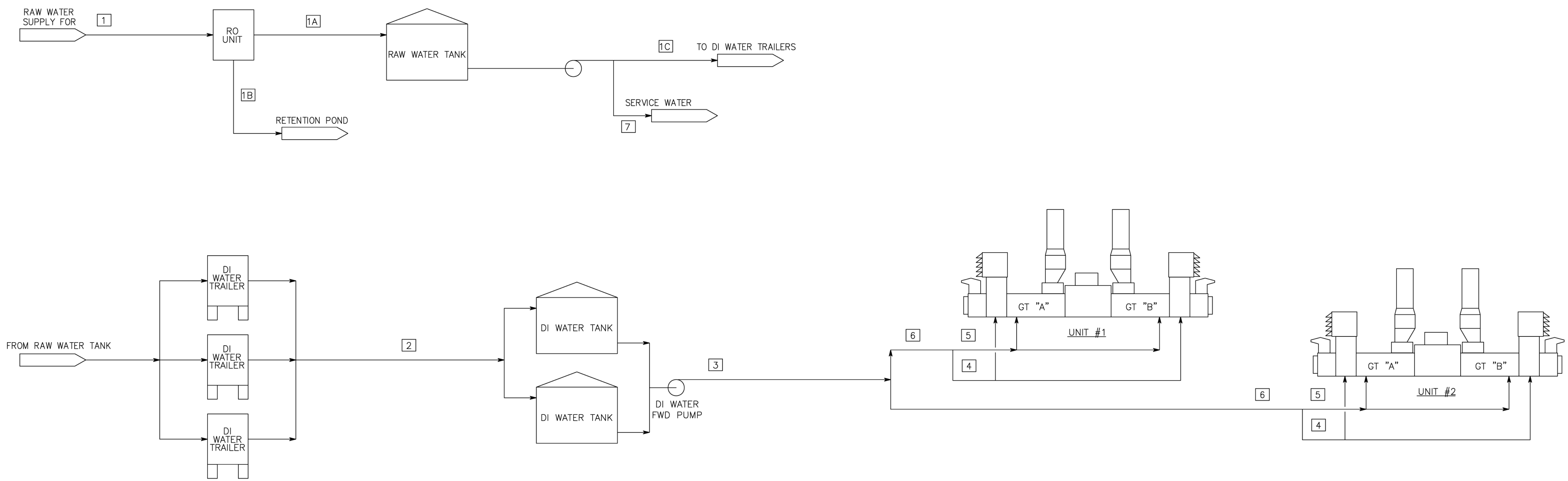
REV A

WATER BALANCE

REV	DATE	DESCRIPTION	BY	APP
A	08-11-06	INITIAL ISSUE	RAR	DAT
B	10-17-06	GENERAL REVISION	RAR	DAT
C	10-25-06	DELETED REFERENCE TO POTABLE WATER	RAR	DAT
D	11-03-06	ADDED NOTE 4	RAR	DAT



NOTES:

1. PEAK DEMAND (138 GPM) WILL BE REQUIRED FOR A 12 HOUR PERIOD/DAY. THIS TRANSLATES INTO APPROX. 100,000 GALLONS OF DI WATER WHICH WILL BE PROVIDED BY THE 150,000 GALLONS OF DI WATER IN THE STORAGE TANKS. RUNNING THE RO UNIT/DEMIN TRAILERS FOR 24 HR/DAY AT 70 GPM (75 GPM SUPPLY MINUS 5 GPM FOR SERVICE WATER) WILL PROVIDE SLIGHTLY MORE THAN 100,000 GALLONS/DAY OF MAKEUP DI WATER TO THE DI STORAGE TANKS. THUS, FLOW IS BALANCED.
2. INLET FOGGING REQUIREMENT IS BASED ON 114°F (DRY BULB), 22% RELATIVE HUMIDITY, 100% POWER CONDITIONS.
3. WATER INJECTION REQUIREMENT IS BASED ON 100% POWER, ISO CONDITIONS AND THE ASSUMPTION THAT NOx AT THE GT EXIT IS CONTROLLED TO 37 PPMVD, REFERENCED TO 15% O2.
4. SERVICE WATER SUPPLY WILL BE INTERMITTENT. PEAK SUPPLY SUPPLY = 5 GPM.

STREAM NO.	DESCRIPTION	SUPPLY (GPM)	PEAK USAGE (NOTE 1) (GPM)
1	RAW WATER SUPPLY	100	–
1A	RO UNIT OUTPUT	75	–
1B	RO WASTE	25	–
1C	RAW WATER SUPPLY TO DI TRAILERS	70	–
2	DI TRAILER OUTPUT	70	–
3	DI WATER REQUIREMENT FOR (2) UNITS	–	138
4	FOGGING SYSTEM REQUIREMENT/UNIT (NOTE 2)	–	20
5	WATER INJECTION SYSTEM REQUIREMENT/UNIT (NOTE 3)	–	49
6	DI WATER REQUIREMENT/UNIT	–	69
7	SERVICE WATER (SEE NOTE 4)	INTERMITTENT	–

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MIDWAY

SCALE NONE
DATE 08/11/06
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APP HAG

WATER BALANCE

NO CALP-181-WB00 SH 1 REV D

CIVIL ENGINEERING
DESIGN & CRITERIA

APPENDIX C
CIVIL ENGINEERING DESIGN AND CRITERIA

Civil Engineering Design Criteria

1.0 Introduction

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and construction of civil engineering systems for the Midway Project. More specific project information will be developed during execution of the project to support detailed design, engineering, material procurement specification, and construction specifications as required.

2.0 Codes and Standards

The design of civil engineering systems for the project will be in accordance with the laws, ordinances, and regulations of the federal government, the State of California, and Fresno County, local ordinances and industry standards. The most current issue or revision of rules, regulations, codes, ordinances, and standards at the time of filing this Application for Certification will apply, unless otherwise noted. If there are conflicts between cited documents, the more conservative requirements will be used.

2.1 Civil Engineering Codes and Standards

The following codes and standards are applicable to the civil engineering design of the power facility:

- American Association of State Highway and Transportation Officials (AASHTO)
- American Concrete Institute (ACI)
- American Institute of Steel Construction (AISC)
- American National Standards Institute (ANSI)
- American Society for Testing and Materials (ASTM)
- American Water Works Association (AWWA)
- American Welding Society (AWS)
- Asphalt Institute (AI)
- California Building Code (CBC)
- California Department of Transportation (Cal Trans)
- California Energy Commission – Recommended Seismic Design Criteria for Non-Nuclear Generating Facilities in California
- Concrete Reinforcing Steel Institute (CRSI)
- Factory Mutual (FM)
- Federal and California Occupational Safety and Health Administration (OSHA and CAL-OSHA)
- National Fire Protection Association (NFPA)
- Steel Structures Painting Council (SSPC)

2.2 Engineering Geology Codes, Standards, and Certifications

Engineering geology activities will conform to the applicable federal, state, and local laws, regulations, ordinances and industry standards.

2.2.1 Federal

None are applicable

2.2.2 State

The Warren-Alquist Act, PRC, Section 25000 et seq. and the California Energy Commission (CEC) Code of Regulations (CCR), Siting Regulations, Title 20 CCR, Chapter 2, require that the Application for Certification (AFC) address the geologic and seismic aspects of the project.

The California Environmental Quality Act (CEQA), PRC 21000 et seq. and the CEQA Guidelines require that potentially significant effects, including geologic hazards, be identified and a determination made as to whether they can be substantially reduced.

2.2.3 Local

California State Planning Law, Government Code Section 65302, requires each city and county to adopt a general plan, consisting of nine mandatory elements, to guide its physical development. Section 65302(f) requires that a seismic safety element be included in the general plan.

The project development activities will require certification by a Professional Geotechnical Engineer and a Professional Engineering Geologist during and following construction, in accordance with the CBC, Chapter 33 and Appendix Chapter 33. The professional Geotechnical Engineer and /or the Professional Engineering Geologist will certify the placement of earthen fills and the adequacy of the site for structural improvements, as follows:

> Both the Professional Geotechnical Engineer and the Professional Engineer will address CBC Appendix Chapter 33, Sections 3309 (Grading Permits), 3312 (Cuts), 3313 (Fills), 3315 (Terraces), 3316 (Erosion Control), and 3318 (Final Reports).
>
> The Professional Geotechnical Engineer will also address CBC Appendix Chapter 33, Sections 3314 (Setbacks) and 3315 (Terraces).

Additionally, the Professional Engineering Geologist will present findings and conclusions pursuant to PRC, Section 25523 (a) and (c); and 20 CCR, Section 1752 (b) and (c).

2.3 Storm Drainage Codes, Standards, and Certifications

Storm drainage design activities will conform to the applicable federal, state, and local laws, regulations, ordinances and industry standards. The design of all storm drainage will be performed by, or under the direct supervision of, a licensed civil engineer.

2.3.1 Federal

Finish floors and grade elevations shall be based upon flood plain elevations as established by the Federal Emergency Management Agency.

2.3.2 State

None are applicable

2.3.3 Local

The County of Fresno County has specific design requirements for storm water management that will be met by this project.

STRUCTURAL ENGINEERING DESIGN & CRITERIA

APPENDIX D
Structural Engineering Design Criteria

1.0 Introduction

This appendix summarizes the codes, standards, criteria and practices that will be generally used in the design and construction of structural engineering systems for the Midway Project. More specific project information will be developed during execution of the Project to support detailed design, engineering, material procurement specification, and construction specifications.

2.0 Codes and Standards

The design of structural engineering systems will be in accordance with the laws, ordinances, and regulations of the federal government, the State of California, and Fresno County ordinances, and the industry standards. The current issue or edition of the documents at the time of filing of this Application for Certification (AFC) will apply, unless otherwise noted. In cases where conflicts between the cited documents exist, requirements of the more conservative document will be used.

The following codes and standards have been identified as applicable, in whole or in part, to Structural engineering design and construction of power plants:

♦ California Building Code (CBC)
♦ American Institute of Steel Construction (AISC):
- Manual of Steel Construction - 9th Edition
- Specification for the Design, Fabrication and Erection of Structural Steel for Buildings – ASD
- Load and Resistance Factor Design Specification for Structural Steel Buildings
- Specification for Structural Joints Using ASTM A325 or A490 Bolts
- Code of Standard Practice for Steel Buildings and Bridges
♦ American Concrete Institute (ACI):
- ACI 318, Building Code Requirements for Structural Concrete
- ACI 301, Specifications for Structural Concrete for Buildings
- ACI 350R, Environmental Engineering Concrete Structures
- ACI 543R, Design, Manufacture, and Installation of Concrete Piles
♦ American Society of Civil Engineers (ASCE):
- ASCE 7 - Minimum Design Loads for Buildings and Other Structures
♦ American Welding Society (AWS):
- Dl.l - Structural Welding Code - Steel
- D1.3 - Structural Welding Code - Sheet Steel
♦ Code of Federal Regulations, Title 29 - Labor, Chapter XVII, Occupational Safety and Health Administration (OSHA).
-Part 1910 - Occupational Safety and Health Standards
- Part 1926 - Construction Safety and Health Regulations
♦ National Association of Architectural Metal Manufacturer (NAAMM) - Metal Bar Grating Manual.
♦ Hoist Manufacturers Institute (HMI), Standard Specifications for Electric Wire Rope Hoists (HMI 100).
♦ National Electric Safety Code (NESC)
♦ National Fire Protection Association (NFPA Standards).
- NFPA 850 Fire Protection for Electric Generating Plants.

- Steel Deck Institute (SDI)-Design Manual for Floor Decks and Roof Decks.
- Design of Large Steam Turbine-Generator Foundations, ASCE 1987.

3.0 CEC Special Requirements

Prior to the start of any increment of construction, the proposed lateral force procedures for structures and the applicable designs, plans and drawings for structures will be submitted for approval.

Proposed lateral-force procedures, designs, plans, and drawings shall be those for:

Major structures
Major foundations, equipment supports, and anchorage
Large, field-fabricated tanks
Turbine/generator pedestal
Switchyard structures

4.0 Structural Design Criteria

4.1 Topographic Elevations

Site topographic elevations will be based on an elevation survey conducted using known elevation benchmarks.

4.2 Frost Penetration

The site is located in an area free of frost penetration. Bottom elevation of all foundations for structures and equipment, however, will be maintained at a minimum of 12 inches below the finished grade.

4.3 Temperatures

The design basis temperatures for civil and structural engineering systems will be as follows:

Maximum: 114 F

Minimum: 18 F

4.4 Design Loads

4.4.1 General

Design loads for structures and foundations will comply with all applicable building code requirements.

4.4.2 Dead Loads

Dead loads will consist of the weights of the structure and all equipment of a permanent or semipermanent nature including tanks, bins, wall panels, partitions, roofing, drains, piping, cable trays, bus ducts, and the contents of tanks and bins measured at full operating capacity. The contents of the tanks and bins, however, will not be considered as effective in resisting structure uplift due to wind forces; but will be considered as effective for seismic forces.

4.4.3 Live Loads

Live loads will consist of uniform floor live loads and equipment live loads. Uniform live loads are assumed equivalent unit loads that are considered sufficient to provide for movable and transitory loads, such as the weights of people, portable equipment and tools, small equipment or parts, which may be moved over or placed on the floors during maintenance operations, and planking. The uniform live loads will not be applied to floor areas that will be permanently occupied by equipment.

Lateral earth pressures, hydrostatic pressures, and wheel loads from trucks will be considered as live loads.

Uniform live loads will be in accordance with ASCE 7, but will not be less than the following:

a. Roofs: 20 psf
b. Floors and Platforms (Steel grating and checkered plates): 100 psf

In addition, a uniform load of 50 psf will be used to account for piping and cable trays, except that where the piping and cable loads exceed 50 psf, the actual loads will be used.

Furthermore, a concentrated load of 5 kips will be applied concurrently to the supporting beams of the floors to maximize stresses in the members, but the reactions from the concentrated loads will not be carried to the columns.

c. Floors (Elevated Concrete floors): 100 psf

In addition, elevated concrete slabs will be designed to support an alternate concentrated load of 2 kips in lieu of the uniform loads, whichever govern. The concentrated load will be treated as uniformly distributed load acting over an area of 2.5 square feet, and will be located in a manner to produce the maximum stress conditions in the slabs.

d. Control Room Floor: 150 psf
e. Stairs, Landings and, Walkways: 100 psf

In addition, a concentrated load of 2 kips will be applied concurrently to the supporting beams for the walkways to maximize the stresses in the members, but the reactions from the concentrated loads will not be carried to the columns.

f. Pipe Racks: 100 psf

Where the piping and cable tray loads exceed the design uniform load, the actual loads will be used. In addition, a concentrated load of 5 kips will be applied concurrently to the supporting beams for the walkways to maximize the stresses in the members, but the reactions from the concentrated loads will not be carried to the columns.

g. Hand Railings

Hand railings will be designed for either a uniform horizontal force of 50 plf applied simultaneously with a 100 plf uniform vertical live load, or a 200-pound concentrated load applied at any point and in any direction, whichever governs.

h. Slabs on Grade: 250 psf
i. Truck Loading Surcharge Adjacent to Structures: 500 psf during normal operation and 1,000 psf during construction
j. Truck Support Structures: AASHTO-HS20-44
k. Special Loading Conditions: Actual loadings

Lay down loads from equipment components during maintenance and floor areas where trucks, forklifts, or other transports will have access will be considered in the design live loads.

Live loads may be reduced in accordance with the provisions of CBC Section 1607.

Posting of the floor load capacity signs for all roofs, elevated floors, platforms and walkways will be in compliance with the OSHA Occupational Safety and Health Standard, Walking and Working Surfaces, Subpart D. Floor load capacity for slabs on grade will not be posted.

4.4.4 Earth Pressures

Earth pressures will be in accordance with the recommendations contained in the PEC geotechnical report.

4.4.5 Groundwater Pressures

Hydrostatic pressures due to groundwater or temporary water loads will be considered.

4.4.6 Wind Loads

The wind forces will be calculated in accordance with CBC, Chapter 16, Division III, with a basic wind speed of 80 mph and a "C" exposure category.

4.4.7 Seismic Loads

Structures will be designed and constructed to resist the effects of earthquake loads as determined in CBC, Chapter 16, Division IV. The site is located on seismic zone 4. The occupancy category of the structure is 3 (Special Occupancy Structure) and corresponding importance factor (I) is 1.50. Other seismic parameters will be obtained from the geotechnical report.

4.4.8 Snow Loads

Snow loads will not be considered.

4.4.9 Turbine-Generator Loads

The combustion turbine-generators and the steam-turbine generators loads for pedestal and foundation design will be furnished by the equipment manufacturers, and will be applied in accordance with the equipment manufacturers' specifications, criteria and recommendations.

4.4.10 Special Considerations for Steel Stacks

Steel stacks will be designed to withstand the normal and abnormal operating conditions in combination with wind loads and seismic loads, and will include the along-wind and across-wind effects on the stacks. The design will meet the requirements of ASME/ANSI STS1-2000, "Steel Stacks," using allowable stress design method, except that increased allowable stress for wind loads, as permitted by AISC, will not be used.

4.4.11 Special Considerations for Structures and Loads During Construction

For temporary structures, or permanent structures left temporarily incomplete to facilitate equipment installations, or temporary loads imposed on permanent structures during construction, the allowable stresses may be increased by 33 percent.

Structural backfill may be placed against walls, retaining walls, and similar structures when the concrete strength attains 80 percent of the design compressive strength (f'c), as determined by sample cylinder tests. Restrictions on structural backfill, if any, will be shown on the engineering design drawings.

Design restrictions imposed on construction shoring removal that are different from normal practices recommended by the ACI Codes will be shown on engineering design drawings. Metal decking used as forms for elevated concrete slabs will be evaluated to adequately support the weight of concrete plus a uniform construction load of 50 psf, without increase in allowable stresses.

5.0 Design Bases

5.1 General

Reinforced concrete structures will be designed by the strength design method, in accordance with ACI 318, "Building Code Requirements for Structural Concrete."

Steel structures will be designed in accordance with AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

Allowable soil bearing pressures for foundation design will be in accordance with the "Final Subsurface Investigation and Foundation Report" for the PEC.

Reinforced concrete for sumps, cooling tower basins, and other structures designed to contain water will meet the requirements of ACI 350.

5.2 Factors of Safety

The factor of safety for all structures, tanks, and equipment supports will be as follows:

Against Overturning: 1.5

Against Sliding: 1.5 for Wind Loads, 1.1 for Seismic Loads

Against Uplift Due to Wind: 1.5

Against Buoyancy: 1.25

5.3 Allowable Stresses

Calculated stresses from the governing loading combinations for structures and equipment supports will not exceed the allowable limits permitted by the applicable codes, standards and specifications.

5.4 Load Factors and Load Combinations

For reinforced concrete structures and equipment supports, using the strength method, the strength design equations will be determined based on CBC, Sections 1612.2,1612.4, 1909.2 and using ACI-318 Eqs (9-2), (9-3). The Allowable Stress Design load combinations of CBC section 1612.3 will be used to assess soil bearing pressure and stability of structures per CBC Sections 1805 and 1629.1, respectively. Steel framed structures will be designed in accordance with CBC, Chapter 22, Divisions I, III and IV and the AISC Specification for the Structural Steel Buildings. Connections will conform to Research Council on Structural Connections of the Engineering Foundation Specification for Structural Joints. Connections for moment frame structures will conform to the recommendations of FEMA Report 350 for seismic connections.

6.0 Construction Materials

6.1 Concrete and Grout

The design compressive strength (f'c) of concrete and grout, as measured at 28 days, will be as follows:

Electrical duct bank encasement and lean concrete backfill (Class L-1): 2000 psi Structural concrete (Class Sl): 3000 psi Structural concrete (Class S2): 4000 psi Grout (Class G-1): 5000 psi

The classes of concrete and grout to be used will be shown on engineering design drawings or indicated in design specifications.

6.2 Reinforcing Steel

Reinforcing steel bars for concrete will be deformed bars of billet steel, conforming to ASTM A 615, Grade 60.

Welded wire fabric for concrete will conform to ASTM A 185.

6.3 Structural and Miscellaneous Steel

Structural and miscellaneous steel will generally conform to ASTM A 36, ASTM A 572 or ASTM A992 except in special situations where higher strength steel is required.

High strength structural bolts, including nuts and washers, will conform to ASTM A 325 or ASTM A 490.

Bolts other than high strength structural bolts will conform to ASTM 307, Grade A.

6.4 Concrete Masonry

Concrete masonry units will be hollow, normal weight, load bearing Type I conforming to ASTM C 90. Mortar will conform to ASTM C 270, Type M. Grout will conform to ASTM C 476.

6.5 Other Materials

Other materials for construction, such as anchor bolts, shear connectors, concrete expansion anchors, embedded metal, etc., will conform to industry standards and will be identified on engineering design drawings or specifications.

MECHANICAL ENGINEERING
DESIGN & CRITERIA

APPENDIX E
Mechanical Engineering Design Criteria

1.0 Introduction

This appendix summarizes the codes, standards, practices and design criteria that will be used in the design and construction of mechanical engineering systems for the Midway project. More specific project information will be developed during execution of the project to support detailed design, engineering, material procurement specification, and construction specifications.

2.0 Codes and Standards

The design of the mechanical systems and components will be in accordance with the laws and regulations of the federal government, the State of California, Fresno County, and local ordinances, and industry standards. The most current issue or revision of rules, regulations, codes, ordinances, and standards at the time of filing this Application for Certification will apply, unless otherwise noted. If there are conflicts between cited documents, the more conservative requirements will apply.

The following codes and standards are applicable to the mechanical aspects of the power facility:

California Building Standards Code, 2001
American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code
American National Standards Institute (ANSI) B16.5, B16.34, and B133.8
ASME/ ANSI B31.1 Power Piping Code
ASME Performance Test Codes
ASME Standard TDP-1
American Boiler Manufacturers Association (ABMA)
American Gear Manufacturers Association (AGMA)
Air Moving and Conditioning Association (AMCA)
American Society for Testing and Materials (ASTM)
American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
American Welding Society (AWS)
Cooling Tower Institute (CTI)
Heat Exchange Institute (HEI)
Manufacturing Standardization Society (MSS) of the Valve and Fitting Industry
National Fire Protection Association (NFPA)
Hydraulic Institute Standards (HIS)
Tubular Exchanger Manufacturers Association (TEMA)
American Institute of Steel Construction (AISC)
American Petroleum Institute (API)
Factory Mutual (FM)
Hydraulic Institute (HI)
Occupational Safety and Health Act (OSHA)
Steel Structures Painting Council (SSPC)
Underwriters Laboratories (UL)
Uniform Building Code (UBC)

3.0 General Design Criteria

3.1 General

The systems, equipment, and materials and their installation will be designed in accordance with applicable codes; industry standards; local, state, and federal regulations; design criteria; manufacturing processes and procedures; and material selection, testing, welding, and finishing procedures specified in this section.

The equipment vendors in accordance with general performance requirements will perform detailed equipment design. General performance requirements will be specified by the EPC (Engineering, Procurement and Construction) contractor. Equipment vendors will be responsible for using construction materials suited for the intended use.

3.2 Materials

Asbestos will not be present in the materials and equipment supplied. Materials will be selected to withstand the design operating conditions, including expected ambient conditions, for the design life of the plant. It is anticipated that some materials will require replacement during the life of the plant due to corrosion, erosion or other factors.

3.3 Pumps

Pumps will be sized in accordance with industry standards. Where feasible, pumps will be sized for maximum efficiency at the normal operating point. Pumps will be designed to be free from excessive vibration throughout the operating range.

3.4 Tanks

Large outdoor storage tanks will not be insulated except where required to maintain appropriate process temperatures or for personnel protection.

Overflow connections and lines will be provided. Maintenance drain connections will be provided for complete tank drainage.

Manholes, where provided, will be at least 24 inches in diameter and hinged to facilitate removal. Storage tanks will have ladders and cleanout doors as required to facilitate access/maintenance. Provisions will be included for proper tank ventilation during internal maintenance.

3.5 Heat Exchangers

Heat exchangers will be provided as components of mechanical equipment packages and may be shell-and-tube or plate type. Heat exchangers will be designed in accordance with TEMA or manufacturer's standards. Fouling factors will be specified in accordance with TEMA.

3.6 Pressure Vessels

Pressure vessels will include the following features and appurtenances:

- Process, vent, and drain connections for startup, operation, and maintenance.
- Materials compatible with the fluid being handled
- A minimum of one manhole and one air ventilation opening will be provided where required for maintenance or cleaning access.
- For vessels requiring insulation, shop-installed insulation clips spaced not greater than 18 inches on center will be utilized.
- Relief valves will be provided for all pressure vessels in accordance with applicable codes.

3.7 Valves

Valves will be arranged for convenient operation from floor level where possible and, if required, will have extension spindles, chain operators, or will be gearing. Hand-actuated valves will be operable by one person. Gear operators will be provided on manual valves 8 inches or larger.

Valves will be arranged to close when the handwheel is rotated in a clockwise direction when looking at the handwheel from the operating position. The direction of rotation to close the valve will be clearly marked on the face of each handwheel.

The stops that limit the travel of each valve in the open or closed position will be arranged on the exterior of the valve body. Valves will be fitted with an indicator to show whether they are open or closed; however, only critical valves will be remotely monitored for position. Valve materials will be suitable for operation at the maximum working pressure and temperature of the piping to which they are connected. Steel valves will have cast or forged steel spindles. Seats and faces will be of low-friction, wear-resistant materials. Valves in throttling service will be selected with design characteristics and of materials that will resist erosion of the valve seats when the valves are operated partly closed.

Valves operating at less than atmospheric pressure will include means to prevent air in-leakage. No provision will be made to repack valve glands under pressure.

3.7.1 Drain and Vent Valves and Traps

Drains and vents in 600-pound class or higher piping and 900°F or higher service will be double-valved. Drain traps will include air cock and easing mechanism. Internal parts will be constructed from corrosion-resistant materials and will be renewable.

Trap bodies and covers will be cast or forged steel and will be suitable for operating at the maximum working pressure and temperature of the piping to which they are connected. Traps will be piped to drain collection tank or sumps and returned to the cycle if convenient.

3.7.2 Motor Actuated Valves

Electric motor actuators will be designed specifically for the operating speeds, differential and static pressures, flowrates, operating environment, and frequency of operations for the application intended. Electric actuators will have self-locking features. A handwheel and declutching mechanism will be provided to allow handwheel engagement at any time except when the motor is energized. Actuators will automatically revert back to motor operation by disengaging the handwheel, The motor actuator will be placed in a position relative to the valve that prevents leakage of liquid or gas from valve joints.

3.7.3 Safety and Relief Valves

Safety valves or relief valves will be provided as required by code for pressure vessels, heaters, and boilers. Safety and relief valves will be installed vertically. Piping systems that can be over-pressurized by a higher-pressure source will also be protected by pressure-relief valves. Equipment or parts of equipment that can be over-pressurized by thermal expansion of the contained liquid will also have thermal relief valves.

3.7.4 Instrument Root Valves

Instrument root valves will be specified for operation at the working pressure and temperature of the piping to which they are connected. Test points and sample lines in systems that are 600-pound class or higher service will be double-valved.

3.8 Heating, Ventilating, and Air Conditioning (HVAC)

HVAC system design will be based on site ambient conditions as described in Section 3.0, Project Description. Air conditioning will include both heating and cooling of filtered air. Except for the HVAC systems serving the control room and administration areas, the systems will not be designed to provide comfort levels for extended human occupancy.

Air velocities in ducts, louvers and grills will be low enough to minimize noise levels in areas where personnel are normally located.

Fans and motors will be mounted on anti-vibration bases to isolate the units from the building structure. Exposed fan outlets and inlets will be fitted with guards. Belt-driven fans, pulleys and belts will be provided with appropriate guards.

Air filters will be housed in a manner that facilitates removal. The filter frames will be designed to pass the air being handled through the filter without leakage.

Ductwork, filter frames, and fan casings will be constructed of galvanized mild steel sheets stiffened with galvanized mild steel flanges. Ductwork will be the sectional bolted type and will be adequately supported. Duct joints will be leak tight. Grills and louvers will be of adjustable metal construction.

3.9 Thermal Insulation and Lagging

Parts of the facility requiring insulation to reduce heat loss or afford personnel safety will be thermally insulated. Minimum insulation thickness for hot surfaces near personnel will be designed to limit the outside lagging surface temperature to a maximum of 140°F, based on 80°F ambient temperature and 1 mph/hr air velocity. Other insulation minimums will be designed to limit heat loss to 80 Btu/hr-sqft based on 80°F ambient condition and an air velocity of 20 mph.

The thermal insulation will have as its main constituent calcium silicate, foam glass, fiberglass, or mineral wool, and will consist of pre-formed slabs or blankets, where feasible. Asbestos material will be prohibited. An aluminum jacket or suitable coating will be provided on the outside surface of the insulation. Where a hard setting compound is used as an outer coating, it will be nonabsorbent and noncracking. Thermal insulation will be chemically inert even when saturated with water. Insulation system materials, including jacketing, will have a flame spreading rating of 25 or less when tested in accordance with ASTM E84.

Insulation at valves, pipe joints or other points where access may be required for maintenance will be removable with minimum disturbance to the pipe insulation. At each flange joint, the molded material will terminate on the pipe at a distance from the flange equal to the over all length of the flange bolts to permit their removal without damaging the molded insulation.

Above ground insulated piping will be clad with pebbled or corrugated aluminum lagging of not less than 30 mm thickness and frame reinforced. At the joints, the sheets will be sufficiently overlapped and corrugated to prevent moisture from penetrating the insulation.

Design temperature limits for thermal insulation will be based on system operating temperatures during normal operations.

Outdoor and underground insulation will be moisture resistant.

Any piping that is subject to freezing will be heat traced or have other means of freeze protection.

3.10 Welding

Welders and welding procedures will be certified in accordance with the requirements of applicable codes and standards before any welding is permitted. Contractors will maintain indexed records of welder qualifications and weld procedures.

3.11 Painting

Except as otherwise specified, equipment will receive the respective manufacturer's standard shop finish. Finish colors will be selected from amongst the paint manufacturer's standard colors.

Finish painting of uninsulated piping will be limited to that required by OSHA for safety or for protection from the elements.

Piping to be insulated will not be painted.

3.12 Lubrication

The types of lubrication specified for facility equipment will be suited to the operating conditions and will comply with the recommendations of the equipment manufacturers.

The initial startup charge of flushing oil will be the equipment manufacturer's standard lubricant for the intended service. Subsequently, such flushing oil will be sampled and analyzed to determine whether it can also be used for normal operation or must be replaced in accordance with the equipment supplier's recommendations.

Rotating equipment will be splash lubricated, force lubricated, or self lubricated. Oil cups will be provided as necessary. Where automatic lubricators are fitted to equipment, provision for emergency hand lubrication will also be specified. Where applicable, equipment will be designed to be manually lubricated while in operation without the need to remove protective guards. Lubrication filling and drain points will be readily accessible.

4.0 Detailed Design Criteria

4.1 General

Two (2) FT8-3 Twin-Pac gas turbine generator sets will be installed in a simple cycle power plant arrangement for the Midway project.

The gas turbines will operate in a natural gas / water injection mode. Thus, both a natural gas and water treatment system are required for the BOP. The water treatment system will generate and store demineralized (DI) water for gas turbine water injection and inlet fogging (inlet air cooling). The owner will supply the raw water (city water) to the power plant terminal point for use in the water treatment system. Demineralized water will be generated via mobile demineralizer trailers. Raw water will also be used for domestic water / service water purposes. The Owner will supply natural gas from the natural gas pipe line adjacent to the power plant. The power plant will also require a compressed air system (for instrument air and service air), a GT drain system, and a Waste Water drain system (oily waste). Each of these systems are described below.

An SCR/CO Catalyst system will be implemented on both gas turbine generator sets to control emissions. In this regard, the BOP shall include an SCR ammonia system that will support unloading, storage and injection of ammonia. This system is also defined below.

4.2 Natural Gas Fuel System

1. The natural gas system will interface with the client's gas metering station.
2. Refer to ESI piping/valve material specification sheet No. 33 for the required carbon steel piping system.
3. The carbon steel piping material is ASTM A-106 Gr. B seamless pipe, and the flange rating is 300# ANSI class, RFF.
4. The small bore piping (2" or smaller diameter) shall be schedule 80, and the large bore piping (diameter greater than or equal to 2-1/2") shall be schedule 40.
5. All connections to underground piping shall be isolated with an insulation kit.
6. External corrosion protection shall be provided for all underground piping.
7. 100 % RT shall be conducted in the field for all weld seams in underground piping, and 10 % RT shall be conducted in the field for all weld seams in above ground piping. A weld map that shows the welder identification, date and time of welding, and RT number shall be provided. The weld map shall be submitted with the RT films to the Client following completion of the construction works.
8. Pneumatic pressure testing shall be conducted using N_2 gas for the field installed piping system in accordance with Process Power Piping Code B31.3.
9. All gas venting to atmosphere shall be extended to a safe place. If it is located on a building roof, the height of venting goose necks shall be at least ten (10) feet above the roof level.
10. Stainless Steel tags that identify underground pipe (at all locations where pipe is going into or coming out of the ground) shall be provided.
11. Service identification color and flow direction marking on the above ground piping shall be provided.
12. All valves in the natural gas system shall be API fire safe rated type.
13. Open drain valves shall be lockable type.
14. One (1) Gas Fuel Coalescer/Filter will be utilized in the BOP to remove liquids and particles from the natural gas.
15. A plant fire safe valve (FSV), Fisher model A41, Posiseal butterfly valve with Phoenix III seals or equal, shall be provided in the main BOP gas line. This FSV is in addition to the FSV installed outside of each gas turbine enclosure. This BOP FSV shall be connected to the plant fire protection control panel that is located in a 24 hour manned area such as the main security gate office or the plant control room. The FSV has a remote manual reset solenoid valve in

addition to OPEN/CLOSED position switches. Either natural gas or plant instrument air shall be used to operate the FSV.

16. WPQ, WPS and PQR for the natural gas piping weld work shall be submitted to the Purchaser for the purpose of a record - one (1) month prior to starting the shop weld work and the site weld works.
17. NDE procedure and the weld repair procedure shall be submitted to the purchaser for the purpose of a record.
18. Cathodic protection may be necessary depending on the soil analysis.

4.3 Compressed Air System

1. Air compressors: Two (2) 100 % capacity oil flood screw compressors shall be installed indoors. Sullair LS-120-50H or equal, shall be selected.
2. Capacity per compressor: 80 CFM at 125 psig
3. One (1) Air Dryer: With twin desiccant type heatless regenerative air vessels (Minus (-) 40F dewpoint at the compressed air pressure).
4. Air filters: Duplex Coalescing pre-filter and particle after-filters to produce 100 psig clean, dry, and oil-free instrument air at the air dyer skid outlet. The coalescing filters shall be capable of removing entrained liquids and particulate to 0.025 microns (absolute) The after-filters shall be particulate filters capable of removing particulate to 1.0 micron (absolute).
5. Dryer skid shall include one (1) air tank. Tank shall be designed, fabricated, tested and certified in accordance with the Unfired Pressure Vessel Code, ASME Section VIII. Capacity of the tank is approximately 400 Gallons. Design pressure and temperature of the air tank is 150 psig at 150 F.
6. All pressure safety valves (PSV) in the compressed air system shall be designed, tested and certified by the ASME Section VIII design code for the unfired pressure vessel application. ASME certification of the PSV shall be submitted to the Purchaser.
7. The piping systems of the air compressor skid and the air dryer skid shall be shop pneumatic tested for 30 minutes with 150 psig dry air or N_2 gas. During shop pressure testing, the air tanks shall be isolated from the testing fluid.
8. The complete system (air compressor skid and dryer skid) shall be cleaned out in the shop using air from the compressors.
9. Cast iron parts are prohibited in the compressed air system.
10. The air compressor and the air dryer system will be operated remotely from the plant control room. A local and remote operation selection switch shall be incorporated in the control system.
11. Refer to ESI piping/valve material specification sheets No. 16 for the stainless steel piping requirements and No. 19 for the carbon steel piping requirements.
12. The Carbon Steel piping material is ASTM A-106 Gr. B seamless pipe. Flange rating is 150# ANSI class / RFF.
13. The carbon steel small bore piping (2" or smaller diameter) shall be schedule 40, and the large bore piping (diameter greater than or equal to 2-1/2") shall be schedule 40. Carbon steel shall be used for air compressor skid piping, air dryer skid piping, and service air piping. If thread connections are required for small diameter piping, schedule 80 seamless piping shall be used.

14. The stainless steel piping material is ASTM A-312, Gr. TP 304L schedule 10 piping. The flange rating is 150# ANSI class / RFF. The instrument air system shall be stainless steel from the air dryer outlet.
15. All connections to underground piping shall be isolated with an insulation kit.
16. External corrosion protection shall be provided for all underground piping.
17. 10% RT shall be conducted in the field on all piping. A weld map that shows the welder identification, date and time of welding, and RT number shall be provided. The weld map shall be submitted with the RT films to the ESI following completion of the construction works.
18. WPS, PQR and WPQ shall be submitted for the purpose of a record - one (1) month before starting the shop weld works and field weld works.
19. The drains for the air coalescing filters in the air dryer skid shall be FCVs operated by timers. The drains for the air tanks in the air dryer skid shall be FCVs operated off of condensate level sensors. PI and TI shall be provided as indicated in the P&ID for monitoring the operation of the compressed air system.
20. PT shall be provided at the air dryer skid outlet to monitor the instrument air pressure, and to activate starting the stand-by air compressor in case the instrument air pressure at the air dryer outlet falls to less than 80 psig (which is a low air pressure limit for the power plant operation). The instrument air pressure will be displayed at the plant control room.
21. The set point of the PCV at the air supply line to the gas turbine is 55 psig.
22. The compressor air dryer skid shall be commercial blasted and painted in accordance with the vendor standards, and the Owner specified color code (later)
23. Stainless Steel tags that identify underground pipe (at all locations where pipe is going into or coming out of the ground) shall be provided.
24. Service identification color and flow direction marking on the above ground piping system shall be provided.
25. Open drain valves shall be a lockable type.
26. The instrument air requirement for each gas turbine during water wash and engine heater operation is 10 CFM at a pressure of 50 psig to 90 psig. During shipment of the air compressor skid and air dryer skid, all openings shall be capped with plastic inserts and plywood bolted covers.

4.4 Water Treatment System

4.4.1 DI Trailer Requirements

1. No. of trailers: Two (2) trailers (design case); DI water production per trailer =70 GPM; Outdoor installation on a concrete mate.
2. Complete water treatment system that produces DI water shall be shop mounted, pre-piped, pre-wired in a container on the trailer and tested. Testing shall including all water treatment system equipment, controls, protections and sequencing devices, quality and quantity monitoring devices, HVAC, lights, and wall mounted electrical receptacles, etc.
3. The quality of DI water produced by the water treatment must meet the following limits:

* Total Solids	<1.0 PPM	ASTM D1888
* Sodium	<0.10 PPM	ASTM D2791
* Silica	<0.02 PPM	ASTM D859

* Conductivity <1.0-1.5 Micromho/cm ASTM D5391

4. The Vendor will supply all flexible hoses necessary to connect to the DI water trailers.
5. The raw water supply interface connection at the DI water trailer inlet is 4” ANSI 150# class RFF, Carbon Steel; the instrument air connection at the DI trailer is ¾” FNPT, stainless steel pipe; the DI water connection at the DI water trailer outlet is 3” ANSI 150# class, RFF, stainless steel.
6. During normal operation (i.e., (2) trailers operating), flow thru each trailer to the DI water tanks must be 70 gpm to meet the peak flow demand of two (2) gas turbines (i.e. 50 gpm for water injection and 20 gpm for inlet fogging).
7. Starting up the trailer at the site will require initially flushing out the resin tower(s) for 30 to 60 minutes at full flow.
8. The DI water produced by the trailer must meet the Nox water quality limit required by PWPS standards.

4.4.2 Water Tank Requirements

1. No. of water storage tanks: Two (2) for DI Water and one (1) for Raw Water, Outdoor installation.
2. Model: Cylindrical vertical tank with weak-roof-to-shell joints,
1. Capacity: 75,000 gallons nominal, each tank.
2. Materials: Stainless steel for DI Water tanks and Carbon Steel for Raw Water tank.
3. Design code: API 650 (with Appendix “S” for Stainless Steel tanks) and API 2000 for venting device.
4. NDE should be conducted per API 650 of the weld seams. All weld seams in the bottom plate, and on the shell and bottom plate joints should be leakage tested by a vacuum chamber.
5. After completion of the tank field erection, hydrostatic testing should be performed with filling fresh water to the tank. Fresh water supply point in the site will be appointed by the Owner. The vendor has to arrange piping to fill and drain the tank with testing fluid for the tank erection leak testing. Following completion of the tank erection leak testing, drain out testing fluid from the tank to the site settling pond.
6. WPS, PQR and WPQ should be submitted prior to starting weld work for the purpose of Owner record.
7. Corrosion allowance: zero (0) inches.
8. Design pressure and temperature: Open vent tank @ 150 F
9. Flow: IN=150 GPM and OUT=350 GPM for normal venting device and overflow connection calculation.
10. A breather vent with filter shall be provided.
11. A pressure / vacuum breaking device (P/V Vent) should be provided.
12. Four (4) grounding lugs on each tank and the tank anchor chairs should be provided as required.
13. Two (2), 24 inch diameter man-ways; one on roof and another on side should be provided on each tank.
14. All connections should be ANSI 150 Lb. class, RFF stainless steel, and bolt holes straddle from the flange face center line.

15. Welding pads should be provided for external supports that will be welded by others on the welding pads for the fill pipe, overflow pipe and DI water pump recirculation piping.
16. The fill pipe and the DI water pump recirculation line should not require a Dip tube in the DI water tank.
17. Tank top access ladder with safety cage and platforms should be provided on the tank top and intermediate the ladder per OSHA standards.
18. The location of all connections to be mounted on the tank should be shown on the tank engineering sketch.
19. Electric heat tracing should be provided as required.

4.4.3 DI Water Pump Skid Requirements

1. No. of DI water pumps: Two (2); 100% capacity, ANSI standards pumps; one (1) for normal operation and one (1) for stand-by; Outdoor installation.
2. Pump Model: End suction ANSI centrifugal pump
3. Capacity and Total Dynamic Head (TDH) per pump: 175 GPM with 180 feet of TDH.
4. Materials: Pump Casing: All wetted parts (Shaft, Wearing Rings, Impeller) shall be made of stainless steel
5. Shaft sealing: Mechanical seal.
6. TEFC motor shall be provided for the DI water pump.
7. Shop testing shall be conducted for verification of the flow and TDH of the pump per HI. Hydrostatic testing of the pump casing shall be conducted on pressure part(s) in accordance with ASME Section VIII.
8. A minimum flow orifice shall be provided in each pump recirculation line.
9. Pressure Indicators (PI) shall be provided at the pump inlet and discharge.
10. PSL at the pump suction is required to prevent the pump from dry running with the pump suction valve accidentally closed.
11. PT in the skid outlet line is required to monitor the DI water pressure as well as to auto start a stand-by pump, in case a running pump is tripped.
12. CE/CIT shall be provided in the inlet line of the DI water pump skid to provide continuous quality monitoring of the DI water from the DI water storage tank. The conductivity reading shall be indicated in the plant control room.
13. The DI water pump skid piping system shall be shop hydrostatic tested for 30 minutes at 1.5 times design pressure with DI water. During the shop hydrostatic testing, the pumps shall be isolated from the testing fluid.
14. The carbon steel parts in the pump skid shall be commercial blasted and painted in accordance with the vendor standards, and the specified color code.
15. The capacity of the pump shall include the required minimum flow for the pump selected.
16. The DI flow required for the four (4) gas turbines with water injection and inlet fogging is ~140 GPM. Required pressure at the gas turbine water injection skid inlet is a maximum of 40 psig.
17. For shipment of the pump skid, the skid piping shall be drained, cleaned and dried out after shop testing. All openings shall be capped with plastic inserts and plywood bolted covers.
18. Electric heat tracing shall be provided if required.

4.4.4 DI Water Piping System Specialties

1. Refer to ESI piping/valve material specification sheet No. 13 for the stainless steel piping requirements. Stainless steel piping shall be used for piping that carries DI water.
    a. The piping material is Stainless Steel, ASTM A-312 Gr. TP-304L and the flange rating is 150# ANSI class / RFF
    b. Small bore piping (2" or smaller diameter) shall be schedule 10. Large bore piping (diameter greater than or equal to 2-1/2") shall be schedule 10.
2. Refer to ESI piping/valve material specification sheet No. 19 for the carbon steel piping requirements. Carbon steel piping shall be used for piping that carries raw water.
    a. The piping material is Carbon Steel, ASTM A-106 Gr. B and the flange rating is 150# ANSI class / RFF
    b. The small bore piping of 2" or smaller diameter piping would be a schedule 40, and the large bore piping above 2-1/2" would be schedule 40.
3. All connections to underground stainless steel piping shall be isolated with an insulation kit.
4. External corrosion protection shall be provided for the all underground stainless steel piping.
5. 10% RT shall be conducted in the field on all piping. A weld map that shows the welder identification, date and time of welding, and RT number shall be provided. The weld map shall be submitted with the RT films to the Client following completion of the construction works.
6. WPS, PQR and WPQ shall be submitted to the Purchaser for the purpose of a record - prior to starting the shop and field weld works.
7. Hydrostatic testing shall be conducted using DI water at 1.5 times the design pressure of the piping system for at least 30 minutes (the testing pressure is to be maintained for visual leakage inspection).
8. Stainless Steel tags that identify underground pipe (at all locations where pipe is going into or coming out of the ground) shall be provided.
9. Service identification color and flow direction marking on the above ground piping system shall be provided.
10. Open drain valves shall be a lockable type.
11. The DI water pressure required at the gas turbine water injection skid inlet is between 5 psig (minimum) and 40 psig (maximum).
12. DI water system shall have connections for hook-up to the gas turbine washing unit. The interface connection is a 2" FNPT Kamlok hose connection that PWPS will supply. Gas turbine washing water flow is about 110 GPM (maximum).
13. Hydrostatic testing fluid for the DI water system must be DI water, as chloride in fresh water may cause stress cracking of the stainless steel parts.
14. During shipment of the pump skid, the skid piping shall be drained, cleaned and dry out after shop testing. All openings shall be capped with plastic inserts and plywood bolted covers.
15. Emergency shower/eye washing units shall be provided as required for the chemical handling areas.
16. Service water system shall be arranged as required for power plant operation and maintenance.
17. Electric heat tracing shall be provided if required.

4.5 GT Drain System

4.5.1 GT Holding Tank Requirements

1. No. of GT holding tanks: Two (2) tanks; one (1) tank per gas turbine unit - 1000 gallons of capacity per tank; Outdoor Underground installation.
2. The tank shall be made of double wall carbon steel (UL- 58 listed) with 5 psig design pressure. Tank shall be installed underground for holding oily drain waste water and gas turbine washing water drain. External corrosion protection coating shall be provided in addition to the attachment of cathodic protection rods (STISP3) to the tank external surface.
3. Leakage detector (Level Switch) shall be provided between the double walls of the tank.
4. An LIT shall be provided to monitor tank level.
5. Both the LIT and the Level Switch shall activate alarms in the plant control room.
6. A pumping out connection and a tank venting connection shall be provided on the tank.
7. Drains from the GT (including the exhaust collector area) shall be connected to the drain header that leads to each gas turbine holding tank.

4.5.2 GT Drain System Piping Requirements

1. All embedded DRAINS in the gas turbine foundation shall be 2” stainless steel schedule 10 pipe with a 4” funnel at the inlet of the drain.
2. The piping material outside of the gas turbine foundation shall be Stainless Steel per ESI piping/valve spec No. 11.
    a. The piping material is Stainless Steel, ASTM A-312 Gr. TP-S 304L and the flange rating is 150# ANSI class / RFF
    b. Small bore piping (2” or smaller diameter) piping shall be schedule 10. Large bore piping (diameter greater than or equal to 2-1/2”)” shall be schedule 10.
3. Vents shall be 2” stainless steel, schedule 10 piping (arranged to prevent drain back flow).
4. 6” drain seal loop is required with a seal water retainer in the loop seal.
5. Minimum pipe size shall be 4” diameter for piping outside of the foundation.
6. Clean out (CO) shall be provided as required for piping outside of the foundation.
7. Adequate sloping of the underground piping from the drain inlet to the gas turbine holding tank shall be maintained so as to have sufficient gravity flow.
8. Open drain valves shall be a lockable type.
9. The GT LO Skid is not connected to the GT drain system because it is self-contained.
10. The stack drains shall be connected through a 6” loop seal to the oil/water separator.

4.6 Waste Water System

4.6.1 Oil/Water Separator Requirements

1. No. of oil/water separators:
    a. Number and size TBD.

   b. Will take drain from transformer containment area, GT exhaust area floor, Generator floor drains, equipment wash down areas, and the ammonia storage area; Outdoor Underground installation.
2. The oil/water separator tank shall be made of double wall carbon steel (UL-58 listed) with 5 psig design pressure. The tank shall be installed underground for holding oily drain waste water. External corrosion protection coating shall be provided in addition to the cathodic protection rod(s), STISP3, attached to the tank external surface.
3. Leakage detector (Level Switch) shall be provided between the double walls of the oil/water separator.
4. An oil level detection system (LSH and LSHH) shall be provided in the oil chamber. This system shall alarm the local control panel for timely pumping out of the oil in the OWS. The same alarm shall be connected to the plant control room.
5. An oil pump out connection and a vent connection for each chamber shall be provided on the oil/water separator.

4.6.2 Waste Water System Piping Requirements

1. The piping material (underground) shall be gasketed PVC piping (with special Buna-N gaskets).
2. Minimum pipe size shall be 4" diameter.
3. Clean out (CO) shall be provided as required for the wastewater underground piping installation.
4. Adequate sloping of the underground piping from the drain inlet to the oil/water separator shall be maintained to ensure sufficient gravity flow.
5. Each sump in the transformer containment areas shall have an isolation valve to protect against an oil spill that could overflow the oil/water separator. These valves will be normally closed. After rain, each area shall be separately drained.
6. Open drain valves shall be a lockable type.

4.7 SCR Ammonia System

4.7.1 Aqueous Ammonia Unloading Pump Requirements

1. No. of ammonia unloading pumps: One (1) pump, Outdoor installation.
2. Pump Model: Centrifugal Pump; Completely sealed construction
3. Capacity and Total Dynamic Head (TDH): 120 GPM with 50 feet of TDH.
4. Area classification for electric parts: Class I, Group D, and Division II,TEFC motor.
5. Materials: Stainless Steel Wetted Parts.
6. Shop testing should be conducted to verify flow and TDH of the pump.
7. Pressure testing of the completely sealed pump casing pressure part(s) in accordance with ASME Section VIII shall be conducted.
8. The specified pump TDH is a preliminary selection. The pump TDH will be adjusted based on the site conditions, as necessary.

9. For shipment of the ammonia unloading pump - the pump shall be drained, cleaned and dried out after completion of shop hydrostatic testing. The pump internals shall be coated with a corrosion inhibitor for site storage.
10. All openings shall be capped with plastic inserts and plywood bolted covers.

4.7.2 Aqueous Ammonia Storage Tank Requirements

1. No. of aqueous ammonia storage tanks: Two (2), Outdoor installation.
2. Model: Horizontal tank
3. Capacity: 12,000 gallons
4. Materials: Carbon steel
5. Designed for a positive pressure of 25 psig at 100F and a vacuum of 4 psig.
6. Tank shall include a carbon steel pressure relief valve.
7. Tank shall include a vacuum break.
8. Tank shall include an N2 gas connection.
9. Tank shall include a LIT to monitor tank level.
10. Designed, fabricated, tested, and stamped in accordance with ASME Section VIII.

11. The location of all connections to be mounted on the tank should be shown on the tank engineering sketch.

4.7.3 Aqueous Ammonia Injection / Control Skid Requirements

1. No. of skids: Two (2), Outdoor installation.
2. Skids include:
   - Dilution air fan
   - Electric air heater
   - Ammonia flow control valve
   - Air/ammonia mixing vessel
3. Area classification for electric parts: Class I, Group D, and Division II,TEFC motor.
4. Aqueous ammonia is forwarded from the storage tank to each ammonia injection control skid via one (1) forwarding pump skid

4.7 4 Aqueous Ammonia Forwarding Pump Skid Requirements

1. No. of Skids: One (1), Outdoor installation
2. No. of forwarding pumps: One (1) pump, Outdoor installation.
3. Pump HP=1.5.
4. Area classification for electric parts: Class I, Group D, and Division II,TEFC motor.
5. Materials: Stainless Steel Wetted Parts.
6. Pressure Indicators (PI) shall be provided at the pump inlet/discharge to monitor the pump operation conditions.
7. A PSL at the pump suction shall be provided to prevent the pump from dry running with the pump suction valve accidentally closed.
8. PT in the outlet line shall be provided to monitor pressure.
9. Shop testing should be conducted to verify flow and TDH of the pump.

10. Pressure testing of the completely sealed pump casing pressure part(s) in accordance with ASME Section VIII shall be conducted.

4.7.5 Aqueous Ammonia System Piping Requirements

1. Refer to ESI piping/valve material specification sheet No. 01 for the piping requirements that apply to all piping upstream of the Ammonia Injection / Control Skid.
    a. The piping material is Carbon Steel, ASTM A-106 Gr. B
    b. The flange rating is 150# ANSI class / RFF
    c. Small bore piping (2” or smaller diameter) shall be schedule 80. Large bore piping (diameter greater than or equal to 2-1/2”) shall be schedule 40.
2. Refer to ESI piping/valve material specification sheet No. 30 for the piping requirements that apply to all piping downstream of the Ammonia Injection / Control Skid.
    d. The piping material is Carbon Steel, ASTM A-106 Gr. B
    e. The flange rating is 300# ANSI class.
    f. Small bore piping (2” or smaller diameter) shall be schedule 80. Large bore piping (diameter greater than or equal to 2-1/2”) shall be schedule 40.
3. All connections to underground piping shall be isolated with an insulation kit.
4. External corrosion protection shall be provided for all underground piping.
5. 100 % RT shall be conducted in the field for all weld seams in underground piping, and 10 % RT shall be conducted in the field for all weld seams in above ground piping. A weld map that shows the welder identification, date and time of welding, and RT number shall be provided. The weld map shall be submitted with the RT films to the Client following completion of the construction works.
6. Shop hydrostatic testing shall be conducted using fresh water for the shop fabricated carbon steel piping in accordance with Process Power Piping Code B31.3. Following completion of the shop hydrostatic testing, the testing fluid shall be blown out with dry air and then the piping internals shall be coated with a corrosion inhibitor for site storage.
7. Pneumatic pressure testing shall be conducted in the field using N_2 gas in accordance with B31.3.
8. Stainless Steel tags that identify underground pipe (at all locations where pipe is going into or coming out of the ground) shall be provided.
9. Service identification color and flow direction marking on the above ground piping system shall be provided.
10. WPS, PQR and WPQ for the ammonia system piping shall be submitted to the Purchaser for the purpose of a record - one (1) month prior to starting the shop weld works and the site weld works.
11. NDE procedure and the weld repair procedure shall be submitted to the purchaser for the purpose of a record.

ELECTRICAL ENGINEERING
DESIGN & CRITERIA

APPENDIX F
Electrical Engineering Design Criteria

1.0 Introduction

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and construction of electrical engineering systems for the Midway Project. More specific project information will be developed prior to construction of the project to support detailed design, engineering, material procurement, and construction specifications as required by the California Energy Commission (CEC).

2.0 Codes and Standards

The design of the electrical systems, subsystem and components will be in accordance with the laws and regulations of the federal government, State of California, Fresno County, local agencies, and industry standards. The most current issue or revision of rules, regulations, codes, ordinances, and standards at the time of the filing of this Application for Certification (AFC) will apply, unless otherwise noted. If there are conflicts between the cited documents, the more conservative requirement shall apply.

The following codes and standards are applicable to the electrical aspects of the power facility.

- American National Standards Institute (ANSI)
- American Society for Testing and Material (ASTM)
- Anti-Frication Bearing Manufacturers Association (AFBMA)
- Insulated Cable Engineers Association (ICEA)
- Institute of Electrical and Electronics Engineers (IEEE)
- Illuminating Engineering Society (IES)
- California Electrical Code (CEC)
- Nation Electrical Manufacturers Association (NEMA)
- National Electrical Safety Code (NESC)
- National Fire Protection Association (NFPA)
- Underwriters Laboratories, Inc. (UL)

3.0 Switchyard and Transformers

3.1 Switchyard

The 115 kV transmission line for the existing CalPeak Panoche Plant is a direct intertie between the CalPeak switchyard and PG&E's Panoche Substation. The existing 115 kV switchyard at PG&E's Panoche Substation is the point of interconnection for the project.

The 115 KV Transmission system will enter the Midway switchyard via at the dead end structure. An 115 kV SF6 circuit breaker with twelve integral current transformers provides the switching for installation. 115 kV air break disconnect switches provide breaker isolation as required by Code. A set of 115 kV potential devices connected to the dead end structure provide system voltage for Utility metering and site voltage monitoring schemes. One set of current transformers at the 115 kV breaker is to be specified with metering accuracy and is to be used as the required input to the Utility metering package

.

Control, protection and monitoring panel or devices for the switchyard will be located in the electrical building and generation control module. Monitoring and alarms will be available to the PLC operator workstations in the control room. The 125Vdc battery system will provide control and protection voltage to circuit breakers.

The switchyard design will meet the requirements of the National Electrical Safety Code-ANSI C2.

A grounding grid will be provided to control step and touch potentials in accordance with IEEE Standard 80, Safety in AC Substation Grounding. All equipment, structures and fencing will be connected to the grounding grid of buried bare copper conductors and ground rods, as required. The substation ground grid will be tied to the plant ground grid.

Lightning protection will be provided by shield wires and/or lightning masts for any overhead lines. The lightning protection system will be designed in accordance with IEEE 998 guidelines.

All electrical faults shall be detected, isolated, and cleared in a safe and coordinated manner as soon as practical to insure the safety of Equipment, Personnel, and the Public. Protective relaying will meet ANSI and IEEE requirements and will be coordinated with PG&E's requirements.

The protection will be designed to maintain redundancy at the 115 kV level. The transformer will be protected by differential, over current and restricted ground fault loops. A second and redundant protection using separate instrument transformers will provide protection for the 115 kV breaker, transformer and generators breakers. There will be a breaker failure scheme associated with the 115 kV breaker. Interfaces requited with the PG&E system are included in the design. Each generator protective system has a breaker failure scheme. The 115 kV circuit breaker will have 2 redundant trip coils.

Interface with PG&E's supervisory control and data acquisition (SCADA) system will be provided. Interface will be at the interface terminal box and RTU. Communication between the facility switchyard and the control building to which it is connected will be included.

3.2 Transformers

The FT8-3 Swift Pac Gas Turbine Generator (GTG) units are connected to a three-winding, oil-filled, 13.8 kV to 115 kV generator step-up transformer (GSU). The GSU will be designed in accordance with ANSI standards C57.12.00, C57.12.90, and C57.116. The transformer is anchored on concrete foundations that also provide oil containment. The high side of the step-up transformer is terminated at. Surge arrestors to protect the transformer from surges due to lightning strikes, switching or other disturbances on the 115 kV system. Transformer impedances and turns ratio are to be selected to optimize 115 kV system VAR support by the generators. Transformer to have no-load tap changer at the high voltage side.

Each auxiliary transformer will supply power to two combustion turbine auxiliary loads in normal operation. The auxiliary power transformer will be sized to take care of the complete auxiliary load of the entire facility in case there is any failure or shut down of one of the auxiliary power transformer or the generator step up transformer. The Secondary Unit Substation (SUS) transformers will be oil-filled outdoor type and will each supply 480V, 3-phase power to the SUS buses through normally closed SUS main breakers. The 480V system will be solidly grounded.

The SUS transformers will be sized to provide 480V auxiliary load to the entire facility. The two 480V switchgears are designed to be interconnected in case of emergency to supply power only from one 480V bus.

The SUSs will provide power through feeder breakers to the various large 480V motors and to motor control centers (MCCs). The MCCs will distribute power to smaller 480V motors, to 480V power panels, and other intermediate 480V loads. The normal supply for the two BOP MCCs will be from the SUS transformers, but automatic transfer switches will allow supply from an alternate source. The MCCs will distribute power to 480-480/277V isolation transformers when 277V, single-phase lighting loads are to be served. The 480V power panels will distribute power to small 480V loads.

Power for the AC power supply (120/208V) system will be provided by the 480V MCCs and 480V power panels. Transformation of 480V power to 120/208V power will be provided by 480-120/208V dry-type transformers.

3.3 DC Power Supply

The DC power supply system for BOP loads will consist of two 125V DC battery bank, two 125V DC full capacity battery chargers, metering, ground detectors, and distribution panels. One 125V DC battery bank will be dedicated to the essential service uninterruptible power supply (UPS) system. The other 125V DC battery bank will feed all other station DC loads. Additional 125V DC systems may also be supplied as part of the CTG equipment.

Under normal operating conditions, the battery chargers will supply DC power to the DC loads. The battery chargers will receive 480V, 3-phase AC power from the AC power supply (480V) system and continuously float-charge the battery while supplying power to the DC loads. The ground detection scheme will detect grounds on the DC power supply system.

Under abnormal or emergency conditions when power from the AC power supply (480V) system is unavailable, the battery will supply DC power to the DC power supply system loads. Recharging of a discharged battery will occur whenever 480V power becomes available from the AC power supply (480V) system. The rate of charge will be dependent on the characteristics of the battery bank, battery charger, and the connected DC load during charging. However, the anticipated maximum recharge time will be 12 hours.

The BOP 125V DC system will be used to provide control power to the 4,160V switchgear, the 480V SUSs, and to critical control circuits.

3.4. Uninterruptible Power Supply (UPS) System

The CTGs will also have an essential service 120V AC, single-phase, 60 hertz power source to supply AC power to essential instrumentation, critical equipment loads, and unit protection and safety systems that require uninterruptible AC power. Both the essential service AC system and the DC power supply system will be designed to ensure that all critical safety and unit protection control circuits always have power and can take the correct action on a unit trip or loss of plant AC power.

The essential service AC system will consist of one full-capacity inverter, a solid-state transfer switch, a manual bypass switch, an alternate source transformer and voltage regulator, and AC panel boards for each CTG.

The normal source of power to the system will be from the DC power supply system through the inverter to the panel boards. A solid-state static transfer switch will continuously monitor both the inverter output and the alternate AC source. The transfer switch will automatically transfer essential AC loads without interruption from the inverter output to the alternate source upon loss of the inverter output.

A manual bypass switch will also be included to enable isolation of the inverter-static transfer switch for testing and maintenance without interruption to the essential service AC loads.

3.5 Emergency Power System

In the event of a total loss of auxiliary power, or in situations when the utility transmission system is out of service, the emergency power required for emergency lighting and CTG critical loads, such as turbine lube oil pumps, will be provided from batteries.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

I. TRANSMISSION SYSTEM ENGINEERING

LOCAL

There are no local LORS related to transmission system engineering.

STATE

GENERAL ORDER 95

California Public Utilities Commission (CPUC) General Order 95 (GO-95), Rules for Overhead Electric Line Construction formulates uniform requirements for construction of overhead lines. Compliance with this order will ensure adequate service and safety to persons engaged in the construction, maintenance, operation or use of overhead electric lines and to the public in general.

GENERAL ORDER 128

CPUC General Order 128 (GO-128), Rules for Construction of Underground Electric Supply and Communications Systems, establishes uniform requirements and minimum standards to be used for underground supply systems to ensure adequate servic e and safety.

CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners.

CAL-ISO

Cal-ISO Reliability Criteria also provide policies, standards, principles and guides to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC s Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.

Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied in assessing the system reliability implications of the PDEF. Also of major importance to the PDEF and other privately funded projects which may sell through the California Power Exchange (Cal-PX) is the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that dispatch not violate system criteria as market participants are requesting generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling

Protocol uses the Cal-ISO power flow model to identify the effects on total transmission losses at each generating unit and scheduling point. Additional calculations are performed to determine if the participant will be paid more or less than, for instance, the generating units dispatched net power output (ISO 1998e, ISO 1998f).

FEDERAL

There are no federal LORS related to transmission system engineering.

II. <u>TRANSMISSION LINE SAFETY AND NUISANCE</u>

LOCAL

There are no local laws or regulations specifically aimed at the physical structure or dimension s of electric power lines to limit their obstruction or hazardous shock hazards, or eliminate the interactive effects of their electric or magnetic fields. All the noted LORS are implemented industry wide to ensure that lines are uniformly constructed to reflect existing health and safety information while ensuring efficiency and reliability.

STATE

GENERAL ORDER 52

General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

GENERAL ORDER 128

GO-128 Rules for Construction of Underground Electric Supply and Communications Systems . Provisions of this order establish requirements and minimum standards for the safe construction of underground AC power and communications circuits.

GENERAL ORDER 95

General Order 95 (GO-95), CPUC, Rules for Overhead Electric Line Construction. This order specifies tree trimming criteria to minimize the potential for power linerelated fires.

GO-95, CPUC, Rules for Overhead Line Construction. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements usually ensures the safety of the general public and line workers.

CALIFORNIA CODE OF REGULATIONS

Title 14 Section 1250 of the California Code of Regulations, Fire Prevention Standards for Electric Utilitie s. This code specifies utility-related measures for fire prevention.

Title 8, Section 2700 et seq., High Voltage Electric Safety Orders. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

NATIONAL ELECTRICAL SAFETY CODE

National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. Provisions in this part of the code specify the national safe operating clearances applicable in areas where the line might be accessible to the public. Such requirements are intended to minimize the potential for direct or indirect contact with the energized line.

FEDERAL

CODE OF FEDERAL REGULATIONS

Title 14, Part 77 of the Federal Code of Regulations (CFR), Objects Affecting the Navigation Space . Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a Notice of Proposed Construction or Alteration is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.

FAA Advisory Circular (AC) No. 70/460-2H, Proposed Construction and or Alteration of Objects that May Affect the Navigation Space. This circular informs each proponent of a project that could pose an aviation hazard of the need to file the Notice of Proposed Construction or Alteration (Form 7640) with the FAA.

FAA AC No. 70/460-1G, Obstruction Marking and Lighting. This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

FEDERAL COMMUNICATIONS COMMISSION REGULATIONS

Transmission line-related radio-frequency interference is one of the indirect effects of line operation as produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields that interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. Such noise, when generated, manifest as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement. Since electric fields cannot penetrate the soil and other objects, underground lines do not produce the radio noise associated with overhead lines.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise.

CONTROL SYSTEMS ENGINEERING DESIGN & CRITERIA

APPENDIX G
Control Systems Engineering Design Criteria

1.0 Introduction

This appendix summarizes the codes, standards, criteria, and practices that will be generally used in the design and installation of instrumentation and controls for the Midway project. More specific project information will be developed during execution of the project to support detailed design, engineering, material procurement specification, and construction specifications.

2.0 Codes and Standards

The design of the control systems and components will be in accordance with the laws and regulations of the federal government, the State of California, County of Fresno and local ordinances, and industry standards. The most current issue or revision of rules, regulations, codes, ordinances, and standards at the time of filing this Application for Certification will apply, unless otherwise noted. If there are conflicts between cited documents, the more conservative requirements will apply.

The following codes and standards are applicable to the mechanical aspects of the power facility:

The Institute of Electrical and Electronics Engineers (IEEE)
Instrument Society of America (ISA)
American National Standards Institute (ANSI)
American Society of Mechanical Engineers (ASME)
American Society for Testing and Materials (ASTM)
National Electrical Manufacturers Association (NEMA)
National Electrical Safety Code (NESC)
National Fire Protection Association (NFPA)

3.0 Control Systems Design Criteria

3.1 General Plant Control Philosophy

The control system will consist of a state-of-the-art, integrated, microprocessor-based PLC using control integration software. The control system will provide for startup, shutdown, and control of plant operation limits and will provide protection for the equipment.

Interlock and logic systems will be provided via hard-wired relays, and/or PLCs.

Process switches (i.e., pressure, temperature, level, flow) used for protective functions will be connected directly to the PLC and the protective system.

3.2 Degree of Automation

The plant will be designed with automation where practical in order to reduce the required actions performed by operating personnel. Through subsystem automation and use of the PLC, the number of individual control switches and indicators that confront the operator will be greatly reduced. This will reduce the complexity and size of the main control room workstations and panels.

3.3 Centralized Control

The majority of the equipment that is required to support the operation of the plant will be located in the control and electrical equipment rooms. The control room contains the PLC CRT-based operator workstations and the auxiliary control panels. In addition, the control room contains the alarm, utility, and log printers.

Local control panels or stations will be furnished only where operator attention is required to set up a system for operation, or where the equipment requires intermittent attention during plant operation. Main control room indicators and control functions will only be duplicated for those variables critical to plant availability.

All of the control processes furnished on the local control panels and central control system will be mirrored in the San Diego operations control center. The plant will have the capability of being operated locally or from the remote location in San Diego. The remote operation will be transferred to the San Diego control center via T-1 line and internet service and will have redundant systems provided by a telephone dial up connection.

3.4 Programmable Logic Controller

The programmable logic controller (PLC) provides modulating control, digital control, monitoring, and indicating functions for the plant power block systems.

The following functions will be provided:

- Controlling the CTGs and other systems in a coordinated manner
- Controlling the BOP systems in response to plant demands
- Monitoring controlled plant equipment and process parameters and delivery of this information to plant operators
- Monitoring the CTG CEMS units for critical alarms, and collecting data for historical log-in
- Providing control displays (printed logs, operator interface) for signals generated within the system or received from input/output (I/O) signals
- Providing consolidated plant process status information through displays presented in a timely and meaningful manner
- Providing alarms for out-of-limit parameters or parameter trends, displaying on operator interface units, and recording on an alarm log printer
- Providing storage and retrieval of historical data

The PLC will be a redundant microprocessor-based system and will consist of the following major components:

- Liquid crystal display (LCD) flat screen operator displays
- Engineer work station
- Distributed processing units
- I/O consoles
- Printers
- Data link to the combustion turbine

The PLC will have redundant processing units linked to a group of operator consoles and the engineer work station by redundant data highways. Each processor will be programmed to perform specific dedicated tasks for control information, data acquisition, and annunciation. By being redundant, no single processor failure can cause or prevent a unit trip.

The PLC and Control integration software will interface with the control systems furnished by the gas turbine supplier to provide supervisory remote control capabilities, as well as data acquisition, annunciation, and historical storage of turbine and generator operating information.

3.4.1 PLC Configuration. Redundant microprocessor-based controllers will communicate via a high speed communications network.

The overall network will provide unit-wide data access for centralized operation through operator workstations.

Remote I/O will be used where practical to reduce the quantity of long cable runs for the PLC interface with remote equipment.

3.4.2 PLC Functions and Tasks. The PLC will perform the following functions and miscellaneous tasks:

- Perform analog and digital plant control functions to accommodate a local and remote operator interface for controlling the power plant equipment
- Monitor both analog and digital signals to provide the operator/engineer with access to data around the plant
- Perform alarm monitoring in the local and remote control rooms for the entire plant
- Provide graphic displays, including both control- and information-type displays, for all systems and equipment, including electrical systems
- Provide data logging and reporting via displays and printed reports
- Provide long-term data storage of process history

4.0 Instrumentation

Pneumatic signal levels, where used, will be 3 to 15 psig for pneumatic transmitter outputs, controller outputs, electric-to-pneumatic converter outputs, and valve positioner inputs. Instrument analog signals for electronic instrument systems shall be 4 to 20 ma dc. The primary sensor full-scale signal level, other than thermocouples, will be between 10 mV and 125 V.

4.1 Pressure Instruments

In general, pressure instruments will have linear scales with units of measurement in pounds per square inch gauge. Pressure gauges will have either a blowout disk or a blowout back and an acrylic or shatterproof glass face. Pressure gauges on process piping will be resistant to plant atmospheres.

Pressure test points will have Derbyshire 3-way isolation valves and caps or plugs. Pressure devices on pulsating services will have pulsation dampers.

4.2 Temperature Instruments

In general, temperature instruments will have scales with temperature units in degrees Fahrenheit. Exceptions to this are electrical machinery RTDs and transformer winding temperatures, which are in degrees Celsius.

Dial thermometers will have 4-1 /2- or 5-inch-in-diameter (minimum) dials and white faces with black scale markings and will be every-angle type and bimetal actuated. Dial thermometers will be resistant to plant atmospheres.

Temperature elements and dial thermometers will be protected by thermowells except when measuring gas or air temperatures at atmospheric pressure. Temperature test points will have thermowells and caps or plugs.

RTDs will be either 100 ohm platinum or 10 ohm copper, ungrounded, three-wire circuits (R_{100}/R_0-1.385). The element will be spring-loaded, mounted in a thermowell, and connected to a cast iron head assembly. Thermocouples will be single-element, grounded, spring-loaded, Chromel-Constantan (ANSI Type E) for general service. Thermocouple heads will be the cast type with an internal grounding screw.

4.3 Level Instruments

Reflex-glass or magnetic level gauges will be used. Level gauges for high-pressure service will have suitable personnel protection.

Gauge glasses used in conjunction with level instruments will cover a range that is covered by the instrument. Level gauges will be selected so that the normal vessel level is approximately at gauge center.

4.4 Flow Instruments

Flow transmitters will be the differential pressure type with the range matching the primary element. In general, linear scales and charts will be used for flow indication and recording.

In general, airflow measurements will be temperature-compensated.

4.5 Control Valves

Control valves in throttling service will generally be the globe-body cage type with body materials, pressure rating, and valve trims suitable for the service involved. Other style valve bodies (e.g., butterfly, eccentric disk) may also be used when suitable for the intended service.

Valves will be designed to fail in a safe position.

Control valve body size will not be more than two sizes smaller than line size, unless the smaller size is specifically reviewed for stresses in the piping.

Control valves in 600-class service and below will be flanged where economical. Where flanged valves are used, minimum flange rating will be ANSI 300 Class.

Severe service valves will be defined as valves requiring anti-cavitation trim, low noise trim, or flashing service, with differential pressures greater than 100 psid.

In general, control valves will be specified for a noise level no greater than 90 dBA when measured 3 feet downstream and 3 feet away from the pipe surface.

Valve actuators will use positioners and the highest pressure, smallest size actuator, and will be the pneumatic-spring diaphragm or piston type. Actuators will be sized to shut off against at least 110 percent of the maximum shutoff pressure and designed to function with instrument air pressure ranging from 60 to 125 psig.

Handwheels will be furnished only on those valves that can be manually set and controlled during system operation (to maintain plant operation) and do not have manual bypasses.
Control valve accessories, excluding controllers, will be mounted on the valve actuator unless severe vibration is expected.

Solenoid valves supplied with the control valves will have Class H coils. The coil enclosure will normally be a minimum of NEMA 4 but will be suitable for the area of installation.

Terminations will typically be by pigtail wires.

Valve position switches (with input to the DCS for display) will be provided for MOVs and open/close pneumatic valves. Automatic combined recirculation flow control and check valves (provided by the pump manufacturer) will be used for pump minimum-flow recirculation control. These valves will be the modulating type.

4.6 Instrument Tubing and Installation

Tubing used to connect instruments to the process line will be 3/8-or 1/2-inch-outsidediameter copper or stainless steel as necessary for the process conditions.

Instrument tubing fittings will be the compression type. One manufacturer will be selected for use and will be standardized as much as practical throughout the plant.

Differential pressure (flow) instruments will be fitted with three-valve manifolds; two-valve manifolds will be specified for other instruments as appropriate.

Instrument installation will be designed to correctly sense the process variable. Taps on process lines will be located so that sensing lines do not trap air in liquid service or liquid in gas service. Taps on process lines will be fitted with a shutoff (root or gauge valve) close to the process line. Root and gauge valves will be main-line class valves.

Instrument tubing will be supported in both horizontal and vertical runs as necessary.

Expansion loops will be provided in tubing runs subject to high temperatures. The instrument tubing support design will allow for movement of the main process line.

4.7 Pressure and Temperature Switches

Field-mounted pressure and temperature switches will have either NEMA Type 4 housings or housings suitable for the environment.

In general, switches will be applied such that the actuation point is within the center one-third of the instrument range.

4.8 Field-Mounted Instruments

Field-mounted instruments will be of a design suitable for the area in which they are located. They will be mounted in areas accessible for maintenance and relatively free of vibration and will not block walkways or prevent maintenance of other equipment. Freeze protection will be provided.

Field-mounted instruments will be grouped on racks. Supports for individual instruments will be prefabricated, off-the-shelf, 2-inch pipe stand. Instrument racks and individual supports will be mounted to concrete floors, to platforms, or on support steel in locations not subject to excessive vibration.

Individual field instrument sensing lines will be sloped or pitched in such a manner and be of such length, routing, and configuration that signal response is not adversely affected.

Local control loops will generally use a locally mounted indicating controller (flow, pressure, temperature, etc.).

Liquid level controllers will generally be the non-indicating, displacement type with external cages.

4.9 Instrument Air System

Branch headers will have a shutoff valve at the takeoff from the main header. The branch headers will be sized for the air usage of the instruments served, but will be no smaller than 3/8 inch. Each instrument air user will have a shutoff valve and filter at the instrument.

CHEMICAL ENGINEERING
DESIGN & CRITERIA

APPENDIX H
Chemical Engineering Design Criteria

1.0 Introduction

This appendix summarizes the codes, standards, criteria and practices that will be generally used in the design and installation of chemical engineering systems for the Panoche Energy Center (PEC). More specific project information will be developed prior to construction of the project to support detailed design, engineering, material procurement specification and construction specifications as required by the California Energy Commission (CEC).

2.0 Codes and Standards

The design of the mechanical systems and components will be in accordance with the laws and regulations of the federal government, the State of California, County of Fresno and local ordinances, and industry standards. The most current issue or revision of rules, regulations, codes, ordinances, and standards at the time of filing this Application for Certification will apply, unless otherwise noted. If there are conflicts between cited documents, the more conservative requirements will apply.

The following codes and standards are applicable to the chemical aspects of the facility:

ANSI-American National Standards Institute
ANSI B31.1-Power Piping Code
ASME-American Society of Mechanical Engineers
ASME-Performance Test Code 31, Ion Exchange Equipment
ASTM-American Society for Testing and Materials
ASTM D859-94--Referee Method B for Silica as SiO2
ASTM D888-96Referee Method A for Dissolved Oxygen
ASTM D513-96Referee Method D for CO2
OSHA-Occupational Safety and Health Administration
UL-Underwriters Laboratories
AWWA-American Waterworks Association
WWA 2540-95-Method C for TDS

Other recognized standards will be used as required to serve as design, fabrication, and construction guidelines when not in conflict with the above listed standards.

The codes and industry standards used for design, fabrication, and construction will be the codes and industry standards, including all addenda, in effect as stated in equipment and construction purchase or contract documents.

3.0 General Criteria

3.1 Water Sources

Raw Water will be supplied from either the existing adjacent CalPeak- Panoche well or from the landowner. A third alternative is for Starwood Midway to contract for water from the Panoche Energy Center (PEC), a nearby power project.

Midway will use a 75,000 gallon tank to store raw water.

3.2 Process Water Requirements

Process water needs to be demineralized before it is used in the GT's. The DI water must meet the following water quality limits required by PWPS standards:

* Total Solids	<1.0 PPM	ASTM D1888
* Sodium	<0.10 PPM	ASTM D2791
* Silica	<0.02 PPM	ASTM D859
* Conductivity	<1.0-1.5 Micromho/cm	ASTM D5391

If Cal-Peak Panoche raw water is to be used, RO treatment prior to demineralization will also be required. Cal-Peak Panoche raw water quality is attached. RO waste will be discharged into the storm water pond.

The Midway project will utilize a mobile water treatment system to produce the required demineralized water. Rented mobile demineralizer trailers will provide water treatment. The rental company on the rental company's premises will perform regeneration of these units. DI water produced by the trailers will be stored in two (2) 75,000-gallon tanks. A forwarding system will be utilized to provide this DI water to the gas turbines within the required flow and pressure limits.

Essential plant functions requiring DI water are evaporative cooling of the GTG inlet air which is done via the Swift Pac Inlet Fogging skid (~ 40 gpm of DI water at peak load conditions), water injection for NOx control during GT combustion (~ 100 gpm of DI water at peak load conditions), and utility water for washdown and other purposes.

The peak supply flow rate required at the site is approximately 140 gpm. The expected annual water consumption is 3.3 million gallon a year or approximately 10 acre-feet.

3.3 Service Water and Sanitary Use Water

Raw water will be chlorinated for use at service water hose connections located around the facility and also as the supply of sanitary water (i.e. showers, sinks, toilets, safety showers, eye wash stations). Service water will be treated as necessary to meet all federal, state, and local requirements for human contact. Signs will be posted to alert personnel that sanitary water is not potable quality and should not be comsumed.

3.4 Construction Water

Water sources for construction will be trucked in or obtained from an onsite water supply well.

3.2 Chemical Storage

There will be a variety of chemicals stored and used during the construction and operation of the Midway project. The storage, handling, and use of all chemicals will be conducted in accordance with applicable laws, ordinances, regulations, and standards (LORS).

Chemicals will be stored in appropriate chemical storage facilities. Bulk chemicals will be stored in storage tanks, and other chemicals will be stored in returnable delivery containers. Chemical storage and chemical feed areas will be designed to retain leaks and spills. Dike and drain piping design will allow a full-tank-capacity spill without overflowing the dikes. For multiple tanks located within the same diked area, the capacity of the largest single tank will determine the volume of the diked area and drain piping. Drain piping for volatile chemicals will be trapped and isolated from other drains to eliminate noxious or toxic vapors. After neutralization, if required, water collected from the chemical storage areas will be trucked offsite for disposal at an approved wastewater disposal facility.

The aqueous ammonia storage and unloading area will have spill containment and ammonia vapor detection equipment. Aqueous ammonia will be stored (as a 19 percent solution, by weight) in two 12,000-gallon onsite tanks.

Eyewash stations will be provided in the vicinity of all chemical storage and use areas. Hose connections will be provided near the chemical storage and feed areas to flush spills and leaks to the plant wastewater collection system.

Plant personnel will use approved personal protective equipment during chemical spill containment and cleanup activities. Personnel will be properly trained in the handling of these chemicals and instructed in the procedures to follow in case of a chemical spill or accidental release. Adequate supplies of absorbent material will be stored onsite for spill cleanup.

A list of the chemicals anticipated to be used at the generating facility and their locations is provided in the Hazardous Materials Handling section (Section 5.15). This list identifies each chemical by type, intended use, and estimated quantity to be stored onsite.

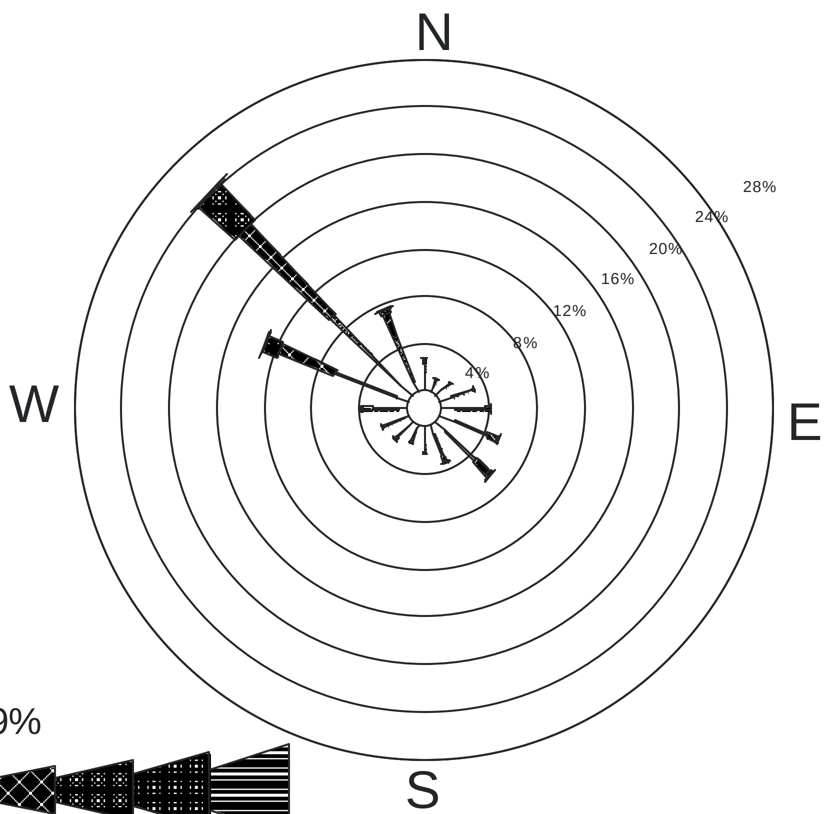
AIR QUALITY DATA

APPENDIX I

AIR QUALITY DATA

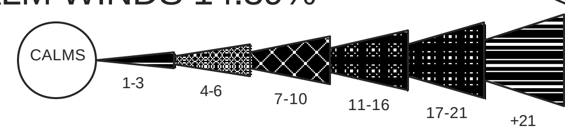
ATTACHMENT A

FRESNO WINDROSES

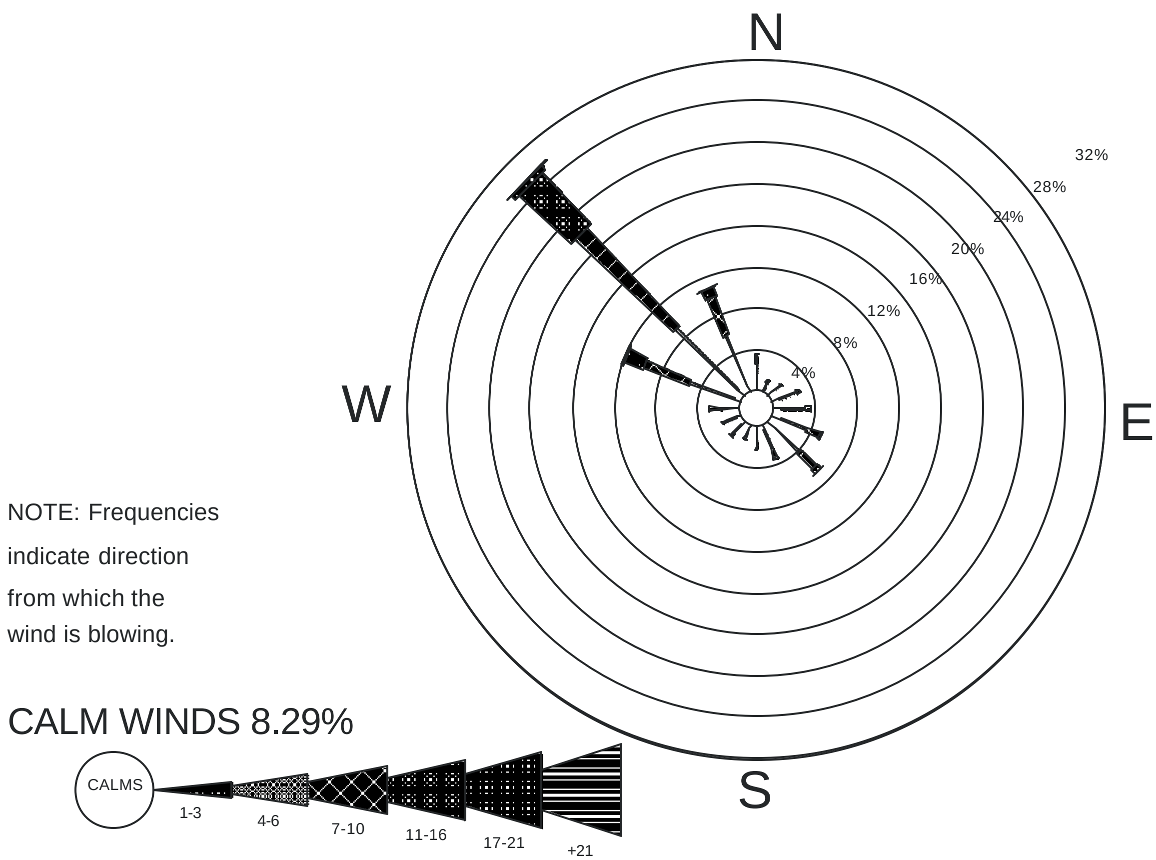


NOTE: Frequencies indicate direction from which the wind is blowing.

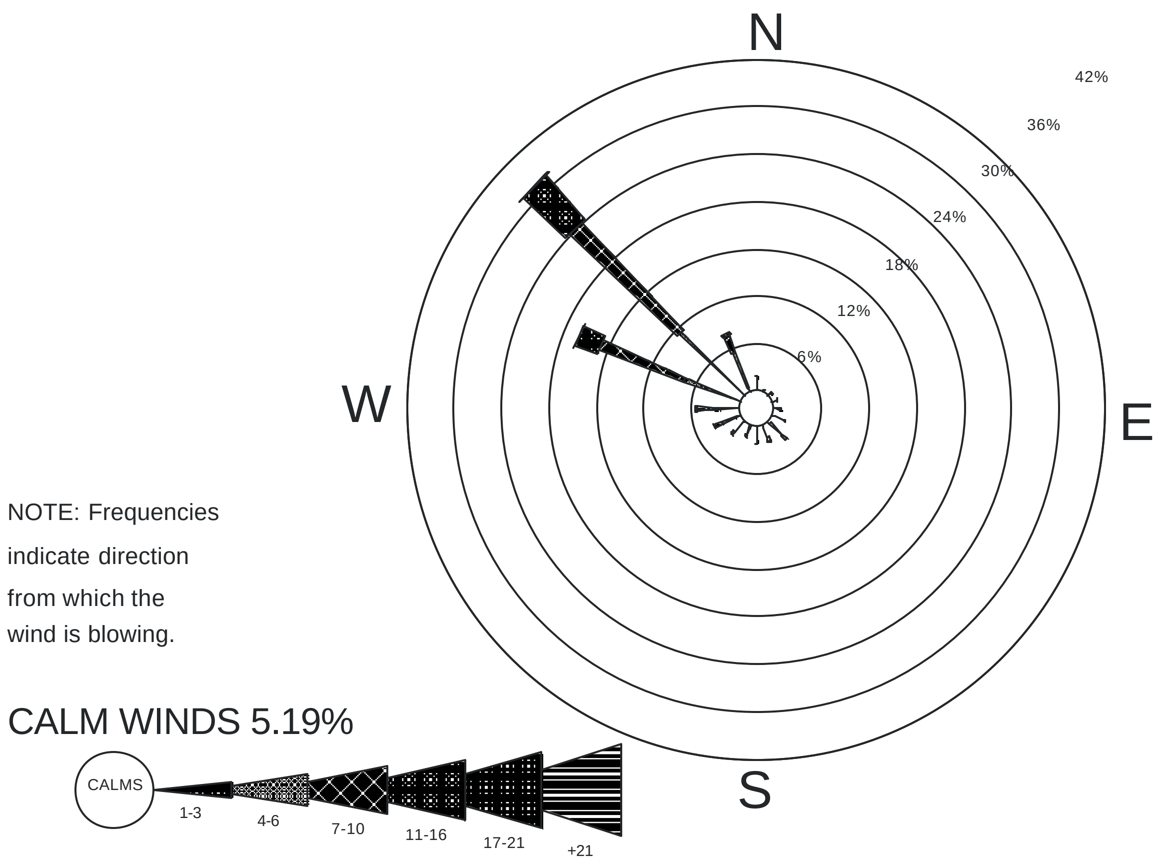
CALM WINDS 14.39%



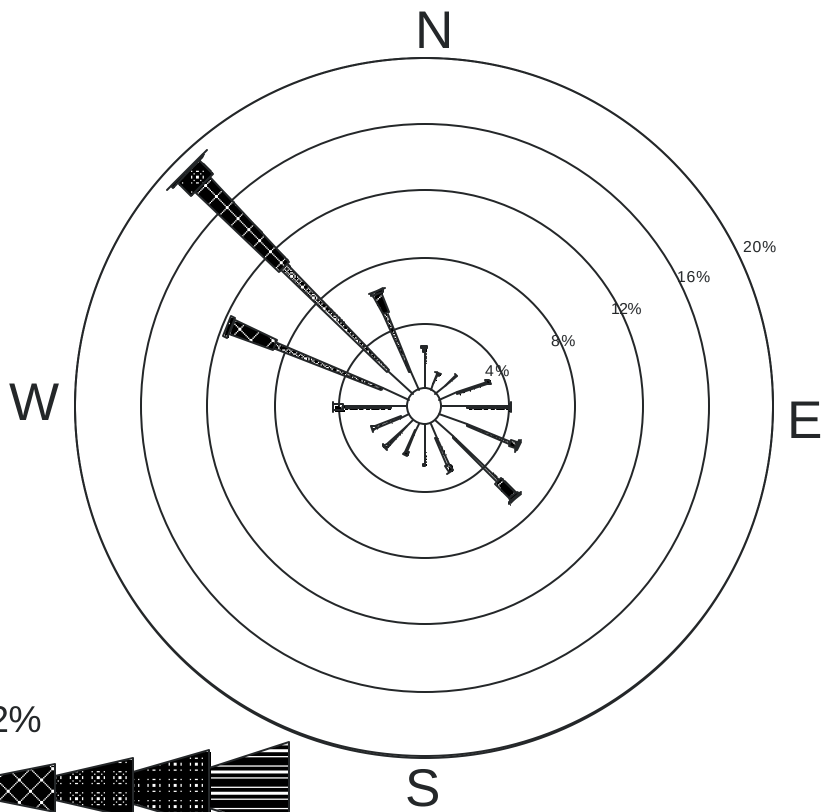
Windrose from Fresno 1987-1991 for All Months



Windrose from Fresno 1987-1991 for Spring

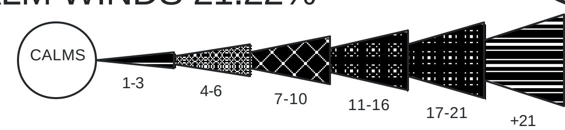


Windrose from Fresno 1987-1991 for Summer

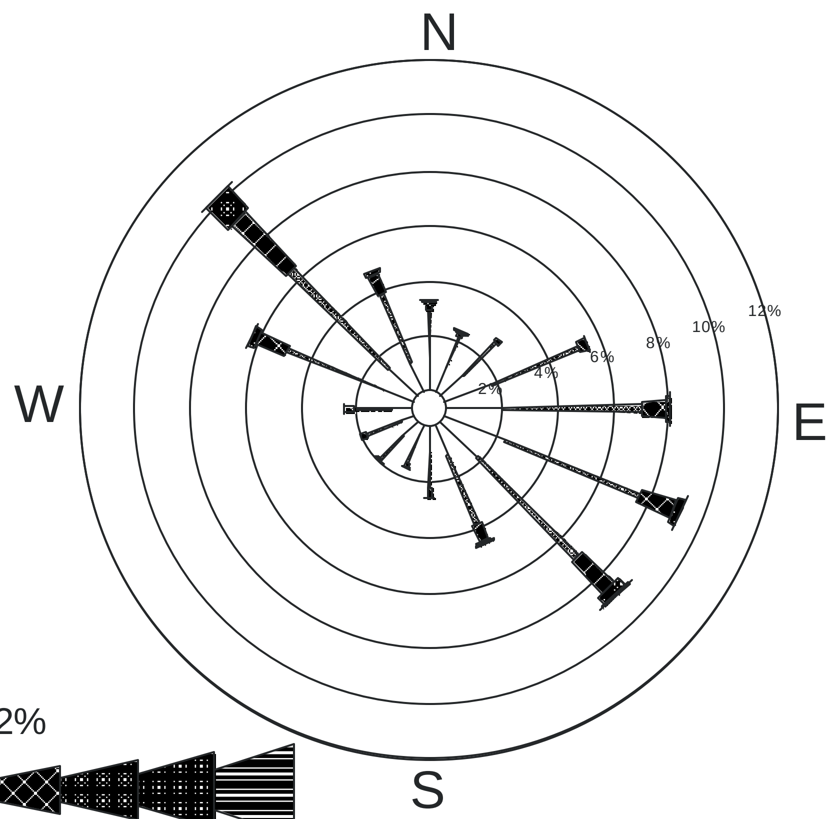


NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 21.22%

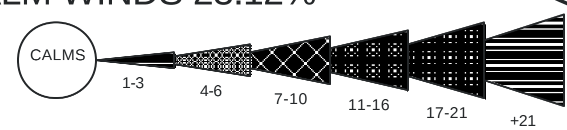


Windrose from Fresno 1987-1991 for Autumn



NOTE: Frequencies indicate direction from which the wind is blowing.

CALM WINDS 23.12%



Windrose from Fresno 1987-1991 for Winter

APPENDIX I

AIR QUALITY DATA

ATTACHMENT B

SUPPORTING INFORMATION ON ESTIMATION OF PROJECT CONSTRUCTION EMISSIONS

Table 3.8-4
CONSTRUCTION EQUIPMENT UTILIZATION - POWER PLANT SITE

CONSTRUCTION EQUIPMENT DESCRIPTION	HP	Construction Equipment Pieces per Month										Piece- Months
		1	2	3	4	5	6	7	8	9	10	
Backhoe	150	1	2	2	2	1	1					9
Boom Truck	220	1	1	1	1	1	1	1	1	1		9
Cranes, 300 Ton	700			1	1	1	1					4
Cranes, 60 Ton	300		1	1	1	1	1	1	1			7
Dump Truck, 2 Ton	210	2	2	2	1	1						8
Excavator	195		1	1	1	1						4
Forklift, Cat V200	175	1	1	1	2	2	2	1				10
Manlift, 60 ft	30			2	2	4	4	4				16
Tandem Dump, 30 CY	250	1	1	1								3
Roller Compactors	100	1	1	1								3
Water Truck	225		6	6	16	16	20	20	20	16	6	126
Welding Machine, Portable	70	1	1	1	2	2	2	2	2	1	1	15
Total		8	17	20	29	30	32	29	24	18	7	214

NOTE: Water truck data is incorrect. One water truck will be present each month, not the number listed.

11/1/2006 17:14

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\starwood.urb
Project Name: Starwood
Project Location: San Joaquin Valley
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

CONSTRUCTION EMISSION ESTIMATES

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	32.73	208.77	275.87	0.02	17.32	7.25	10.07
TOTALS (lbs/day, mitigated)	32.73	143.85	275.87	0.02	3.98	2.69	1.29

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\starwood.urb
Project Name: Starwood
Project Location: San Joaquin Valley
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Winter)

CONSTRUCTION EMISSION ESTIMATES

*** 2008 ***	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
TOTALS (lbs/day,unmitigated)	32.73	208.77	275.87	0.02	17.32	7.25	10.07
TOTALS (lbs/day, mitigated)	32.73	143.85	275.87	0.02	3.98	2.69	1.29

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\starwood.urb
Project Name: Starwood
Project Location: San Joaquin Valley
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Winter)

Construction Start Month and Year: February, 2008
Construction Duration: 10
Total Land Use Area to be Developed: 5.6 acres
Maximum Acreage Disturbed Per Day: 1 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	10.00	-	10.00
Off-Road Diesel	31.89	197.32	266.93	-	7.01	7.01	0.00
On-Road Diesel	0.56	10.75	2.04	0.02	0.28	0.23	0.05
Worker Trips	0.28	0.70	6.90	0.00	0.03	0.01	0.02
Maximum lbs/day	32.73	208.77	275.87	0.02	17.32	7.25	10.07
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.47	121.27	162.06	-	4.27	4.27	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.24	-	-	-	-	-	-
Asphalt Off-Road Diesel	6.87	42.17	57.56	-	1.44	1.44	0.00
Asphalt On-Road Diesel	0.07	1.06	0.24	0.00	0.03	0.03	0.00
Asphalt Worker Trips	0.03	0.01	0.30	0.00	0.01	0.00	0.01
Maximum lbs/day	26.67	164.51	220.16	0.00	5.74	5.73	0.01
Max lbs/day all phases	32.73	208.77	275.87	0.02	17.32	7.25	10.07

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Feb '08
Phase 2 Duration: 1.5 months
On-Road Truck Travel (VMT): 456
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Excavators	180	0.580	8.0
1	Graders	174	0.575	8.0
6	Off Highway Trucks	417	0.490	8.0
2	Rollers	114	0.430	8.0
1	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Mar '08
Phase 3 Duration: 8.5 months
Start Month/Year for SubPhase Building: Mar '08
SubPhase Building Duration: 8.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Cranes	190	0.430	8.0
2	Off Highway Trucks	417	0.490	8.0
2	Other Equipment	190	0.620	8.0
3	Rough Terrain Forklifts	94	0.475	8.0

Start Month/Year for SubPhase Architectural Coatings: Aug '08
SubPhase Architectural Coatings Duration: .5 months
Start Month/Year for SubPhase Asphalt: Sep '08

SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 1.0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

CONSTRUCTION EMISSION ESTIMATES MITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	1.22	-	1.22
Off-Road Diesel	31.89	135.76	266.93	-	2.59	2.59	0.00
On-Road Diesel	0.56	7.40	2.04	0.02	0.14	0.09	0.05
Worker Trips	0.28	0.70	6.90	0.00	0.03	0.01	0.02
Maximum lbs/day	32.73	143.85	275.87	0.02	3.98	2.69	1.29
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.47	83.43	162.06	-	1.58	1.58	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.24	-	-	-	-	-	-
Asphalt Off-Road Diesel	6.87	29.01	57.56	-	0.53	0.53	0.00
Asphalt On-Road Diesel	0.07	0.73	0.24	0.00	0.01	0.01	0.00
Asphalt Worker Trips	0.03	0.01	0.30	0.00	0.01	0.00	0.01
Maximum lbs/day	26.67	113.18	220.16	0.00	2.13	2.12	0.01
Max lbs/day all phases	32.73	143.85	275.87	0.02	3.98	2.69	1.29

Construction-Related Mitigation Measures

Phase 2: Off-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 2: Off-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: On-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 2: On-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 2: Stockpiles: Cover all stock piles with tarps
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 9.5%)
Phase 2: Unpaved Roads: Water all haul roads 2x daily
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 30.0%)
Phase 2: Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 40.0%)
Phase 2: Soil Disturbance:
Percent Reduction(ROG 0.0% NOx 0.0% CO 0.0% SO2 0.0% PM10 68.0%)
Phase 3: Off-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 3: Off-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: Off-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 3: Off-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 3: On-Road Diesel Exhaust: Use aqueous diesel fuel
Percent Reduction(ROG 0.0% NOx 14.0% CO 0.0% SO2 0.0% PM10 63.0%)
Phase 3: On-Road Diesel Exhaust: Use lean-NOx catalyst
Percent Reduction(ROG 0.0% NOx 20.0% CO 0.0% SO2 0.0% PM10 0.0%)
Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Feb '08
Phase 2 Duration: 1.5 months

On-Road Truck Travel (VMT): 456

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Excavators	180	0.580	8.0
1	Graders	174	0.575	8.0
6	Off Highway Trucks	417	0.490	8.0
2	Rollers	114	0.430	8.0
1	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions

Start Month/Year for Phase 3: Mar '08

Phase 3 Duration: 8.5 months

Start Month/Year for SubPhase Building: Mar '08

SubPhase Building Duration: 8.5 months

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Cranes	190	0.430	8.0
2	Off Highway Trucks	417	0.490	8.0
2	Other Equipment	190	0.620	8.0
3	Rough Terrain Forklifts	94	0.475	8.0

Start Month/Year for SubPhase Architectural Coatings: Aug '08

SubPhase Architectural Coatings Duration: .5 months

Start Month/Year for SubPhase Asphalt: Sep '08

SubPhase Asphalt Duration: 0.5 months

Acres to be Paved: 1.0

Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Winter Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.00	0.00	0.00	0	0.00
Hearth	0.00	0.00	0.00	0.00	0.00
Landscaping - No winter emissions					
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	0.00	-	-	-	-
TOTALS(lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
TOTAL EMISSIONS (lbs/day)	0.00	0.00	0.00	0.00	0.00

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2005 Temperature (F): 40 Season: Winter

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	56.10	2.30	97.10	0.60
Light Truck < 3,750 lbs	15.10	4.00	93.40	2.60
Light Truck 3,751- 5,750	15.50	1.90	96.80	1.30
Med Truck 5,751- 8,500	6.80	1.50	95.60	2.90
Lite-Heavy 8,501-10,000	1.00	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	10.00	20.00	70.00
Heavy-Heavy 33,001-60,000	0.80	0.00	12.50	87.50
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.60	87.50	12.50	0.00
School Bus	0.30	0.00	0.00	100.00
Motor Home	1.40	14.30	78.60	7.10

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

The user has overridden the Default Phase Lengths
Site Grading Miles/Round Trip changed from 20 to 40
Phase 2 mitigation measure Off-Road Diesel Exhaust: Use aqueous diesel fuel
has been changed from off to on.
Phase 2 mitigation measure Off-Road Diesel Exhaust: Use lean-NOx catalyst
has been changed from off to on.
Phase 2 mitigation measure On-Road Diesel Exhaust: Use aqueous diesel fuel
has been changed from off to on.
Phase 2 mitigation measure On-Road Diesel Exhaust: Use lean-NOx catalyst
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Phase 2 mitigation measure Stockpiles: Cover all stock piles with tarps
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Water all haul roads 2x daily
has been changed from off to on.
Phase 2 mitigation measure Unpaved Roads: Reduce speed on unpaved roads to < 15 mph
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Changes made to the default values for Area

Changes made to the default values for Operations

11/1/2006 17:14

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\starwood.urb
Project Name: Starwood
Project Location: San Joaquin Valley
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

Construction Start Month and Year: February, 2008
Construction Duration: 10
Total Land Use Area to be Developed: 5.6 acres
Maximum Acreage Disturbed Per Day: 1 acres
Single Family Units: 0 Multi-Family Units: 0
Retail/Office/Institutional/Industrial Square Footage: 0

CONSTRUCTION EMISSION ESTIMATES UNMITIGATED (lbs/day)

Source	ROG	NOx	CO	SO2	PM10 TOTAL	PM10 EXHAUST	PM10 DUST
*** 2008***							
Phase 1 - Demolition Emissions							
Fugitive Dust	-	-	-	-	0.00	-	0.00
Off-Road Diesel	0.00	0.00	0.00	-	0.00	0.00	0.00
On-Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum lbs/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phase 2 - Site Grading Emissions							
Fugitive Dust	-	-	-	-	10.00	-	10.00
Off-Road Diesel	31.89	197.32	266.93	-	7.01	7.01	0.00
On-Road Diesel	0.56	10.75	2.04	0.02	0.28	0.23	0.05
Worker Trips	0.28	0.70	6.90	0.00	0.03	0.01	0.02
Maximum lbs/day	32.73	208.77	275.87	0.02	17.32	7.25	10.07
Phase 3 - Building Construction							
Bldg Const Off-Road Diesel	19.47	121.27	162.06	-	4.27	4.27	0.00
Bldg Const Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arch Coatings Off-Gas	0.00	-	-	-	-	-	-
Arch Coatings Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asphalt Off-Gas	0.24	-	-	-	-	-	-
Asphalt Off-Road Diesel	6.87	42.17	57.56	-	1.44	1.44	0.00
Asphalt On-Road Diesel	0.07	1.06	0.24	0.00	0.03	0.03	0.00
Asphalt Worker Trips	0.03	0.01	0.30	0.00	0.01	0.00	0.01
Maximum lbs/day	26.67	164.51	220.16	0.00	5.74	5.73	0.01
Max lbs/day all phases	32.73	208.77	275.87	0.02	17.32	7.25	10.07

Phase 1 - Demolition Assumptions: Phase Turned OFF

Phase 2 - Site Grading Assumptions
Start Month/Year for Phase 2: Feb '08
Phase 2 Duration: 1.5 months
On-Road Truck Travel (VMT): 456
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Excavators	180	0.580	8.0
1	Graders	174	0.575	8.0
6	Off Highway Trucks	417	0.490	8.0
2	Rollers	114	0.430	8.0
1	Rubber Tired Dozers	352	0.590	8.0
2	Tractor/Loaders/Backhoes	79	0.465	8.0

Phase 3 - Building Construction Assumptions
Start Month/Year for Phase 3: Mar '08
Phase 3 Duration: 8.5 months
Start Month/Year for SubPhase Building: Mar '08
SubPhase Building Duration: 8.5 months
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
4	Cranes	190	0.430	8.0
2	Off Highway Trucks	417	0.490	8.0
2	Other Equipment	190	0.620	8.0
3	Rough Terrain Forklifts	94	0.475	8.0

Start Month/Year for SubPhase Architectural Coatings: Aug '08
SubPhase Architectural Coatings Duration: .5 months
Start Month/Year for SubPhase Asphalt: Sep '08

SubPhase Asphalt Duration: 0.5 months
Acres to be Paved: 1.0
Off-Road Equipment

No.	Type	Horsepower	Load Factor	Hours/Day
1	Off Highway Trucks	417	0.490	8.0
1	Pavers	132	0.590	8.0
1	Paving Equipment	111	0.530	8.0
1	Rollers	114	0.430	8.0

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	0.00	0.00	0.00	0	0.00
Hearth - No summer emissions					
Landscaping	0.00	0.00	0.00	0.00	0.00
Consumer Prdcts	0.00	-	-	-	-
Architectural Coatings	0.00	-	-	-	-
TOTALS(lbs/day,unmitigated)	0.00	0.00	0.00	0.00	0.00

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
TOTAL EMISSIONS (lbs/day)	0.00	0.00	0.00	0.00	0.00

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2005 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	56.10	2.30	97.10	0.60
Light Truck < 3,750 lbs	15.10	4.00	93.40	2.60
Light Truck 3,751- 5,750	15.50	1.90	96.80	1.30
Med Truck 5,751- 8,500	6.80	1.50	95.60	2.90
Lite-Heavy 8,501-10,000	1.00	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	1.00	10.00	20.00	70.00
Heavy-Heavy 33,001-60,000	0.80	0.00	12.50	87.50
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.10	0.00	0.00	100.00
Motorcycle	1.60	87.50	12.50	0.00
School Bus	0.30	0.00	0.00	100.00
Motor Home	1.40	14.30	78.60	7.10

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip Speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			

Changes made to the default values for Land Use Trip Percentages

Changes made to the default values for Construction

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Changes made to the default values for Area

Changes made to the default values for Operations

Midway - Calculations for inputs to ISC Model for Construction Emissions - Combustion Main site

	Grading lb/day	Building lb/day	Main Site Emissions lb/day	short-term 1,3,8-hr Main Site Emissions lb/hr	short-term 24-hr Main Site Emissions lb/hr	long-term annual Main Site Emissions lb/hr
NOX	143.85	113.18	143.85	17.98		4.34
CO	275.87	220.16	275.87	34.48		
SO2	0.02	0.0001	0.02	2.50E-03	8.33E-04	6.03E-04
PM10 COMB	2.69	2.12	2.69		0.11	0.08
PM10 DUST	1.29	0.01	1.29		0.05	0.04
Data from URBEMIS2002						

Inputs to ISC

	Main Site Emissions 1 volume source lb/hr short-term 1,3,8-hr	Main Site Emissions 1 volume source lb/hr short-term 24-hr	Main Site Emissions 1 volume source lb/hr - long-term
NOX	17.981		4.34E+00
CO	34.484		
SO2	2.50E-03	8.33E-04	6.03E-04
PM10 COMB		1.12E-01	8.11E-02
PM10 Fugitive Dust		5.38E-02	3.89E-02

Acres-->ft^2

	Acres	SQ. FT
main site	5.6	243936

Midway - Calculations for inputs to ISC Model for Construction Emissions - Combustion Water Line

	Grading lb/day	Water Line Emissions lb/day	short-term 1,3,8-hr Water Line Emissions lb/hr	short-term 24-hr Water Line Emissions lb/hr	long-term annual Water Line Emissions lb/hr
NOX	40.07	40.07	5.01		1.21
CO	72.77	72.77	9.10		
SO2	0.0001	0.00	1.25E-05	4.17E-06	3.01E-06
PM10 COMB	0.83	0.83		0.03	0.03
PM10 DUST	0.07	0.07		0.00	0.00

Data from URBEMIS2002

Inputs to ISC

	Water Line Emissions 4 area sources lb/hr short-term 1,3,8-hr	Water Line Emissions 4 area sources lb/hr short-term 24-hr	Water Line Emissions 4 area sources lb/hr - long-term
NOX	1.252		3.02E-01
CO	2.274		
SO2	3.125E-06	1.04E-06	7.53E-07
PM10 COMB		8.65E-03	6.25E-03
PM10 Fugitive Dust		7.29E-04	5.27E-04

Acres-->ft^2

	Acres	SQ. FT
water line	0.4845	21104.82

EMISSION CALCULATIONS FOR CONSTRUCTION RELATED ONROAD VEHICLES

TABLE 1 EMISSION FACTOR FOR ONROAD VEHICLES

Onroad Vehicle	Fuel Type	Vehicle Count	Weight (lbs)	Vehicle Type	EF (lbs/VMT) [1] TOG	CO	NOx	PM10	SO2
On-Site Vehicles									
Truck - Water/Fuel	D	2	58000	HHD	3.05E-03	2.29E-02	2.65E-02	6.23E-04	3.46E-05
Dump Truck	D	1	45400	HHD	3.05E-03	2.29E-02	2.65E-02	6.23E-04	3.46E-05
Service Truck - 3 ton	D	1	24000	LHD	1.39E-02	1.41E-01	1.49E-02	9.22E-05	0.00E+00
Highway Vehicles (Off-site)									
Worker's Vehicles [2]	G/D	88	4000	LDA/LDT	1.38E-03	1.29E-02	1.28E-03	7.95E-05	9.29E-06
Light Delivery Trucks	D	4	16000	LDH	1.39E-02	1.41E-01	1.49E-02	9.22E-05	0.00E+00
Heavy Duty Delivery Trucks	D	4	30000	MDH	1.49E-03	6.02E-03	2.81E-02	6.99E-04	3.96E-05

1. To obtain the emission factors, EMFAC2002 was run in the "planning inventory" mode for the modeling year of 2008. The Fresno County average fleet information was chosen, and the inventory was run for winter. The emission factor for a given vehicle category was back calculated using the daily emissions and daily VMT for that vehicle category.
2. The emission factors for worker's vehicles are a weighted average, assuming 50% passenger cars and 50% light duty trucks.
Vehicle count is highest estimated work force onsite in any month (110).
Assumes 1.25 employees per vehicle.

TABLE 2 EMISSION CALCULATION FOR ONROAD VEHICLES

Onroad Vehicles (Access Road)	Total Days	Trips or Hours/Day/Unit	Round Trip Distance	Daily Total VMT	Daily Emissions (lbs) [1] TOG	CO	NOx	PM10	SO2	Project Emissions (lbs) TOG	CO	NOx	PM10	SO2
On-Site Vehicles														
Truck - Water	220	4	4	32	9.76E-02	7.33E-01	8.48E-01	1.99E-02	1.11E-03	21	161	187	4	0
Dump Truck	220	4	4	16	4.88E-02	3.66E-01	4.24E-01	9.97E-03	5.54E-04	11	81	93	2	0
Service Truck - 1 ton	220	1	2	2	2.78E-02	2.82E-01	2.98E-02	1.84E-04	0.00E+00	6	62	7	0	0
Service Truck - 3 ton	220	1	2	2	2.78E-02	2.82E-01	2.98E-02	1.84E-04	0.00E+00	6	62	7	0	0
Trucks - Pickup 3/4 ton	220	16	1	32	4.42E-02	4.13E-01	4.10E-02	2.54E-03	2.97E-04	10	91	9	1	0
Total				**Total**	**0.25 lbs**	**2.08 lbs**	**1.37 lbs**	**0.03 lbs**	**0.00 lbs**	**54.16**	**456.72**	**301.96**	**7.22**	**0.43**
Highway Vehicles (Off-site)	**Total Days**									**0.0 tons**	**0.2 tons**	**0.2 tons**	**0.0 tons**	**0.0 tons**
Worker's Vehicles [2]	220	1	50	4400	6.1	56.8	5.6	0.3	4.09E-02	1,336	12,487	1,239	77	9
Light Delivery Trucks	220	4	50	800	11.1	112.8	11.9	0.1	0.00E+00	2,446	24,816	2,622	16	0
Heavy Duty Delivery Trucks	220	4	50	800	1.2	4.8	22.5	0.6	3.17E-02	262	1,060	4,946	123	7
Total				**Total**	**1.19 lbs**	**4.82 lbs**	**22.48 lbs**	**0.56 lbs**	**0.03 lbs**	**4,044 lbs**	**38,363 lbs**	**8,807 lbs**	**216 lbs**	**16 lbs**
										2.0 tons	**19.2 tons**	**4.4 tons**	**0.1 tons**	**0.008 tons**

1. Based on equipment usage for the fifth construction month, which is the peak activity month.
2. The emission factors for worker's vehicles are a weighted average, assuming 50% passenger cars and 50% light duty trucks.

TABLE 3 EMISSIONS FROM VEHICLE TRAFFIC ON PAVED ROAD

Vehicle Type	Mean Vehicles Speed (mph) [Vehicles Weight (tons)]	Total No. Of Trips / Day	PM10 EF (lbs/VMT) [1]	Round Trip Distance (mile)	Daily VMT (all units)	Total No. of Days Operated	VMT/ Project	Daily Emissions (lbs)	Project Emissions (lbs)
Worker's Vehicles [1]	45	1	0.0388	50	50	220	11000	1.9389	426.57
Light Delivery Trucks	[08]	4	0.0493	50	200	220	44000	9.8502	2167.05
Heavy Duty Delivery Trucks	[12]	4	0.0591	50	200	220	44000	11.8219	2600.82
Total								**24**	**5,194**

2.60 tons

1. EF are calculated using equations in AP-42, Section 13.2.2. Equation 1b is used for passenger cars; equation 1a is used for heavy duty delivery trucks.
EF calculations are based on the following assumptions:
Paved road silt content (%) 0.1348 SCAQMD CEQA Table A-9-C-1, 5% local, 5% collector, 90% freeway

APPENDIX I

AIR QUALITY DATA
ATTACHMENT C

SUPPORTING INFORMATION ON ESTIMATION OF PROJECT OPERATION EMISSIONS low catalyst temps

	1 UNIT	2 UNITS	1 UNIT	2 UNITS	1 UNIT	2 UNITS
Ambient Temperature (°F)	114	114	63.3	63.3	18	18
Stack Diameter (ft)	15	15	15	15	15	15
Exhaust Flow (lb/hr)	780654.0	1561308	840143.5	1680287	883119.0	1766238
Exhaust Flow (acfm)	423776.83	847554	444060.84	888122	441869.49	883739
Stack Exit Velocity, ft/m	2398.09	4796.2	2512.87	5025.7	2500.47	5000.9
Stack Exit Velocity, m/s	12.18	24.36	12.77	25.53	12.70	25.40
Stack Exit Velocity, ft/s	39.97	79.94	41.88	83.76	41.67	83.35
Turbine Outlet Temperature (°F)	830	830	796	796	729	729
CTG Load Level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Evap. Cooler	ON	ON	ON	ON	OFF	OFF
Data from Vendor		Area =	176.71	ft^2		

high catalyst temps

	1 UNIT	2 UNITS	1 UNIT	2 UNITS	1 UNIT	2 UNITS
Ambient Temperature (°F)	114	114	63.3	63.3	18	18
Stack Diameter (ft)	15	15	15	15	15	15
Exhaust Flow (lb/hr)	723774.5	1447549	777753	1555506	814816	1629632
Exhaust Flow (acfm)	408145.11	816290	428435.38	856871	426215.12	852430
Stack Exit Velocity, ft/m	2309.63	4619.3	2424.45	4848.9	2411.88	4823.8
Stack Exit Velocity, m/s	11.73	23.47	12.32	24.63	12.25	24.50
Stack Exit Velocity, ft/s	38.49	76.99	40.41	80.81	40.20	80.40
Turbine Outlet Temperature (°F)	880	880	849	849	783	783
CTG Load Level	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Evap. Cooler	ON	ON	ON	ON	OFF	OFF
Data from Vendor		Area =	176.71	ft^2		

Expected Operation of Each Gas Turbine - Normal Operation

(Reference: Table 3.4-1 Midway Generating Unit Estimated Performance and Emissions Data FT8-3 Swift Pacs with Foggers)

Heat Consumed (MMBTU/hr)	290.8	290.8	311.2	311.2	309.5	309.5
Nitrogen, % Vol	73.13	73.13	74.20	74.20	74.69	74.69
Oxygen, % Vol	15.45	15.45	15.50	15.50	15.44	15.44
Carbon Dioxide, % Vol	2.14	2.14	2.26	2.26	2.36	2.36
Argon, % Vol	0.87	0.87	0.89	0.89	0.89	0.89
Water Vapor, % Vol	8.41	8.41	7.15	7.15	6.61	6.61
Molecular Weight	28.22	28.22	28.37	28.37	28.44	28.44

Data from Vendor

Average Emission Rates from Each Gas Turbine (lbs/hr) - Normal Operations

NO_X at 37 ppmvd pre-BACT level	39.10	39.10	41.80	41.80	41.60	41.60
NO_X at 2.5 ppmvd BACT level	2.60	5.30	2.80	5.70	2.80	5.70
CO at pre BACT level	12.40	12.40	13.30	13.30	17.60	17.60
CO ppmvd pre-BACT level	19.00	19.00	19.00	19.00	26.00	26.00
CO at BACT level	2.40	4.80	2.60	5.20	3.40	6.80
CO ppmvd BACT level	3.80	3.80	3.80	3.80	5.00	5.00
VOC at 1.7 ppmvd BACT level	0.60	1.20	0.70	1.40	0.70	1.40
SO_2 short-term rate	0.41	0.81	0.43	0.87	0.43	0.86
SO_2 long-term rate	0.26	0.52	0.28	0.56	0.28	0.55
PM_{10}	1.85	3.70	1.85	3.70	1.85	3.70
NH_3 at 10 ppmvd tBACT level	7.30	14.60	7.30	14.60	7.30	14.60

Sulfur content in fuel basis for above:	0.5	grain total S/100 scf	short-term
	0.32	grain total S/100 scf	long-term

Data from Vendor

Startup / Shutdown Emissions from Each Turbine (2 Turbines = 1 SwiftPac Unit)

Startup

duration in minutes	18	18	42	Average	1 hour of
	Startup	Total Startup	Normal	Startup	Startup
	Emissions	Emissions	Emissions	Emissions	Emissions
	lb/event	**lb/event**	lb/hour	lb/hour	lb/hour
NO_X	1.25	1.25	2.80	3.21	4.2
CO	3.75	3.75	3.40	6.13	12.50
VOC	0.25	0.25	1.40	1.23	0.83
SO_2	0.13	0.13	0.43	0.44	0.44
PM_{10}	0.56	0.56	1.85	1.85	1.85

Assumptions:

Startup Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by client.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of six operating cases listed above

NO_x emission estimates from actual CEMS data. VOC and CO emission estimates from client Table 3.4-1A.

PM_{10} emission estimates from normal operations. SO_2 estimates based on 0.5 grains/100 scf natural gas.

Shutdown

duration in minutes	18	42	Average	1 hour of
	Shutdown	Normal	Startup	Shutdown
	Emissions	Emissions	Emissions	Emissions
	lb/event	lb/hour	lb/hr	lb/hour
NO_X	0.45	2.80	2.41	1.50
CO	6.40	3.40	8.78	21.33
VOC	0.25	0.70	0.74	0.83
SO_2	0.13	0.43	0.44	0.44
PM_{10}	0.56	1.85	1.85	1.85

Assumptions:

Shutdown Emissions for CO, NO_2, PM_{10}, and VOC integrated from data provided by client.

SO_2 emissions assume complete conversion of all sulfur to SO_2.

Normal emissions are highest of six operating cases listed above.

NO_x emission estimates from actual CEMS data. VOC and CO emission estimates from client Table 3.4-1A.

PM_{10} emission estimates from normal operations. SO_2 estimates based on 0.5 grains/100 scf natural gas.

Commissioning Emissions

		Total Pounds Emitted		
	Hours	NO_x	CO	VOC
Controlled Break-in	5	47.79	12.09	0.41
Overspeed Test	1	9.56	2.42	0.08
Brush Generator Test	17	322.91	142.08	6.74
Water Injection Tuning	12.5	374.08	209.53	8.72
Fogger Commissioning	4	166.61	52.91	2.66
Catalyst Loading	4	166.61	52.91	2.66
SCR Commissioning	4	88.94	31.61	2.66
Full Load Testing	7.75	19.68	22.54	5.05
Emission Compliance	12	33.79	30.89	7.99
Startups/Shutdowns		44.37	31.16	1.44
Total Commissioning Hours	67.25	1274.34	588.14	38.41
		Maximum Emission Rates lb/hr		
		NO_x	CO	VOC
Controlled Break-in		9.56	2.42	0.08
Overspeed Test		9.56	2.42	0.08
Brush Generator Test		18.99	8.36	0.40
Water Injection Tuning		29.93	16.76	0.70
Fogger Commissioning		41.65	13.23	0.67
Catalyst Loading		41.65	13.23	0.67
SCR Commissioning		22.24	7.90	0.67
Full Load Testing		2.54	2.91	0.65
Emission Compliance		2.82	2.57	0.67

Worst-Case 1-Hour Emissions per Turbine

Worst-Case 1-Hour Emissions are equal to the commissioning emission rates, except for SO_2 and PM_{10} which have worst-case emissions during startup.

Emissions per turbine	**lb/hr**		**g/s**
NO_2	41.65		5.25
CO	19.90		2.51
VOC	0.70		0.09
SO_2	0.44		0.05
PM_{10}	1.85		0.23

The highest 1-hour commissioning emission rate occurs during a subset of the water injection tuning test.

Worst-Case 3 Hour Emission Rate per Turbine

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

Worst-case 3-Hour Scenario are equal to 3 hours at normal rate.

	Worst-case Total	**Startup /Warmup**	**Shutdown**	**Normal Operations**	**Worst-case Total**	**Startup /Warmup**	**Shutdown**		**Normal Operations**	**Worst-case Total**
Emissions per turbine	**lb/hr**				**Total lbs**					**g/s**
Total Hours of Operation	3.0			3.00					3.000	
SO_2	0.44			0.44	1.31				1.31	0.05

Worst-Case 8-Hour Emission Rates

Only CO is considered for an average 8-hour Ambient Air Quality Standard.

Worst-case 8-Hour Scenario includes 8 hours of commissioning. Only one turbine will be undergoing commissioning at any one time.

	Worst-case Total	**Startup /Warmup**	**Shutdown**	**Commissioning**	**Normal Operations**	**Worst-case Total**	**Startup /Warmup**		**Shutdown**	**Commissioning**	**Normal Operations**	**Worst-case Total**
Emissions per turbine	**lb/hr**					**Total lbs**						**g/s**
Total Hours of Operation	8			8	0					8	0.00	
CO	16.76			16.76	0.00	134.10				134.10	0.00	2.11

Worst-Case 24 Hour Emission Rate

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-Hour Scenario for PM_{10} includes 1 Startup, 1 Shutdown, and remaining time at normal rate.

Worst-case 24-hour scenario for SO_2 uses normal operations.

	Worst-case Total	**Startup /Warmup**	**Shutdown**	**Normal Operations**	**Worst-case Total**	**Startup /Warmup**	**Shutdown**		**Normal Operations**	**Worst-case Total**
Emissions per turbine	**lb/hr**				**Total lbs**					**g/s**
Total Hours of Operation	24	0.90	0.900	22.200		0.90	0.900		22.200	
NO_X	2.80	4.17	1.50	2.80	67.26	3.75	1.35		62.16	0.35
CO	3.67	12.50	21.33	2.60	88.17	11.25	19.20		57.72	0.46
VOC	0.71	0.83	0.83	0.70	17.04	0.75	0.75		15.54	0.09
SO_2	0.43	0.44	0.44	0.43	10.43	0.40	0.40		9.64	0.05
PM_{10}	1.85	1.85	1.85	1.85	44.40	1.67	1.67		41.07	0.23

CTG Commissioning testing could operate for 24 hours.

Average Annual Emissions

Average Operation lb/hr Emission Rates presented below for normal operations are based on the 63°F, 100% load operation scenario for 4,000 total operating hours, which includes 365 startup/warmup events and 365 shutdown events. Worst-case total emission rate incorporates estimated operating hours at different temperatures.

Emissions per turbine	Worst-case Total	Startup /Warmup	Shutdown	Normal Operations	Worst-case Total	Startup /Warmup	Shutdown		Normal Operations	Worst-case Total
	lb/hr							Total lbs		g/s
Total Hours of Operation	4000	109.50	109.50	3781.00						
Number per Scenario		365	365							
Duration of Event (min)		18.0	18.0	60						
NO_X	1.28	4.17	1.50	2.80	11207.3	456.3	164.3		10586.8	0.16
CO	1.89	12.50	21.33	3.40	16560.2	1368.8	2336.0		12855.4	0.24
VOC	0.32	0.83	0.83	0.70	2829.2	91.3	91.3		2646.7	0.04
SO_2	0.13	0.44	0.44	0.28	1147.3	48.4	48.4		1050.6	0.02
PM_{10}	0.84	1.85	1.85	1.85	7400.0	202.6	202.6		6994.9	0.11

Note: Worst-case lb/hr is the total emissions (lbs) over 8760 hours/year

Annual SO_2 normal operations based on 0.32 grains/100 scf natural gas.

Estimated annual normal operating hours 3781

ANNUAL TOTALS	1 turbine	2 turbines (1 unit)	2 units (4 turbines)	
NO_X	5.60	11.21	22.41	tpy
CO	8.28	16.56	33.12	tpy
VOC	1.415	2.829	5.66	tpy
SO_2	0.57	1.15	2.29	tpy
PM_{10}	3.70	7.40	14.80	tpy

1-Hour Worst-Case Emission Scenario for Midway

Only NO_2, CO and SO_2 are considered for the 1-hour Ambient Air Quality Standard.

Worst-case 1-Hour Scenario for NO_2 and CO includes new turbines operating for 1 hour at highest commissioning rate.

Worst-case 1-Hour Scenario for SO_2 includes new turbines operating for 1 hour at startup.

Emissions per turbine	lb/hr	g/s
NO_2	41.65	5.25
CO	19.90	2.51
SO_2	0.44	0.05

3 Hour Emissions Scenarios for Midway

Only SO_2 is considered for an average 3-hour Ambient Air Quality Standard.

The worst-case 3-hour emission rate is the maximum SO_2 rate for 100% load, normal operating case (63°F; with Evap. Cooler On).

Emissions per turbine	lb/hr	g/s
SO_2	0.44	0.05

8-Hour Emissions Scenarios for Midway

Only CO is considered for an average 8-hour Ambient Air Quality Standard.
Worst-case 8-Hour Scenario includes 8 hours of commissioning.

Emissions per turbine	lb/hr	g/s
CO	19.90	2.51

24-Hour Emissions Scenarios for Midway

Only SO_2 and PM_{10} are considered for an average 24-hour Ambient Air Quality Standard.

Worst-case 24-Hour Scenario for PM_{10} includes 1 Startup, 1 Shutdown, and remaining time at normal rate. SO_2 uses normal operating rate.

Emissions per turbine	lb/hr	g/s
NO_2	2.80	0.35
CO	3.67	0.46
VOC	0.71	0.09
SO_2	0.44	0.05
PM_{10}	1.85	0.23

Average Annual Emissions for Midway

Average Operation Emission Rates are based on the annual operation scenarios for 4,000 hours
which includes 365 startup/warmup events and 365 shutdown events.
annual SO_2 assumes 0.32 grains/scf

Emissions per turbine	lb/hr	g/s
NO_X	1.28	0.16
CO	1.89	0.24
VOC	0.32	0.04
SO_2	0.13	0.02
PM_{10}	0.84	0.11

Note: Worst-case annual lb/hr is the total emissions (lbs) over 8760 hours/year

Table 3.4-1
Midway Generating Unit
Estimated Performance and Emissions Data
FT8-3 Swift Pacs (TP) with Foggers
Water Injected to 37 PPM NOx at GT Exit
72290 Generators, 60 Hz, 0.85 PF

Gas Turbines Operating		2	1	2	1	2	1	2
Foggers Operating		No	No	Yes	Yes	Yes	Yes	Yes
Ambient Temperature	Deg F	18	18	63.3	63.3	114	114	59
Relative Humidity	%	91	91	40	40	22	22	60
Ambient Pressure	PSIA	14.48	14.48	14.48	14.48	14.48	14.48	14.48
Altitude	Feet	410	410	410	410	410	410	410
Compressor Inlet Temperature	Deg F	18.0	18.0	51.1	51.1	80.8	80.8	51.8
Fogger Water Consumption per GT	GPM	0.0	0.0	3.9	3.9	9.7	9.7	2.3
Inlet Duct Pressure Loss	in. H2O	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Exhaust Duct Pressure Loss	in. H2O	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Fuel Lower Heating Value	BTU/lb	20559	20559	20559	20559	20559	20559	20559
HHV/LHV Ratio		1.11	1.11	1.11	1.11	1.11	1.11	1.11
Twin Pac Gross Power Output	MW	60.889	28.211	60.107	27.794	54.867	25.170	60.020
Gross Heat Rate (LHV)	BTU/kWh	9158	9883	9327	10086	9549	10408	9331
Gross Heat Rate (HHV)	BTU/kWh	10165	10970	10353	11195	10600	11553	10357
Inlet Flow per GT	PPS	202.8	202.8	193.7	193.7	180.5	180.5	193.5
Fuel Input (HHV) per GT	MMBTU/H	309.5	309.5	311.2	311.2	290.8	290.8	310.8
Fuel Flow per GT	PPH	13561	13561	13635	13635	12743	12743	13620
Water Injection Flow per GT	GPM	22.9	22.9	24.5	24.5	23.1	23.1	24.5
Gas Turbine Exhaust Flow per GT	PPS	208.7	208.7	199.9	199.9	186.3	186.3	199.6
Gas Turbine Exhaust Gas Temperature	Deg F	839	839	904	904	933	933	905
GT Exhaust Gas Relative Enthalpy (ref 77 F)	BTU/lb	198.0	198.0	217.5	217.5	228.2	228.2	217.8
Exhaust Emissions at GT Exit								
NOx referenced to 15% O2	ppmvd	37	37	37	37	37	37	37
NOx as NO2 per GT	PPH	41.6	41.6	41.8	41.8	39.1	39.1	41.8
CO referenced to 15% O2	ppmvd	26	26	19	19	19	19	19
CO per GT	PPH	17.6	17.6	13.3	13.3	12.4	12.4	13.3
VOC as CH4 referenced to 15% O2	ppmvd	1.7	1.7	1.7	1.7	1.7	1.7	1.7
VOC per GT	PPH	0.7	0.7	0.7	0.7	0.6	0.6	0.7
SO2 per GT	PPH	1.0	1.0	1.0	1.0	0.9	0.9	1.0
Total Particulates per GT	PPH	2.0	2.0	2.1	2.1	1.9	1.9	2.1
GT Exhaust Streams Combined Prior to SCR / CO Converter (Data presented on a Unit basis with the indicated number of GT's Operating)								
Dilution Air Added Before SCR	PPS	56.0	28.0	99.8	49.9	119.7	59.9	99.3
Total Stack Flow	PPS	473.5	236.8	499.5	249.8	492.3	246.1	498.6
Stack Temperature	Deg F	750	750	750	750	750	750	750
SCR Effectiveness Assumed	%	93.2	93.2	93.2	93.2	93.2	93.2	93.2
NOx after SCR referenced to 15% O2	ppmvd	2.5	2.5	2.5	2.5	2.5	2.5	2.5
NOx after SCR as NO2	PPH	5.6	2.8	5.7	2.8	5.3	2.6	5.6
CO Converter Effectiveness Assumed	%	81	81	81	81	81	81	81
CO After CO Converter referenced to 15% O2	ppmvd	5.0	5.0	3.8	3.8	3.8	3.8	3.8
CO after CO Converter	PPH	6.8	3.4	5.2	2.6	4.8	2.4	5.2
Stack Exhaust Composition								
N2	Vol %	74.13	74.13	73.58	73.58	72.36	72.36	73.51
Ar	Vol %	0.88	0.88	0.88	0.88	0.86	0.86	0.87
CO2	Vol %	2.76	2.76	2.62	2.62	2.47	2.47	2.62
H2O	Vol %	7.73	7.73	8.30	8.30	9.73	9.73	8.39
O2	Vol %	14.50	14.50	14.62	14.62	14.58	14.58	14.59

Notes:
1. Data assumes the use of fuel and water conforming to PWPS Specifications FR-2 and Ar-1.
2. Emissions measured using appropriate USEPA reference methods.
3. Particulates shown are the based on AP42 Factor (0.0066 lb/MMBTU(HHV)).
4. Sulfur dioxide estimates based on a fuel sulfur content of 1 gr/100scf.
5. Data labeled as "per GT" applies to each gas turbine in the Twin Pac unit.
6. Estimates assume the use of SCR's with catalyst limitations of 750F, use of higher temperature catalyst would chang the amount of dilution air required as well as stack temperature and total stack flow estimates shown.
7. All data is to be considered as estimated and is supplied for informational purposes.
8. Single GT operation assumes the opposite power turbine is coupled to the generator and windmilling

8/28/2006

FT8-3 Emissions Estimates During Commissioning

	Commissioning Step	Load	Duration (Hours)	Water Inj	SCR	CO Conv	NOx (PPH) per GT	CO (PPH) per GT	VOC (PPH) per GT	NOx (Pounds) per GT	CO (Pounds) per GT	VOC (Pounds) per GT
I	Power Turbine Break In	SI	5	No	No	No	9.56	2.42	0.08	47.79	12.09	0.41
II	Overspeed Test	SI	1	No	No	No	9.56	2.42	0.08	9.56	2.42	0.08
III	Brush Generator Testing	SI	8	No	No	No	9.56	2.42	0.08	76.47	19.34	0.65
		Base	1.5	Yes	No	No	41.65	13.23	0.67	62.48	19.84	1.00
		50	1.5	Yes	No	No	35.35	14.95	0.56	53.02	22.42	0.85
		40	1.5	Yes	No	No	29.58	2.59	0.72	44.36	3.88	1.08
		30	1.5	Yes	No	No	23.88	18.40	0.68	35.82	27.61	1.01
		20	1.5	Yes	No	No	18.67	18.61	0.74	28.01	27.91	1.11
		10	1.5	Yes	No	No	15.17	14.05	0.69	22.75	21.08	1.03
IV	Water Injection Tuning											
	Heat Soak	Base	2	Yes	No	No	41.65	13.23	0.67	83.31	26.46	1.33
	Tuning	Base	1.5	Yes	No	No	41.65	13.23	0.67	62.48	19.84	1.00
		83%	2	Yes	No	No	35.18	14.99	0.57	70.36	29.98	1.13
		67%	2	Yes	No	No	29.65	18.39	0.72	59.30	36.78	1.43
		50%	2	Yes	No	No	23.85	18.39	0.67	47.70	36.78	1.35
	1050 F EGT		3	Yes	No	No	16.98	19.90	0.83	50.93	59.69	2.48
V	Fogger Commissioning	Base	4	Yes	No	No	41.65	13.23	0.67	166.61	52.91	2.66
VI	Run Prior to Catalyst Loading	Base	4	Yes	No	No	41.65	13.23	0.67	166.61	52.91	2.66
VII	SCR Commissioning	Base	2	Yes	No	No	41.65	13.23	0.67	83.31	26.46	1.33
			2	Yes	Yes	Yes	2.82	2.57	0.67	5.63	5.15	1.33
VIII	Performance Test											
	Heat Soak	Base	2	Yes	Yes	Yes	2.82	2.57	0.67	5.63	5.15	1.33
		Base	2	Yes	Yes	Yes	2.82	2.57	0.67	5.63	5.15	1.33
		95%	0.75	Yes	Yes	Yes	2.68	2.73	0.63	2.01	2.04	0.47
		90%	0.75	Yes	Yes	Yes	2.55	3.10	0.60	1.91	2.33	0.45
		80%	0.75	Yes	Yes	Yes	2.31	3.15	0.59	1.73	2.36	0.44
		70%	0.75	Yes	Yes	Yes	2.07	3.78	0.69	1.56	2.83	0.52
		50%	0.75	Yes	Yes	Yes	1.61	3.58	0.67	1.21	2.68	0.51
IX	Emission Compliance	Base	12	Yes	Yes	Yes	2.82	2.57	0.67	33.79	30.89	7.99
							(lbs)	(lbs)	(lbs)			
	Startups to Sync. Idle (5)						0.27	0.075	0	1.35	0.375	0
	Startup Cycles to Base (6)						5.05	3.38	0.13	30.3	20.28	0.78
	Shutdown cycles from 50% (6)						2.12	1.75	0.11	12.72	10.5	0.66
							Pounds Emitted per GT			1274.34	588.14	38.41
			Total Time (Hours)	67.25			**Total Pounds Emitted**			2548.7	1176.3	76.8
			FT8-2 CEM Data	94						1283	878	
							Ratio FT8-3 to FT8-2 CEM Data			**2.0**	**1.3**	

Notes:

1. SCR commissioning estimates are preliminary. Waiting for more accurate estimate of test requirements.
2. Data based on Tamb of 52 F, the average of the average monthly temperatures for Jan., Feb. and March. Assumed commissioning would occur during first quarter.
3. Assumed 1 start to baseload and 1 shutdown from 50% load per phase for pases IV to IX. No reduction from SCR or CO converter included.(5 MW/min loading/unload rate, 17.9 min start, 11.8 min shutdown from 50%)

10/13/06

FT8-3 Emissions Estimates During Commissioning

	Commissioning Step	Load	Duration (Hours)	Water Inj	SCR	CO Conv	NOx (PPH) per GT	CO (PPH) per GT	VOC (PPH) per GT	NOx (Pounds) per GT	CO (Pounds) per GT	VOC (Pounds) per GT
I	Power Turbine Break In	SI	5	No	No	No	9.56	2.42	0.08	47.79	12.09	0.41
II	Overspeed Test	SI	1	No	No	No	9.56	2.42	0.08	9.56	2.42	0.08
III	Brush Generator Testing	SI	8	No	No	No	9.56	2.42	0.08	76.47	19.34	0.65
		Base	1.5	Yes	No	No	41.65	13.23	0.67	62.48	19.84	1.00
		50	1.5	Yes	No	No	35.35	14.95	0.56	53.02	22.42	0.85
		40	1.5	Yes	No	No	29.58	2.59	0.72	44.36	3.88	1.08
		30	1.5	Yes	No	No	23.88	18.40	0.68	35.82	27.61	1.01
		20	1.5	Yes	No	No	18.67	18.61	0.74	28.01	27.91	1.11
		10	1.5	Yes	No	No	15.17	14.05	0.69	22.75	21.08	1.03
IV	Water Injection Tuning											
	Heat Soak	Base	2	Yes	No	No	41.65	13.23	0.67	83.31	26.46	1.33
	Tuning	Base	1.5	Yes	No	No	41.65	13.23	0.67	62.48	19.84	1.00
		83%	2	Yes	No	No	35.18	14.99	0.57	70.36	29.98	1.13
		67%	2	Yes	No	No	29.65	18.39	0.72	59.30	36.78	1.43
		50%	2	Yes	No	No	23.85	18.39	0.67	47.70	36.78	1.35
	1050 F EGT		3	Yes	No	No	16.98	19.90	0.83	50.93	59.69	2.48
V	Fogger Commissioning	Base	4	Yes	No	No	41.65	13.23	0.67	166.61	52.91	2.66
VI	Run Prior to Catalyst Loading	Base	4	Yes	No	No	41.65	13.23	0.67	166.61	52.91	2.66
VII	SCR Commissioning	Base	2	Yes	No	No	41.65	13.23	0.67	83.31	26.46	1.33
			2	Yes	Yes	Yes	2.82	2.57	0.67	5.63	5.15	1.33
VIII	Performance Test											
	Heat Soak	Base	2	Yes	Yes	Yes	2.82	2.57	0.67	5.63	5.15	1.33
		Base	2	Yes	Yes	Yes	2.82	2.57	0.67	5.63	5.15	1.33
		95%	0.75	Yes	Yes	Yes	2.68	2.73	0.63	2.01	2.04	0.47
		90%	0.75	Yes	Yes	Yes	2.55	3.10	0.60	1.91	2.33	0.45
		80%	0.75	Yes	Yes	Yes	2.31	3.15	0.59	1.73	2.36	0.44
		70%	0.75	Yes	Yes	Yes	2.07	3.78	0.69	1.56	2.83	0.52
		50%	0.75	Yes	Yes	Yes	1.61	3.58	0.67	1.21	2.68	0.51
IX	Emission Compliance	Base	12	Yes	Yes	Yes	2.82	2.57	0.67	33.79	30.89	7.99
							(lbs)	(lbs)	(lbs)			
	Startups to Sync. Idle (5)						0.27	0.075	0	1.35	0.375	0
	Startup Cycles to Base (6)						5.05	3.38	0.13	30.3	20.28	0.78
	Shutdown cycles from 50% (6)						2.12	1.75	0.11	12.72	10.5	0.66
									Pounds Emitted per GT	1274.34	588.14	38.41
			Total Time (Hours)			67.25			**Total Pounds Emitted**	2548.7	1176.3	76.8
			FT8-2 CEM Data			94				1283	878	
									Ratio FT8-3 to FT8-2 CEM Data	**2.0**	**1.3**	

Notes:

1. SCR commissioning estimates are preliminary. Waiting for more accurate estimate of test requirements.
2. Data based on Tamb of 52 F, the average of the average monthly temperatures for Jan., Feb. and March. Assumed commissioning would occur during first quarter.
3. Assumed 1 start to baseload and 1 shutdown from 50% load per phase for pases IV to IX. No reduction from SCR or CO converter included.(5 MW/min loading/unload rate, 17.9 min start, 11.8 min shutdown from 50%)

10/13/06

Table 3.4-1A
FT8-3 Swift Pac
Estimated Startup and Shutdown Emission Quantities

1) The following emissions estimates are based on the Northern California Natural Gas used for CalPeak.
2) Total emissions produced during the startup or shutdown period will vary if loading/unloading rates different than the indicated value are selected.
3) Estimated emission quantities below are based upon steady state emission rates at various operating conditions during startup and shutdown, such as purge timer duration, accel to GG Idle, GG idle hold, accel to sync idle, synchronization and breaker closure, 25%, 50%, 75%, and 100% of rated output.
4) Calculation of emission quantities are performed by integrating the emission rates at various operating points, over the duration at the representative condition. Quantities of emissions reported below are the sum of each emission from initiation of fuel flow through attainment of rated power.
5) No credit has been taken for reduction of emissions from the CO converter or SCR during the 17.9 minute start up to full load or for the shut down cycle making the values shown conservative. Design effectiveness will be reached by full load. SCR and CO converter reduction efficiencies were taken into account for the 12.1 minute period after full load is reached out to 30 minutes.
6) WI-37 designation indicates base-load water injection NOx control levels (37 ppmvd@15% O2).
7) Duration refers to the amount of time from start initiation to full load or stop initiation to fuel chop using the indicated load / unload rates.

		Estimated Emissions	
		Specified Natural Gas, WI-37	
		Quantities per Swift Pac	
Parameter		**Startup**	**Shutdown**
Duration	min	30.0	30.0
Load / Unload Rate Used	MW/min	5	2.5
NOx as NO2	lbs	11.2	20.2
CO	lbs	7.5	12.8
VOC	lbs	0.5	0.5

8/28/2006

SCR SYSTEM DATA SHEET

Quote/Job: 4145-4528 End User:
Customer: ESI Project:

LOW CATALYST TEMPERATURE

Item	Units			
		52500	52500	52500
Case		18F	63.3F	114F
Fuel		NG	NG	NG
Reactor Inlet Conditions:				
Flow Rate with Cooling Air, Wet	lb/hr	1,763,434	1,677,498	1,558,537
Flue Gas Temperature (Cooled)	degrees F	729	796	830
O2	Vol %, wet	15.44	15.50	15.45
H2O	Vol %, wet	6.61	7.15	8.41
N2	Vol %, wet	74.69	74.20	73.13
CO2	Vol %, wet	2.36	2.26	2.14
Ar	Vol %, wet	0.89	0.89	0.87
NOx @ 15 % O2	ppmvd	37	37	37
NOx	lb/hr	73.20	66.81	59.10
CO	ppmvd	26	19	19
CO	lb/hr	31.32	20.89	18.48
SOx	ppmvd	0	0	0
SOx	lb/hr	0	0	0
NO Reduction	Percent	93.243243	93.243243	93.243243
CO Reduction	Percent	76.923077	68.421053	68.421053
Dilution Air Required	lb/hr	2633	2633	2633
Dilution Air Required	SCFM	544	544	544
Aqueous Ammonia Consumption	lb/hr	171	156	138
Aqueous Ammonia Consumption	gal/month	15410	14065	12442
Total Mass Injected by SCR	lb/hr	2804	2789	2771
Reactor Outlet Conditions:				
Flue Gas Flow Rate, Wet	lb/hr	1,766,238	1,680,287	1,561,308
Emissions:				
NOx	ppmvd	2.5	2.5	2.5
NOx	lb/hr	4.9	4.5	4.0
CO	ppmvd	6.0	6.0	6.0
CO	lb/hr	7.2	6.6	5.8
SOx	ppmvd	0.0	0.0	0.0
NH3	ppmvd	9.9	9.9	9.9
NH3	lb/hr	7.2656642	6.6	5.9
Required Heater Capacity	kW	120	120	120
Required Heater Size	inches	24	24	24
Aqueous Ammonia Concentration	Percent	19	19	19

PEERLESS SCR SYSTEM DATA SHEET - CONFIDENTIAL
Existing 150 HP

Quote/Job: 4145-4528 End User: Starwood Power
Customer: ESI Project: Midway

HIGH CATALYST TEMPERATURE

Item	Units			
		25000	25000	25000
Case		18F	63.3F	114F
Fuel		NG	NG	NG
Reactor Inlet Conditions:				
Flow Rate with Cooling Air, Wet	lb/hr	1,626,828	1,552,717	1,444,777
Flue Gas Temperature (Cooled)	degrees F	783	849	880
O2	Vol %, wet	14.99	15.07	15.02
H2O	Vol %, wet	7.16	7.71	9.06
N2	Vol %, wet	74.44	73.89	72.75
CO2	Vol %, wet	2.52	2.43	2.30
Ar	Vol %, wet	0.88	0.88	0.87
NOx @ 15 % O2	ppmvd	37	37	37
NOx	lb/hr	73.25	66.81	59.10
CO	ppmvd	26	19	19
CO	lb/hr	31.34	20.89	18.48
SOx	ppmvd	0	0	0
SOx	lb/hr	0	0	0
NO Reduction	Percent	93.24	93.24	93.24
CO Reduction	Percent	76.92	68.42	68.42
Dilution Air Required	lb/hr	2,633	2,633	2,633
Dilution Air Required	SCFM	544	544	544
Aqueous Ammonia Consumption	lb/hr	171	156	138
Aqueous Ammonia Consumption	gal/month	15,420	14,065	12,442
Total Mass Injected by SCR	lb/hr	2,804	2,789	2,771
Reactor Outlet Conditions:				
Flue Gas Flow Rate, Wet	lb/hr	1,629,632	1,555,506	1,447,549
Emissions:				
NOx	ppmvd	2.5	2.5	2.5
NOx	lb/hr	4.9	4.5	4.0
CO	ppmvd	6.0	6.0	6.0
CO	lb/hr	7.2	6.6	5.8
SOx	ppmvd	0.0	0.0	0.0
NH3	ppmvd	9.9	9.9	9.9
NH3	lb/hr	7.27	6.6	5.9
Required Heater Capacity	kW	120	120	120
Required Heater Size	inches	24	24	24
Aqueous Ammonia Concentration	Percent	19	19	19

BASE CASE
Start Up and Shut Down NOx = CalPeak Actual Data
NOx, CO, NH4 per EPC Guarantee
SO2 at .32 gr/100scf
PM10 from P&W

	EPC PPM	2 Units Air Permit lbs/hr	2 Units Startup lbs/cycle	Tons 365 Cycles/yr	Tons 4000 Hours/yr	Less Cycle Time/hours 219	Total Emissions	ERC Offset Tons 1.5 X	PM10 to SO2 Conversion 1.8
NOx (1)	2.5	11.4	6.8	1.24	22.8	1.25	**22.79**	34.19	
VOC	2	2.8	2	0.37	5.6	0.31	5.66	5.66	(4)
CO	6	13.6	40.6	7.41	27.2	1.49	33.12	NR	
PM10 (6)		7.4	4.44	0.81	14.8	0.81	14.80	22.20	40 (5)
SO2		1.13	0.68	0.12	2.27	0.12	2.27	2.27	(4)
NH4	<10								
				Hours for Start Cycle (3		219			

15-Oct-06

Quarterly Allocation of ERC's

	Annual	1st qtr	2nd qtr	3rd qtr	4th qtr	Check lbs	Check tns
Oper. Hours	4000	800	800	1400	1000		
ERC allocation		20%	20%	35%	25%		
ERC Offset lbs							
NOx	68378	13676	13676	23932	17095	68378	34.19
VOC	11317	2263	2263	3961	2829	11317	5.66
PM10	44400	8880	8880	15540	11100	44400	22.20
SO2	4531	906	906	1586	1133	4531	2.27

(1) NOx startup/ shutdown based upon CalPeak data with a 30 minute startup cycle.
(2) PM10 and SO2 startup/shutdown amounts are prorated from the hourly emission rate
(3) The startup/shutdown cycle is from P&W with an 18 minute startup and 18 minute shutdown
(4) The VOC and SO2 emissions are offset on a 1X1 basis

Quarterly Allocation of ERC's SOX as PM10

	Annual	1st qtr	2nd qtr	3rd qtr	4th qtr	Check lbs	Check tns
Oper. Hour	4000	800	800	1400	1000		
ERC allocation		20%	20%	35%	25%		
ERC Offset lbs							
NOx	0	13676	13676	23932	17095	68378	34.19
VOC	11317	2263	2263	3961	2829	11317	5.66
SO2	79920	15984	15984	27972	19980	79920	39.96
SO2	4531	906	906	1586	1133	4531	2.27
Total SO2	84451	16890	16890	29558	21113	84451	42.23

$8/ton
$10/ton
$25.9/ton
$27.5/ton

(1) NOx startup/ shutdown based upon CalPeak data with a 30 minute startup cycle.
(2) PM10 and SO2 startup/shutdown amounts are prorated from the hourly emission rate
(3) The startup/shutdown cycle is from P&W with an 18 minute startup and 18 minute shutdown
(4) The VOC and SO2 emissions are offset on a 1X1 basis
(5) The PM10 is converted to SO2 using a 1.8 factor
(6) PM10 emission rate is lowered to 3.7 to remain below 15 TPY

APPENDIX I

AIR QUALITY DATA

ATTACHMENT D

MODELING PROTOCOL

URS

October 11, 2006

Mr. Keith Golden
Air Quality Specialist
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Subject: Modeling Protocol for the Starwood Midway Project
Fresno County, California
URS Project No. 27656130.00210

Dear Keith:

Please find enclosed two copies of the air quality modeling protocol for the Starwood Midway Power, which is being proposed by Starwood Power – Midway, LLC. The new facility will be located about 50 miles west of the city of Fresno, and will have a normal generating capacity of about 120 MW, using two (2) FT8-3 Swift Pac generating units in a simple cycle configuration.

It is my understanding that the Energy Commission has not yet designated a Project Manager for the Midway project, so in the interest of expediting CEC's review, I am sending this protocol directly to you. Please distribute it among your colleagues as appropriate. Note that we are also soliciting comments at the same time from the San Joaquin Valley Air Pollution Control District

The Application for Certification for this project will be submitted by early November, so we will appreciate receiving your review comments as soon as possible to allow us to incorporate any required changes. However, this protocol does address all of the points that have been raised by CEC in its recent reviews of protocols URS has submitted for other power projects.

Thank you in advance for your review of this protocol. Do not hesitate to contact me directly with any questions or concerns regarding any aspect of our intended modeling methodology.

Sincerely,

URS CORPORATION

John Lague
Senior Air Quality Consultant

JL:ml

Enclosures

cc: Rich Weiss
David Marx

URS Corporation
1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108
Tel: 619.294.9400
Fax: 619.293.7920

October 11, 2006

Mr. Errol Villegas
Senior Permitting Engineer
San Joaquin Valley Air Pollution Control District
1990 E. Gettysburg Ave
Fresno, CA 93726

Subject: Modeling Protocol for the Starwood Midway Project
Fresno County, California
URS Project No. 27656130.00210

Dear Mr. Villegas:

Please find enclosed two copies of the air quality modeling protocol for the Starwood Midway Power, which is being proposed by Starwood Power – Midway, LLC. The new facility will be located about 50 miles west of the city of Fresno, and will have a normal generating capacity of about 120 MW, using two (2) FT8-3 Swift Pac generating units in a simple cycle configuration.

The Application for Certification for this project will be submitted to the California Energy Commission (CEC) by early November, and the application for Authority to Construct will be submitted at about the same time. Accordingly, we will appreciate receiving your review comments as soon as possible to allow us to incorporate any required changes. Note that we are also soliciting comments at the same time from the air quality staff at CEC. Please distribute the protocol among your colleagues as appropriate.

Thank you in advance for your review of the protocol. Do not hesitate to contact me directly with any questions or concerns regarding any aspect of our intended modeling methodology.

Sincerely,

URS CORPORATION

John Lague
Senior Air Quality Consultant

JL:ml

Enclosures

cc: Rich Weiss
David Marx

Air Quality Modeling Protocol for the Starwood Midway Power Project
Fresno County, California

Prepared For:

**San Joaquin Valley Air Pollution Control District and
California Energy Commission**

Prepared on behalf **of Midway, LLC**
By:

**URS Corporation
1615 Murray Canyon Road
San Diego, California 92108**

AIR QUALITY MODELING PROTOCOL FOR THE STARWOOD MIDWAY POWER PROJECT FRESNO COUNTY, CALIFORNIA

Prepared for

San Joaquin Valley Air Pollution Control District
and
California Energy Commission

October 10, 2006

URS

1615 Murray Canyon Road, Suite 1000
San Diego, CA 92108-4314
619.294.9400 Fax: 619.293.7920

TABLE OF CONTENTS

Tables

Figures

Appendices

$\mu g/m^3$	Micrograms per cubic meter
AAQS	Ambient Air Quality Standards
AERMOD	American Meteorological Society/Environmental Protection Agency regulatory model
AFC	Application for certification
AQRV	Air quality related values
ARB	Air Resources Board
ATC	Authority to construct
BACT	Best available control technology
BPIP	Building profile input program
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CEC	California Energy Commission
CO	Carbon monoxide
CTG	Combustion turbine generator
°C	degrees Celsius
DOC	Determination of compliance
g/s	Gram per second
HARP	Hotspots analysis and reporting program
HRA	Health risk assessment
ISCST3	Industrial Source Complex Short Term 3rd version
km	Kilometers
LORS	Laws, ordinances, regulations, and standards
MEI	Maximally exposed individual
mm	Millimeter
MW	Megawatt
NAAQS	National Ambient Air Quality Standards
NNSR	Non-attainment New Source Review
NO_2	Nitrogen dioxide

NO_x	Nitrogen oxides
NSR	New source review
O_3	Ozone
OEHHA	Office of Environmental Health Hazard Assessment
OLM	Ozone limiting method
Pb	Lead
$PM_{2.5}$	Particulate matter less than 2.5 μm in diameter
PM_{10}	Particulate matter less than 10 μm in diameter
ppm	Parts per million
PSD	Prevention of significant deterioration
ROC	Reactive organic compound
SCR	Selective catalytic reduction
SJVAPCD	San Joaquin Valley Air Pollution Control District
SO_2	Sulfur dioxide
TAC	Toxic air contaminants
T-BACT	Best available control technology for toxics
TPY	Tons per year
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
ZOI	Zone of impact

SECTION 1 INTRODUCTION

1.1 BACKGROUND

The Starwood Power – Midway, LLC Peaking Project (Midway) is proposing to build and operate a new approximately 120 megawatt (MW) natural gas-fired simple cycle peaking plant which includes two (2) Pratt &Whitney FT8-3 SwiftPac natural gas fired combustion turbine generators (CTG). Each Swift Pac Unit has two (2) FT8-3 combustion gas turbines that drive opposite ends of a single electric generator. The Midway site is in western Fresno County in the San Joaquin Valley approximately 50 miles west of the city of Fresno and approximately 2 miles east of Interstate 5 (I-5) (Figure 1). The project is subject to the site licensing requirements of the California Energy Commission (CEC). The CEC will coordinate its independent air quality evaluations with the San Joaquin Valley Air Pollution Control District (SJVAPCD) through the Determination of Compliance (DOC) process. Annual emissions of all criteria pollutants will be below the emission level thresholds specified in SJVAPCD Regulations Rule 4201, 4301, and 4703. Also, the annual emissions of all criteria pollutants will be below the emission level thresholds for a Major Source according to the United States Environmental Protection Agency's (USEPA) Prevention of Significant Deterioration (PSD) regulations. Specifically, the Midway Facility will emit less than 250 tons per year (tpy) of nitrogen oxides (NO_x), carbon monoxide (CO), reactive organic compounds (ROC), sulfur dioxide (SO_2), particle matters (PM_{10}), less than 0.6 tons per year of lead (Pb), and less than 7.0 tons per year of sulfuric acid mist. These determinations have been made for the applicant's proposed operating limits of 4,000 hours per year per turbine which includes up to 365 startup/shutdown cycles per turbine per year.

Even though Federal PSD regulations will not apply to the Midway facility, the air dispersion modeling for this project will be conducted in conformance with PSD requirements in many ways. For example, worst-case predicted impacts will be compared with the applicable monitoring exemption limits to demonstrate that the project will be exempt from the requirements relating to pre-construction ambient air quality monitoring. The PSD regulations apply only to those pollutants for which the project area is in attainment of the National Ambient Air Quality Standards (NAAQS). State and local new source review (NSR) and non-attainment NSR (NNSR) regulations potentially apply to all criteria pollutants, depending on the quantity of pollutants emitted. The area around the Midway Facility is classified as attainment with respect to the NAAQS for nitrogen dioxide (NO_2), CO, and SO_2, and non-attainment for ozone (O_3), particulate matter less than 2.5 and 10 micrometers in diameter ($PM_{2.5}$ and PM_{10}, respectively). With respect to the California Ambient Air Quality Standards (CAAQS), the area around the Midway facility is classified as attainment for NO_2, CO, sulfates, Pb, hydrogen sulfide, and SO_2, and non-attainment for O_3, PM_{10}, and $PM_{2.5}$. NO_2 and SO_2 are regulated as PM_{10} precursors, and NO_2 and ROC as O_3 precursors. Project emissions of non-attainment pollutants and their precursors will be offset to satisfy state and local NNSR regulations.

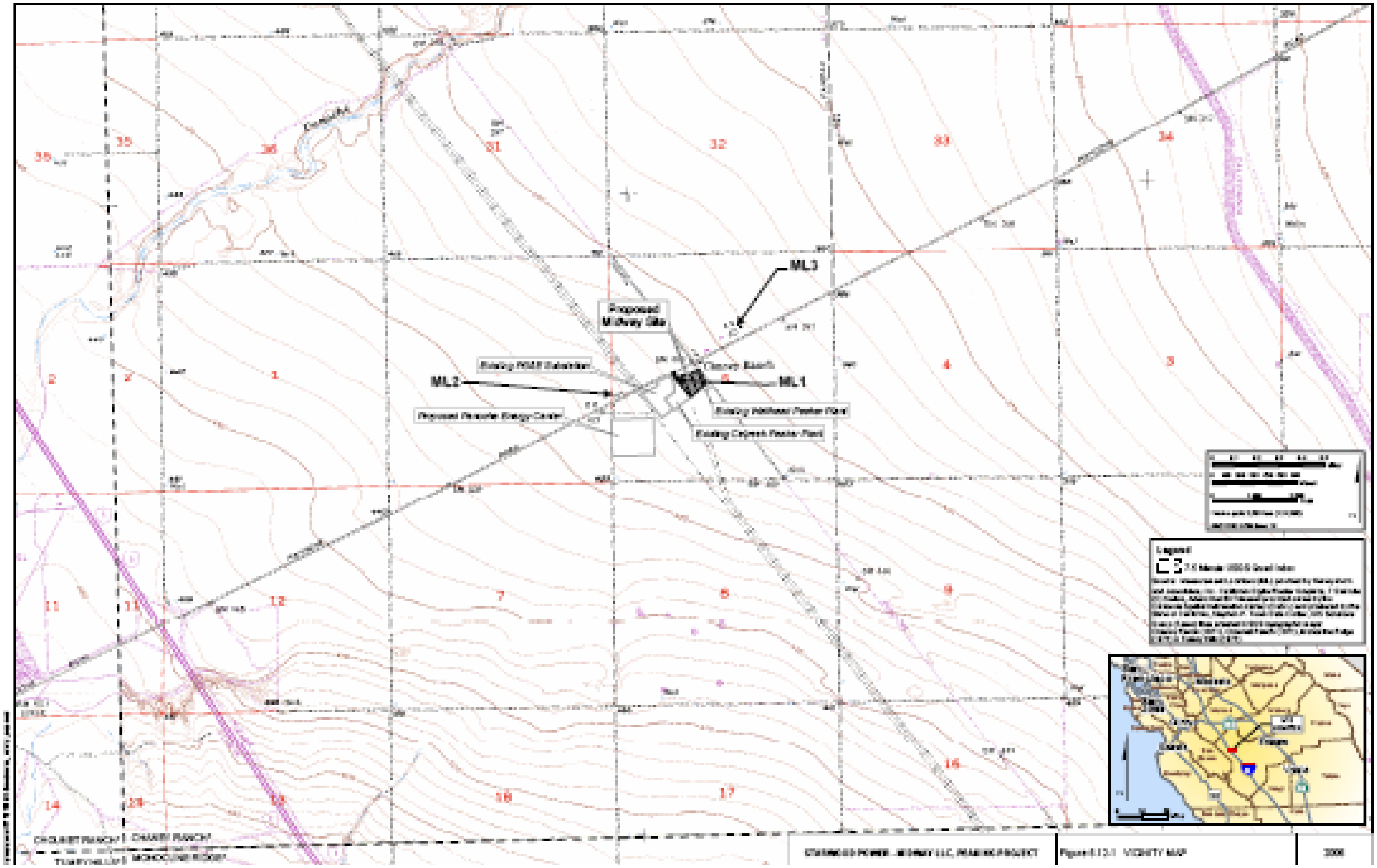
Note that SJVAPCD has determined that the proposed Midway project will constitute a minor modification to an existing minor facility, because of some common ownership with the adjacent CalPeak Panoche power plant. The modeling analyses described in this Protocol has been designed to conform to these circumstances.

1.2 PURPOSE

The CEC and SJVAPCD both require the use of atmospheric dispersion modeling to demonstrate that a new power generation facility will comply with applicable air quality standards and to determine the potential impacts on human health from toxic air contaminants. In addition, CEC power plant siting regulations require that the cumulative impacts of the proposed project and reasonably foreseeable projects within 10 km of the project site be assessed via modeling.

This document summarizes the procedures that are proposed for the air dispersion modeling for project certification and permitting. Modeling of both operation and construction emissions due to the proposed power plant will be performed in accordance with CEC guidance (CEC, 1997). This protocol is being submitted to the CEC and SJVAPCD for their review and comment prior to completion of the applicable permit applications. The proposed model selection and modeling approach is based on review of applicable regulations and agency guidance documents, and discussions with agency staff.

Figure 1,
General Vicinity – Starwood Midway Project



SECTION 2 PROJECT DESCRIPTION

2.1 PROJECT LOCATION

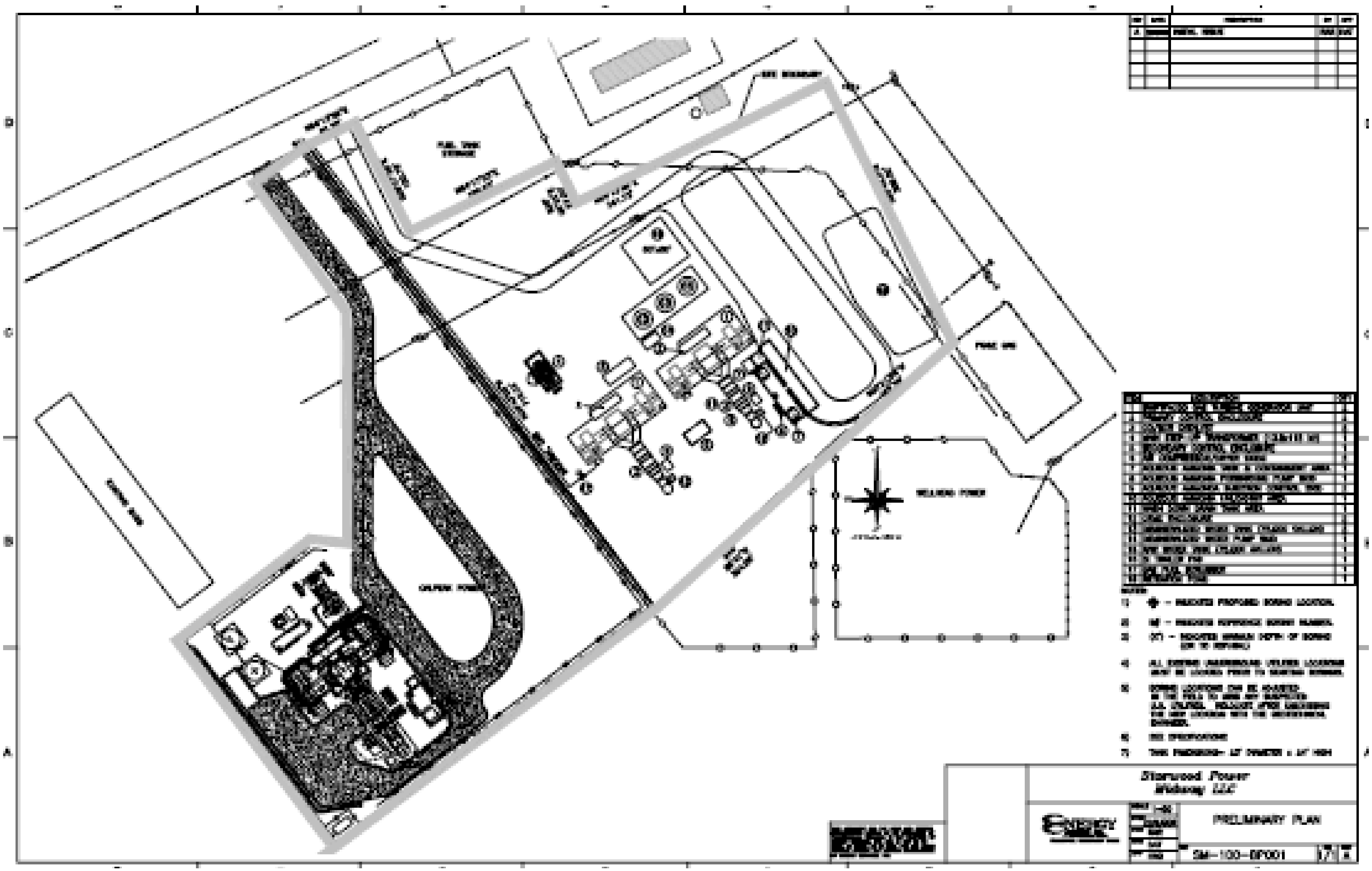
The Midway site will be located in the unincorporated area of western Fresno County approximately 50 miles west of the city of Fresno. The 5.6-acre project site is immediately adjacent the existing PG&E substation. West Panoche Road lies just north of the site (see Figure 1). The nearest intersections are W. Panoche Road and S. Fairfax Ave. approximately one mile to the northeast and W. Panoche Rd. and I-5 approximately 2 miles to the southwest. The project site is within approximately two miles (3.2 km) of complex terrain (i.e., with elevation exceeding proposed stack heights) and is surrounded by agricultural land.

2.2 DESCRIPTION OF THE PROPOSED SOURCES

The proposed project is the construction and operation of two (2) FT8-3 SwiftPac CTG Units, associated transformers, water tanks, and other ancillary facilities. Each FT8-3 CTG Unit incorporates two turbines. Thus, there will be a total of four turbines as part of the proposed project. The gas turbines will be fired exclusively on natural gas and will be equipped with water injection and selective catalytic reduction (SCR) for the control of NO_x emissions and an oxidation catalyst for control of CO emissions. The four CTGs will operate in simple cycle mode and will have two exhaust stacks with a height of 50 feet and a diameter of 15 feet. Aqueous ammonia will be used in the SCR system for control of turbine NO_x emissions. There are no other fuel burning equipment associated with the Midway project.

SJVAPCD has determined that the Midway project will be permitted as a modification to the existing CalPeak Panoche project. Figure 2 shows the proposed locations of the new generating units relative to the existing facility.

Figure 2
Facility Plot Plan



SECTION 3 REGULATORY SETTING

3.1 CALIFORNIA ENERGY COMMISSION REQUIREMENTS

For projects with electrical power generation capacity greater than 50 MW, CEC requires that applicants prepare a comprehensive Application for Certification (AFC) document addressing the proposed projects environmental and engineering features. An AFC must include the following air quality information (CEC, 1997):

- A description of the project, including project emissions, fuel type(s), control technologies and stack characteristics;
- The basis for all emission estimates and/or calculations;
- An analysis of Best Available Control Technology (BACT) according to SJVAPCD Rules;
- Existing baseline air quality data for all regulated pollutants;
- Existing meteorological data, including temperature, wind speed and direction and mixing height;
- A listing of applicable laws, ordinances, regulations and standards (LORS) and a determination of compliance with all applicable LORS;
- An emissions offsets strategy;
- An air quality impact assessment (i.e., national and state ambient air quality standards [AAQS] and PSD review) and protocol for the assessment of cumulative impacts of the proposed project along with permitted and under construction projects within a 10 km radius; and
- An analysis of human exposure to air toxics (i.e., health risk assessment [HRA]).

For the Midway Project, the air quality impact assessment, the cumulative impacts assessment, and the HRA will be performed using dispersion models.

3.2 SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT REQUIREMENTS

The SJVAPCD has promulgated NSR requirements under Rule 2201. In general, all equipment with the potential to emit air pollutants is subject to NSR requirements. NSR has four major requirements that potentially apply to new sources:

- Installation of BACT;
- Ambient air quality impact modeling to demonstrate compliance with NAAQS and CAAQS;
- Emission offsets; and
- Certification of statewide compliance with air quality requirements.

Assembly Bill 2588, California Air Toxics Hot Spots Program (and SJVAPCD Rule 3110) allows a predicted incremental cancer risk from toxic air contaminants (TAC) at any receptor up to ten in one million, prior to public notification, if best available control technology for toxics (T-BACT) is implemented. A TAC analysis should include TAC emission estimates and a modeling analysis to identify the Zone of Impact (ZOI) and the Maximally Exposed Individual (MEI). The ZOI encompasses the area within which the incremental carcinogenic risk (due to the inhalation pathway only) equals or exceeds one in one million (if any).

3.3 U.S. ENVIRONMENTAL PROTECTION AGENCY REQUIREMENTS

USEPA has promulgated PSD regulations applicable to Major Sources in Fresno County. The Midway facility will not be a Major Source for any criteria pollutants. Many of the PSD requirements are the same as the AFC and NSR requirements described above (e.g., project description, BACT, ambient air quality standards analysis); however, PSD requires the following additional analyses:

- A PSD increment (consumption) analysis;
- An analysis of air quality related values (AQRV) to ensure the protection of visibility of federal Class I wilderness areas within 100 km of the proposed project;
- An evaluation of potential impacts on soils and vegetation of commercial and recreational value; and
- An evaluation of potential growth-inducing impacts.

However, for the Midway facility, these additional PSD requirements will not apply, because the new Midway Facility will not be a Major Source.

SECTION 4 MODELS PROPOSED AND MODELING TECHNIQUES

This section describes the dispersion models and modeling techniques to be used in performing the air quality analysis for the Midway facility. The objectives of the modeling are to demonstrate that air emissions from the Midway facility will not cause or contribute to a PSD increment exceedance or an ambient air quality standard violation, and will not cause a significant health risk.

In November 2005, the USEPA officially recognized the American Meteorological Society/ Environmental Protection Agency Regulatory Model (AERMOD) as the preferred dispersion model for regulatory applications, replacing the Industrial Source Complex Short Term 3 (ISCST3) model. USEPA allowed a one-year "grace period" commencing November 9, 2005 during which the use of either model is acceptable, depending on the preference of the local air quality jurisdiction. When contacted on this point, the SJVAPCD stated that either ISCST3 or AERMOD could be used for the Midway facility air quality modeling analyses. The use of ISCST3 remains acceptable until the District assembles meteorological input data sets suitable for application with AERMOD, which they hope to accomplish before the one-year grace period has expired. Under these circumstances, we have elected to use ISCST3 for the licensing/permitting analyses associated with the Midway facility.

4.1 SCREENING MODELING

Previous power plant modeling analyses submitted to CEC and SJVAPCD have included screening modeling for the proposed new turbines alone to determine the stack parameters and operating loads that correspond to maximum ground-level impacts from the most important project sources, i.e., the combustion turbine generators. However the configuration of the Starwood project makes such screening modeling unnecessary. Instead, several alternate emissions scenarios will be evaluated by means of refined modeling as described in the following subsections. The only sources for this project will be the two SwiftPac, i.e., the project will include no cooling tower, emergency generator or emergency firewater pump

4.2 REFINED MODELING

The purpose of the refined modeling analysis is to demonstrate that air emissions from the Midway facility will not cause or contribute to an ambient air quality violation; and will not cause a significant health risk impact. The most recent version (02035) of the ISCST3 model will be used for the refined modeling of criteria pollutants. The regulatory default option will be selected. The short-term model version will be used for modeling concentrations of pollutants having short-term (e.g., one to 24 hour) ambient standards. Modeling for pollutants having both short-term and annual standards (i.e., PM10, SO2 and NO2), will be conducted using ISCST3 with the PERIOD option to predict impacts on the annual standard. Specific modeling techniques for PSD, AAQS, and HRA analyses are discussed below.

The AFC application for the Midway project will include an analysis of the land use adjacent to the project. This analysis will be conducted in accordance with Section 8.2.8 of the Guideline on Air Quality Models (EPA-450/2-78-027R and Auer [1978]).

Based on the Auer land use procedure, more than 90 percent of the area within a 10 km radius of the Midway could be classified as rural. Since the Auer classification scheme requires more than the 50 percent of the area within the 10 km radius around a source to be non-rural for an urban classification, the rural mode will be used in the ISCST3 modeling analyses.

The following ISCST3 regulatory default settings will also be used:

- Wind profile exponents of 0.7, 0.7, 0.10, 0.15, 0.35, and 0.35;
- Final plume rise;
- Stack tip downwash effects included; and
- Buoyancy-induced dispersion option used.

4.2.1 PSD Increment Analysis

As stated earlier in this protocol, a PSD increment analysis will not be required because the Midway facility will not be a major source as defined in the PSD regulations. However, although not required, the maximum predicted incremental criteria pollutant concentrations from the Midway facility sources will be compared with the PSD significant impact level (see Table 4-1) for each pollutant as a reference point.

Table 4-1
Relevant Ambient Air Quality Standards and Significance Levels

Pollutant	Averaging Time	CAAQS (a,b)	NAAQS (b,c)	Ambient Impact Significance Levels (μg/m³)	PSD Significant Emission Rates (TPY)	PSD Increments (μg/m³)	
						Class I	Class II
CO	8-hour	9.0 ppm (10,000 μg/m³)	9.0 ppm (10,000 μg/m³)	500	100		
	1-hour	20 ppm (23,000 μg/m³)	35 ppm (40,000 μg/m³)	2,000			
NO_2 [(d)]	Annual		0.053 ppm (100 μg/m³)	1	100	2.5	25
	1-hour	0.25 ppm (470 μg/m³)					
SO_2	Annual		0.03 ppm (80 μg/m³)	1	100	2	20
	24-hour	0.04 ppm[(e)] (105 μg/m³)	0.14 ppm (365 μg/m³)	5		5	91
	3-hour		0.5 ppm (1,300 μg/m³)	25		25	512
	1-hour	0.25 ppm (655 μg/m³)					
PM_{10}	Annual	20 μg/m³	50 μg/m³	1	100	4	17
	24-hour	50 μg/m³	150 μg/m³	5		8	30
$PM_{2.5}$	Annual	12 μg/m³	15 μg/m³				
	24-hour		65 μg/m³				
O_3	8-hour	0.07 ppm (137 μg/m³)	0.08 ppm (157 μg/m³)	See footnote[(f)]	100 (of ROCs)		
	1-hour	0.09 ppm (180 μg/m³)	See footnote[(g)]				

a. California standards for ozone (as volatile organic compounds), carbon monoxide, sulfur dioxide (1-hour), nitrogen dioxide, and PM_{10}, are values that are not to be exceeded. The visibility standard is not to be equaled or exceeded.
b. Concentrations are expressed first in units in which they were promulgated. Equivalent units are given in parentheses and based on a reference temperature of 25° C and a reference pressure of 760 mm of mercury. All measurements of air quality area to be corrected to a reference temperature of 25° C and a reference pressure of 760 mm of mercury (1,013.2 millibar).
c. National standards, other than those for ozone and based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
d. Nitrogen dioxide (NO_2) is the compound regulated as a criteria pollutant; however, emissions are usually based on the sum of all oxides of nitrogen (NO_x).
e. At locations where the state standards for ozone and/or PM_{10} are violated. National standards apply elsewhere.
f. Modeling is required for any net increase of 100 tons per year or more of ROCs subject to PSD.
g. New federal 8-hour ozone and fine particulate matter ($PM_{2.5}$) standards were promulgated by USEPA on July 18, 1997. The federal 1-hour ozone standard was revoked by USEPA on June 15, 2005.

Blanks	=	Not applicable	NAAQS	=	National Ambient Air Quality Standard
ºC	=	degrees Centigrade	ppm	=	parts per million by volume, or micromoles of pollutant per mole of gas
CAAQS	=	California Ambient Air Quality Standard	TPY	=	ton per year
mm	=	millimeters	μg/m³	=	micrograms per cubic meter

4.2.2 Ambient Air Quality Standard Analysis

The purpose of the ambient air quality standard analysis is to determine whether the Midway facility will cause or contribute to an ambient air quality violation. The project will not be considered to cause or contribute to an ambient air quality violation unless impacts from the project itself combined with the background concentration exceed the AAQS, or the project has a significant impact at the same location and time as a predicted ambient air quality violation. The following approach is proposed for performing the ambient air quality analysis:

1. The receptor grid and spacing described in Section 4.5 will be used for the analysis.
2. Short-term and annual AAQS modeling will be performed using ISCST3. Annual AAQS modeling will be performed using ISCST3 with the PERIOD option. Both short-term and annual analyses will be run using sequential hourly meteorological data for five years. Maximum impact equals modeled impact plus background. For Midway modeling, the highest modeled impact for any given year will be used.

   For CO modeling, the PLOTFILE output option in ISCST3 will be invoked to save the maximum impact that, when added to background, exceeds the AAQS. If 1-hour and 8-hour concentrations do not exceed the AAQS, then compliance is demonstrated and no further modeling is necessary for CO.

   For NO_2 modeling, the PLOTFILE output option in ISCST3 will be invoked to save the maximum impact that exceeds the AAQS (minus background). Initially, the modeling will assume full conversion of NO_x to NO_2. Should it be required, NO_2 estimates will be reduced using the USEPA ozone limiting method (OLM) (for either hourly or annual impacts). If 1-hour and annual concentrations do not exceed the applicable ambient air quality standard, then compliance is demonstrated and no further modeling is necessary for NO_2.

   For SO_2 modeling, the PLOTFILE output option in ISCST3 will be invoked to save the maximum impact that, when added to background exceeds the AAQS. If 1-hour, 3-hour, and 24-hour concentrations do not exceed the AAQS, then compliance is demonstrated and no further modeling is necessary for SO_2.

   For PM_{10} modeling, the maximum of the five one-year average PM_{10} concentrations will be reported. If concentrations do not exceed the AAQS, then compliance is demonstrated and no further modeling is necessary for PM_{10}.

4.2.3 Health Risk Assessment Analysis

The CEC and SJVAPCD require a health risk assessment to evaluate TAC emissions from the operation of the project. Contaminants emitted by the project with potential carcinogenic, chronic, and acute effects will be considered. This health risk assessment will be performed following the Office of Environmental Health Hazard Assessment (OEHHA), Air Toxics Hot Spots Program Risk Assessment Guidelines (OEHHA, 2003). As recommended by this guideline, the California Air Resources Board (CARB) Hotspots Analysis and Reporting Program (HARP) (CARB, 2005) will be used to perform a refined health risk assessment for the project. HARP includes two modules: a dispersion module and a risk module. The HARP dispersion module incorporates the USEPA ISCST3 air dispersion model, and the HARP risk module implements the latest Risk Assessment Guidelines developed by OEHHA.

First, ground-level concentrations from the Midway facility emissions will be estimated using the ISCST3 dispersion model within HARP. The HARP modeling analysis will be consistent with, and use similar appropriate parameters, as the modeling approach discussed above for the AAQS analyses using ISCST3. Based on the impacts determined by the ISCST3 model, the HARP model will be used to estimate the corresponding health risks. The results obtained for the year(s) of meteorological data resulting in the highest 1-hour and annual impacts as determined above will be used and receptors will be placed at 25 meter spacing around the Midway facility fenceline and 500 meter spacing outside of the fence out to 10 km. All receptors that HARP creates that are inside the fenceline will be excluded. HARP will also include the census receptors out to 10 km, and additional receptors will be placed at all sensitive locations (e.g., schools, hospitals, etc.) out to a distance of 1 mile. The HRA performed by means of the HARP model will follow the following steps:

- Define the location of the maximum exposed individual (MEI) (i.e., the location where the highest carcinogenic risk may occur);
- Define the locations of the maximum chronic non-carcinogenic adverse health effects and the maximum acute adverse health effects; and
- Calculate concentrations and adverse health effects at locations of maximum impact for each pollutant.

The HARP model will be performed for the inhalation pathway for diesel particulate and for all applicable uptake pathways for all other TACs. A discussion of the surrounding land use, sensitive receptors and local meteorology will be provided in the AFC.

4.2.4 Air Quality Related Values and Visibility Analysis

A PSD analysis of AQRV and visibility will not be required, because the Midway Project will not be a major source and SJVAPCD rules do not otherwise require such an analysis.

4.3 MODELING EMISSIONS INVENTORY

4.3.1 Project Sources

Operational emissions from the project will be dominated by the combustion turbine-generators. Table 4-2 summarizes preliminary annual (combined) emission estimates for the turbines. Conceptual plant design includes SCR for NO_x and oxidation catalysts for CO that will comply with recent BACT determinations for similar projects in California and elsewhere. Emissions of SO_2 and PM_{10} will be low, owing to the exclusive use of interstate pipeline quality natural gas as fuel for the gas turbines.

Table 4-2
Preliminary Estimated Emissions for Midway Combustion Turbine Generators
(tpy)

NO_x	CO	SO_2	ROC	PM_{10}
22.79	30.49	2.27	5.48	16.80

Each SwiftPac generating unit consists of two simple cycle gas turbines, and these units are the only emissions sources associated with the operational project. Each turbine will be operated only at 100% load, such that evaluation of partial load conditions for individual turbines is not meaningful. However, the exhaust flow rate from either SwiftPac stack will obviously be lower when only one turbine is operational, so it may be possible to produce higher ground-level concentrations (due to lower plume rise) when only one turbine is in use.

The only realistic possible modes of operation will be:

1. One turbine of one SwiftPac operating at 100% capacity **- 1 turbine operating** (2 combinations)
2. Two turbines of one SwiftPac operating at 100% capacity **- 2 turbines operating** (2 combinations)
3. Two turbines for one Swift**P**ac operating at 100% capacity and one turbine of the second Swift**P**ac operating at full capacity **- -3 turbines operating** (2 combinations)
4. Two turbines for each of the two SwiftPacs operating at 100% capacity **- 4 turbines operating**

Theoretically, a situation could also occur in which one turbine from each of the SwiftPacs operates at the same time, but Starwood has stated that this scenario would never occur in practice, since it would be more fuel efficient to operate two turbines of the same SwiftPac whenever only the output of two turbines is required. In any case, the impacts for that situation obviously could not be higher than those for Scenario 3 listed above (two turbines plus one turbine). Accordingly, the case with one turbine operating for each SwiftPac will not be modeled.

It is also obvious that modeling Scenario 1 above could not result in higher pollutant concentrations than Scenario 3, so only the latter case will be retained for modeling. Similarly, the cases with two turbines operating at just one SwiftPac (Scenario 2) could not produce higher impacts than those for either both SwiftPacs operating with two turbines each (Scenario 4) or a combination with two turbines for one SwiftPac and one turbine for a second SwiftPac (Scenario 3). Accordingly Scenario 2 was also eliminated from the modeling analysis.

Based on this reasoning, only three equipment operating scenarios will be modeled to ensure that maximum impacts from the proposed project will be addressed. These include:

1. Two operational turbines for one SwiftPac and one operational turbine for the second SwiftPac (2 combinations depending on which SwiftPac is assumed to have two operating turbines)

2. Two operational turbines each for both SwiftPacs

Thus the refined modeling analysis will include separate simulations with each of these three emission source configurations along with the full meteorological input data set to ensure that the maximum impacts will be reported. The lowest exhaust gas flow rates indicated by Pratt &Whitney over the full expected range of ambient temperature conditions at the Midway site will be used to model a SwiftPac with either one or two turbines operating as appropriate.

Startup and shutdown scenarios will be addressed, in addition to the normal operations, as will turbine commissioning emissions. The modeling emission inventory for the proposed facility will include the maximum emission rate for each source for each appropriate averaging time. The modeling analyses conducted for the AFC, DOC, and authority to construct (ATC) permit applications will be based on the refined emissions estimates.

Temporary construction emissions will result from heavy equipment exhaust (primarily NO_x emissions and diesel particulate emissions) and fugitive dust (PM_{10}) from earthmoving activities and vehicle traffic on paved and unpaved surfaces. Per the recommendation of SJVAPCD staff, construction emissions will be estimated by means of the URBEMIS2002 model with project-specific input information on the expected construction schedule, equipment fleet, and areas to be graded. The model inputs will also account for the effects of implementing control measures for controlling fugitive dust emissions during construction. The resulting emissions estimates will be modeled using the same receptor grids and meteorological inputs used for the modeling of project operations. The construction site, parking area, and lay-down area will be modeled as area or volume sources. To the extent possible, the emissions scenarios selected for modeling will reflect a reasonably realistic worst-case month for construction activities and fugitive dust generation. Ultra-low sulfur diesel fuel will be utilized in any emission calculations for construction equipment used at the Midway site.

Toxic air contaminants, or TAC, will also be emitted from the operational Midway project due to combustion of natural gas and diesel fuels. However, only small quantities of TACs will be emitted, primarily, benzene, formaldehyde, and polycyclic aromatic hydrocarbons, because only natural gas will be used as fuel for the CTGs. Turbine emission estimates for TAC will be based on emission factors and/or speciation profiles for particulate and organic compounds available from CARB and/or vendor data, if available.

4.3.2 Cumulative Impact Analysis Using Off-Property Sources

According to a memorandum from SJVAPCD on Sep. 6th, 2006, the Midway Facility will be considered as a minor modification to the existing CalPeak Panoche power plant. A cumulative modeling analysis will be performed to evaluate the combined impact of the Midway facility with those of the existing CalPeak and Wellhead power plants. The cumulative modeling analysis will also include the contribution of the EIF Panoche Energy Center, the application for which is currently being processed by CEC and SJVAPCD.

A request has been made to SJVAPCD asking for a list of all existing and planned sources located within ten kilometers of the proposed Midway facility. When received, this list will be forwarded to CEC for review. Based on this information, and the CEC response, additional sources may be included in the cumulative source modeling analysis.

4.4 BUILDING WAKE EFFECTS

The effect of building wakes (i.e., downwash) upon the stack plumes of emission sources at the Midway facility will be evaluated in accordance with USEPA guidance (USEPA, 1985). Direction-specific building data will be generated for stacks below good engineering practice (GEP) stack height using the most recent version of USEPA Building Parameter Input Program – Prime (BPIP-Prime). Appropriate information will be provided in the AFC and other permit applications that describe the input assumptions and output results from the BPIP-Prime model. The ISCST3 model considers direction-specific downwash using both the Huber-Snyder and Schulman-Scire algorithms as evaluated in the BPIP-Prime program.

4.5 RECEPTOR GRID

The receptor grids that will be used in the ISCST3 modeling analyses described in this protocol will be as follows:

- 25-meter spacing along the property line and extending from the property line out to 1,000 meters beyond the property line;
- 100-meter spacing from 1 km to 5 km of project sources; and
- 250-meter spacing within 5 km to 10 km of project sources.
- Additional discrete receptors at sensitive receptor locations within these modeling grids.

If a maximum predicted concentration for a particular pollutant and averaging time is located within the portion of the receptor grid with either 100-m or 250-m spacing, a supplemental dense receptor grid will be placed around the original maximum concentration point and the model will be rerun. The dense grid will use 25-meter spacing and will extend 500 meters in all directions from the original point of maximum concentration.

For the HRA modeling, receptors will be placed around the property line with 25 meter spacing, and 500 meter spacing will be used outside of the fenceline out to 10 km. All receptors that HARP creates that are inside the fence will be excluded. HARP will also include the census receptors out to 10 km. These census receptors will include the populated areas near the proposed Midway facility location. Discrete receptors will also be placed at all sensitive locations (e.g., schools, hospitals, etc.) out to 1 mile.

A detailed project map and a 7 ½- minute U.S Geological Survey (USGS) map will be provided in the AFC. Actual Universal Transverse Mercator (UTM) coordinates will be used. The CAAQS and NAAQS apply to all locations offsite of the applicant's facility, i.e. where public access is not under the control of the applicant. The CAAQS and NAAQS are not evaluated on the property controlled by the applicant. In other words, the air within a facility's property is not considered ambient air relative to that facility's emissions.

4.6 METEOROLOGICAL AND AIR QUALITY DATA

4.6.1 Meteorological Data

Meteorological data suitable for direct input to ISCST3 were obtained from the SJVAPCD for the Fresno Yosemite International Airport meteorological station which is located, in the City of Fresno approximately 48 miles east of the Midway facility site. The five years of meteorological data to be used in modeling analysis were obtained from the SJVAPCD website and include hourly surface data from 1987 through 1991 and concurrent upper air sounding data from Oakland, California. In this data set missing data have been replaced by SJVAPCD following USEPA approved data substitution techniques.

The meteorological data recorded at Fresno Yosemite International Airport are acceptable for use at Midway facility for two reasons, proximity and terrain similarity. The terrain immediately surrounding the Project site can be categorized as flat, or gradually sloping irrigated farm lands, with very little inhabited lands. The terrain around the Fresno Yosemite International Airport is also relatively flat and the area outside the urban area is flat irrigated farm lands. Thus the land use and the far field significant terrain features are similar. Additionally, there are no significant terrain features separating the Fresno County/Yosemite Airport from the Midway facility site that would cause differences in wind or temperature conditions in these respective areas. Therefore the 5 years of meteorological data selected from the Fresno County/Yosemite Airport were determined to be representative for purposes of evaluating the Project's air quality impacts. The Fresno County Airport is the closest full-time meteorological recording station to the Midway facility site, and thus meteorological conditions at the sites will be very similar.

The meteorological data used in this analysis were determined to be reasonably representative of conditions at the Project site by the modeling staff of the SJVAPCD who recommended this data set to the project team (SJVUAPCD, 2006) The Oakland upper air data monitoring stations is located approximately 110 miles northwest of Midway facility site. This is the closest National Weather Service upper air station and is considered by SJVAPCD to be the most representative data available for use in modeling analyses for sources throughout central and northern California.

Wind roses for each season of each year are provided as Appendix A to this protocol document.

4.6.2 Air Quality Monitoring Data

Available SJVAPCD/CARB air quality data from 2001 through 2005 will be used to determine baseline air pollutant concentrations. Data from Fresno First Street and Fresno Fremont School monitoring stations will be evaluated as potentially representative of the proposed project site conditions.

The Fresno First Street monitoring station records lead, CO, NO_2, PM_{10}, $PM_{2.5}$, and O_3. The Fresno First Street monitoring station is located approximately 46 miles to the east of Midway facility site. The Fresno First Street station is the closest station that monitors all the criteria pollutants, except SO_2. The Fresno – Fremont School station is the closest station that monitors ambient $SO_{2.}$ To the extent that monitoring data from the Fresno stations have been used here to characterize conditions at the Project Site, this practice would almost certainly overestimate pollutant levels at the Midway facility site because of the much lower population density and level of development of the Midway facility area compared with the locations of these urban monitoring stations.

The modeled maximum incremental impacts from the proposed Midway facility site for all pollutants emitted in significant amounts will be compared with the corresponding PSD *de minimis* monitoring exemption levels. If the modeled maximum impacts exceed the *de minimis* monitoring exemption levels for a pollutant or pollutants, the AFC will include an analysis supporting the representativeness and use of the data from the selected air monitoring station in lieu of the need for pre-construction monitoring for that pollutant. The data collected at the air monitoring stations identified in the protocol will be used to represent the background air quality when performing the AAQS analyses. The AFC will include an analysis supporting the representativeness and use of the data from the air monitoring station for AAQS evaluations. The most recent five years of air quality monitoring data will be provided (2001-2005) to ensure that recent air quality trends in the Fresno area are captured in the baseline data. The highest reported concentration that has occurred within the last five years will be used for each pollutant and averaging time corresponding to the AAQS.

These data will be added to the modeled maximum impacts from the facility for each pollutant and averaging time, and the totals will then be compared with the applicable AAQS. This is a conservative approach because it assumes that the highest recorded value and the modeled maximum impact both occur at the same time and at the same location.

SECTION 5 PRESENTATION OF MODELING RESULTS

5.1 NAAQS AND CAAQS ANALYSIS

The results of the AAQS analyses to evaluate the construction and operational impacts of the Midway facility will be presented in summary tables. A figure indicating the locations of the maximum predicted pollutant concentrations for each applicable pollutant and averaging time will be provided. Background concentrations (see Section 4.6.2) will be added to the maximum modeled values from the Midway sources to yield total concentrations, which will be compared with the NAAQS and CAAQS.

5.2 HEALTH RISK ASSESSMENT ANALYSIS

Maps at a scale of 1:24,000 will depict the following data:

- Elevated terrain within a 10-km radius of the project;
- Distribution of population via census data with 10-km radius of the project and sensitive receptors, including schools, pre-schools, etc., within a 1-mile radius of the project;
- Current and future residential land uses;
- Location of proposed new or modified transmission lines;
- Isopleths for any areas where predicted exposures to air toxics result in estimated chronic non-cancer impacts and acute impacts equal to or exceeding a hazard index of 1.0; and
- Isopleths for any areas where exposures to air toxics lead to an estimated carcinogenic risk equal to or exceeding one in one million.

Health risk assessment modeling results will be summarized to include maximum annual (chronic, carcinogenic, and non-carcinogenic) and hourly (acute) adverse health effects from toxic air contaminant emissions. Health risk values will be calculated and presented in the summary table for the points of maximum impact and the sensitive receptors with the maximum risk values.

5.3 DATA SUBMITTAL

Electronic copies of the modeling input and output files will be provided to SJVAPCD and the CEC.

SECTION 6 REFERENCES

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California Air Resources Board (CARB), 2005. HARP (Hotspots Analysis and Reporting Program), Version 1.1 (Build 23.02.21), April 2005.

CEC, 1997. "Regulations Pertaining to the Rules of Practice and Procedure and Plant Site Certification". Title 20, California Code of Regulations. Chapter 1, 2, 5.

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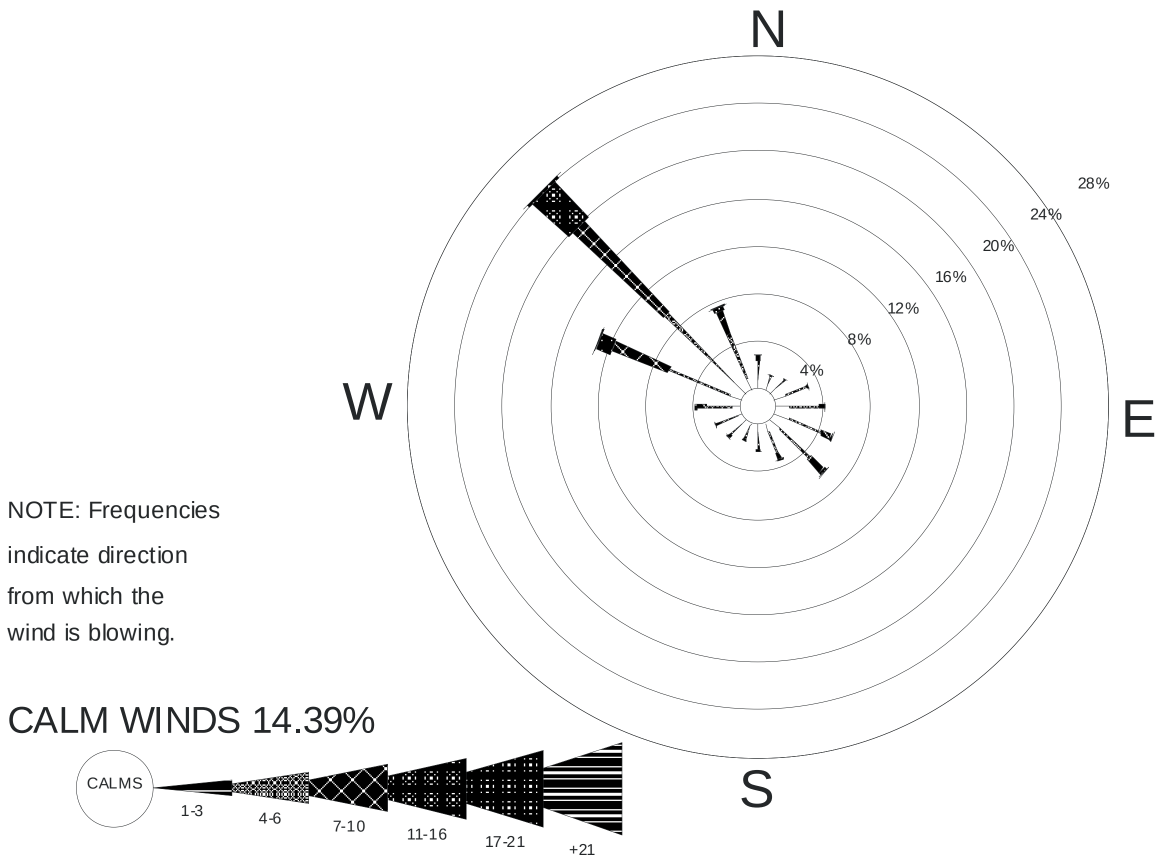
United States Environmental Protection Agency, 1997. Addendum to ISC3 User's Guide. The Prime Plume Rise and Building Downwash Model. November 1997.

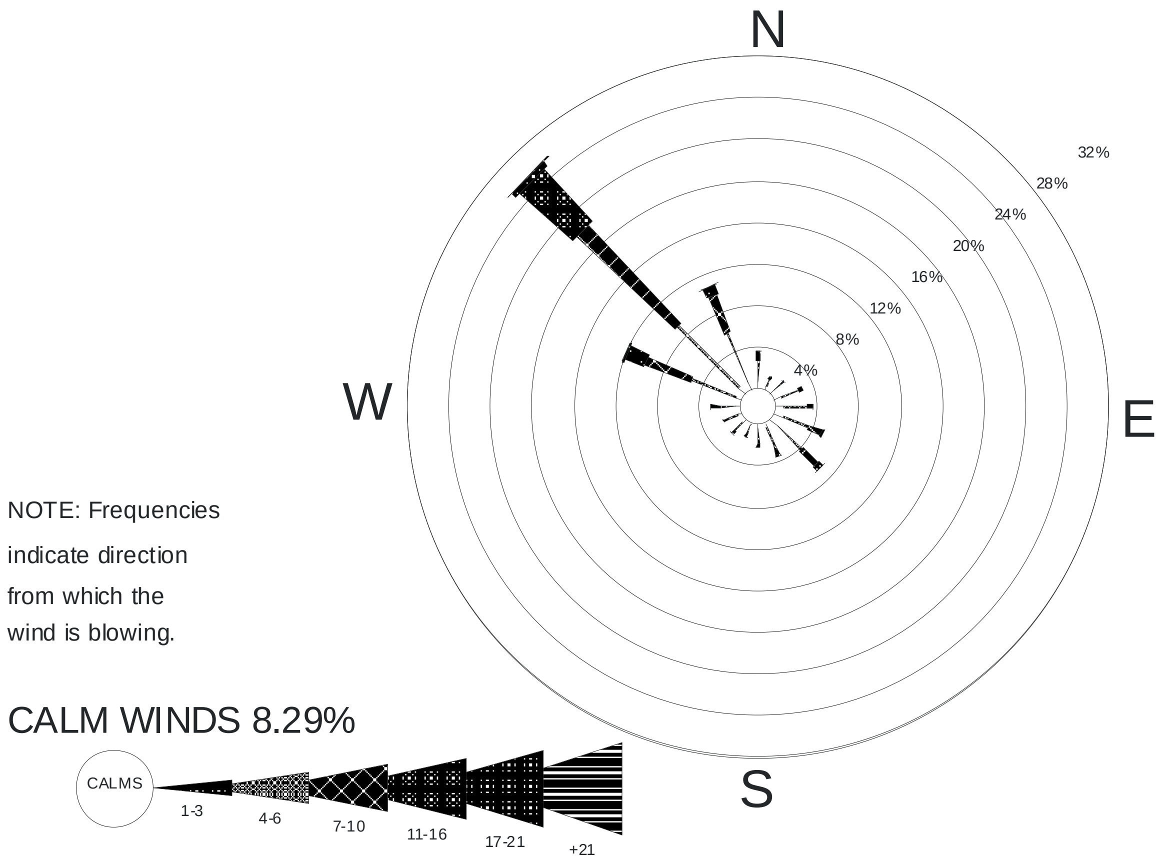
United States Environmental Protection Agency, 2002. Addendum to the User's Guide for the Industrial Source Complex Dispersion Models. Volume I – User's Instructions.

United States Forest Service et al. 2000. Federal Land Managers Air Quality Related Values Workgroup (FLAG) Phase 1 Report. Prepared by U.S. Forest Service Air Quality Program, National Park Service Air Resources Division, U.S. Fish and Wildlife Service Air Quality Branch. December 2000.

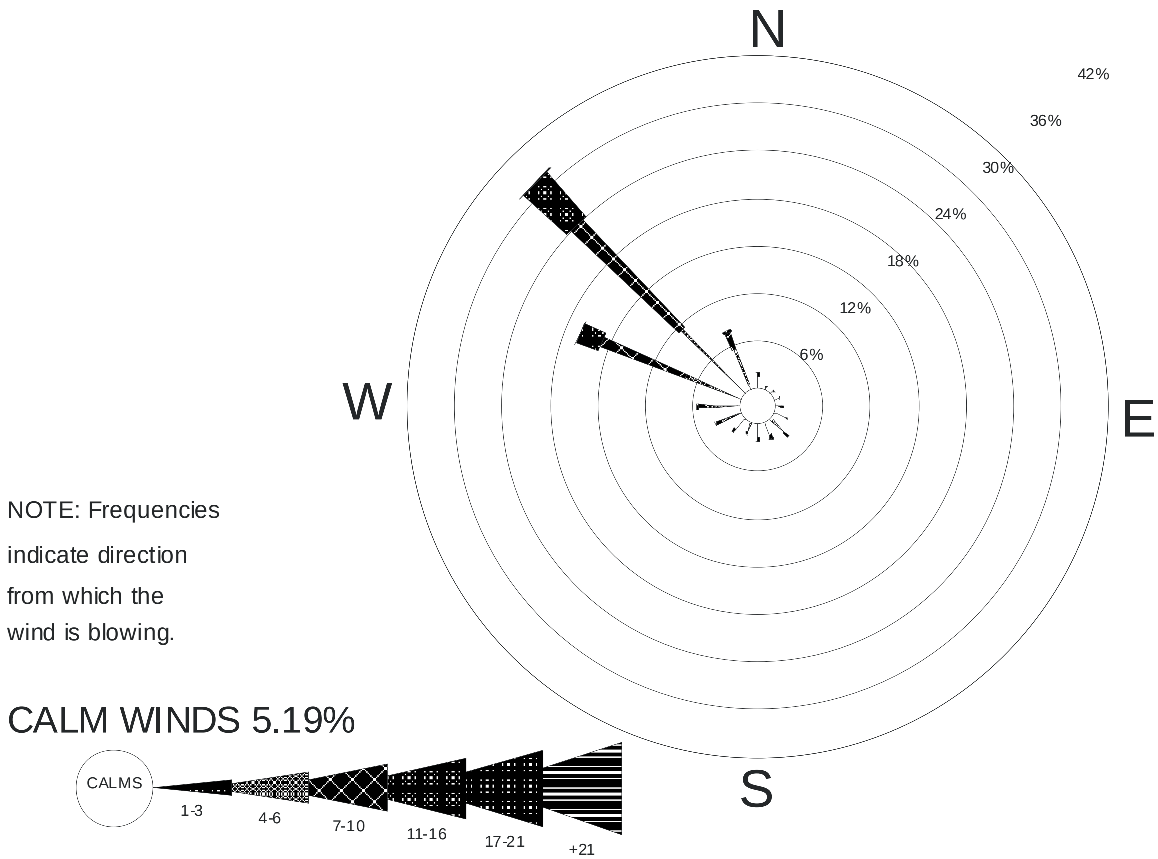
APPENDIX A Annual and Seasonal Windroses for the Fresno Yosemite International Airport (1987-1991)



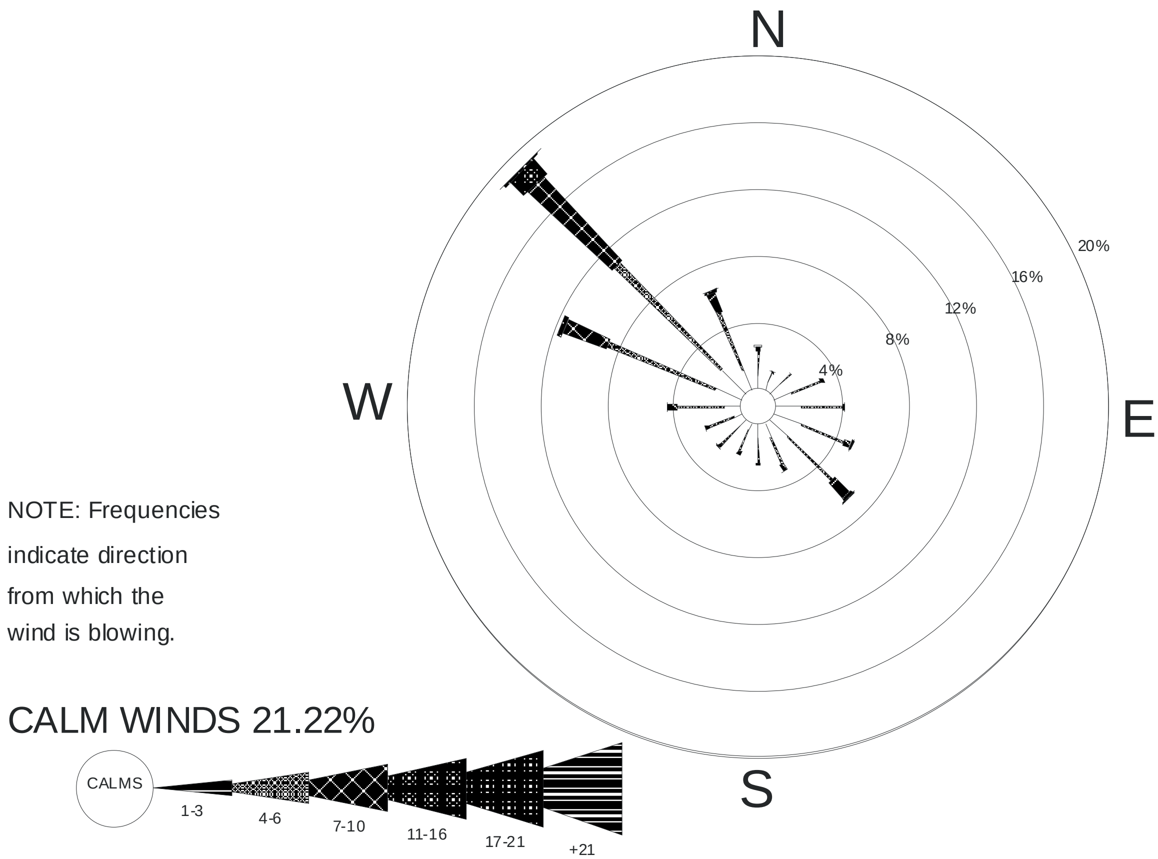
Windrose from Fresno 1987-1991 for All Months



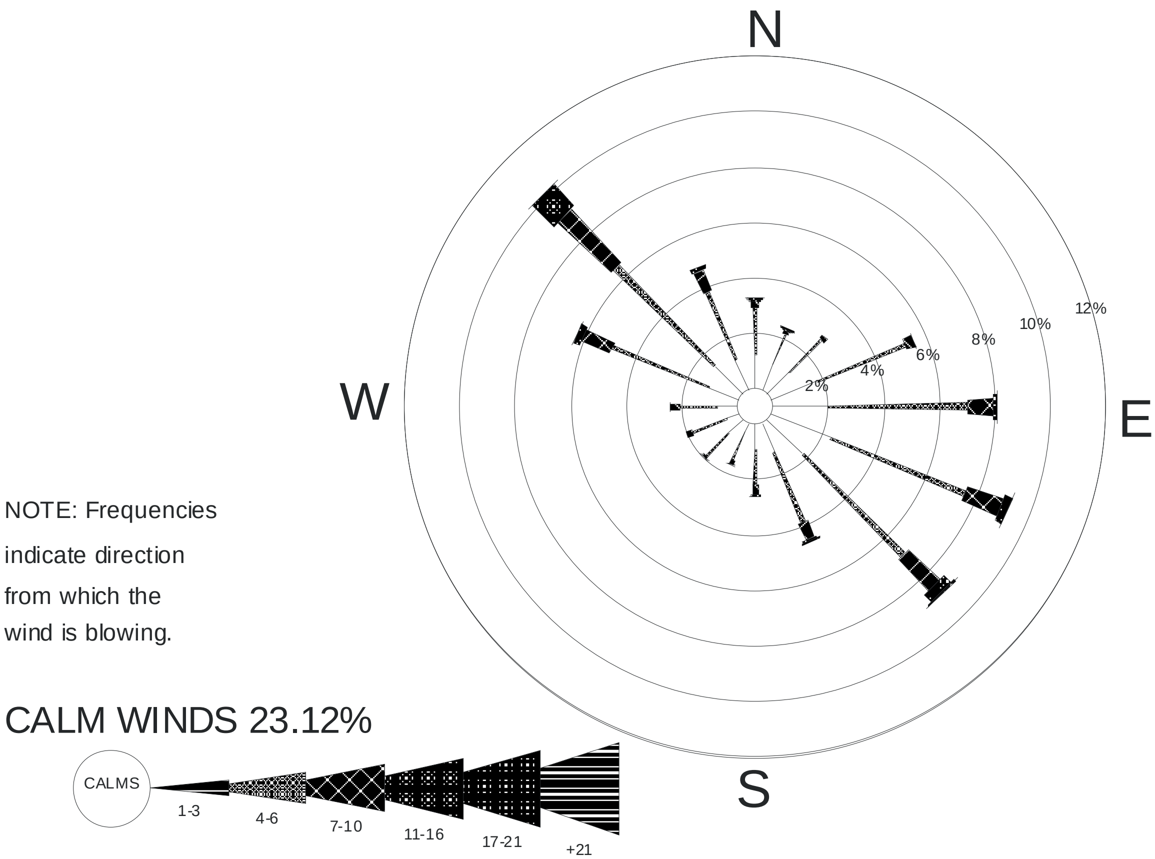
Windrose from Fresno 1987-1991 for Spring



Windrose from Fresno 1987-1991 for Summer



Windrose from Fresno 1987-1991 for Autumn



Windrose from Fresno 1987-1991 for Winter

APPENDIX I

AIR QUALITY DATA

ATTACHMENT E

BACT ANALYSIS

A BACT assessment was conducted for the proposed Starwood-Midway facility (Starwood) which considered all NO_x and CO control technologies currently proposed or in use on natural gas-fired combustion turbines with more than 50 MMBtu per hour fuel energy input. To identify feasible emission limits for comparable turbine units, several information sources were consulted, including the following:

- USEPA RACT/BACT/LAER Clearinghouse (USEPA 2005);
- CARB BACT Clearinghouse database and CARB BACT Guidelines for Power Plants (Adopted 7/22/99); and
- Recent California Energy Commission (CEC) Applications for Certification.

Table 1, Summary of Recent NO_x BACT Determinations for Combustion Turbine Generators Rated at Greater than 40 MW in Peaking Service, lists selected recent NO_x BACT proposals and determinations for natural gas-fired advanced technology combustion turbines in California. Note that there were no readily available BACT data for the Pratt & Whitney FT-8-3 SwiftPac turbines. The data provided in the following table are for roughly equivalent emission units (GE LM6000 turbines). Nearly all recent simple-cycle turbine projects in California had a NO_x BACT level of 2.5 ppm dry volume (ppmvd) (at 15 percent oxygen [O_2]), to be achieved by means of dry low-NO_x burners and SCR with ammonia injection. However, in some cases, SCR in conjunction with water or steam injection has been selected. The combustion turbines of the Starwood facility will achieve the BACT concentration of 2.5 ppmvd at 15 percent O_2 using steam or water injection, rather than dry low-NO_x combustor technology, and SCR, except during maintenance, startup, and shutdown events.

TABLE 1
SUMMARY OF RECENT NO_X BACT DETERMINATIONS FOR COMBUSTION TURBINE GENERATORS RATED AT GREATER THAN 40 MW IN PEAKING SERVICE

Name	Location	Rating	Vendor, Model	Emission Limit	Control(s)	Permit Date
Kings River Conservation District Peaking Plant	CA	40+ each, 2 turbines, 97 MW total	GE LM6000 Sprint PC	3.0 ppm	Water injection and SCR	5/04
Modesto Electric Generation Project	CA	40+ each, 2 turbines, 95 MW total	GE LM6000 Sprint	2.5 ppm	Water injection and SCR	2/04
Riverside Energy Resource Center	CA	40+ each, 2 turbines, 96 MW total	GE LM6000 Sprint PC NxGen	2.5 ppm	Water injection and SCR	12/04
San Francisco Electric Reliability Project	CA	40+ each, 3 turbines, 145 MW total	GE LM6000	2.5 ppm	Water injection and SCR	Tentative 4/06

DLE = Dry low emissions combustor
GE = General Electric
MW = megawatt
ppm = Parts per million by volume, dry basis, at 15 percent oxygen
SCR = Selective catalytic reduction

Similarly, most recent simple-cycle turbine projects have been approved with a CO emissions limit of 6 ppmvd and a VOC emissions limit of 2 ppmvd (both at 15 percent O_2), based on the use of an oxidation catalyst. The Starwood facility natural gas turbines will achieve these same BACT concentrations for CO and VOC by application of oxidation catalysts. Exclusive use of natural gas fuel has been determined to be BACT for SO_x and PM_{10} in all other comparable projects for several years.

ASSESSMENT OF NO_X CONTROL TECHNOLOGIES

Based on a review of the materials described above, the following NO_x control technologies were evaluated to determine whether they are able to achieve BACT NO_x levels in practice:

- DLE and Goal Line SCONOx™
- DLE and SCR with ammonia injection

SCONOx™

SCONOx™ is a NO_x reduction system produced by Goal Line Environmental Technologies (now distributed by EmeraChem) for natural gas turbine applications within an exhaust temperature range significantly below the design operating parameters of the simple-cycle Pratt & Whitney FT-8-3 SwiftPac turbines that will be employed at the Starwood facility. The SCONOx™ system uses a coated catalyst to oxidize both NO_x and CO, and thereby reduce plant emissions. As demonstrated by an initial installation on several gas turbines in co-generation applications, SCONOx™ is capable of achieving NO_x emission concentrations of 2 ppm based on a maximum inlet concentration of 25 ppm, and 90 percent CO reduction based on a maximum inlet concentration of 50 ppm. CO emissions are reduced in SCONOx™ by the oxidation of CO to CO_2. A two-step process reduces NO_x emissions. First, NO_x emissions are oxidized to NO_2 and then adsorbed onto the catalyst. In the second step, a proprietary regenerative natural gas is passed through the catalyst periodically. This natural gas de-desorbs the NO_2 from the catalyst and reduces it to N_2. The system does not use ammonia as a reagent; rather, it uses natural gas as the basis for a proprietary catalyst regeneration process.

However, the SCONOx™ technology has not been sufficiently demonstrated on higher exhaust temperature simple-cycle peaking natural gas turbines such as those proposed for the Project. The system consists of a catalyst that is installed in the flue gas at a point where the temperature is between 280°F and 650°F. The Starwood facility CTGs operate at 750 °F; therefore, the SCONOx™ application is not appropriate for this high temperature technology.

Potential advantages of the SCONOx™ process include:

- **No Ammonia.** The SCONOx™ process does not use ammonia. This eliminates any ammonia storage and transportation safety issues and the potential for ammonia slip or ammonia-based particulate formation.
- **Carbon Monoxide Reduction.** SCONOx™ will reduce CO emissions as well as NO_x emissions.

Potential disadvantages of the SCONOx™ process include:

- **High Capital and Operating Cost.** SCONOx™ is significantly more expensive than SCR with ammonia injection, primarily due to the higher cost of initial and replacement catalyst. The SCONOx™ catalyst is a precious metal catalyst, which is very expensive.
- **Not Suitable for Exhaust Temperatures of Simple-Cycle Natural Gas Turbine Peaking Applications**. SCONOx™ has been primarily installed on small co-generation systems. The Starwood facility will be a simple-cycle peaking operation. Peaking units require more rapid startup and more frequent load changes than typical co-generation systems. The main concerns are the damper systems that would be required with SCONOx™ for the units and assuring proper regeneration gas distribution. The effectiveness and longevity of these damper systems have not been demonstrated on simple-cycle natural gas turbines, and their cost of replacement would be substantial. In addition, steam is required to produce the SCONOx™ regeneration gas. The Starwood facility will have no steam production.
- **Catalyst "Washing."** A proprietary catalyst washing system must be used and an on-line catalyst washing system design has not yet been fully developed. If an on-line catalyst washing system is not used, then the facility must be shut down for cleaning.

Because the low NO_x emission rates attainable on natural gas turbines in co-generation systems with SCONOx™ have not been sufficiently demonstrated as "achieved in practice" on simple-cycle natural gas turbine applications and the other factors discussed above, SCONOx™ does not represent current, technically feasible BACT for the Starwood facility. Accordingly, a comparative cost analysis with the proposed NOx control technologies is not required. However, SJVAPCD staff has agreed with previous BACT evaluations that determined the use of SCONOx™ for simple-cycle CTGs is not a cost effective option. These findings reinforce the elimination of SCONOx™ on grounds of technical infeasibility.

SCR with Ammonia Injection

SCR with ammonia injection systems for reduction of NO_x emissions have been widely used in simple-cycle natural gas turbine applications for many years, and are considered a proven technology. SCR systems are commercially available from several vendors, unlike SCONOx™, which is available from a single vendor. The SCR process involves the injection of ammonia into the flue gas stream by means of an ammonia injection grid upstream of the catalyst. The ammonia reacts with NO_x natural gases in the presence of the catalyst. The catalyst is not regenerated and requires periodic replacement. SCR vendors typically offer a 3-year guarantee on catalyst life. SCR with ammonia injection systems have been used in numerous simple-cycle applications in California and throughout the world.

Water or steam injection has been a proven NO_x control technique for many years. Injection of water or steam into the primary combustion zone of advanced combustors of a CTG reduces the formation of thermal NO_x by decreasing the peak combustion temperature. Water injection decreases the peak flame temperature by diluting the combustion gas stream and acting as a heat sink by absorbing heat necessary to: (a) vaporize the water (latent heat of vaporization); and (b) raise the vaporized water temperature to the combustion temperature. High purity water must be employed to prevent turbine corrosion and deposition of solids on the turbine blades. The use of water or steam injection in diffusion flame combustors firing natural gas can typically achieve NO_x exhaust concentrations of 25 ppmvd, corrected to 15 percent O_2.

The Project will use water injection and SCR with ammonia injection designed to achieve a NO_x emission limit of 2.5 ppm (at 15 percent O_2). As noted in Table 1, Summary of Recent NO_x BACT Determinations for Combustion Turbine Generators Rated at Greater than 40 MW in Peaking Service, water injection and SCR have recently been permitted at a NO_x emission level of 2.5 ppmvd (at 15 percent O_2) for numerous California turbines that are similar in capacity to the proposed Starwood facility turbines. Accordingly, water injection with SCR with ammonia injection is considered to be BACT for the Starwood facility.

OTHER TECHNOLOGIES

Technologies that cannot achieve a NO_x emissions limit of 2.5 ppmvd (at 15 percent O_2) in practice were not considered as BACT candidates for the Starwood facility. These technologies include SCR without DLE, DLE without SCR, and water/steam injection without SCR.

ASSESSMENT OF CO CONTROL TECHNOLOGIES

The Starwood facility CTGs are guaranteed to emit no more than 6 ppm of CO (at 15 percent O_2), with natural gas fuel and use of a CO oxidation catalyst (except during startup and shutdown). In discussions with the applicant, SJVAPCD has already confirmed that the use of a CO oxidation catalyst to achieve a stack concentration of 6 ppmvd at 15 percent O_2 will result in emissions of CO that will conform to current SJVAPCD BACT requirements.

The following CO control technologies are evaluated:

- Combustion design/control; and
- Oxidizing catalyst.

Combustion Design/Control

Natural gas turbine combustion technology has significantly improved over recent years with regard to lowering CO emissions. The Starwood-Midway facility proposes to operate two Pratt & Whitney FT-8-3 SwiftPac turbines. For other installations, turbines have been guaranteed by the manufacturer to achieve a CO rate of 9 ppm (at 15 percent O_2) without post-combustion control technologies under a wide range of operating conditions (50 percent to 100 percent load) and ambient conditions (17°F to 114°F).

Oxidizing Catalyst

CO oxidizing catalysts have been used with natural gas-fired turbines for over a decade when uncontrolled CO emission levels are unacceptably high. CO catalysts operate at elevated temperatures within the exhaust stream. CO-oxidizing catalysts can be considered technically feasible for use in simple-cycle peaking applications. Thus, installation of a CO-oxidizing catalyst on the natural gas turbines is considered to be BACT for the Starwood facility.

ASSESSMENT OF VOC CONTROL TECHNOLOGIES

The proposed BACT level of 2 ppmvd (at 15 percent O_2) for VOC control with water injection, SCR, and an oxidation catalyst is consistent with the most stringent level found among recent BACT determinations for simple-cycle natural gas turbines, and is therefore considered to be BACT for the Starwood facility.

SJVAPCD considers control of VOC to a level of 0.6 ppmvd at15 percent O_2 to be technically feasible. However, a demonstration was provided to the District in connection with the Panoche Energy Center (PEC), that the cost for the additional catalyst material that would be required to achieve this lower VOC rate would be prohibitively costly. Accordingly, the proposed BACT level for Starwood facility is 2 ppmvd referenced to 15 percent O_2.

ASSESSMENT OF SO_2 AND PM_{10} CONTROL TECHNOLOGIES

Sulfur dioxide and PM_{10} emissions will be controlled through the exclusive use of clean-burning pipeline quality natural gas. This control technology has been widely and uniformly implemented for control of SO_2 and PM_{10} emissions from combustion turbines in California and throughout the United States, and is considered to be BACT for the Starwood facility.

ASSESSMENT OF AMMONIA SLIP CONTROL TECHNOLOGIES

Ammonia emissions will be limited to 10 ppmvd (at 15 percent O_2). This proposed BACT is consistent with SJVAPCD policy to control NO_x.

SUMMARY OF PROPOSED BACT

Table 2, Summary of Proposed BACT, presents the proposed BACT emission levels for the Starwood facility, based on the assessment described in the preceding subsections.

TABLE 2
SUMMARY OF PROPOSED BACT FOR THE STARWOOD FACILITY

Pollutant	**Control Technology**	**Concentration ppm at 15 percent O_2 dry**
NO_x	Water injection and SCR with ammonia injection	2.5 (1-hour average)
CO	Catalytic oxidation	6.0 (1-hour average)
VOC	Catalytic oxidation	2.0 (1-hour average)
SO_2	Pipeline quality natural gas	NA
PM_{10}	Pipeline quality natural gas	NA
Ammonia slip		10 (1-hour average)

Notes:
BACT = Best Available Control Technology
CO = carbon monoxide
NA = not applicable
NO_x = nitrogen oxides
O_2 = oxygen
PM_{10} = particulate matter less than or equal to 10 microns in diameter
ppm = parts per million
SCR = Selective catalytic reduction
ROC = reactive organic compounds
SO_2 = sulfur dioxide

REFERENCES

US Environmental Protection Agency, 2006 BACT/RACT/LAER Clearinghouse. On-line data base, current data as of October, 2006. http://cfpub.epa.gov/rblc/htm/bl02.cfm

CULTURAL RESOURCES TECHNICAL REPORT

This report is confidential and is not appropriate for public distribution. Copies have been provided to the California Energy Commission under separate cover.

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT

This report is confidential and is not appropriate for public distribution. Copies have been provided to the California Energy Commission under separate cover.

GEOTECHNICAL INVESTIGATION REPORT

August 9, 2006
File No.: 73384.GEO

Starwood Power-Midway, LLC
591 West Putnam Avenue
Greenwich, Connecticut 06830

Attention: Mr. Richard Weiss

SUBJECT: Geotechnical Investigation Report
Proposed Midway Facility
Fresno County, California

Dear Mr. Weiss:

The attached report presents the results of a geotechnical investigation for the Proposed Midway facility located on West Panoche Road east of Interstate Highway 5, in Fresno County, California. The report describes the study, findings, conclusions and recommendations for use in project design and construction.

Kleinfelder appreciates the opportunity to provide geotechnical engineering services to Starwood Power-Midway, LLC during the design phase of this project. If there are any questions concerning the information presented in this report, please contact this office at your convenience.

Respectfully submitted,
KLEINFELDER, INC.

REGISTERED PROFESSIONAL ENGINEER
JOSUE A. MONTES, JR.
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GEOTECHNICAL INVESTIGATION REPORT
PROPOSED MIDWAY FACILITY
FRESNO COUNTY, CALIFORNIA

Prepared For:

Starwood Power-Midway, LLC
591 Putnam Avenue
Greenwich, Connecticut 06830

August 9, 2006

Prepared For:

Starwood Power-Midway, LLC
591 Putnam Avenue
Greenwich, Connecticut 06830

GEOTECHNICAL INVESTIGATION REPORT
PROPOSED MIDWAY FACILITY
FRESNO COUNTY, CALIFORNIA

Kleinfelder Job No.: 73884.GEO

Prepared by:

Romeo R. Shiplee
Staff Engineer

Josue A. Montes, Jr. PE
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August 9, 2006

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1. INTRODUCTION

1.1 GENERAL

This report presents the results of a geotechnical investigation for the Proposed Midway facility located on West Panoche Road east of Interstate Highway 5, in Fresno County, California. The report describes the study, findings, conclusions and recommendations for use in project design and construction. The location of the project site is illustrated on Plate 1, "Site Vicinity Map".

This report includes recommendations related to the geotechnical aspects of project design and construction. Conclusions and recommendations presented in this report are based on the subsurface conditions encountered at the locations of the exploration and the provisions and requirements outlined in the "Additional Services" and "Limitations" Sections of this report. Recommendations presented herein should not be extrapolated to other areas or used for other projects without prior review.

1.2 PROPOSED CONSTRUCTION

Understanding of the project is based on a review of furnished site plans and preliminary design information.

The proposed project will involve construction of various equipment and structures, including an EER building, boiler building, a gas turbine and a heat recovery steam generator (HRSG). Maximum wall and column loads for the buildings are unknown at this time, but assumed not to exceed 2.0 kips per foot and 50 kips, respectively. Equipment loads are unknown at this time, but are anticipated not to exceed 1000 psf. Appurtenant construction will include underground utilities.

Grading plans were not available at the time this report was prepared; however based on the site topography, cuts and fills of approximately 1 to 2 feet in vertical extent are anticipated to create pad grades and positive site drainage.

1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this investigation was to explore the site subsurface conditions and provide recommendations and opinions to aid in project design and construction. This report addresses the following items:

- ❑ A description of the proposed project, including a site vicinity map showing the approximate location of the site and a site plan showing the approximate locations of the exploration points for this study
- ❑ A description of the site surface and subsurface conditions encountered during the field investigation, including boring logs
- ❑ A summary of the field exploration and laboratory testing programs
- ❑ Recommendations for site preparation and earthwork, including a discussion of over-excavation, moisture conditioning, compaction and the use of on-site and quality of imported soils for engineered fill
- ❑ Recommended geotechnical design parameters for building and equipment foundations, including soil bearing pressures and anticipated settlements
- ❑ Recommendations for resistance of lateral loads on foundations
- ❑ Recommended subgrade preparation for conventional concrete building slabs supported-on-grade
- ❑ Recommended subgrade modulus for elastic evaluation of static loads
- ❑ Recommended dynamic shear modulus (G), Poisson's ratio (μ), mass density (ρ), soil modulus of elasticity (E_s), and angle of internal friction (ϕ) for use in evaluating foundations for vibrating machinery
- ❑ Recommended seismic design criteria (1997 UBC/2001 CBC)
- ❑ Comments on the general engineering seismology of the site, including a description of the site geologic setting
- ❑ Comments on the corrosion potential of on-site soils to buried metal and concrete
- ❑ Comments on field electrical resistivity for evaluation of facility grounding
- ❑ Comments on groundwater conditions encountered

2. FIELD AND LABORATORY EXPLORATION

2.1 FIELD EXPLORATION

The field exploration was performed on July 13 and 14, 2006 and consisted of drilling nine (9) test borings within the project site, and a site reconnaissance by a staff engineer. The test borings were drilled with a CME 75 truck-mounted drill rig using 8-inch diameter hollow stem flight auger. The boring depths were 41.5 feet below the existing ground surface with the exception of one (1) boring to a depth of 101.5 feet below existing ground surface. The locations of the test borings are indicated on Plate 2, "Site Plan".

The soils encountered in the borings were visually classified in the field and a continuous log was recorded. Relatively undisturbed samples were collected from the test borings at selected depths by driving a 2.5-inch I.D. split barrel sampler containing brass liners into the undisturbed soil with a 140-pound automatic hammer free falling a distance of 30 inches. In addition, samples of the subsurface material were obtained using a 1.4-inch I.D. standard penetrometer, driven 18 inches in accordance with ASTM D1586 test procedures. The sampler was used without liners. Resistance to sampler penetration was noted on the boring logs as the number of blows per foot over the last 12 inches of sampler penetration. The blow counts listed in the boring logs have not been corrected for the effects of overburden pressure, rod length, sampler size, or hammer efficiency. Bulk samples were also obtained from auger cuttings at selected boring locations.

2.2 FIELD AND LABORATORY TESTS

Penetration rates, determined in general accordance with ASTM D1586, were used to aid in evaluating the consistency, compression, and strength characteristics of the foundation soils.

The field resistivity of the soil was measured at the site using the Wenner four-electrode method and a Model 4620 Ground Resistance Tester, manufactured by AEMC, Inc. The Wenner method involves the use of four metal probes or electrodes driven into the ground, along a straight line, with equal spacing. Resistance measurements were conducted with probe spacing of 5, 10, 20, and 30 feet corresponding to the depth of measurement, respectively. Results of the field resistivity tests are provided in Section 5.4.

Laboratory tests were performed on selected near surface samples to evaluate certain physical characteristics. The following laboratory tests were used to develop the design geotechnical parameters:

- ❑ Unit Weight (ASTM D2937)
- ❑ Moisture Content (ASTM D2216)
- ❑ Direct Shear (ASTM D3080)
- ❑ Collapse Potential (ASTM D 5333)
- ❑ Grain-Size Distribution (ASTM D422, without hydrometer)
- ❑ Moisture Density Relationship (ASTM D1557)
- ❑ pH and Electrical Resistivity (California Test Method No. 643)
- ❑ Soluble Sulfate Content (California Test Method No. 417)
- ❑ Soluble Chloride Content (California Test Method No. 422)

The dry density and moisture content test results are shown on the boring logs in Appendix A. The soluble sulfate, soluble chloride, pH and minimum resistivity are discussed in the "Corrosion Potential" section (Section 5.5). The remaining test results are provided in Appendix B.

3. SITE CONDITIONS

3.1 SURFACE CONDITIONS

The proposed site is located on West Panoche Road east of Interstate Highway 5, in Fresno County, California. The site is bordered by agricultural land to the north, south and east, and the PG&E Panoche facility to the west. At the time of the field reconnaissance, the site supported sparse growth of annual weeds and grasses. The existing surface conditions are relatively flat. The site contained several large pieces electrical equipment.

3.2 EARTH MATERIALS

The following description provides a general summary of the subsurface conditions encountered during the field exploration and further validated by the laboratory testing program. For a more thorough description of the actual conditions encountered at specific boring locations, refer to the boring logs presented in Appendix A. All soils have been classified according to the Unified Soil Classification System (ASTM D2487).

The natural earth material from the Patterson Alluvium formation consists of Holocene age sediments. The near surface soil encountered in the test borings consisted of silt to depths ranging from 4.5 to 14.5 feet. The near surface soil is underlain by discontinuous layers of silty sand, lean clay and poorly graded sand to the depth explored. The granular soils generally had a relative density of medium dense to very dense. The fine grained material had a relative consistency of medium stiff to very stiff.

3.3 GROUNDWATER CONDITIONS

Groundwater was not encountered within the depths explored, 101.5 feet below existing grade. The State of California Department of Water Resources, "Lines of Equal Elevation of Water in Wells", Spring 2004 indicates the depth to groundwater exceeds 130 feet. It is possible that groundwater conditions at the site could change at some time in the future due to variations in rainfall, groundwater withdrawal, construction activities, or other factors not apparent at the time the test borings were made.

4. ENGINEERING SEISMOLOGY

4.1 FAULTS LOCAL TO THE PROJECT

The project site and its vicinity are located in an area traditionally characterized by low seismic activity. There are no known faults that cut through the local soils in or near the site, and the site is not located within an Alquist-Priolo Earthquake Fault Zone as defined by Special Publication 42 (revised 1994) published by the California Geologic Survey (CGS).

Based on review of published data and a current understanding of the geologic framework and tectonic setting of the proposed development, the primary source of seismic shaking at this site is anticipated to be the Great Valley Fault System, Segment 12, which is located approximately 4.7 miles southwest of the site.

4.2 SEISMIC DESIGN CRITERIA

There are no anticipated geotechnical factors at this site that are unique and would necessitate special seismic consideration for design of the structures. Use of the 1997 UBC/2001 CBC design criteria would be appropriate, unless the structural engineer deems more specific data (e.g. elastic response spectra) necessary. The site is in Seismic Zone 3. The Soil Profile is considered S_D and the governing Seismic Source Type is B. The Seismic Zone Factor (Z) is 0.3.

4.3 LIQUEFACTION

In order for liquefaction and possible associated settlement of soils due to ground shaking to occur, it is generally accepted that four conditions will exist:

- The subsurface soils are in a relatively loose state,
- The soils are saturated,
- The soils are non-plastic,

- Ground shaking is of sufficient intensity to act as a triggering mechanism.

The absence of groundwater would preclude liquefaction.

5. DESIGN RECOMMENDATIONS

5.1 GENERAL

The proposed structure may be designed using conventional spread footing foundations supported on approved undisturbed native soil or properly compacted fill. The following recommendations are based on the assumption that the recommendations in Section 6, "EARTHWORK", have been implemented. Specific comments and recommendations regarding the geotechnical aspects of project design are presented in subsequent sections.

5.2 SPREAD FOUNDATIONS

5.2.1 Allowable Vertical Bearing Pressures and Settlements

Mat foundations or conventional spread footings can be used to support the structures and equipment. The following design parameters are applicable to footings supported on approved undisturbed native soil or engineered fill placed in accordance with the earthwork recommendations presented in Section 6 of this report.

Generally, two geotechnical issues determine the design bearing pressure for conventional spread footing foundations: (1) strength of the foundation soil and (2) tolerable settlement. For lightly loaded structures, design bearing may be dictated by code-required minimum footing geometry or constructability considerations.

The available bearing capacity, based only on the shear strength of the soil, will be dependent upon the footing geometry. Presented in Table 5.2-1 are the expressions for the allowable bearing capacity (shear strength considerations only) for static loading (D.L. + L.L.) and total combined loading (D.L. + L.L. + transient loading, such as wind or seismic).

TABLE 5.2-1
AVAILABLE ALLOWABLE BEARING

<table>
<tr><th>Loading Condition</th><th>Available Allowable Bearing (psf)</th></tr>
<tr><td>Static Loading</td><td>420B + 1130D</td></tr>
<tr><td>Total Combined Loading</td><td>640B + 1700D</td></tr>
<tr><td colspan="2">Note: B is footing width in feet and D is footing embedment depth in feet</td></tr>
</table>

Analysis, based on Schmertmann, determined the following estimated static settlement for equipment supported on engineered fill. The settlements provided consider only response to structural loads based on sustained loading equal to 100 percent of total static (DL + LL) loading. Settlement is anticipated to occur rapidly after load application.

TABLE 5.2-2
ESTIMATED SETTLEMENT

<table>
<tr><th>Footing Type</th><th>Loading (DL + LL)</th><th>Design Bearing (psf)</th><th>Estimated Settlement (inch)</th></tr>
<tr><td>Strip</td><td>To 2.0 kips/ft</td><td>To 2000</td><td>Less than 0.25</td></tr>
<tr><td rowspan="3">Square</td><td>To 25 kips</td><td>To 3000</td><td>Less than 0.25</td></tr>
<tr><td rowspan="2">50 kips</td><td>3000</td><td>0.4</td></tr>
<tr><td>4000</td><td>0.45</td></tr>
</table>

TABLE 5.2-3
ESTIMATED SETTLEMENT DUE TO STATIC

Footing Type	Dimensions (ft)	Assumed Loading (DL + LL)	Design Bearing (psf)	Estimated Settlement (inch)
Miscellaneous Mat	38X120	250 kips	170	Less than 0.25
		1440 kips	1000	Less than 0.4

If deemed necessary by the design engineer, Kleinfelder can provide the estimated settlement for other loading conditions and footing geometries.

The design bearing pressures are net values so the weight of embedded concrete does not need to be included in the foundation loading.

A modulus of subgrade reaction, K_p (B_p = 1 foot), of 330 pci can be used for undisturbed native or properly compacted fill when considering analysis of a beam on an elastic foundation.

5.2.2 Lateral Resistance

Lateral loads applied to foundations can be resisted by a combination of passive lateral bearing and base friction. The allowable and ultimate passive pressures and frictional coefficients for undisturbed native or properly compacted fill are presented in Table 5.2-4.

TABLE 5.2-4
PASSIVE PRESSURES AND FRICTIONAL COEFFICIENTS

	Allowable		Ultimate
	Static	Total Combined	
Frictional Coefficient	0.42	0.5	0.63
Passive Pressure (psf/ft of depth)	325	430	645
Lateral Translation Needed to Develop Passive Pressure	0.005 D	0.007 D	0.019 D

Note D is footing depth.

If the deflection resulting from the strain necessary to develop the passive pressure is within structural tolerance, the passive pressure and frictional resistance can be used in combination. Otherwise, additional passive pressure values could be provided based on tolerable deflection. The allowable values already incorporate a factor of safety and, as such, would be compared directly to the driving loads. If analytical approaches require the input of a ratio of available resisting forces and driving loads greater than unity, the ultimate values would be used.

5.2.3 Dynamic Geotechnical Properties

The parameters presented in Table 5.2-5 can be used in evaluating the dynamic structure/soil interaction of vibrating foundations.

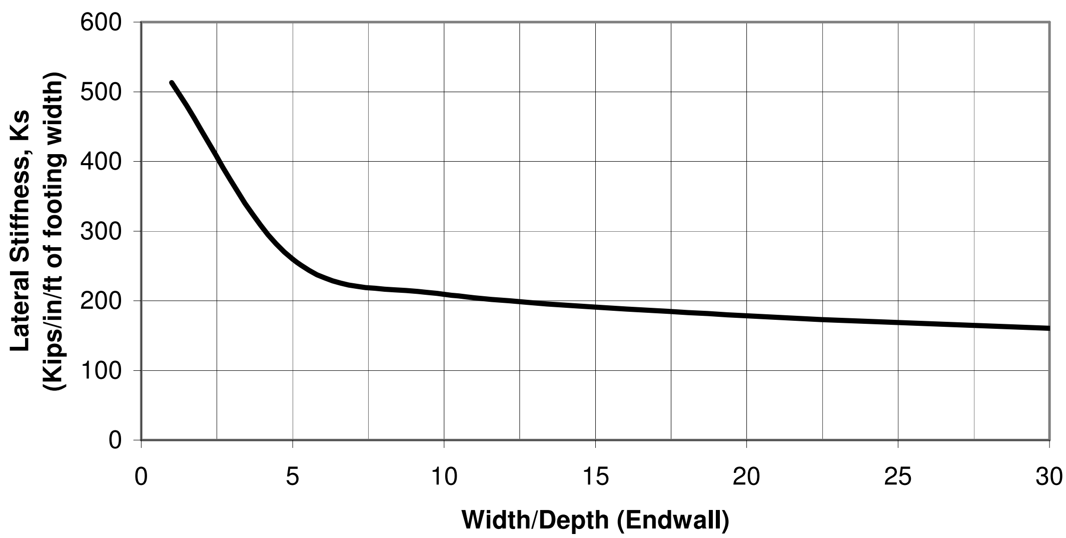
TABLE 5.2-5
DYNAMIC SOIL PROPERTIES

Soil Density, γ	118 pcf
Mass Density, ρ	3.7 lbs-sec^2/ft^4
Poisson's Ratio, μ	0.3
Dynamic Shear Modulus, G_{max}	1800 ksf
Modulus of Elasticity, E_s	4680 ksf
Soil Strength	Angle of Internal Friction, Φ = 32

5.2.4 Dynamic Stiffness

The dynamic lateral stiffness against the ends of the mat will be dependent upon the mat embedment depth and width. Figure 5.2-1 indicates the dynamic lateral stiffness of soil for foundations with varying width to depth ratios. The dynamic lateral stiffness presented assumes properly engineered fill against the side of the mat.

FIGURE 5.2-1
DYNAMIC LATERAL FOUNDATION STIFFNESS



This stiffness does not consider any tractional shear developed along the base of the mat. The dynamic tractional stiffness can be estimated utilizing the following expressions.

Dynamic Tractional Stiffness = $410(BL)^{0.5}$ (kips/in)
Where; B = mat width (feet)
L = mat length (feet)

The dynamic vertical translational stiffness at the bottom of the mat is dependent on the width and length of the mat. The dynamic vertical translational stiffness can be estimated utilizing the following expression.

Dynamic Vertical Translational Stiffness = 500(BL)0.5 (kips/in)
Where; B = mat width (feet)
L = mat length (feet)

5.2.5 Construction Considerations

Prior to placing steel or concrete, foundation excavations should be cleaned of any debris, disturbed soil, and water. All foundation excavations should be observed by a representative of the project Geotechnical Engineer just prior to placing steel or concrete. The purpose of these observations is to check that the bearing soils actually encountered in the foundation excavations are similar to those assumed in analysis and to verify the recommendations contained herein are implemented during construction. In addition, the moisture content subgrade soil under conventional building slab-on-grade should be checked immediately prior to the placement of concrete.

5.3 CONVENTIONAL CONCRETE BUILDING SLABS-ON-GRADE

5.3.1 Subgrade Preparation

Conventional slabs-on-grade should be supported on engineered fill as described in Section 6 of this report. The subgrade should have a moisture content of at least optimum to a depth of 12 inches immediately prior to placing any vapor retarding membrane or pouring the slab.

5.3.2 Capillary and Moisture/Vapor Break

Considering the soil type and regional groundwater depth, a capillary break (i.e. clean sand or gravel layer) is not necessary.

In buildings where equipment or other components are moisture-sensitive, it is recommended the subgrade be covered by a vapor retarding membrane, such as 10 mil PVC. The subgrade surface should be smooth and care should be exercised to avoid tearing, ripping, or otherwise puncturing the vapor retarding membrane. If the vapor retarding membrane becomes torn or disturbed, it should be removed and replaced or properly patched. The vapor retarding membrane could be covered with approximately 1 to 2 inches of saturated surface dry (SSD), relatively clean sand to protect it during construction. Concrete should not be placed if sand overlying the vapor barrier has been allowed to attain a moisture content greater than about 5% (due to precipitation or excessive moistening). Excessive water beneath interior floor slabs could result in future significant vapor transmission through the slab, adversely affecting moisture-sensitive floor coverings and could inhibit proper concrete curing. Concrete could be placed directly on the vapor retarding membrane if care is taken to not damage the membrane. If the protective sand layer is not used, the building designer should be in agreement. Many slab designers feel the sand cushion is important to proper concrete curing.

It should be noted that, although the slab support discussed above is currently the industry standard, this system might not be completely effective in preventing floor slab moisture vapor transmission problems. This system will not necessarily assure that floor slab moisture transmission rates or indoor humidity levels will not inhibit mold growth. A qualified specialist(s) with knowledge of slab moisture protection systems and other potential components that may be influenced by moisture, should address these post-construction conditions separately. The purpose of a geotechnical study is to address subgrade conditions only, and consequently, it does not evaluate future potential conditions.

5.3.3 Conventional Slab Design

There are no geotechnical considerations (e.g. expansive soil), which would require special design of slabs. Therefore, the thickness and reinforcement of slabs-on-grade should be determined by structural considerations and should be designed by the project structural engineer. A modulus of subgrade reaction, K_p (B_p = 1 foot), of 375 pci may be used for elastic analysis of slabs on properly compacted subgrade.

Slab concrete should have good density, a low water/cement ratio, and proper curing to promote a low porosity. It is recommended the water/cement ratio not exceed 0.45 to minimize vapor transfer.

5.4 IN-SITU SOIL RESISTIVITY TESTING

The resistivity of the soil was measured at the site to assist designers in evaluation of a potential grounding system. Soil resistivity was measured using the Wenner four-electrode method and a Model 4620 Ground Resistance Tester, manufactured by AEMC, Inc. The Wenner method involves the use of four metal probes or electrodes driven into the ground, along a straight line, an equal distance from each other. An alternating current from the soil resistance meter is induced into the soil. The current creates a voltage gradient that is proportional to the average resistance of the soil mass to a depth equal to the distance between probes. The resistivity of each layer of soil was then calculated using the Megger Method as follows:

$$\rho = A\ 2\ \pi\ R$$

where;

ρ= soil resistivity at depth (ohm-cm)
A = distance between the electrodes (cm)
R = resistance of soil layer from a to b (ohms)
π= constant 3.1416

Three resistivity test lines were performed at the project site. Two resistivity lines were taken in the center of the property (R-1 and R-2) and one at the eastern portion of the property (R-3). Resistance measurements were conducted with probe spacing of 5, 10, 20, and 30 feet at the project site.

The result of the field resistivity testing is provided in Table 5.4-1.

TABLE 5.4-1
FIELD RESISTIVITY TEST RESULTS

Location	Spacing in feet	Reading	X	Factor	Resistivity ohm-cm
R-1	5	15.95		957.6	15,272.1
	10	16.05		1915.1	30,737.4
	20	16.43		3830.2	62,926.9
	30	15.82		5745.3	90,885.9
R-2	5	16.35		957.6	15,655.1
	10	16.44		1915.1	31655.1
	20	15.83		3830.2	60,628.9
	30	16.11		5745.3	92,552.0
R-3	5	17.24		957.6	16,507.3
	10	16.79		1915.1	32,154.5
	20	16.82		3830.2	64,420.9
	30	16.96		5745.3	97,435.2

Note: Tests were performed at an ambient temperature of approximately 90 degrees.

The average resistivity of a layer in ohm-cm is the average resistivity of soil to a depth equal to the pin spacing (i.e. a 10-foot spacing is a 10-foot thick layer).

5.5 CORROSION POTENTIAL

Soil samples obtained from test borings B-1 and B-9 at depths of 1 to 5 feet were tested for pH, minimum resistivity, soluble sulfate content, and soluble chloride content. The test results are presented in Table 5.5-1.

TABLE 5.5-1
SUMMARY OF CORROSION TESTS

Sample Location	pH	Minimum Resistivity (ohm – cm)	Resistivity at Field Moisture (ohm – cm)	Soluble Sulfate (mg/kg)	Soluble Chloride (mg/kg)
B-1	7.7	790	15,165	208	38.1
B-9	7.8	790	3,495	93.3	34.8

Note: The designer should be aware the minimum resistivity value is generally used to identify potential corrosiveness of subgrade soil to unprotected buried metal and should not be used for design of project electrical grounding systems.

The test results suggest that the levels of soluble sulfates and chlorides present are within usually tolerable limits for normal reinforced concrete structures. Therefore, normal Type II cement concrete cover of reinforcement should be adequate for foundation concrete.

The resistivity at field moisture is relatively high and generally indicative of a very low corrosion potential to unprotected metal at the present soil moisture. However, as soil moisture increases, the resistivity reduces and the corrosive potential increases. The minimum resistivity may indicate the soil could have the potential to be severely corrosive to unprotected metal.

Corrosion is dependent upon a complex variety of conditions, which are beyond the geotechnical practice. Consequently, a qualified corrosion engineer should be consulted if the owner desires specific recommendations regarding material types and/or mitigation.

5.6 SITE DRAINAGE

Drainage should be directed away from the improvements to prevent ponding and/or saturation of the soils. Final pad grading should provide discernable gradients and drainage paths which direct surface run-off away from the structures. No water should be allowed to pond on-site. Where applicable, design should consider the use of roof drains with downspouts which discharge to areas (hardscape or pipes) that convey water away from structures and appurtenances.

6. EARTHWORK

6.1 GENERAL

It is anticipated that site grading can be accomplished with conventional equipment and techniques. Recommendations regarding site grading are presented in subsequent sections of this report. All reference to relative compaction, maximum density and optimum moisture is based on ASTM Test Method D1557.

6.2 SITE PREPARATION

6.2.1 Stripping and Grubbing

At the time of the reconnaissance, sparse vegetation was present on the site. It is likely the amount of surface vegetation will vary with time. Any surface vegetation and any miscellaneous surface obstructions should be removed from the project area, prior to any site grading. Surface strippings should not be incorporated into fill unless they can be sufficiently blended to result in an organic content less 3 percent by weight (ASTM D2974).

6.2.2 Over-Excavation

Over-excavation is typically reserved for soils that, in their natural state, will not provide adequate bearing for structures. The native soils at the project site should provide adequate bearing for the proposed structures. Therefore, provided the recommendations provided in Section 6 are followed, no over-excavation is required.

6.2.3 Scarification and Compaction

After stripping and performing any necessary removals, all areas to receive fill should be scarified at least 8 inches below the exposed subgrade elevation. The subgrade soil should be uniformly moisture conditioned to at, or above, optimum and compacted to 90% of the maximum dry density.

6.3 ENGINEERED FILL

6.3.1 Materials

All engineered fill soils should be nearly free of organic or other deleterious debris and less than 3 inches in maximum dimension. The on-site soil materials, exclusive of debris, may be used as engineered fill provided they contain less than 3 percent organics by weight (ASTM D2974).

Recommended requirements for any imported soil to be used as engineered fill, as well as applicable test procedures to verify material suitability are provided on Table 6.3-1.

TABLE 6.3-1
SOIL MATERIALS TEST PROCEDURES

Gradation		Test Procedures	
Sieve Size	**Percent Passing**	**ASTM[1]**	**Caltrans[2]**
76 mm (3 inch)	100	C136	202
19 mm (¾ inch)	80 – 100	C136	202
No. 4	60 - 100	C136	202
No. 200	20 – 50	C136	202
Plasticity			
Liquid Limit	Plasticity Index		
< 25	< 9	D4318	204
Soluble Sulfates			
< 2000 ppm		-	417
Soluble Chloride			
<150 ppm		-	422
Resistivity			
>2000 ohm x cm		-	532

Notes:
[1] American Society for Testing and Materials Standards (latest edition)
[2] State of California, Department of Transportation, Standard Test Methods (latest edition)

Any imported fill materials to be used for engineered fill should be sampled and tested by a representative of the project Geotechnical Engineer prior to being transported to the site.

6.3.2 Compaction Criteria

Soils with a Plasticity Index (PI) of less than 9 used for engineered fill should be uniformly moisture conditioned to at, or above, the optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness and compacted to at least 90 percent relative compaction. Disking and/or blending may be required to uniformly moisture condition soils used for engineered fill.

Soils with a PI of 9 or greater should be uniformly moisture-conditioned to at least 3% above optimum moisture, placed in horizontal lifts less than 8 inches in loose thickness and compacted to at least 90%, but not more than 95%, of the maximum dry density. Disking and or blending may be required to uniformly moisture condition soils used for engineered fill.

6.3.3 Construction Considerations

Should site grading be performed during or subsequent to wet weather, near-surface site soils may be significantly above optimum moisture content. These conditions could hamper equipment maneuverability and efforts to compact site soils to the recommended compaction criteria. Disking to aerate, chemical treatment, replacement with drier material, stabilization with a geotextile fabric or grid, or other methods may be required to mitigate the effects of excessive soil moisture and facilitate earthwork operations. Any consideration of chemical treatment (e.g. lime) to facilitate construction would require additional soil chemistry evaluation and could affect landscape areas and some construction materials (e.g. aluminum).

If construction is performed during dry, hot or windy weather, it may be necessary to periodically apply surface watering to counter evaporative loss or re-establish moisture prior to constructing slabs (see Section 5.3.1).

6.4 TEMPORARY EXCAVATIONS

6.4.1 General

All excavations must comply with applicable local, State, and Federal safety regulations including the current OSHA Excavation and Trench Safety Standards. Construction site safety is generally the responsibility of the contractor, who shall also be solely responsible for the means, methods, and sequencing of construction operations. The information below is provided as a service to the client. Under no circumstances should the information provided be interpreted to mean that Kleinfelder is assuming responsibility for construction site safety or the contractor's activities; such responsibility is not being implied and should not be inferred.

6.4.2 Excavations and Slopes

The contractor should be aware that slope height, slope inclination, or excavation depths (including utility trench excavations) should in no case exceed those specified in local, State, and/or Federal safety regulations (e.g., OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Such regulations are strictly enforced and, if they are not followed, the owner, contractor, and/or earthwork and utility subcontractors could be liable for substantial penalties.

Near surface excavations should be constructed and maintained in conformance with current OSHA requirements (29 CFR Part 1926) for a Type B soil. Excavations deeper than about 4 feet should be constructed and maintained in conformance with current OSHA requirements (29 CFR Part 1926) for a type C soil.

6.4.3 Construction Considerations

Heavy construction equipment, building materials, excavated soil, and vehicular traffic should be kept sufficiently away from the top of any excavation to prevent any unanticipated surcharging. If it is necessary to encroach upon the top of an excavation, Kleinfelder can provide comments on slope gradients or loads on shoring to address surcharging, if provided with the geometry. Shoring, bracing, or underpinning required for the project (if any), should be designed by a professional engineer registered in the State of California.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering all excavations. All runoff should be collected and disposed of outside the construction limits.

6.5 TRENCH BACKFILL

6.5.1 Materials

Pipe zone backfill (i.e., bedding, haunching, and initial backfill per ASTM D2321) should consist of soil compatible with design requirements for the specific types of pipes. Consideration should be given to use of Class III or better material. It is recommended the project designer or pipe supplier develop the final material specifications based on planned pipe types, bedding conditions, tolerable deflection and other factors beyond the scope of this study. Randomly excavated on-site soil will likely be Class IV material per ASTM D2321. Selective excavation and striping would produce useable quantities of Class III material.

Trench zone backfill (i.e., material placed between the pipe zone backfill and finished subgrade) may consist of native soil that meets the requirements for engineered fill.

6.5.2 Compaction Criteria

All trench backfill should be placed and compacted in accordance with recommendations provided for engineered fill. Reduced compaction (85% minimum) could be specified for trench zone backfill in non-structural areas. Mechanical compaction is recommended; ponding or jetting should not be used.

Table 6.6-1 provides estimated geotechnical parameters for designers to consider in evaluating pipe zone backfill criteria that is compatible with pipe types and deformation tolerances.

TABLE 6.6-1
PIPE ZONE BACKFILL PARAMETERS

Soil Stiffness Modulus (psi)			Backfill Density (pcf)	
E'_n (Trench Sidewall)	E'_b (Backfill)		85% Compaction	90% Compaction
	85% Compaction	90% Compaction		
Class III				
4000	900	1350	120	127
Class IV				
4000	700	1000	113	120

E'_n represents the modulus for the trench wall soil and is based on relative density and data by Howard (1996). E'_b is the modulus for backfill derived from random excavation of on-site soil and is based on data by Hartley and Duncan (1982) and Watkins and Anderson (2000). The design E' will be dependent upon the pipe diameter and trench width, which dictates the relative influence of E'_n and E'_b. Methods by Howard (1996) are suggested for evaluating the design E'. Kleinfelder can furnish a recommended design E', if provided with pipe diameter and specifications for trench construction.

In evaluating the maximum load (Wc) on pipes, a Kμ' of 0.19 (K = 0.29 and μ' = 0.65) can be used in determining the load coefficient Cd.

7. ADDITIONAL SERVICES

7.1 PLANS AND SPECIFICATIONS REVIEW

It is recommended Kleinfelder conduct a general review of plans and specifications to evaluate that the earthwork and foundation recommendations have been properly interpreted and implemented during design. In the event Kleinfelder is not retained to perform this recommended review, no responsibility will be assumed for misinterpretation of the recommendations.

7.2 CONSTRUCTION OBSERVATION AND TESTING

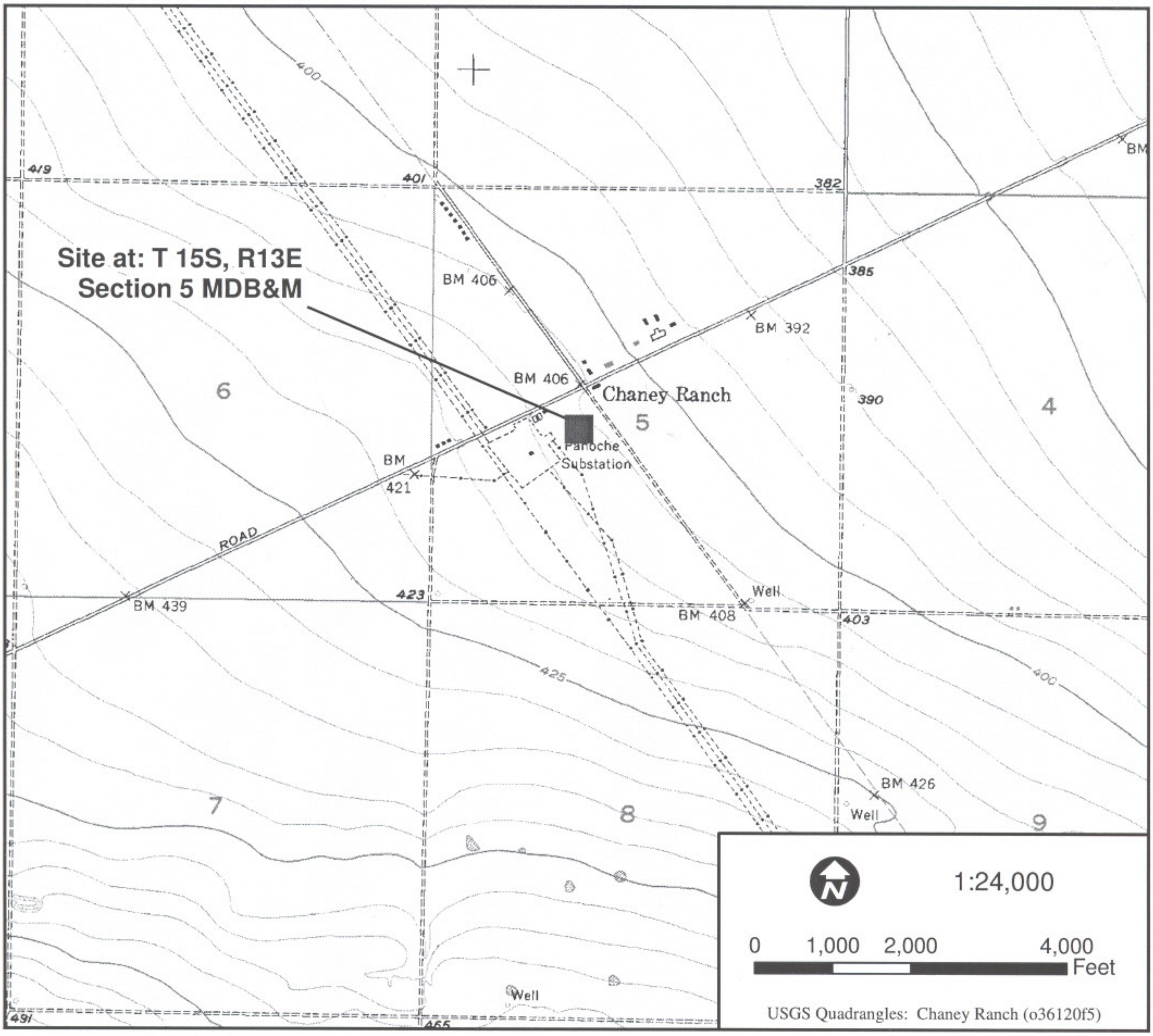
It is recommended that all earthwork during construction be monitored by a representative from Kleinfelder, including site preparation, placement of all engineered fill and trench backfill, construction of slab and pavement subgrades, and all foundation excavations. The purpose of these services would be to provide Kleinfelder the opportunity to observe the soil conditions encountered during construction, evaluate the applicability of the recommendations presented in this report to the soil conditions encountered, and recommend appropriate changes in design or construction procedures if conditions differ from those described herein.

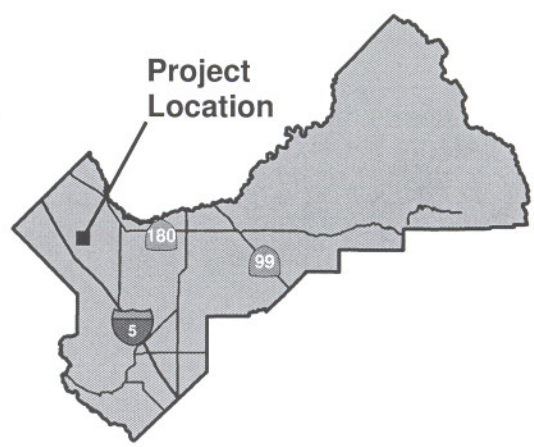
8. LIMITATIONS

Recommendations contained in this report are based on the field observations and subsurface explorations, laboratory tests, and present knowledge of the proposed construction. It is possible that soil conditions could vary between or beyond the points explored. If soil conditions are encountered during construction that differ from those described herein, Kleinfelder should be notified immediately in order that a review may be made and any supplemental recommendations provided. If the scope of the proposed construction changes from that described in this report, the recommendations provided should also be reviewed.

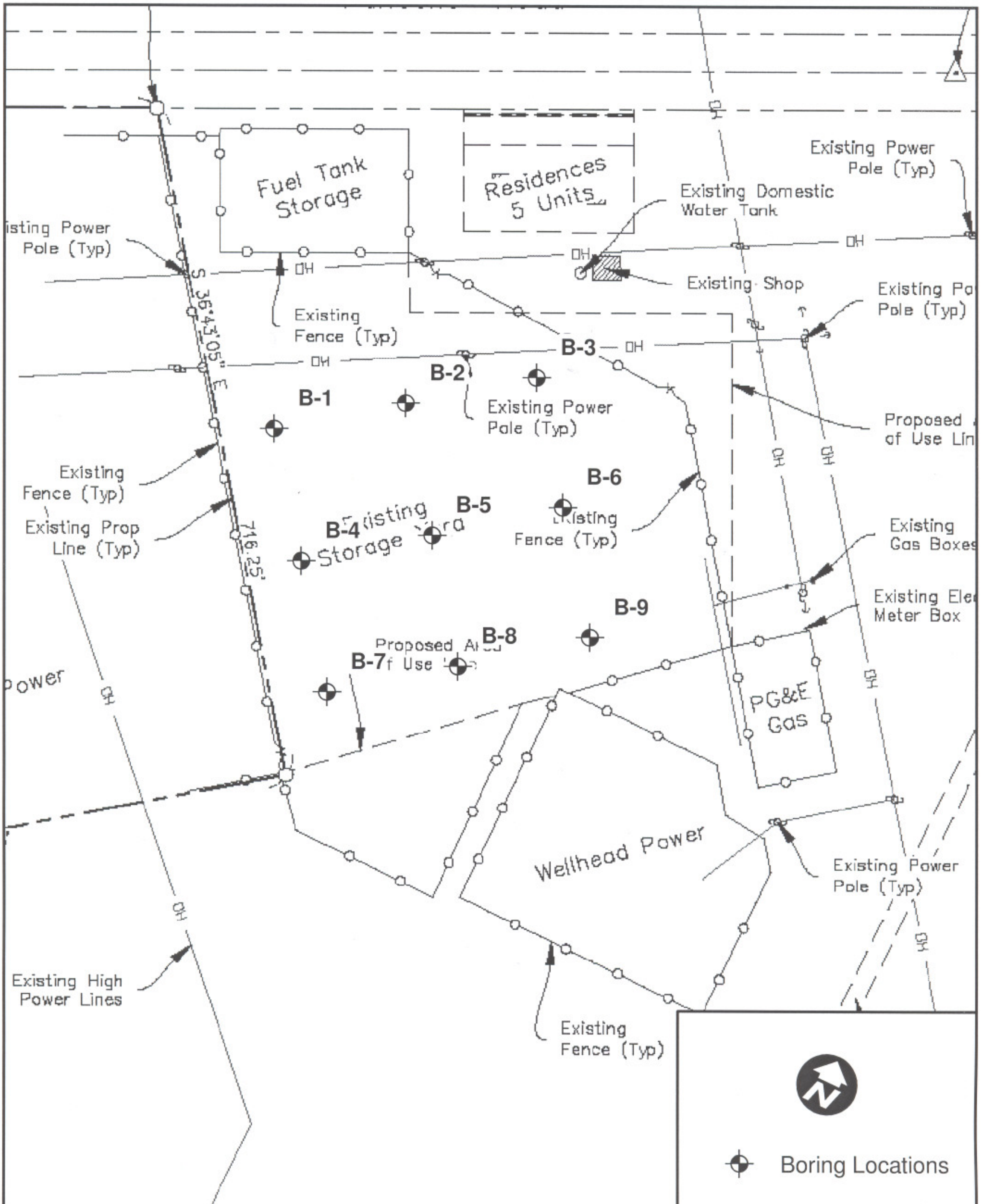
This report has been prepared in substantial accordance with the generally accepted geotechnical engineering practice, as it exists in the general area at the time of the study. No warranty is expressed or implied. The recommendations provided in this report are based on the assumption that Kleinfelder will conduct an adequate program of tests and observations during the construction phase in order to evaluate compliance with the recommendations.

This report may be used only by Starwood Power-Midway, LLC, their designated representatives and designers, and governing regulatory agencies, and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one year (without review) from the date of the report. Land use, site conditions or other factors may change over time, and additional work may be required with the passage of time. Any other party who wishes to use this report shall notify Kleinfelder of such intended use. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party.





KLEINFELDER 1410 F Street, Fresno, California, 93706 (559) 486-0750 fax: (559) 442-5081		**PROJECT VICINITY MAP** Calpeak Facility West Panoche Road Fresno County, California	**PLATE** **1**
PROJECT NUMBER: 73384.GEO	DATE: August 9, 2006		



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1410 F Street, Fresno, California, 93706
(559) 486-0750 fax: (559) 442-5081

PROJECT NUMBER: 73384.GEO | DATE: August 9, 2006

PROJECT SITE MAP
Calpeak Facility
West Panoche Road
Fresno County, California

PLATE 2

LOG SYMBOLS

Symbol	Description	Symbol	Description
	BULK / BAG SAMPLE	-4	PERCENT FINER THAN THE NO. 4 SIEVE (ASTM Test Method C 136)
	MODIFIED CALIFORNIA SAMPLER (2-1/2 inch outside diameter)	-200	PERCENT FINER THAN THE NO. 200 SIEVE (ASTM Test Method C 117)
	CALIFORNIA SAMPLER (3 inch outside diameter)	LL	LIQUID LIMIT (ASTM Test Method D 4318)
	STANDARD PENETRATION SPLIT SPOON SAMPLER (2 inch outside diameter)	PI	PLASTICITY INDEX (ASTM Test Method D 4318)
	NX SIZE CORE BARREL	EI	EXPANSION INDEX (UBC Standard 18-2)
	CONTINUOUS SAMPLER (3 inch outside diameter)	COL	COLLAPSE POTENTIAL
▼	WATER LEVEL (level after completion)	UC	UNCONFINED COMPRESSION
▽	WATER LEVEL (level where first encountered)	MC	MOISTURE CONTENT
	SEEPAGE	NFGWE	NO FREE GROUND WATER ENCOUNTERED

GENERAL NOTES

1. **Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual.**
2. **No warranty is provied as to the continuity of soil conditions between individual sample locations.**
3. **Logs represent general soil conditions observed at the point of exploration on the date indicated.**
4. **In general, Unified Soil Classification designations presented on the logs were evaluated by visual methods only. Therefore, actual designations (based on laboratory tests) may vary.**
5. **A temporary benckmark for relative elevation was located at:**

KEYLOGG 73384.GPJ 8/9/06

KLEINFELDER

Drafted By:	Project No.: **73384.GEO**	**LOG KEY**	**PLATE**
Date:	File Number:	**CALPEAK FACILITY** **WEST PANOCHE ROAD** **FRESNO COUNTY, CALIFORNIA**	**A**

Date Completed:	7/13/06	*Surface Conditions:*	Dry hard silt, sparse grass, flat
Logged By:	C.Davis	*Rig Type:*	CME 85
Total Depth:	41.5 feet	*Auger Type:*	6" H.S.
		Groundwater:	No free groundwater encountered.

Depth, ft	FIELD: Sample	FIELD: Blows/ ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura-tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION (*Approximate Surface Elevation (feet):*)
								SILT (ML)- light brown, moist, medium dense, with fine grained sand
		15	104.5	10.3				
5		3						
10		10	94.9	22.5				
								SILTY SAND (SM)- light brown, moist, medium dense, fine grained
15		8						
20		16	104.8	5.6				
25								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-1
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

A1

Depth, ft	Sample	Blows/ft	Dry Density pcf	Moisture Content %	Approx. Satura-tion %	Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
		7						
30		16	102.7	21.5				**LEAN CLAY (CL)**- light brown, moist, stiff, with fine grained sand
35		17						**POORLY GRADED SAND (SP)**- light brown, moist, medium dense, fine to medium grained
40		18						**SILTY SAND (SM)**- brown, moist, medium dense, fine to medium grained
45								
50								

Notes:
1.) Bottom of boring at 41.5 feet.
2.) No free groundwater encountered.
3.) Boring backfilled with soil cuttings 7/13/06.

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-1
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
2 of 2

A1

Date Completed: 7/13/06
Logged By: C.Davis
Total Depth: 41.5 feet

Surface Conditions: Dry hard silt, sparse grass, flat
Rig Type: CME 85 Auger Type: 6" H.S.
Groundwater: No free groundwater encountered.

Depth, ft	FIELD: Sample	FIELD: Blows/ ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura- tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION Approximate Surface Elevation (feet):
								SILT (ML)- light brown, moist, medium dense, with fine grained sand
		20	105.1	11.2				
5		9						
								SILTY SAND (SM)- brown, moist, medium dense, fine grained
10		7						
15		9	89.1	29.3				
20		3						
25								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-2
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Depth, ft	Sample	Blows/ft	Dry Density pcf	Moisture Content %	Approx. Saturation %	Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
		10	87.5	9.7				
30		15						
35		13	102.7	16.7				**SILT (ML)**- brown, moist, medium dense, with fine grained sand, slightly plastic
40		17						
45								**Notes:** **1.) Bottom of boring at 41.5 feet.** **2.) No free groundwater encountered.** **3.) Boring backfilled with soil cuttings 7/13/06.**
50								

KLEINFELDER

PROJECT NO. **73384.GEO**

LOG OF BORING B-2
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
2 of 2

A2

Date Completed: 7/13/06	*Surface Conditions:* **Dry hard silt, sparse grass, flat**
Logged By: **C.Davis**	*Rig Type:* **CME 85** *Auger Type:* **6" H.S.**
Total Depth: **41.5 feet**	*Groundwater:* **No free groundwater encountered.**

Depth, ft	FIELD: Sample	FIELD: Blows/ ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura-tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION (*Approximate Surface Elevation (feet):*)
								SILT (ML)- brown, moist, medium dense, with fine grained sand
		21	104.4	12.1				
5		5						
10								**SILTY SAND (SM)**- brown, moist, medium dense, fine grained
		11	95.5	8.6				
15		4						
20		13						
25								

Depth, ft	FIELD: Sample	FIELD: Blows/ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura-tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
		8						
30		11	100.9	3.9				**POORLY GRADED SAND (SP)**- light brown, moist, medium dense, fine to medium grained
35		11						**LEAN CLAY (CL)**- light brown, moist, stiff, with fine grained sand
40		20						
45								
50								

Notes:
1.) Bottom of boring at 41.5 feet.
2.) No free groundwater encountered.
3.) Boring backfilled with soil cuttings 7/13/06.

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-3
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Date Completed: 7/13/06

Logged By: C.Davis

Total Depth: 41.5 feet

Surface Conditions: Dry hard silt, sparse grass, flat

Rig Type: CME 85 Auger Type: 6" H.S.

Groundwater: No free groundwater encountered.

Depth, ft	FIELD: Sample	FIELD: Blows/ ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura-tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION Approximate Surface Elevation (feet):
0								**SILT (ML)**- brown, moist, medium dense, with fine grained sand
		21						
								SILTY SAND (SM)- light brown, moist, medium dense, fine grained
5		7	85.7	20.0				
								SILT (ML)- brown, moist, medium dense, medium dense, with fine grained sand
10		5						
15		16	106.8	3.3				
								SILTY SAND (SM)- brown, moist, medium dense, fine grained
20		8						
25								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-4
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
1 of 2

A4

Depth, ft	Sample	Blows/ft	Dry Density pcf	Moisture Content %	Approx. Satura- tion %	Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
		19	106.3	3.9				
30		15						
35		21						**LEAN CLAY (CL)**- brown, moist, medium dense, with fine grained sand
40		18						
45								**Notes:** **1.) Bottom of boring at 41.5 feet.** **2.) No free groundwater encountered.** **3.) Boring backfilled with soil cuttings 7/13/06.**
50								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-4
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE 2 of 2

A4

Date Completed: 7/13/04
Logged By: C.Davis
Total Depth: 101.5 feet

Surface Conditions: Dry hard silt, sparse grass, flat
Rig Type: CME 85 Auger Type: 6" H.S.
Groundwater: No free groundwater encountered.

Depth, ft	FIELD: Sample	FIELD: Blows/ ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura-tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION (Approximate Surface Elevation (feet):)
								SANDY LEAN CLAY (CL)- brown, moist, medium dense, with fine grained sand
		18	108.9	16.1				
								SILT (ML)- light brown, moist, medium dense, with fine grained sand
5		5						
								SILTY SAND (SM)- light brown, moist, medium dense, fine grained
10		8	88.9	3.8				
15		5						
20		16	86.2	1.2				
25								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-5
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Depth, ft	Sample	Blows/ft	Dry Density pcf	Moisture Content %	Approx. Saturation %	Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
		6						
30		15	83.5	20.6				
								SILT (ML)- light brown, moist, medium dense, with fine grained sand
35		17						
								LEAN CLAY (CL)- light brown, moist, stiff, with fine grained sand
40		22						
45								**SILTY SAND (SM)**- light brown, moist, medium dense, fine grained
		16						
50		25						

Depth, ft	FIELD Sample	FIELD Blows/ft	LABORATORY Dry Density pcf	LABORATORY Moisture Content %	LABORATORY Approx. Satura-tion %	LABORATORY Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
55		12						
60		32	100.5	11.4				
								... very dense, with fine gravel
65		80						
70								
								SILT (ML)- light brown, moist, medium dense, withfine grained sand
75		21						
								SILTY SAND (SM)- light brown, moist, medium dense, fine grained
80		50/3						

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-5
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
3 of 4

A5

Depth, ft	Sample	Blows/ft	Dry Density pcf	Moisture Content %	Approx. Saturation %	Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
85		50/2						**POORLY GRADED SAND (SP)**- light brown, moist, medium dense, fine to medium sand
90		13						**SILTY SAND (SM)**- brown, moist, medium dense, fine to medium grained
95		23						**SILT (ML)**- light brown, moist, medium dense, with fine grained sand
100		50/2						**SILTY SAND (SM)**- brown, moist, medium dense, fine grained
105								**Notes:** **1.) Bottom of boring at 41.5 feet.** **2.) No free groundwater encountered.** **3.) Boring backfilled with soil cuttings 7/14/06.**
110								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-5
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Date Completed:	7/13/06
Logged By:	C.Davis
Total Depth:	41.5 feet

Surface Conditions: **Dry hard silt, sparse grass, flat**

Rig Type: **CME 85** Auger Type: **6" H.S.**

Groundwater: **No free groundwater encountered.**

Depth, ft	FIELD Sample	FIELD Blows/ ft	LABORATORY Dry Density pcf	LABORATORY Moisture Content %	LABORATORY Approx. Satura-tion %	LABORATORY Other Tests	Pen, tsf	DESCRIPTION Approximate Surface Elevation (feet):
								SILT (ML)- brown, moist, medium dense, with fine grained sand
		21	100.6	18.1				
								SILTY SAND (SM)- brown, moist, medium dense, fine grained
5		7	92.2	7.7				
10		9						
15		11	104.5	9.0				
20		7						
25								**SILT (ML)**- brown, moist, medium dense, with

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-6
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Depth, ft	Sample	Blows/ft	Dry Density pcf	Moisture Content %	Approx. Saturation %	Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
								fine grained sand
		17						
30		21						
35								**LEAN CLAY (CL)**- brown, moist, stiff, with fine grained sand
		21	100.2	19.4				
40		19						
45								
50								

Notes:
1.) Bottom of boring at 41.5 feet.
2.) No free groundwater encountered.
3.) Boring backfilled with soil cuttings 7/13/06.

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-6
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Date Completed: 7/14/06

Logged By: C.Davis

Total Depth: 41.5 feet

Surface Conditions: Dry hard silt, sparse grass, flat

Rig Type: CME 85 Auger Type: 6" H.S.

Groundwater: No free groundwater encountered.

Depth, ft	FIELD Sample	FIELD Blows/ ft	LABORATORY Dry Density pcf	LABORATORY Moisture Content %	LABORATORY Approx. Satura-tion %	LABORATORY Other Tests	Pen, tsf	DESCRIPTION Approximate Surface Elevation (feet):
								SILT (ML)- brown, moist, medium dense, with fine grained sand
		16	107.4	15.8				
5		5						
								SILTY SAND (SM)- light brown, moist, medium dense, fine grained
10		10	90.0	7.1				
15		9						
								POORLY GRADED SAND (SP)- light brown, moist, medium dense, fine to medium grained
20		18	86.9	18.2				
25								**SILTY SAND (SM)**- light brown, moist, medium

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-7
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Depth, ft	Sample	Blows/ft	Dry Density pcf	Moisture Content %	Approx. Saturation %	Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
		8						dense, fine grained
30		16						**LEAN CLAY (CL)**- brown, moist, stiff, with fine grained sand
35		8						
40		23						
45								**Notes:** **1.) Bottom of boring at 41.5 feet.** **2.) No free groundwater encountered.** **3.) Boring backfilled with soil cuttings 7/13/06.**
50								

Date Completed: **7/14/06**
Logged By: **C.Davis**
Total Depth: **41.5 feet**

Surface Conditions: **Dry hard silt, sparse grass, flat**
Rig Type: **CME 85** Auger Type: **6" H.S.**
Groundwater: **No free groundwater encountered.**

Depth, ft	FIELD: Sample	FIELD: Blows/ ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura-tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION (Approximate Surface Elevation (feet):)
0								**SILT (ML)**- brown, moist, medium dense, with fine grained sand
		17						
5		19						
10		14						
								SILTY SAND (SM)- light brown, moist, medium dense, fine grained
15		7	89.9	3.2				
20		19						
25								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-8
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
1 of 2

A8

Depth, ft	FIELD Sample	Blows/ft	LABORATORY Dry Density pcf	Moisture Content %	Approx. Satura-tion %	Other Tests	Pen, tsf	DESCRIPTION (Continued from previous plate)
		17						
30		30						
35		28	105.1	4.9				
40		23						**SILT (ML)**- brown, moist, medium dense, with fine grained sand
45								
50								

Notes:
1.) Bottom of boring at 41.5 feet.
2.) No free groundwater encountered.
3.) Boring backfilled with soil cuttings 7/13/06.

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-8
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

Date Completed: **7/14/06**

Logged By: **C.Davis**

Total Depth: **41.5 feet**

Surface Conditions: **Dry hard silt, sparse grass, flat**

Rig Type: **CME 85** *Auger Type:* **6" H.S.**

Groundwater: **No free groundwater encountered.**

Depth, ft	FIELD: Sample	FIELD: Blows/ ft	LABORATORY: Dry Density pcf	LABORATORY: Moisture Content %	LABORATORY: Approx. Satura-tion %	LABORATORY: Other Tests	Pen, tsf	DESCRIPTION
								Approximate Surface Elevation (feet):
								SILT (ML)- brown, moist, medium dense, with fine grained sand
		16	105.3	15.4				
5		8						
								SILTY SAND (SM)- brown, moist, medium dense, fine grained
10		12	36.8	3.1				
15		4						
20		14						
25								

KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-9
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
1 of 2

A9

Depth, ft	FIELD Sample	FIELD Blows/ft	LABORATORY Dry Density pcf	LABORATORY Moisture Content %	LABORATORY Approx. Satura-tion %	LABORATORY Other Tests	Pen, tsf	DESCRIPTION
								(Continued from previous plate)
		14						
30		31	33.2	21.5				
35		16						**SILT (ML)**- brown, moist, medium dense, with fine grained sand
40		21						
45								**Notes:** **1.) Bottom of boring at 41.5 feet.** **2.) No free groundwater encountered.** **3.) Boring backfilled with soil cuttings 7/13/06.**
50								

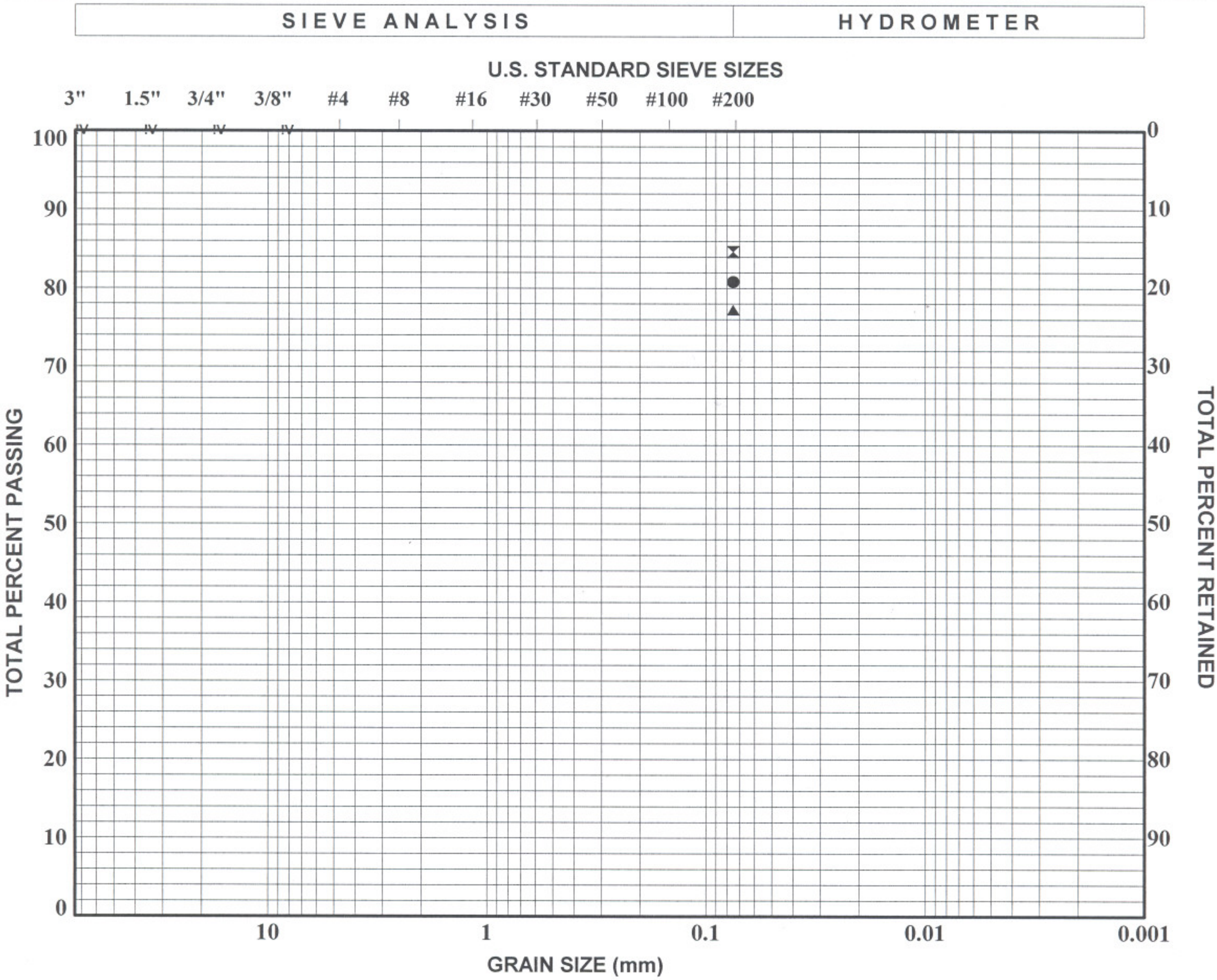
KLEINFELDER

PROJECT NO. 73384.GEO

LOG OF BORING B-9
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
2 of 2

A9



GRAVEL		SAND			SILT	CLAY
coarse	fine	coarse	medium	fine		

Symbol	Sample	Depth (ft)	Description	Classification
●	B-5	0.0 - 5.0	Silt	ML
⧗	B-7	0.0 - 5.0	Silt	ML
▲	B-7	6.0	Silt	ML

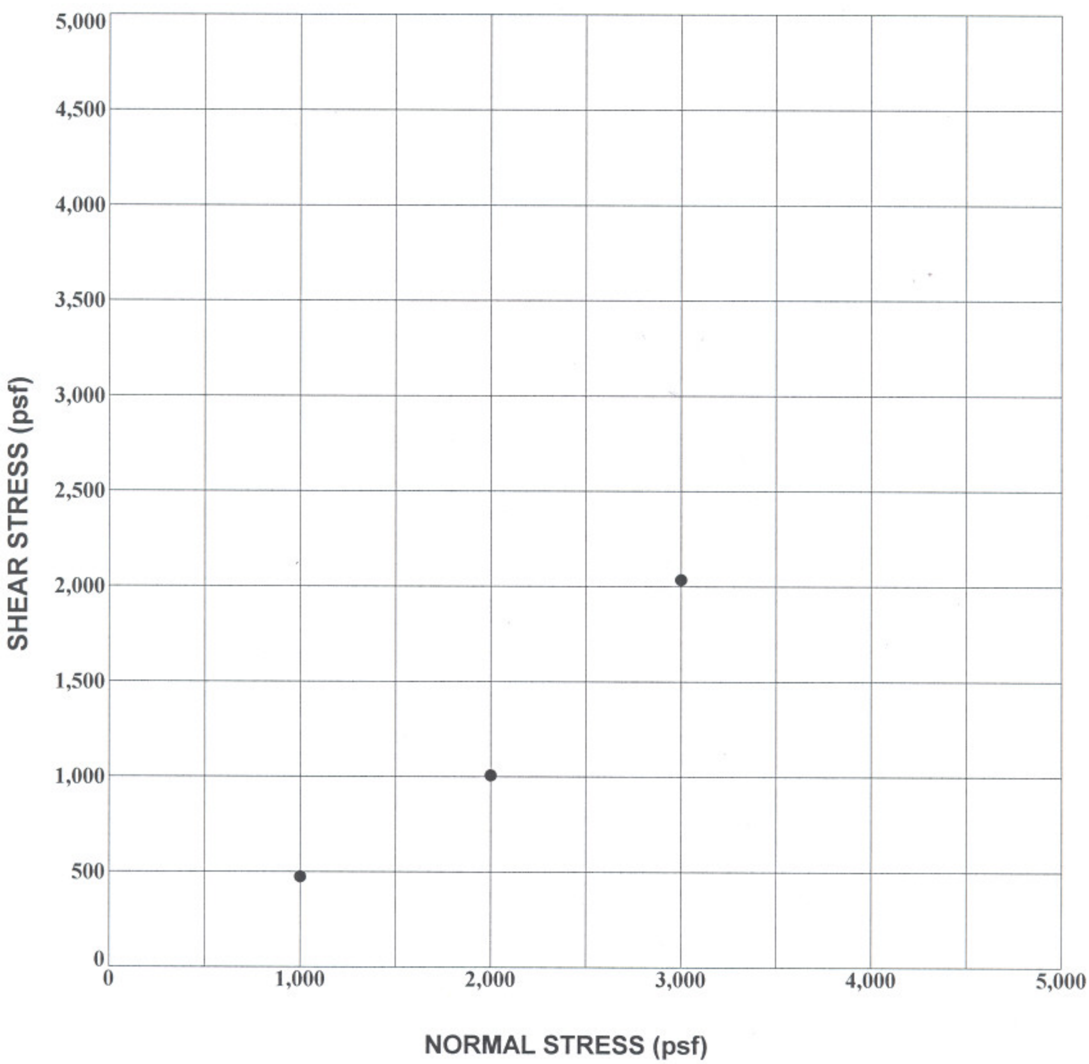
KLEINFELDER

PROJECT NO. 73384.GEO

GRAIN SIZE DISTRIBUTION
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
B-1

DIRECT SHEAR



Source: B-2

Depth: 2.0 ft

Test Type: Consolidated - Drained

Soil Description: Silt (ML)

Dry Density (pcf)	105.1	105.1	105.1
Initial Water Content (%)	11.2	11.2	11.2
Final Water Content (%)	26.4	21.6	21.6
Normal Stress (psf)	1000	2000	3000
Shear Stress(psf)	474	1006	2034

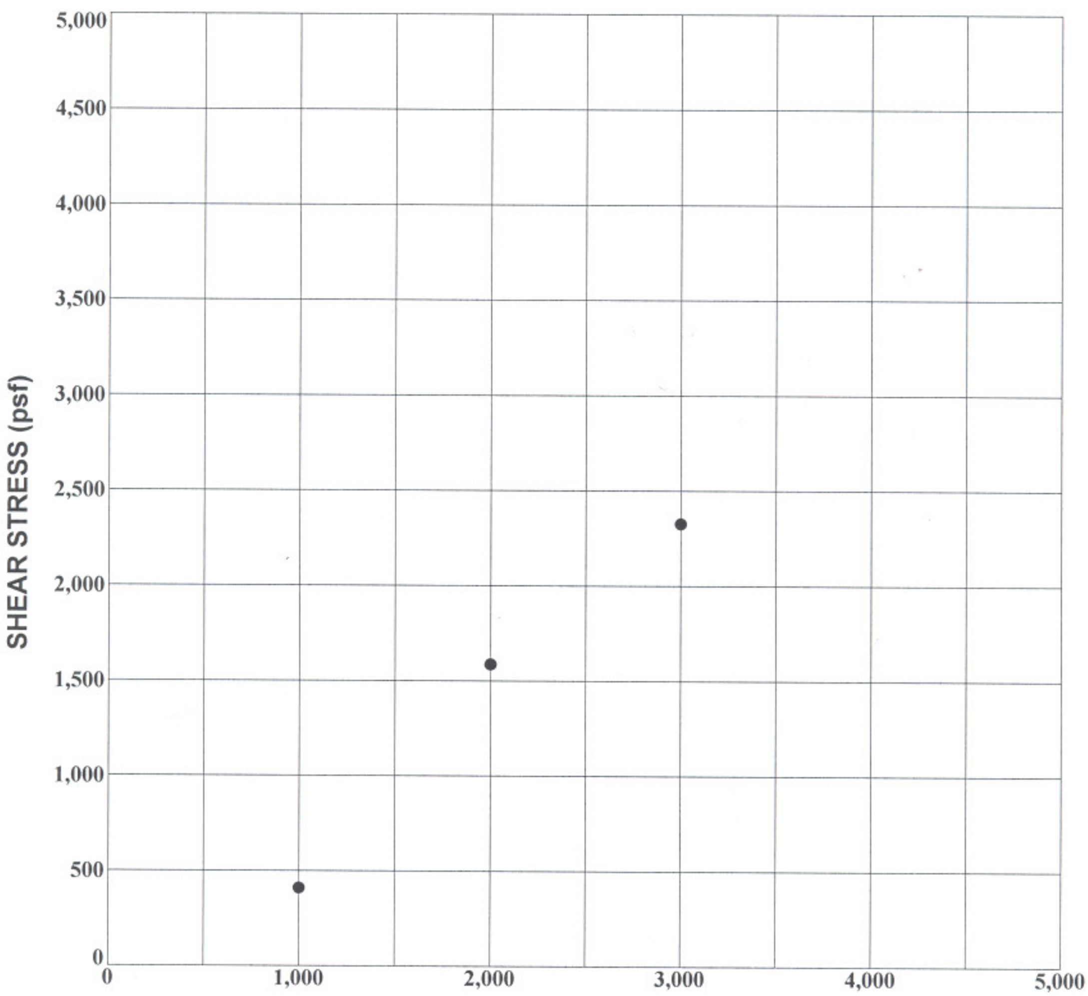
KLEINFELDER

DIRECT SHEAR TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
B-2

PROJECT NO. 73384.GEO

DIRECT SHEAR



Source: B-5
Depth: 2.0 ft
Test Type: Consolidated - Drained
Soil Description: Silt (ML)

Dry Density (pcf)	108.9	108.9	108.9
Initial Water Content (%)	16.1	16.1	16.1
Final Water Content (%)	19.8	19.9	26.2
Normal Stress (psf)	1000	2000	3000
Shear Stress(psf)	409	1587	2326

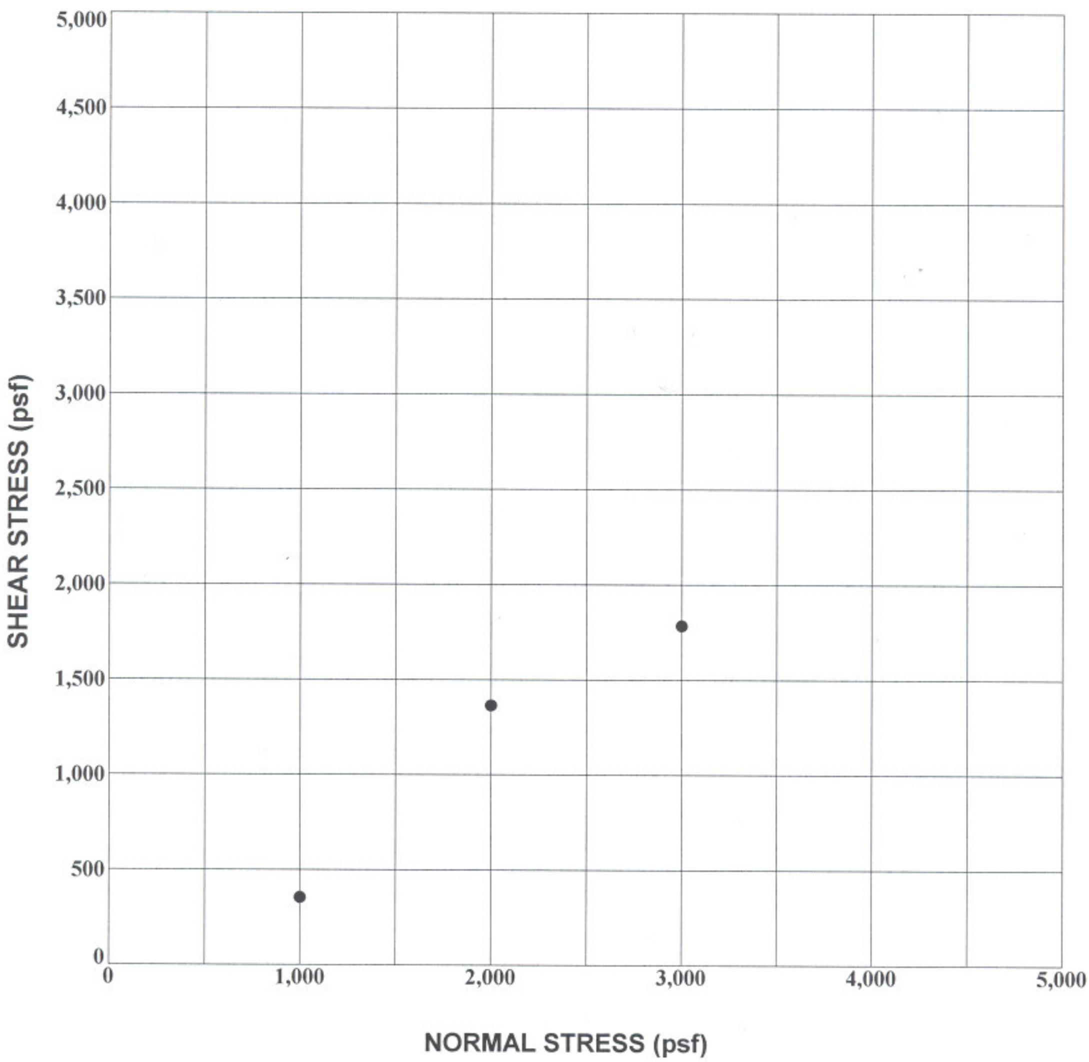
KLEINFELDER

PROJECT NO. 73384.GEO

DIRECT SHEAR TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
B-3

DIRECT SHEAR



Source: B-6
Depth: 6.0 ft
Test Type: Consolidated - Drained
Soil Description: Silt (ML)

Dry Density (pcf)	92.2	92.2	92.2
Initial Water Content (%)	7.7	7.7	7.7
Final Water Content (%)	24.7	26.8	26.4
Normal Stress (psf)	1000	2000	3000
Shear Stress(psf)	354	1364	1784

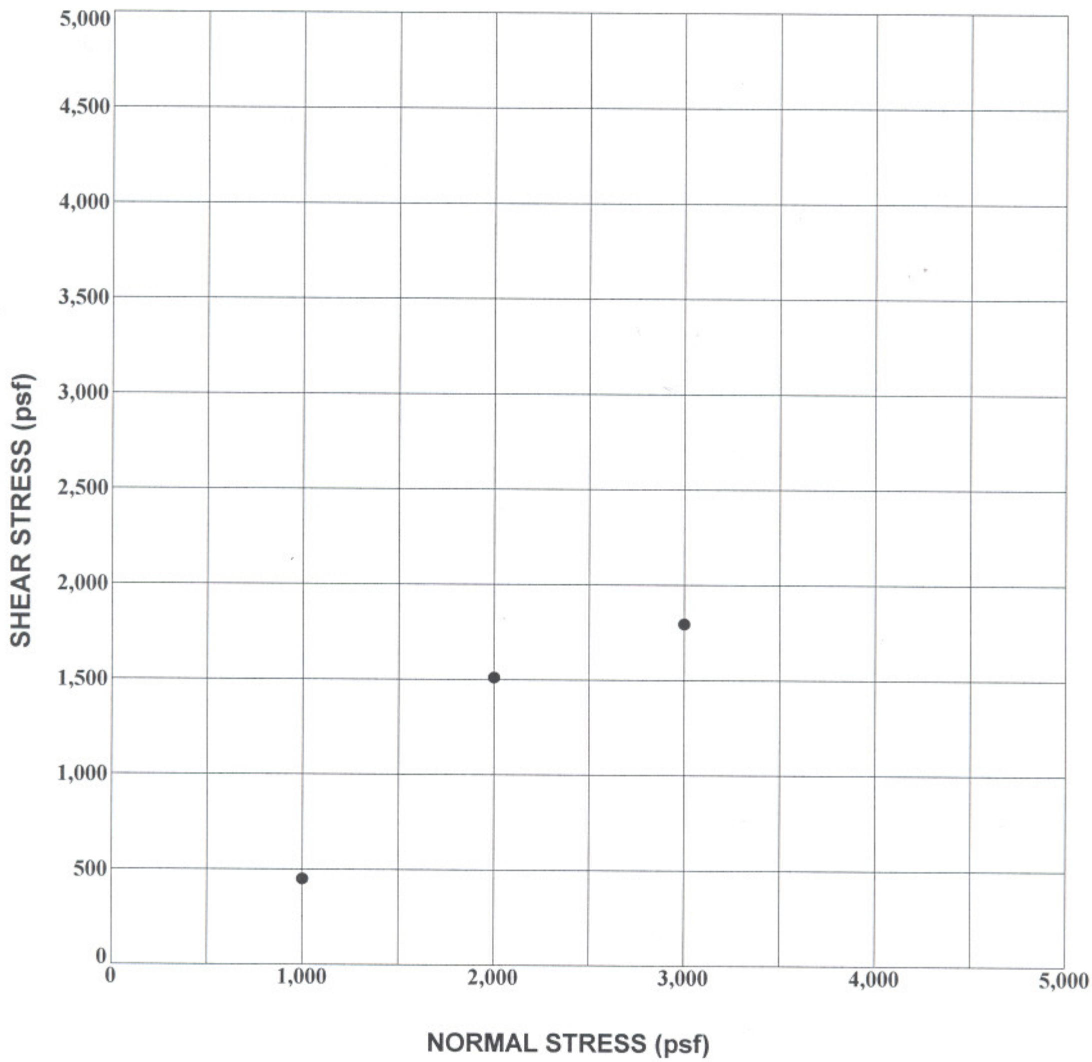
KLEINFELDER

PROJECT NO. 73384.GEO

DIRECT SHEAR TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
B-4

DIRECT SHEAR



Source: B-7
Depth: 2.0 ft
Test Type: Consolidated - Drained
Soil Description: Silt (ML)

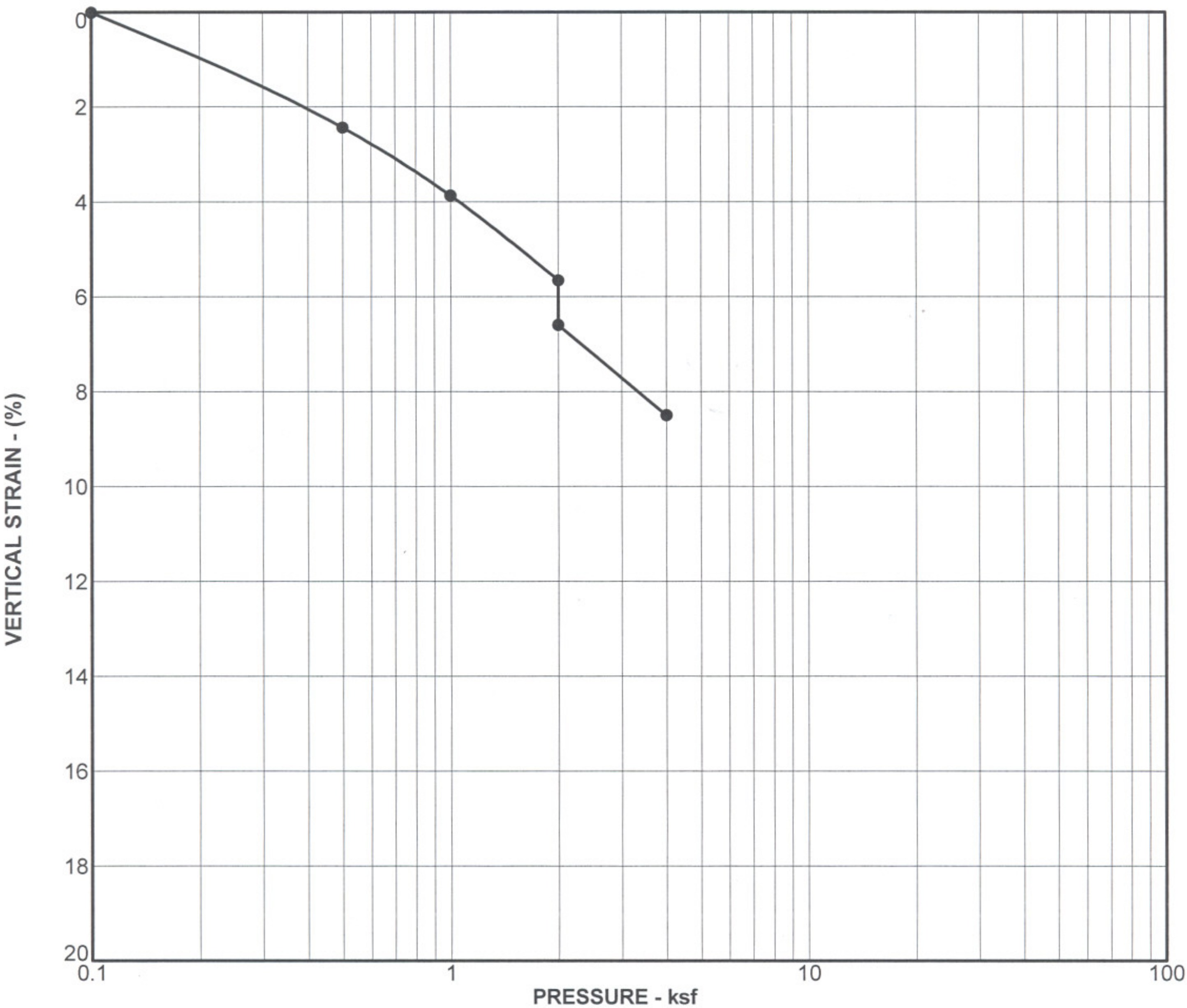
Dry Density (pcf)	107.4	107.4	107.4
Initial Water Content (%)	15.8	15.8	15.8
Final Water Content (%)	31.1	29.2	26.6
Normal Stress (psf)	1000	2000	3000
Shear Stress(psf)	450	1510	1795

KLEINFELDER

PROJECT NO. 73384.GEO

DIRECT SHEAR TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE
B-5



Sample	B-4
Depth	6.0 ft
Description	Silt
Classification	ML

	Initial	Final
Dry density, pcf	88.9	97.2
Water content, %	20.0	32.7
Sample height, in.	1	0.9149

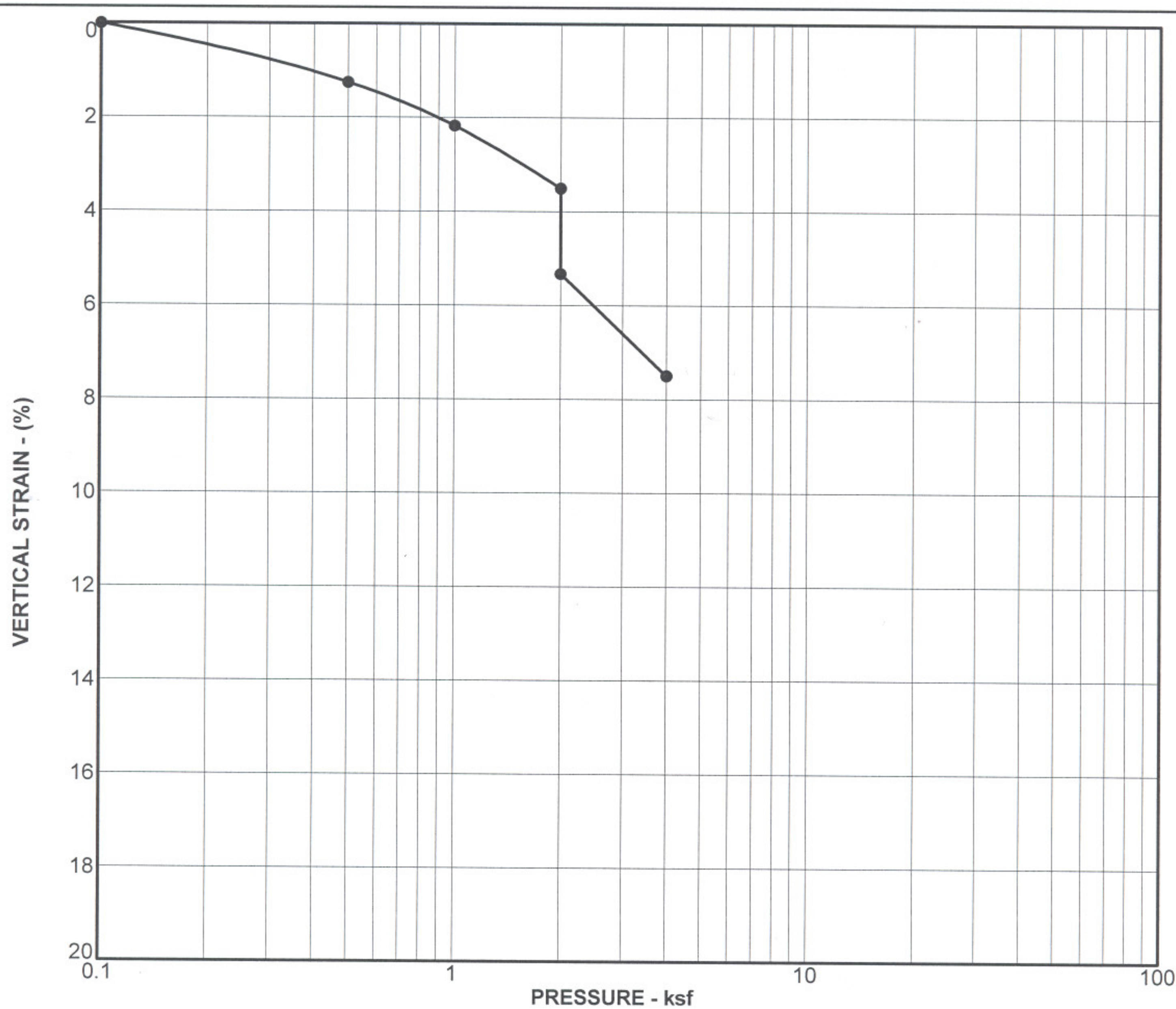
KLEINFELDER

PROJECT NO. 73384.GEO

CONSOLIDATION TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE

B-6



Sample	B-5
Depth	11.0 ft
Description	Silty Sand
Classification	SM

	Initial	Final
Dry density, pcf	86.5	93.5
Water content, %	5.5	19.8
Sample height, in.	1	0.9248

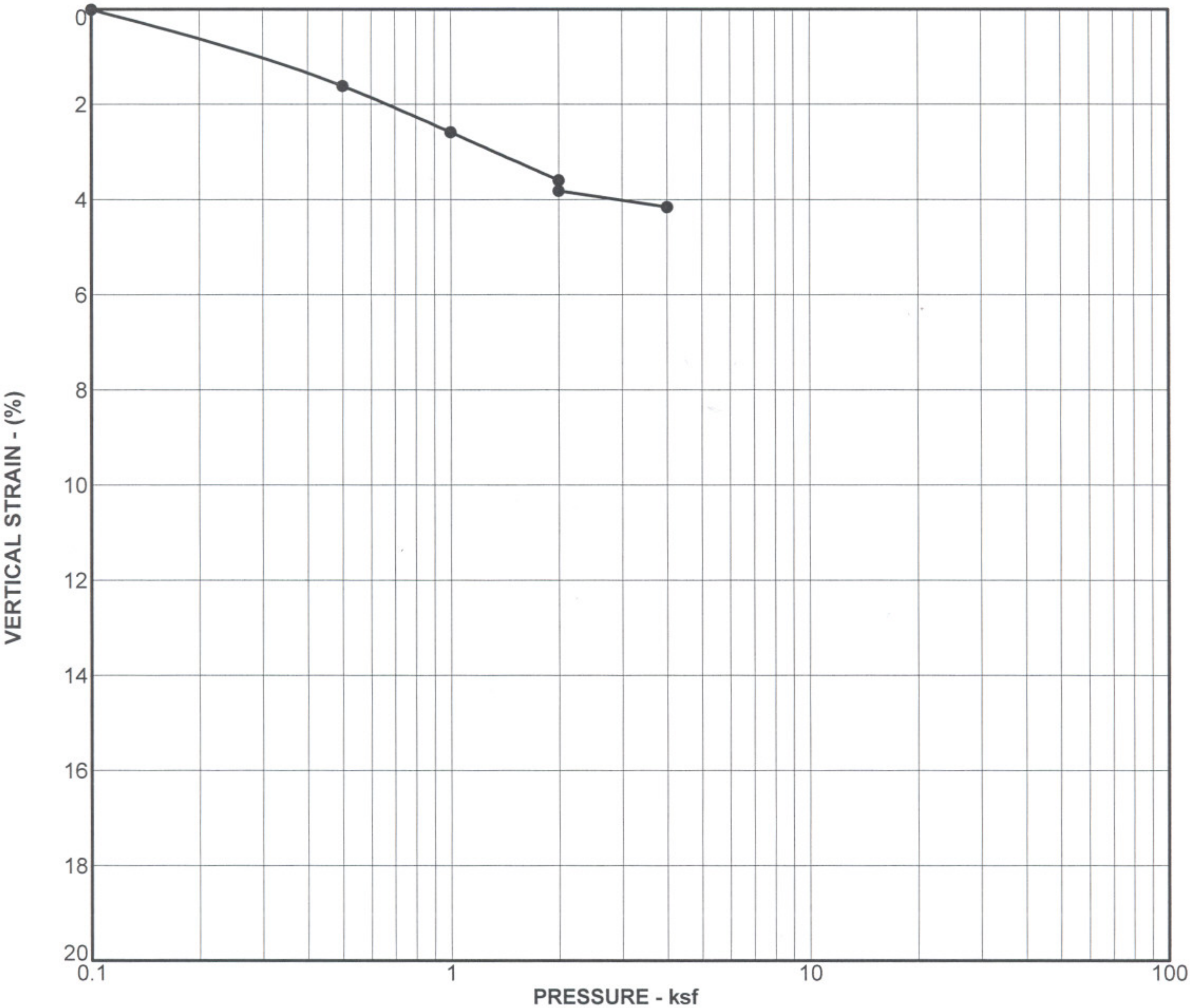
KLEINFELDER

PROJECT NO. 73384.GEO

CONSOLIDATION TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE

B-7



Sample	B-6
Depth	2.0 ft
Description	Silt
Classification	ML

	Initial	Final
Dry density, pcf	100.6	105.0
Water content, %	18.1	11.7
Sample height, in.	1	0.9583

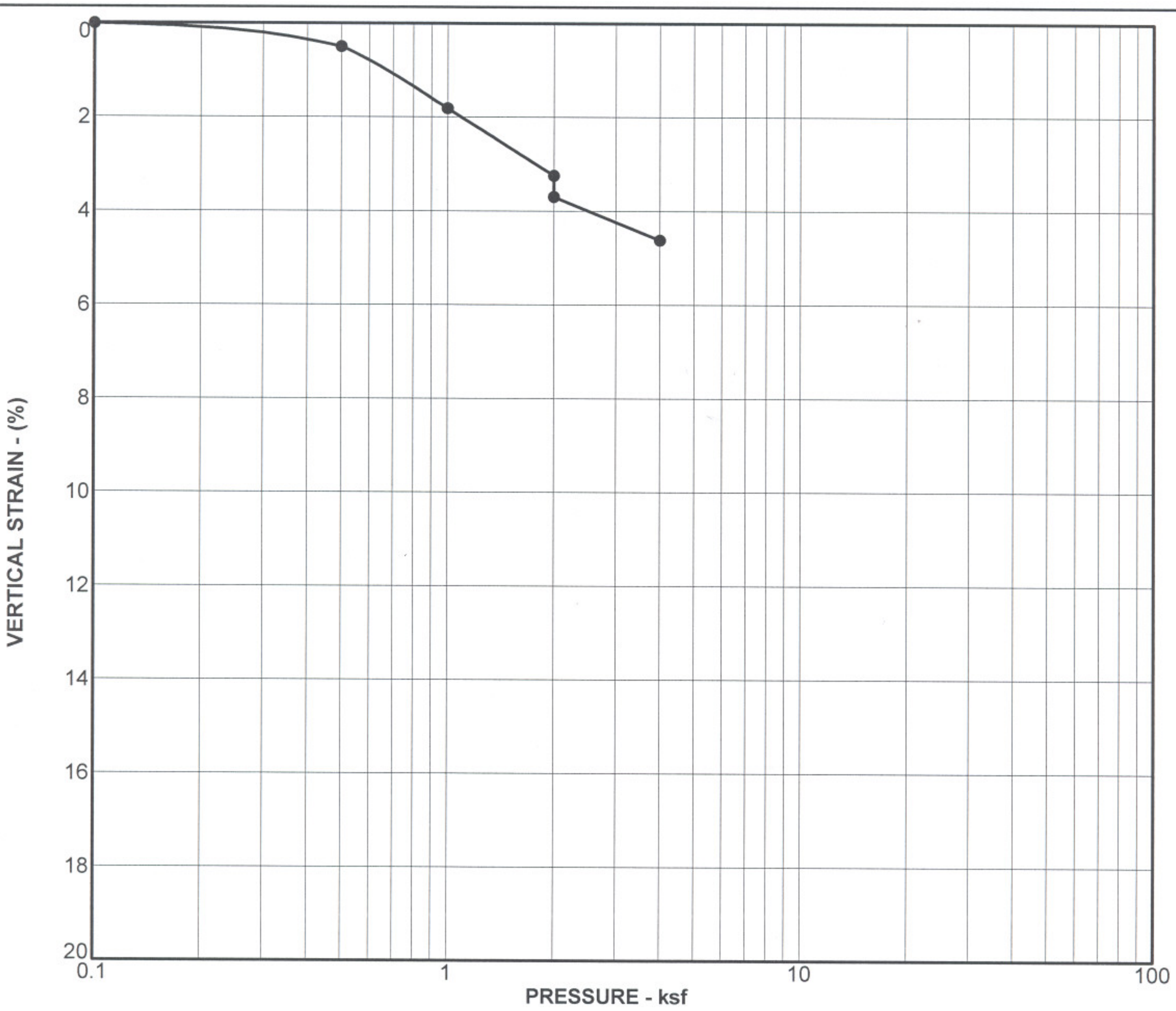
KLEINFELDER

PROJECT NO. 73384.GEO

CONSOLIDATION TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE

B-8



Sample	B-7
Depth	2.0 ft
Description	Silt
Classification	ML

	Initial	Final
Dry density, pcf	107.4	111.0
Water content, %	15.8	19.7
Sample height, in.	1	0.9535

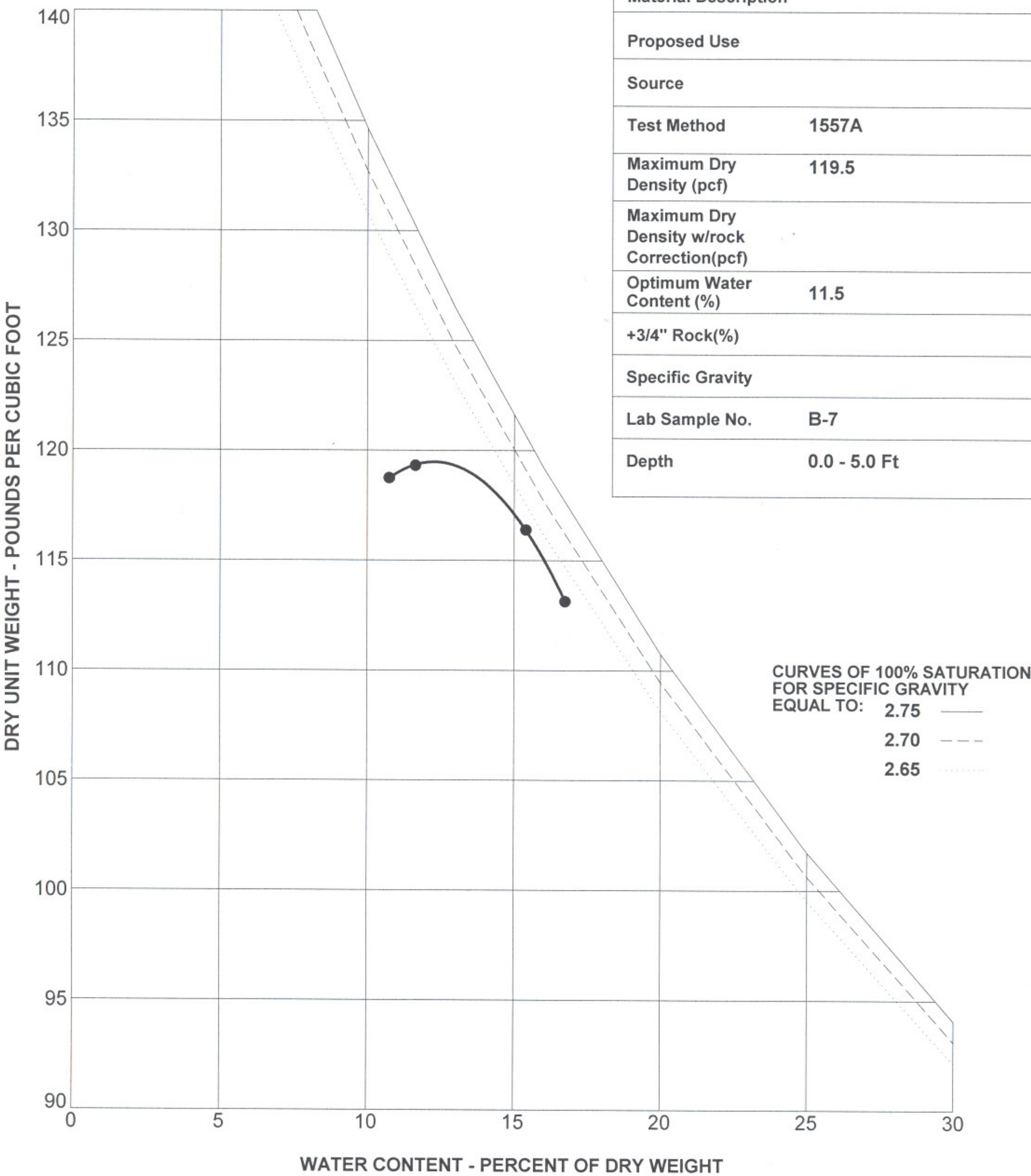
KLEINFELDER

PROJECT NO. 73384.GEO

CONSOLIDATION TEST
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE

B-9



SUMMARY OF TEST RESULTS	
Material Description	Silt
Proposed Use	
Source	
Test Method	1557A
Maximum Dry Density (pcf)	119.5
Maximum Dry Density w/rock Correction(pcf)	
Optimum Water Content (%)	11.5
+3/4" Rock(%)	
Specific Gravity	
Lab Sample No.	B-7
Depth	0.0 - 5.0 Ft

KLEINFELDER

PROJECT NO. 73384.GEO

MOISTURE DENSITY RELATIONSHIP
CALPEAK FACILITY
WEST PANOCHE ROAD
FRESNO COUNTY, CALIFORNIA

PLATE

B-10

WATER DATA

Water Resources Appendix

CONTENTS

I.
Existing CalPeak Well Data

BSK ANALYTICAL LABORATORIES

Certificate of Analysis

NELAP Certificate #04227CA
ELAP Certificate #1180

Report Issue Date: 04/18/2006

Gayle Pate
CalPeak Power, LLC
7365 Mission George Road Suite C
San Diego, CA 92120-1274

BSK Submission #: 2006032352
BSK Sample ID #: 705432

Project ID: Project Desc:

Submission Comments:
Sample Type: Liquid
Sample Description: Well Water
Sample Comments:

Date Sampled: 03/30/2006
Time Sampled: 1430
Date Received: 03/30/2006

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date/Time	Analysis Date/Time
Alkalinity (as CaCO3)	SM 2320 B	**140**	mg/L	3	1	3	03/30/06	03/30/06
Ammonia (NH3-N)	SM 4500-NH3 F	**ND**	mg/L	1	1	1	04/06/06	04/06/06
Bicarbonate (as CaCO3)	SM 2320 B	**140**	mg/L	3	1	3	03/30/06	03/30/06
Boron (B)	EPA 200.7	**4.2**	mg/L	0.1	1	0.1	04/04/06	04/11/06
Calcium (Ca)	EPA 200.7	**240**	mg/L	0.1	1	0.1	04/04/06	04/11/06
Carbonate (as CaCO3)	SM 2320 B	**ND**	mg/L	1	1	1	03/30/06	03/30/06
Chloride (Cl)	EPA 300.0	**200**	mg/L	1	6	6	03/31/06	03/31/06
Conductivity - Specific (EC)	SM 2510 B	**4000**	µmho/cm	1	1	1	03/30/06	03/30/06
Hardness (as CaCO3)	SM 2340 B	**1500**	mg/L	1.0	1	1.0	04/14/06	04/14/06
Hydroxide (as CaCO3)	SM 2320 B	**ND**	mg/L	1	1	1	03/30/06	03/30/06
Iron (Fe)	EPA 200.7	**ND**	mg/L	0.05	1	0.05	04/04/06	04/11/06
Magnesium (Mg)	EPA 200.7	**220**	mg/L	0.1	1	0.1	04/04/06	04/11/06
Nitrate (NO3)	EPA 300.0	**140**	mg/L	1	6	6	03/31/06 12:43	03/31/06 12:43
o-Phosphate (o-PO4-P)	EPA 300.0	**ND**	mg/L	0.2	6	1.2	03/31/06 12:43	03/31/06 12:43
pH at 21.60°C	SM 4500-H+ B	**7.8**	Std. Unit	-	1	N/A	03/30/06 19:17	03/30/06 19:17
Potassium (K)	EPA 200.7	**8.4**	mg/L	2	1	2	04/04/06	04/11/06
Silica - Total (SiO2)	EPA 200.7	**47**	mg/L	0.2	1	0.2	04/04/06	04/11/06
Sodium (Na)	EPA 200.7	**470**	mg/L	1	1	1	04/04/06	04/11/06
Sulfate (SO4)	EPA 300.0	**1900**	mg/L	2	30	60	03/31/06	03/31/06
Total Dissolved Solids (TDS)	SM 2540 C	**3400**	mg/L	5	1	5	03/31/06	04/04/06
Total Suspended (TSS)	SM 2540 D	**ND**	mg/L	5	1	5	03/31/06	04/04/06

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting
: PQL x Dilution
ND: None Detected at DLR
pCi/L: Picocurie per Liter

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory. See External Laboratory Report attachments.

Report Authentication Code:

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

FINAL

CalPeak Power, LLC 04/18/2006

Project ID/Desc:

BSK Submission #: 2006032352

Laboratory Order #: 705432

Sample Desc: Well Water

MASS BALANCE REPORT

Analyte	Concentration (mg/L)	Mult	Cation Meq	Anion Meq
Alkalinity	140			
Conductivity	4000			
TDS	3400			
pH	7.8			
Nitrate	140	0.0161		2.250
Sulfate	1900	0.0208		39.520
Bicarbonate	140	0.0200		2.780
Carbonate	ND	0.0200		
Chloride	200	0.0282		5.640
Calcium	240	0.0500	11.900	
Potassium	8.4	0.0255	0.210	
Magnesium	220	0.0822	18.330	
Sodium	470	0.0435	20.450	

Ion Totals/ Deviation: **50.890** **50.200** **0.690**

% Difference:	**0.7**
Sodium Absorption Ratio (SAR):	**5.3**
% Sodium:	**40.3**
TDS/EC:	**0.860**
Alkalinity:	**116**
Hardness (mg/L):	**1,512.6**

PLICATE
ler's Copy
Pa. ___ of ___
Owner's Well No. ___
Date Work Began ___ Ended 10-2-01
Local Permit Agency FRESNO
Permit No. 20554 Permit Date 7-2-01

STATE OF CALIFORNIA
WELL COMPLETION REPORT
Refer to Instruction Pamphlet
No. 748728

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

GEOLOGIC LOG

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

DEPTH FROM SURFACE Ft. to Ft.		DESCRIPTION Describe material, grain size, color, etc.
0	20	top soil
20	40	gravel (large)
40	60	clay & gravel
60	85	gravel (large)
85	120	rocks
120	160	gravel
160	180	hard clay
180	210	rocks 2"
210	270	clay & gravel
270	290	gravel
290	310	clay
310	340	rocks 2"
340	415	clay & gravel
415	430	gravel (large 2")
430	450	clay & gravel
450	490	rocks
490	510	clay

TOTAL DEPTH OF BORING 510 (Feet)
TOTAL DEPTH OF COMPLETED WELL 500 (Feet)

WELL OWNER

PONCHE SUB STATION
Name ARB INC
Mailing Address 43711 W. PONACHE RD.
MENDOTA, CA. 93640
CITY STATE ZIP

WELL LOCATION

Address 43711 W. PONACHE RD.
City MENDOTA
County FRESNO
APN Book 27 Page 06 Parcel 01
Township 15s Range 13e Section 5
Latitude ___ DEG. MIN. SEC. NORTH Longitude ___ DEG. MIN. SEC. WEST

LOCATION SKETCH

NORTH

WEST EAST

SOUTH

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

ACTIVITY (✓)

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

PLANNED USES (✓)

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

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER 250 (Ft.) BELOW SURFACE
DEPTH OF STATIC WATER LEVEL 250 (Ft.) & DATE MEASURED 10-21-01
ESTIMATED YIELD * 100 (GPM) & TEST TYPE ___
TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN 0 (Ft.)
* May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	BLANK	SCREEN	CON-DUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	440	10	x				PVC	5	sch200	
440	500	10		x			PVC	5	sch200	.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	CE-MENT (✓)	BEN-TONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	20		x		
20	500			x	5/16#2

ATTACHMENTS (✓)

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

CERTIFICATION STATEMENT

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

NAME ARTHUR & ORUM WELL DRILLING INC.
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

3262 E. CONEJO AVE. FRESNO, CA. 93725
ADDRESS CITY STATE ZIP

Signed ___ 10-3-01 361319
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

II.
Irrigation Return Flow
Agricultural Backwash Pond
Water Quality Data

BSK ANALYTICAL LABORATORIES

JJ Fair
CalPeak Power, LLC
7365 Mission George Road Suite C
San Diego, CA 92120-1274

Certificate of Analysis

ELAP Certificate #1180

Report Issue Date: 10/13/2006

BSK Submission #: 2006100419

BSK Sample ID #: 776004

Project ID: Project Desc: Starwood / Panoche

Submission Comments:

Sample Type: Liquid
Sample Description: Settling Pond
Sample Comments:

Date Sampled: 10/03/2006
Time Sampled: 1100
Date Received: 10/05/2006

Inorganics

Analyte	Method	Result	Units	PQL	Dilution	DLR	Prep Date	Analysis Date	
Alkalinity (as CaCO3)	SM 2320 B	**72**	mg/L	3.0	1	3.0	10/05/2006	10/05/2006	
Ammonia (NH3-N)	SM 4500-NH3 F	**ND**	mg/L	1.0	1	1.0	10/10/2006	10/10/2006	
Bicarbonate (as CaCO3)	SM 2320 B	**ND**	mg/L	3.0	1	3.0	10/05/2006	10/05/2006	
Boron (B)	EPA 200.7	**0.13**	mg/L	0.10	1	0.10	10/09/2006	10/09/2006	
Calcium (Ca)	EPA 200.7	**14**	mg/L	0.10	1	0.10	10/09/2006	10/09/2006	
Carbonate (as CaCO3)	SM 2320 B	**62**	mg/L	1.0	1	1.0	10/05/2006	10/05/2006	
Chloride (Cl)	EPA 300.0	**48**	mg/L	1.0	1	1.0	10/05/2006	10/05/2006	
Conductivity - Specific (EC)	SM 2510 B	**310**	µmho/cm	1.0	1	1.0	10/05/2006	10/05/2006	
Hardness (as CaCO3)	SM 2340 B	**61**	mg/L	1.0	1	1.0	10/12/2006	10/12/2006	
Hydroxide (as CaCO3)	SM 2320 B	**9.8**	mg/L	1.0	1	1.0	10/05/2006	10/05/2006	
Iron (Fe)	EPA 200.7	**0.076**	mg/L	0.050	1	0.050	10/09/2006	10/09/2006	
Magnesium (Mg)	EPA 200.7	**6.3**	mg/L	0.10	1	0.10	10/09/2006	10/09/2006	
Nitrate (NO3)	EPA 300.0	**ND**	mg/L	1.0	1	1.0	10/05/2006	10/05/2006	H
o-Phosphate (o-PO4-P)	EPA 300.0	**ND**	mg/L	0.20	1	0.20	10/05/2006	10/05/2006	H
pH	SM 4500-H+ B	**9.8**	Std. Unit	-	1	N/A	10/05/2006	10/05/2006	H
Potassium (K)	EPA 200.7	**ND**	mg/L	2	1	2	10/09/2006	10/09/2006	
Silica - Total (SiO2)	EPA 200.7	**10**	mg/L	0.20	1	0.20	10/09/2006	10/09/2006	
Sodium (Na)	EPA 200.7	**38**	mg/L	1.0	1	1.0	10/09/2006	10/09/2006	
Sulfate (SO4)	EPA 300.0	**21**	mg/L	2	1	2	10/05/2006	10/05/2006	
Total Solids (TS)	SM 2540 B	**190**	mg/L	5.0	1	5.0	10/09/2006	10/11/2006	
Total Dissolved Solids (TDS)	SM 2540 C	**170**	mg/L	5.0	1	5.0	10/09/2006	10/11/2006	

mg/L: Milligrams/Liter (ppm)
mg/Kg: Milligrams/Kilogram (ppm)
µg/L: Micrograms/Liter (ppb)
µg/Kg: Micrograms/Kilogram (ppb)
%Rec: Percent Recovered (surrogates)

PQL: Practical Quantitation Limit
DLR: Detection Limit for Reporting
: PQL x Dilution
ND: None Detected at DLR

H: Analyzed outside of hold time
P: Preliminary result
S: Suspect result. See Case Narrative for comments.
E: Analysis performed by External laboratory.
See External Laboratory Report attachments.

Report Authentication Code:

1414 Stanislaus Street Fresno, CA 93706-1623 Phone 559-497-2888, In CA 800-877-8310 Fax 559-485-6935

III.
General Information
San Joaquin Valley Groundwater Basin
Westside Subbasin

San Joaquin Valley Groundwater Basin Westside Subbasin

- Groundwater Subbasin Number: 5-22.09
- County: Fresno, Kings
- Surface Area: 640,000 acres (1,000 square miles)

Basin Boundaries and Hydrology

The San Joaquin Valley is surrounded on the west by the Coast Ranges, on the south by the San Emigdio and Tehachapi Mountains, on the east by the Sierra Nevada and on the north by the Sacramento-San Joaquin Delta and Sacramento Valley. The northern portion of the San Joaquin Valley drains toward the Delta by the San Joaquin River and its tributaries, the Fresno, Merced, Tuolumne, and Stanislaus Rivers. The southern portion of the valley is internally drained by the Kings, Kaweah, Tule, and Kern Rivers that flow into the Tulare drainage basin including the beds of the former Tulare, Buena Vista, and Kern Lakes.

The Westside Subbasin consists mainly of the lands in Westlands Water District. It is located between the Coast Range foothills on the west and the San Joaquin River drainage and Fresno Slough on the east. The subbasin is bordered on the southwest by the Pleasant Valley Groundwater Subbasin and on the west by Tertiary marine sediments of the Coast Ranges, on the north and northeast by the Delta-Mendota Groundwater Subbasin, and on the east and southeast by the Kings and Tulare Lake Groundwater Subbasins. Average annual precipitation varies across the subbasin from 7 inches in the south to 9 inches in the north.

Hydrogeologic Information

Water Bearing Formations

The aquifer system comprising the Westside Subbasin consists of unconsolidated continental deposits of Tertiary and Quaternary age. These deposits form an unconfined to semi-confined upper aquifer and a confined lower aquifer. These aquifers are separated by an aquitard named the Corcoran Clay (E-Clay) member of the Tulare Formation.

The unconfined to semi-confined aquifer (upper zone) above the Corcoran Clay includes younger alluvium, older alluvium, and part of the Tulare Formation. These deposits consist of highly lenticular, poorly sorted clay, silt, and sand intercalated with occasional beds of well-sorted fine to medium grained sand. The depth to the top of the Corcoran Clay varies from approximately 500 feet to 850 feet (DWR 1981).

The confined aquifer (lower zone) consists of the lower part of the Tulare Formation and possibly the uppermost part of the San Joaquin Formation. This unit is composed of lenticular beds of silty clay, clay, silt, and sand interbedded with occasional strata of well-sorted sand. Brackish or saline water underlies the usable groundwater in the lower zone.

Unpublished DWR (San Joaquin District) information indicates specific yield ranges from 5.1 to 17.8 percent to a depth of 300 feet. The highest specific yields are associated with coarser sediments distributed along the eastern portion of the subbasin from the Sierra Nevada Mountains. The USGS (Williamson and others 1989) used a subbasin average specific yield of 10.3 percent for groundwater modeling purposes. Earlier USGS work estimated an average specific yield of 9 percent from a depth of 10 to 200 feet (Davis and others 1959).

Restrictive Structures

Flood basin deposits along the eastern subbasin have caused near surface soils to drain poorly thus restricting the downward movement of percolating water. This causes agriculturally applied water to buildup as shallow water in the near surface zone. Areas prone to this buildup are often referred to as drainage problem areas.

The Corcoran Clay is a lacustrine diatomaceous clay unit that underlies much of the subbasin. Within the subbasin it varies in thickness from 20 to 120 feet (Belitz and Heimes 1990). Prior to groundwater development, the Corcoran Clay effectively separated the upper and lower zones. Numerous wells penetrate the clay and have allowed partial interaction between the zones.

Recharge Areas

Primary recharge to the aquifer system is from the seepage of Coast Range streams along the west side of the subbasin and the deep percolation of surface irrigation. Davis and Poland (1957) indicated that secondary recharge to the upper and lower aquifers occurred from areas to the east and northeast as subsurface flows.

Groundwater Level Trends

Groundwater levels were generally at their lowest levels in the late 1960s, prior to importation of surface water. The Central Valley Project began delivering surface water to the San Luis Unit in 1967-68. Water levels gradually increased to a maximum in about 1987-88, falling briefly during the 1976-77 drought. Water levels began dropping again during the 1987-92 drought with water levels showing the effects until 1994. Through a series of wet years, after the drought, 1998 water levels recovered nearly to 1987-88 levels.

Groundwater Storage

Groundwater Storage Capacity. Davis and others (1959) estimated the groundwater storage capacity at 10,940,000 af in the depth zone from 10 to 200 feet of the Mendota-Huron storage unit. This was over an area of 639,000 acres and a specific yield varying from 8.0 to 9.6 percent. This occupies a portion of the upper aquifer.

Using an average thickness of 675 feet (ground surface to top of Corcoran Clay), specific yield of 9 percent, over an area of 600,000 acres; the storage capacity of the upper aquifer is approximately 36,500,000 af.

Using a thickness of 1,200 feet from the average base of the Corcoran Clay to the average base of fresh groundwater, a specific yield of 9 percent, over

600,000 acres; the storage capacity of the lower aquifer is approximately 65,000,000 af.

Groundwater in Storage. The USGS estimated the water in storage in 1961 was 52,000,000 af (Williamson 1989). This estimate was to a depth of less than or equal to 1,000 feet.
Using an average depth to water in October 1984 of 111 feet, a specific yield of 9 percent, over an area of 600,000 acres; the available storage is estimated to be 6,000,000 af.

Groundwater Budget (Type C)

Davis and Poland (1957) estimated seepage from west side streams amounted to 30,000-40,000 af per year. For 1951, secondary recharge from the east into the upper aquifer was 20,000-30,000 af and was 150,000-200,000 af into the lower aquifer (Davis and Poland 1957).

Westlands Water District (1999) estimated the average deep percolation between 1978 and 1996 was 244,000 af per year. The District (1998) also estimated the average applied groundwater between 1978 and 1997 was 193,000 af per year.

Groundwater Quality

Characterization. Groundwaters of the west side of the San Joaquin Valley are generally of the sulfate or bicarbonate type (Davis and others 1959).

The waters of the upper aquifer, generally, are high in calcium and magnesium sulfate (Davis and Poland 1957). Groundwater below 300 feet and above the Corcoran Clay shows a tendency of decreased dissolved solids with increased depth. Most of the groundwater of the lower aquifer is of the sodium sulfate type (Davis and Poland 1957). The difference in quality between the upper and lower aquifers is that the confined zone contains less dissolved solids (Davis and others 1959). Groundwater in western Fresno County can have an upper range between 2,000 and 3,000 mg/L (Davis and others 1959).

DHS data indicates an average TDS of 520 mg/L in the subbasin with a range from 220 mg/L to 1,300 mg/L based on the analyses of six Title 22 monitoring wells.

Dubrovsky and others (1993) indicated dissolved solids in shallow groundwater can be greater than 10,000 mg/L at some locations in the lower fan areas. One sample had a TDS of 35,000 mg/L.

Impairments. High total dissolved solids is one impairment of groundwater in the subbasin. Groundwaters at certain locations contain selenium and boron that may affect usability.

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	2	0
Radiological	1	0
Nitrates	2	0
Pesticides	2	0
VOCs and SVOCs	2	0
Inorganics – Secondary	2	2

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: – 560-2,000	Average: 1,100 (Davis and Poland 1957)
	Total depths (ft)	
Domestic	Range: - Not determined	Average: Not determined
Municipal/Irrigation	Range: - 120-3,000	Average: 600-1,800 varies by type and location

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
Westlands Water District	Groundwater levels	960 Annually and may vary
Westlands Water District	Miscellaneous water quality	Varies
Department of Health Services and cooperators	Title 22 water quality	50 Varies

Basin Management

Groundwater management:	AB 3030 Plan adopted by Westlands Water District
Water agencies	
Public	Westlands Water District
Private	

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Davis, G.H. and J. F. Poland. 1957. Ground-Water Conditions in the Mendota- Huron Area Fresno and Kings Counties, California. USGS. Water Supply Paper No. 1360-G.

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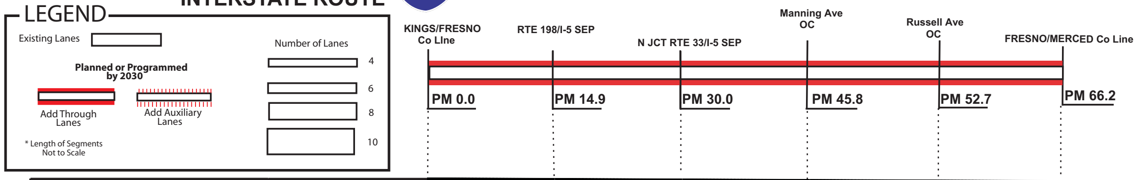
Errata

Updated groundwater management information and added hotlinks to applicable websites. (1/20/06)

TRAFFIC COUNTS

INTERSTATE ROUTE



Segment: Is self-explanatory except for several data sets:

Rural/Urban: Indicates whether the segment is in a rural area or city limits.

Terrain: Shows the general highway grade: minimal grade = level; moderate grade = rolling; and severe grade = mountainous.

ROW: Portrays Right-of-Way (ROW) and geometric data in feet and meters.

Shoulder Range: Is a range of treated surface (8' standard), both inside and outside shoulders.

Ultimate (UTC): Is the typical ROW needed for the ultimate facility, i.e., 8 lane freeway (8F) 218' is the standard typical UTC ROW - will be updated upon corridor plan lining by specific sections of highway.

Facility: Shows the Existing Facility, the desired facility type (2030 Concept) by 2030-RTPA's and Caltrans, and the Ultimate Facility to preserve ROW and plan line beyond 2030. It also shows whether a passing lane exists. 2C(I) indicates that the highway has been improved in select locations with operational or safety improvements. Examples are: passing lanes, channelization and traffic signals.

LOS: The current (2005) LOS (level of service), along with the expected calculated LOS in 2015 and 2030. The 2030 Concept is the target LOS desired, i.e., LOS C, for attainment by 2030 Caltrans.

Deficiency: Occurs when the target LOS is degraded, i.e., LOS D worse than LOS C, with the year of occurrence shown. It also shows whether a capacity improving project is in the STIP, and what the LOS would be with the 2030 Concept improvement.

Directional Split: Denotes the split in peak hour traffic flow on a directional basis (NB/SB or WB/EB) either in the morning (AM) or evening (PM).

AADT: signifies Annual Average Daily Traffic.

Peak Hour: indicates a representation of the maximum hour of traffic flow during the day.

% Trucks: shows the percent of trucks for AADT and Peak Hour.

*Concept Facility meets Concept LOS.

** Deficient-Concept Facility does not meet Concept LOS .

+The ultimate ROW is generally the same as the existing ROW.

++ (AUX) Auxiliary lanes are truck climbing lanes.

^ 99P Median is variable width - greater than 100' - split alignment.

SEGMENT	12	13	14	15	16
County / Route	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5
Description Begin	KINGS/FRESNO CO LINE	RTE 198/I-5 SEPARATION	N JCT RTE 33/I-5 SEPARATION	MANNING AVE OC	RUSSELL AVE OC
Description End	RTE 198/I-5 SEPARATION	N JCT RTE 33/I-5 SEPARATION	MANNING AVE OC	RUSSELL AVE OC	FRESNO/MERCED CO LINE
Postmile Limits Begin/End	0.0 / 14.9	14.9 / 30.0	30.0 / 45.8	45.8 / 52.7	52.7 / 66.2
Length (MI)	14.9 MI	15.1 MI	15.8 MI	6.9 MI	13.5 MI
Rural or Urban	RURAL	RURAL	RURAL	RURAL	RURAL
Terrain	FLAT	FLAT	FLAT	FLAT	FLAT
ROW: Range Existing (FT)	208.0 / 208.0 FT	208.0 / 208.0 FT	208.0 / 208.0 FT	208.0 / 208.0 FT	208.0 / 208.0 FT
Median Range (FT)	82.0 / 84.0 FT	84.0 / 99P^ FT	84.0 / 99P^ FT	84.0 / 84.0 FT	84.0 / 84.0 FT
Shoulder Range (FT)	10.0 / 10.0 FT	2.0 / 10.0 FT	5.0 / 10.0 FT	5.0 / 10.0 FT	5.0 / 10.0 FT
Lane Width (FT)	12.0 FT	12.0 FT	12.0 FT	12.0 FT	12.0 FT
Ultimate ROW (FT)	+ FT	+ FT	+ FT	+ FT	+ FT
Facility: Existing	4F	4F	4F	4F	4F
2030 Concept	6F	6F	6F	6F	6F
UTC	8F	8F	8F	8F	8F
LOS: 2005	B	B	B	B	B
LOS: 2015	C	C	C	C	C
LOS: 2030	D	D	D	D	D
LOS: 2030 Concept	C	C	C	C	C
Deficiency/Year Deficient	2030	2030	2030	2030	2030
Project in STIP/RTP (Y/N)	Yes	Yes	Yes	Yes	Yes
LOS W/ Concept Improvement	C*	C*	C*	C*	B*
Directional Split (Peak Hour)	52/48	52/48	52/48	52/48	55/45
AADT: 2005	52,300	52,300	52,300	51,500	49,800
AADT: 2015	69,600	71,100	71,100	69,500	67,200
AADT: 2030	92,600	97,300	96,800	94,200	91,100
Peak Hour: 2005	3,660	3,660	3,660	3,610	3,480
Peak Hour: 2015	4,870	4,980	4,980	4,870	4,700
Peak Hour: 2030	6,480	6,810	6,770	6,610	6,370
% Trucks: AADT	30 %	30 %	30 %	30 %	30 %
% Trucks: Peak Hour	8 %	8 %	8 %	8 %	8 %

B . A . Y . M . E . T . R . I . C . S

D A I L Y   T U B E   C O U N T   S U M M A R Y

PROJECT:	FIREBAUGH TS	RECORDER SET:	05 / 30 / 2006
LOCATION:	PANOCHE EAST OF I-5 NB RAMPS	RECORDER START:	06 / 01 / 2006
DIRECTION:	EASTBOUND & WESTBOUND	RECORDER END:	06 / 01 / 2006
CITY:	FIREBAUGH	MACHINE ID:	M-3455

	NORTHBOUND					SOUTHBOUND					NB + SB				
TIME	00:00	00:15	00:30	00:45	*TOT*	00:00	00:15	00:30	00:45	*TOT*	00:00	00:15	00:30	00:45	*TOT*
June 1, 2006 (Wednesday)															
12:00 AM	1	0	0	1	*2*	0	0	1	2	*3*	*1*	*0*	*1*	*3*	*5*
01:00 AM	2	1	0	4	*7*	0	0	1	0	*1*	*2*	*1*	*1*	*4*	*8*
02:00 AM	2	0	1	1	*4*	0	0	1	0	*1*	*2*	*0*	*2*	*1*	*5*
03:00 AM	0	0	2	1	*3*	0	1	0	0	*1*	*0*	*1*	*2*	*1*	*4*
04:00 AM	0	0	1	3	*4*	0	3	1	0	*4*	*0*	*3*	*2*	*3*	*8*
05:00 AM	3	2	0	1	*6*	0	2	2	0	*4*	*3*	*4*	*2*	*1*	*10*
06:00 AM	4	18	17	9	*48*	1	4	10	9	*24*	*5*	*22*	*27*	*18*	*72*
07:00 AM	5	4	7	6	*22*	5	4	5	5	*19*	*10*	*8*	*12*	*11*	*41*
08:00 AM	7	8	8	8	*31*	7	7	8	8	*30*	*14*	*15*	*16*	*16*	*61*
09:00 AM	4	10	12	9	*35*	10	5	8	11	*34*	*14*	*15*	*20*	*20*	*69*
10:00 AM	6	11	5	8	*30*	5	4	6	13	*28*	*11*	*15*	*11*	*21*	*58*
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12:00 NN	8	9	14	7	*38*	15	7	10	16	*48*	*23*	*16*	*24*	*23*	*86*
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03:00 PM	9	15	7	8	*39*	7	18	22	16	*63*	*16*	*33*	*29*	*24*	*102*
04:00 PM	6	11	14	10	*41*	13	13	15	13	*54*	*19*	*24*	*29*	*23*	*95*
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08:00 PM	0	2	4	2	*8*	1	2	4	0	*7*	*1*	*4*	*8*	*2*	*15*
09:00 PM	0	1	5	2	*8*	1	2	0	1	*4*	*1*	*3*	*5*	*3*	*12*
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11:00 PM	1	2	0	0	*3*	0	3	1	0	*4*	*1*	*5*	*1*	*0*	*7*
TOTAL:					***528***					***529***					***1,057***
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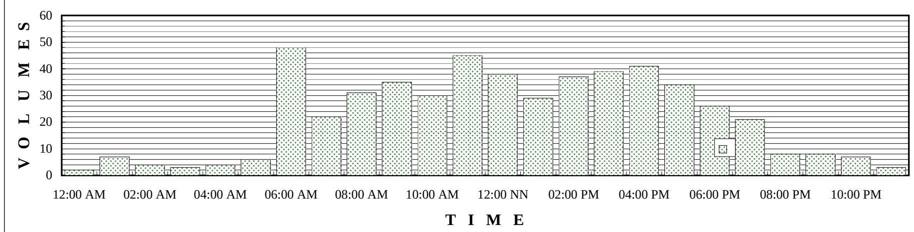
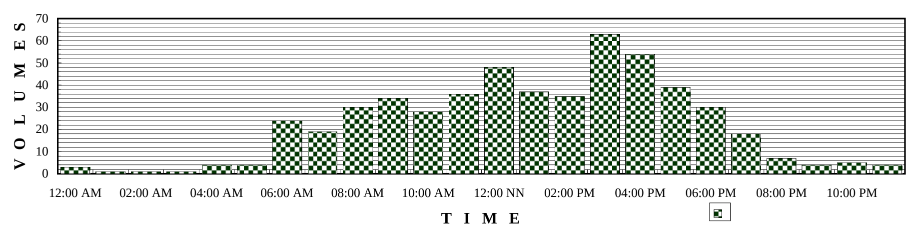
NOON PEAK HR. (11 AM - 4 PM):					***39***					***63***					***102***
PM PEAK HR. (4 PM - 7 PM):					***41***					***54***					***95***

Contra Costa County: (510) 232-1271   SF/Peninsula: (415) 750-1317   Alameda County: (510) 233-2292

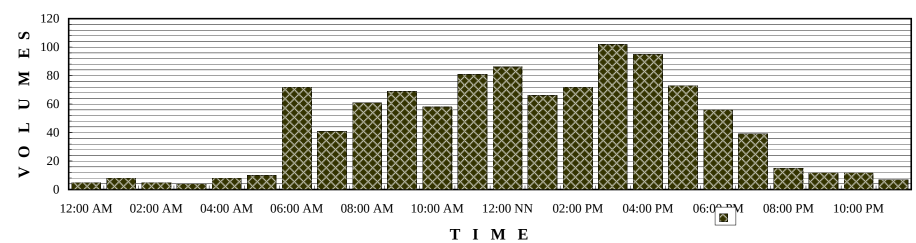
PANOCHE EAST OF I-5 NB RAMPS



PANOCHE EAST OF I-5 NB RAMPS



PANOCHE EAST OF I-5 NB RAMPS



B . A . Y . M . E . T . R . I . C . S

D A I L Y   T U B E   C O U N T   S U M M A R Y

PROJECT:	FIREBAUGH TS	RECORDER SET:	05 / 30 / 2006
LOCATION:	PANOCHE EAST OF PROJECT SITE	RECORDER START:	06 / 01 / 2006
DIRECTION:	EASTBOUND & WESTBOUND	RECORDER END:	06 / 01 / 2006
CITY:	FIREBAUGH	MACHINE ID:	M-2926

	NORTHBOUND					SOUTHBOUND					NB + SB				
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June 1, 2006 (Wednesday)															
12:00 AM	1	2	0	0	*3*	0	1	1	1	*3*	*1*	*3*	*1*	*1*	*6*
01:00 AM	1	0	0	1	*2*	0	1	0	0	*1*	*1*	*1*	*0*	*1*	*3*
02:00 AM	1	0	0	1	*2*	0	0	1	0	*1*	*1*	*0*	*1*	*1*	*3*
03:00 AM	0	1	0	2	*3*	0	1	1	0	*2*	*0*	*2*	*1*	*2*	*5*
04:00 AM	0	0	0	2	*2*	1	2	0	1	*4*	*1*	*2*	*0*	*3*	*6*
05:00 AM	2	0	3	5	*10*	1	1	0	2	*4*	*3*	*1*	*3*	*7*	*14*
06:00 AM	4	4	1	0	*9*	3	3	4	4	*14*	*7*	*7*	*5*	*4*	*23*
07:00 AM	3	5	5	7	*20*	2	4	9	5	*20*	*5*	*9*	*14*	*12*	*40*
08:00 AM	4	6	6	5	*21*	6	8	7	10	*31*	*10*	*14*	*13*	*15*	*52*
09:00 AM	5	2	0	11	*18*	8	3	7	7	*25*	*13*	*5*	*7*	*18*	*43*
10:00 AM	3	6	10	5	*24*	2	6	9	3	*20*	*5*	*12*	*19*	*8*	*44*
11:00 AM	4	10	8	7	*29*	2	5	11	4	*22*	*6*	*15*	*19*	*11*	*51*
12:00 NN	9	6	10	5	*30*	12	9	6	11	*38*	*21*	*15*	*16*	*16*	*68*
01:00 PM	9	13	8	7	*37*	8	10	3	8	*29*	*17*	*23*	*11*	*15*	*66*
02:00 PM	7	7	10	7	*31*	7	10	5	9	*31*	*14*	*17*	*15*	*16*	*62*
03:00 PM	4	2	8	10	*24*	3	6	10	5	*24*	*7*	*8*	*18*	*15*	*48*
04:00 PM	9	10	8	12	*39*	4	2	10	7	*23*	*13*	*12*	*18*	*19*	*62*
05:00 PM	8	12	5	8	*33*	9	9	9	9	*36*	*17*	*21*	*14*	*17*	*69*
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07:00 PM	0	2	4	2	*8*	3	3	5	4	*15*	*3*	*5*	*9*	*6*	*23*
08:00 PM	1	3	2	1	*7*	2	1	2	2	*7*	*3*	*4*	*4*	*3*	*14*
09:00 PM	1	2	0	2	*5*	1	0	1	2	*4*	*2*	*2*	*1*	*4*	*9*
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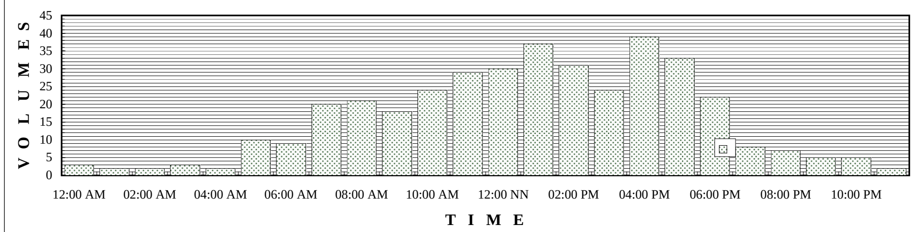
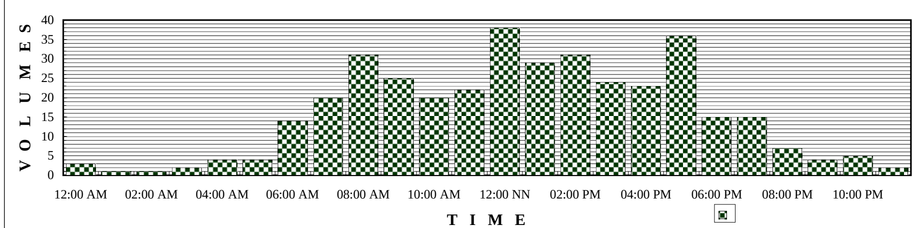
TOTAL:					***386***					***376***					***762***
AM PEAK HR. (6 AM - 11 AM):					***29***					***31***					***52***
NOON PEAK HR. (11 AM - 4 PM):					***37***					***38***					***68***
PM PEAK HR. (4 PM - 7 PM):					***39***					***36***					***69***

Contra Costa County: (510) 232-1271   SF/Peninsula: (415) 750-1317   Alameda County: (510) 233-2292

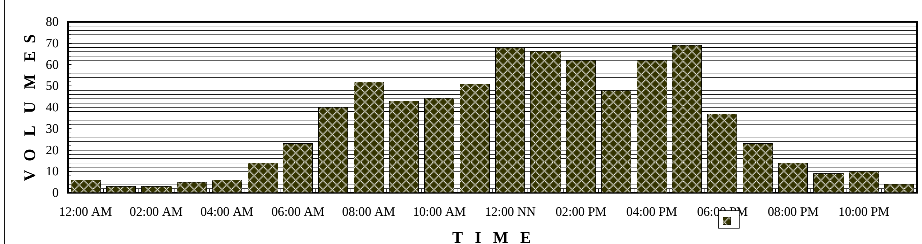
PANOCHE EAST OF PROJECT SITE



PANOCHE EAST OF PROJECT SITE



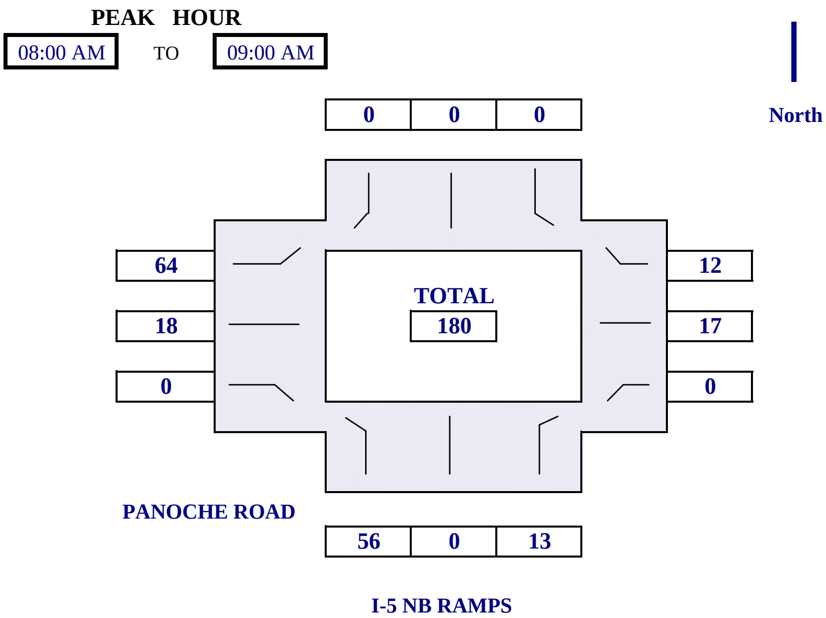
PANOCHE EAST OF PROJECT SITE

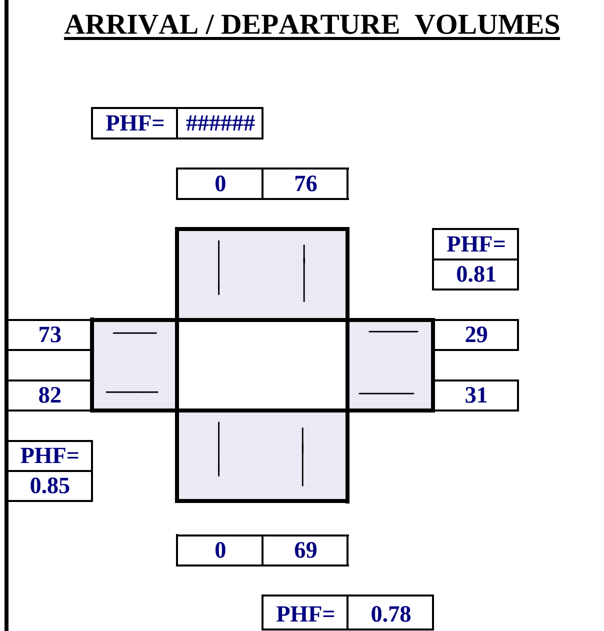


BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: PANOCHE ROAD TS	SURVEY DATE: 6 / 1 / 2006		DAY: THURSDAY
N-S Approach: I-5 NB RAMPS	SURVEY TIME: 7:00 AM	TO	9:00 AM
E-W Approach: PANOCHE ROAD	CITY: FIREBAUGH		FILE: PN5NFBAM





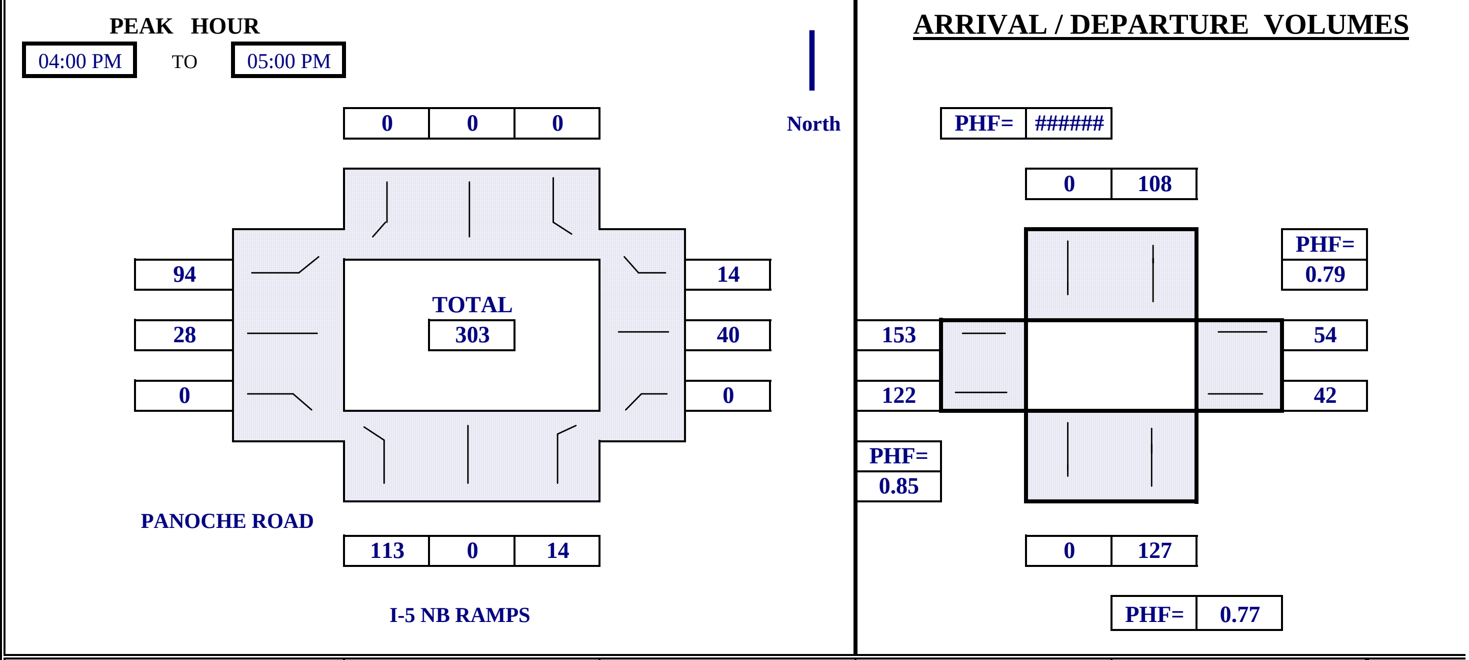
TIME PERIOD From		To	NORTHBOUND Left	NORTHBOUND Thru	NORTHBOUND Right	SOUTHBOUND Left	SOUTHBOUND Thru	SOUTHBOUND Right	EASTBOUND Left	EASTBOUND Thru	EASTBOUND Right	WESTBOUND Left	WESTBOUND Thru	WESTBOUND Right	TOTAL
SURVEY DATA															
07:00 AM	---	07:15 AM	7	0	2	0	0	0	13	4	0	0	4	1	31
07:15 AM	---	07:30 AM	21	0	3	0	0	0	27	6	0	0	6	3	66
07:30 AM	---	07:45 AM	36	0	4	0	0	0	39	12	0	0	12	3	106
07:45 AM	---	08:00 AM	51	0	7	0	0	0	57	15	0	0	15	4	149
08:00 AM	---	08:15 AM	64	0	10	0	0	0	73	20	0	0	19	7	193
08:15 AM	---	08:30 AM	81	0	15	0	0	0	85	22	0	0	22	10	235
08:30 AM	---	08:45 AM	95	0	18	0	0	0	103	28	0	0	28	13	285
08:45 AM	---	09:00 AM	107	0	20	0	0	0	121	33	0	0	32	16	329
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	7	0	2	0	0	0	13	4	0	0	4	1	31
07:15 AM	---	07:30 AM	14	0	1	0	0	0	14	2	0	0	2	2	35
07:30 AM	---	07:45 AM	15	0	1	0	0	0	12	6	0	0	6	0	40
07:45 AM	---	08:00 AM	15	0	3	0	0	0	18	3	0	0	3	1	43
08:00 AM	---	08:15 AM	13	0	3	0	0	0	16	5	0	0	4	3	44
08:15 AM	---	08:30 AM	17	0	5	0	0	0	12	2	0	0	3	3	42
08:30 AM	---	08:45 AM	14	0	3	0	0	0	18	6	0	0	6	3	50
08:45 AM	---	09:00 AM	12	0	2	0	0	0	18	5	0	0	4	3	44
HOURLY TOTALS															
07:00 AM	---	08:00 AM	51	0	7	0	0	0	57	15	0	0	15	4	149
07:15 AM	---	08:15 AM	57	0	8	0	0	0	60	16	0	0	15	6	162
07:30 AM	---	08:30 AM	60	0	12	0	0	0	58	16	0	0	16	7	169
07:45 AM	---	08:45 AM	59	0	14	0	0	0	64	16	0	0	16	10	179
08:00 AM	---	09:00 AM	56	0	13	0	0	0	64	18	0	0	17	12	180

East Bay : (510) 232-1271 *SF/Peninsula: (415) 750-1317*

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

PROJECT: PANOCHE ROAD TS	SURVEY DATE: 6 / 1 / 2006		DAY: THURSDAY
N-S Approach: I-5 NB RAMPS	SURVEY TIME: 4:00 PM	TO	6:00 PM
E-W Approach: PANOCHE ROAD	CITY: FIREBAUGH		FILE: PN5NFBPM



TIME PERIOD From		To	NORTHBOUND Left	Thru	Right	SOUTHBOUND Left	Thru	Right	EASTBOUND Left	Thru	Right	WESTBOUND Left	Thru	Right	TOTAL
							S U R V E Y D A T A								
04:00 PM	---	04:15 PM	29	0	2	0	0	0	25	4	0	0	10	2	*72*
04:15 PM	---	04:30 PM	66	0	6	0	0	0	47	12	0	0	19	7	*157*
04:30 PM	---	04:45 PM	89	0	9	0	0	0	73	22	0	0	32	11	*236*
04:45 PM	---	05:00 PM	113	0	14	0	0	0	94	28	0	0	40	14	*303*
05:00 PM	---	05:15 PM	127	0	16	0	0	0	118	33	0	0	47	16	*357*
05:15 PM	---	05:30 PM	144	0	20	0	0	0	143	37	0	0	53	20	*417*
05:30 PM	---	05:45 PM	164	0	22	0	0	0	167	44	0	0	61	22	*480*
05:45 PM	---	06:00 PM	183	0	24	0	0	0	184	50	0	0	68	24	*533*
							T O T A L B Y P E R I O D								
04:00 PM	---	04:15 PM	29	0	2	0	0	0	25	4	0	0	10	2	*72*
04:15 PM	---	04:30 PM	37	0	4	0	0	0	22	8	0	0	9	5	*85*
04:30 PM	---	04:45 PM	23	0	3	0	0	0	26	10	0	0	13	4	*79*
04:45 PM	---	05:00 PM	24	0	5	0	0	0	21	6	0	0	8	3	*67*
05:00 PM	---	05:15 PM	14	0	2	0	0	0	24	5	0	0	7	2	*54*
05:15 PM	---	05:30 PM	17	0	4	0	0	0	25	4	0	0	6	4	*60*
05:30 PM	---	05:45 PM	20	0	2	0	0	0	24	7	0	0	8	2	*63*
05:45 PM	---	06:00 PM	19	0	2	0	0	0	17	6	0	0	7	2	*53*
							H O U R L Y T O T A L S								
04:00 PM	---	05:00 PM	113	0	14	0	0	0	94	28	0	0	40	14	*303*
04:15 PM	---	05:15 PM	98	0	14	0	0	0	93	29	0	0	37	14	*285*
04:30 PM	---	05:30 PM	78	0	14	0	0	0	96	25	0	0	34	13	*260*
04:45 PM	---	05:45 PM	75	0	13	0	0	0	94	22	0	0	29	11	*244*
05:00 PM	---	06:00 PM	70	0	10	0	0	0	90	22	0	0	28	10	*230*

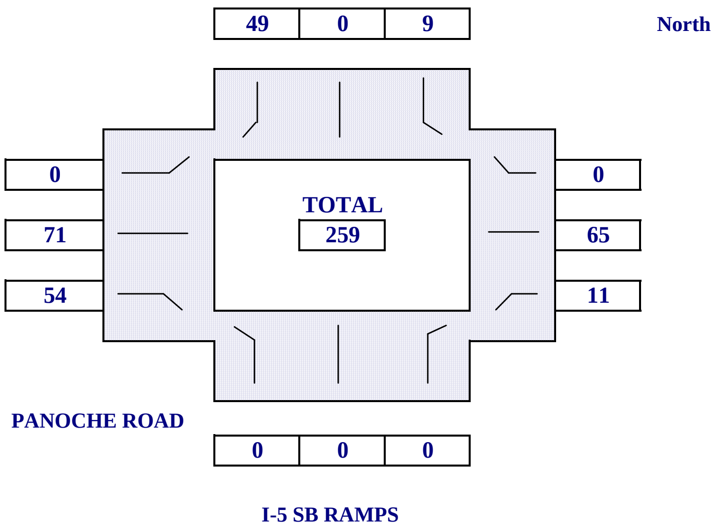
BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

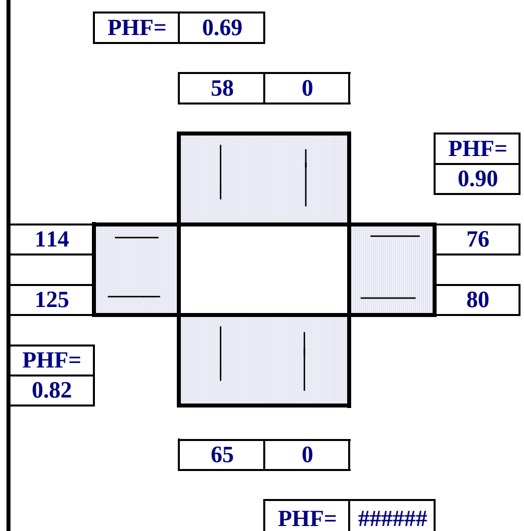
PROJECT: PANOCHE ROAD TS	**SURVEY DATE:** 6 / 1 / 2006		**DAY:** THURSDAY
N-S Approach: I-5 SB RAMPS	**SURVEY TIME:** 7:00 AM	**TO**	9:00 AM
E-W Approach: PANOCHE ROAD	**CITY:** FIREBAUGH		**FILE:** PN5SFBAM

PEAK HOUR

07:45 AM TO 08:45 AM



ARRIVAL / DEPARTURE VOLUMES



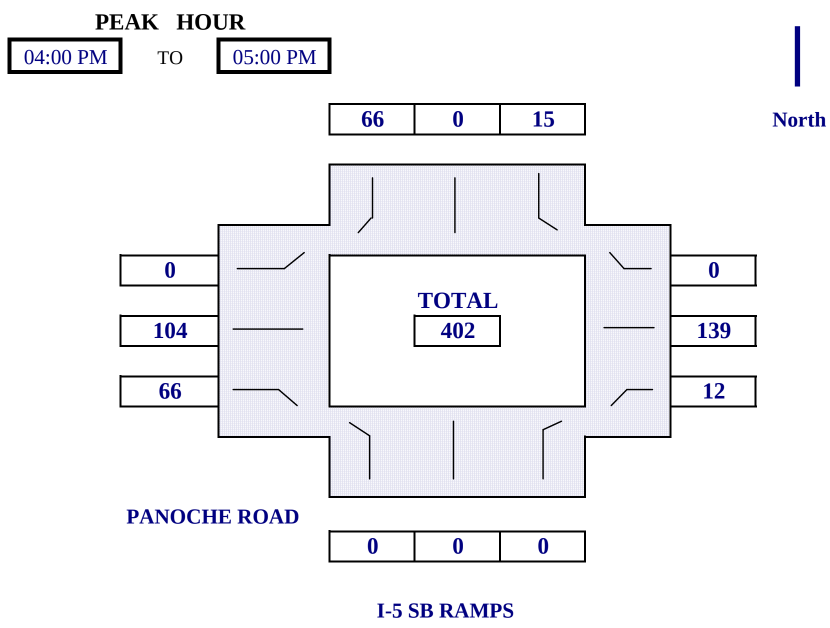
TIME PERIOD			NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
From		To	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	TOTAL
SURVEY DATA															
07:00 AM	---	07:15 AM	0	0	0	2	0	12	0	15	7	1	10	0	*47*
07:15 AM	---	07:30 AM	0	0	0	6	0	29	0	27	17	2	25	0	*106*
07:30 AM	---	07:45 AM	0	0	0	9	0	42	0	42	30	2	45	0	*170*
07:45 AM	---	08:00 AM	0	0	0	11	0	51	0	62	48	4	62	0	*238*
08:00 AM	---	08:15 AM	0	0	0	15	0	66	0	78	60	7	76	0	*302*
08:15 AM	---	08:30 AM	0	0	0	16	0	77	0	91	75	10	94	0	*363*
08:30 AM	---	08:45 AM	0	0	0	18	0	91	0	113	84	13	110	0	*429*
08:45 AM	---	09:00 AM	0	0	0	22	0	103	0	131	96	14	125	0	*491*
TOTAL BY PERIOD															
07:00 AM	---	07:15 AM	0	0	0	2	0	12	0	15	7	1	10	0	*47*
07:15 AM	---	07:30 AM	0	0	0	4	0	17	0	12	10	1	15	0	*59*
07:30 AM	---	07:45 AM	0	0	0	3	0	13	0	15	13	0	20	0	*64*
07:45 AM	---	08:00 AM	0	0	0	2	0	9	0	20	18	2	17	0	*68*
08:00 AM	---	08:15 AM	0	0	0	4	0	15	0	16	12	3	14	0	*64*
08:15 AM	---	08:30 AM	0	0	0	1	0	11	0	13	15	3	18	0	*61*
08:30 AM	---	08:45 AM	0	0	0	2	0	14	0	22	9	3	16	0	*66*
08:45 AM	---	09:00 AM	0	0	0	4	0	12	0	18	12	1	15	0	*62*
HOURLY TOTALS															
07:00 AM	---	08:00 AM	0	0	0	11	0	51	0	62	48	4	62	0	*238*
07:15 AM	---	08:15 AM	0	0	0	13	0	54	0	63	53	6	66	0	*255*
07:30 AM	---	08:30 AM	0	0	0	10	0	48	0	64	58	8	69	0	*257*
07:45 AM	---	08:45 AM	0	0	0	9	0	49	0	71	54	11	65	0	*259*
08:00 AM	---	09:00 AM	0	0	0	11	0	52	0	69	48	10	63	0	*253*

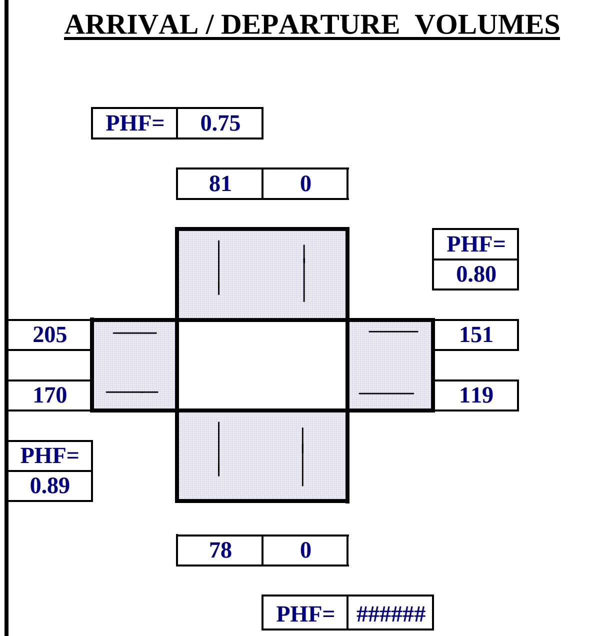
East Bay : (510) 232-1271 *SF/Peninsula: (415) 750-1317*

BAYMETRICS TRAFFIC RESOURCES

INTERSECTION TURNING MOVEMENT SUMMARY

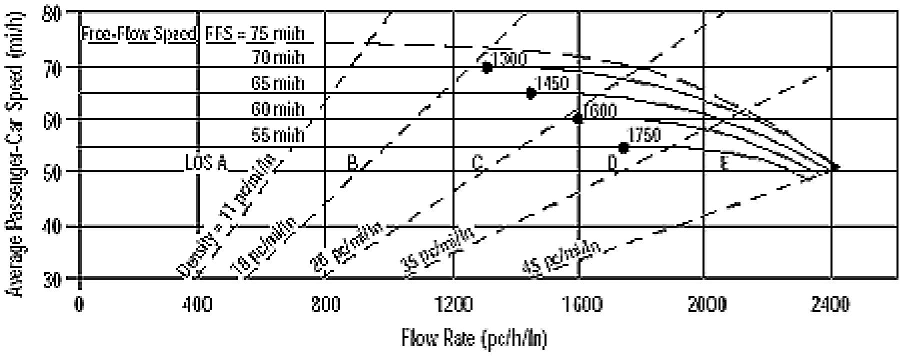
PROJECT:	PANOCHE ROAD TS	SURVEY DATE:	6 / 1 / 2006	DAY:	THURSDAY
N-S Approach:	I-5 SB RAMPS	SURVEY TIME:	4:00 PM	TO	6:00 PM
E-W Approach:	PANOCHE ROAD	CITY:	FIREBAUGH	FILE:	PN5SFBPM





TIME PERIOD From		To	NORTHBOUND Left	NORTHBOUND Thru	NORTHBOUND Right	SOUTHBOUND Left	SOUTHBOUND Thru	SOUTHBOUND Right	EASTBOUND Left	EASTBOUND Thru	EASTBOUND Right	WESTBOUND Left	WESTBOUND Thru	WESTBOUND Right	TOTAL
							SURVEY DATA								
04:00 PM	---	04:15 PM	0	0	0	4	0	10	0	25	15	2	35	0	*91*
04:15 PM	---	04:30 PM	0	0	0	6	0	35	0	55	33	7	77	0	*213*
04:30 PM	---	04:45 PM	0	0	0	9	0	54	0	82	53	10	114	0	*322*
04:45 PM	---	05:00 PM	0	0	0	15	0	66	0	104	66	12	139	0	*402*
05:00 PM	---	05:15 PM	0	0	0	16	0	82	0	135	82	15	159	0	*489*
05:15 PM	---	05:30 PM	0	0	0	20	0	89	0	159	91	16	185	0	*560*
05:30 PM	---	05:45 PM	0	0	0	22	0	99	0	187	105	16	207	0	*636*
05:45 PM	---	06:00 PM	0	0	0	25	0	106	0	210	117	18	230	0	*706*
							TOTAL BY PERIOD								
04:00 PM	---	04:15 PM	0	0	0	4	0	10	0	25	15	2	35	0	*91*
04:15 PM	---	04:30 PM	0	0	0	2	0	25	0	30	18	5	42	0	*122*
04:30 PM	---	04:45 PM	0	0	0	3	0	19	0	27	20	3	37	0	*109*
04:45 PM	---	05:00 PM	0	0	0	6	0	12	0	22	13	2	25	0	*80*
05:00 PM	---	05:15 PM	0	0	0	1	0	16	0	31	16	3	20	0	*87*
05:15 PM	---	05:30 PM	0	0	0	4	0	7	0	24	9	1	26	0	*71*
05:30 PM	---	05:45 PM	0	0	0	2	0	10	0	28	14	0	22	0	*76*
05:45 PM	---	06:00 PM	0	0	0	3	0	7	0	23	12	2	23	0	*70*
							HOURLY TOTALS								
04:00 PM	---	05:00 PM	0	0	0	15	0	66	0	104	66	12	139	0	*402*
04:15 PM	---	05:15 PM	0	0	0	12	0	72	0	110	67	13	124	0	*398*
04:30 PM	---	05:30 PM	0	0	0	14	0	54	0	104	58	9	108	0	*347*
04:45 PM	---	05:45 PM	0	0	0	13	0	45	0	105	52	6	93	0	*314*
05:00 PM	---	06:00 PM	0	0	0	10	0	40	0	106	51	6	91	0	*304*

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S
Design (N)	FFS, LOS, v_p	N, S, [
Design (v_p)	FFS, LOS, N	v_p, S, [
Planning (LOS)	FFS, N, AADT	LOS, S
Planning (N)	FFS, LOS, AADT	N, S, [
Planning (v_p)	FFS, LOS, N	v_p, S, [

General Information / Site Information

Analyst	S. QUICK	Highway/Direction of Travel	I-5
Agency or Company	URS CORP.	From/To	Manning Ave to Russell
Date Performed	9/22/2006	Jurisdiction	Fresno County
Analysis Time Period	Existing	Analysis Year	2006

Project Description Starwood Power Plant

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	1875 veh/h	Peak-Hour Factor, PHF	0.90
AADT	51500 veh/day	%Trucks and Buses, P_T	25
Peak-Hr Prop. of AADT, K	0.07	%RVs, P_R	0
Peak-Hr Direction Prop, D	52	General Terrain:	Level
DDHV = AADT x K x D	1875 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.889

Speed Inputs / Calc Speed Adj and FFS

Lane Width	12.0	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}		mi/h
Interchange Density	0.50	I/mi	f_{ID}		mi/h
Number of Lanes, N	2		f_N		mi/h
FFS (measured)	70.0	mi/h	FFS	70.0	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1172	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	70.0	mi/h		

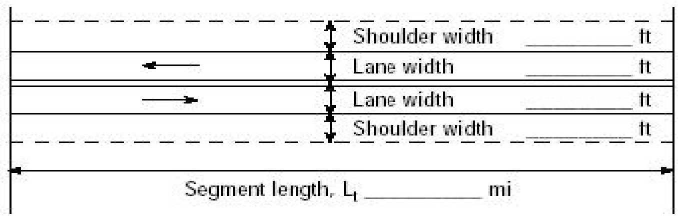
$D = v_p / S$	16.7	pc/mi/ln	S	mi/h
LOS	B		$D = v_p / S$	pc/mi/
			Required Number of Lanes, N	

Glossary		Factor Location		
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	4	f_{LW} - Exhibit
V - Hourly volume	D - Density			
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11		f_{LC} - Exhibit
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12		f_N - Exhibit 2
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3		f_{ID} - Exhibit 2

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/22/2006	Jurisdiction	Fresno County
Analysis Time Period	Existing AM	Analysis Year	2006

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	41 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	0.905
Two-way flow rate[1], v_p (pc/h) $v_p=V/ (PHF * f_G * f_{HV})$	49
v_p * highest directional split proportion[2] (pc/h)	29

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/ f_{HV})$	53.0 mi/h	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) $ATS=FFS-0.00776v_p-f_{np}$	52.6

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	0.985
Two-way flow rate[1], v_p (pc/h) $v_p=V/ (PHF * f_G * f_{HV})$	45
v_p * highest directional split proportion[2] (pc/h)	27
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	3.9
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.5
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	6.3

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c $v/c=V_p/ 3,200$	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) $VMT_{15}= 0.25L_t(V/PHF)$	22

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	82
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.4

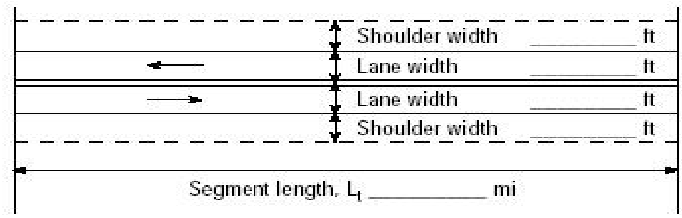
Notes

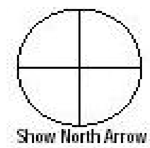
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		*Site Information*	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/22/2006	Jurisdiction	Fresno County
Analysis Time Period	Existing PM	Analysis Year	2006

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	73 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	88
v_p * highest directional split proportion[2] (pc/h)	53

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.3

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	81
v_p * highest directional split proportion[2] (pc/h)	49
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	6.9
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.3
Percent time-spent-following, PTSF(%) PTSF=BPTSF+f $_{d/np}$	9.1

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	40

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	146
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.8

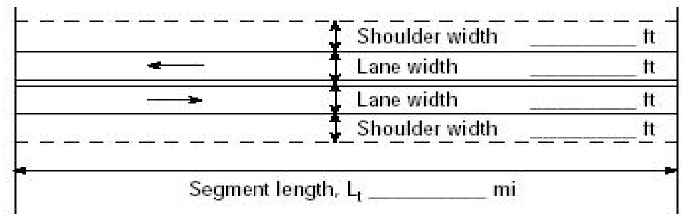
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F.
2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/22/2006	Jurisdiction	Fresno County
Analysis Time Period	Existing AM	Analysis Year	2006

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	52 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	62
v_p * highest directional split proportion[2] (pc/h)	37

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.5

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	57
v_p * highest directional split proportion[2] (pc/h)	34
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	4.9
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.4
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	7.3

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	28

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	104
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.5

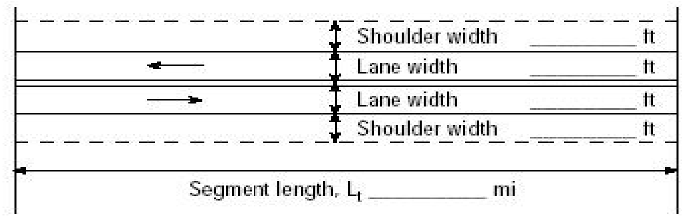
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/22/2006	Jurisdiction	Fresno County
Analysis Time Period	Existing PM	Analysis Year	2006

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	69 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	83
v_p * highest directional split proportion[2] (pc/h)	50

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.4

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	76
v_p * highest directional split proportion[2] (pc/h)	46
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	6.5
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.3
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	8.7

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	37

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	138
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.7

Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	64	18	0	0	17	12	56	0	13	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	20	0	0	18	13	61	0	14	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	32			20			184	190	20	198	184
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	32			20			184	190	20	198	184
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	95			100			92	100	99	100	100
cM capacity (veh/h)	1501			1516			723	650	1022	698	656

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	70	20	32	75
Volume Left	70	0	0	61
Volume Right	0	0	13	14
cSH	1501	1700	1700	765
Volume to Capacity	0.05	0.01	0.02	0.10
Queue Length 95th (ft)	4	0	0	8
Control Delay (s)	7.5	0.0	0.0	10.2
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	10.2
Approach LOS				B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	71	54	11	65	0	9	0	49	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	77	59	12	71	0	10	0	53	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	71			136			201	230	71	254	201
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	71			136			201	230	71	254	201
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			99	100	94	100	100
cM capacity (veh/h)	1451			1372			725	642	957	631	667

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	136	12	71	63
Volume Left	0	12	0	10
Volume Right	59	0	0	53
cSH	1700	1372	1700	912
Volume to Capacity	0.08	0.01	0.04	0.07
Queue Length 95th (ft)	0	1	0	6
Control Delay (s)	0.0	7.6	0.0	9.2
Lane LOS		A		A
Approach Delay (s)	0.0	1.1		9.2
Approach LOS				A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	94	28	0	0	40	14	113	0	14	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	102	30	0	0	43	15	123	0	15	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	59			30			286	293	30	301	286
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	59			30			286	293	30	301	286
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	93			100			80	100	98	100	100
cM capacity (veh/h)	1466			1502			607	555	1008	584	560

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	102	30	59	138
Volume Left	102	0	0	123
Volume Right	0	0	15	15
cSH	1466	1700	1700	635
Volume to Capacity	0.07	0.02	0.03	0.22
Queue Length 95th (ft)	6	0	0	21
Control Delay (s)	7.6	0.0	0.0	12.2
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	12.2
Approach LOS				B

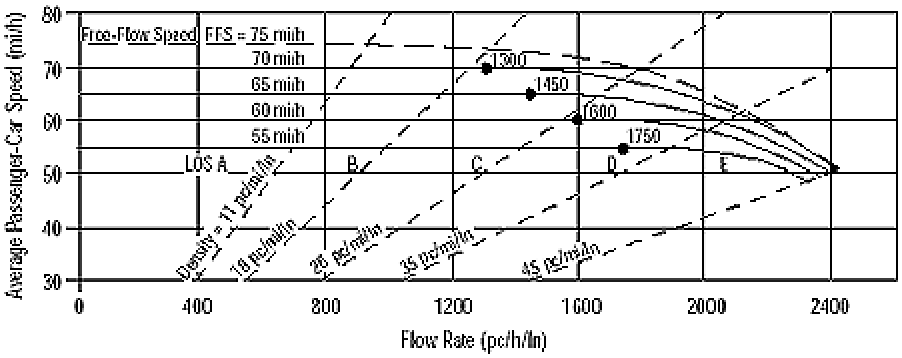
Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	104	66	12	139	0	15	0	66	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	113	72	13	151	0	16	0	72	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	151			185			326	362	151	398	326
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	151			185			326	362	151	398	326
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			97	100	92	100	100
cM capacity (veh/h)	1354			1315			598	540	862	491	566

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	185	13	151	88
Volume Left	0	13	0	16
Volume Right	72	0	0	72
cSH	1700	1315	1700	797
Volume to Capacity	0.11	0.01	0.09	0.11
Queue Length 95th (ft)	0	1	0	9
Control Delay (s)	0.0	7.8	0.0	10.1
Lane LOS		A		B
Approach Delay (s)	0.0	0.6		10.1
Approach LOS				B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information / Site Information

Analyst	S. QUICK	Highway/Direction of Travel	I-5
Agency or Company	URS CORP.	From/To	Manning Ave to Russell
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build	Analysis Year	2008

Project Description Starwood Power Plant

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	1987 veh/h	Peak-Hour Factor, PHF	0.90
AADT	54590 veh/day	%Trucks and Buses, P_T	25
Peak-Hr Prop. of AADT, K	0.07	%RVs, P_R	0
Peak-Hr Direction Prop, D	52	General Terrain:	Level
DDHV = AADT x K x D	1987 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.889

Speed Inputs / Calc Speed Adj and FFS

Lane Width	12.0	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}		mi/h
Interchange Density	0.50	I/mi	f_{ID}		mi/h
Number of Lanes, N	2		f_N		mi/h
FFS (measured)	70.0	mi/h	FFS	70.0	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures / Design (N)

Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1242	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h
S	70.0	mi/h			

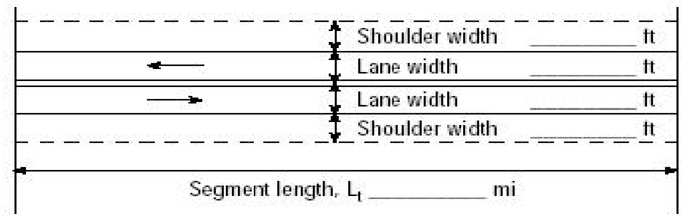
$D = v_p / S$	17.7	pc/mi/ln	S	mi/h
LOS	B		$D = v_p / S$	pc/mi/
			Required Number of Lanes, N	

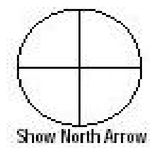
Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10 4	f_{LW} - Exhibit
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 2
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 2
DDHV - Directional design hour volume			

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build AM	Analysis Year	2008

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	43 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	52
v_p * highest directional split proportion[2] (pc/h)	31

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.6

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	47
v_p * highest directional split proportion[2] (pc/h)	28
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	4.0
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.4
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	6.5

Level of Service and Other Performance Measures

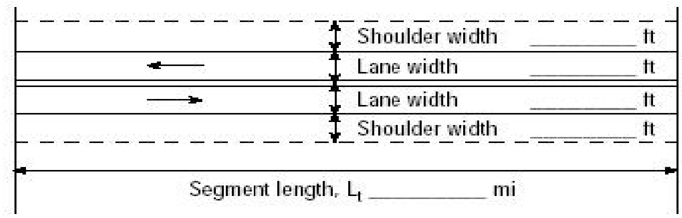
Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	23

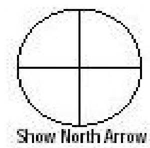
Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	86
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.4
Notes	
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.	

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build PM	Analysis Year	2008

Input Data





Class I highway ☐	Class II highway ☑
Terrain	Level ☑ Rolling ☐
Two-way hourly volume	77 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	0.905
Two-way flow rate[1], v_p (pc/h) $v_p=V/ (PHF * f_G * f_{HV})$	92
v_p * highest directional split proportion[2] (pc/h)	55

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS $FFS=S_{FM}+0.00776(V_f/ f_{HV})$	53.0 mi/h	Free-flow speed, FFS $(FSS=BFFS-f_{LS}-f_A)$	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) $ATS=FFS-0.00776v_p-f_{np}$	52.3

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} $f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))$	0.985
Two-way flow rate[1], v_p (pc/h) $v_p=V/ (PHF * f_G * f_{HV})$	85
v_p * highest directional split proportion[2] (pc/h)	51
Base percent time-spent-following, BPTSF(%) $BPTSF=100(1-e^{-0.000879v_p})$	7.2
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.2
Percent time-spent-following, PTSF(%) $PTSF=BPTSF+f_{d/np}$	9.4

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c $v/c=V_p/ 3,200$	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) $VMT_{15}= 0.25L_t(V/PHF)$	42

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) VMT_{60}=V*L_t	154
Peak 15-min total travel time, TT_{15}(veh-h) TT_{15}= VMT_{15}/ATS	0.8

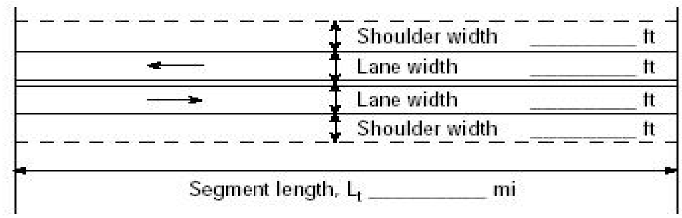
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build AM	Analysis Year	2008

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	55 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	66
v_p * highest directional split proportion[2] (pc/h)	40

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.5

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	61
v_p * highest directional split proportion[2] (pc/h)	37
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	5.2
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.4
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	7.6

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	30

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	110
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.6

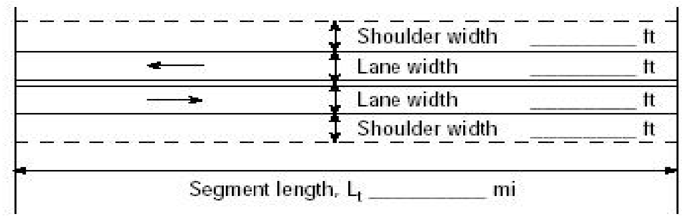
Notes

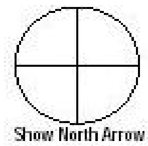
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build PM	Analysis Year	2008

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	73 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	88
v_p * highest directional split proportion[2] (pc/h)	53

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.3

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	81
v_p * highest directional split proportion[2] (pc/h)	49
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	6.9
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.3
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	9.1

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	40

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	146
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.8

Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	68	19	0	0	18	13	59	0	14	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	21	0	0	20	14	64	0	15	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	34			21			195	202	21	210	195
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	34			21			195	202	21	210	195
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	95			100			91	100	99	100	100
cM capacity (veh/h)	1498			1515			709	638	1021	682	644

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	74	21	34	79
Volume Left	74	0	0	64
Volume Right	0	0	14	15
cSH	1498	1700	1700	753
Volume to Capacity	0.05	0.01	0.02	0.11
Queue Length 95th (ft)	4	0	0	9
Control Delay (s)	7.5	0.0	0.0	10.3
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	10.3
Approach LOS				B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	75	57	12	69	0	10	0	52	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	62	13	75	0	11	0	57	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	75			143			214	245	75	270	214
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	75			143			214	245	75	270	214
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			98	100	94	100	100
cM capacity (veh/h)	1446			1363			711	630	951	613	655

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	143	13	75	67
Volume Left	0	13	0	11
Volume Right	62	0	0	57
cSH	1700	1363	1700	902
Volume to Capacity	0.08	0.01	0.04	0.07
Queue Length 95th (ft)	0	1	0	6
Control Delay (s)	0.0	7.7	0.0	9.3
Lane LOS		A		A
Approach Delay (s)	0.0	1.1		9.3
Approach LOS				A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	24.5%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	100	30	0	0	42	15	120	0	15	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	33	0	0	46	16	130	0	16	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	62			33			304	312	33	320	304
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	62			33			304	312	33	320	304
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	93			100			78	100	98	100	100
cM capacity (veh/h)	1462			1499			588	539	1005	564	545

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	109	33	62	147
Volume Left	109	0	0	130
Volume Right	0	0	16	16
cSH	1462	1700	1700	617
Volume to Capacity	0.07	0.02	0.04	0.24
Queue Length 95th (ft)	6	0	0	23
Control Delay (s)	7.7	0.0	0.0	12.7
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	12.7
Approach LOS				B

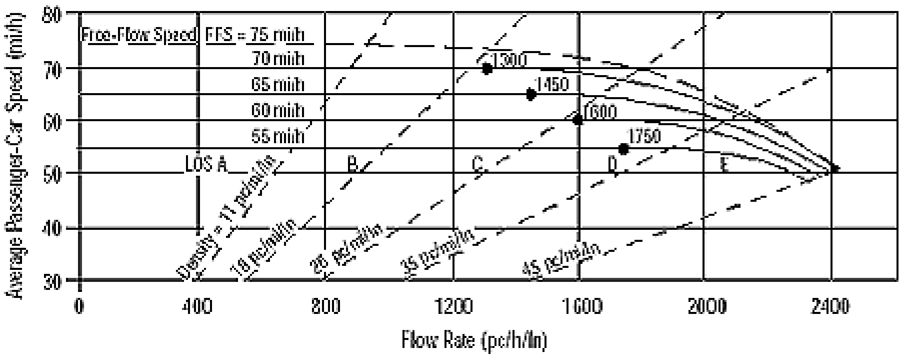
Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	110	70	13	147	0	16	0	70	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	120	76	14	160	0	17	0	76	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	160			196			346	384	160	422	346
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	160			196			346	384	160	422	346
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			97	100	91	100	100
cM capacity (veh/h)	1344			1303			580	524	852	470	551

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	196	14	160	93
Volume Left	0	14	0	17
Volume Right	76	0	0	76
cSH	1700	1303	1700	784
Volume to Capacity	0.12	0.01	0.09	0.12
Queue Length 95th (ft)	0	1	0	10
Control Delay (s)	0.0	7.8	0.0	10.2
Lane LOS		A		B
Approach Delay (s)	0.0	0.6		10.2
Approach LOS				B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	S. QUICK	Highway/Direction of Travel	I-5
Agency or Company	URS CORP.	From/To	Manning Ave to Russell
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	2008 Construction	Analysis Year	2008

Project Description Starwood Power Plant

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	1989 veh/h	Peak-Hour Factor, PHF	0.90
AADT	54645 veh/day	%Trucks and Buses, P_T	25
Peak-Hr Prop. of AADT, K	0.07	%RVs, P_R	0
Peak-Hr Direction Prop, D	52	General Terrain:	Level
DDHV = AADT x K x D	1989 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.889

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}		mi/h
Interchange Density	0.50	I/mi	f_{ID}		mi/h
Number of Lanes, N	2		f_N		mi/h
FFS (measured)	70.0	mi/h	FFS	70.0	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1243	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	70.0	mi/h		

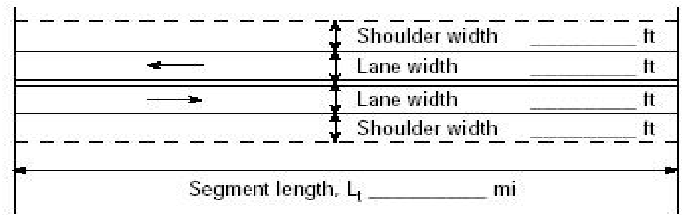
$D = v_p / S$	17.8	pc/mi/ln	S	mi/h
LOS	B		$D = v_p / S$	pc/mi/
			Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 4
V - Hourly volume	D - Density		
v_p - Flow rate	FFS - Free-flow speed	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit
LOS - Level of service	BFFS - Base free-flow speed	f_p - Page 23-12	f_N - Exhibit 2
DDHV - Directional design hour volume		LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 2

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		**Site Information**	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Construction AM	Analysis Year	2008

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	107 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	129
v_p * highest directional split proportion[2] (pc/h)	77

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.0

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	118
v_p * highest directional split proportion[2] (pc/h)	71
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	9.9
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.1
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	11.9

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.04
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	58

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	214
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	1.1

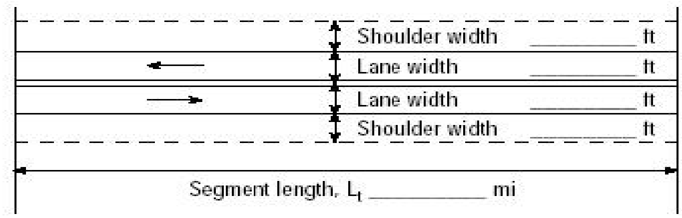
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		*Site Information*	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Construction PM	Analysis Year	2008

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	136 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	163
v_p * highest directional split proportion[2] (pc/h)	98

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	51.7

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	150
v_p * highest directional split proportion[2] (pc/h)	90
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	12.4
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	1.9
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	14.2

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.05
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	74

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	272
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	1.4

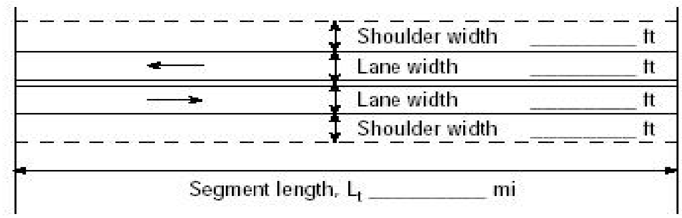
Notes

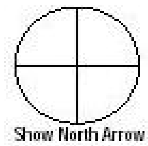
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Construction AM	Analysis Year	2008

Input Data





Class I highway ☐ Class II highway ☑

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	119 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	143
v_p * highest directional split proportion[2] (pc/h)	86

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	51.9

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	131
v_p * highest directional split proportion[2] (pc/h)	79
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	10.9
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.0
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	12.9

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.04
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	65

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	238
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	1.3

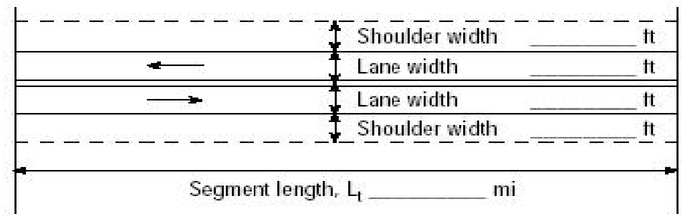
Notes

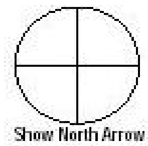
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Construction PM	Analysis Year	2008

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	133 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	160
v_p * highest directional split proportion[2] (pc/h)	96

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	51.8

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	147
v_p * highest directional split proportion[2] (pc/h)	88
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	12.1
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	1.9
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	14.0

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.05
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	72

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	266
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	1.4

Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	68	49	0	0	20	13	59	0	45	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	74	53	0	0	22	14	64	0	49	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	36			53			230	237	53	279	230
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	36			53			230	237	53	279	230
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	95			100			90	100	95	100	100
cM capacity (veh/h)	1495			1473			672	610	979	592	616

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	74	53	36	113
Volume Left	74	0	0	64
Volume Right	0	0	14	49
cSH	1495	1700	1700	777
Volume to Capacity	0.05	0.03	0.02	0.15
Queue Length 95th (ft)	4	0	0	13
Control Delay (s)	7.5	0.0	0.0	10.4
Lane LOS	A			B
Approach Delay (s)	4.4		0.0	10.4
Approach LOS				B

Intersection Summary			
Average Delay	6.3		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	75	57	14	69	0	40	0	52	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	62	15	75	0	43	0	57	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	75			143			218	249	75	274	218
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	75			143			218	249	75	274	218
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			94	100	94	100	100
cM capacity (veh/h)	1446			1363			705	625	951	608	651

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	143	15	75	100
Volume Left	0	15	0	43
Volume Right	62	0	0	57
cSH	1700	1363	1700	826
Volume to Capacity	0.08	0.01	0.04	0.12
Queue Length 95th (ft)	0	1	0	10
Control Delay (s)	0.0	7.7	0.0	10.0
Lane LOS		A		A
Approach Delay (s)	0.0	1.3		10.0
Approach LOS				A

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	26.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	100	30	0	0	71	15	120	0	15	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	33	0	0	77	16	130	0	16	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	93			33			335	343	33	352	335
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	93			33			335	343	33	352	335
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	92			100			77	100	98	100	100
cM capacity (veh/h)	1423			1499			560	516	1005	537	522

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	109	33	93	147
Volume Left	109	0	0	130
Volume Right	0	0	16	16
cSH	1423	1700	1700	589
Volume to Capacity	0.08	0.02	0.05	0.25
Queue Length 95th (ft)	6	0	0	24
Control Delay (s)	7.7	0.0	0.0	13.1
Lane LOS	A			B
Approach Delay (s)	6.0		0.0	13.1
Approach LOS				B

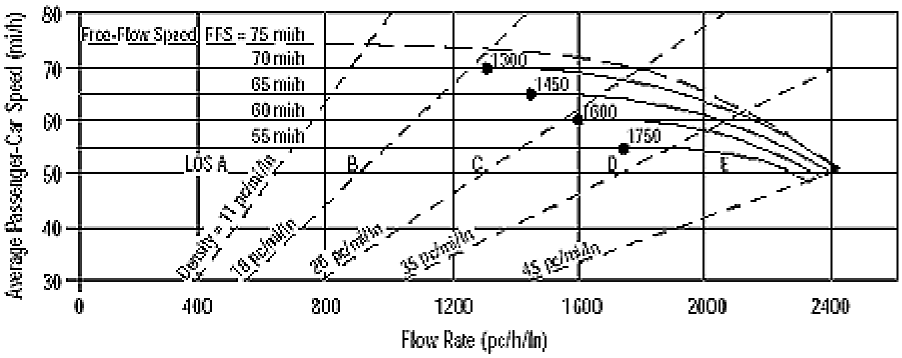
Intersection Summary			
Average Delay	7.3		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	110	70	42	147	0	16	0	70	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	120	76	46	160	0	17	0	76	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	160			196			409	447	160	485	409
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	160			196			409	447	160	485	409
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			96			97	100	91	100	100
cM capacity (veh/h)	1344			1303			517	471	852	418	495

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	196	46	160	93
Volume Left	0	46	0	17
Volume Right	76	0	0	76
cSH	1700	1303	1700	760
Volume to Capacity	0.12	0.04	0.09	0.12
Queue Length 95th (ft)	0	3	0	10
Control Delay (s)	0.0	7.9	0.0	10.4
Lane LOS		A		B
Approach Delay (s)	0.0	1.7		10.4
Approach LOS				B

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	28.6%	ICU Level of Service	A
Analysis Period (min)	15		

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		***Site Information***	
Analyst	S. QUICK	Highway/Direction of Travel	I-5
Agency or Company	URS CORP.	From/To	Manning Ave to Russell
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build	Analysis Year	2009

Project Description Starwood Power Plant

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	2043 veh/h	Peak-Hour Factor, PHF	0.90
AADT	56135 veh/day	%Trucks and Buses, P_T	25
Peak-Hr Prop. of AADT, K	0.07	%RVs, P_R	0
Peak-Hr Direction Prop, D	52	General Terrain:	Level
DDHV = AADT x K x D	2043 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.889

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width	12.0	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}		mi/h
Interchange Density	0.50	I/mi	f_{ID}		mi/h
Number of Lanes, N	2		f_N		mi/h
FFS (measured)	70.0	mi/h	FFS	70.0	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1277	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	70.0	mi/h		

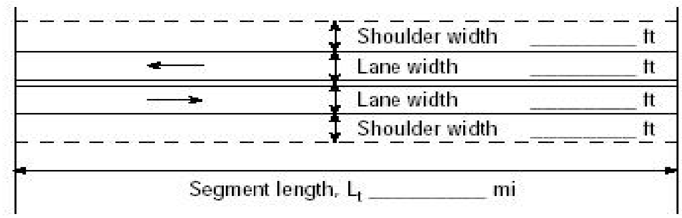
$D = v_p / S$	18.2	pc/mi/ln	S	mi/h
LOS	C		$D = v_p / S$	pc/mi/
			Required Number of Lanes, N	

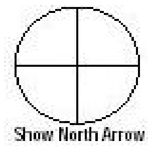
Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 2
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 2
DDHV - Directional design hour volume			

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build AM	Analysis Year	2009

Input Data





☐ Class I highway	☑ Class II highway
Terrain	☑ Level ☐ Rolling
Two-way hourly volume	45 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	54
v_p * highest directional split proportion[2] (pc/h)	32

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.6

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	50
v_p * highest directional split proportion[2] (pc/h)	30
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	4.3
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.4
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	6.7

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	24

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) VMT_{60}=V*L_t	90
Peak 15-min total travel time, TT_{15}(veh-h) TT_{15}= VMT_{15}/ATS	0.5

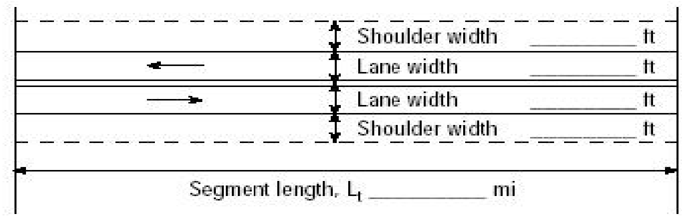
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build PM	Analysis Year	2009

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	80 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	96
v_p * highest directional split proportion[2] (pc/h)	58

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.3

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	88
v_p * highest directional split proportion[2] (pc/h)	53
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	7.4
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.2
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	9.7

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	43

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	160
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.8

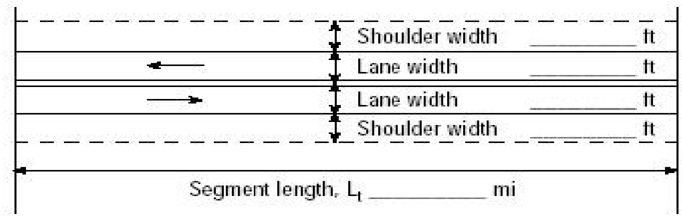
Notes

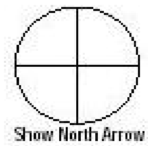
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		***Site Information***	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build AM	Analysis Year	2009

Input Data





☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	57 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	68
v_p * highest directional split proportion[2] (pc/h)	41

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.5

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	63
v_p * highest directional split proportion[2] (pc/h)	38
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	5.4
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.4
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	7.7

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	31

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	114
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.6

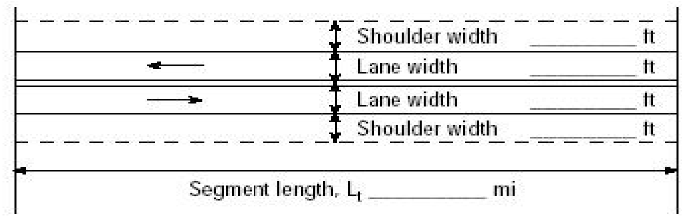
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	No Build PM	Analysis Year	2009

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	75 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	90
v_p * highest directional split proportion[2] (pc/h)	54

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.3

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	83
v_p * highest directional split proportion[2] (pc/h)	50
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	7.0
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.2
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	9.3

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	41

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	150
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.8
Notes	
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	70	20	0	0	19	13	61	0	14	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	22	0	0	21	14	66	0	15	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	35			22			202	209	22	217	202
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	35			22			202	209	22	217	202
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	95			100			91	100	99	100	100
cM capacity (veh/h)	1496			1513			701	632	1019	675	638

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	76	22	35	82
Volume Left	76	0	0	66
Volume Right	0	0	14	15
cSH	1496	1700	1700	744
Volume to Capacity	0.05	0.01	0.02	0.11
Queue Length 95th (ft)	4	0	0	9
Control Delay (s)	7.5	0.0	0.0	10.4
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	10.4
Approach LOS				B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	77	59	12	71	0	10	0	53	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	84	64	13	77	0	11	0	58	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	77			148			219	251	77	277	219
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	77			148			219	251	77	277	219
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			98	100	94	100	100
cM capacity (veh/h)	1443			1358			705	624	949	606	651

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	148	13	77	68
Volume Left	0	13	0	11
Volume Right	64	0	0	58
cSH	1700	1358	1700	899
Volume to Capacity	0.09	0.01	0.05	0.08
Queue Length 95th (ft)	0	1	0	6
Control Delay (s)	0.0	7.7	0.0	9.3
Lane LOS		A		A
Approach Delay (s)	0.0	1.1		9.3
Approach LOS				A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	102	31	0	0	44	15	123	0	15	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	34	0	0	48	16	134	0	16	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	64			34			311	320	34	328	311
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	64			34			311	320	34	328	311
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	92			100			77	100	98	100	100
cM capacity (veh/h)	1459			1498			581	533	1004	557	538

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	111	34	64	150
Volume Left	111	0	0	134
Volume Right	0	0	16	16
cSH	1459	1700	1700	609
Volume to Capacity	0.08	0.02	0.04	0.25
Queue Length 95th (ft)	6	0	0	24
Control Delay (s)	7.7	0.0	0.0	12.8
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	12.8
Approach LOS				B

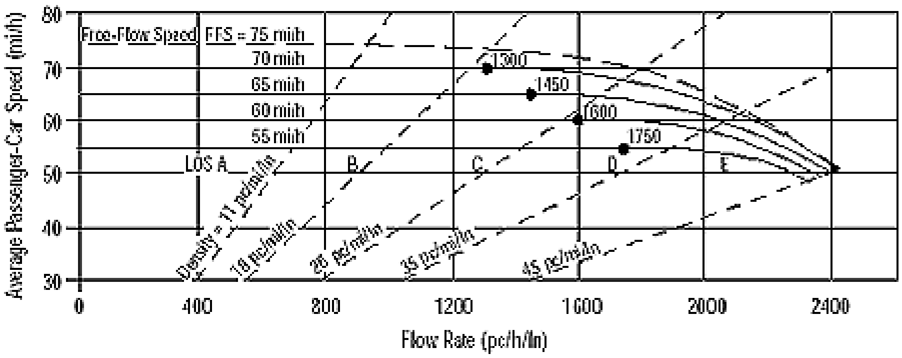
Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	113	72	13	152	0	16	0	72	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	123	78	14	165	0	17	0	78	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	165			201			355	395	165	434	355
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	165			201			355	395	165	434	355
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			97	100	91	100	100
cM capacity (veh/h)	1338			1297			571	517	846	460	544

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	201	14	165	96
Volume Left	0	14	0	17
Volume Right	78	0	0	78
cSH	1700	1297	1700	778
Volume to Capacity	0.12	0.01	0.10	0.12
Queue Length 95th (ft)	0	1	0	10
Control Delay (s)	0.0	7.8	0.0	10.3
Lane LOS		A		B
Approach Delay (s)	0.0	0.6		10.3
Approach LOS				B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

BASIC FREEWAY SEGMENTS WORKSHEET



Application	Input	Output
Operational (LOS)	FFS, N, v_p	LOS, S
Design (N)	FFS, LOS, v_p	N, S, D
Design (v_p)	FFS, LOS, N	v_p, S, D
Planning (LOS)	FFS, N, AADT	LOS, S
Planning (N)	FFS, LOS, AADT	N, S, D
Planning (v_p)	FFS, LOS, N	v_p, S, D

General Information		Site Information	
Analyst	S. QUICK	Highway/Direction of Travel	I-5
Agency or Company	URS CORP.	From/To	Manning Ave to Russell
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Operations	Analysis Year	2009

Project Description Starwood Power Plant

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	2043 veh/h	Peak-Hour Factor, PHF	0.90
AADT	56135 veh/day	%Trucks and Buses, P_T	25
Peak-Hr Prop. of AADT, K	0.07	%RVs, P_R	0
Peak-Hr Direction Prop, D	52	General Terrain:	Level
DDHV = AADT x K x D	2043 veh/h	Grade % Length	mi
Driver type adjustment	1.00	Up/Down %	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.889

Speed Inputs			Calc Speed Adj and FFS		
Lane Width	12.0	ft	f_{LW}		mi/h
Rt-Shoulder Lat. Clearance	6.0	ft	f_{LC}		mi/h
Interchange Density	0.50	I/mi	f_{ID}		mi/h
Number of Lanes, N	2		f_N		mi/h
FFS (measured)	70.0	mi/h	FFS	70.0	mi/h
Base free-flow Speed, BFFS		mi/h			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1277	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h
S	70.0	mi/h		

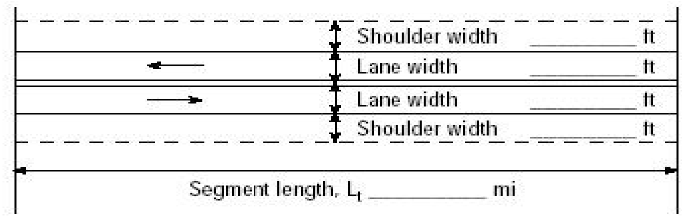
$D = v_p / S$	18.2	pc/mi/ln	S		mi/h
LOS	C		$D = v_p / S$		pc/mi/
			Required Number of Lanes, N		

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits23-8, 23-10	f_{LW} - Exhibit 4
V - Hourly volume	D - Density	E_T - Exhibits 23-8, 23-10, 23-11	f_{LC} - Exhibit
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 23-12	f_N - Exhibit 2
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 23-2, 23-3	f_{ID} - Exhibit 2
DDHV - Directional design hour volume			

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Operations AM	Analysis Year	2009

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	45 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	54
v_p * highest directional split proportion[2] (pc/h)	32

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.6

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	50
v_p * highest directional split proportion[2] (pc/h)	30
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	4.3
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.4
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	6.7

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	24

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V^*L_t$	90
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.5

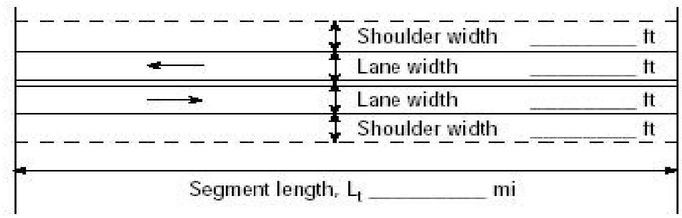
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of I-5 NB Ramps
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Operations PM	Analysis Year	2009

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	80 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	96
v_p * highest directional split proportion[2] (pc/h)	58

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.3

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ P_T(E_T-1)+P_R(E_R-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	88
v_p * highest directional split proportion[2] (pc/h)	53
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	7.4
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.2
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	9.7

Level of Service and Other Performance Measures

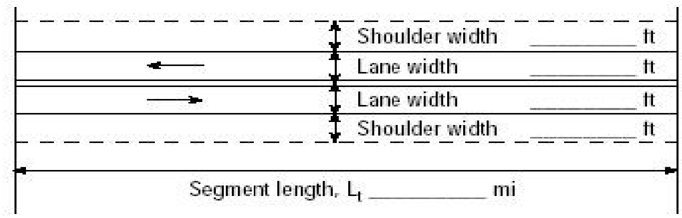
Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	43

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) VMT_{60}=V*L_t	160
Peak 15-min total travel time, TT_{15}(veh-h) TT_{15}= VMT_{15}/ATS	0.8
Notes	
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.	

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		*Site Information*	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Operations AM	Analysis Year	2009

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	59 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	71
v_p * highest directional split proportion[2] (pc/h)	43

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
Field Measured speed, S_{FM}	mi/h	Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Observed volume, V_f	veh/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
		Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.4

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	65
v_p * highest directional split proportion[2] (pc/h)	39
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	5.6
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.3
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	7.9

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.02
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	32

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) VMT_{60}=V*L_t	118
Peak 15-min total travel time, TT_{15}(veh-h) TT_{15}= VMT_{15}/ATS	0.6

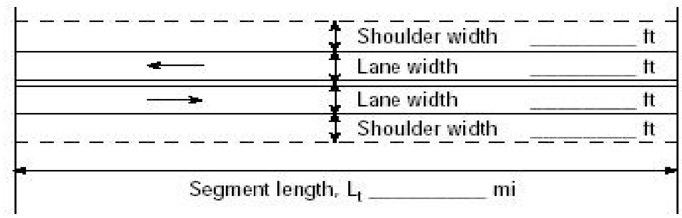
Notes

1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.

TWO-WAY TWO-LANE HIGHWAY SEGMENT WORKSHEET

General Information		Site Information	
Analyst	S. QUICK	Highway	Panoche Rd
Agency or Company	URS CORP.	From/To	Panoche East of Project Site
Date Performed	9/26/2006	Jurisdiction	Fresno County
Analysis Time Period	Operations PM	Analysis Year	2009

Input Data



☐ Class I highway ☑ Class II highway

Terrain ☑ Level ☐ Rolling

Two-way hourly volume	77 veh/h
Directional split	60 / 40
Peak-hour factor, PHF	0.92
No-passing zone	0
% Trucks and Buses , P_T	15 %
% Recreational vehicles, P_R	4%
Access points/ mi	8

Average Travel Speed

Grade adjustment factor, f_G (Exhibit 20-7)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-9)	1.7
Passenger-car equivalents for RVs, E_R (Exhibit 20-9)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.905
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	92
v_p * highest directional split proportion[2] (pc/h)	55

Free-Flow Speed from Field Measurement		Estimated Free-Flow Speed	
		Base free-flow speed, $BFFS_{FM}$	55.0 mi/h
Field Measured speed, S_{FM}	mi/h	Adj. for lane width and shoulder width[3], f_{LS} (Exhibit 20-5)	0.0 mi/h
Observed volume, V_f	veh/h	Adj. for access points, f_A (Exhibit 20-6)	2.0 mi/h
Free-flow speed, FFS FFS=S_{FM}+0.00776(V_f/ f_{HV})	53.0 mi/h	Free-flow speed, FFS (FSS=BFFS-f_{LS}-f_A)	53.0 mi/h

Adj. for no-passing zones, f_{np} (mi/h) (Exhibit 20-11)	0.0
Average travel speed, ATS (mi/h) ATS=FFS-0.00776v_p-f_{np}	52.3

Percent Time-Spent-Following

Grade Adjustment factor, f_G (Exhibit 20-8)	1.00
Passenger-car equivalents for trucks, E_T (Exhibit 20-10)	1.1
Passenger-car equivalents for RVs, E_R (Exhibit 20-10)	1.0
Heavy-vehicle adjustment factor, f_{HV} f_{HV}=1/ (1+ $P_T(E_T$-1)+$P_R(E_R$-1))	0.985
Two-way flow rate[1], v_p (pc/h) v_p=V/ (PHF * f_G * f_{HV})	85
v_p * highest directional split proportion[2] (pc/h)	51
Base percent time-spent-following, BPTSF(%) BPTSF=100(1-$e^{-0.000879v_p}$)	7.2
Adj. for directional distribution and no-passing zone, $f_{d/hp}$(%)(Exh. 20-12)	2.2
Percent time-spent-following, PTSF(%) PTSF=BPTSF+$f_{d/np}$	9.4

Level of Service and Other Performance Measures

Level of service, LOS (Exhibit 20-3 for Class I or 20-4 for Class II)	A
Volume to capacity ratio v/c v/c=V_p/ 3,200	0.03
Peak 15-min veh-miles of travel,VMT_{15} (veh- mi) VMT_{15}= 0.25L_t(V/PHF)	42

Peak-hour vehicle-miles of travel, VMT_{60} (veh- mi) $VMT_{60}=V*L_t$	154
Peak 15-min total travel time, TT_{15}(veh-h) $TT_{15}= VMT_{15}/ATS$	0.8
Notes	
1. If v_p >= 3,200 pc/h, terminate analysis-the LOS is F. 2. If highest directional split v_p>= 1,700 pc/h, terminated anlysis-the LOS is F.	

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	70	20	0	0	19	13	61	0	14	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	76	22	0	0	21	14	66	0	15	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	35			22			202	209	22	217	202
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	35			22			202	209	22	217	202
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	95			100			91	100	99	100	100
cM capacity (veh/h)	1496			1513			701	632	1019	675	638

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	76	22	35	82
Volume Left	76	0	0	66
Volume Right	0	0	14	15
cSH	1496	1700	1700	744
Volume to Capacity	0.05	0.01	0.02	0.11
Queue Length 95th (ft)	4	0	0	9
Control Delay (s)	7.5	0.0	0.0	10.4
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	10.4
Approach LOS				B

Intersection Summary			
Average Delay	6.6		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	77	59	12	71	0	10	0	53	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	84	64	13	77	0	11	0	58	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	77			148			219	251	77	277	219
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	77			148			219	251	77	277	219
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			98	100	94	100	100
cM capacity (veh/h)	1443			1358			705	624	949	606	651

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	148	13	77	68
Volume Left	0	13	0	11
Volume Right	64	0	0	58
cSH	1700	1358	1700	899
Volume to Capacity	0.09	0.01	0.05	0.08
Queue Length 95th (ft)	0	1	0	6
Control Delay (s)	0.0	7.7	0.0	9.3
Lane LOS		A		A
Approach Delay (s)	0.0	1.1		9.3
Approach LOS				A

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	24.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	102	31	0	0	44	15	123	0	15	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	111	34	0	0	48	16	134	0	16	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	64			34			311	320	34	328	311
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	64			34			311	320	34	328	311
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	92			100			77	100	98	100	100
cM capacity (veh/h)	1459			1498			581	533	1004	557	538

Direction, Lane #	EB 1	EB 2	WB 1	NB 1
Volume Total	111	34	64	150
Volume Left	111	0	0	134
Volume Right	0	0	16	16
cSH	1459	1700	1700	609
Volume to Capacity	0.08	0.02	0.04	0.25
Queue Length 95th (ft)	6	0	0	24
Control Delay (s)	7.7	0.0	0.0	12.8
Lane LOS	A			B
Approach Delay (s)	5.9		0.0	12.8
Approach LOS				B

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	SBL2	SBL	SBR	NWL	NWR
Lane Configurations											
Sign Control		Free			Free			Stop		Stop	
Grade		0%			0%			0%		0%	
Volume (veh/h)	0	113	72	13	152	0	16	0	72	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	123	78	14	165	0	17	0	78	0	0
Pedestrians											
Lane Width (ft)											
Walking Speed (ft/s)											
Percent Blockage											
Right turn flare (veh)											
Median type								None		None	
Median storage veh)											
Upstream signal (ft)											
pX, platoon unblocked											
vC, conflicting volume	165			201			355	395	165	434	355
vC1, stage 1 conf vol											
vC2, stage 2 conf vol											
vCu, unblocked vol	165			201			355	395	165	434	355
tC, single (s)	4.2			4.2			7.2	6.6	6.4	7.2	6.6
tC, 2 stage (s)											
tF (s)	2.3			2.3			3.6	4.1	3.4	3.6	4.1
p0 queue free %	100			99			97	100	91	100	100
cM capacity (veh/h)	1338			1297			571	517	846	460	544

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	201	14	165	96
Volume Left	0	14	0	17
Volume Right	78	0	0	78
cSH	1700	1297	1700	778
Volume to Capacity	0.12	0.01	0.10	0.12
Queue Length 95th (ft)	0	1	0	10
Control Delay (s)	0.0	7.8	0.0	10.3
Lane LOS		A		B
Approach Delay (s)	0.0	0.6		10.3
Approach LOS				B

Intersection Summary			
Average Delay	2.3		
Intersection Capacity Utilization	29.0%	ICU Level of Service	A
Analysis Period (min)	15		

PHASE I
ENVIRONMENTAL SITE ASSESSMENT

PHASE I
ENVIRONMENTAL SITE ASSESSMENT
OF
MIDWAY SITE
W. PANOCHE ROAD
FIREBAUGH, CALIFORNIA 93622
FOR
STARWOOD ENERGY GLOBAL GROUP, LLC

AUGUST 2006

42386

Burns & McDonnell Engineering Company, Inc.
Engineers-Geologists-Scientists
Kansas City, Missouri

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LIST OF ACRONYMS

AST	Aboveground storage tank
ASTM	American Society of Testing and Materials
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CERCLIS	Comprehensive Environmental Response Compensation and Liability Information System
CERCLIS – NFRAP	CERCLIS – No Further Remedial Action Planned
CUPA	Certified Unified Program Agency
EDR	Environmental Data Resources
EPCRA	Emergency Planning and Community Right To Know Act
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
FINDS	Facility Index System
FOIA	Freedom of Information Act
LLC	Limited Liability Corporation
NPL	National Priorities List
PCB	Polychlorinated biphenyl
PG&E	Pacific Gas & Electric
ppm	Parts per million
RCRA	Resource Conservation and Recovery Act
RCRA-LQG	RCRA – Large Quantity Generator
RCRA-SQG	RCRA – Small Quantity Generator
RCRIS	Resource Conservation and Recovery Information System
SWF/LF	Solid Waste Facility/Landfill
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage and Disposal
USGS	United States Geological Survey
UST	Underground Storage Tank

* * * * *

NOTICE

This report is an instrument of service prepared by Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) for the exclusive use of the Starwood Energy Global Group, LLC and its affiliates (collectively, Starwood). In order to create a report on which Starwood could rely, Burns & McDonnell worked closely with Starwood in development of the scope of services upon which all subsequent tasks have been based. No party other than Starwood is permitted by Burns & McDonnell to rely on this instrument of Burns & McDonnell's service.

According to the American Society of Testing and Materials (ASTM), Phase I Environmental Site Assessments (ESAs) are conducted to satisfy one of the requirements to qualify for the innocent landowner defense described in the Comprehensive Environmental Response Compensation and Liability Act (CERCLA liability): that is, the practices that constitute "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 USC § 9601(35)(B). The opinions relative to known or suspect environmental conditions given in this report are based upon information derived from the most recent site reconnaissance and from other activities described in the report.

The most recent site reconnaissance was performed on March 23, 2006. Starwood is advised that the conditions observed by Burns & McDonnell are subject to change. Certain indicators of the presence of hazardous substances and petroleum products may have been latent at the time of the most recent site reconnaissance and may subsequently have become observable. In a similar manner, the research effort conducted for a Phase I ESA is limited. Accordingly, it is possible that Burns & McDonnell's research, while fully appropriate for a Phase I ESA, failed to indicate the existence of important information sources. Assuming such sources actually exist, the information could not have been considered in the formulation of Burns & McDonnell's findings and opinions.

A Phase I ESA is a service whose basic elements are determined by the standard of care prevailing at the time the service was rendered in the area where it was rendered. Because standards of care can be identified only through retrospective inquiry, Burns & McDonnell has applied the standard of care as published by The American Society for Testing and Materials (ASTM) Standard E1527-00. By definition, such standards set forth minimum requirements.

Problems have arisen in the past because people and organizations have assumed, improperly, that they could rely on a Phase I ESA report developed for another party. So there is no confusion in this respect, recognize that Starwood is the only intended beneficiary of this report. Starwood is the party to which Burns & McDonnell has explained the risks involved and which has been involved in the shaping of the scope of services needed to satisfactorily manage those risks from Starwood's perspective. Accordingly, reliance on this report by any party other than Starwood would result in reliance on assumptions whose extent and nature would distort the meaning and impact of the findings and opinions related herein. Reliance on this report would in turn result in misinterpretation of these findings and opinions and potentially unwise actions based on those misinterpretations. Burns & McDonnell's findings and opinions related in this report may not be relied upon by any party except Starwood.

* * * * *

EXECUTIVE SUMMARY

This Executive Summary Does not Fully Summarize Findings and Opinions Findings and Opinions are Related Through the Full Report Only

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) was retained by Starwood Energy Global Group, LLC and its affiliates (collectively, Starwood), to conduct a Phase I Environmental Site Assessment (ESA) of the property located at W. Panoche Road, Firebaugh, Fresno County, California, 93622 (the Property or the Site). The Property is located in Section 5, Township 15 South, Range 13 East as shown on the 1971 Chaneyranch, California United States Geological Survey (USGS) topographic map, and is referred to in this report as the Property. A Property vicinity map showing the Property and the surrounding area is in Appendix A.

This assessment has been conducted in accordance with the scope and limitations of ASTM Standard *E1527-00.* Any exceptions to, or deletions from, this practice are described in Section 9.0 of this report. Burns & McDonnell visually surveyed the Property and adjoining properties from public points of view. Burns & McDonnell examined readily available environmental records associated with the Property and interviewed persons, identified by Starwood, possessing knowledge of the current and former uses of the Property.

The Property comprises approximately 5.62 acres and is illustrated on the site map in Appendix B. The Property is unimproved and is used as an equipment laydown yard by CalPeak Power-Midway, LLC. Burns & McDonnell's observations during Site reconnaissance indicate that adjoining properties are industrial to the east and west, residential to the north, and agricultural to the south.

Burns & McDonnell reviewed historical records including aerial photographs and historical topographic maps. According to historical sources, the Property appears to have been undeveloped as recently as 1998; however, it is adjacent to the Pacific Gas & Electric (PG&E) Substation which has been present since 1949 and may have been used periodically by PG&E or by the farmer who owns the surrounding agricultural property.

Environmental Data Resources (EDR) provided a report of environmental agency listings and identified 3 sites within the search area in the 51 databases it searched. The Property was not identified in any of the databases. EDR identified 24 sites (Orphan Sites) with insufficient street information to locate them with respect to the Property. One orphan site, PG&E, appears to be adjacent to the Property. A copy of the database report prepared by EDR is provided in Appendix C.

Burns & McDonnell performed this Phase I ESA to identify *Recognized Environmental Conditions*, as defined in Section 1.1, associated with the Property and other issues that may not meet the definition of a Recognized Environmental Condition but that Burns & McDonnell considers to be potential environmental concerns associated with the Property.

RECOGNIZED ENVIRONMENTAL CONDITIONS

Burns & McDonnell performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-00 of the Property. Any exceptions to, or deletions from, this practice are described in Section 9.0 of this report. This Phase I ESA has revealed no evidence of *Recognized Environmental Conditions* in connection with the Property.

HISTORICAL RECOGNIZED ENVIRONMENTAL CONDITIONS

This Phase I ESA has revealed no evidence of *Historical Recognized Environmental Conditions* in connection with the Property.

POTENTIAL ENVIRONMENTAL CONCERNS

This Phase I ESA has revealed no evidence of *Potential Environmental Concerns* in connection with the Property, except for the following:

- An AST farm, containing eleven diesel ASTs, is located adjacent to the north of the Property. Due to the general topography of the area, releases from these ASTs should flow generally northeast, if not contained on the site. Mr. Baker, Property owner representative, is not aware of any spills in conjunction with the ASTs; therefore, it is not believed that the ASTs have negatively impacted the Property.
- Historically, the Property has been used for agricultural purposes which may have included the use of pesticides and herbicides. There is the potential that pesticide and/or herbicide contamination is present on the Property at low levels; however, it is not believed to have impacted the Property.

* * * * *

1.0 INTRODUCTION

At the request of Starwood Energy Global Group, LLC and its affiliates (collectively, Starwood), Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) conducted a Phase I Environmental Site Assessment (ESA) of property located at W. Panoche Road in Firebaugh, Fresno County, California, 93622 (the Property or the Site). The Property is currently occupied by CalPeak Power – Midway, LLC, which uses the area for equipment storage. The USGS topographic map showing the Property location and the surrounding area is in Appendix A.

1.1 Purpose

The purpose of this Phase I ESA was to identify *Recognized Environmental Conditions* associated with the current and historical usage of the Property and adjoining properties, nearby off-Site sources of potential impact, and the potential environmental impact on the Property from surrounding conditions or activities. Burns & McDonnell performed this Phase I ESA to satisfy one of the requirements to qualify for the innocent landowner defense described in the Comprehensive Environmental Response Compensation and Liability Act (CERCLA liability): that is, the practices that constitute "all appropriate inquiry into the previous ownership and uses of the property consistent with good commercial or customary practice" as defined in 42 USC § 9601(35)(B). This Phase I ESA may not be a comprehensive evaluation of business risks nor is it an environmental compliance audit.

The term *Recognized Environmental Condition* as defined by American Society of Testing and Materials (ASTM) means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of a property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *Recognized Environmental Conditions*.

1.2 Detailed Scope of Services

Burns & McDonnell's agreement dated April 19, 2006 contains the detailed scope of services and terms and conditions governing this work. A copy of the scope of services is contained in Appendix I.

1.3 Significant Assumptions

Burns & McDonnell obtained environmental database information from Environmental Data Resources (EDR), a commercial provider of that service. Burns & McDonnell provided EDR the Property address and asked EDR to use the Property address as the center of its search radius. Accordingly, the search distances shown on the radius maps may not be actual distances from the Property.

Burns & McDonnell did not request Fire Insurance Maps from EDR for the Property, based on Burns & McDonnell's knowledge that fire insurance maps do not exist for this area based on previous work conducted by Burns & McDonnell with EDR at an adjacent site. Burns & McDonnell did not attempt to obtain Fire Insurance Maps from other sources, however, Starwood should be aware that other Fire Insurance Maps may exist that Burns & McDonnell did not review.

Burns & McDonnell assumes that hidden, unapparent, or latent conditions or defects are not in or on the Property, subsoil, or structures other than those noted in this report. Burns & McDonnell assumes no responsibility for such conditions or inspection, engineering, or repair, which might be required to discover or correct such factors.

The following significant assumptions were used to formulate the recommendations and opinions contained in this report:

- groundwater flow generally follows the topography,
- existing reports are accurate,
- interview comments are accurate,
- environmental database information is complete,
- the person interviewed meets the definition of the key site manager,
- conditions at the time of the site visit were representative of ordinary conditions at the Property,
- location of Property boundaries are accurate,
- geologic conditions are the same as shown on published maps, and
- groundwater conditions are the same as shown on published maps.

1.4 Limitations and Exceptions of this Phase I ESA

This report is an instrument of service prepared by Burns & McDonnell for the exclusive use of Starwood. In order to create a report on which Starwood could rely, Burns & McDonnell worked closely with Starwood in development of the scope of service upon which all subsequent tasks have been based. No party other than Starwood is permitted by Burns & McDonnell to rely on this instrument of Burns & McDonnell's service.

According to the ASTM, Phase I Environmental Site Assessments (ESAs) are conducted to satisfy one of the requirements to qualify for the innocent landowner defense described in the Comprehensive Environmental Response Compensation and Liability Act (CERCLA liability); that is, the practices that constitute "all appropriate inquiry into the previous ownership and uses of the Property consistent with good commercial or customary practice" as defined in 42 USC § 9601(35)(B). The opinions relative to hazardous substances and petroleum products given in this report are based upon information derived from the most recent Site reconnaissance and from other activities described herein.

The most recent site reconnaissance was performed on March 23, 2006. Starwood is advised that the conditions observed by Burns & McDonnell are subject to change. Certain indicators of the presence of hazardous substances and petroleum products may have been latent at the time of the most recent site reconnaissance and may subsequently have become observable. In a similar manner, the research effort conducted for a Phase I ESA is limited. Accordingly, it is possible that Burns & McDonnell's research, while fully appropriate for a Phase I ESA, failed to indicate the existence of important information sources. Assuming such sources actually exist, their information could not have been considered in the formulation of Burns & McDonnell's findings and the opinions.

A Phase I ESA is a service whose basic elements are determined by the standard of care prevailing at the time the service was rendered in the area where it was rendered. Because standards of care can be identified only through retrospective inquiry, Burns & McDonnell has assumed that the standard of care is the ASTM Standard E1527-00. By definition, such standards set forth minimum requirements.

Problems have arisen in the past because people and organizations have assumed, improperly, that they could rely on a Phase I ESA report developed for another party. So there is no confusion in this respect, recognize that Starwood is the only intended beneficiary of this report. Starwood is the party to which Burns & McDonnell has explained the risks involved and which has been involved in the shaping of the scope of services needed to satisfactorily manage those risks from Starwood's perspective. Accordingly, reliance on this report by any party other than Starwood would result in reliance on assumptions whose extent and nature would distort the meaning and impact of the findings and opinions related herein. Reliance on this report would in turn result in misinterpretation of these findings and opinions and potentially unwise actions based on those misinterpretations. Burns & McDonnell's findings and opinions related in this in this report may not the relied upon by any party except Starwood.

This Phase I ESA did not include any inquiry with respect to corporate environmental compliance, radon, methane, asbestos, lead paint, mold or wetlands.

This Phase I ESA is presumed to be valid 180 days. Thereafter, this Phase I ESA is invalid, unless updated as part of a subsequent service by Burns & McDonnell.

1.5 Special Terms and Conditions

This Phase I ESA was performed pursuant to Burns & McDonnell's agreement dated April 19, 2006. In accordance with the Scope of Services and Responsibilities of Client, as described in Section 5 of ASTM E1527-00, Starwood was requested to furnish the following information:

- Starwood provided Burns & McDonnell with the location of the Property to be assessed.
- Starwood identified Mr. Barry Baker, Manager of the Property owner, PAO Investments, LLC, as a person possessing knowledge of the uses and physical characteristics of the Property.
- Starwood indicated that prior reports and correspondences concerning the Property do not exist.
- Starwood did not make Burns & McDonnell aware of any specialized knowledge or experience material to *Recognized Environmental Conditions* in connection with the Property.
- Starwood provided Burns & McDonnell with the chain-of-title for the Property.

The scope of work described in Burns & McDonnell's agreement is contained in Appendix I.

Starwood is the prospective tenant of the Property. Starwood has requested that a Phase I ESA be performed in order to evaluate the current environmental condition of the Property for its own purposes.

As noted above, this Phase I ESA was conducted and this report was prepared for use solely by Starwood. This report shall not be relied upon by or transferred to any other party without the express written authorization of both Starwood and Burns & McDonnell.

* * * * *

2.0 SITE DESCRIPTION

2.1 Location and Legal Description

The Property is located at W. Panoche Road in Firebaugh, Fresno County, California, 93622. The Property consists of approximately 5.62 acres of land. The current legal title holder of the Property, PAO Investments, LLC, acquired the Property in 1989. A full legal description is included in Appendix H, page 11.

2.2 Site and Vicinity Characteristics

The Property is located south of West Panoche Road, approximately 2 miles east of I-5. The general area of the Property is agricultural; however, immediately adjacent properties are industrial and residential in nature. According to the 1971 USGS Chaneyranch, California quadrangle topographic map (refer to Appendix A), the Property lies at approximately 410 feet above mean sea level and the topography of the area of the Property slopes gently to the northeast. The Property itself is relatively flat. The surface elevation of the Property does not appear to vary. Surface water drainage for the Property area is generally by sheet flow away from the Property; however storm water may also collect in low areas on the Property, as was observed during the Site visit.

2.3 Current Use of the Property

The Property is currently occupied by CalPeak Power, LLC and is used for equipment storage. According to the Fresno County Assessor's office, the Property is zoned as "A-20E Agricultural Exclusive". Burns & McDonnell found no information in the government lists and records reviewed to contradict the summary of Property use in this section.

2.4 Description of Structures, Roads and Improvements

The Property is unimproved; however it is fenced and locked. The Site is generally accessed through a gate on the west side, which enters from the CalPeak Power-Panoche, LLC electric generating station. There are no structures or roads present on the Property. Equipment associated with the CalPeak Power-Panoche, LLC station to the west is stored on the Property, directly on the ground surface. The stored equipment is generally arranged such that there are passageways between the equipment for vehicle access.

2.5 Current Uses of the Adjoining Properties

The following table summarizes the occupants and apparent uses of the adjoining properties.

Table 2-1 Summary of Adjoining Properties		
Address and Direction	Occupant	Apparent Use
43699 Panoche Rd., west	CalPeak Power-Panoche, LLC	Power generating station
43649 Panoche Rd., east	Wellhead Power Panoche, LLC	Power generating station
North	Diesel Tank Farm; Residential	Diesel Tank Farm; Residential
South	Agricultural	Agricultural (pomegranates)

* * * * *

3.0 USER PROVIDED INFORMATION

3.1 Title Records

Land title records were provided by Starwood for Burns & McDonnell's review. A copy of the title report is included in Appendix H. The title records indicate numerous easements on the Property for such things as pipelines, lines of poles, etc.

3.2 Environmental Liens or Activity and Use Limitations

Prior to beginning work on the Phase I ESA, Burns & McDonnell asked Mr. Weiss, of Starwood, and Mr. Barry Baker, Owner representative, if there were:

- any pending, threatened, or past litigation relevant to hazardous substances or petroleum products in, on, or from the Property;
- any pending, threatened, or past administrative proceedings relevant to hazardous substances or petroleum products in, on or from the Property;
- any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products, and
- any limitations on activity or Property use.

According to both Mr. Weiss and Mr. Baker, there are no pending, threatened or past proceedings or limitations of these kinds.

3.3 Specialized Knowledge

Prior to beginning work on the Phase I ESA, Burns & McDonnell asked Mr. Weiss if Starwood had any specialized knowledge or experience that may be material to *Recognized Environmental Conditions* in connection with the Property. Mr. Weiss indicated that Starwood has no such information.

3.4 Valuation Reduction for Environmental Issues

Burns & McDonnell asked Mr. Weiss if Starwood has actual knowledge that the purchase price of the Property is significantly less than the purchase price of comparable properties. Mr. Weiss indicated that Starwood is not aware of any such valuation reduction.

3.5 Owner, Key Site Manager and Occupant Information

Starwood provided the following information concerning the Property:

Owner of Record:	PAO Investments, LLC
Occupant Name:	CalPeak Power-Midway, LLC
Key Site Manager:	Mr. Barry Baker, Manager PAO Investments, LLC

3.6 Reason for Performing this Phase I ESA

Starwood indicated that it is performing this Phase I ESA in order to evaluate the current environmental condition of the Property for its own purposes.

* * * * *

4.0 RECORDS REVIEW

Burns & McDonnell obtained and reviewed environmental and physical setting records and historic information in an effort to identify *Recognized Environmental Conditions* in connection with the Property. The following subsections are a narrative description of the records Burns & McDonnell obtained and reviewed. Where applicable, the approximate search distance is given.

4.1 Physical Setting Sources

The ASTM standard source for physical setting information is the USGS 7.5 Minute Topographical Map. The 1971 USGS Chaneyranch, California quadrangle topographic map is located in Appendix A.

4.2 Standard Environmental Record Sources, Federal and State

EDR provided an ASTM Radius Report containing United States Environmental Protection Agency (EPA), State and Tribal database information in accordance with ASTM defined search distances. Appendix C contains EDR's Radius Report that lists the federal, state and tribal databases searched, a description of the databases and the most recent release date of each database. The appended report also shows EPA, State and Tribal regulated sites within the search area and other regulated sites that could be in the search area, but were unplottable due to insufficient address or other locator information. These unplottable sites are called "Orphan Sites" in this report.

EDR included the following twelve ASTM-required databases in its search of environmental records:

Table 4-1
ASTM Standard Database Search Distances

Database Name	Approximate Minimum Search Distance in Miles
Federal National Priorities List (NPL)	1.0
Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	0.5
Federal Comprehensive Environmental Response, Compensation, and Liability Information System No Further Remedial Action Planned (CERCLIS - NFRAP)	Property and Adjoining (0.25)
Federal Resource Conservation and Recovery Information System - Treatment, Storage, and Disposal Facilities Listed on the Corrective Action Tracking System (RCRIS CORRACTS TSD)	1.0

Table 4-1 ASTM Standard Database Search Distances	
Database Name	Approximate Minimum Search Distance in Miles
Federal Resource Conservation and Recovery Information System - Treatment, Storage, and Disposal Facilities not Listed on the Corrective Action Tracking System (RCRIS non-CORRACTS TSD)	0.5
Federal Resource Conservation and Recovery Information System Generators (RCRIS)	Property and Adjoining (0.25)
Federal Emergency Response Notification System (ERNS)	Property only
State Equivalent NPL List	1.0
State Equivalent CERCLIS List	0.5
State Solid Waste Landfills and/or Solid Waste Disposal Site Lists (SWF/LF)	0.5
State Registered Underground Storage Tank Lists (USTs)	Property and Adjoining (0.25)
State Leaking UST Report (LUST)	0.5

EDR reported 3 sites in 2 of the 62 databases searched (ASTM-required and ASTM-supplemental, combined). Sites were identified in the following databases: RCRA-SQG and Fresno Co. CUPA. The FINDS database is simply a registry system that includes general facility information and "pointers" to other sources that contain more detail. This database will not be discussed since it only includes general information.

EDR reported 24 orphan sites as potentially being within the ASTM defined search distances of the Property. Using visual observations during the Site reconnaissance, Burns & McDonnell determined that 1 of these orphan sites is within the ASTM defined search distance. This orphan site is the PG&E electrical substation located west of the Property. It is identified in the Fresno Co. CUPA database.

4.2.1 Fresno County CUPA

The Fresno County Certified Unified Program Agency (CUPA) is 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 (USTs) and aboveground storage tanks (ASTs).

The Wellhead Power Panoche, LLC site is located adjacent to the Property, to the east. This site is identified as being involved in the following programs: CALARP RMP Facility, Medium Hazardous Materials Handler, Extremely Hazardous Substance Handler (EPCRA) and Conditionally Exempt Small Quantity Generator.

The CalPeak Power – Panoche LLC site is located adjacent to the Property to the west. This site is identified as being involved in the following programs: CALARP RMP Facility, Large Hazardous Materials Handler, Extremely Hazardous Substance Handler (EPCRA) and Conditionally Exempt Small Quantity Generator.

The PG&E site to the west of the Property is identified in the orphan summary in this database. There are no details given regarding the site.

4.2.2 Federal Resource Conservation and Recovery Information System Sites (RCRIS)

The Resource Conservation and Recovery Information System (RCRIS) contains information about hazardous waste generators and treatment, storage and disposal (TSD) sites. The generator information is organized by large quantity (LQG) and small quantity (SQG). The TSD information is organized by those sites requiring corrective action (RCRIS CORRACTS TSD) and those that do not (RCRIS non-CORRACTS TSD).

4.2.2.1 Hazardous Waste Small Quantity Generators (RCRIS SQG)

RCRIS SQG provides information on facilities reporting they generate hazardous waste in quantities low enough to be classified as small quantity generators pursuant to the Resource Conservation and Recovery Act. This list includes all facilities that submitted notifications of hazardous waste activity and one time generators of hazardous wastes. The PG&E site is reported to be a RCRA-SGQ site. It is located immediately west of the Property. There are no violations reported for this site.

4.3 Historical Use Information On The Property And Adjoining Properties

Burns & McDonnell reviewed reasonably ascertainable and practically reviewable historical information concerning the Property and adjoining properties. The historical information Burns & McDonnell reviewed included:

- Aerial Photographs
- Zoning/Land Use Records
- Recorded Land Title Records
- Topographic Maps

4.3.1 Summary of Past Uses of the Property

Burns & McDonnell obtained information during the Site visit on March 23, 2006, interviews conducted, and records reviewed in order to identify the uses of the Property back to 1940 or the first developed use of the Property. According to the historical aerial photographs and topographic maps in conjunction with information from the Property, it appears that the Property was used for agricultural purposes prior to its use by CalPeak Power, LLC as a laydown area beginning in 2001.

4.3.2 Aerial Photographs

Burns & McDonnell obtained and reviewed historic aerial photographs from EDR for the years 1957, 1965, 1981, 1987 and 1998. Burns & McDonnell reviewed these aerial photographs to obtain information about the history of development on and in the vicinity of the Property. Copies of aerial photographs are included in Appendix E. The date of each photograph and the observations noted during the review are summarized in the paragraphs below:

1957	The Property appears to be used for agricultural purposes. The PG&E substation is present to the west of the Property.
1965	The Property appears to be unused. The PG&E substation is present to the west of the Property.
1981	The Property appears to be actively used for agricultural purposes. The western most portion of the Property appears to have been cleared for access to the PG&E substation.
1987	The Property appears unchanged.
1998	The Property appears to no longer be used for agricultural purposes. It appears to have been cleared/graded.

4.3.3 Fire Insurance Maps

Based on recent work on an adjoining site, Burns & McDonnell knows that Fire Insurance Maps do not exist for the Property.

4.3.4 Property Tax Records

Burns & McDonnell did not review tax records for the Property because the Chain-of-Title was provided for the Property.

4.3.5 Building Department Records

Burns & McDonnell did not review building department records for the Property because there are not structures on the Property and no structures are believed to have been present in the past.

4.3.6 Zoning/Land Use Records

Burns & McDonnell reviewed information on file at the Fresno County Planning and Zoning department in an effort to identify the land use and zoning classification of the Property. Refer to Section 2.3 for a discussion of the Property zoning.

4.3.7 Fire Department Records

Burns & McDonnell contacted the Fresno County Fire Protection District in an effort to identify records of USTs and stored chemicals and wastes at the Property and to look for records of fires and explosions on the Property in the Past. The representative indicated that the District's records are filed by date and not by address or property owner name, therefore their records are not readily reviewable.

4.3.8 Existing Technical/Environmental Reports

Starwood provided no existing technical or environmental reports for the Property. Also, Mr. Baker indicated that no prior technical or environmental reports exist for the Property.

4.3.9 Recorded Land Title Records

Land title records were provided by Starwood and are discussed in Section 3.1.

4.3.10 Historic Topographic Maps

Burns & McDonnell reviewed historic topographic maps obtained from EDR. Copies of topographic maps are included in Appendix F. The following paragraphs provide a summary of Burns & McDonnell's review of the historic topographic maps for the Property.

1913	The Property appears to be undeveloped.
1955	The PG&E substation is visible on adjacent property. The Property remains undeveloped.
1971	Unchanged from the 1955 topographic map.

4.3.11 Local Street Directories

Burns & McDonnell did not review local street directories based on the knowledge from work at an adjacent Property for which City Directories were obtained. Those directories indicated that the street on which the Property is located is not listed in available directories.

4.3.12 Freedom of Information Act Requests

Burns & McDonnell submitted a FOIA request to the Fresno County Environmental Health Department on May 1, 2006 in order to obtain copies of records for the Property and for the diesel AST farm on adjoining property (see Appendix G). A follow-up inquiry was made with regard to the original request; however, at the time of this report Burns & McDonnell has not received the records requested.

4.3.13 Summary of the Past Uses of Adjoining Properties

To the extent that Burns & McDonnell's reviews of historic information for the Property revealed the historic use of adjoining properties, Burns & McDonnell also gathered information concerning the historic uses of those adjoining properties. Based on Burns & McDonnell's knowledge of the area of the Property, the PG&E substation was constructed in 1949. Other adjacent properties appear to have been agricultural in nature since at least 1957. The apartment house to the north appears to have been present as early as 1981. According to the Property owner representative, Mr. Baker, the fuel farm on the north side of the Property was constructed in the early 1970's, during the energy crisis. He believes the apartment house may have been constructed at approximately the same time. Mr. Baker also stated that the Wellhead Power-Panoche, LLC and CalPeak Power-Panoche, LLC generating facilities were constructed at the same time in 2001.

* * * * *

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

Burns & McDonnell performed reconnaissance of the Property and publicly visible portions of adjoining properties to obtain information indicating the likelihood of identifying *Recognized Environmental Conditions* in connection with the Property. Ms. Sarah E. S. Sizemore, Environmental Engineer with Burns & McDonnell, performed the site reconnaissance on March 23, 2006. Ms. Sizemore was accompanied by Mr. Ed Smith, CalPeak Power, LLC Operations & Maintenance Technician at the adjacent CalPeak Power-Panoche, LLC facility, and Mr. Brad Heisey, of Tyr Energy on behalf of the Buyer's Group, during the site reconnaissance. The following conditions restricted the site reconnaissance:

- The ground in some areas of the Property was obscured by large pieces of equipment and could not be visibly observed.
- The ground in some areas of the Property, particularly on the east side, was wet from recent rainfall and could not be observed directly.

5.2 General Property Setting

Refer to Sections 2.1 and 2.2 for a description of the general property setting.

5.2.1 Current Use of the Property and Adjoining Properties

Refer to Sections 2.3 and 2.5 for a description of the current use of the Property and adjoining properties.

5.2.2 Current Property Zoning

Refer to Sections 2.3 for a description of the current Property zoning.

5.2.3 Property Topography

Refer to Section 2.2 for a description of the Property topography.

5.2.4 Property Geology And Hydrogeology

According to the current soil information available on-line from the United States Department of Agriculture's Fresno County, California Soil Survey, the Property area is composed of Panoche Clay Loam, with 0 to 2% slopes. Additional details were not available.

The database report obtained from EDR for this report indicates that Ciervo is the dominant soil in the area. It is described as a Class C clay soil with slow infiltration rates. It is moderately well drained with a layer of low hydraulic conductivity. The corrosion potential of this soil is classified as High. The depth to the water table is reported as 3 to 6 feet and depth to bedrock is reported as greater than 60 inches.

5.3 Questions About Helpful Documents

Burns & McDonnell's proposal requested that Starwood assist Burns & McDonnell by placing at its disposal all available information pertinent to the Property including, but not limited to geotechnical reports, environmental reports, records, correspondences, plats of survey, building, grading and development plans, tax number, current legal title holder of the Property and any other data relevant to the Burns & McDonnell's services.

Prior to the Site reconnaissance Burns & McDonnell asked Mr. Rich Weiss if Starwood knew of any existing documents as follows:

- environmental site assessment reports,
- environmental audit reports,
- environmental permits (for example, solid waste disposal permits, hazardous waste disposal permits, wastewater permits, NPDES permits),
- registrations for USTs or ASTs,
- material safety data sheets,
- community right-to-know plan,
- safety plans;
- preparedness and prevention plans;
- spill prevention, control, and countermeasure plans;
- reports regarding hydrogeologic conditions on the Property or surrounding properties,
- notices or other correspondence from any government agency relating to past or current violations of environmental laws with respect to the Property or relating to environmental liens encumbering the Property,
- hazardous waste generator notices or reports, and
- geotechnical studies.

Starwood indicated that it did not have any such documents and directed Burns & McDonnell to contact the Property owner regarding such information. Mr. Baker, Property owner representative, indicated he had no such documents.

5.4 Hazardous Substances And Petroleum Products

During the Site reconnaissance, Burns & McDonnell looked for indications of the use, treatment, storage, disposal, and generation of hazardous substances and petroleum products on the Property. No hazardous substance or petroleum products were observed in connection with identified uses.

5.5 Storage Tanks

Burns & McDonnell looked for indications of the presence of ASTs and USTs during its Site reconnaissance. The following sections provide details of Burns & McDonnell's findings.

5.5.1 Aboveground Storage Tanks (AST)

Burns & McDonnell saw no ASTs on the Property during the Site reconnaissance. There is a tank farm containing eleven ASTs (7 horizontal ASTs and 4 vertical ASTs) on adjoining property to the north of the Site. This property is also owned by the Property owner. Mr. Baker indicated the ASTs were installed in the early 1970's, prior to his purchase of the property in 1989. Diesel fuel is stored in all of the ASTs. Mr. Baker indicated that he is not aware of any spills or releases in conjunction with the diesel ASTs. The ASTs w3ere not identified in the EDR report, which searched the California AST Database maintained by the State Water Resources Control Board.

5.5.2 Underground Storage Tanks (UST)

Burns & McDonnell looked for vent pipes, fill pipes or access ways indicating the existence of USTs on the Property during the Site reconnaissance. Burns & McDonnell saw no evidence of USTs on the Property during the Site reconnaissance. Burns & McDonnell asked Mr. Baker if any USTs exist on the Property. Mr. Baker indicated that he was not aware of any current or historic USTs on the Property.

5.6 Odors

Burns & McDonnell observed no strong, pungent, or noxious odors during the Site reconnaissance.

5.7 Pools Of Liquid

Burns & McDonnell observed standing surface water from recent rainfall in the central and eastern areas of the Property during the Site reconnaissance. (See photos in Appendix D.)

Burns & McDonnell saw no pools or sumps containing liquids likely to be hazardous substances or petroleum products on the Property during the Site reconnaissance.

5.8 Drums

The following table summarizes the content, capacity, and location of drums identified by Burns & McDonnell during the Site reconnaissance (See photos in Appendix D):

Table 5-1
Summary of Drums

Description of Substance	Estimated Quantity	Location Stored
Unidentified	85 gallons (17, 5-gallon buckets)	Pallet near south side of Property.
Unidentified	30 gallons (30, 1-gallon pails)	Pallet near west side of Property.

These containers were being stored on the Property by CalPeak Power, LLC. The containers appeared to be intact and in good condition. All of the containers were stored off the ground on wood pallets.

5.9 Unidentified Substance Containers

Burns & McDonnell looked for open or damaged containers containing unidentified substances suspected of being hazardous substances or petroleum products. The following table summarizes the apparent capacity and location of unidentified containers observed by Burns & McDonnell during the Site reconnaissance (See photos in Appendix D):

Table 5-2
Summary of Unidentified Substance Containers

Description of Substance	Estimated Quantity	Location Stored
Unidentified; not labeled	85 gallons (17, 5-gallon buckets)	Pallet near south side of Property.
Unidentified; not labeled	30 gallons (30, 1-gallon pails)	Pallet near west side of Property.

These containers were being stored on the Property by CalPeak Power, LLC. The containers appeared to be intact and in good condition. All of the containers were stored off the ground on wood pallets.

5.10 PCBs

Burns & McDonnell looked for evidence of electrical or hydraulic equipment known to contain PCBs or likely to contain PCBs during the Site reconnaissance of the Property. Burns & McDonnell saw no evidence of PCB containing equipment during reconnaissance of the Property. Under TSCA, unlabeled electrical equipment is presumed to contain PCBs at concentrations greater than 50 parts per million (ppm) but less than 500 ppm. Burns & McDonnell asked Mr. Baker if any PCB containing electrical or hydraulic equipment exists on the Property. Mr. Baker indicated that no such equipment exists and that, to his knowledge, transformers have never been stored on the Property.

5.11 Exterior Observations

5.11.1 Pits, Ponds, or Lagoons

Burns & McDonnell looked for pits, ponds, or lagoons on the Property during the Site reconnaissance. Burns & McDonnell also looked for pits, ponds, or lagoons on adjoining the properties to the extent that they were visually observed from the Property or identified in the interviews or records reviews. Burns & McDonnell saw no pits, ponds or lagoons on the Property during the Site reconnaissance. Storm water runoff generally sheet flows from the Property to the northwest; however, it may accumulate in some low areas on the Property as observed during the Site visit.

Two retention ponds were observed at the CalPeak Power-Panoche, LLC generating facility on adjoining property to the west of the Site. The main retention pond is used to collect storm water runoff from the facility. The main pond overflows into a second retention pond that runs along the eastern boundary of the CalPeak Power generating facility. This pond has no outlet and water evaporates or percolates into the ground. No sheen was observed on the surface of either pond during the Site reconnaissance.

5.11.2 Stained Soil or Pavement

Burns & McDonnell looked for areas of stained soil or pavement during the reconnaissance of the Property. Burns & McDonnell saw no areas of stained soil or pavement during the reconnaissance of the Property; however some portions of the ground surface were not visible due to large pieces of equipment being stored or due to standing water from recent rainfall. Some areas of the ground were also still discolored from recent rainfall in areas where the standing water had evaporated or infiltrated the soil, but the soil had not yet fully dried.

5.11.3 Stressed Vegetation

Burns & McDonnell looked for areas of stressed vegetation (from something other than insufficient water) during the reconnaissance of the Property. Burns & McDonnell saw no areas of stressed vegetation during the reconnaissance of the Property.

5.11.4 Solid Waste

Burns & McDonnell looked for areas on the Property that are apparently filled or graded by non-natural causes (or filled by fill of unknown origin) suggesting trash or other solid waste disposal, or mounds or depressions suggesting trash or other solid waste disposal. Burns & McDonnell identified no such areas on the Property during this Phase I ESA.

5.11.5 Wastewater

Burns & McDonnell looked for wastewater or other liquid (including storm water) or any discharge into a drain, ditch, or stream on or adjacent to the Property during the reconnaissance of the Property. Burns & McDonnell saw no discharges into a drain, ditch, or stream on or adjacent to the Property.

5.11.6 Wells

Burns & McDonnell looked for dry wells, irrigation wells, injection wells, and potable water wells on the Property as part of this Phase I ESA. Mr. Baker indicated that he was not aware of any dry wells or water wells of any kind on the Property. Furthermore, Burns & McDonnell saw no dry wells, irrigation wells, injection wells, or potable water wells on the Property during the reconnaissance of the Property.

5.11.7 Septic Systems

Burns & McDonnell looked for on-Site septic systems or cesspools on the Property during this Phase I ESA. Mr. Baker indicated that no on-site septic systems or cesspools of any kind exist on the Property. Furthermore, Burns & McDonnell saw no on-site septic systems or cesspools on the Property during the reconnaissance of the Property.

5.12 Interior Observations

There are no structures on the Property.

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6.0 INTERVIEWS

Burns & McDonnell interviewed the following persons in order to obtain information indicating *Recognized Environmental Conditions* in connection with the Property.

6.1 Interview with Current Property Owner and Key Site Manager

On May 1, 2006, Burns & McDonnell interviewed Mr. Barry Baker, Manager of the Property owner, PAO Investments, Inc., regarding the current and historical use of the Property and adjoining properties, institutional controls, specialized knowledge regarding environmental conditions or concerns, owner, property, and occupant information. Information obtained as a result of this interview is presented in the appropriate section(s) of this report.

6.2 Interview with Current Occupant(s)

On March 23, 2006 Burns & McDonnell interviewed, Mr. Ed Smith, CalPeak Power, LLC Operations & Maintenance Technician for the CalPeak Power, LLC Panoche site, regarding current uses of the Property and adjoining properties and specialized knowledge regarding environmental conditions or concerns at the Property. Information obtained as a result of this interview is presented in the appropriate section(s) of this report.

* * * * *

7.0 FINDINGS & OPINIONS

This Phase I ESA has revealed the following findings associated with the Property:

- The Property is approximately 5.62 acres in size. The Property is unimproved and is used by CalPeak Power, LLC as an equipment storage and laydown yard. CalPeak Power, LLC has been using the Property since their electric generating facility became operational December 2001. Previously, the Property was used for agricultural purposes. The CalPeak Power, LLC power generating facility is located to the west of the Property. The Wellhead Power, LLC power generating facility is located to the east of the Property. An AST farm is located to the north of the Property.
- The AST farm to the north of the Property includes eleven diesel ASTs. Due to the general topography of the area, releases from these ASTs should flow generally northeast, if not contained on the site. Mr. Baker, Property owner representative, is not aware of any spills in conjunction with the ASTs; therefore, it is not believed that the ASTs have negatively impacted the Property.
- Historically, the Property has been used for agricultural purposes which may have included the use of pesticides and/or herbicides. There is the potential that pesticide and/or herbicide contamination is present on the Property at low levels; however it is not believed to have negatively impacted the Property.

* * * * *

8.0 CONCLUSIONS

Burns & McDonnell performed a Phase I ESA in conformance with the scope and limitations of ASTM Practice E 1527-00 of the Midway Site, W. Panoche Road Firebaugh, California. Any exceptions to, or deletions from, this practice are described in Section 9.0 of this report. This Phase I ESA revealed no evidence of *Recognized Environmental Conditions* in connection with the Property.

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9.0 DEVIATIONS

The following are considered deviations from the ASTM 1527-00 standard:

- Burns & McDonnell was unable to review 50 years of business records for the Property because the current occupant has not owned the Property for that length of time and the records they maintain were not practically reviewable.
- Burns & McDonnell was unable to document the first obvious use of Property.

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10.0 ADDITIONAL SERVICES

There were no additional services included with this Phase I ESA.

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11.0 REFERENCES

EDR Radius Map with GeoCheck, W. Panoche, W. Panoche Road, Firebaugh, California, 93622, Inquiry Number 1664661.1s, April 28, 2006.

EDR Historical Topographic Map Report, Panoche – Fresno, 43699 W. Panoche Road, Firebaugh, California, 93622, Inquiry Number 1635106.20, March 16, 2006.

EDR Sanborn Aerial Photo Decade Package, Panoche – Fresno, 43699 W. Panoche Road, Firebaugh, California, 93622, Inquiry Number 1635106.22, March 17, 2006.

* * * * *

12.0 SIGNATURES OF ENVIRONMENTAL PROFESSIONALS

The following environmental professionals were responsible for this report:

____

Ms. Sarah E. S. Sizemore
Environmental Engineer

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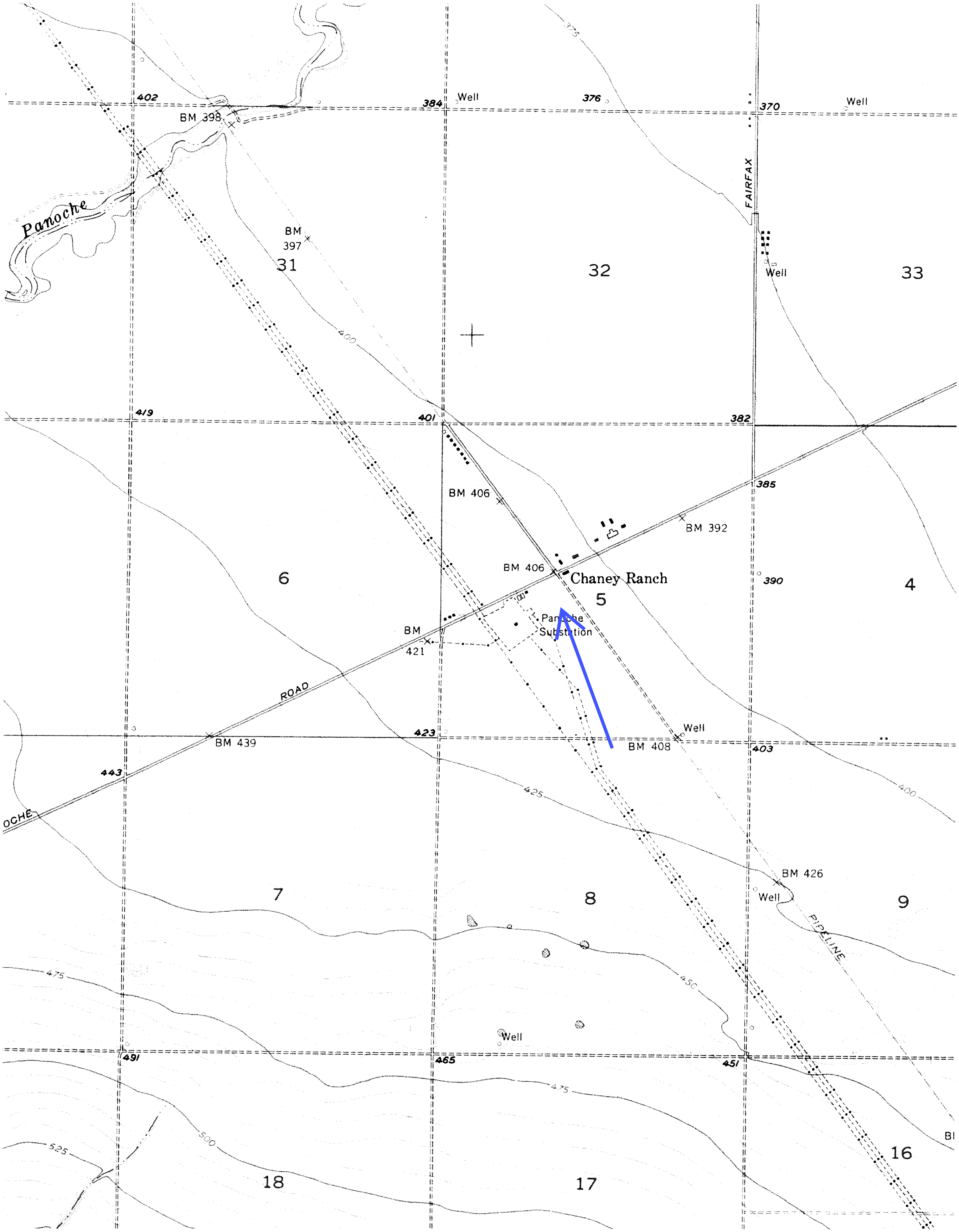
13.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS PARTICIPATING IN THE PHASE I ENVIRONMENTAL SITE ASSESSMENT

(See attached resumes)

APPENDIX A

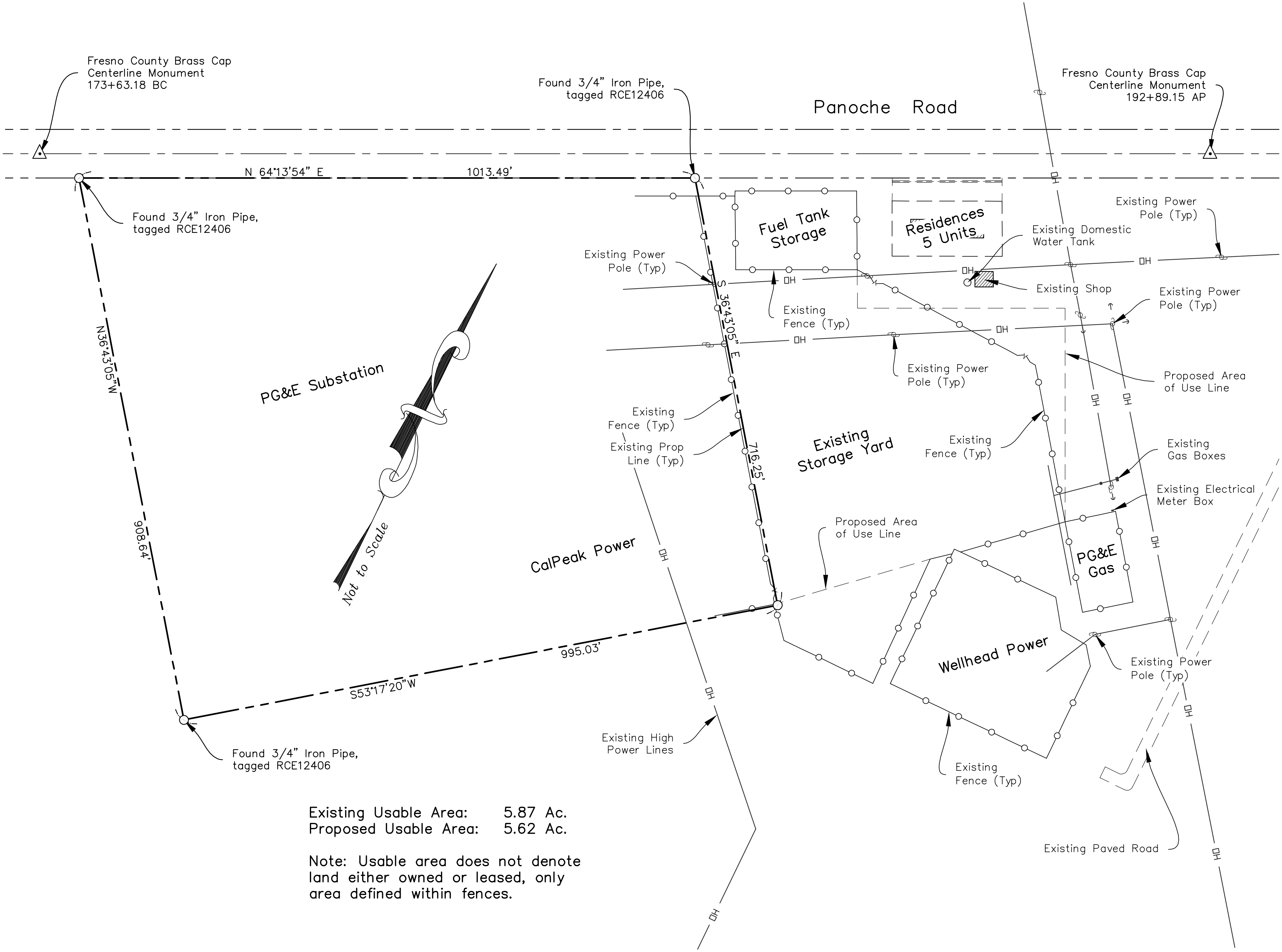
Site Vicinity Map



N ^ EDR INQUIRY# 1635106.20 TARGET QUAD: CHANEYRANCH PhotoRevised: 1955-1971 Series: 7.5' Scale: 1:24,000

APPENDIX B

Site Plan



Fresno County Brass Cap
Centerline Monument
173+63.18 BC
Found 3/4" Iron Pipe,
tagged RCE12406
Fresno County Brass Cap
Centerline Monument
192+89.15 AP
Panoche Road
N 64°13'54" E
1013.49'
Found 3/4" Iron Pipe,
tagged RCE12406
Fuel Tank
Storage
Residences
5 Units
Existing Power
Pole (Typ)
Existing Domestic
Water Tank
Existing Power
Pole (Typ)
Existing Shop
Existing Power
Pole (Typ)
Existing
Fence (Typ)
S 36°43'05" E
N36°43'05"W
PG&E Substation
Existing Power
Pole (Typ)
Proposed Area
of Use Line
Existing
Fence (Typ)
Existing Prop
Line (Typ)
716.25'
Existing
Storage Yard
Existing
Fence (Typ)
Existing
Gas Boxes
Existing Electrical
Meter Box
908.64'
Not to Scale
CalPeak Power
Proposed Area
of Use Line
PG&E
Gas
Wellhead Power
Existing Power
Pole (Typ)
995.03'
S53°17'20"W
Existing High
Power Lines
Existing
Fence (Typ)
Found 3/4" Iron Pipe,
tagged RCE12406
Existing Paved Road
OH
Existing Usable Area: 5.87 Ac.
Proposed Usable Area: 5.62 Ac.
Note: Usable area does not denote
land either owned or leased, only
area defined within fences.

APPENDIX C

Radius Map Report

The EDR Radius Map
with GeoCheck®

EDR® Environmental Data Resources Inc

W. Panoche Rd.
W. Panoche Rd.
FIREBAUGH, CA 93622

Inquiry Number: 1664661.1s

April 28, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

TABLE OF CONTENTS

GEOCHECK ADDENDUM

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

W. PANOCHE RD.
FIREBAUGH, CA 93622

COORDINATES

Latitude (North):	36.655000 - 36˚ 39' 18.0''
Longitude (West):	120.578900 - 120˚ 34' 44.0''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	716413.2
UTM Y (Meters):	4059130.0
Elevation:	406 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	36120-F5 CHANEY RANCH, CA
Most Recent Revision:	1971

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

FEDERAL RECORDS

NPL National Priority List
Proposed NPL Proposed National Priority List Sites
Delisted NPL National Priority List Deletions
NPL RECOVERY Federal Superfund Liens
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

EXECUTIVE SUMMARY

ERNS - Emergency Response Notification System
HMIRS - Hazardous Materials Information Reporting System
US ENG CONTROLS - Engineering Controls Sites List
US INST CONTROL - Sites with Institutional Controls
DOD - Department of Defense Sites
FUDS - Formerly Used Defense Sites
US BROWNFIELDS - A Listing of Brownfields Sites
CONSENT - Superfund (CERCLA) Consent Decrees
ROD - Records Of Decision
UMTRA - Uranium Mill Tailings Sites
ODI - Open Dump Inventory
TRIS - Toxic Chemical Release Inventory System
TSCA - Toxic Substances Control Act
FTTS - FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
SSTS - Section 7 Tracking Systems
PADS - PCB Activity Database System
MLTS - Material Licensing Tracking System
MINES - Mines Master Index File
FINDS - Facility Index System/Facility Registry System
RAATS - RCRA Administrative Action Tracking System

STATE AND LOCAL RECORDS

AWP - Annual Workplan Sites
Cal-Sites - Calsites Database
CA BOND EXP. PLAN - Bond Expenditure Plan
NFA - No Further Action Determination
NFE - Properties Needing Further Evaluation
REF - Unconfirmed Properties Referred to Another Agency
SCH - School Property Evaluation Program
Toxic Pits - Toxic Pits Cleanup Act Sites
SWF/LF - Solid Waste Information System
CA WDS - Waste Discharge System
WMUDS/SWAT - Waste Management Unit Database
Cortese - "Cortese" Hazardous Waste & Substances Sites List
SWRCY - Recycler Database
LUST - Geotracker's Leaking Underground Fuel Tank Report
CA FID UST - Facility Inventory Database
SLIC - Statewide SLIC Cases
UST - Active UST Facilities
HIST UST - Hazardous Substance Storage Container Database
AST - Aboveground Petroleum Storage Tank Facilities
SWEEPS UST - SWEEPS UST Listing
CHMIRS - California Hazardous Material Incident Report System
Notify 65 - Proposition 65 Records
DEED - Deed Restriction Listing
VCP - Voluntary Cleanup Program Properties
CLEANERS - Cleaner Facilities
WIP - Well Investigation Program Case List
CDL - Clandestine Drug Labs
HAZNET - Facility and Manifest Data
EMI - Emissions Inventory Data

TRIBAL RECORDS

INDIAN RESERV - Indian Reservations

EXECUTIVE SUMMARY

INDIAN LUST Leaking Underground Storage Tanks on Indian Land
INDIAN UST Underground Storage Tanks on Indian Land

EDR PROPRIETARY RECORDS

Manufactured Gas Plants EDR Proprietary Manufactured Gas Plants

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 RECORDS

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 02/24/2006 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
PG AND E PANOCHE SUBSTATION	***43711 W PANOCHE RD***	***0 - 1/8 W***	***2***	***6***

STATE AND LOCAL RECORDS

Fresno Co. CUPA: Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

A review of the Fresno Co. CUPA list, as provided by EDR, and dated 01/18/2006 has revealed that there are 2 Fresno Co. CUPA sites within approximately 0.25 miles of the target property.

EXECUTIVE SUMMARY

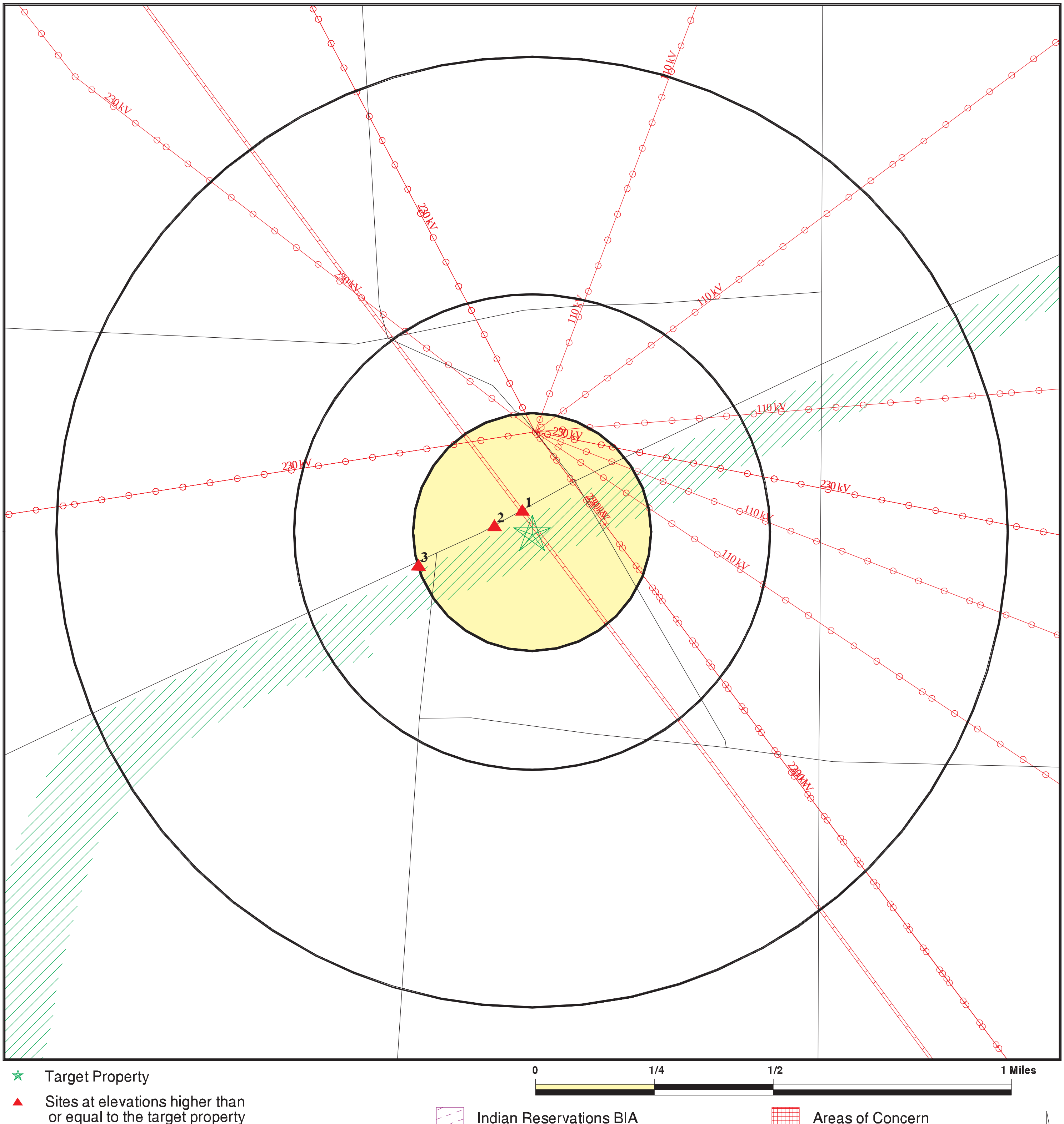
Equal/Higher Elevation	Address	Dist / Dir	Map ID	Page
WELLHEAD POWER PANOCHE LLC	43649 W PANOCHE	0 - 1/8 NNW	1	6
CALPEAK POWER - PANOCHE LLC	43699 W PANOCHE	1/8 - 1/4 WSW	3	8

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped:

Site Name	Database(s)
S.P. OPERATOR	SWEEPS UST
CLIFF'S EXXON	SWEEPS UST
PANOCHE TRAVELPORT	SWEEPS UST
CHEVRON #92316	HAZNET, SWEEPS UST
SHELL PIPELINE CO - PANOCHE STATION	Fresno Co. CUPA
PG&E	Fresno Co. CUPA
FIREBAUGH CANAL WATER DISTRICT	Fresno Co. CUPA
PANOCHE HILLS TIRE DISPOSAL	Fresno Co. CUPA
H F COX PETEROLEUM TRANSPORT	Fresno Co. CUPA
PANOCHE MOBIL*	Fresno Co. CUPA
WESTSIDE 76*	Fresno Co. CUPA
CALIFORNIA AQUEDUCT	CHMIRS, Fresno Co. CUPA
SUMNER PECK RANCH	Toxic Pits
MENDOTA SITE	CERC-NFRAP
CHEVRON #92316	UST
WESTSIDE 76*	UST
CHEVRON STATION 92316	RCRA-SQG, FINDS, HAZNET
PANOCHE TRAVELPORT	HAZNET
SR 33 AT FAIRFAX RD BETWEEN FIREBAUGH & DOS PALO	ERNS
46378 WEST PANOCHE ROAD	ERNS
46330 PINOCHE RD AT I-5	ERNS
1/4 MI S OF NICE AND 1/2 MI W OF OXFORD	ERNS
SILAXO STATION (AKA: TEXACO/GETTY OIL)	SLIC
CHOPERENA TIRE DISPOSAL SITE (PANOCHE BURN SITE)	SLIC

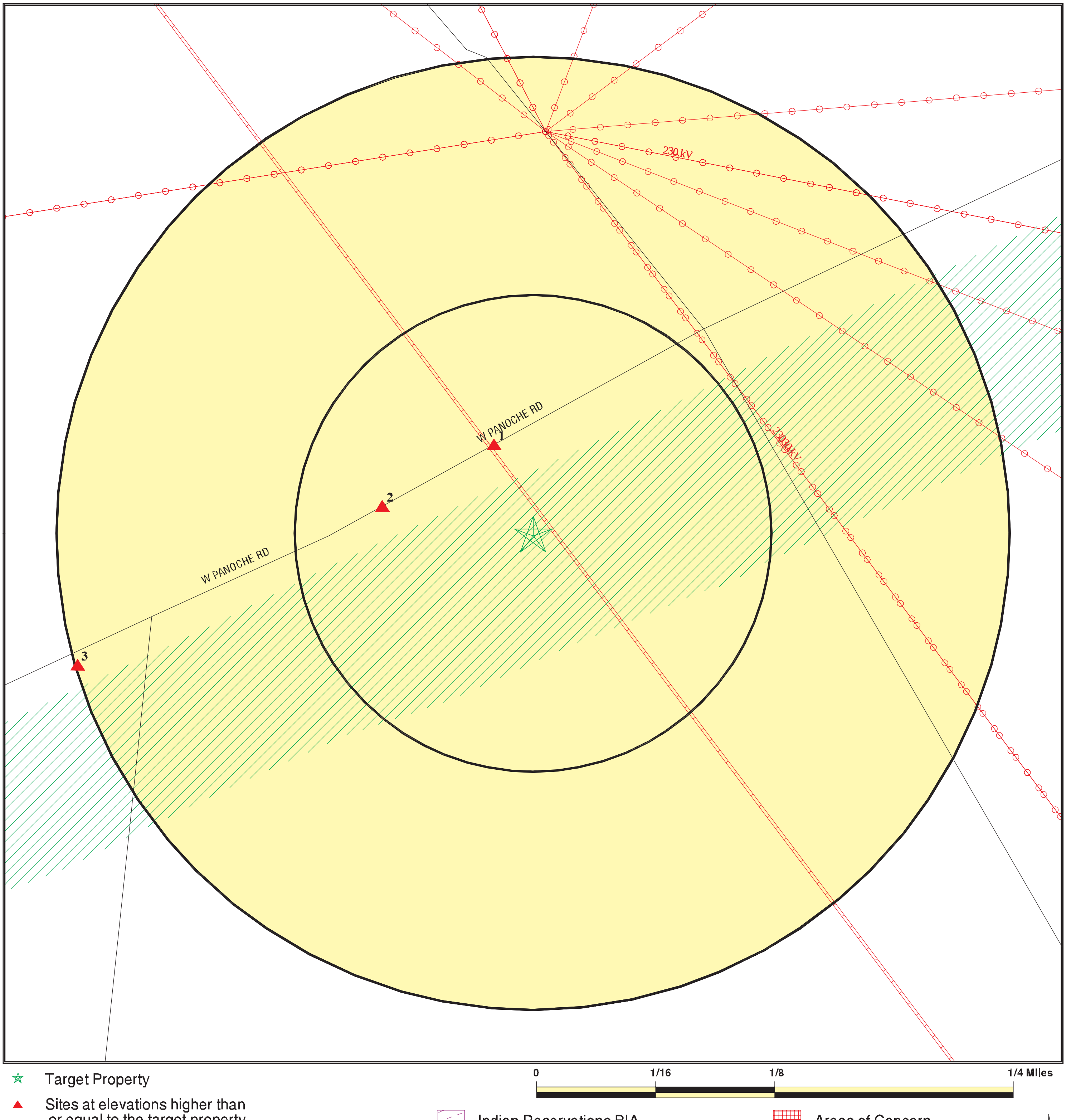
OVERVIEW MAP - 1664661.1s



Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
National Priority List Sites
Landfill Sites
Dept. Defense Sites
Indian Reservations BIA
Power transmission lines
Oil & Gas pipelines
100-year flood zone
500-year flood zone
Areas of Concern

SITE NAME:	W. Panoche Rd.	CLIENT:	Burns & McDonnell Engineering
ADDRESS:	W. Panoche Rd.	CONTACT:	Sarah Sizemore
	FIREBAUGH CA 93622	INQUIRY #:	1664661.1s
LAT/LONG:	36.6550 / 120.5789	DATE:	April 28, 2006

DETAIL MAP - 1664661.1s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

SITE NAME:	W. Panoche Rd.	CLIENT:	Burns & McDonnell Engineering
ADDRESS:	W. Panoche Rd.	CONTACT:	Sarah Sizemore
	FIREBAUGH CA 93622	INQUIRY #:	1664661.1s
LAT/LONG:	36.6550 / 120.5789	DATE:	April 28, 2006

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 RECORDS								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
Delisted NPL		1.000	0	0	0	0	NR	0
NPL RECOVERY		TP	NR	NR	NR	NR	NR	0
CERCLIS		0.500	0	0	0	NR	NR	0
CERC-NFRAP		0.500	0	0	0	NR	NR	0
CORRACTS		1.000	0	0	0	0	NR	0
RCRA TSD		0.500	0	0	0	NR	NR	0
RCRA Lg. Quan. Gen.		0.250	0	0	NR	NR	NR	0
RCRA Sm. Quan. Gen.		0.250	1	0	NR	NR	NR	1
ERNS		TP	NR	NR	NR	NR	NR	0
HMIRS		TP	NR	NR	NR	NR	NR	0
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
FUDS		1.000	0	0	0	0	NR	0
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
STATE AND LOCAL RECORDS								
AWP		1.000	0	0	0	0	NR	0
Cal-Sites		1.000	0	0	0	0	NR	0
CA Bond Exp. Plan		1.000	0	0	0	0	NR	0
NFA		0.250	0	0	NR	NR	NR	0
NFE		0.250	0	0	NR	NR	NR	0
REF		0.250	0	0	NR	NR	NR	0
SCH		0.250	0	0	NR	NR	NR	0
Toxic Pits		1.000	0	0	0	0	NR	0
State Landfill		0.500	0	0	0	NR	NR	0
CA WDS		TP	NR	NR	NR	NR	NR	0
WMUDS/SWAT		0.500	0	0	0	NR	NR	0
Cortese		0.500	0	0	0	NR	NR	0
SWRCY		0.500	0	0	0	NR	NR	0
LUST		0.500	0	0	0	NR	NR	0
CA FID UST		0.250	0	0	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
SLIC		0.500	0	0	0	NR	NR	0
UST		0.250	0	0	NR	NR	NR	0
HIST UST		0.250	0	0	NR	NR	NR	0
AST		0.250	0	0	NR	NR	NR	0
Fresno Co. CUPA		0.250	1	1	NR	NR	NR	2
SWEEPS UST		0.250	0	0	NR	NR	NR	0
CHMIRS		TP	NR	NR	NR	NR	NR	0
Notify 65		1.000	0	0	0	0	NR	0
DEED		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
DRYCLEANERS		0.250	0	0	NR	NR	NR	0
WIP		0.250	0	0	NR	NR	NR	0
CDL		TP	NR	NR	NR	NR	NR	0
HAZNET		TP	NR	NR	NR	NR	NR	0
EMI		TP	NR	NR	NR	NR	NR	0
TRIBAL RECORDS								
INDIAN RESERV		1.000	0	0	0	0	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
EDR PROPRIETARY RECORDS								
Manufactured Gas Plants		1.000	0	0	0	0	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID Direction Distance Distance (ft.) Elevation	Site	Database(s)	EDR ID Number EPA ID Number

MAP FINDINGS

1 **NNW** **< 1/8** **270 ft.**

WELLHEAD POWER PANOCHE LLC
43649 W PANOCHE
FIREBAUGH, CA 93622

Fresno Co. CUPA — **S105700926** **N/A**

Relative: Higher
Actual: 407 ft.

CUPA:

Facility ID: FA0275386
Region: CUPA
Program Element: CALARP RMP FACILITY
Owner Name: WELLHEAD POWER PANOCHE LLC
APM Number: 027-060-78S

Facility ID: FA0275386
Region: CUPA
Program Element: CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR
Owner Name: WELLHEAD POWER PANOCHE LLC
APM Number: 027-060-78S

Facility ID: FA0275386
Region: CUPA
Program Element: MEDIUM HAZARDOUS MATERIALS HANDLER
Owner Name: WELLHEAD POWER PANOCHE LLC
APM Number: 027-060-78S

Facility ID: FA0275386
Region: CUPA
Program Element: EXTREMELY HAZARDOUS SUBSTANCE HANDLER (EPCRA)
Owner Name: WELLHEAD POWER PANOCHE LLC
APM Number: 027-060-78S

---

2 **West** **< 1/8** **425 ft.**

PG AND E PANOCHE SUBSTATION
43711 W PANOCHE RD
FIREBAUGH, CA 93622

RCRA-SQG **FINDS** **HAZNET** — **1000597649** **CAD983616681**

Relative: Higher
Actual: 409 ft.

RCRAInfo:

Owner: PG AND E CO
(415) 972-7746
EPA ID: CAD983616681
Contact: WILLIAM FRAZIER
(209) 263-5210
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: CAD983616681
TSD EPA ID: Not reported
Gen County: Fresno
Tsd County: Kings
Tons: 6.74
Facility Address 2: Not reported
Waste Category: Asbestos-containing waste
Disposal Method: Not reported
Contact: --

PG AND E PANOCHE SUBSTATION (Continued) **1000597649**

Telephone: --
Mailing Name: Not reported
Mailing Address: 650 O ST
FRESNO, CA 93760
County Not reported

Gepaid: CAD983616681
TSD EPA ID: CAD009466392
Gen County: Fresno
Tsd County: 7
Tons: 18.0000
Facility Address 2: Not reported
Waste Category: Other empty containers 30 gallons or more
Disposal Method: Recycler
Contact: PG AND E CO
Telephone: (415) 972-7746
Mailing Name: Not reported
Mailing Address: 650 O ST
FRESNO, CA 93760
County Fresno

Gepaid: CAD983616681
TSD EPA ID: CAT000646117
Gen County: Fresno
Tsd County: Kings
Tons: 1.9670
Facility Address 2: Not reported
Waste Category: Polychlorinated biphenyls and material containing PCB's
Disposal Method: Disposal, Land Fill
Contact: PG AND E CO
Telephone: (415) 972-7746
Mailing Name: Not reported
Mailing Address: 650 O ST
FRESNO, CA 93760
County Fresno

Gepaid: CAD983616681
TSD EPA ID: NVT330010000
Gen County: Fresno
Tsd County: 99
Tons: .2204
Facility Address 2: Not reported
Waste Category: Liquids with polychlorinated biphenyls > 50 mg/l
Disposal Method: Not reported
Contact: PG AND E CO
Telephone: (415) 972-7746
Mailing Name: Not reported
Mailing Address: 650 O ST
FRESNO, CA 93760
County Fresno

PG AND E PANOCHE SUBSTATION (Continued) **1000597649**

Gepaid: CAD983616681
TSD EPA ID: CAE009466392
Gen County: Fresno
Tsd County: 0
Tons: 9.0000
Facility Address 2: Not reported
Waste Category: Other empty containers 30 gallons or more
Disposal Method: Not reported
Contact: PG AND E CO
Telephone: (415) 972-7746
Mailing Name: Not reported
Mailing Address: 650 O ST
FRESNO, CA 93760
County Fresno

Click this hyperlink while viewing on your computer to access
4 additional CA HAZNET record(s) in the EDR Site Report.

3
WSW
1/8-1/4
1313 ft.

CALPEAK POWER - PANOCHE LLC — **Fresno Co. CUPA** — **S105418747** / **N/A**
43699 W PANOCHE
FIREBAUGH, CA 93622

Relative:
Higher

Actual:
415 ft.

CUPA:

Facility ID: FA0275162
Region: CUPA
Program Element: CALARP RMP FACILITY
Owner Name: CALPEAK ENERGY LP
APM Number: 270-060-61SU

Facility ID: FA0275162
Region: CUPA
Program Element: LARGE HAZARDOUS MATERIALS HANDLER
Owner Name: CALPEAK ENERGY LP
APM Number: 270-060-61SU

Facility ID: FA0275162
Region: CUPA
Program Element: EXTREMELY HAZARDOUS SUBSTANCE HANDLER (EPCRA)
Owner Name: CALPEAK ENERGY LP
APM Number: 270-060-61SU

Facility ID: FA0275162
Region: CUPA
Program Element: CONDITIONALLY EXEMPT SMALL QUANTITY GENERATOR
Owner Name: CALPEAK ENERGY LP
APM Number: 270-060-61SU

City	EDR ID	Site Name	Site Address	Zip	Database(s)
FIREBAUGH	S105511405	SHELL PIPELINE CO - PANOCHE STATION	I-5 / CALIFORNIA	93622	Fresno Co. CUPA
FIREBAUGH	S106931707	S.P. OPERATOR	I-5 / PANOCHE RD	93622	SWEEPS UST
FIREBAUGH	92280234	SR 33 AT FAIRFAX RD BETWEEN FIREBAUGH & DOS PALO	SR 33 AT FAIRFAX RD BETWEEN FIREBAUGH & DOS PALO	93622	ERNS
FIREBAUGH	S106486131	SILAXO STATION (AKA: TEXACO/GETTY OIL)	HWY 33; SECT 11, T12S/R13E	93622	SLIC
FIREBAUGH	S106487459	PG&E	AVENUE 12 / HIGHWAY 33	93622	Fresno Co. CUPA
FIREBAUGH	S104868432	FIREBAUGH CANAL WATER DISTRICT	2412 DOS PALOS RD (HIGHWAY 33)	93622	Fresno Co. CUPA
FIREBAUGH	S106924720	CLIFF'S EXXON	1307 N HIGHWAY 33	93622	SWEEPS UST
FIREBAUGH	S104869782	PANOCHE HILLS TIRE DISPOSAL	LITTLE PANOCHE / I-5	93622	Fresno Co. CUPA
FIREBAUGH	S104869783	H F COX PETEROLEUM TRANSPORT	LITTLE PANOCHE RD / I-5	93622	Fresno Co. CUPA
FIREBAUGH	S106486009	CHOPERENA TIRE DISPOSAL SITE (PANOCHE BURN SITE)	LITTLE PANOCHE RD-S 21,T13S/R11E - MDB / M	93622	SLIC
FIREBAUGH	2000551497	46378 WEST PANOCHE ROAD	46378 WEST PANOCHE ROAD		ERNS
FIREBAUGH	S106930476	PANOCHE TRAVELPORT	46331 W PANOCHE BLVD	93622	SWEEPS UST
FIREBAUGH	S106112694	PANOCHE MOBIL*	46365 PANOCHE	93622	Fresno Co. CUPA
FIREBAUGH	1005441296	CHEVRON STATION 92316	46330 W PANOCHE RD NO I 5	93622	RCRA-SQG, FINDS, HAZNET
FIREBAUGH	S103660909	CHEVRON #92316	46330 PANOCHE RD	93622	HAZNET, SWEEPS UST
FIREBAUGH	S106112696	WESTSIDE 76*	46370 W PANOCHE	93622	Fresno Co. CUPA
FIREBAUGH	U003938774	CHEVRON #92316	46330 PANOCHE	93622	UST
FIREBAUGH	U003942999	WESTSIDE 76*	46370 PANOCHE	93622	UST
FIREBAUGH	S106091019	PANOCHE TRAVELPORT	6331 W PANOCHI RD	93622	HAZNET
FIREBAUGH	91241922	46330 PINOCHE RD AT I-5	46330 PINOCHE RD AT I-5	93622	ERNS
FIREBAUGH	92293516	1/4 MI S OF NICE AND 1/2 MI W OF OXFORD	1/4 MI S OF NICE AND 1/2 MI W OF OXFORD	93622	ERNS
FRESNO COUNTY	S104867814		CALIFORNIA AQUEDUCT		CHMIRS, Fresno Co. CUPA
MENDOTA	S100925074	SUMNER PECK RANCH	P.O. BOX 507	93640	Toxic Pits
MENDOTA	1003877975	MENDOTA SITE	1 MI NE HWY 33	93640	CERC-NFRAP

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.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

FEDERAL RECORDS

NPL: National Priority List

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: 02/24/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: N/A
Last EDR Contact: 03/01/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 6
Telephone: 214-655-6659

EPA Region 8
Telephone: 303-312-6774

Proposed NPL: Proposed National Priority List Sites

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: N/A
Last EDR Contact: 03/01/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: Quarterly

DELISTED NPL: National Priority List Deletions

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: 02/24/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: N/A
Last EDR Contact: 03/01/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: Quarterly

NPL RECOVERY: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by 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 received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

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: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: EPA
Telephone: 703-413-0223
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/15/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

RCRA: Resource Conservation and Recovery Act Information

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: 02/21/2006
Date Data Arrived at EDR: 03/01/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 30

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 04/27/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Quarterly

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 01/12/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 40

Source: National Response Center, United States Coast Guard
Telephone: 202-260-2342
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2005	Source: U.S. Department of Transportation
Date Data Arrived at EDR: 01/16/2006	Telephone: 202-366-4555
Date Made Active in Reports: 02/21/2006	Last EDR Contact: 04/14/2006
Number of Days to Update: 36	Next Scheduled EDR Contact: 07/17/2006
	Data Release Frequency: Annually

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 08/02/2005	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/12/2005	Telephone: 703-603-8905
Date Made Active in Reports: 10/06/2005	Last EDR Contact: 03/03/2006
Number of Days to Update: 55	Next Scheduled EDR Contact: 07/03/2006
	Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 01/10/2005	Source: Environmental Protection Agency
Date Data Arrived at EDR: 02/11/2005	Telephone: 703-603-8905
Date Made Active in Reports: 04/06/2005	Last EDR Contact: 03/03/2006
Number of Days to Update: 54	Next Scheduled EDR Contact: 07/03/2006
	Data Release Frequency: Varies

DOD: Department of Defense Sites
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: 12/31/2004	Source: USGS
Date Data Arrived at EDR: 02/08/2005	Telephone: 703-692-8801
Date Made Active in Reports: 08/04/2005	Last EDR Contact: 02/06/2006
Number of Days to Update: 177	Next Scheduled EDR Contact: 05/08/2006
	Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites
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: 12/05/2005	Source: U.S. Army Corps of Engineers
Date Data Arrived at EDR: 01/19/2006	Telephone: 202-528-4285
Date Made Active in Reports: 02/21/2006	Last EDR Contact: 04/03/2006
Number of Days to Update: 33	Next Scheduled EDR Contact: 07/03/2006
	Data Release Frequency: Varies

US BROWNFIELDS: A Listing of Brownfields Sites

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: 11/29/2005
Date Data Arrived at EDR: 12/05/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Semi-Annually

CONSENT: Superfund (CERCLA) Consent Decrees

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: 12/14/2004
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 04/25/2005
Number of Days to Update: 69

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

ROD: Records Of Decision

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: 12/07/2005
Date Data Arrived at EDR: 01/06/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 46

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

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.

Date of Government Version: 11/04/2005
Date Data Arrived at EDR: 11/28/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 63

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Varies

ODI: Open Dump Inventory

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: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

TRIS: Toxic Chemical Release Inventory System

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: 12/31/2003
Date Data Arrived at EDR: 07/13/2005
Date Made Active in Reports: 08/17/2005
Number of Days to Update: 35

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

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: 12/31/2002
Date Data Arrived at EDR: 04/27/2004
Date Made Active in Reports: 05/21/2004
Number of Days to Update: 24

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 04/12/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

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: 01/17/2006
Date Data Arrived at EDR: 01/24/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 34

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

Date of Government Version: 01/17/2006
Date Data Arrived at EDR: 01/24/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 34

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

SSTS: Section 7 Tracking Systems

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: 12/31/2003
Date Data Arrived at EDR: 01/03/2005
Date Made Active in Reports: 01/25/2005
Number of Days to Update: 22

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 12/27/2005
Date Data Arrived at EDR: 02/08/2006
Date Made Active in Reports: 02/27/2006
Number of Days to Update: 19

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 02/08/2006
Next Scheduled EDR Contact: 05/08/2006
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

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: 02/10/2006
Date Data Arrived at EDR: 02/16/2006
Date Made Active in Reports: 03/31/2006
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 11/08/2005
Date Data Arrived at EDR: 12/27/2005
Date Made Active in Reports: 01/30/2006
Number of Days to Update: 34

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/29/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Semi-Annually

FINDS: Facility Index System/Facility Registry System

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: 01/09/2006
Date Data Arrived at EDR: 01/16/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 36

Source: EPA
Telephone: N/A
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

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: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 06/17/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 48

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Biennially

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STATE AND LOCAL RECORDS

AWP: Annual Workplan Sites
Known Hazardous Waste Sites. California DTSC's Annual Workplan (AWP), formerly BEP, identifies known hazardous substance sites targeted for cleanup.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: California Environmental Protection Agency
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Annually

CAL-SITES: Calsites Database
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: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

CA BOND EXP. PLAN: Bond Expenditure Plan
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: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NFA: No Further Action Determination
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: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

NFE: Properties Needing Further Evaluation
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: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

REF: Unconfirmed Properties Referred to Another Agency
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: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

SCH: School Property Evaluation Program

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: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

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: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/30/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: No Update Planned

SWF/LF (SWIS): Solid Waste Information System

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: 03/13/2006
Date Data Arrived at EDR: 03/15/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 29

Source: Integrated Waste Management Board
Telephone: 916-341-6320
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

CA WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 03/20/2006
Date Data Arrived at EDR: 03/21/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 23

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 03/21/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Quarterly

WMUDS/SWAT: Waste Management Unit Database

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: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List

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: 04/01/2001
Date Data Arrived at EDR: 05/29/2001
Date Made Active in Reports: 07/26/2001
Number of Days to Update: 58

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-9100
Last EDR Contact: 04/25/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 01/05/2006
Date Data Arrived at EDR: 01/09/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 22

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

LUST: Geotracker's Leaking Underground Fuel Tank Report
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: 01/09/2006
Date Data Arrived at EDR: 01/09/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 22

Source: State Water Resources Control Board
Telephone: 916-341-5752
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 03/28/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 916-542-5424
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: No Update Planned

LUST REG 9: Leaking Underground Storage Tank Report
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: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
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: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-4130
Last EDR Contact: 02/06/2006
Next Scheduled EDR Contact: 05/08/2006
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 7: Leaking Underground Storage Tank Case Listing

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-346-7491
Last EDR Contact: 12/27/2005
Next Scheduled EDR Contact: 03/27/2006
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-346-7491
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Date of Government Version: 01/15/2006
Date Data Arrived at EDR: 01/16/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 36

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 04/27/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

LUST REG 3: Leaking Underground Storage Tank Database

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 02/13/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
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: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-576-2220
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

CA FID UST: Facility Inventory Database
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: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases

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: 01/09/2006
Date Data Arrived at EDR: 01/09/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 22

Source: State Water Resources Control Board
Telephone: 916-341-5752
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 02/17/2006
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 24

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 02/13/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Any contaminated site that impacts groundwater or has the potential to impact groundwater.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Unregulated sites that impact groundwater or have the potential to impact groundwater.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SLIC REG 6L: SLIC Sites

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 01/17/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 35

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

Date of Government Version: 03/14/2006
Date Data Arrived at EDR: 03/14/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 03/13/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Annually

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 01/09/2006
Date Data Arrived at EDR: 01/09/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 22

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Semi-Annually

HIST UST: Hazardous Substance Storage Container Database
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: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

AST: Aboveground Petroleum Storage Tank Facilities
Registered Aboveground Storage Tanks.

Date of Government Version: 01/30/2006
Date Data Arrived at EDR: 01/30/2006
Date Made Active in Reports: 02/17/2006
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5712
Last EDR Contact: 01/30/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: Quarterly

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1980's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 12/31/2004
Date Data Arrived at EDR: 11/30/2005
Date Made Active in Reports: 01/19/2006
Number of Days to Update: 50

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

NOTIFY 65: Proposition 65 Records

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: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: No Update Planned

DEED: Deed Restriction Listing

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: 01/03/2006
Date Data Arrived at EDR: 01/04/2006
Date Made Active in Reports: 01/19/2006
Number of Days to Update: 15

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

VCP: Voluntary Cleanup Program Properties

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: 08/08/2005
Date Data Arrived at EDR: 08/29/2005
Date Made Active in Reports: 09/21/2005
Number of Days to Update: 23

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 04/05/2006
Next Scheduled EDR Contact: 05/29/2006
Data Release Frequency: Quarterly

DRYCLEANERS: Cleaner Facilities

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: 04/18/2005
Date Data Arrived at EDR: 04/18/2005
Date Made Active in Reports: 05/06/2005
Number of Days to Update: 18

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 04/03/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Annually

WIP: Well Investigation Program Case List

Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 01/23/2006
Date Data Arrived at EDR: 01/24/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 28

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 31

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 04/25/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

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: 12/31/2003
Date Data Arrived at EDR: 10/11/2005
Date Made Active in Reports: 10/31/2005
Number of Days to Update: 20

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 02/24/2006
Next Scheduled EDR Contact: 05/08/2006
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2003
Date Data Arrived at EDR: 07/19/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 23

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 04/14/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Varies

TRIBAL RECORDS

INDIAN RESERV: Indian Reservations

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: 12/31/2004
Date Data Arrived at EDR: 02/08/2005
Date Made Active in Reports: 08/04/2005
Number of Days to Update: 177

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 02/06/2006
Next Scheduled EDR Contact: 05/08/2006
Data Release Frequency: Semi-Annually

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 09/07/2005
Date Data Arrived at EDR: 09/08/2005
Date Made Active in Reports: 10/31/2005
Number of Days to Update: 53

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 01/10/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

INDIAN LUST: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/22/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 22

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

INDIAN UST: Underground Storage Tanks on Indian Land

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/22/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 22

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites
A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 02/16/2006
Date Data Arrived at EDR: 02/17/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 24

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 04/25/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Semi-Annually

Underground Tanks

Date of Government Version: 02/27/2006	Source: Alameda County Environmental Health Services
Date Data Arrived at EDR: 02/28/2006	Telephone: 510-567-6700
Date Made Active in Reports: 03/23/2006	Last EDR Contact: 04/25/2006
Number of Days to Update: 23	Next Scheduled EDR Contact: 07/24/2006
	Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List

List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 03/20/2006	Source: Contra Costa Health Services Department
Date Data Arrived at EDR: 03/21/2006	Telephone: 925-646-2286
Date Made Active in Reports: 04/13/2006	Last EDR Contact: 03/13/2006
Number of Days to Update: 23	Next Scheduled EDR Contact: 05/29/2006
	Data Release Frequency: Semi-Annually

FRESNO COUNTY:

CUPA Resources List

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: 01/18/2006	Source: Dept. of Community Health
Date Data Arrived at EDR: 01/18/2006	Telephone: 559-445-3271
Date Made Active in Reports: 02/21/2006	Last EDR Contact: 04/10/2006
Number of Days to Update: 34	Next Scheduled EDR Contact: 08/07/2006
	Data Release Frequency: Semi-Annually

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 12/09/2005	Source: Kern County Environment Health Services Department
Date Data Arrived at EDR: 12/09/2005	Telephone: 661-862-8700
Date Made Active in Reports: 01/11/2006	Last EDR Contact: 03/27/2006
Number of Days to Update: 33	Next Scheduled EDR Contact: 06/05/2006
	Data Release Frequency: Quarterly

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 12/31/1998	Source: EPA Region 9
Date Data Arrived at EDR: 07/07/1999	Telephone: 415-972-3178
Date Made Active in Reports: N/A	Last EDR Contact: 07/06/1999
Number of Days to Update: 0	Next Scheduled EDR Contact: N/A
	Data Release Frequency: No Update Planned

City of El Segundo Underground Storage Tank

Date of Government Version: 02/27/2006	Source: City of El Segundo Fire Department
Date Data Arrived at EDR: 02/28/2006	Telephone: 310-524-2236
Date Made Active in Reports: 03/23/2006	Last EDR Contact: 02/27/2006
Number of Days to Update: 23	Next Scheduled EDR Contact: 05/15/2006
	Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 02/24/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Date of Government Version: 02/27/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/23/2006
Number of Days to Update: 23

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 02/27/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Semi-Annually

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 01/31/2006
Date Data Arrived at EDR: 03/24/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 20

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 02/13/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Date of Government Version: 02/14/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 13

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 02/15/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Varies

City of Los Angeles Landfills

Date of Government Version: 03/01/2005
Date Data Arrived at EDR: 03/18/2005
Date Made Active in Reports: 04/08/2005
Number of Days to Update: 21

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/05/2006
Date Data Arrived at EDR: 02/16/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 25

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 02/03/2006
Next Scheduled EDR Contact: 05/15/2006
Data Release Frequency: Annually

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 02/10/2006
Date Data Arrived at EDR: 02/28/2006
Date Made Active in Reports: 03/23/2006
Number of Days to Update: 23

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 01/30/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: Semi-Annually

NAPA COUNTY:

Sites With Reported Contamination

Date of Government Version: 04/03/2006
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 9

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/27/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Semi-Annually

Closed and Operating Underground Storage Tank Sites

Date of Government Version: 12/27/2005
Date Data Arrived at EDR: 12/28/2005
Date Made Active in Reports: 01/11/2006
Number of Days to Update: 14

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 03/27/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Annually

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 02/01/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 17

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 03/08/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 03/01/2006
Date Data Arrived at EDR: 03/29/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 15

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 03/08/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 12/01/2005
Date Data Arrived at EDR: 12/16/2005
Date Made Active in Reports: 01/11/2006
Number of Days to Update: 26

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 03/08/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 04/03/2006
Date Data Arrived at EDR: 04/04/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 9

Source: Placer County Health and Human Services
Telephone: 530-889-7312
Last EDR Contact: 03/20/2006
Next Scheduled EDR Contact: 06/19/2006
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Underground Storage Tank Tank List

Date of Government Version: 02/09/2006
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/09/2006
Number of Days to Update: 27

Source: Health Services Agency
Telephone: 951-358-5055
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Quarterly

Listing of Underground Tank Cleanup Sites

Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 02/09/2006
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 31

Source: Department of Public Health
Telephone: 951-358-5055
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

CS - Contaminated Sites

Date of Government Version: 02/02/2006
Date Data Arrived at EDR: 02/13/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 28

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/30/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: Quarterly

ML - Regulatory Compliance Master List

Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 02/02/2006
Date Data Arrived at EDR: 02/10/2006
Date Made Active in Reports: 03/13/2006
Number of Days to Update: 31

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/30/2006
Next Scheduled EDR Contact: 05/01/2006
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits

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: 03/22/2006
Date Data Arrived at EDR: 03/23/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 21

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

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: 05/16/2005
Date Data Arrived at EDR: 05/18/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 29

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 04/28/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 11/01/2005
Date Data Arrived at EDR: 12/29/2005
Date Made Active in Reports: 01/19/2006
Number of Days to Update: 21

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Varies

SAN FRANCISCO COUNTY:

Local Oversite Facilities

Date of Government Version: 03/16/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

Underground Storage Tank Information

Date of Government Version: 03/16/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 02/28/2006
Date Data Arrived at EDR: 03/17/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 27

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 03/17/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Semi-Annually

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 01/09/2006
Date Data Arrived at EDR: 01/10/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 21

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Annually

Fuel Leak List

Date of Government Version: 01/11/2006
Date Data Arrived at EDR: 01/12/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 19

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 04/10/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Semi-Annually

SANTA CLARA COUNTY:

Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/28/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: No Update Planned

LOP Listing

A listing of open leaking underground storage tanks.

Date of Government Version: 03/29/2006
Date Data Arrived at EDR: 03/30/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 14

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 03/28/2006
Next Scheduled EDR Contact: 06/26/2006
Data Release Frequency: Varies

Hazardous Material Facilities

Date of Government Version: 03/09/2006
Date Data Arrived at EDR: 03/13/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 31

Source: City of San Jose Fire Department
Telephone: 408-277-4659
Last EDR Contact: 03/06/2006
Next Scheduled EDR Contact: 06/05/2006
Data Release Frequency: Annually

SOLANO COUNTY:

Leaking Underground Storage Tanks

Date of Government Version: 12/13/2005
Date Data Arrived at EDR: 12/14/2005
Date Made Active in Reports: 01/19/2006
Number of Days to Update: 36

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 03/27/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

Underground Storage Tanks

Date of Government Version: 10/13/2005
Date Data Arrived at EDR: 10/31/2005
Date Made Active in Reports: 12/08/2005
Number of Days to Update: 38

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 04/13/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

SONOMA COUNTY:

Leaking Underground Storage Tank Sites

Date of Government Version: 01/23/2006
Date Data Arrived at EDR: 01/23/2006
Date Made Active in Reports: 02/21/2006
Number of Days to Update: 29

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/24/2006
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Date of Government Version: 12/31/0005
Date Data Arrived at EDR: 01/05/2006
Date Made Active in Reports: 01/31/2006
Number of Days to Update: 26

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 04/26/2006
Next Scheduled EDR Contact: 07/03/2006
Data Release Frequency: Semi-Annually

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/31/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 13

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 08/01/2005
Date Data Arrived at EDR: 09/20/2005
Date Made Active in Reports: 10/06/2005
Number of Days to Update: 16

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 02/20/2006
Next Scheduled EDR Contact: 05/22/2006
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 02/24/2006
Date Data Arrived at EDR: 03/27/2006
Date Made Active in Reports: 04/13/2006
Number of Days to Update: 17

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 03/15/2006
Next Scheduled EDR Contact: 06/12/2006
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 12/29/2005
Date Data Arrived at EDR: 01/20/2006
Date Made Active in Reports: 02/15/2006
Number of Days to Update: 26

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/10/2006
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Date of Government Version: 01/18/2006
Date Data Arrived at EDR: 02/09/2006
Date Made Active in Reports: 03/09/2006
Number of Days to Update: 28

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 04/11/2006
Next Scheduled EDR Contact: 07/17/2006
Data Release Frequency: Annually

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

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

W. PANOCHE RD.
W. PANOCHE RD.
FIREBAUGH, CA 93622

TARGET PROPERTY COORDINATES

Latitude (North):	36.65500 - 36˚ 39’ 18.0’’
Longitude (West):	120.5789 - 120˚ 34’ 44.1’’
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	716413.2
UTM Y (Meters):	4059130.0
Elevation:	406 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	36120-F5 CHANEY RANCH, CA
Most Recent Revision:	1971

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.

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.

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).

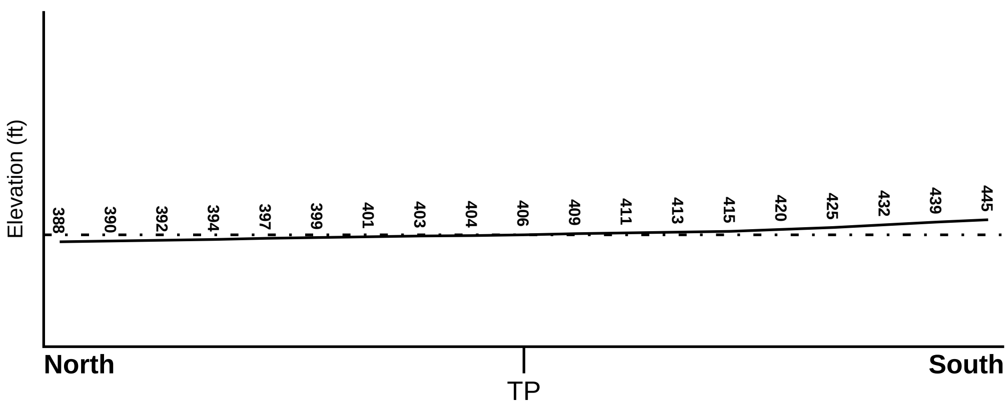
TOPOGRAPHIC INFORMATION

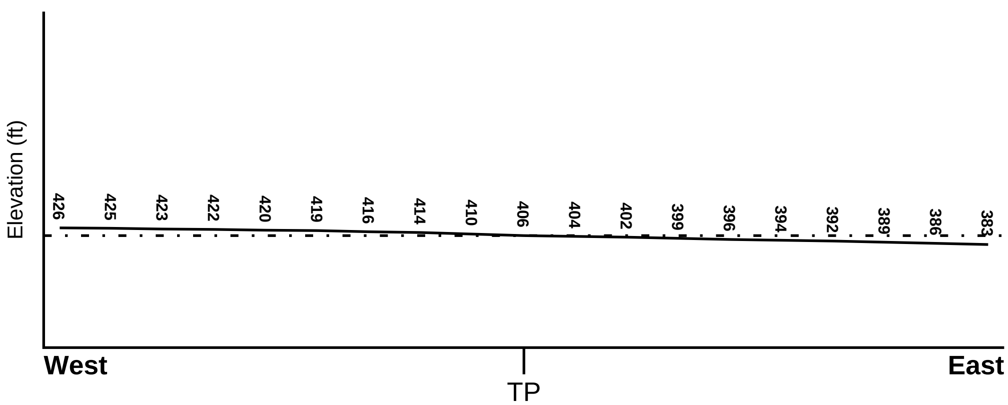
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General NE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 406 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
FRESNO, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 0650291085B

Additional Panels in search area: 0650291100B

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
CHANEY RANCH	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps. The following information is based on Soil Conservation Service STATSGO data.

Soil Component Name:	CIERVO
Soil Surface Texture:	clay
Hydrologic Group:	Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.
Soil Drainage Class:	Moderately well drained. Soils have a layer of low hydraulic conductivity, wet state high in the profile. Depth to water table is 3 to 6 feet.

Hydric Status: Soil does not meet the requirements for a hydric soil.

Corrosion Potential - Uncoated Steel:	HIGH
Depth to Bedrock Min:	> 60 inches
Depth to Bedrock Max:	> 60 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	16 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.20 Min: 0.06	Max: 8.40 Min: 7.40
2	16 inches	65 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 0.20 Min: 0.06	Max: 8.40 Min: 7.40
3	65 inches	72 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 0.60 Min: 0.20	Max: 8.40 Min: 7.40

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: clay loam
loam
sandy loam

Surficial Soil Types: clay loam
loam
sandy loam

Shallow Soil Types: loam

Deeper Soil Types: stratified

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water 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
A1	USGS3203099	0 - 1/8 Mile North
A2	USGS3203098	1/8 - 1/4 Mile NE
A3	USGS3203102	1/8 - 1/4 Mile NNE
A4	USGS3203103	1/8 - 1/4 Mile NNE
A5	USGS3203104	1/8 - 1/4 Mile NNE
6	USGS3203077	1/8 - 1/4 Mile WSW
B7	USGS3203075	1/4 - 1/2 Mile WSW
B8	USGS3203073	1/4 - 1/2 Mile WSW
9	USGS3203131	1/2 - 1 Mile SW
10	USGS3203316	1/2 - 1 Mile SE
11	USGS3202970	1/2 - 1 Mile NW
C12	USGS3203109	1/2 - 1 Mile ENE
C13	USGS3203110	1/2 - 1 Mile ENE
14	USGS3203232	1/2 - 1 Mile SE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

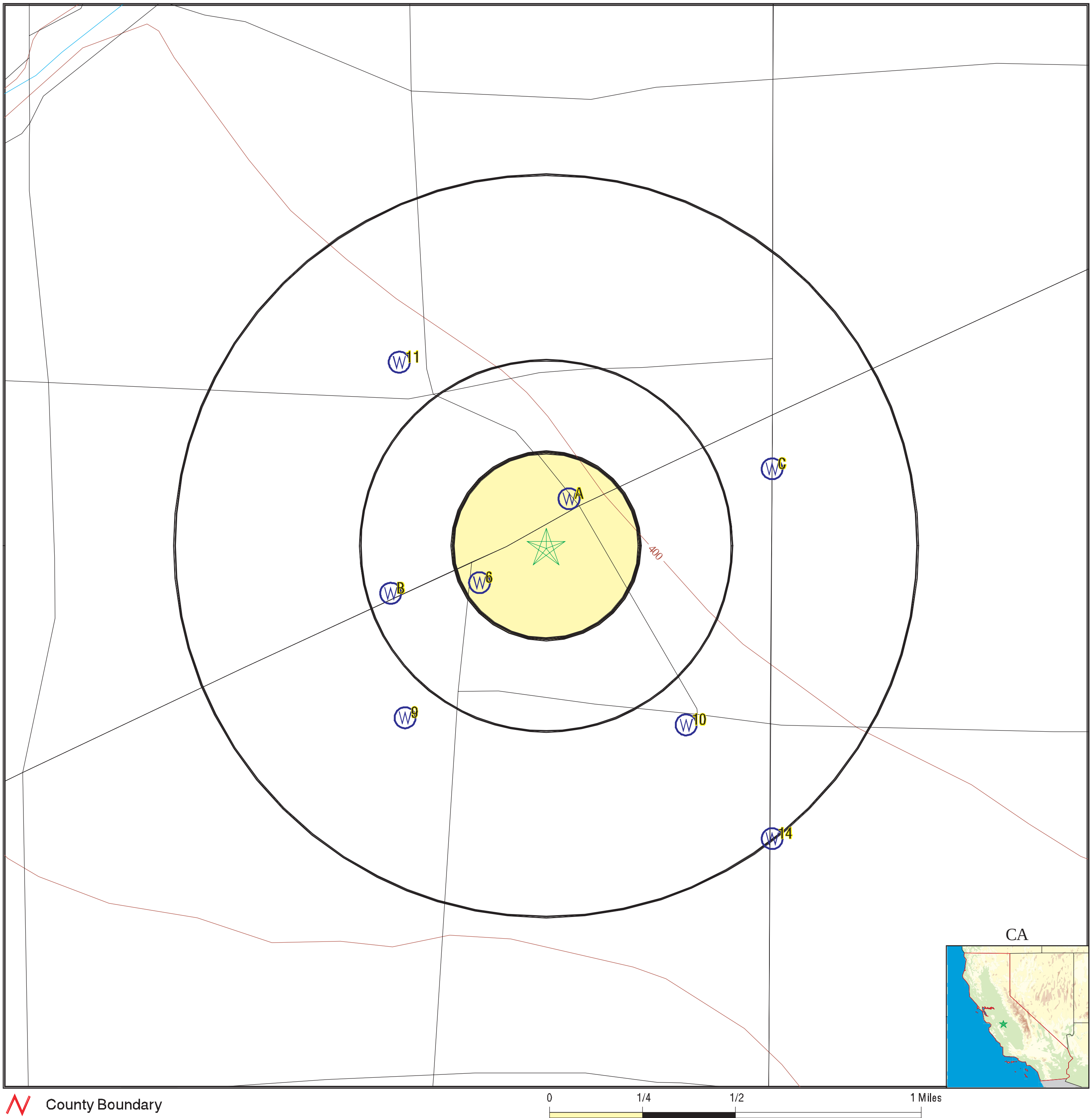
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

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 - 1664661.1s



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

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location
HD Closest Hydrogeological Data
Oil, gas or related wells

SITE NAME: W. Panoche Rd. ADDRESS: W. Panoche Rd. FIREBAUGH CA 93622 LAT/LONG: 36.6550 / 120.5789	CLIENT: Burns & McDonnell Engineering CONTACT: Sarah Sizemore INQUIRY #: 1664661.1s DATE: April 28, 2006

Map ID Direction Distance Elevation	Database	EDR ID Number
A1 **North** **0 - 1/8 Mile** **Lower**	**FED USGS**	**USGS3203099**

Agency cd:	USGS	Site no:	363924120343901
Site name:	015S013E05F001M		
Latitude:	363924		
Longitude:	1203439	Dec lat:	36.65661775
Dec lon:	-120.57850546	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	SESENWS05 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	403.00	Altitude method:	M
Altitude accuracy:	5.	Altitude datum:	NGVD29
Hydrologic:	TulareBuena Vista Lakes. California. Area = 8510 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	19510314	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	1000	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

A2 **NE** **1/8 - 1/4 Mile** **Lower**	**FED USGS**	**USGS3203098**

Agency cd:	USGS	Site no:	363924120343501
Site name:	015S013E05F003M		
Latitude:	363924		
Longitude:	1203435	Dec lat:	36.65661775
Dec lon:	-120.57739431	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	Not Reported
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	400	Altitude method:	M
Altitude accuracy:	2.5	Altitude datum:	NGVD29
Hydrologic:	Middle San JoaquinLower Chowchilla. California. Area = 2640 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19880206
Date inventoried:	19880206	Mean greenwich time offset:	PST

Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	638	Hole depth:	645
Source of depth data:	owner	Project number:	470645679
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1989-05-11
Water quality data end date:	1989-06-07	Water quality data count:	2
Ground water data begin date:	1988-03-00	Ground water data end date:	1992-05-07
Ground water data count:	20		

Ground-water levels, Number of Measurements: 20

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1992-05-07	323.07		1991-07-23	306.95	
1991-02-08	297.08		1990-09-14	288.5	
1990-04-19	260.0		1990-02-27	281.12	
1989-09-28	284.2		1989-07-26	285.1	
1989-06-29	285.1		1989-05-24	283.7	
1989-04-27	281.4		1989-03-22	283.3	
1989-02-23	276.6		1988-11-22	285.36	
1988-10-25	285.98		1988-07	287.09	
1988-06	287.61		1988-05-02	288.78	
1988-04-04	289.47		1988-03	290.29	

A3
NNE
1/8 - 1/4 Mile
Lower

FED USGS **USGS3203102**

Agency cd:	USGS	Site no:	363925120343601
Site name:	015S013E05F005M		
Latitude:	363925		
Longitude:	1203436	Dec lat:	36.65689553
Dec lon:	-120.57767211	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	Not Reported
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	400	Altitude method:	M
Altitude accuracy:	2.5	Altitude datum:	NGVD29
Hydrologic:	Middle San JoaquinLower Chowchilla. California. Area = 2640 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19870617
Date inventoried:	19870617	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	300.0	Hole depth:	302.5
Source of depth data:	owner	Project number:	470645679
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count:	0	Water quality data begin date:	1987-07-27
Water quality data end date:	1987-07-27	Water quality data count:	1
Ground water data begin date:	1987-08-00	Ground water data end date:	1992-05-07
Ground water data count:	26		

Ground-water levels, Number of Measurements: 26

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1992-05-07	190.70		1991-07-23	191.04	
1991-02-08	188.48		1990-09-14	186.7	
1990-04-19	172.8		1990-02-27	186.69	
1989-09-28	187.80		1989-07-26	188.44	
1989-06-29	188.93		1989-05-24	189.43	
1989-04-27	189.65		1989-03-22	189.90	
1989-03-07	190.5		1988-11-22	196.39	
1988-10-25	196.20		1988-07	193.29	
1988-06	193.30		1988-05-02	194.29	
1988-04-04	194.39		1988-03	194.94	
1988-02	195.42		1988-01	195.82	
1987-12	196.19		1987-11	196.44	
1987-10-05	196.88		1987-08	195.22	

A4
NNE
1/8 - 1/4 Mile
Lower

FED USGS **USGS3203103**

Agency cd:	USGS	Site no:	363925120343604
Site name:	015S013E05F004M		
Latitude:	363925		
Longitude:	1203436	Dec lat:	36.65689553
Dec lon:	-120.57767211	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	Not Reported
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	400	Altitude method:	M
Altitude accuracy:	2.5	Altitude datum:	NGVD29
Hydrologic:	Middle San JoaquinLower Chowchilla. California. Area = 2640 sq.mi.		
Topographic:	Alluvial fan		
Site type:	Ground-water other than Spring	Date construction:	19881013
Date inventoried:	19881013	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	215	Hole depth:	219
Source of depth data:	driller	Project number:	470642800
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1989-03-07
Water quality data end date:	1989-03-07	Water quality data count:	1
Ground water data begin date:	1988-10-25	Ground water data end date:	1992-05-07
Ground water data count:	15		

Ground-water levels, Number of Measurements: 15

Date	Feet below Surface	Feet to Sealevel	Date	Feet below Surface	Feet to Sealevel
1992-05-07	193.60		1991-07-23	191.82	
1991-02-08	188.45		1990-09-14	187.2	
1990-04-19	172.8		1990-02-27	186.64	
1989-09-28	187.78		1989-07-26	189.38	
1989-06-29	189.89		1989-05-24	190.40	
1989-04-27	190.64		1989-03-22	190.82	
1989-02-23	191.5		1988-11-22	192.18	
1988-10-25	192.46				

A5
NNE
1/8 - 1/4 Mile
Lower

FED USGS **USGS3203104**

Agency cd:	USGS	Site no:	363926120343601
Site name:	015S013E05F002M		
Latitude:	363926		
Longitude:	1203436	Dec lat:	36.6571733
Dec lon:	-120.57767211	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	Not Reported
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	400	Altitude method:	M
Altitude accuracy:	2.5	Altitude datum:	NGVD29
Hydrologic:	Middle San JoaquinLower Chowchilla. California. Area = 2640 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19870716
Date inventoried:	19870716	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	635	Hole depth:	666
Source of depth data:	owner	Project number:	470645679
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

6
WSW
1/8 - 1/4 Mile
Higher

FED USGS **USGS3203077**

Agency cd:	USGS	Site no:	363913120345201
Site name:	015S013E05M002M		
Latitude:	363913		
Longitude:	1203452	Dec lat:	36.65356224
Dec lon:	-120.58211663	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	Not Reported
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	412.00	Altitude method:	M
Altitude accuracy:	2.5	Altitude datum:	NGVD29
Hydrologic:	TulareBuena Vista Lakes. California. Area = 8510 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19701008
Date inventoried:	Not Reported	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	250	Hole depth:	250
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

B7
WSW
1/4 - 1/2 Mile
Higher

FED USGS USGS3203075

Agency cd:	USGS	Site no:	363912120350601
Site name:	015S013E05M001M		
Latitude:	363912		
Longitude:	1203506	Dec lat:	36.65328448
Dec lon:	-120.58600567	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	NWNWSWS05 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	417.00	Altitude method:	M
Altitude accuracy:	5.	Altitude datum:	NGVD29
Hydrologic:	Middle San JoaquinLower Chowchilla. California. Area = 2640 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19440905
Date inventoried:	19500822	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ALLUVIUM ABOVE AND BELOW E-CLAY (MIOCENE-PLEISTOCENE)		
Well depth:	1520	Hole depth:	Not Reported
Source of depth data:	other reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00

Peak flow data count:	0	Water quality data begin date:	1951-08-15
Water quality data end date:	1951-08-15	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

B8
WSW
1/4 - 1/2 Mile
Higher

FED USGS **USGS3203073**

Agency cd:	USGS	Site no:	363911120350901
Site name:	015S013E06J001M		
Latitude:	363911		
Longitude:	1203509	Dec lat:	36.65300671
Dec lon:	-120.58683903	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	SENESES06 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	418.00	Altitude method:	M
Altitude accuracy:	2.5	Altitude datum:	NGVD29
Hydrologic:	Middle San JoaquinLower Chowchilla. California. Area = 2640 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19610701
Date inventoried:	19620517	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ALLUVIUM BELOW E-CLAY (MIOCENE-PLEISTOCENE)		
Well depth:	1399	Hole depth:	Not Reported
Source of depth data:	other reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1968-07-16
Water quality data end date:	1968-07-16	Water quality data count:	1
Ground water data begin date:	0000-00-00	Ground water data end date:	0000-00-00
Ground water data count:	0		

Ground-water levels, Number of Measurements: 0

9
SW
1/2 - 1 Mile
Higher

FED USGS **USGS3203131**

Agency cd:	USGS	Site no:	363854120350501
Site name:	015S013E05N001M		
Latitude:	363854		
Longitude:	1203505	Dec lat:	36.64828451
Dec lon:	-120.58572773	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	SWSWSWS05 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000

Altitude:	423.00	Altitude method:	M
Altitude accuracy:	5.	Altitude datum:	NGVD29
Hydrologic:	TulareBuena Vista Lakes. California. Area = 8510 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19440101
Date inventoried:	19500822	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ALLUVIUM ABOVE AND BELOW E-CLAY (MIOCENE-PLEISTOCENE)		
Well depth:	1544	Hole depth:	Not Reported
Source of depth data:	other reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1951-08-15
Water quality data end date:	1951-08-15	Water quality data count:	1
Ground water data begin date:	1954-05-01	Ground water data end date:	1954-05-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1954-05-01	511.00	

10
SE
1/2 - 1 Mile
Higher

FED USGS **USGS3203316**

Agency cd:	USGS	Site no:	363853120341601
Site name:	015S013E05R001M		
Latitude:	363853		
Longitude:	1203416	Dec lat:	36.64800664
Dec lon:	-120.57211606	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	SWSESES05 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	408.00	Altitude method:	M
Altitude accuracy:	5.	Altitude datum:	NGVD29
Hydrologic:	TulareBuena Vista Lakes. California. Area = 8510 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19450101
Date inventoried:	19500818	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ALLUVIUM ABOVE AND BELOW E-CLAY (MIOCENE-PLEISTOCENE)		
Well depth:	1528	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1951-08-15
Water quality data end date:	1951-08-15	Water quality data count:	1
Ground water data begin date:	1951-05-01	Ground water data end date:	1951-05-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1951-05-01	528.00	

11
NW
1/2 - 1 Mile
Lower

FED USGS USGS3202970

Agency cd:	USGS	Site no:	363944120350601
Site name:	015S013E05D001M		
Latitude:	363944		
Longitude:	1203506	Dec lat:	36.66217333
Dec lon:	-120.58600593	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	NWNWNWS05 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	402.00	Altitude method:	M
Altitude accuracy:	5.	Altitude datum:	NGVD29
Hydrologic:	Middle San JoaquinLower Chowchilla. California. Area = 2640 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19450101
Date inventoried:	19500822	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	1450	Hole depth:	Not Reported
Source of depth data:	other reported	Project number:	Not Reported
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

C12
ENE
1/2 - 1 Mile
Lower

FED USGS USGS3203109

Agency cd:	USGS	Site no:	363929120340101
Site name:	015S013E04E001M		
Latitude:	363929		
Longitude:	1203401	Dec lat:	36.65800657
Dec lon:	-120.56794952	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	NWSWNWS04 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000

Altitude:	387.00	Altitude method:	M
Altitude accuracy:	5.	Altitude datum:	NGVD29
Hydrologic:	TulareBuena Vista Lakes. California. Area = 8510 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19480101
Date inventoried:	19560724	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ALLUVIUM ABOVE AND BELOW E-CLAY (MIOCENE-PLEISTOCENE)		
Well depth:	1805	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	1951-08-15
Water quality data end date:	1951-08-15	Water quality data count:	1
Ground water data begin date:	1960-05-01	Ground water data end date:	1960-05-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1960-05-01	548.00	

C13
ENE
1/2 - 1 Mile
Lower

FED USGS **USGS3203110**

Agency cd:	USGS	Site no:	363929120340102
Site name:	015S013E04E002M		
Latitude:	363929		
Longitude:	1203401	Dec lat:	36.65800657
Dec lon:	-120.56794952	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	SWSWNWS04 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	386.00	Altitude method:	M
Altitude accuracy:	5.	Altitude datum:	NGVD29
Hydrologic:	TulareBuena Vista Lakes. California. Area = 8510 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19610101
Date inventoried:	19620517	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	1404	Hole depth:	Not Reported
Source of depth data:	Not Reported	Project number:	Not Reported
Real time data flag:	0	Daily flow data begin date:	0000-00-00
Daily flow data end date:	0000-00-00	Daily flow data count:	0
Peak flow data begin date:	0000-00-00	Peak flow data end date:	0000-00-00
Peak flow data count:	0	Water quality data begin date:	0000-00-00
Water quality data end date:	0000-00-00	Water quality data count:	0
Ground water data begin date:	1962-12-01	Ground water data end date:	1962-12-01
Ground water data count:	1		

Ground-water levels, Number of Measurements: 1

Date	Feet below Surface	Feet to Sealevel
1962-12-01	630.00	

14
SE
1/2 - 1 Mile
Higher

FED USGS **USGS3203232**

Agency cd:	USGS	Site no:	363837120340101
Site name:	015S013E09E002M		
Latitude:	363837		
Longitude:	1203401	Dec lat:	36.64356218
Dec lon:	-120.5679491	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	06
State:	06	County:	019
Country:	US	Land net:	SWSWNWS09 T15S R13E M
Location map:	CHANEY RANCH	Map scale:	24000
Altitude:	418.00	Altitude method:	M
Altitude accuracy:	2.5	Altitude datum:	NGVD29
Hydrologic:	TulareBuena Vista Lakes. California. Area = 8510 sq.mi.		
Topographic:	Valley flat		
Site type:	Ground-water other than Spring	Date construction:	19610101
Date inventoried:	19610505	Mean greenwich time offset:	PST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	Not Reported		
Well depth:	1426	Hole depth:	Not Reported
Source of depth data:	other reported	Project number:	Not Reported
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

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
93622	2	0	0.00

Federal EPA Radon Zone for FRESNO County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for FRESNO COUNTY, CA

Number of sites tested: 100

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.251 pCi/L	98%	2%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	1.433 pCi/L	100%	0%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

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.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

LOCAL / REGIONAL WATER AGENCY RECORDS

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.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

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.

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.

OTHER STATE DATABASE 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.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

APPENDIX D
Site Photographs

Photo 1: South side of Property, looking west toward CalPeak Power generating station and PG&E substation.

Photo 2: Seventeen 5-gallon buckets of an unidentified substance. Buckets are in varying stages of fullness.

Photo 3: South side of Property, looking east toward the Wellhead Power generating facility.

Photo 4: Looking southwest from the central portion of the Property. The CalPeak Power generating station and PG&E substation are visible in the distance.

Photo 5: Typical equipment storage on Property. Aboveground storage tanks on adjoining property are visible on the left side, in the distance.

Photo 6: Buckets of metal fittings stored on the Property.

Photo 7: Equipment stored in central portion of Property, looking north.

Photo 8: Equipment stored in central portion of Property, looking northwest.

Photo 9: Wet area on east side of Property, looking southeast.

Photo 10: Neighboring (not adjacent) property to east.

Photo 11: Standing water from recent rainfall and wet soil from recent rainfall in central portion of Property. CalPeak Power and PG&E are visible in the distance.

Photo 12: Aboveground storage tanks on adjoining property to the north.

Photo 13: Looking south from north central area of Property.

Photo 14: Looking east from north central portion of Property. ASTs on adjoining property to north are visible on left side of photograph.

Photo 15: Approximately 30 1-gallon buckets of an unidentified substance near the west boundary of the Property. Buckets are in varying degrees of fullness.

APPENDIX E
Aerial Photographs

The EDR Aerial Photo Decade Package

Panoche - Fresno
43699 W. Panoche Road
Firebaugh, CA 93622

Inquiry Number: 1635106.22

March 17, 2006

EDR® Environmental Data Resources Inc

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

THE EDR AERIAL PHOTO DECADE PACKAGE

Environmental Data Resources, Inc.s (EDR) Aerial Photography Print Service is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDRs professional researchers provide digitally reproduced historical aerial photographs at one photo per decade.

References
EPAs Standards and Practices for All Appropriate Inquiries (AAI), section 312.24, identifies the historical sources of information necessary to achieve the objectives and performance factors of section 312.20. According to AAI, *"historical documents and records may include, but are not limited to, aerial photographs, fire insurance maps, building department records, chain of title documents, and land use records."*

To meet the prior use requirements of ASTM E 1527-05, Section 8.3.2, the following standard *historical sources* may be used: aerial photographs, fire insurance maps, property tax files, land title records (although these cannot be the sole historical source consulted), topographic maps, city directories, building department records, or zoning/land use records. ASTM E 1527-05, Section 8.3 on Historical Use Information, identifies the prior use requirements for a Phase I environmental site assessment. ASTM E 1527-05 requires *"All obvious uses of the property shall be identified from the present, back to the property's first developed use, or back to 1940, whichever is earlier. This task requires reviewing only as many of the standard historcal sources as are necessary and both reasonably ascertainable and likely to be useful."* (ASTM E 1527-05, Section 8.3.2) *Reasonably ascertainable means information that is publicly available, obtainable from a source within reasonable time and cost constraints, and practically reviewable.*

Data Gaps
In order to address *data gaps*, additional sources of information may be consulted. According the AAI, Section 312.20 (g), *"to the extent there are data gaps (as defined in section 312.10) in the information developed...that affect the ability of persons (including the environmental professional) conducting the all appropriate inquiries to identify conditions indicative of releases or threatened releases...such persons should identify such data gaps, identify the sources of information consulted to address such data gaps, and comment upon the significance of such data gaps."* According to ASTM E 1527-05, Section 8.3.2.3, *"historical research is complete when either: (1) the objectives in 8.3.1 through 8.3.2.2 are achieved; or (2) data failure is encountered. Data failure occurs when all of the standard historical sources that are reasonably ascertainable and likely to be useful have been reviewed and yet the objectives have not been met....If data failure is encountered, the report shall document the failure and, if any of the standard historical sources were excluded, give the reasons for their exclusion."*

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account executive.

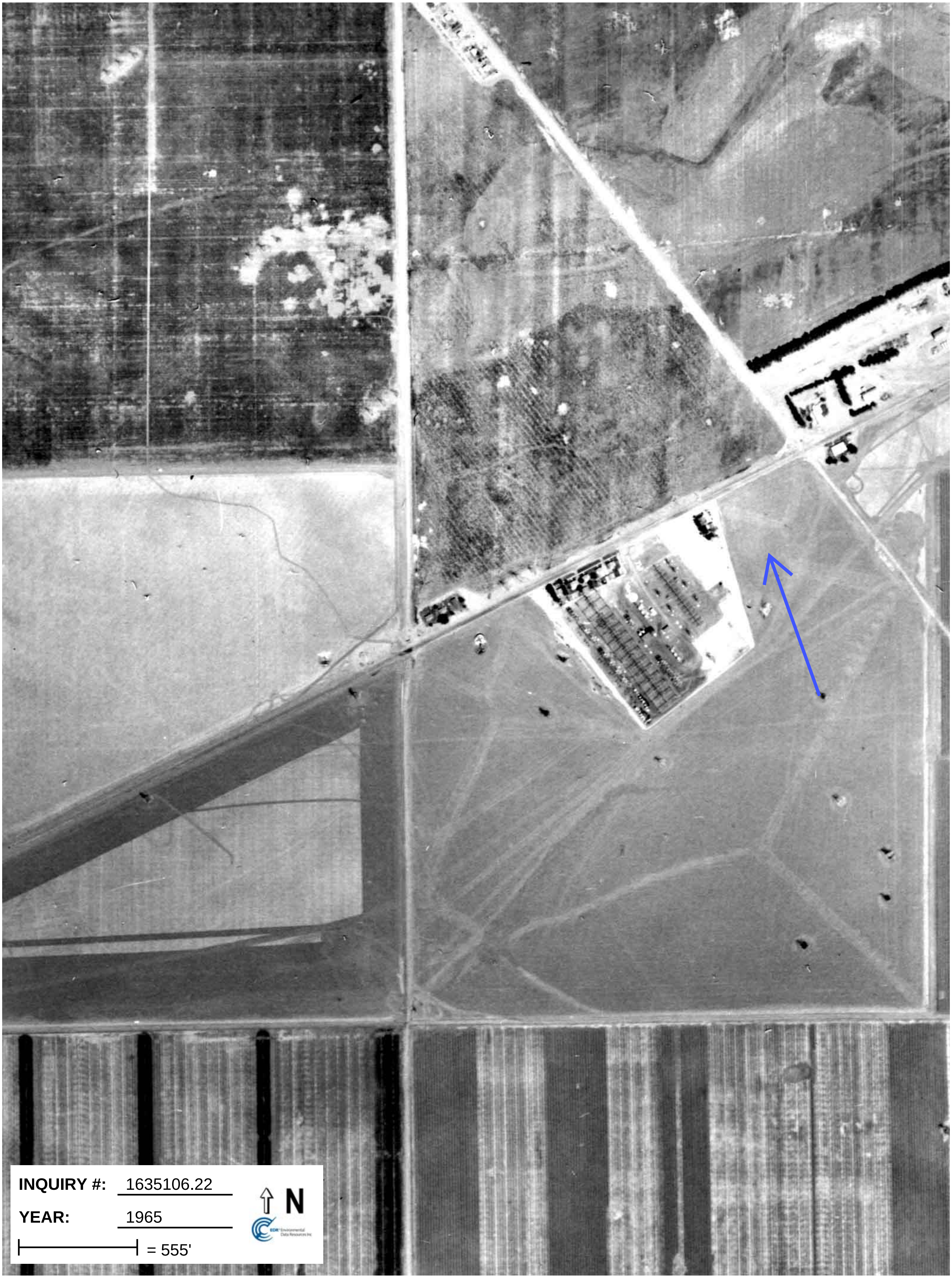
Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

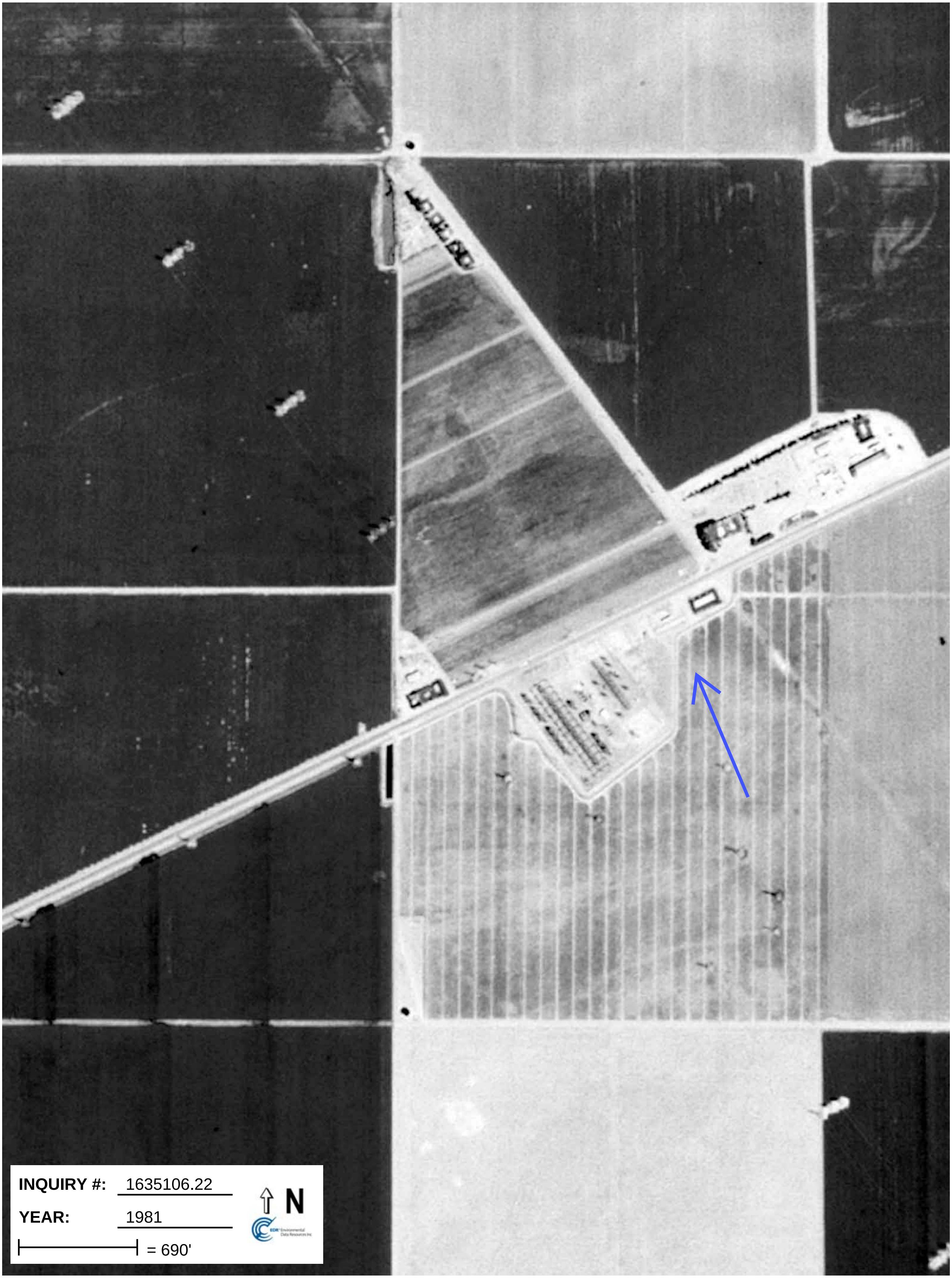
Date EDR Searched Historical Sources:
Aerial Photography March 17, 2006

Target Property:
43699 W. Panoche Road
Firebaugh, CA 93622

Year	***Scale***	***Details***	***Source***
1957	Aerial Photograph. Scale: 1"=555'	Flight Year: 1957	Cartwright
1965	Aerial Photograph. Scale: 1"=555'	Flight Year: 1965	Cartwright
1981	Aerial Photograph. Scale: 1"=690'	Flight Year: 1981	WSA
1987	Aerial Photograph. Scale: 1"=666'	Flight Year: 1987	USGS
1998	Aerial Photograph. Scale: 1"=666'	Flight Year: 1998	USGS


INQUIRY #: 1635106.22
YEAR: 1957
= 555'
N


INQUIRY #: 1635106.22
YEAR: 1965
= 555'
N

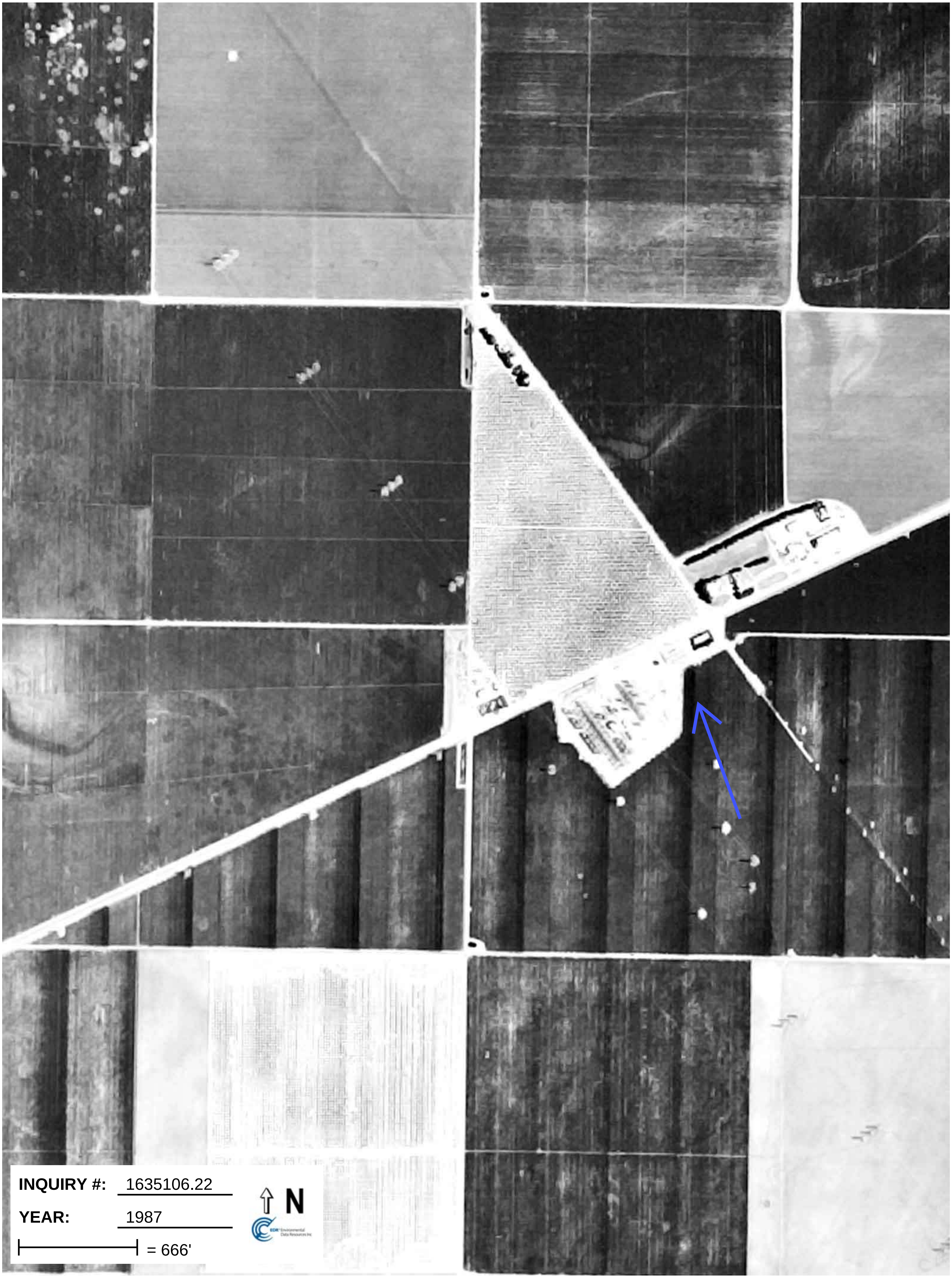


INQUIRY #: 1635106.22

YEAR: 1981

= 690'

N


INQUIRY #: 1635106.22
YEAR: 1987
= 666'
N


INQUIRY #: 1635106.22
YEAR: 1998
= 666'
N

APPENDIX F
Historic Topographic Maps

EDR® Environmental Data Resources Inc

EDR Historical Topographic Map Report

Panoche - Fresno
43699 W. Panoche Road
Firebaugh, CA 93622

Inquiry Number: 1635106.20

March 16, 2006

The Standard in Environmental Risk Management Information

440 Wheelers Farms Road
Milford, Connecticut 06461

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.'s (EDR) Historical Topographic Map Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR Historical Topographic Map Report includes a search of available public and private color historical topographic map collections. For more than a century, the USGS has been creating and revising topographic maps for the entire country at a variety of scales. There are about 60,000 U.S. Geological Survey (USGS) produced topographic maps covering the United States.

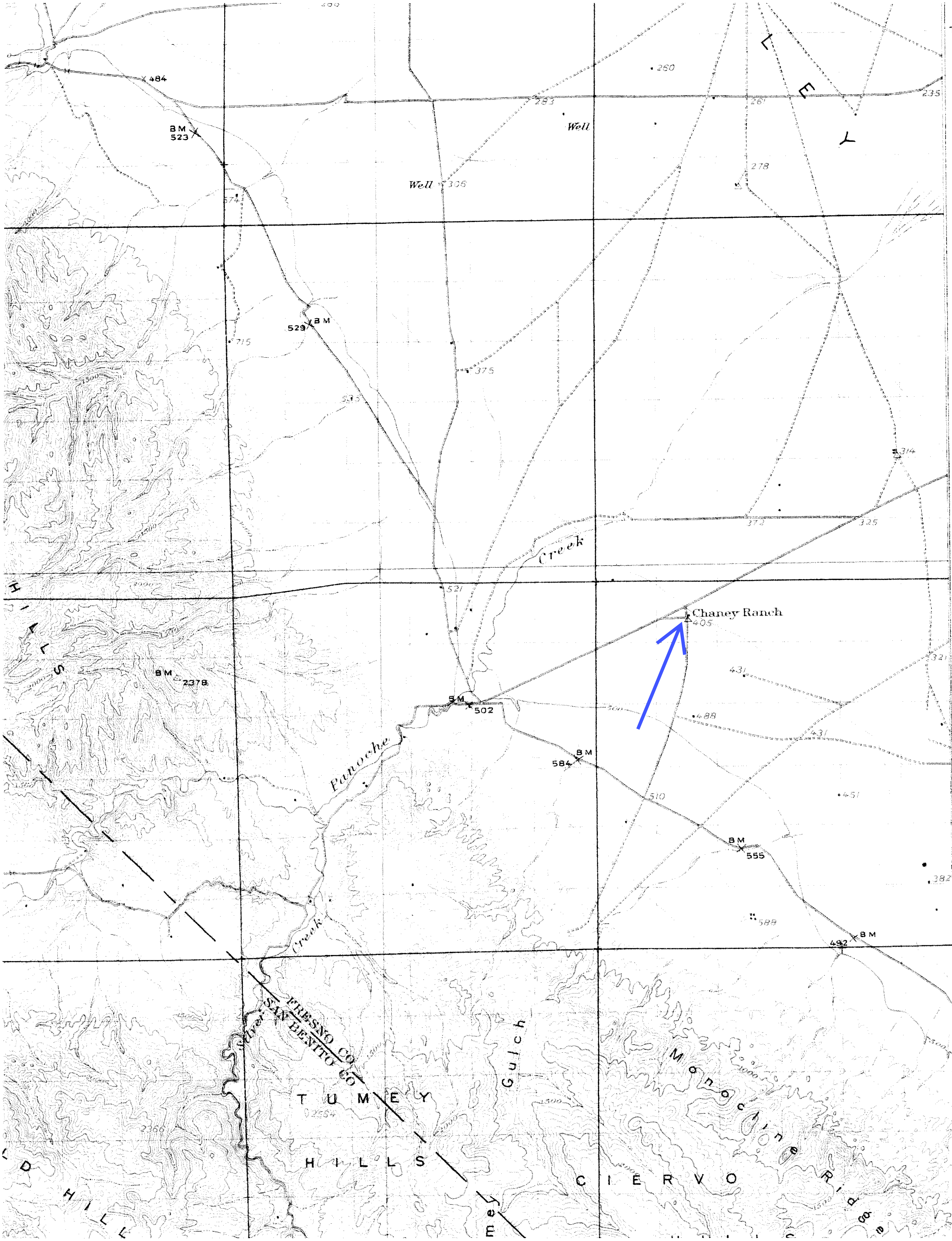
References

To meet the prior use requirements of ASTM E 1527-05, Section 8.3.2, the following *standard historical sources* may be used: aerial photographs, fire insurance maps, property tax files, land title records (although these cannot be the sole historical source consulted), topographic maps, city directories, building department records, or zoning/land use records. ASTM E 1527-05, Section 8.3 on Historical Use Information, identifies the prior use requirements for a Phase I environmental site assessment. ASTM E 1527-05 requires *"All obvious uses of the property shall be identified from the present, back to the property's first developed use, or back to 1940, whichever is earlier. This task requires reviewing only as many of the standard historcal sources as are necessary and both reasonably ascertainable and likely to be useful."* (ASTM E 1527-05, Section 8.3.2) *Reasonably ascertainable means information that is publicly available, obtainable from a source within reasonable time and cost constraints,and practically reviewable.*

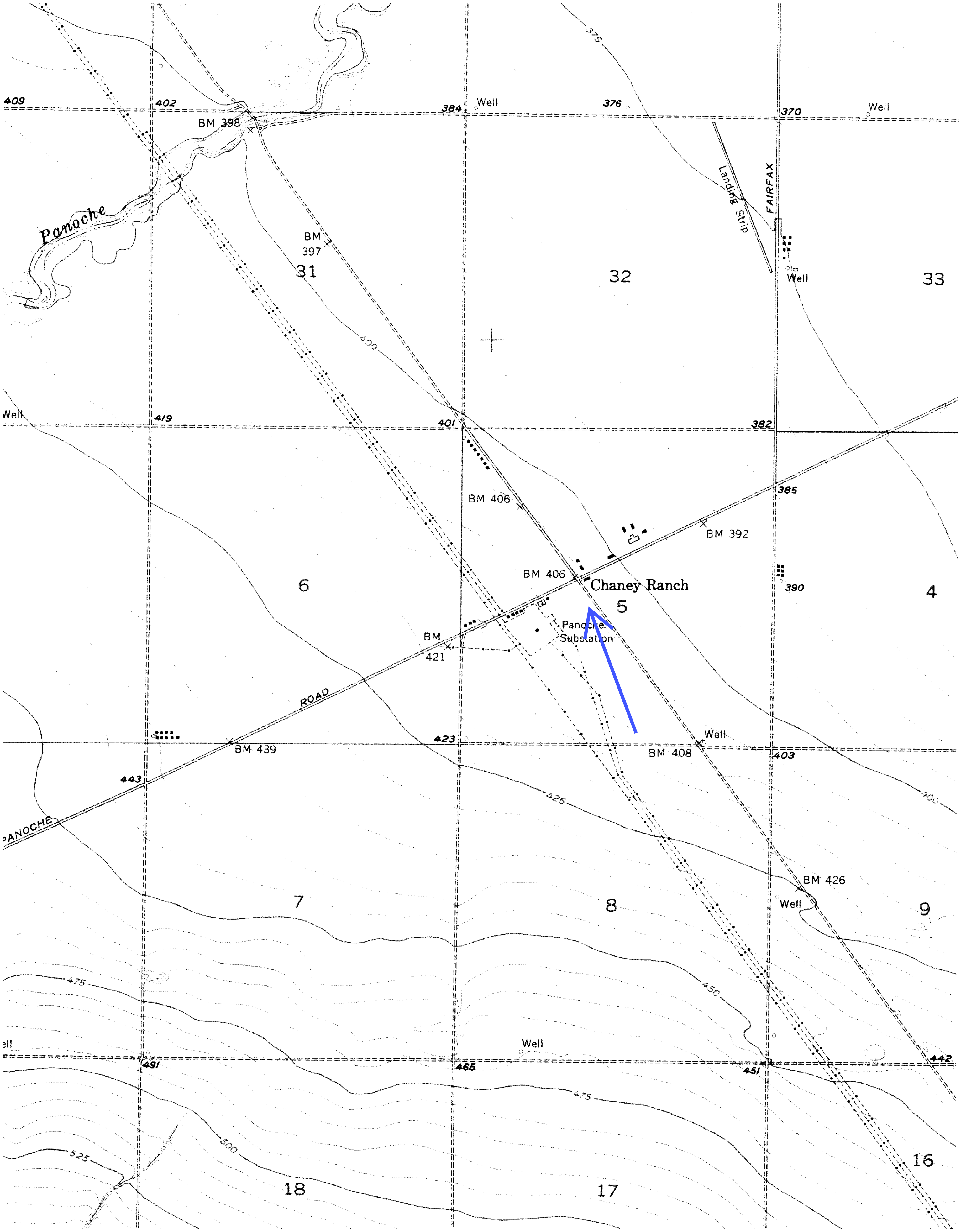
EPA's Standards and Practices for All Appropriate Inquiries (AAI), Section § 312.24, identifies the historical sourcesof information necessary to achieve the objectives and performance factors of § 312.20. According to AAI,*"historical documents and records may include, but are not limited to, aerial photographs, fire insurance maps,building department records, chain of title documents, and land use records."*

Data Gaps

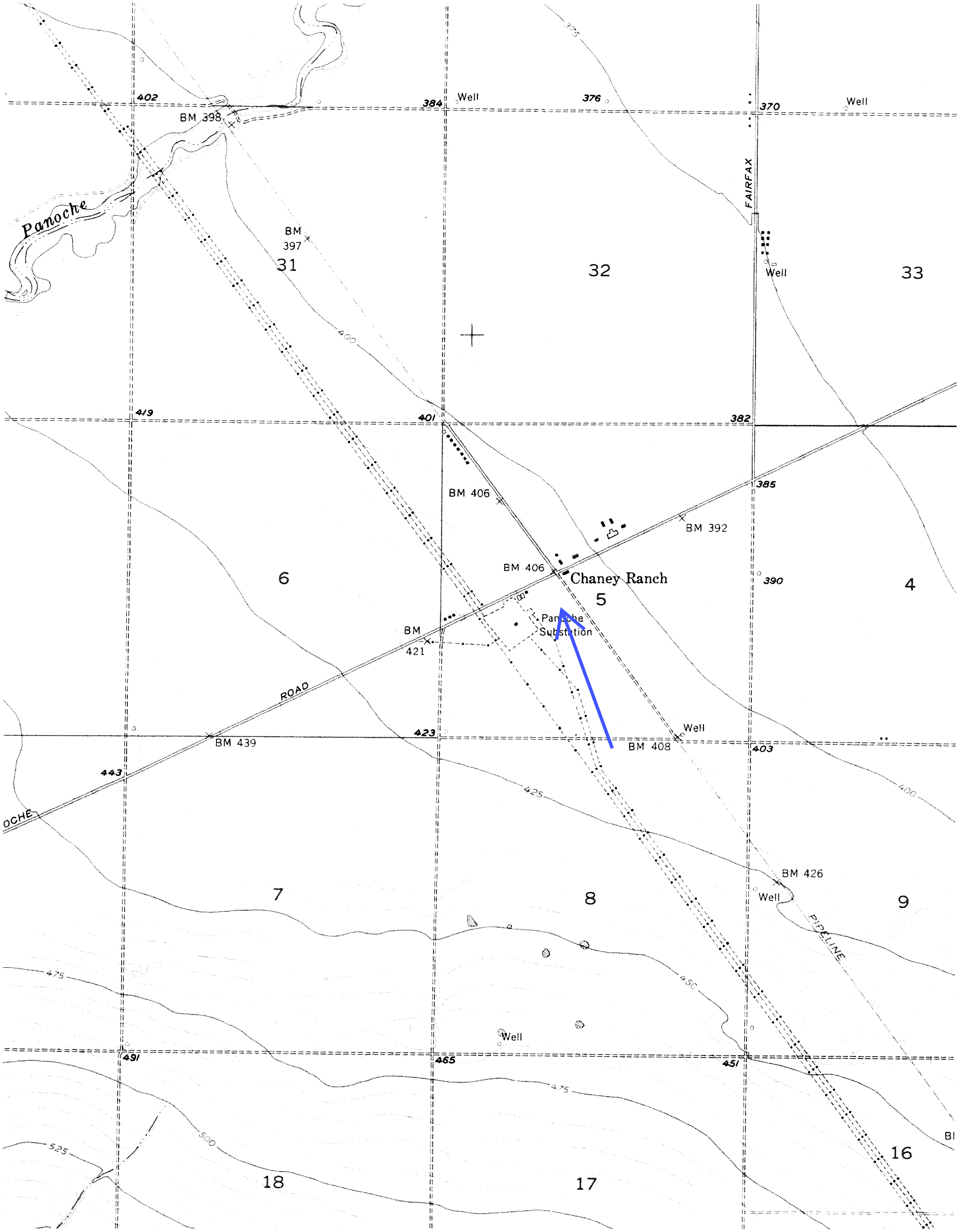
In order to address data gaps, additional sources of information may be consulted. According the AAI, Section § 312.20 (g), *"to the extent there are data gaps (as defined in § 312.10) in the information developed...that affect the ability of persons (including the environmental professional) conducting the all appropriate inquiries to identify conditions indicative of releases or threatened releases....such persons should identify such data gaps, identify the sources of information consulted to address such data gaps, and comment upon the significance of such data gaps."* According to ASTM E 1527-05, Section 8.3.2.3, "historical research is complete when either: (1) the objectives in 8.3.1 through 8.3.2.2 are achieved; or (2) data failure is encountered. Data failure occurs when all of the standard historical sources that are reasonably ascertainable and likely to be useful have been reviewed and yet the objectives have not been met....If data failure is encountered, the report shall document the failure and, if any of the standard historical sources were excluded, give the reasons for their exclusion."



N ^ EDR INQUIRY# 1635106.20 TARGET QUAD: PANOCHE YEAR: 1913 Series: 30' Scale: 1:125,000



N ^ EDR INQUIRY# 1635106.20 TARGET QUAD: CHANEYRANCH YEAR: 1955 Series: 7.5' Scale: 1:24,000



N ^ EDR INQUIRY# 1635106.20 TARGET QUAD: CHANEYRANCH PhotoRevised: 1955-1971 Series: 7.5' Scale: 1:24,000

APPENDIX G

FOIA Requests

INTERVIEW MEMO

Person Contacted:	Ed Smith, CalPeak Power Operations & Maintenance Technician
Phone No.:	Interviewed in Person; can be contacted through John Bryant, CalPeak Power Plant Manager at 619-229-3770 ext. 302
Representing:	CalPeak Power, LLC (occupant)
Project Name:	Starwood Energy – Midway Phase I ESA
Project No.:	
RE:	Current Property Use Information

Date & Time	**Comments**
3/23/2006 Morning	Mr. Smith accompanied Burns & McDonnell during the Site reconnaissance. He indicated that, to his knowledge, no spills had occurred on the Property and that CalPeak had not stored any hazardous materials at the Site. He was not aware of any spills in conjunction with the aboveground storage tanks (ASTs) on the neighboring property to the north. He was not aware of any underground storage tanks on the Property or any previous ASTs on the Property.

TELEPHONE CALL MEMO

Person Contacted:	Diane
Phone No.:	559-485-7500
Representing:	Fresno County Fire Protection District
Project Name:	Starwood Energy – Midway Phase I ESA
Project No.:	
RE:	Hazardous Material Spill Response; Spill Response; ASTs and USTs at the Property

Date & Time	**Comments**
4/26/2006 Afternoon	The Fresno County Fire Protection District was contacted regarding the presence of USTs/ASTs at the Property as well as any spill response activities that may have occurred at the Site. Diane with the Fire Protection District indicated that records are maintained by specific dates on which the incident occurred. They can not find address specific information within their system because they can only search by date. Because there is no specific address associated with the Property, no determination could be made regarding the presence of USTs or ASTs by the Fire Protection District.

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INTERVIEW MEMO

Person Contacted:	John Bryant
Phone No.:	619-229-3770 ext 302; john.bryant@calpeak.com
Representing:	CalPeak Power, LLC (occupant)
Project Name:	Starwood Energy – Midway Phase I ESA
Project No.:	
RE:	Current and Historic Property Use Information

Date & Time	**Comments**
4/28/2006 Afternoon	Mr. Bryant was contacted by e-mail regarding CalPeak Power's use of the Property. Mr. Bryant indicated that CalPeak has used the Property as an equipment laydown area since it began operation of its adjacent power generating facility in December 2001. He stated that prior to CalPeak's use of the Property, the Property was vacant.

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TELEPHONE CALL MEMO

Person Contacted: Barry Baker

Phone No.: 559-659-3942

Representing: Property Owner

Project Name: Starwood Energy – Midway Phase I ESA

Project No.:

RE: Current and Historic Property Ownership and Use Information

Date & Time	Comments
4/26/2006	Mr. Baker was not in.
Afternoon	Left message with my phone number and requested that he return my call.
5/1/2006	Mr. Baker returned my call from Friday.

Mr. Baker confirmed that he is the owner of the Property. He stated he purchased the Property in 1989 from Wells Fargo Bank. He believes it may have been a foreclosure property but wasn't sure.

Mr. Baker stated that he owns the Property that the fuel farm (ASTs to north), apartments (also to north) and Wellhead Power (to the south southeast) occupy. He indicated that the full size of his property is approximately 7,000 acres.

Prior to CalPeak Power leasing the Property, it was used for agricultural purposes. Some irrigation pipe and equipment was stored on part of the Property (northern and westernmost areas), but the remainder was cultivated. He indicated that the cultivated area extended much closer to the apartment house when he first purchased the Property.

CalPeak Power has leased the Property from him since they began construction in 2001. It was originally leased as a construction laydown yard;

however CalPeak opted to retain their lease after construction for equipment storage on the Property. Mr. Baker has not been made aware of any incidents by CalPeak that may have impacted the Property.

The fuel farm on the north side of the Property is used for diesel fuel storage only. He was not sure of the exact construction date of the ASTs, but indicated they were installed in the early 1970's during the fuel crisis. He stated that no spills have occurred at the fuel farm since he became the owner and he was not made aware of any prior spills when he purchased the Property.

The apartments were also constructed prior to his purchase of the Property. He estimated they may have been roughly 15 years old when he purchased the Property in 1989 and thought they may have been constructed at approximately the same time as the fuel farm. The apartments are rental units and are currently occupied.

The Wellhead Power generating facility was constructed at the same time as the CalPeak Power facility (2001). He has not been made aware of any spills or environmental issues at the Wellhead Power facility during or since construction.

Mr. Baker stated he is not aware of any wells, ASTs or USTs currently or previously on the Property. He also indicated that he has never stored transformers on the Property. He stated that he is not aware of any environmental problems with the Property.

APPENDIX H

Scope of Services

Burns &
McDonnell
SINCE 1898

April 19, 2006

Rich Weiss
Starwood Energy Global Group, LLC
2737 Arbuckle
Houston, Texas 77005

Proposal for Phase One Environmental Site Assessment
At the Midway Site in Firebaugh, California

Dear Mr. Weiss:

In accordance with your request, we are pleased to submit our proposal for professional services for a Phase I Environmental Site Assessment (Phase I ESA) as follows:

PROJECT

Starwood Energy Global Group, LLC (hereinafter referred to as CLIENT) is seeking a study and report concerning a Phase I Real Estate Transfer Environmental Site Assessment (Assessment) of Property located in Firebaugh, Fresno County, California and adjacent to the Pacific Gas & Energy Panoche Station.

SCOPE OF SERVICES

In order to meet the objectives of this project, Burns & McDonnell (hereinafter referred to as CONSULTANT) proposes the following multi-component approach, which is consistent with ASTM Standard E1527-00 for performing an environmental site assessment for commercial real estate. It is understood that the purpose for conducting this site assessment is to satisfy one of the requirements to qualify for the innocent land owner defense to CERCLA liability and is not intended to include a more comprehensive evaluation of business environment risk associated with a parcel of commercial real estate. See Exhibit A for details of scope of work.

Note that CLIENT is responsible for providing records of historic ownership for the Property; disclosing leases, easements, environmental liens and activity and use limitations for the Property; and other user requirements. Please refer to Section 3.0 Client's Responsibilities of the attached Exhibit A.

SCHEDULE

CONSULTANT and CLIENT agree to the following Schedule. A draft report will be prepared for review two weeks after notice-to-proceed. A final report will be ready one week after receiving comments from CLIENT.

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

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SINCE 1898

Mr Rich Weiss
April 19, 2006
Page 2

COMPENSATION

Total payment for the Scope of Services described herein shall be completed for the lump sum of

A draft copy of the report will be provided to CLIENT in .pdf format via e-mail or on CD, depending on finished file size. Two hard copies of the final report will be provided plus an electronic copy (.pdf format) on CD.

This estimated fee does not include fees or visits for obtaining information from government agencies through the Freedom of Information Act, in excess of $. If we find that greater than 25 pages of business records or responses from government agencies require review, Burns & McDonnell will contact CLIENT for additional fee authorization prior to performing the review.

If we learn that the Properties are or were a listed LUST, CERCLIS, SWLF, SPL, RCRA or NPL site we will adjust our fee accordingly to allow for Burns & McDonnell to obtain, review and summarize the additional information.

The cost of providing professional services under the Agreement is based CONSULTANT's knowledge of site conditions and its judgement at the time that this cost estimate was prepared and assumes that the site visit can be completed in a single day. In the event that CONSULTANT identifies concealed conditions, which differ materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Agreement, the basic fee will be equitably adjusted.

The attached Supplemental Phase I - Real Estate Transfer Environmental Site Assessments Terms and Conditions is incorporated and made a part of this Agreement.

We appreciate the opportunity to present this proposal. If it is acceptable, please sign and return one copy for our file.

Sincerely,

J. David Langford
Associate Vice President

Sarah E. S. Sizemore
Environmental Engineer

Attachments:
REITSA Terms and Conditions Dated 03/03/03
Exhibit A, Scope of Work

ACCEPTED:
Starwood Energy Global Group, LLC

By____________________

Title Sr. Managing Director

Date 5/15/06

EXHIBIT A

Scope of Work
Submitted to Starwood Energy Global Group, LLC for
Phase I Environmental Site Assessment
Midway Project Site
Firebaugh, Fresno County, California

April 19, 2006

1.0 PROJECT

In accordance with the Burns & McDonnell Engineering Company, Inc. (hereafter referred to as CONSULTANT) proposal to Starwood Energy Global Group, LLC (CLIENT) dated April 19, 2006, the following Project Scope of Work shall be performed:

2.0 SCOPE OF SERVICES

The project scope consists of assisting CLIENT with Phase I Environmental Site Assessments of Property located in Firebaugh, Fresno County, California.

Because CONSULTANT has limited information concerning the Property, the following assumptions have been made for the purposes of cost estimating:

- There are no structures used on the Property.

Changes in any of the forgoing assumptions may change the fee quoted in this proposal.

CONSULTANT agrees to furnish labor, materials, equipment, and other items necessary to complete the services described herein for CLIENT. This scope of services will be completed in accordance with American Society for Testing and Materials *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (E1527-00).

2.1 Regulatory Background Review

a. CONSULTANT will purchase and review a government database area map search and list report (Report) for the Property. The Report will be purchased from one commercial provider of that service. The Report purchased will use the approximate latitude and longitude of the center of the Property as its location and will contain the following information:

- National Priority List (NPL) and State Priority List (SPL) for sites within a one (1) mile search distance of the Property
- Federal and State equivalent Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) and state landfill and/or solid waste disposal list sites (SWLF) within a one-half (½) mile search distance of the Property.
- Resource Conservation and Recovery Act (RCRA) Notifiers List for generators at and adjoining the Property.
- RCRA CORRACTS Treatment, Storage and/or Disposal (TSD) sites within a one (1) mile search distance of the Property

- Non-CORRACIS TSDs within a one-half (½) mile search distance to the Property.
- Federal Emergency Response Notification list sites (ERNs) for the Property only.
- State list of registered underground storage tanks (USTs) for USTs sites within a one-quarter (¼) mile search distance of the Property.
- State list of reported leaking underground storage tank (LUST) incidents for LUST sites within a one half (½) mile search distance of the Property.

b. CONSULTANT will review historical aerial photographs, from as many different time periods as practical. The following sources may be used:

- Either the local County or Township Assessor's office,
- The local office of the United States Natural Resource Conservation Service,
- The City Planning and Zoning Department,
- Commercial Provider.

Aerial photographs will be reviewed in an effort to identify the past uses of the Property. If possible, CONSULTANT will purchase copies of the photographs reviewed, however, CONSULTANT will not purchase copies of more than one photograph per decade. The quoted fee in this scope of work does not include purchasing more than) in aerial photographs.

c. CONSULTANT will review the USGS 7.5 Minute Topographic Map for the Property to evaluate the regional topography and drainage features on or within ½ mile of the Property.

d. CONSULTANT will purchase and review historic fire insurance maps (Fire Insurance Maps), if they are available. Fire Insurance Maps will be purchased from one commercial provider of that service. The Fire Insurance Maps purchased will use the street address of the Property as the search criteria. CONSULTANT will review the Fire Insurance Maps, if available, to identify known past uses of the Property. The quoted fee in this scope of work does not include purchasing more than $ in Fire Insurance Maps.

e. CONSULTANT will interview the person(s) identified by CLIENT as possessing knowledge of the current and former uses of the Property. CONSULTANT also will interview credible people identified, if any, that may possess knowledge of the current and former uses of the Property. Persons attempts will be made to interview include current Property owners and/or operators.

f. CONSULTANT will review file information concerning the Property at the local fire, building and planning departments and the township or county Assessor's Office, or will interview representatives of these offices by telephone concerning records they have.

g. CONSULTANT will review reasonably ascertainable published geologic maps or literature for the Property in an effort to identify the thickness of soil and the types of soil and rock underlying the Property. CONSULTANT will not conduct intrusive data gathering or sampling of soil, rock or water at the Property, to obtain this information.

h. CONSULTANT will submit Freedom of Information Act Requests to federal and state environmental agencies to request copies of file information concerning land and water related matters at the Property. FOIA requests will be sent to the federal and state environmental agencies with authority over land and water issues and ask them for file information about the Property only. The quoted fee in this scope of work does not include more than $50.00 in copying charges for records obtained as a result of these FOIA requests.

2.2 Site Reconnaissance

a. CONSULTANT will perform a site visit to visually and physically[1] observe the Property. CONSULTANT will perform this site visit in an effort to obtain information that may indicate the likelihood of identifying Recognized Environmental Conditions on the Property.

b. CONSULTANT will visually observe the Property in an effort to identify transformers or capacitors that may contain polychlorinated biphenyls (PCBs). CONSULTANT will look to see if transformers or capacitors are leaking and attempt to identify visible markings that may confirm their ownership.

c. CONSULTANT will visually observe the Property to identify aboveground storage tanks and visible signs of underground storage tanks (e.g., fill pipes, manways, vent lines, and dispensing pumps).

d. CONSULTANT will photograph each accessible property line and each accessible side of Property improvements to document the condition of the Property at the time of the site reconnaissance. Finally, CONSULTANT will photograph each area that, at the time of the site reconnaissance, CONSULTANT plans to identify as a Recognized Environmental Condition at the Property.

e. CONSULTANT will review waste manifests, material safety data sheets, raw materials inventory lists, and tenant lists for a 50-year period, if these records exist and are made available to CONSULTANT, in an effort to identify issues of environmental relevance to

[1] Physically observe as used herein means we will also make note of odors that may suggest environmental impact to the Property.

the Property for that time period. Reviews of these documents requiring more than 1 hour are beyond the scope of services of this scope of work and will be billed on a time and expense basis.

2.3 Visual Observation of Adjoining and Surrounding Lands

CONSULTANT will visually and physically observe adjoining properties from the CLIENT's Property and public points of view in an effort to identify use of and apparent environmental threats to the Property posed by adjoining properties. Also, CONSULTANT will visually and physically observe up gradient surrounding properties within ¼ mile of the Property, as shown on the local USGS topographic quadrangle map. CONSULTANT will perform visual observations of surrounding properties from the Property and public points of view in an effort to identify use of and apparent environmental threats to the Property posed by up-gradient surrounding properties

2.4 Sampling

CONSULTANT will not take any type of soil, water, or air samples. CONSULTANT will not take any samples for asbestos or mold or lead-based paint analysis.

2.5 Data Evaluation and Reporting

CONSULTANT will prepare a narrative report that summarizes the information obtained during the work described in Sections 2.1 through 2.4. A draft copy of the report will be provided to CLIENT in .pdf format via e-mail or on CD, depending on finished file size. CLIENT comments will be incorporated into the report and two hard copies of the final report will be provided plus an electronic copy (.pdf format) on CD.

2.6 Additional Services

Telephone consultation and interpretations of findings will be billed on a time-and-expense basis and are beyond the scope of services outlined in Sections 2.1 through 2.4.

At CLIENT's request, CONSULTANT will provide additional services that are beyond the scope of services outlined in Sections 2.1 through 2.4. CONSULTANT will bill time for those non-scope services on a time-and-expense basis. CONSULTANT will proceed with additional services only upon a written notice to proceed from CLIENT. Additional services may include the following items:

- Sampling of readily observable and representative suspected ACBM and analysis bulk samples of ACBM.
- Sampling of readily observable and representative or suspected mold.
- Development of an Operations and Maintenance or Management Plan that addresses the ACBM located within the facility.
- Design and implementation of Phase II environmental assessments to include groundwater studies, underground storage tank management, design of subsurface testing (borings, water, and soil analysis) and RCRA compliance programs.

3.0 CLIENT'S RESPONSIBILITY

CLIENT agrees to provide the following:

- Give prompt written notice to CONSULTANT whenever CLIENT observes or otherwise becomes aware of any development that affects the scope or timing of CONSULTANT's services,
- Provide written and legal authorization for CONSULTANT to perform services on the Property, including right of access to the Property,
- Provide the reason the Phase I ESA is required,
- Describe the type of Property and type of Property transaction, for example, sale, purchase or exchange,
- Provide the complete and correct address for the Property,
- Provide a map or other documentation showing the Property location and boundaries,
- Disclose whether there are any environmental liens on the Property, or activity and use limitations (such as a deed restriction),
- Disclose whether the value of the Property has been reduced below comparable properties due at least in part to environmental conditions associated with the Property (CONSULTANT will be interested to know the environmental condition causing the value reduction),
- The scope of services desired for the Phase I ESA (including whether any parties to the Property transactions may have a required standard scope of services or whether any considerations beyond the requirements of Practice E 1527-00 are to be considered by CONSULTANT),
- Provide the names, addresses and roles of all parties who will rely on the Phase I ESA reports,
- Identify the Property contact and how the contact can be reached,
- Provide historic ownership or chain-of-ownership for the Property. A chain-of-ownership for environmental purposes will be provided by the CLIENT for the Property. The land title records provided will include recorded liens related to environmental cleanup or hazards on the Property, deed restrictions and activity or use limitations. Data will be provided for the period from the date of the signed agreement back to 1940 or to a time prior to 1940 when the Property was first developed, whichever is earliest. To the extent the information is available, leases and easements on the Property will be included.
- Disclose any special terms and conditions which must be agreed upon by CONSULTANT, and
- Any other knowledge or experience with the Property that may be pertinent to CONSULTANT including, but not limited to geotechnical reports, environmental reports, records, correspondences, plats of survey, building, grading and development plans, tax number, current legal title holder of the Property and any other data concerning the Property and its environmental condition.

APPENDIX I

Land Title Records

2nd Amended

First American Title Company

7625 North Palm Avenue, Suite 101
Fresno, CA 93711

Roger Noble
White & Case
1155 Avenue of the Americas, Suite 2614
New York, NY 10036
Phone: (212)819-8970
Fax:

Customer Reference:

Order Number:	1003-2372988 (JW)
Title Officer:	Jim Weeks
Phone:	(559)221-1968
Fax No.:	(559)244-3503
E-Mail:	jimweeks@firstam.com
Buyer:	
Owner:	PAO INVESTMENTS, LLC
Property:	43649 West Panoche Road Firebaugh, CA

PRELIMINARY REPORT

In response to the above referenced application for a policy of title insurance, this company hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an Exception below or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage of said Policy or Policies are set forth in Exhibit A attached. Copies of the Policy forms should be read. They are available from the office which issued this report

Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.

It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

Dated as of June 1, 2006 at 7:30 A.M.

The form of Policy of title insurance contemplated by this report is:

TBD

A specific request should be made if another form or additional coverage is desired.

Title to said estate or interest at the date hereof is vested in:

Pao Investments, LLC, a California limited liability company

The estate or interest in the land hereinafter described or referred to covered by this Report is:

A fee.

The Land referred to herein is described as follows:

(See attached Legal Description)

At the date hereof exceptions to coverage in addition to the printed Exceptions and Exclusions in said policy form would be as follows:

1. General and special taxes and assessments for the fiscal year 2006-2007, a lien not yet due or payable.

2. The lien of supplemental taxes, if any, assessed pursuant to Chapter 3.5 commencing with Section 75 of the California Revenue and Taxation Code.

3. Rights of the public in and to that portion of the land lying within Panoche Road.

4. Intentionally Omitted

5. Subject to any vested and accrued water rights for mining, agricultural, manufacturing or other purposes, and rights to ditches and reservoirs used in connection with such water rights as may be recognized and acknowledged by the local customs, laws, and decisions of courts, also to right of proprietor of a vein or lode to extract and remove his ore therefrom should the same be found to penetrate or intersect the premises hereby granted, as provided by law; and there is reserved from the lands hereby granted a right of way thereon for ditches or canals constructed by the authority of the United States as reserved in patent from the United States of America, recorded April 19, 1893 in Book T, Page 12 of Patents.

6. Intentionally Omitted

7. An easement for two lines of pipe for the transportation of oil, petroleum, gas, water and other substances, and if the same shall be desired, a single line of poles, telephone and telegraph lines and incidental purposes, recorded September 05, 1914 as Book 560, Page 183 of Official Records.

In Favor of:	Valley Pipe Line Company, a corporation
Affects:	A portion of said land

8. An easement for Pipelines and incidental purposes, recorded October 7, 1929 as Book 1025, Page 366 of Official Records.

In Favor of:	Pacific Gas and Electric Company
Affects:	a portion of said land

Document(s) declaring modifications thereof recorded October 21, 1992 as Instrument no. 92-159696 of Official Records.

9. An easement for the production storage and transportation, and the exploration and testing of that portion of said land lying within the southeast quarter of said section 33, for oil, gas and other hydrocarbon substances and minerals, and also the right to drill for, produce and use water from said land in connection with drilling or mining operations thereon and incidental purposes, recorded May 13, 1941 as Instrument No. 17232, Book 2040, Page 398 of Official Records.

In Favor of:	B. E. Montgomery
Affects:	A portion of said land

10. Intentionally Omitted

11. An easement for a single line of poles with necessary wire and other fixtures, together with the right of ingress and egress and incidental purposes, recorded June 12, 1945 as Book 2259, Page 187 of Official Records.

In Favor of:	Standard Oil Company of California, a corporation and Standard Gasoline Company, a corporation
Affects:	A portion of said land

The terms and provisions contained in the document entitled "Assignment of Easement and Right-of-Way" recorded July 26, 1993 as Instrument No. 93110656 of Official Records.

12. Intentionally Omitted

13. Intentionally Omitted

14. An easement for a line of poles with necessary wire and other fixtures, together with the right of ingress and egress and incidental purposes, recorded April 12, 1949 as Instrument No. 18194 of Official Records.

In Favor of:	Pacific Gas and Electric Company, a California Corporation
Affects:	A portion of said land

15. Intentionally Omitted

16. The terms and provisions contained in the document recorded February 03, 1950 in Book 2828, Page 426 of Official Records.

17. Intentionally Omitted

18. Intentionally Omitted

19. An easement for a pipe line or pipe lines and appurtenances thereof for the transportation of oil, gas, water and other substances with the right of ingress and egress and incidental purposes, recorded August 23, 1956 as Book 3812, Page 390 of Official Records.

In Favor of:	Union Oil Company of California
Affects:	A portion of said land

A document entitled "Assignment" recorded on January 31, 1992 as Instrument No. 92012493 of Official Records.

20. An easement for a line of poles with wires for the transmission of electric energy, and for communication purposes, and all necessary and proper crossarms, guys, anchors and other appliances and fixtures for use in connection with said poles and wires together with the right of ingress and egress and incidental purposes, recorded May 05, 1961 as Book 4551, Page 204 of Official Records.

In Favor of:	Pacific Gas and Electric Company
Affects:	A portion of said land

21. An easement for a line of poles, wires and appurtenances and incidental purposes, recorded July 11, 1963 as Book 4882, Page 307 of Official Records.

In Favor of:	Pacific Gas and Electric Company
Affects:	A portion of said land

22. An easement for pipe lines for conveying gas, with necessary and proper valves and other appliances and fittings, and devices for controlling electrolysis for use in connection with pipe lines, together with adequate protection therefor and incidental purposes, recorded July 16, 1963 as Book 4883, Page 729 of Official Records.

In Favor of:	Pacific Gas and Electric Company
Affects:	A portion of said land

23. Intentionally Omitted

24. Terms, provisions, covenants, restrictions and conditions contained in a document executed pursuant to the California Land Conservation Act of 1965 (Williamson Act) and recorded February 27, 1969 as Book 5665, Page 182 of Official Records.

25. An oil and gas lease executed by Edmond R. Doak, a married man, as his sole and separate property as lessor and Bell Petroleum Company, a corporation as lessee, recorded November 15, 1972 as Book 6092, Page 776 of Official Records.

Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

26. An oil and gas lease executed by Anita Mae Albrecq, Anita Mae Albrecq, Trustee under Declaration of Trust dated May 3, 1971, Diana B. Howard, formerly Diana B. Albrecq, Charles Butler Albrecq, Trustor under Declaration of Trust dated May 3, 1971 and Charles Butler Albrecq

as lessor and Bell Petroleum Company, a Corporation as lessee, recorded May 31, 1973 as book 6171, Page 453 of Official Records.

Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

27. An oil and gas lease executed by Anita Mae Albrecq, Guardian of the Estate of Kenneth Jesse Albrecq, a minor as lessor and Bell Petroleum Company as lessee, recorded July 30, 1973 as Book 6194, Page 588 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

28. An oil and gas lease executed by Russell Giffen, a married man, as his sole and separate property as lessor and Fuller Oil Company, a California corporation as lessee, recorded April 15, 1982 as Book 7892, Page 401 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

29. An oil and gas lease executed by Russell Giffen, a married man, as his sole and separate property as lessor and Fuller Oil Company, a California corporation as lessee, recorded April 15, 1982 as Book 7892, Page 403 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

30. An oil and gas lease executed by Russell Giffen, a married man, as his sole and separate property as lessor and Fuller Oil Company, a California corporation as lessee, recorded April 15, 1982 as Book 7892, Page 408 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

31. An oil and gas lease executed by Russell Giffen, a married man, as his sole and separate property as lessor and Fuller Oil Company, a California corporation as lessee, recorded April 15, 1982 as Book 7892, Page 410 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

32. An oil and gas lease executed by Michael Giffen, a married man, as his separate property as lessor and Fuller Oil Company, a California corporation as lessee, recorded August 04, 1982 as Book 7949, Page 9 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

33. Intentionally Omitted

34. The terms and provisions contained in the document entitled "Certificate of Waiver of Parcel Map No. 88-63" recorded August 31, 1989 as Instrument No. 89-093723 of Official Records.

35. An easement for non-exclusive private road easements and the right to erect and maintain power lines, and right to build and maintain drainage ditches and to install and maintain pipelines and incidental purposes, recorded September 29, 1989 as Instrument No. 89-106611 of Official Records.

In Favor of:	Byron Baker, et al
Affects:	A portion of said land

36. Intentionally Omitted

37. Intentionally Omitted

38. An easement for to construct install replace (of the initial or any other size) maintain, and use such valves and other devices and equipment as PG&E shall from time to time deem necessary for metering regulating and is charging gas into the atmosphere within, to install concrete curbing on, to cover with Bitumastic pavement and to enclose with a fence and incidental purposes, recorded July 07, 1992 as Instrument No. 92-094730 and re-recorded September 15, 1992 as Instrument No. 92-140215 of Official Records.

In Favor of:	Pacific Gas and Electric Company, a California corporation
Affects:	A portion of said land

The terms and provisions contained in the document entitled "Agreement Modifying an Easement" recorded February 11, 1993 as 93-020130 of Official Records.

39. The terms and provisions contained in the document entitled "Non-Disturbance Agreement Consent To Removal Of Crops And Other Personal Property" recorded June 22, 1994 as Instrument No. 94-101434 of Official Records.

40. A financing statement recorded June 02, 1997 as Instrument No. 97-070354 of Official Records.

Debtor:	Baker Farming Co., a California General Partnership
Secured party:	Glendale Federal Bank, Federal Savings Bank, a United States Corporation

An amendment to the financing statement was recorded July 06, 2000 as Instrument No. 2000-0079982 of Official Records.

A continuation statement was recorded April 09, 2002 as Instrument No. 2002-0058264 of Official Records.

An amendment to the financing statement was recorded April 09, 2002 as Instrument No. 2002-0058265 of Official Records.

An amendment to the financing statement was recorded April 09, 2002 as Instrument No. 2002-0058266 of Official Records.

An amendment to the financing statement was recorded January 30, 2006 as Instrument No. 2006-0019813 of Official Records.

An amendment to the financing statement was recorded January 30, 2006 as Instrument No. 2006-0019814 of Official Records.

41. Intentionally Omitted

42. An oil and gas lease executed by Nana Oil & Gas, Inc., a California corporation as lessor and R&R Resources, a California Limited Liability Company as lessee, recorded May 13, 2002 as Instrument No. 2002-0077794 of Official Records.

    Defects, liens, encumbrances or other matters affecting the leasehold estate, whether or not shown by the public records.

43. An option in favor of Starwood Power-Midway, LLC, a Delaware limited liability company as contained in or disclosed by a document recorded April 07, 2006 as Instrument No. 2006-0073855 of Official Records.

44. Information in possession of the Company indicates that a division of land may have occurred involving the land described herein. Although the policy or policies of title insurance contemplated hereby will not insure against loss or damage by reason of any claim that the land described herein may not constitute a lawfully created parcel according to the Subdivision Map Act (Section 66410 et seq. of the California Government Code) and local ordinances adopted pursuant thereto, the city/county of Fresno may require one or more of the following prior to issuance of permits for development of the land:
    a. A certificate of compliance recorded in the public records.
    b. Filing of a final map or parcel map.
    c. A waiver of a final map or parcel map.

45. Rights of parties in possession.

INFORMATIONAL NOTES

1. Taxes for proration purposes only for the fiscal year 2005-2006.

First Installment:	$3,057.35, PAID
Second Installment:	$3,057.35, PAID
Tax Rate Area:	140-006
APN:	027-060-78S, AFFECTS THIS AND OTHER PROPERTY

2. According to the latest available equalized assessment roll in the office of the county tax assessor, there is located on the land a(n) Commercial Structure known as 43649 West Panoche Road, Firebaugh, California.

3. According to the public records, there has been no conveyance of the land within a period of twenty four months prior to the date of this report, except as follows:

   A document recorded March 24, 2006 as Instrument No. 2006-0061258 of Official Records.

From:	Barry Baker and Byron Baker, as Co-trustees of the Sharla M. Baker Trust utd June 13, 1978
To:	Pao Investments LLC, a California limited liability company

4. This preliminary report/commitment was prepared based upon an application for a policy of title insurance that identified land by street address or assessor's parcel number only. It is the responsibility of the applicant to determine whether the land referred to herein is in fact the land that is to be described in the policy or policies to be issued.

5. Should this report be used to facilitate your transaction, we must be provided with the following prior to the issuance of the policy:

   A. WITH RESPECT TO A CORPORATION:

      a. A certificate of good standing of recent date issued by the Secretary of State of the corporation's state of domicile.

      b. A certificate copy of a resolution of the Board of Directors authorizing the contemplated transaction and designating which corporate officers shall have the power to execute on behalf of the corporation.

      c. Requirements which the Company may impose following its review of the above material and other information which the Company may require.

   B. WITH RESPECT TO A CALIFORNIA LIMITED PARTNERSHIP:

      a. A certified copy of the certificate of limited partnership (form LP-1) and any amendments thereto (form LP-2) to be recorded in the public records;

b. A full copy of the partnership agreement and any amendments;

c. Satisfactory evidence of the consent of a majority in interest of the limited partners to the contemplated transaction;

d. Requirements which the Company may impose following its review of the above material and other information which the Company may require.

C. WITH RESPECT TO A FOREIGN LIMITED PARTNERSHIP:

a. A certified copy of the application for registration, foreign limited partnership (form LP-5) and any amendments thereto (form LP-6) to be recorded in the public records;

b. A full copy of the partnership agreement and any amendment;

c. Satisfactory evidence of the consent of a majority in interest of the limited partners to the contemplated transaction;

d. Requirements which the Company may impose following its review of the above material and other information which the Company may require.

D. WITH RESPECT TO A GENERAL PARTNERSHIP:

a. A certified copy of a statement of partnership authority pursuant to Section 16303 of the California Corporation Code (form GP-I), executed by at least two partners, and a certified copy of any amendments to such statement (form GP-7), to be recorded in the public records;

b. A full copy of the partnership agreement and any amendments;

c. Requirements which the Company may impose following its review of the above material required herein and other information which the Company may require.

E. WITH RESPECT TO A LIMITED LIABILITY COMPANY:

a. A copy of its operating agreement and any amendments thereto;

b. If it is a California limited liability company, a certified copy of its articles of organization (LLC-1) and any certificate of correction (LLC-11), certificate of amendment (LLC-2), or restatement of articles of organization (LLC-10) to be recorded in the public records;

c. If it is a foreign limited liability company, a certified copy of its application for registration (LLC-5) to be recorded in the public records;

d. With respect to any deed, deed of trust, lease, subordination agreement or other document or instrument executed by such limited liability company and presented for recordation by the Company or upon which the Company is asked to rely, such document or instrument must be executed in accordance with one of the following, as appropriate:

(i) If the limited liability company properly operates through officers appointed or elected pursuant to the terms of a written operating agreement, such documents must be executed by at least two duly elected or appointed officers, as follows: the chairman of the board, the president or any vice president, and any secretary, assistant secretary, the chief financial officer or any assistant treasurer;

(ii) If the limited liability company properly operates through a manager or managers identified in the articles of organization and/or duly elected pursuant to the terms of a written operating agreement, such document must be executed by at least two such managers or by one manager if the limited liability company properly operates with the existence of only one manager.

e. Requirements which the Company may impose following its review of the above material and other information which the Company may require.

F. WITH RESPECT TO A TRUST:

a. A certification pursuant to Section 18500.5 of the California Probate Code in a form satisfactory to the Company.

b. Copies of those excerpts from the original trust documents and amendments thereto which designate the trustee and confer upon the trustee the power to act in the pending transaction.

c. Other requirements which the Company may impose following its review of the material require herein and other information which the Company may require.

G. WITH RESPECT TO INDIVIDUALS:

a. A statement of information.

The map attached, if any, may or may not be a survey of the land depicted hereon. First American expressly disclaims any liability for loss or damage which may result from reliance on this map except to the extent coverage for such loss or damage is expressly provided by the terms and provisions of the title insurance policy, if any, to which this map is attached.

LEGAL DESCRIPTION

Real property in the unincorporated area of the County of Fresno, State of California, described as follows:

BEING A PORTION OF THE SOUTHWEST QUARTER OF SECTION 5, TOWNSHIP 15 SOUTH, RANGE 13 EAST; MOUNT DIABLO BASE AND MERIDIAN, IN THE COUNTY OF FRESNO, STATE OF CALIFORNIA, LYING SOUTH OF THE SOUTHERLY RIGHT-OF-WAY LINE OF PANOCHE ROAD AND EAST OF THAT CERTAIN PARCEL OF LAND DESCRIBED IN THE DEED FROM B.E. MONTGOMERY AND WIFE TO PACIFIC GAS AND ELECTRIC COMPANY DATED NOVEMBER 17, 1948 AND RECORDED IN BOOK 2689 AT PAGE 410, OFFICIAL RECORDS FRESNO COUNTY, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:
COMMENCING AT THE SOUTHWEST CORNER OF SAID SECTION 5; THENCE NORTH 00°21 '06" EAST ALONG THE WEST LINE OF SAID SECTION 5 A DISTANCE OF 1760.25 FEET TO A POINT ON THE SAID SOUTHERLY RIGHT-OF-WAY LINE OF PANOCHE ROAD (80 FEET WIDE); THENCE NORTH 64°43'53" EAST ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE A DISTANCE OF 69.62 FEET TO THE BEGINNING OF A CURVE CONCAVE TO THE NORTHWEST HAVING A RADIUS OF 56,540.00 FEET; THENCE NORTHEASTERLY 509.96 FEET ALONG SAID CURVE AND SOUTHERLY RIGHT-OF-WAY LINE THROUGH A CENTRAL ANGLE OF 00°31 '07" TO THE BEGINNING OF A TANGENT LINE; THENCE NORTH 64°13'59" EAST ALONG SAID SOUTHERLY RIGHT-OF- WAY LINE A DISTANCE OF 1077.76 FEET TO THE NORTHEASTERLY CORNER OF SAID LAND AS DESCRIBED PER DEED TO PACIFIC GAS AND ELECTRIC COMPANY; SAID POINT ALSO BEING THE TRUE POINT OF BEGINNING; THENCE THE FOLLOWING COURSES:
1) NORTH 6493'59" EAST CONTINUING ALONG SAID SOUTHERLY RIGHT-OF-WAY LINE A DISTANCE OF 65.30 FEET;
2) SOUTH 26°27'26" EAST LEAVING SAID SOUTHERLY RIGHT-OF-WAY LINE A DISTANCE OF 150.79 FEET;
3) NORTH 64°17'53" EAST A DISTANCE OF 199.83 FEET;
4) SOUTH 26°09'22" EAST A DISTANCE OF 57.00 FEET;
5) NORTH 64°13'59" EAST A DISTANCE OF 341.73 FEET;
6) SOUTH 25°46'01" EAST A DISTANCE OF 358.02 FEET;
7) SOUTH 50°21'56" WEST A DISTANCE OF 187.78 FEET;
8) SOUTH 46°38'42" WEST A DISTANCE OF 304.95 FEET TO THE SOUTHEASTERLY CORNER OF SAID LAND AS DESCRIBED PER DEED TO PACIFIC GAS AND ELECTRIC COMPANY;
9) NORTH 36°43'OS" WEST ALONG THE EASTERLY LINE OF SAID LAND AS DESCRIBED PER DEED TO PACIFIC
GAS AND ELECTRIC COMPANY A DISTANCE OF 716.22 FEET TO THE NORTHEASTERLY CORNER OF SAID DEED TO PACIFIC GAS AND ELECTRIC COMPANY AND TRUE POINT OF BEGINNING

EXCEPT FROM THE SOUTHWEST QUARTER, 54% INTEREST IN AND TO ALL OIL, GAS AND MINERALS, AS HERETOFORE RESERVED OF RECORD.

ALSO EXCEPT FROM THE SOUTH HALF OF THE NORTHWEST QUARTER, AN UNDIVIDED 56% INTEREST IN AND TO ALL OIL, GAS AND MINERALS, AS HERETOFORE RESERVED OF RECORD.

ALSO EXCEPT THEREFROM AN UNDIVIDED ONE-HALF
INTEREST IN AND TO ALL OIL, GAS AND MINERALS, AS RESERVED IN THE DEED FROM GIFFEN, INC., DATED OCTOBER 31, 1974, RECORDED NOVEMBER 20, 1974 IN BOOK 6370, PAGE 143 OF OFFICIAL RECORDS, DOCUMENT NO. 87110.
ALSO EXCEPT THEREFROM ONE-HALF INTEREST IN
AND TO ALL OIL, GAS AND MINERALS, IN AND TO THE FOLLOWING DEEDS:

DEED FROM JAMES W. TELLES AND DIANE TELLES, HUSBAND AND WIFE AS TO AN UNDIVIDED 5.25% INTEREST, RECORDED DECEMBER 3, 1975 IN BOOK 6531, PAGE 705 OF OFFICIAL RECORDS, DOCUMENT NO. 100668, AND RE-RECORDED JANUARY 21, 1976 IN BOOK 6540, PAGE 44 OF OFFICIAL RECORDS, DOCUMENT NO. 5342;
DEED FROM JOHN TELLES, A SINGLE PERSON AS TO AN UNDIVIDED 1.25% INTEREST, RECORDED DECEMBER 3, 1975 IN BOOK 6531, PAGE 712 OF OFFICIAL RECORDS, DOCUMENT NO. 100669, AND RE-RECORDED JANUARY 21, 1976 IN BOOK 6540, PAGE 52 OF OFFICIAL RECORDS, DOCUMENT NO. 5343;
DEED FROM JESS P. TELLES, III AND PATTY R TELLES, HUSBAND AND WIFE AS TO AN UNDIVIDED 5.25% INTEREST, RECORDED DECEMBER 3, 1975 IN BOOK 6531, PAGE 719 OF OFFICIAL RECORDS, DOCUMENT NO. 100670, AND RE-RECORDED JANUARY 21, 1976 IN BOOK 6540, PAGE 36 OF OFFICIAL RECORDS, DOCUMENT NO. 5341;
DEED FROM JOLENE VAJRETTI, A SINGLE PERSON, AS TO AN UNDIVIDED 4% INTEREST, RECORDED JANUARY 15, 1976 IN BOOK 6537, PAGE 516 OF OFFICIAL RECORDS, DOCUMENT NO. 3604;
DEED FROM JOSEPH VAJRETTI AND MARIE VAJRETTI, HUSBAND AND WIFE, AS TO AN UNDIVIDED 8% INTEREST, RECORDED JANUARY 15, 1976 IN BOOK 6537, PAGE 523 OF OFFICIAL RECORDS, DOCUMENT NO. 3605
DEED FROM HELEN B. TELLES, DEALING WITH HER SEPARATE PROPERTY, AS TO AN UNDIVIDED 4% INTEREST, RECORDED JANUARY 15, 1976 IN BOOK 6537, PAGE 530 OF OFFICIAL RECORDS, DOCUMENT NO. 3606;
DEED FROM MANUEL A. SOUZA, JR. AND CECELIA ANN SOUZA, AS TO AN UNDIVIDED 8% INTEREST, RECORDED JANUARY 15, 1976 IN BOOK 6537, PAGE 537 OF OFFICIAL RECORDS, DOCUMENT NO. 3607.

APN: 027-060-78S, AFFECTS THIS AND OTHER PROPERTY

NOTICE

Section 12413.1 of the California Insurance Code, effective January 1, 1990, requires that any title insurance company, underwritten title company, or controlled escrow company handling funds in an escrow or sub-escrow capacity, wait a specified number of days after depositing funds, before recording any documents in connection with the transaction or disbursing funds. This statute allows for funds deposited by wire transfer to be disbursed the same day as deposit. In the case of cashier's checks or certified checks, funds may be disbursed the next day after deposit. In order to avoid unnecessary delays of three to seven days, or more, please use wire transfer, cashier's checks, or certified checks whenever possible.

If you have any questions about the effect of this new law, please contact your local First American Office for more details.

EXHIBIT A
LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS (BY POLICY TYPE)

1. CALIFORNIA LAND TITLE ASSOCIATION STANDARD COVERAGE POLICY - 1990
SCHEDULE B

EXCEPTIONS FROM COVERAGE

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1 Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records. Proceedings by a public agency which may result in taxes or assessments, or notice of such proceedings, whether or not shown by the records of such agency or by the public records.

2 Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of the land or which may be asserted by persons in possession thereof.

3. Easements, liens or encumbrances, or claims thereof, which are not shown by the public records.

4 Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by the public records.

5 (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the public records

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1 (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.

2 Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.

3 Defects, liens, encumbrances, adverse claims or other matters:
(a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
(b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
(c) resulting in no loss or damage to the insured claimant;
(d) attaching or created subsequent to Date of Policy; or
(e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage or for the estate or interest insured by this policy.

4 Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable "doing business" laws of the state in which the land is situated.

5. Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.

6 Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by their policy or the transaction creating the interest of the insured lender, by reason of the operation of federal bankruptcy, state insolvency or similar creditors' rights laws.

2. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY FORM B - 1970
SCHEDULE OF EXCLUSIONS FROM COVERAGE

1 Any law, ordinance or governmental regulation (including but not limited to building and zoning ordinances) restricting or regulating or prohibiting the occupancy, use or enjoyment of the land, or regulating the character, dimensions or location of any improvement now or hereafter erected on the land, or prohibiting a separation in ownership or a reduction in the dimensions of area of the land, or the effect of any violation of any such law, ordinance or governmental regulation.

2 Rights of eminent domain or governmental rights of police power unless notice of the exercise of such rights appears in the public records at Date of Policy.

3 Defects, liens, encumbrances, adverse claims, or other matters (a) created, suffered, assumed or agreed to by the insured claimant; (b) not known to the Company and not shown by the public records but known to the insured claimant either at Date of Policy or at the date such claimant acquired an estate or interest insured by this policy and not disclosed in writing by the insured claimant to the Company prior to the date such insured claimant became an insured hereunder; (c) resulting in no loss or damage to the insured claimant; (d) attaching or

created subsequent to Date of Policy; or (e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the estate or interest insured by this policy

3. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY FORM B - 1970 WITH REGIONAL EXCEPTIONS

When the American Land Title Association policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 2 above are used and the following exceptions to coverage appear in the policy

SCHEDULE B

This policy does not insure against loss or damage by reason of the matters shown in parts one and two following:
Part One

1 Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2 Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3 Easements, claims of easement or encumbrances which are not shown by the public records.
4 Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5 Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
6 Any lien, or right to a lien, for services, labor or material heretofore or hereafter furnished, imposed by law and not shown by the public records

4. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1970 WITH A.L.T.A. ENDORSEMENT FORM 1 COVERAGE SCHEDULE OF EXCLUSIONS FROM COVERAGE

1 Any law, ordinance or governmental regulation (including but not limited to building and zoning ordinances) restricting or regulating or prohibiting the occupancy, use or enjoyment of the land, or regulating the character, dimensions or location of any improvement now or hereafter erected on the land, or prohibiting a separation in ownership or a reduction in the dimensions or area of the land, or the effect of any violation of any such law ordinance or governmental regulation.
2 Rights of eminent domain or governmental rights of police power unless notice of the exercise of such rights appears in the public records at Date of Policy
3 Defects, liens, encumbrances, adverse claims, or other matters (a) created, suffered, assumed or agreed to by the insured claimant, (b) not known to the Company and not shown by the public records but known to the insured claimant either at Date of Policy or at the date such claimant acquired an estate or interest insured by this policy or acquired the insured mortgage and not disclosed in writing by the insured claimant to the Company prior to the date such insured claimant became an insured hereunder, (c) resulting in no loss or damage to the insured claimant; (d) attaching or created subsequent to Date of Policy (except to the extent insurance is afforded herein as to any statutory lien for labor or material or to the extent insurance is afforded herein as to assessments for street improvements under construction or completed at Date of Policy).
4 Unenforceability of the lien of the insured mortgage because of failure of the insured at Date of Policy or of any subsequent owner of the indebtedness to comply with applicable "doing business" laws of the state in which the land is situated

5. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1970 WITH REGIONAL EXCEPTIONS

When the American Land Title Association Lenders Policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy, the exclusions set forth in paragraph 4 above are used and the following exceptions to coverage appear in the policy

SCHEDULE B

This policy does not insure against loss or damage by reason of the matters shown in parts one and two following:
Part One

1 Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2 Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3 Easements, claims of easement or encumbrances which are not shown by the public records.
4 Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5 Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
6 Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records

6. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1992 WITH A.L.T.A. ENDORSEMENT FORM 1 COVERAGE EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1 (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy;
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.

2 Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.

3. Defects, liens, encumbrances, adverse claims, or other matters:
(a) whether or not recorded in the public records at Date of Policy, but created, suffered, assumed or agreed to by the insured claimant;
(b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
(c) resulting in no loss or damage to the insured claimant;
(d) attaching or created subsequent to Date of Policy (except to the extent that this policy insures the priority of the lien of the insured mortgage over any statutory lien for services, labor or material or the extent insurance is afforded herein as to assessments for street improvements under construction or completed at date of policy); or
(e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the insured mortgage.

4 Unenforceability of the lien of the insured mortgage because of the inability or failure of the insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with the applicable "doing business" laws of the state in which the land is situated.

5 Invalidity or unenforceability of the lien of the insured mortgage, or claim thereof, which arises out of the transaction evidenced by the insured mortgage and is based upon usury or any consumer credit protection or truth in lending law.

6. Any statutory lien for services, labor or materials (or the claim of priority of any statutory lien for services, labor or materials over the lien of the insured mortgage) arising from an improvement or work related to the land which is contracted for and commenced subsequent to Date of Policy and is not financed in whole or in part by proceeds of the indebtedness secured by the insured mortgage which at Date of Policy the insured has advanced or is obligated to advance.

7 Any claim, which arises out of the transaction creating the interest of the mortgagee insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
(i) the transaction creating the interest of the insured mortgagee being deemed a fraudulent conveyance or fraudulent transfer; or
(ii) the subordination of the interest of the insured mortgagee as a result of the application of the doctrine of equitable subordination; or
(iii) the transaction creating the interest of the insured mortgagee being deemed a preferential transfer except where the preferential transfer results from the failure:
(a) to timely record the instrument of transfer; or
(b) of such recordation to impart notice to a purchaser for value or a judgment or lien creditor.

7. AMERICAN LAND TITLE ASSOCIATION LOAN POLICY - 1992 WITH REGIONAL EXCEPTIONS

When the American Land Title Association policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 6 above are used and the following exceptions to coverage appear in the policy

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1 Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.

2. Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.

3 Easements, claims of easement or encumbrances which are not shown by the public records

4 Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.

5. Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.

6 Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records

8. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY - 1992

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1 (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the public records at Date of Policy.

2 Rights of eminent domain unless notice of the exercise thereof has been recorded in the public records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without knowledge.

3. Defects, liens, encumbrances, adverse claims, or other matters:
(a) created, suffered, assumed or agreed to by the insured claimant;
(b) not known to the Company, not recorded in the public records at Date of Policy, but known to the insured claimant and not disclosed in writing to the Company by the insured claimant prior to the date the insured claimant became an insured under this policy;
(c) resulting in no loss or damage to the insured claimant;
(d) attaching or created subsequent to Date of Policy; or
(e) resulting in loss or damage which would not have been sustained if the insured claimant had paid value for the estate or interest insured by this policy.

4 Any claim, which arises out of the transaction vesting in the insured the estate or interest insured by this policy, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that is based on:
(i) the transaction creating the estate or interest insured by this policy being deemed a fraudulent conveyance or fraudulent transfer; or
(ii) the transaction creating the estate or interest insured by this policy being deemed a preferential transfer except where the preferential transfer results from the failure:
(a) to timely record the instrument of transfer; or
(b) of such recordation to impart notice to a purchaser for value or a judgment or lien creditor

9. AMERICAN LAND TITLE ASSOCIATION OWNER'S POLICY - 1992
WITH REGIONAL EXCEPTIONS

When the American Land Title Association policy is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 8 above are used and the following exceptions to coverage appear in the policy.

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:
Part One:

1 Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2 Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3 Easements, claims of easement or encumbrances which are not shown by the public records.
4 Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5 Unpatented mining claims; reservations or exceptions in patents or in Acts authorizing the issuance thereof; water rights, claims or title to water.
6 Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records

10. AMERICAN LAND TITLE ASSOCIATION RESIDENTIAL
TITLE INSURANCE POLICY - 1987
EXCLUSIONS

In addition to the Exceptions in Schedule B, you are not insured against loss, costs, attorneys' fees and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation This includes building and zoning ordinances and also laws and regulations concerning:
* land use
* improvements on the land
* land division
* environmental protection

This exclusion does not apply to violations or the enforcement of these matters which appear in the public records at Policy Date
This exclusion does not limit the zoning coverage described in items 12 and 13 of Covered Title Risks

2 The right to take the land by condemning it, unless:
* a notice of exercising the right appears in the public records on the Policy Date
* the taking happened prior to the Policy Date and is binding on you if you bought the land without knowing of the taking.

3. Title Risks:
* that are created, allowed, or agreed to by you
* that are known to you, but not to us, on the Policy Date - unless they appeared in the public records
* that result in no loss to you
* that first affect your title after the Policy Date - this does not limit the labor and material lien coverage in Item 8 of Covered Title Risks

4 Failure to pay value for your title

5 Lack of a right:
* to any land outside the area specifically described and referred to in Item 3 of Schedule A, or
* in streets, alleys, or waterways that touch your land

This exclusion does not limit the access coverage in Item 5 of Covered Title Risks.

11. EAGLE PROTECTION OWNER'S POLICY

CLTA HOMEOWNER'S POLICY OF TITLE INSURANCE - 1998
ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE - 1998

Covered Risks 14 (Subdivision Law Violation). 15 (Building Permit). 16 (Zoning) and 18 (Encroachment of boundary walls or fences) are subject to Deductible Amounts and Maximum Dollar Limits of Liability

EXCLUSIONS

In addition to the Exceptions in Schedule B, you are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1 Governmental police power, and the existence or violation of any law or government regulation This includes ordinances, laws and regulations concerning:

a building	b. zoning
c land use	d. improvements on the land
e land division	f environmental protection

This exclusion does not apply to violations or the enforcement of these matters if notice of the violation or enforcement appears in the Public Records at the Policy Date.
This exclusion does not limit the coverage described in Covered Risk 14, 15, 16, 17 or 24

2 The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes This Exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at the Policy Date

3 The right to take the Land by condemning it, unless:
a. a notice of exercising the right appears in the Public Records at the Policy Date; or
b. the taking happened before the Policy Date and is binding on You if You bought the Land without Knowing of the taking

4. Risks:
a that are created, allowed, or agreed to by You, whether or not they appear in the Public Records;
b that are Known to You at the Policy Date, but not to Us, unless they appear in the Public Records at the Policy Date;
c that result in no loss to You; or
d. that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.d, 22, 23, 24 or 25.

5. Failure to pay value for Your Title

6. Lack of a right:
a to any Land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
b. in streets, alleys, or waterways that touch the Land.

This exclusion does not limit the coverage described in Covered Risk 11 or 18

12. SECOND GENERATION EAGLE LOAN POLICY AMERICAN LAND TITLE ASSOCIATION EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (10/13/01)

EXCLUSIONS FROM COVERAGE

The following matters are expressly excluded from the coverage of this policy and the Company will not pay loss or damage, costs, attorneys' fees or expenses which arise by reason of:

1. (a) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances, or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use, or enjoyment of the Land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the Land; (iii) a separation in ownership or a change in the dimensions or area of the Land or any parcel of which the Land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the Land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14 and 16 of this policy.
(b) Any governmental police power not excluded by (a) above, except to the extent that a notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the Public Records at Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 12, 13, 14 and 16 of this policy.
2. Rights of eminent domain unless notice of the exercise thereof has been recorded in the Public Records at Date of Policy, but not excluding from coverage any taking which has occurred prior to Date of Policy which would be binding on the rights of a purchaser for value without Knowledge.
3. Defects, liens, encumbrances, adverse claims or other matters:
(a) created, suffered, assumed or agreed to by the Insured Claimant;
(b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;
(c) resulting in no loss or damage to the Insured Claimant;
(d) attaching or created subsequent to Date of Policy (this paragraph does not limit the coverage provided under Covered Risks 8, 16, 18, 19, 20, 21, 22, 23, 24, 25 and 26); or
(e) resulting in loss or damage which would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of the Insured at Date of Policy, or the inability or failure of any subsequent owner of the indebtedness, to comply with applicable doing business laws of the state in which the Land is situated.
5. Invalidity or unenforceability of the lien of the Insured Mortgage, or claim thereof, which arises out of the transaction evidenced by the Insured Mortgage and is based upon usury, except as provided in Covered Risk 27, or any consumer credit protection or truth in lending law.
6. Real property taxes or assessments of any governmental authority which become a lien on the Land subsequent to Date of Policy. This exclusion does not limit the coverage provided under Covered Risks 7, 8 (e) and 26.
7. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy This exclusion does not limit the coverage provided in Covered Risk 8
8. Lack of priority of the lien of the Insured Mortgage as to each and every advance made after Date of Policy, and all interest charged thereon, over liens, encumbrances and other matters affecting title, the existence of which are Known to the Insured at:
(a) The time of the advance; or
(b) The time a modification is made to the terms of the Insured Mortgage which changes the rate of interest charged, if the rate of interest is greater as a result of the modification than it would have been before the modification.
This exclusion does not limit the coverage provided in Covered Risk 8
9. The failure of the residential structure, or any portion thereof to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This exclusion does not apply to violations of building codes if notice of the violation appears in the Public Records at Date of Policy.

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:

1 The following existing statutes, reference to which are made part of the ALTA 8.1 Environmental Protection Lien Endorsement incorporated into this Policy following item 28 of Covered Risks: NONE

13. SECOND GENERATION EAGLE LOAN POLICY AMERICAN LAND TITLE ASSOCIATION EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (10/13/01) WITH REGIONAL EXCEPTIONS

When the American Land Title Association loan policy with EAGLE Protection Added is used as a Standard Coverage Policy and not as an Extended Coverage Policy the exclusions set forth in paragraph 12 above are used and the following exceptions to coverage appear in the policy

SCHEDULE B

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) which arise by reason of:
Part One:
1 Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the public records.
2 Any facts, rights, interests, or claims which are not shown by the public records but which could be ascertained by an inspection of said land or by making inquiry of persons in possession thereof.
3 Easements, claims of easement or encumbrances which are not shown by the public records.
4 Discrepancies, conflicts in boundary lines, shortage in area, encroachments, or any other facts which a correct survey would disclose, and which are not shown by public records.
5 Unpatented mining claims; reservations or exceptions in patents or in acts authorizing the issuance thereof; water rights, claims or title to water.
6 Any lien, or right to a lien, for services, labor or material theretofore or hereafter furnished, imposed by law and not shown by the public records.
Part Two:

1 The following existing statutes, reference to which are made part of the ALTA 8 1 Environmental Protection Lien Endorsement incorporated into this Policy following item 28 of Covered Risks: None.

PRIVACY POLICY

We Are Committed to Safeguarding Customer Information

In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information – particularly any personal or financial information. We agree that you have a right to know how we will utilize the personal information you provide to us. Therefore, together with our parent company, The First American Corporation, we have adopted this Privacy Policy to govern the use and handling of your personal information.

Applicability

This Privacy Policy governs our use of the information which you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity. First American has also adopted broader guidelines that govern our use of personal information regardless of its source First American calls these guidelines its *Fair Information Values*, a copy of which can be found on our website at www.firstam.com.

Types of Information

Depending upon which of our services you are utilizing, the types of nonpublic personal information that we may collect include:

- Information we receive from you on applications, forms and in other communications to us, whether in writing, in person, by telephone or any other means;
- Information about your transactions with us, our affiliated companies, or others; and
- Information we receive from a consumer reporting agency.

Use of Information

We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insurers, property and casualty insurers, and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies, and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies, or to other financial institutions with whom we or our affiliated companies have joint marketing agreements.

Former Customers

Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

Confidentiality and Security

We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities who need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy and First American's *Fair Information Values*. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

OFFSITE CONSEQUENCE ANALYSIS

Calculation of Model Parameters for OCA for Accidental Release of Aqueous Ammonia
Starwood Midway Peaking Project

Equation Used to Determine the Emission Rate of Ammonia:

$$\boxed{QR = \frac{0.284U^{0.78} MW^{2/3} A \times VP}{82.05T}}$$

where: QR = emission rate of ammonia (pounds per minute)
U = wind speed (meters per second)
MW = molecular weight of ammonia (grams per gram-mole)
A = surface area of spilled liquid pool (square feet)
VP = vapor pressure of ammonia above solution (millimeters of mercury)
T = temperature of liquid (degrees Kelvin)

	Scenario 1		Scenario 2	
U =	1.5	m/s	1.5	m/s
MW =	17.03	grams/gram-mol	17.03	grams/gram-mol
A =	14.9	ft^2	14.9	ft^2
VP =	606	mm Hg	606	mm Hg
T =	316.59	K	316.59	K

Drain Dimensions

diameter of 2 drains below tanks =	32	inches
diameter of drain below unloading area =	26	inches
Drain hole Area =	14.86	ft^2
=	1.38	m^2
length for modeling =	1.17	m
width for modeling =	1.17	m

Scenario 1
QR = 0.894 lbs ammonia / min 6.758 g ammonia / s

Scenario 2
QR = 0.894 lbs ammonia / min 6.758 g ammonia / s

Equation Used to Determine the Emission Rate Per Area:
(parameter required for dispersion model)

$$E = \frac{QR}{A}$$

where: E = emission rate of ammonia (g / s*m^2)
QR = emission rate of ammonia (g/s)
A = surface area of spilled liquid pool (m^2)

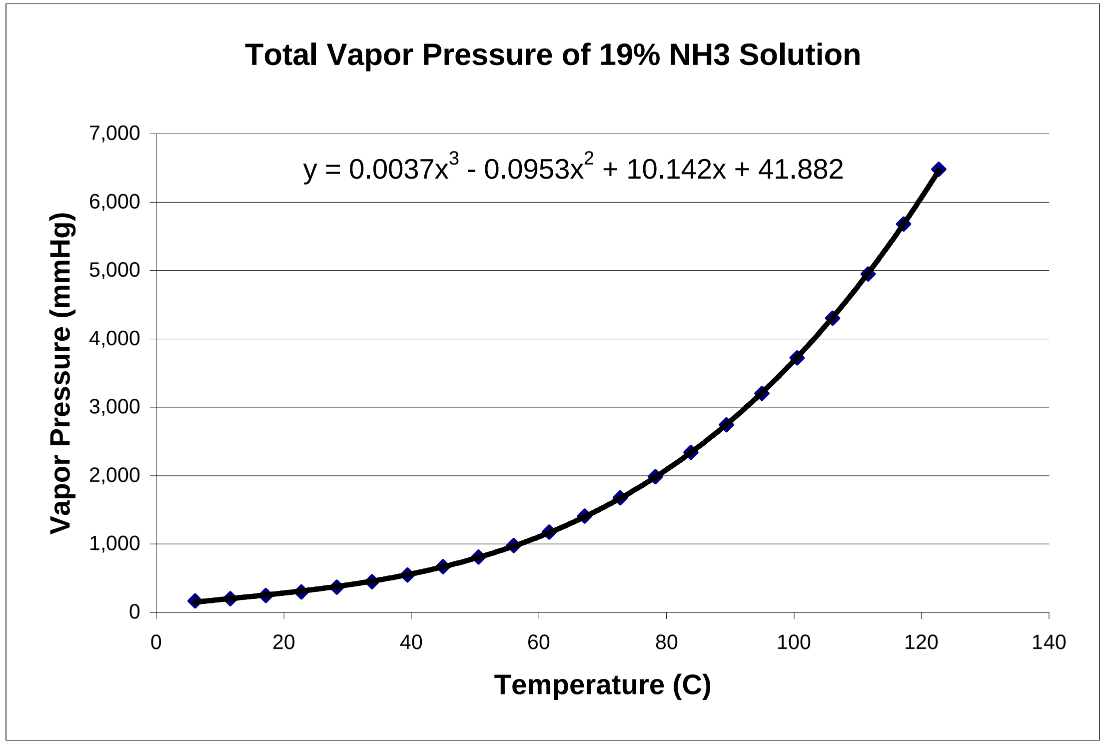
Scenario 1
E = 0.455 g / s*m^2

Scenario 2
E = 0.455 g / s*m^2

Determination of Vapor Pressure above an Aqueous Ammonia Solution

From Perry's Chemical Engineering Handbook
Table 2-24: Total Vapor Pressures of Aqueous Solutions of NH_3
19.1% aqueous solution by wt

Temp deg F	VP (lb/in2)	Temp deg C	VP (mmHg)
40	2.01	4.44	103.95
50	2.67	10.00	138.08
60	3.51	15.56	181.52
70	4.56	21.11	235.82
80	5.85	26.67	302.53
90	7.43	32.22	384.24
100	9.34	37.78	483.02
110	11.64	43.33	601.96
120	14.42	48.89	745.73
130	17.67	54.44	913.80
140	21.49	60.00	1111.35
150	26	65.56	1344.59
160	31.16	71.11	1611.44
170	37.11	76.67	1919.14
180	44.02	82.22	2276.49
190	51.81	87.78	2679.35
200	60.62	93.33	3134.96
210	70.72	98.89	3657.28
220	81.91	104.44	4235.97
230	94.43	110.00	4883.44
240	108.6	115.56	5616.24
250	124.08	121.11	6416.79



For a 19.1% solution of aquesous ammonia, the Vapor pressure, for a given temperature is . . .

Temp deg K	Temp deg F	Temp deg C	According to Perry's **mmHg**
298.15	77	25	294
316.59	110.2	43.4	606

SCREEN3 Model Results

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)	**CONC PPM**
-------	----------	----	----- -	----	------	------	------	
1	2.59E+06	6	1.5	1.5	10000	0	45	3702.86
2	4.34E+06	6	1.5	1.5	10000	0	45	6194.29
10	6.33E+05	6	1.5	1.5	10000	0	45	904.00
20	2.18E+05	6	1.5	1.5	10000	0	40	310.71
27	1.32E+05	6	1.5	1.5	10000	0	39	188.86
30	1.11E+05	6	1.5	1.5	10000	0	43	158.14
40	6.78E+04	6	1.5	1.5	10000	0	45	96.87
50	4.62E+04	6	1.5	1.5	10000	0	31	66.00
60	3.37E+04	6	1.5	1.5	10000	0	44	48.17
70	2.58E+04	6	1.5	1.5	10000	0	31	36.89
80	2.05E+04	6	1.5	1.5	10000	0	31	29.27
90	1.67E+04	6	1.5	1.5	10000	0	38	23.86
100	1.39E+04	6	1.5	1.5	10000	0	33	19.87
150	6873	6	1.5	1.5	10000	0	31	9.82
200	4169	6	1.5	1.5	10000	0	36	5.96
300	2087	6	1.5	1.5	10000	0	32	2.98
400	1278	6	1.5	1.5	10000	0	37	1.83
500	874.2	6	1.5	1.5	10000	0	31	1.25
600	641.1	6	1.5	1.5	10000	0	31	0.92
700	493.3	6	1.5	1.5	10000	0	38	0.70
800	398.4	6	1.5	1.5	10000	0	31	0.57
900	330.1	6	1.5	1.5	10000	0	31	0.47
1000	278.9	6	1.5	1.5	10000	0	31	0.40

INTERPOLATION OF END POINTS

		Lethal	IDLH	CalARP	CEC
Concentration	x	2000	300	200	75
	x1	6194.29	310.71	310.71	96.87
	x2	904.00	188.86	188.86	66.00
Distance	y1	2	20	20	40
	y2	10	27	27	50
	y =	**8.34**	**20.62**	**26.36**	**47.08**

Summary of Results
Starwood Midway Peaking Project

Levels of Concern	Threshold Limit (ppm)	Scenario 1 and 2 Distance to Threshold	
		(meters)	(feet)
Lethal	2000	8.3	27.4
IDLH	300	20.6	67.6
CalARP	200	26.4	86.5
CEC	75	47.1	154.5

	Concentration (ppm)	
Scenario	**Nearest Public Receptor (Wellhead Power Station)**	**Nearest Residence (Agricultural Housing)**
Scenario 1 (spill from failure of storage tank)	188.9	0.9
Scenario 2 (spill from ammonia unloading of tanker truck)	188.9	0.9
Distance from Ammonia storage facility	27 meters	600 meters

11/06/06
15:15:18
*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

Starwood OCA

SIMPLE TERRAIN INPUTS:
SOURCE TYPE = AREA
EMISSION RATE (G/(S-M**2)) = .455000
SOURCE HEIGHT (M) = .0000
LENGTH OF LARGER SIDE (M) = 1.1700
LENGTH OF SMALLER SIDE (M) = 1.1700
RECEPTOR HEIGHT (M) = .0000
URBAN/RURAL OPTION = RURAL
THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

MODEL ESTIMATES DIRECTION TO MAX CONCENTRATION

BUOY. FLUX = .000 M**4/S**3; MOM. FLUX = .000 M**4/S**2.

*** STABILITY CLASS 6 ONLY ***
*** ANEMOMETER HEIGHT WIND SPEED OF 1.50 M/S ONLY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
1.	.2592E+07	6	1.5	1.5	10000.0	.00	45.
100.	.1391E+05	6	1.5	1.5	10000.0	.00	33.
200.	4169.	6	1.5	1.5	10000.0	.00	36.
300.	2087.	6	1.5	1.5	10000.0	.00	32.
400.	1278.	6	1.5	1.5	10000.0	.00	37.
500.	874.2	6	1.5	1.5	10000.0	.00	31.
600.	641.1	6	1.5	1.5	10000.0	.00	31.
700.	493.3	6	1.5	1.5	10000.0	.00	38.
800.	398.4	6	1.5	1.5	10000.0	.00	31.
900.	330.1	6	1.5	1.5	10000.0	.00	31.
1000.	278.9	6	1.5	1.5	10000.0	.00	31.

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 1. M:

2.	.4336E+07	6	1.5	1.5	10000.0	.00	45.

****
*** SCREEN DISCRETE DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	MAX DIR (DEG)
10.	.6328E+06	6	1.5	1.5	10000.0	.00	45.
20.	.2175E+06	6	1.5	1.5	10000.0	.00	40.
27.	.1322E+06	6	1.5	1.5	10000.0	.00	39.
30.	.1107E+06	6	1.5	1.5	10000.0	.00	43.
40.	.6781E+05	6	1.5	1.5	10000.0	.00	45.
50.	.4620E+05	6	1.5	1.5	10000.0	.00	31.
60.	.3372E+05	6	1.5	1.5	10000.0	.00	44.
70.	.2582E+05	6	1.5	1.5	10000.0	.00	31.
80.	.2049E+05	6	1.5	1.5	10000.0	.00	31.
90.	.1670E+05	6	1.5	1.5	10000.0	.00	38.
150.	6873.	6	1.5	1.5	10000.0	.00	31.

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	.4336E+07	2.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

PUBLIC HEALTH

Toxic Air Contaminant Emissions from Each New Swiftpac

Starwood Power Midway Peaking Project

Max Fuel Flow per Turbine (HHV) **311.2** **MMBtu/hr**

Maximum annual hours of operation per turbine **4,000** **hr/yr**

includes startups, warmups, shutdowns and maintenance

Operations Fuel Flow based on the average operation scenario (63°F, 100% load operation scenario)

Pollutant	CAS	Emission Factor (lb/MMBtu)	Emission Factor (lb/MMcf)	Emission factor source	Hourly Emission Rate per Turbine (lb/hr)	Annual Emission Rate per Turbine (lb/yr)	Hourly Emission Rate per Swiftpac (lb/hr)	Annual Emission Rate per Swiftpac (lb/yr)
Ammonia	7664417			max TBACT level	7.3	2.92E+04	14.60	5.84E+04
Acetaldehyde	75070	3.61E-05	0.037	VCAPCD 1995	1.12E-02	4.50E+01	2.25E-02	9.00E+01
Acrolein	107028	8.79E-06	0.009	VCAPCD 1995	2.74E-03	1.09E+01	5.47E-03	2.19E+01
Benzene	71432	1.10E-05	0.0113	VCAPCD 1995	3.43E-03	1.37E+01	6.87E-03	2.75E+01
Ethylbenzene	100414	1.29E-05	0.0132	VCAPCD 1995	4.01E-03	1.60E+01	8.02E-03	3.21E+01
Formaldehyde	50000	9.18E-05	0.094	VCAPCD 1995	2.86E-02	1.14E+02	5.71E-02	2.29E+02
Hexane	110543	1.71E-03	1.75	VCAPCD 1995	5.32E-01	2.13E+03	1.06E+00	4.25E+03
Propylene	115071	1.03E-03	1.0522	VCAPCD 1995	3.20E-01	1.28E+03	6.40E-01	2.56E+03
Toluene	108883	7.09E-05	0.0726	VCAPCD 1995	2.21E-02	8.83E+01	4.41E-02	1.77E+02
Xylenes	1330207	2.82E-05	0.0289	VCAPCD 1995	8.78E-03	3.51E+01	1.76E-02	7.03E+01
PAHs	1151	1.95E-07	0.0002	VCAPCD 1995	6.08E-05	2.43E-01	1.22E-04	4.86E-01
Naphthalene	91203	7.81E-07	0.0008	VCAPCD 1995	2.43E-04	9.73E-01	4.86E-04	1.95E+00

Notes:

a Emission factors obtained from the Ventura County Air Pollution Control District AB2588 Emission Factors for Internal Combustion Turbines 1995. Per the recommendation of Ester Davila SJVAPCD.

b Ammonia emission rate based on an exhaust NH_3 limit of 10 ppmv @ 15% O_2 provided by the turbine vendor.

c Used a HHV of 1024 Btu/scf.

LIST OF PROPERTY OWNERS

Appendix R - Property Owners List

Ownership Information	Pct	Inst #	Date Rec	JT	SD
02706053S					
Narr - SUR RTS 17.88 ACS IN N1/2 SEC 5 T15R1					
Loc - 043405 PANOCHE RD FIREBAU					
VAQUERO FARMS INC		112227	19831201		
2800 W MARCH LN #330 STOCKTON CA 95219					
02706054S					
Narr - SUR RTS 163.53 AC IN N1/2 OF SEC 5 T1					
Site -					
PRUETT GREGORY R ASOPERATION TRUSTEE		179790	19991217		
HYCKE CINDY PRUETT DISPOSITION TRUSTEE		179790	19991217		
PRUETT GREGORY R DISPOSITION TRUSTEE -		179790	19991217		
OF C P HUCKE IRREVOC TR DTD 2-18-97		179790	19991217		
(CR #179790 12-17-99)		064309	19970519		
2800 W MARCH LN #330 STOCKTON CA 95219					
02706056S					
Narr - SUR RTS 120.32 AC IN SECS 5 & 6 T15R1					
Loc - 043946 W PANOCHE RD FIREBA					
FARMERS INTERNATIONAL INC		016911	20040123		
1260 MUIR AVE CHICO CA 95973					
02706061SU					
02706077S					
Narr - SUR RT 64.24 AC IN NE1/4 SEC 5 T15R13					
Site -					
HANSEN ROBERT TRUSTEE -		118104	19900928		
-		000000	19900928		
OF SHARLA BAKER U/T/D 6-13-78		118104	19900928		
% PANOCHE FARMS P O BOX 867					
FIREBAUGH CA 93622					
02706078S					
Narr - SUR RTS 128.49 AC IN W1/2 SEC 5 T15R1					
Loc - 043649 W PANOCHE RD FIREBA					
PAO INVESTMENTS LLC		061258	19060324		
45499 W PANOCHE RD FIREBAUGH CA 93622					
02706079S					
Narr - SUR RT 160 AC SE1/4 SEC 5 T15R13					
Site -					
BAKER BARRY S TRUSTEE		159044	20001228		
MC DOUGAL JUDITH M TRUSTEE -		159044	20001228		
OF J R BAKER T/U/D DTD 11-1-00		159044	20001228		
P O BOX 867 FIREBAUGH CA 93622					