Revised Environmental Assessment/ Final Environmental Impact Report for the Downtown San Bernardino Passenger Rail Project

APPENDICES A–D

State Clearinghouse No. 2011051024

Federal Transit Administration

San Bernardino Associated Governments

August 2012

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NOTICE OF PREPARATION

Governments SANBAG Working Together

San Bernardino Associated Governments

1170 W. 3rd Street, 2nd Fl, San Bernardino, CA 92410
Phone: (909) 884-8276 Fax: (909) 885-4407
Web: www.sanbag.ca.gov

TRANSPORTATION MEASURE I

•San Bernardino County Transportation Commission •San Bernardino County Transportation Authority
•San Bernardino County Congestion Management Agency •Service Authority for Freeway Emergencies

Notice of Preparation

May 9, 2011

To: Agencies, Organizations, and Interested Parties

From: Mitchell A. Alderman, P.E.
Director of Transit & Rail Programs
SANBAG
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92410-1715

Subject: Notice of Preparation of a Draft Environmental Impact Report/Environmental Assessment for the Downtown San Bernardino Passenger Rail Project

Project Title: Downtown San Bernardino Passenger Rail Project

San Bernardino Associated Governments (SANBAG) is the Lead Agency for preparation of an Environmental Impact Report (EIR) in accordance with the California Environmental Quality Act (CEQA). The EIR's purpose is to identify the significant effects on the environment of a project, to identify alternatives to the project, and to indicate the manner in which those significant effects can be mitigated or avoided. The EIR addresses the environmental issues associated with the proposed Downtown San Bernardino Passenger Rail Project (proposed project). In accordance with the National Environmental Policy Act (NEPA), an Environmental Assessment (EA) will be prepared as a joint document with the EIR. The Federal Transit Administration (FTA) is the Lead Agency for the NEPA process.

The purpose of this Notice of Preparation (NOP) is to notify agencies, organizations, and individuals that SANBAG plans to prepare a Draft EIR and to request input on the environmental analysis to be performed. From public agencies, we are requesting comments on the scope and content of the environmental information, which is germane to each agency's statutory responsibilities with regard to the proposed project. We are also requesting interested individuals' or organizations' views on the scope of the environmental document.

No Initial Study Checklist has been prepared for the proposed project. Based on a preliminary review of the project site and in consideration of the proposed project activities, SANBAG has determined that potentially significant impacts related to aesthetics, air quality/greenhouse gases, biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, and transportation/circulation may occur as a result of project implementation. In this instance, because the Lead Agency has decided to prepare an EIR, preparation of an Initial Study is not required by CEQA. SANBAG will prepare a Draft EIR as authorized by Section 15060(d) of the State CEQA Guidelines. The FTA is preparing an EA in accordance with NEPA and FTA Procedures for Environmental Impact and Procedures.

Scoping Meeting:

The 30-day scoping period for this project begins on Monday, May 9, 2011 and ends on Friday, June 10, 2011. Please provide your scoping comments no later than Friday, June 10, 2011.

The scoping meeting for the Downtown San Bernardino Passenger Rail Project will be held on:

- Tuesday, May 17, 2011. 5:00 – 7:00 PM. Santa Fe Depot (1170 W. 3rd Street, 1st Floor, San Bernardino, CA 92410-1715)

Project Location and Environmental Setting:

The proposed project would extend Metrolink service from the existing San Bernardino Metrolink Station/Santa Fe Depot located at 1170 West Third Street to proposed new rail platforms near the southwest corner of Rialto Avenue and E Street in the City of San Bernardino, San Bernardino County, California. The proposed project site is located within the westernmost one mile of the existing Redlands Subdivision Rail Line. The Redlands Subdivision, also known as the Redlands Corridor, is approximately ten miles long and extends from San Bernardino to beyond the University of Redlands in the City of Redlands. The project site and Area of Potential Effects (APE) that will be evaluated in the EIR/EA is limited to areas immediately surrounding the proposed rail alignment and includes an area approximately one mile long that runs the length of the project site.

Project Description:

SANBAG is proposing to extend Metrolink service approximately one mile east from the existing Metrolink Station/Santa Fe Depot to new rail platforms at the southwest corner of Rialto Avenue and E Street in the City of San Bernardino. The Downtown San Bernardino Passenger Rail Project consists of several major components which are listed and briefly described below. The primary components of the proposed project may include double tracking within the project area, the construction of the rail platforms, station amenities, and parking near Rialto Avenue and E Street, grade crossing improvements, railroad signalization, bridge widening, and roadway closures. The project may also involve culvert replacements and extensions, utility replacements and relocations, relocation or closing of monitoring wells and implementation of safety controls.

Project components include:

- Track Improvements. Proposed track improvements include a redesign of the existing single track alignment and the addition of a second track extending from the Shortway segment just west of the San Bernardino Metrolink Station/Santa Fe Depot and terminating at the E Street rail station. The new double-track segment will involve Centralized Traffic Control (CTC). Existing rail and railroad ties will be salvaged as part of the Project.
- San Bernardino Metrolink Station/Santa Fe Depot. An Americans with Disabilities Act (ADA) compliant passenger bridge overcrossing will be constructed at the existing Metrolink Station/Santa Fe Depot. The bridge may be designed in the Mission Revival architectural style. New platforms will also be built north of the Depot building to access the additional rail lines. Parking reconfiguration and installation of new amenities at the station is also proposed.
- E Street Rail Station. The proposed Rialto Avenue/E Street rail station will include the installation of new station platforms, ticket machines, seating areas, lighting, and a parking area.
- Street Improvements[1]:
  - I Street at Rialto Avenue will be converted to a cul-de-sac on the south side. The north leg of the intersection will be converted to a right-in/right-out intersection.
  - The intersection of K Street and Third Street to be reconfigured so that Third Street becomes the west leg of the intersection forming a T-intersection with K Street.
- Grade Crossings. Four existing at-grade crossings are required to be modified or closed in order to accommodate the double-track and corresponding operational characteristics:
  - Third Street, Second Street, Rialto Avenue, and G Street.

[1] The Interstate 215 widening project under construction in 2010-2011 will convert I Street south of Third Street to a cul-de-sac, and is separate from the proposed Project.

- Parcel Acquisitions and Relocations. Acquisition of additional right-of-way is required which will affect fifty-six (56) parcels, including two alley vacations and easements within public streets. Three of the parcels scheduled to be acquired contain active businesses requiring relocation.
- Culvert Replacements, Extensions, and Relocations. Drainage facilities along the rail corridor will require replacement, extension, or relocation.
- Utility Replacement and Relocation. Storm drains, sewer lines, water lines, under drains, railroad signal house, street lights, power poles, fiber optic lines, commercial billboard, and an oil line will require replacement, relocation, or extension.
- Relocation of Monitoring Wells. Groundwater monitoring wells will be required to be abandoned or relocated by others.
- Traffic and Rail Signals. Additional rail and traffic signals will be installed for the corridor based on the final project design.
- Rail Operations. An operating plan has been developed using Rail Traffic Controller (RTC) modeling and operational analysis based on input from SANBAG, Metrolink, Amtrak, and BNSF. Operations are projected to commence in 2014.
- Maintenance. Typical railroad maintenance will be required during the operational phase of the project.

Potential Environmental Effects of the Proposed Project:

The potential environmental effects of the proposed project include, but are not limited to: aesthetics, air quality/greenhouse gases, biological resources, cultural resources, hazards and hazardous materials, hydrology and water quality, land use and planning, noise, and transportation/circulation. These topics will be analyzed in the EIR/EA.

Responses to this Notice of Preparation:

This NOP is being circulated pursuant to California Public Resource Code Section 21153(a) and the State CEQA Guidelines, Section 1508. Public agencies and the public are invited to comment on the proposed scope and content of the environmental information to be included in the EIR/EA. A 30-day comment period is provided to return written comments to SANBAG. Written responses and comments will be accepted until Friday, June 10, 2011. Please include the name of the project in the subject heading. Please also provide the name of a contact person in your organization, if applicable.

Please send written comments to:

Mitchell A. Alderman, P.E.
Director of Transit & Rail Programs
SANBAG
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92410-1715.

Your comments may also be sent by e-mail to malderman@sanbag.ca.gov.

Project Applicant:

Per Section 15367 of the State CEQA Guidelines, a Lead Agency is defined as "the public agency which has the principal responsibility for carrying out or approving a project." In the case of the proposed Project, the Lead Agency is SANBAG for compliance with CEQA. FTA is the Lead Agency for compliance with NEPA.

Signature: Mitchell A. Alderman Date: 5/5/11

Title: Director of Transit & Rail Programs
Telephone: (909) 884-8276

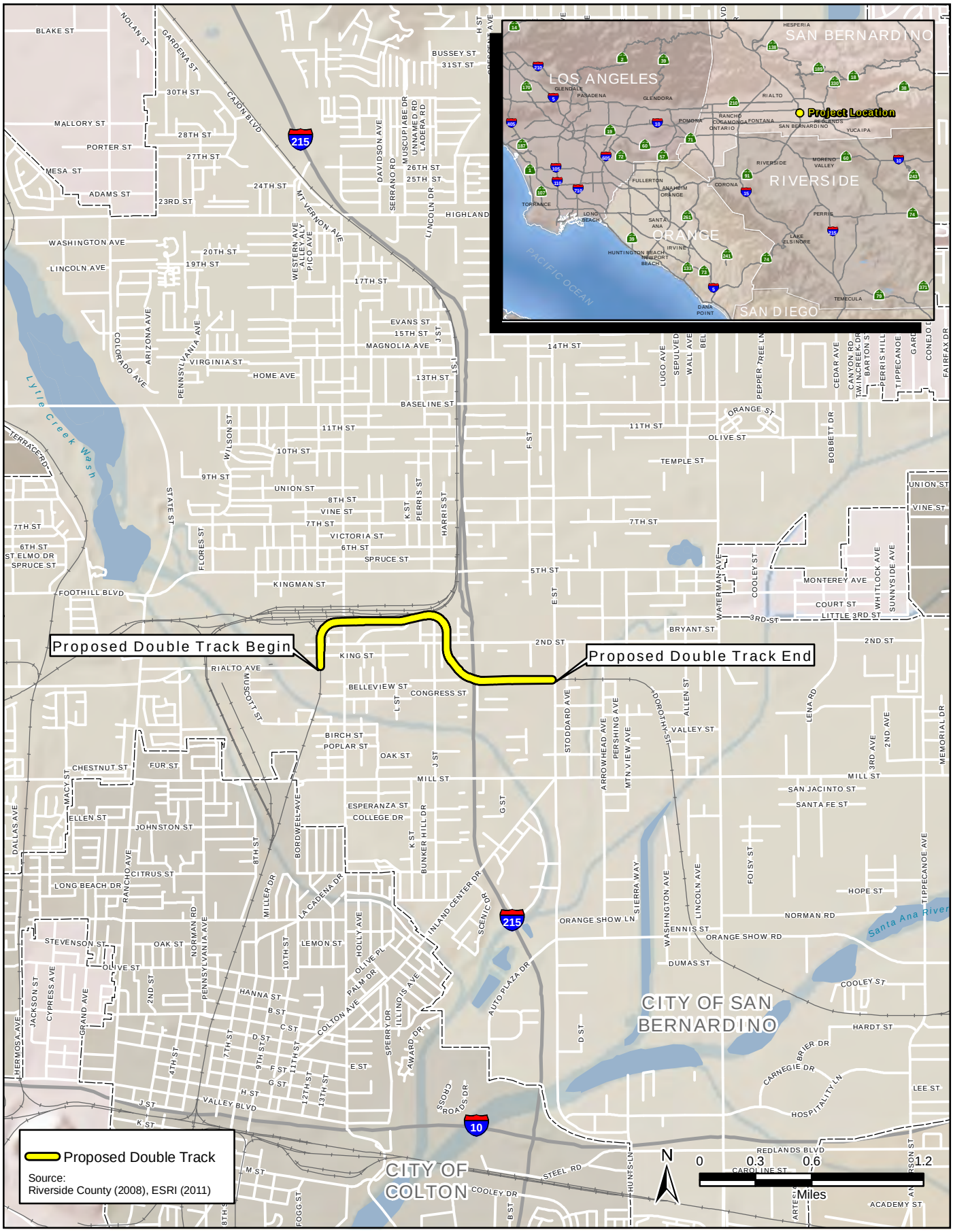
References:

California Environmental Quality Act
1970. CEQA Statute, California Public Resources Code § 21000 et seq.

Federal Highway Administration and Federal Transit Administration
2009. Environmental Impact and Related Procedures, 23 CFR Part 771.

National Environmental Policy Act
1966. NEPA, Section 4(f) of the U.S. Department of Transportation Act (49 USC 303).

SANBAG
2007. Redlands Passenger Rail Station Area Plans.
2003. Redlands Rail Feasibility Study.



Regional Location Map
Downtown San Bernardino Passenger Rail Project

DISTRIBUTION LIST

State Clearinghouse
P.O. Box 3044
Sacramento, CA 95812-3044

Terry Roberts
California State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95812-3044

Clerk of the Board
County of San Bernardino
385 N. Arrowhead Ave., 2nd floor
San Bernardino, CA 92415-0130
Attn: Clerk of the Board

Southern California Association of
Governments, Inland Office
3600 Lime Street, Suite 216
Riverside, CA 92501

Southern California Regional Rail Authority
Metrolink
700 S Flower St, Suite 2600
Los Angeles, CA 90017

Omnitrans
1700 West Fifth Street
San Bernardino, CA 92411

U.S. Department of Transportation
Federal Transit Administration
Region IX
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

BNSF Railway Company
Attention: Robert E. Brendza
Director Industrial Development
740 East Carnegie Drive
San Bernardino, CA 92408

City of Colton
Development Department
Planning Division
659 N La Cadena Drive
Colton CA 92324

U.S. Department of Transportation
Federal Transit Administration
Region IX, Los Angeles Office
888 S Figueroa, Suite 1850
Los Angeles, CA 90017

Union Pacific Railroad
1400 Douglas Street
Omaha, NE 68179

City of Colton, Public Works Department
Engineering Division
650 N. La Cadena Drive
Colton, CA 92324

City of San Bernardino
Community Development
Division of Planning
300 N. "D" Street - 3rd Floor
San Bernardino, CA 92418

Amtrak Corporate Headquarters
60 Massachusetts Ave NE
Washington, DC 20002-4285

University of Redlands
Office of Facilities Planning &
Management 1200 East Colton Ave
P.O. Box 3080
Redlands, CA, 92373

City of Redlands
Development Services Department
35 Cajon Street
Redlands, CA 92373

County of San Bernardino
Economic Development Agency
San Bernardino County Government Center
385 North Arrowhead Ave, 2nd floor
San Bernardino, CA 92415-0043

California State University, San Bernardino
Capital Planning, Design and Construction
5500 University Parkway
San Bernardino, CA 92407-2393

City of Loma Linda
Community Development
Planning Division
25541 Barton Road
Loma Linda, CA 92354

County of San Bernardino
Redevelopment Agency
San Bernardino County Government Center
385 North Arrowhead Ave, 2nd floor
San Bernardino, CA 92415-0043

California Public Utilities Commission
Los Angeles Office
320 West 4th Street, Ste. 500
Los Angeles, CA 90013

California Department of Transportation
CALTRANS District #8
Office of Forecasting/IGR/CEQA Review
464 W. Fourth Street, 6th Floor MS 726
San Bernardino, CA 92401-1400

County of San Bernardino
Community Development Division
San Bernardino County Government Center
385 North Arrowhead Ave, 2nd floor
San Bernardino, CA 92415-0043

California Energy Commission
1516 Ninth St., Mail Stop 29
Sacramento, CA 95814-5504

U.S. Department of Transportation
Federal Railroad Administration
Region 7
801 I Street - Suite 466
Sacramento, CA 95814

South Coast Air Quality Management District
CEQA Section
Attn: Steve Smith
21865 Copley Dr
Diamond Bar, CA 91765

California Air Resources Board
1001 I Street
P. O. Box 2815
Sacramento, CA 95812

Honorable Mayor Patrick J. Morris
City of San Bernardino
300 North D Street
San Bernardino, CA 92418-0001

County of San Bernardino
Flood Control
825 East Third Street
San Bernardino, CA 92415

California Dept. of Toxic Substance
Control
Attn: Ken Chiang
9211 Oakdale Avenue
Chatsworth, CA 91311-6505

Eastern Information Center
Department of Anthropology
University of California
Riverside, CA 92521-0418

Dave Singleton
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

Superintendent
San Bernardino Unified School District
777 North "F" Street
San Bernardino, CA 92410

California Department of Fish and Game
Inland Desert/Eastern Sierra Region
Attn: Leslie MacNair
3602 Inland Empire Blvd., Suite C-220
Ontario, CA 91764

U. S. Army Corps of Engineers
L.A. District – Environment & Planning
911 Wilshire Boulevard, 14th Floor
Los Angeles, CA 90017

City of San Bernardino
Public Works Division.
300 N. "D" Street, 5th Floor
San Bernardino, CA 92418

Regional Water Quality Control Board #8
CEQA Review
Santa Ana Basin Region
3737 Main Street, Suite 500
Riverside, CA 92501-3348

US Fish and Wildlife Services
Attn; CEQA Reviewer
6010 Hidden Valley Road
Carlsbad, CA 92011

San Bernardino Valley Municipal Water District
ATTN: Randy Van Gelder
380 E. Vanderbilt Way
San Bernardino, CA 92408-2725

Reference Librarian
San Bernardino County Library
Loma Linda Branch
25581 Barton Road
Loma Linda, CA 92354

Reference Librarian
San Bernardino Public Library
555 West 6th Street
San Bernardino, CA 92410

University of Redlands
Armacost Library
1249 E. Colton Ave.
Redlands, CA 92373

US Environmental Protection Agency
Office of Federal Activities
EIS/EA Filing Section, Mail Code 2252-A
Ariel Rios Building (South Oval Lobby)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

NOP list
5/6/2011
by DCL

PUBLIC REVIEW COMMENTS

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

JERRY BROWN
GOVERNOR

RECEIVED
MAY 13 2011
SAN BERNARDINO ASSOCIATED GOV

Notice of Preparation

May 10, 2011

To: Reviewing Agencies

Re: Downtown San Bernardino Passenger Rail Project
SCH# 2011051024

Attached for your review and comment is the Notice of Preparation (NOP) for the Downtown San Bernardino Passenger Rail Project draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Mitchell A. Alderman, P.E.
San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92410-1715

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at [illegible]

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# 2011051024
Project Title Downtown San Bernardino Passenger Rail Project
Lead Agency San Bernardino Associated Governments

Type NOP Notice of Preparation

Description SANBAG is proposing to extend Metrolink service approximately one mile east from the existing San Bernardino Metrolink Station/Santa Fe Depot to the proposed San Bernardino Transit Center in downtown San Bernardino, California. The Downtown San Bernardino Passenger Rail Project consists of several major components, including double-tracking the existing rail corridor (westernmost one mile of the redlands branchline), construction of rail platforms, station amenities, parking lot near the transit center, grade crossing improvements and closures, railroad signalization, and roadway improvements. Other improvements include darinage facility improvements, replacements, and extensions, utility replacements/relocations, and implementation of safety controls.

Lead Agency Contact

Name Mitchell A. Alderman, P.E.
Agency San Bernardino Associated Governments
Phone 909 884-8276 **Fax**
email
Address 1170 W. 3rd Street, 2nd Floor
City San Bernardino **State** CA **Zip** 92410-1715

Project Location

County San Bernardino
City San Bernardino
Region
Cross Streets Third Street to Rialto Avenue and E Street
Lat / Long 34° N / 117° W
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways I-215
Airports
Railways BNSF/Metrolink
Waterways Lytle Creek, Santa Ana River
Schools Richardson Middle
Land Use General Plan: Industrial, Commercial General; Zoned: Commercial General (CG), CG-1, CG-2, Industrial Heavy, Industrial Light.

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Noise; Toxic/Hazardous; Traffic/Circulation; Water Quality; Landuse; Cumulative Effects; Other Issues

Reviewing Agencies Resources Agency; Office of Historic Preservation; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Game, Region 6; Native American Heritage Commission; Public Utilities Commission; California Highway Patrol; Caltrans, District 8; Air Resources Board, Transportation Projects; Department of Toxic Substances Control; Regional Water Quality Control Board, Region 8

Date Received 05/10/2011 **Start of Review** 05/10/2011 **End of Review** 06/08/2011

Note: Blanks in data fields result from insufficient information provided by lead agency.

County: San Bernardino SCH#

Resources Agency

- [x] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Mike Sotelo
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Gerald R. Zimmerman
- [ ] **Dept. of Conservation**
  Rebecca Salazar
- [ ] **California Energy Commission**
  Eric Knight
- [ ] **Cal Fire**
  Allen Robertson
- [ ] **Central Valley Flood Protection Board**
  James Herota
- [x] **Office of Historic Preservation**
  Ron Parsons
- [x] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [x] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou
- [ ] _____
  Conservancy

Fish and Game

- [ ] **Depart. of Fish & Game**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Game Region 1**
  Donald Koch
- [ ] **Fish & Game Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Game Region 2**
  Jeff Drongesen
- [ ] **Fish & Game Region 3**
  Charles Armor
- [ ] **Fish & Game Region 4**
  Julie Vance
- [ ] **Fish & Game Region 5**
  Don Chadwick
  Habitat Conservation Program
- [x] **Fish & Game Region 6**
  Gabrina Gatchel
  Habitat Conservation Program
- [ ] **Fish & Game Region 6 I/M**
  Brad Henderson
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Game M**
  George Isaac
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Steve Shaffer
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Anna Garbeff
  Environmental Services Section
- [ ] **Dept. of Public Health**
  Bridgette Binning
  Dept. of Health/Drinking Water

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Linda Flack
- [ ] **Cal EMA (Emergency Management Agency)**
  Dennis Castrillo
- [ ] **Governor's Office of Planning & Research**
  State Clearinghouse
- [x] **Native American Heritage Comm.**
  Debbie Treadway
- [x] **Public Utilities Commission**
  Leo Wong
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [ ] **State Lands Commission**
  Marina Brand
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Business, Trans & Housing

- [ ] **Caltrans - Division of Aeronautics**
  Philip Crimmins
- [ ] **Caltrans - Planning**
  Terri Pencovic
- [x] **California Highway Patrol**
  Scott Loetscher
  Office of Special Projects
- [ ] **Housing & Community Development**
  CEQA Coordinator
  Housing Policy Division

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Bruce de Terra
- [ ] **Caltrans, District 4**
  Lisa Carboni
- [ ] **Caltrans, District 5**
  David Murray
- [ ] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Elmer Alvarez
- [x] **Caltrans, District 8**
  Dan Kopulsky
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Jacob Armstrong
- [ ] **Caltrans, District 12**
  Chris Herre

Cal EPA

Air Resources Board

- [ ] Airport Projects
  Jim Lerner
- [x] Transportation Projects
  Douglas Ito
- [ ] Industrial Projects
  Mike Tollstrup
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Steven Herrera
  Division of Water Rights
- [x] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [x] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____

Last Updated on 01/10/11

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

RECEIVED
MAY 31 2011
SAN BERNARDINO ASSOCIATED GOVTS

May 25, 2011

Mr. Mitchell A. Alderman, P.E., Director of Transit and Rail Program
San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92410-1715

Re: SCH#2011051024; CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the: **"Downtown San Bernardino Passenger Rail Project;"** located in the City of San Bernardino; San Bernardino County, California

Dear Mr. Alderman:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources. The NAHC wishes to comment on the above-referenced proposed Project.

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and interested Native American individuals as 'consulting parties' under both state and federal law. State law also addresses the freedom of Native American Religious Expression in Public Resources Code §5097.9.

The California Environmental Quality Act (CEQA – CA Public Resources Code 21000-21177, amendments effective 3/18/2010) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the CEQA Guidelines defines a significant impact on the environment as 'a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE), and if so, to mitigate that effect. The NAHC Sacred Lands File (SLF) search resulted in; **Native American cultural resources were not identified** within the 'area of potential effect (APE), based on the USGS coordinates of the project location provided. However, there are Native American cultural resources in close proximity to the APE. The NAHC "Sacred Sites,' as defined by the Native American Heritage Commission and the California Legislature in California Public Resources Code §§5097.94(a) and 5097.96. Items in the NAHC Sacred Lands Inventory are confidential and exempt from the Public Records Act pursuant to California Government Code §6254.10.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries of cultural resources or burial sites once a project is underway. Culturally affiliated tribes and individuals may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We strongly urge that you make contact with the list of Native American Contacts on the attached list of Native American contacts, to see if your proposed project might impact Native American cultural resources and to

obtain their recommendations concerning the proposed project. Pursuant to C"A Public Resources Code § 5097.95, the NAHC requests that the Native American consulting parties be provided pertinent project information. Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). Pursuant to CA Public Resources Code §5097.95, the NAHC requests that pertinent project information be provided consulting tribal parties. The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and Section 2183.2 that requires documentation, data recovery of cultural resources.

Furthermore we recommend, also, that you contact the California Historic Resources Information System (CHRIS) California Office of Historic Preservation for pertinent archaeological data within or near the APE, at (916) 445-7000 for the nearest Information Center in order to learn what archaeological fixtures may have been recorded in the APE.

Consultation with tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C 4321-43351) and Section 106 and 4(f) of federal NHPA (16 U.S.C. 470 *et seq*), 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq.* and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation.

Furthermore, Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery'.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. Regarding tribal consultation, a relationship built around regular meetings and informal involvement with local tribes will lead to more qualitative consultation tribal input on specific projects.

The response to this search for Native American cultural resources is conducted in the NAHC Sacred Lands Inventory, established by the California Legislature (CA Public Resources Code 5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code 6254.10) although Native Americans on the attached contact list may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of he NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places and there may be sites within the APE eligible for listing on the California Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APEs and possibility threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,

Dave Singleton
Program Analyst

Cc: State Clearinghouse

Attachment: Native American Contact List

Native American Contact List
San Bernardino County
May 25, 2011

Pechanga Band of Mission Indians
Paul Macarro, Cultural Resource Center
P.O. Box 1477 Luiseno
Temecula , CA 92593
(951) 770-8100
pmacarro@pechanga-nsn.gov
(951) 506-9491 Fax

Gabrielino Tongva Nation
Sam Dunlap, Chairperson
P.O. Box 86908 Gabrielino Tongva
Los Angeles , CA 90086
samdunlap@earthlink.net
(909) 262-9351 - cell

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairman
P.O. Box 391670 Cahuilla
Anza , CA 92539
admin@ramonatribe.com
(951) 763-4105
(951) 763-4325 Fax

Morongo Band of Mission Indians
Michael Contreras, Cultural Heritage Prog.
12700 Pumarra Road Cahuilla
Banning , CA 92220 Serrano
(951) 201-1866 - cell
mcontreras@morongo-nsn.gov
(951) 922-0105 Fax

San Manuel Band of Mission Indians
James Ramos, Chairperson
26569 Community Center Drive Serrano
Highland , CA 92346
(909) 864-8933
(909) 864-3724 - FAX
(909) 864-3370 Fax

San Manuel Band of Mission Indians
Ann Brierty, Policy/Cultural Resources Departmen
26569 Community Center. Drive Serrano
Highland , CA 92346
(909) 864-8933, Ext 3250
abrierty@sanmanuel-nsn.gov
(909) 862-5152 Fax

Gabrieleno/Tongva San Gabriel Band of Mission
Anthony Morales, Chairperson
PO Box 693 Gabrielino Tongva
San Gabriel , CA 91778
GTTribalcouncil@aol.com
(626) 286-1632
(626) 286-1758 - Home
(626) 286-1262 -FAX

Serrano Nation of Indians
Goldie Walker
P.O. Box 343 Serrano
Patton , CA 92369
(909) 862-9883

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2011051024; CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the Downtown San Bernardino Passenger "Rail Project; San Bernardino County, California.

Native American Contact List
San Bernardino County
May 25, 2011

Ernest H. Siva
Morongo Band of Mission Indians Tribal Elder
9570 Mias Canyon Road Serrano
Banning , CA 92220 Cahuilla
siva@dishmail.com
(951) 849-4676

SOBOBA BAND OF LUISENO INDIANS
Joseph Ontiveros, Cultural Resource Department
P.O. BOX 487 Luiseno
San Jacinto , CA 92581
jontiveros@soboba-nsn.gov
(951) 663-5279
(951) 654-5544, ext 4137

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH#2011051024; CEQA Notice of Preparation (NOP); draft Environmental Impact Report (DEIR) for the Downtown San Bernardino Passenger "Rail Project; San Bernardino County, California.

STATE OF CALIFORNIA

EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
320 WEST 4TH STREET, SUITE 500
LOS ANGELES, CA 90013

RECEIVED
JUN - 6 2011
SAN BERNARDINO
ASSOCIATED GOVTS

June 3, 2011

Mitchell A. Alderman, P.E.
San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92410

Dear Mr. Alderman:

Re: SCH# 2011051024; Downtown San Bernardino Passenger Rail Project

The California Public Utilities Commission (Commission) has jurisdiction over the safety of highway-rail crossings (crossings) in California. The California Public Utilities Code requires Commission approval for the construction or alteration of crossings and grants the Commission exclusive power on the design, alteration, and closure of crossings.

The Commission's Rail Crossings Engineering Section (RCES) is in receipt of the *Notice of Preparation* for the Downtown San Bernardino Passenger Rail Project. As stated in the Notice of Preparation document, the applicant is required to modify or close the four existing at-grade crossings in order to accommodate the double-track and corresponding operational characteristics. In addition to the four existing at-grade crossings being modified or closed, the San Bernardino Metrolink Station/Santa Fe Depot Station will construct a pedestrian overpass and the E Street Rail Station will construct a new pedestrian at-grade crossing. RCES staff has met with the applicant for a field diagnostic meeting on May 27, 2010 and a follow-up field diagnostic meeting on May 9, 2011. The crossing safety improvement recommendations included:

- Installation of Commission Standard 9 (Flashing Light Signal Assembly with Automatic Gate Arm) warning device;
- Construction of raised center medians;
- Installation of crossing illumination;
- Installation of pedestrian safety treatments; and
- Crossing closures.

As reviewed during the meeting, modifications to existing crossings are within the scope of Commission General Order (GO) 88-B: "Rules for Altering Public Highway-Rail Crossings." A request for authorization must be submitted to the Commission through RCES. One of the primary prerequisites for a GO 88-B application is concurrence of all parties (railroad, local agency and Commission) to the proposed changes. In addition, for construction of the two new pedestrian crossings, a formal application will be required and must be submitted to the Commission through the Commission Docket Office. Additional information regarding filing requirements can be found at http://www.cpuc.ca.gov/PUC/transportation/crossings/Filing+Procedures.

Please continue to keep RCES informed of the project's development. If you have any questions, please contact me at 213-576-1399 or email at bll@cpuc.ca.gov.

Sincerely,

Bill Lay
Utilities Engineer
Rail Crossings Engineering Section
Consumer Protection & Safety Division

cc: Melvin Thomas, BNSF Railway Company
Gerard Reminiskey, HDR Engineering

Department of Toxic Substances Control

Linda S. Adams
Acting Secretary for
Environmental Protection

Deborah O. Raphael, Director
5796 Corporate Avenue
Cypress, California 90630

Edmund G. Brown Jr.
Governor

RECEIVED
JUN - 8 2011
SAN BERNARDINO
ASSOCIATED GOVTS

June 7, 2011

Mr. Mitchell A. Alderman
San Bernardino Associated Governments
1170 W. 3rh Street, 2nd Floor
San Bernardino, California 92410

NOTICE OF PREPARATION (NOP) FOR DOWNTOWN SAN BERNARDINO PASSENGER RAIL PROJECT (SCH# 2011051024)

Dear Mr. Alderman:

The Department of Toxic Substances Control (DTSC) has received your submitted Notice of Preparation Report for the above-mentioned project. The following project description is stated in your document: "SANBAG is proposing to extend Metrolink service approximately one mile east from the existing San Bernardino Metrolink Station/Santa Fe Depot to the proposed San Bernardino Transit Center in downtown San Bernardino, California. The Downtown San Bernardino Passenger Rail Project consists of several major components, including double-tracking the existing rail corridor, construction of rail platforms, station amenities, parking lot near the transit center, grade crossing improvements and closures, railroad signalization, and roadway improvements. Other improvements include drainage facility improvements, replacements, and extensions, utility replacements/relocations, and implementation of safety controls".

Based on the review of the submitted document DTSC has the following comments:

1) The EIR should evaluate whether conditions within the project area may pose a threat to human health or the environment. Following are the databases of some of the regulatory agencies:

   - National Priorities List (NPL): A list maintained by the United States Environmental Protection Agency (U.S.EPA).

   - Envirostor (formerly CalSites): A Database primarily used by the California Department of Toxic Substances Control, accessible through DTSC's website (see below).

- Resource Conservation and Recovery Information System (RCRIS): A database of RCRA facilities that is maintained by U.S. EPA.

- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS): A database of CERCLA sites that is maintained by U.S.EPA.

- Solid Waste Information System (SWIS): A database provided by the California Integrated Waste Management Board which consists of both open as well as closed and inactive solid waste disposal facilities and transfer stations.

- GeoTracker: A List that is maintained by Regional Water Quality Control Boards.

- Local Counties and Cities maintain lists for hazardous substances cleanup sites and leaking underground storage tanks.

- The United States Army Corps of Engineers, 911 Wilshire Boulevard, Los Angeles, California, 90017, (213) 452-3908, maintains a list of Formerly Used Defense Sites (FUDS).

2) The EIR should identify the mechanism to initiate any required investigation and/or remediation for any site that may be contaminated, and the government agency to provide appropriate regulatory oversight. If necessary, DTSC would require an oversight agreement in order to review such documents.

3) Any environmental investigations, sampling and/or remediation for a site should be conducted under a Workplan approved and overseen by a regulatory agency that has jurisdiction to oversee hazardous substance cleanup. The findings of any investigations, including any Phase I or II Environmental Site Assessment Investigations should be summarized in the document. All sampling results in which hazardous substances were found above regulatory standards should be clearly summarized in a table. All closure, certification or remediation approval reports by regulatory agencies should be included in the EIR.

4) If buildings, other structures, asphalt or concrete-paved surface areas are being planned to be demolished, an investigation should also be conducted for the presence of other hazardous chemicals, mercury, and asbestos containing materials (ACMs). If other hazardous chemicals, lead-based paints (LPB) or products, mercury or ACMs are identified, proper precautions should be taken during demolition activities. Additionally, the contaminants should be remediated in compliance with California environmental regulations and policies.

5) Future project construction may require soil excavation or filling in certain areas. Sampling may be required. If soil is contaminated, it must be properly disposed and not simply placed in another location onsite. Land Disposal Restrictions (LDRs) may be applicable to such soils. Also, if the project proposes to import soil to backfill the areas excavated, sampling should be conducted to ensure that the imported soil is free of contamination.

6) Human health and the environment of sensitive receptors should be protected during any construction or demolition activities. If necessary, a health risk assessment overseen and approved by the appropriate government agency should be conducted by a qualified health risk assessor to determine if there are, have been, or will be, any releases of hazardous materials that may pose a risk to human health or the environment.

7) If it is determined that hazardous wastes are, or will be, generated by the proposed operations, the wastes must be managed in accordance with the California Hazardous Waste Control Law (California Health and Safety Code, Division 20, Chapter 6.5) and the Hazardous Waste Control Regulations (California Code of Regulations, Title 22, Division 4.5). If it is determined that hazardous wastes will be generated, the facility should also obtain a United States Environmental Protection Agency Identification Number by contacting (800) 618-6942. Certain hazardous waste treatment processes or hazardous materials, handling, storage or uses may require authorization from the local Certified Unified Program Agency (CUPA). Information about the requirement for authorization can be obtained by contacting your local CUPA.

8) DTSC can provide cleanup oversight through an Environmental Oversight Agreement (EOA) for government agencies that are not responsible parties, or a Voluntary Cleanup Agreement (VCA) for private parties. For additional information on the EOA or VCA, please see www.dtsc.ca.gov/SiteCleanup/Brownfields, or contact Ms. Maryam Tasnif-Abbasi, DTSC's Voluntary Cleanup Coordinator, at (714) 484-5489.

If you have any questions regarding this letter, please contact me at ashami@dtsc.ca.gov, or by phone at (714) 484-5472.

Sincerely,

Al Shami
Project Manager
Brownfields and Environmental Restoration Program

cc: Governor's Office of Planning and Research
State Clearinghouse
P.O. Box 3044
Sacramento, California 95812-3044
state.clearinghouse@opr.ca.gov

CEQA Tracking Center
Department of Toxic Substances Control
Office of Environmental Planning and Analysis
P.O. Box 806
Sacramento, California 95812
ADelacr1@dtsc.ca.gov

CEQA # 3219

SCOPING MEETING

MEMORANDUM

Date: July 29, 2011

To: HDR

From: Westbound Communications

RE: Downtown San Bernardino Passenger Rail Project Scoping Meeting Summary

Overview

As part of the community outreach for the Downtown San Bernardino Passenger Rail Project, the public outreach team coordinated a scoping meeting in San Bernardino on May 17 at the San Bernardino Santa Fe Depot from 5 p.m. to 7 p.m. The two-hour meeting gave the public an opportunity to provide comment on the draft environmental impact report for the Downtown San Bernardino Passenger Rail Project.

A PowerPoint overview of the project was presented to attendees. In addition, project development team members from environmental, design, right-of-way, and public outreach were available to assist the public with any questions regarding the project. A certified court reporter from Gillespie Reporting & Document Management, Inc. was hired to document public input.

Outreach Approach

Leading up to the scoping meeting, Westbound notified the public of the opportunity to provide input through a number of activities – exceeding notification requirements.

Advertisements - Placed ads in three newspapers covering English and Spanish audiences

- *San Bernardino Sun* - Published ¼ page full color ad on Friday, May 13 through Sunday, May 15; Online banner that had approximately 67,000 on the website – www.sbsun.com
- *Inland Empire Community Newspapers* – Published ¼ page black and white English ad in all four papers (*The IE Weekly, Rialto Record, Colton Courier, El Chicano*) Thursday, May 12
- *La Prensa* - Published ¼ page black and white Spanish ad Friday, May 13.

Certified Mail and Informational Flier Distribution – Certified mail to inform property owners nearest the project about the scoping meeting. In addition, Westbound hand-delivered notice to properties closest to project area. Delivered 5,500 fliers in the city of San Bernardino.

- Developed English and Spanish flier

Database Notification – Emails sent to more than 600 contacts

- First round notification emails sent Friday, May 6
- Reminder email sent Wednesday, May 11 and May 16

Personalized Email Notifications, Public Access Television, Online – Local television, website and email notifications sent

- Links to flier posted on cities of San Bernardino and Redlands and the County of San Bernardino website homepages
- Channel 3 informational slides produced and included in City of San Bernardino public access television station rotation
- Downtown San Bernardino Constant Contact newsletter (San BernarDEALios) notification to their database of nearly 400 local business leaders, residents, elected, etc.
- Meeting information posted on SANBAG and City of San Bernardino home pages

VIP/City Council Notification – A list of more than 80 contacts from such agencies as SANBAG, BNSF, Metrolink, congressmembers, senators, assemblymembers, and more received personalized emails from SANBAG PIO Jane Dreher

Attendance & Public Comments

Approximately 35-40 people attended the scoping meeting. They had an opportunity to fill out comment cards about the Downtown San Bernardino Passenger Rail Project. Overall, public input was very supportive of the project. Following are highlights of the comments gathered from the meetings:

- Quiet zone is an excellent plan
- Consider pedestrian tunnel instead of bridge to eliminate visual impact on historic Santa Fe Depot building
- Access plan to parking with 3rd and I streets becoming cul-de-sacs
- Better job could have been done to reach out to area residents (NOTE: publicizing meeting far exceeded all requirements; SANBAG was extremely proactive as evidenced in recap of Outreach Approach section. Furthermore, Westbound continued to publicize the opportunity for public input after the meeting had taken place).

###

Downtown San Bernardino Passenger Rail Project
Public Scoping Meeting
Santa Fe Depot
Tuesday, May 17, 2011

Governments SANBAG Working Together

Name	Address	Organization	Phone	Email
Ruthie Robinson	274 N. I Street	Big 2 Antonios	(909) 889.9655	Big2Anto@yahoo.com Big2Joy@yahoo.com
CAROLANN WILLIAMS	PO BOX 2422 FONTANA	carolann.williams@omnitrans.org	909 379 7214	
WALT STANCKIEWITZ		SANBAG BOARD		
JIM HAMLIN				jimbhamlin@gmail.com
Lily Fernandez	531 N. Santa Fe St #104 Hemet Ca 92543			
CAT EMANUELSON	HEMET CA 92543			

Downtown San Bernardino Passenger Rail Project
Public Scoping Meeting
Santa Fe Depot
Tuesday, May 17, 2011

Governments SANBAG Working Together

Name	Address	Organization	Phone	Email
Gil J. Botello	149 E. Valley St S.B, CA 92408	Westside Bypass Improvement Council	(213) 663-8823	gil.botello@gmail.com gil.botello@gmail.c
[illegible]	2450 Ohio Ave			
Stephen Rogers	820 Church St. Redlands, CA 92374	SWRPE Consulting	(909) 556-1988	steve_rogers@verizon.net
Gina Tenorio	1699 E. Washington St #227B COLTON, CA 92324	LOMA LINDA PATCH	909-213-5355	Gina.tenorio@patch.com lomalinda.patch.com
PHIL MERKLEY	29066 LAKERIDGE HIGHLAND CA 92346	SBRMS	909-862-5015	~~philip~~ P1merkley@roadrunner.com
CATHY ~~MORLEY~~ Swearman	1841 Bluebonnet BLVD BULLHEAD City AZ			

Downtown San Bernardino Passenger Rail Project
Public Scoping Meeting
Santa Fe Depot
Tuesday, May 17, 2011

Governments SANBAG Working Together

Name	Address	Organization	Phone	Email
BARB SLEIGH	3331 Leroy St San Bernardino - CA 92404	Animals vet ASS. ARTIST	909) 266-7547	Kiowafox.@yahoo.com.
Ric Olalde	1220 Research Lane Redlands CA	Kleinfelder	909-753-2691	Rolalde@kleinfelder
SKIP SCHNEIDER	186 E KING ST SAN BERNARDINO 92408		909 855 4000	SKIPE BADGERANDPRAIRIE DOG.COM
Fred Mousavipour	City of Redlands	City of Redlands	909-795-7553	Fmousavipour@cityofredlands.org
ANDREA LYTLE	P.O. BOX 5008 SAN BERNARDINO CA 92412	BUSINESS PROPERTY OWNER	—	—
Lemon Lytle	P.O. Box 5008 San Bernardino, CA 92412		—	—
Hamid Azhand	29197 Clear Spring Lane Highland CA 92346	Cal State University San Bernardino	(909)537-5136	hazhand@csusb.edu

Downtown San Bernardino Passenger Rail Project
Public Scoping Meeting
Santa Fe Depot
Tuesday, May 17, 2011

Governments SANBAG Working Together

mrcecilk@yahoo.com

Name	Address	Organization	Phone	Email
GERRY DALE SLAUGHTER	1100 N. D St SAN BERNARDINO, CA 92410	VARP INC	909-381-3774	
CECIL A. KARSTENSEN	1392 WARD WAY MENTONE 92359	~~RESIDENT~~ TRAC/RAILPAC NARP	909-794-7221	MRCECILK@YAHOO.COM
Gloria Mantzoros	146 E. Palmyra Dr.	Resident	909 889-7310	Gmantzoros@aol.com
VARICK MANTZOROS	29075 Marcos Ln. Highland CA. 92346	Resident	909-322-3859	JG Produce@AOL.com
Michael Tschudi	629 Northwestern Dr Claremont, CA 91711	~~re~~sident	909-626-9540	mktschudi@gmail.com
Sarah Drobis	523 W. 6th St, Suite 1234 LA, CA 90014	Gibson Transportation	2136830088	~~Sarah~~ sdrobis@gibsontrans.com
Pat Morris	300 N. D ST SB	City Mgr		

Downtown San Bernardino Passenger Rail Project
Public Scoping Meeting
Santa Fe Depot
Tuesday, May 17, 2011

Governments SANBAG Working Together

Name	Address	Organization	Phone	Email
Brian Pittman	552 WEST 10TH STREET SAN BERNARDINO (92410)	WESTBOUND-COMMUNICATIONS RECIPIENT	909. 277-1111 909 965-7682	infotobrian @gmail.com
Gabriel Perez	2785 cedar street 92404		909-936 6086	sbgabe@yahoo.com
GARY WALBOURNE	2395 CONNER ST COLTON, CA 92324	PRIDE ENVELOPE	909-889-0770	PRIDEEPS @ AOL.COM
Marlene Borsuk	5217 North "I" St, San Bernardino, CA 92407			Cammchuw@gmail.com
Kristine Scott	155 S. 9 St SAN Bernardino, Ca 92410	The goco	909-809-0317	KScott@sanpartnet.com
Arnold San Miguel	1170 W. 3rd St Ste 140 San Bernardino CA 92410	SCAG	909 806 3556	sanmiguea@scag.ca.gov
John CHIU	464 W. 4th St., 6th Fl S.B. CA 92401	CALTRANS	909 388 7139	John_Chiu@dot.ca.gov

Governments SANBAG Working Together

Thank you for your interest in the Downtown San Bernardino Passenger Rail Project.

San Bernardino Associated Governments (SANBAG) would like to accurately and personally address your questions and concerns. Please complete the contact information below and indicate the best way to reach you.

CONTACT INFORMATION

Name: CECIL A. KARSTENSEN

Street Address: 1393 WARD WAY

City: MENTONE State: CA Zip Code: 92359

Phone: (909) 794-7221 Cell: (909) 384-2448

Email: MRCECILK@YAHOO.COM FAX: ( )

Are you a local business owner? Yes: ☐ No: ☑

If so, please name the business:

Preferred Contact Method: (Please check one)

By Phone: ☐ Email: ☑ FAX: ☐ In Writing: ☐

YOUR COMMENTS/QUESTIONS ~~HOW ARE PROT~~ HOW DO YOU PLAN ON PROTECTING THE TRACKS FROM TRESPASSERS & ACCIDENTS? THE QUIET ZONE FROM THE DEPOT TO E ST IS AN EXCELLENT PLAN! 3RD & I STREETS ARE CUL-DE-SAC. TRAFFIC CIRCULATION & ACCESS TO PARKING FACILITIES POSSIBLE DEFECIT LOS, TIME ELEMENTS, ETC.

Thank you for your input on the Downtown San Bernardino Passenger Rail Project.
A SANBAG project liaison will contact you as soon as possible.

For more information, contact Jane Dreher, SANBAG Public Information Officer (909) 884-8276 • jdreher@sanbag.ca.gov

---

Governments SANBAG Working Together

Thank you for your interest in the Downtown San Bernardino Passenger Rail Project.

San Bernardino Associated Governments (SANBAG) would like to accurately and personally address your questions and concerns. Please complete the contact information below and indicate the best way to reach you.

CONTACT INFORMATION

Name: Gary Walbourne, Isabel Walbourne

Street Address: 850 N. E St.

City: San Bernardino State: CA Zip Code: 92410

Phone: (909) 889-0770 Cell: ( )

Email: prideeps@aol.com FAX: (909) 889-0779

Are you a local business owner? Yes: ☒ No: ☐

If so, please name the business: Pride Envelope Co., Inc.

Preferred Contact Method: (Please check one)

By Phone: ☐ Email: ☒ FAX: ☐ In Writing: ☐

YOUR COMMENTS/QUESTIONS WE ARE CONCIRNED ABOUT NOISE, VIBRATION IN BUILDINGS AND POLLUTION IN BUSINESS CLOSE TO THIS RAIL SYSTEM

Thank you for your input on the Downtown San Bernardino Passenger Rail Project.
A SANBAG project liaison will contact you as soon as possible.

For more information, contact Jane Dreher, SANBAG Public Information Officer (909) 884-8276 • jdreher@sanbag.ca.gov

Governments
SANBAG
Working Together

Thank you for your interest in the Downtown San Bernardino Passenger Rail Project.

San Bernardino Associated Governments (SANBAG) would like to accurately and personally address your questions and concerns. Please complete the contact information below and indicate the best way to reach you.

CONTACT INFORMATION

Name: Jason Desjardins

Street Address: 274 N. "I" Street

City: San Bernardino State: Ca. Zip Code: 92410

Phone: (909) 889-9655 Cell: (909) 205-8029 (818) 535-7444

Email: bigzauto@yahoo.com FAX: (909) 381-2145

Are you a local business owner? Yes: X No:

If so, please name the business: Big Z Autoworks.

Preferred Contact Method: (Please check one)

By Phone: Email: FAX: In Writing:

YOUR COMMENTS/QUESTIONS How much of the yard will be used. And will it be the Westside of the tracks that will be used. Are we going to talk about what the property is worth.

Thank you for your input on the Downtown San Bernardino Passenger Rail Project.
A SANBAG project liaison will contact you as soon as possible.

For more information, contact Jane Dreher, SANBAG Public Information Officer (909) 884-8276 • jdreher@sanbag.ca.gov

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Governments
SANBAG
Working Together

Thank you for your interest in the Downtown San Bernardino Passenger Rail Project.

San Bernardino Associated Governments (SANBAG) would like to accurately and personally address your questions and concerns. Please complete the contact information below and indicate the best way to reach you.

CONTACT INFORMATION

Name: Jason Desjardins

Street Address: 274 N. "I" Street

City: San Bernardino State: Ca. Zip Code: 92410

Phone: (909) 205-8029 Cell: (818) 535-7444

Email: BigZAuto@yahoo.com FAX: (909) 381-2145

Are you a local business owner? Yes: X No:

If so, please name the business: Big Z Autoworks, Inc.

Preferred Contact Method: (Please check one)

By Phone: X Email: X FAX: X In Writing: X

YOUR COMMENTS/QUESTIONS I would like to request that the west side of the train track be used is this possible.

Thank you for your input on the Downtown San Bernardino Passenger Rail Project.
A SANBAG project liaison will contact you as soon as possible.

For more information, contact Jane Dreher, SANBAG Public Information Officer (909) 884-8276 • jdreher@sanbag.ca.gov

Governments
SANBAG
Working Together

Thank you for your interest in the Downtown San Bernardino Passenger Rail Project.

San Bernardino Associated Governments (SANBAG) would like to accurately and personally address your questions and concerns. Please complete the contact information below and indicate the best way to reach you.

CONTACT INFORMATION

Name: PHIL MERKLEY

Street Address: 29066 LAKE RIDGE LN

City: HIGHLAND State: CA Zip Code: 92346

Phone: (909) 862-5015 Cell: ( )

Email: pmerkley@roadrunner.com FAX: ( )

Are you a local business owner? Yes: ☐ No: ☒

If so, please name the business:

Preferred Contact Method: (Please check one)

By Phone: ☐ Email: ☐ FAX: ☐ In Writing: ☐

YOUR COMMENTS/QUESTIONS CONSIDER A PEDESTRIAN TUNNEL INSTEAD OF THE BRIDGE TO ELIMINATE THE VISUAL IMPACT ON THE HISTORIC SANTA FE DEPOT BUILDING, WHICH IS ON THE NATIONAL REGISTER OF HISTORIC PLACES.

Thank you for your input on the Downtown San Bernardino Passenger Rail Project.
A SANBAG project liaison will contact you as soon as possible.

For more information, contact Jane Dreher, SANBAG Public Information Officer (909) 884-8276 • jdreher@sanbag.ca.gov

SANBAG Downtown San Bernardino

Passenger Rail Project Public Hearing

LOCATION: SANTA FE DEPOT
1170 West Third Street
San Bernardino, California

DATE AND TIME: Tuesday, May 17, 2011
5:00 p.m. - 7:00 p.m.

REPORTED BY: KRISTI JOHNSON, CSR
CSR NO. 12585

JOB NO: 70111-KJ

PUBLIC COMMENT APPEARANCES:

Gloria Mantzoros
123 South G Street
San Bernardino, CA 92410
Phone number: (909) 889-7310
E-mail address: JGproduce@AOL.com

Gil J. Botello
149 East Valley Street
San Bernardino, CA 92408
Phone number: (213) 663-8923
E-mail address: GilBotello@gmail.com

San Bernardino, CA Tuesday, May 17, 2011

MS. MANTZOROS: What we see on the map there is G Street, right in front of our building, there is a divider, and what I understand is, they will be extending the divider, and that will affect the trucks backing up to our dock, to the dock at our produce place. So although we have two entrances, only one, usually, serves our purpose because of the big semi-trucks backing up to the dock. The other entrance, it's not helping us any. So if you extend the divider more than what it is now, then it will create a big problem for us.

MR. BOTELLO: I want to say I support this project 110 percent. I think it will be great for the economic development in our city and in our county. It's going to greatly improve the infrastructure in Downtown San Bernardino, and that's needed, especially for poor people and working people who need access to public transportation. I want to go on record and say that.

Here is my concern: This is a great presentation, very comprehensive, laid out beautifully, but resident stakeholders here, people who live in this district, who live in the project

area who are going to be most impacted by the design, by the construction, and by the change, I don't think -- I'm sure it wasn't intentional. I think that the railroad and their PR firm could have done a much better job of outreaching to resident stakeholders who are going to be greatly impacted by the change. Initially, it's going to be a burden because there's going to be a lot of construction, closures, this and that, but that's growth. That's progress. When it's done, they're going to love it, but my fear and my concern is that they have not been invited to be a part of this process.

I spoke to Mitch Alderman and I spoke to Robert Chavez, who is the PR guy. I expressed my concern, and they will follow up and try and see if they can do a better job of outreaching before June 10th, which is when the comment period ends.

For that, I'm glad that I came tonight because I feel like I made a difference in this process. I want to thank you guys for giving me the opportunity to participate.

(Proceedings concluded at 7:00 p.m.)

R E P O R T E R' S C E R T I F I C A T E

I, Kristi Johnson, a certified shorthand reporter, No. 12585, for the State of California, do hereby certify:

That the said Proceedings was taken down by me in stenotype at the time and place therein stated and was thereafter reduced to printing under my direction.

I further certify that I am not in any way interested in the event of this cause, and that I am not related to either of the parties hereto.

In witness whereof, I have hereunto subscribed my name this 26th day of May, 2011.

_____

KRISTI JOHNSON, CSR NO. 12585

DOWNTOWN SAN BERNARDINO

PASSENGER RAIL PROJECT

Scoping Meeting
Tuesday, May 17, 2011
5:00 to 7:00 p.m.
Presentation at 5:15 p.m.
Santa Fe Depot
1170 West 3rd Street
San Bernardino, CA 92410

CALIFORNIA ENVIRONMENTAL QUALITY ACT

SCOPING MEETING NOTICE

WHAT'S BEING PLANNED?

The east-west corridor between west San Bernardino and the city's Downtown is often congested for drivers and mass transit commuters alike. Recognizing a need for increased transit options, San Bernardino Associated Governments (SANBAG), the county's transportation authority and commission, developed the Downtown San Bernardino Passenger Rail Project.

As part of the project, two Metrolink tracks, fully signaled, may be extended one-mile from the Santa Fe Depot in San Bernardino to the planned San Bernardino Transit Center in the downtown area at Rialto Avenue and E Street.

The project's preliminary plans were completed in March 2011. Final design will begin in June 2011 and is expected to be completed and submitted in December 2011.

WHY A SCOPING MEETING?

The purpose of a scoping meeting is to solicit input from the public, which will assist SANBAG in determining the scope of the environmental issues that need to be addressed in the environmental impact report that is being prepared for the project. This process will help ensure that issues are identified early and properly studied. SANBAG invites interested individuals, organizations, and local and state agencies to attend the scoping meeting to receive project information and to provide the opportunity to discuss issues or questions they may have, as well as provide input as to the scope and content of the environmental impact report.

Governments
SANBAG
Working Together

FOR MORE INFORMATION

For more information, questions about the project, or to be placed on the mailing list, please contact:
Jane Dreher, Public Information Officer for SANBAG
1170 W. 3rd Street, 2nd Floor | San Bernardino, CA 92410 | 909.884.8276 | **jdreher@sanbag.ca.gov**

PROYECTO PARA FERROCARRIL DE PASAJEROS

DEL CENTRO DE SAN BERNARDINO

Reunión Exploratoria
Martes, 17 de mayo del 2011
5:00 a 7:00 p.m.
Presentación a las 5:15 p.m.
Santa Fe Depot
1170 West 3rd Street
San Bernardino, CA 92410

NOTIFICACIÓN DE REUNIÓN EXPLORATORIA

DEL ACTO DE CALIDAD AMBIENTAL

¿QUÉ SE TIENE PLANIFICADO?

El corredor este-oeste entre el oeste de San Bernardino y el centro de la ciudad está congestionado con frecuencia para los conductores y para los usuarios de transporte público. San Bernardino Associated Governments, la comisión y autoridad de transporte del condado, o SANBAG por sus siglas en inglés, reconoce la necesidad de más opciones de tránsito y por ello ha desarrollado el Proyecto de Ferrocarril Para Pasajeros del Centro de San Bernardino.

Como parte del proyecto, se extenderá por una milla dos de las vías de Metrolink desde el Santa Fe Depot hasta el propuesto Centro de Tránsito de San Bernardino en el área del centro en Rialto Avenue y E Street.

Los planes preliminares del proyecto se completaron en marzo del 2011. El diseño final comenzará en junio del 2011 y se espera que sean completados y entregados en diciembre 2011.

¿POR QUÉ UNA REUNIÓN EXPLORATORIA?

El propósito de ésta reunión exploratoria es pedir comentarios del público, los cuales ayudarán a SANBAG determinar los temas ambientales que deberán tratarse en el reporte de impacto ambiental del proyecto. Este proceso asegurará que todos los temas sean identificados y estudiados a fondo. SANBAG invita a individuos, organizaciones, entidades locales y estatales interesadas a asistir a la reunión exploratoria para recibir información sobre el proyecto y para expresar temas o preguntas que tengan así como dar opiniones sobre la exploración y el contenido del reporte de impacto ambiental.

Governments
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PARA MÁS INFORMACIÓN

Si tiene alguna pregunta o si desea recibir información sobre el proyecto, contactar a Jane Dreher, Oficial de Información Pública de SANBAG, al (909) 884-8276. O visite nuestra página web **www.sanbag.ca.gov.**

WORLD&NATION

Get the latest news updates on **SBSUN.COM**.

Around the **WORLD**

Demjanjuk convicted over Nazi camp deaths

MUNICH — A German court convicted retired U.S. autoworker John Demjanjuk on Thursday of taking part in the murder of tens of thousands of Jews as a Nazi death camp guard, breaking legal ground that could pave the way for the prosecution of many low-level cogs in Hitler's machinery of destruction.

The 91-year-old Demjanjuk was sentenced to five years in prison on 28,060 counts of accessory to murder — one each for the number of people killed at the Sobibor death camp during the six months in 1943 when he was convicted of standing guard there.

But Demjanjuk will spend no immediate time behind bars. Presiding Judge Ralph Alt ordered him released from custody pending his appeal — a process that could take at least a year. It was not immediately clear when Demjanjuk would be released or where he would go.

The case was considered groundbreaking because although scores of Nazi war criminals have been tried and convicted in Germany, in this case there was no evidence that Demjanjuk committed a specific crime.

Spaniards fearing aftershocks flee city

LORCA, Spain — Thousands of Spaniards have fled this small agricultural city, fearing major aftershocks might level it after the country's deadliest earthquakes in 55 years killed nine people and caused extensive damage.

Lorca was transformed into a ghost town, with a steady stream of cars carrying many of its 90,000 residents to nearby cities and towns to stay with relatives. Stores, restaurants and schools were closed as the sirens of police vehicles and ambulances filled the air and helicopters hovered overhead.

The Associated Press

Feeling the heat

Pressure mounts on Gadhafi within capital

By Diaa Hadid and Maggie Michael
The Associated Press

TRIPOLI, Libya — Pressure is mounting on Moammar Gadhafi from within his stronghold in the Libyan capital, with increasing NATO airstrikes and worsening shortages of fuel and goods. An activist said today that there has also been a wave of anti-government protests in several Tripoli neighborhoods this week — dissent that in the past has been met with zero tolerance and brutal force.

Gadhafi's rebel opposition, meanwhile, received major political boosts from abroad. Britain promised to provide them with police gear, and the Obama administration invited a rebel delegation to the White House for talks today.

Highlighting the pressure, the sound of two NATO strikes could be heard early today. It was not immediately clear what they targeted. They followed a round of NATO airstrikes early Thursday that hit Gadhafi's fortified compound in Tripoli. Just hours beforehand, the Libyan leader had appeared on state TV for the first time since his son was killed nearly two weeks ago. Before his appearance, rumors swirled that he had been killed or injured.

Reporters were shown the airstrike damage by Libyan officials, including one who said Gadhafi and his family had moved away from the Bab al-Aziziya compound some time ago. One missile appeared to have targeted some sort of underground bunker at the compound — a sprawling complex of buildings surrounded by towering concrete blast walls.

NATO, which has hit the Libyan capital repeatedly this week, said Thursday's attack successfully hit "a large command and control bunker complex in downtown Tripoli that was used to coordinate attacks against civilian populations."

Early today, an anti-government activist in the Libyan capital said there had been protests this week in at least three neighborhoods in the capital, accompanied by exchanges of gunfire between opposition activists and Gadhafi forces.

He said he saw in one neighborhood, Fashloum, there were soldiers flooding the area and were patrolling the streets in vehicles. He said he did not personally see a demonstration there but heard from other activists that there was a brief gunbattle in that area.

The Associated Press

In this image made from Libyan TV, Libyan leader Moammar Gadhafi holds a meeting with tribal leaders from eastern Libya, in Tripoli, Libya, on Wednesday.

Ensign case goes to Justice

By Larry Margasa The Associated Press

WASHINGTON — Former Sen. John Ensign of Nevada broke federal law, made false statements to the Federal Election Commission and obstructed a Senate Ethics Committee's investigation into his conduct, the panel said Thursday in a scathing report that sent the matter to the Justice Department for possible prosecution.

The former Republican lawmaker "created a web of deceit that entangled and compromised numerous people," the committee said, adding that it had assembled enough evidence to warrant possible expulsion had Ensign not resigned.

Ensign quit May 3, one day before he was to have testified under oath about an affair with the wife of a top aide, the aide's subsequent lobbying of Ensign's office, and a payment from Ensign's parents to the one-time aide's family.

The committee asked the FEC to conduct its own investigation, concluding that Ensign made false statements to the agency about the payment to the former aide's family.

The Senate committee hired former federal prosecutor Carol Elder Bruce to complete its investigation and relied on her findings in making the referrals to the Justice Department and FEC. Besides the legal issues, the committee revealed information about the affair itself, and efforts of those close to Ensign to get him to end it.

"The special counsel is confident that the evidence that would have been presented in an adjudicatory hearing would have been substantial and sufficient to warrant the consideration of the sanction of expulsion," the report said.

The Associated Press

The Senate's ethics panel said Thursday that former Nev. Sen. John Ensign broke federal law and obstructed a Senate Ethics Committee's investigation into his conduct.

Around the **NATION**

2 accused of plotting to bomb synagogue

NEW YORK — A man who complained the world was treating Muslims "like dogs" plotted with an accomplice to kill Jews by bombing a synagogue, and possibly the Empire State building, and bought a grenade and guns for the attacks, authorities charged Thursday.

But there was no indication that what authorities called a homegrown plot, orchestrated as part of a sting operation, ever put New Yorkers in danger or that the men were affiliated with any terrorist organization.

The two suspects, 26-year-old Ahmed Ferhani, an Algerian, and 20-year-old Mohamed Mamdouh, a U.S. citizen of Moroccan descent accused of being his accomplice, were charged Thursday with conspiracy as a crime of terrorism under a rarely-used state law.

Obama wants FBI chief to stay longer

WASHINGTON — Reluctant to see another shake-up in his national security team, President Barack Obama said Thursday he wants to stick with FBI Director Robert Mueller, the sturdy face of the bureau whose term has spanned from the Sept. 11 attacks on America to the killing of terrorist leader Osama bin Laden. Key lawmakers indicated support for Obama's surprise decision.

Keeping Mueller on the job would require an act of Congress since the law allows an FBI director to serve only for 10 years, and Mueller's term is up on Sept. 4.Obama said he wants Mueller to remain for two more years, which would keep him in place well after the next presidential election, into September 2013.

Mueller is the longest-serving FBI chief since J. Edgar Hoover, whose checkered 48-year term ended with his death in 1972 and led Congress to put the term limit in place.

The Associated Press

DOWNTOWN SAN BERNARDINO
PASSENGER RAIL PROJECT

CALIFORNIA ENVIRONMENTAL QUALITY ACT
SCOPING MEETING NOTICE

JOIN US!

San Bernardino Associated Governments will host a public scoping meeting on the Downtown San Bernardino Passenger Rail Project on Tuesday, May 17, 2011. As part of the project, two Metrolink tracks, fully signaled, may be extended one mile from the Santa Fe Depot in San Bernardino to the planned San Bernardino Transit Center in the downtown area in Rialto Avenue and E Street.

The purpose of the scoping meeting is to solicit input from the public, which will assist SANBAG in determining the scope of the environmental issues that need to be addressed in the environmental impact report being prepared for the project. This process will help ensure issues are identified early and properly studied.

The meeting will be an opportunity for the public to learn about the purpose of the project, area, and timeline. A presentation and displays illustrating key parts of the projects will be available to review.

CONTACT INFORMATION

If you have questions, please contact Jane Dreher, San Bernardino Associated Governments Public Information Officer, at (909) 884-8276. Or, visit our website at www.sanbag.ca.gov.

Governments SANBAG Working Together

The meeting will be held at the following date, time and location:

Tuesday, May 17, 2011
5:00 - 7:00 p.m.
Presentation at 5:15 p.m.
Santa Fe Depot
1170 West 3rd Street
San Bernardino, CA 92410

You're Invited
7TH ANNUAL
SAN BERNARDINO POLICE DEPARTMENT
K9 UNIT FUNDRAISER

$$ DOLLARS
FOR
DOGS $$
K9 UNIT FUNDRAISER
Monday, May 16th, 2011
From 11am-10pm
The Mexico Café • 909.882.3000

THE MEXICO Cafe

892 E. Highland Avenue,
San Bernardino CA 92404
909.882.3000

The Mexico Cafe is once again welcoming the San Bernardino Police Department to come in and serve the public. All tips and donations will be used for maintaining SBPD K9 Unit. The O cers will be serving lunch and dinner, so if you ever wanted to make a Cop take orders from you, this is your chance.

CALIFORNIA

Get the latest news updates on SBSUN.COM.

Budget to drop unemployment board

Panel slammed as high-paid post for former lawmakers

The Associated Press

SACRAMENTO — As part of his revised budget, Gov. Jerry Brown will propose eliminating a state board that has been criticized for providing a highly paid landing spot for termed-out lawmakers looking for work.

The elimination of the California Unemployment Insurance Appeals Board is part of Brown's revised budget to help close the state's remaining $15.4 billion deficit. The Democratic governor will release the full plan Monday.

Administration spokesman Gil Duran said Friday the move will save $1.2 million a year, but that the cut was also symbolic.

Six of the board's seven members are former lawmakers. They each make $128,109 a year, even though the board meets once — and occasionally twice — a month.

Duran said it did not seem efficient for the state to have such a board at a time when deep cuts are being made to services for the poor, elderly and disabled, and cuts to schools and public safety are being considered.

"Although state revenues have improved because of the underlying strength of California's business climate, we're not out of the woods yet — not even close. Cutbacks in boards, commissions and other state services will continue as we work towards a truly balanced budget," Brown told The Associated Press in a statement.

The six former lawmakers who would lose their jobs on the board under Brown's plan are Republicans Roy Ashburn, Bonnie Garcia, Dennis Hollingsworth and George Plescia, and Democrats Denise Ducheny and Alberto Torrico.

The board, which grants or denies unemployment insurance benefit appeals, has been criticized in recent years for backlogs and decisions that some critics said were delayed deliberately.

The state Employment Development Department first rules on requests for unemployment benefits. Appeals are then heard by an administrative law judge and ultimately can be decided by the full board, which is appointed by the governor and legislative leaders.

Ducheny, a former state senator who represented the San Diego area, was named by Senate President Pro Tem Darrell Steinberg, while Torrico, a former Fremont assemblyman, was appointed by Assembly Speaker John Perez. The four other lawmakers were named by former Gov. Arnold Schwarzenegger.

Hollingsworth had served as Senate minority leader, while Ashburn had represented the Bakersfield area in the state Senate. Both voted for budgets negotiated by Schwarzenegger.

Torrico said there was a misconception surrounding how the board works and its members' duties.

"Every article I read, we're getting paid to attend one to two meetings a month, which is false. That's a very small part of our job," Torrico said. "We process 25-50 cases a day, every day, every week of the year."

He estimated the state has brought in $20 billion in federal unemployment money since the economy soured.

Given the state's budget crisis, Torrico said he supports Brown's efforts to save money and be more efficient. But he said the governor needs to have an alternative appeals process to keep the federal money flowing.

Around the STATE

Suspect in plane fight must stay in jail

SAN FRANCISCO — A Yemen native accused of trying to barge into the cockpit of a San Francisco-bound American Airlines flight will remain in federal custody while his mental state will be evaluated, a judge ordered Friday.

Rageh Al-Murisi poses a risk of not appearing in court and is still a danger to the community, U.S. District Judge James Larson said at a hearing to reconsider a defense lawyer's request to grant bail.

Assistant Federal Public Defender Elizabeth Falk argued that Al-Murisi, 28, was mentally unstable and needed out of custody treatment. But Assistant U.S. Attorney Elise Becker said while Al-Murisi may need a mental evaluation, he poses a "significant threat and risk" to society.

Court battle heats up in bid to oust judge

SAN FRANCISCO — Lawyers are aggressively contesting claims that the federal judge who overturned California's gay marriage ban was biased because he has been in a long-term relationship with another man.

The lawyers, who represent two gay couples who sued to end the ban, filed legal papers Friday arguing that "factually groundless" speculation that now-retired Judge Vaughn Walker wants to marry his partner and therefore would benefit from his own ruling is insufficient evidence to vacate the decision.

Grand jury indicts school officer in hoax

LOS ANGELES — A grand jury indictment unsealed Friday accused a school police officer of falsely reporting he had been shot by a car burglary suspect, a claim that set off a manhunt that tied up a large section of the city and kept students confined at eight campuses for hours.

Jeff Stenroos, 30, appeared before Superior Court Judge Patricia Schnegg and pleaded not guilty to the six-count indictment, handed up Thursday and supersedes a complaint originally filed.

Stenroos is charged with insurance fraud, workers' compensation fraud, preparing a false police report, preparing false documentary evidence and planting false evidence, said Deputy District Attorney Paul Nunez of the Justice System Integrity Division.

From wire reports

Ex-model found in house died of heart disease

The Associated Press

LOS ANGELES — The badly decomposed body found in a dilapidated hillside home overlooking Beverly Hills was former B-movie actress and 1959 Playboy Playmate Yvette Vickers and an autopsy showed she died from heart disease, authorities said Friday.

VICKERS

Vickers, 82, was found April 27 by a neighbor in her Benedict Canyon house. While foul play wasn't suspected, her death captured headlines after authorities estimated her remains could have been there from a few months to a year.

Born Yvette Vedder in 1928, Vickers' first film role was in "Sunset Boulevard" in 1950. After the James Cagney-directed "Short Cut to Hell" flopped, she turned to B-movies, appearing in "Attack of the 50 Foot Woman" and "Attack of the Giant Leeches."

Thousands of teachers protest at Capitol over proposed cuts

The Associated Press

SACRAMENTO — Thousands of California teachers rallied in cities throughout the state Friday to demonstrate against the threat of deep education cuts and to appeal to Republican lawmakers to raise tax revenue for public schools.

Major demonstrations were taking place at the state Capitol, where more than two dozen teachers were arrested Thursday night, and in San Francisco, Los Angeles and San Diego.

"Education can't take these cuts anymore," said Joyce Medeiros, 48, one of at least 1,000 teachers, students and supporters who filled Civic Center Plaza in San Francisco.

The sixth-grade teacher at San Juan School in San Juan Bautista, where K-3 classes now have 32 students, used to be a PE teacher before the district cut physical education, art and music programs.

"We've taken our cuts. It's time to look for other solutions," she said.

Friday evening's demonstrations marked an end to a week-long series of protests organized by the California Teachers Association, the state's largest teachers union.

Educators are trying to pressure Republican lawmakers to support Gov. Jerry Brown's attempt to extend a series of temporary increases in the sales, vehicle and income taxes. Without those, the governor has warned of deep cuts to public schools that could force thousands of teacher layoffs, larger class sizes and a shorter school year.

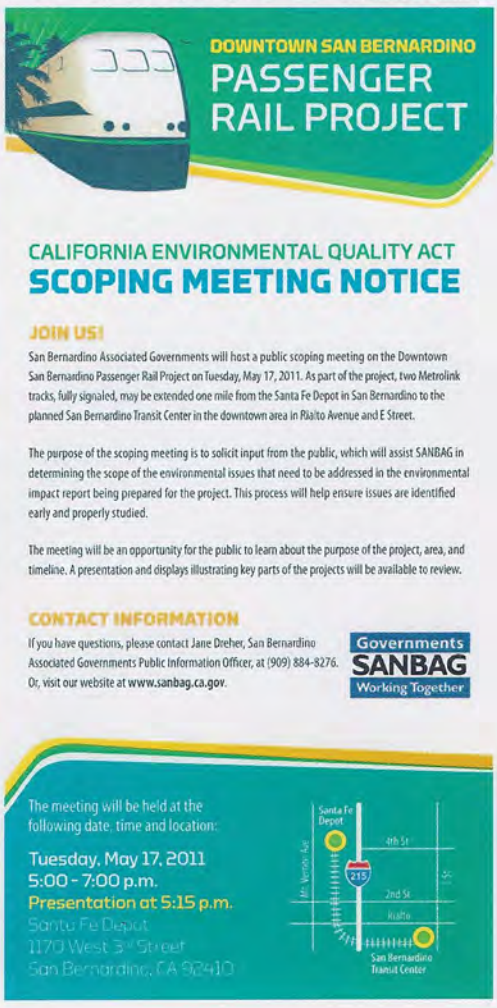
But Assembly Republicans countered with their own budget proposal this week in which they propose to spend about $2 billion from an unanticipated $2.5 billion in tax revenues on schools, which they say would leave them fully funded.

Education lobbyists said the GOP's budget plan would suspend a $450 million annual payment that funds programs in some of the state's neediest school districts.

On Monday, Brown is scheduled to release his updated plan to close California's remaining $15.4 billion deficit. Republicans in the state Legislature have steadfastly opposed the tax extensions, but Brown and Democratic lawmakers say an all-cuts budget would devastate public education and other core state programs.

Most of the Friday demonstrations had a festive atmosphere, with musicians banging on drums and demonstrators blowing whistles. Signs reading "Tax the Rich" and "Bail out schools not banks" were common.

About 1,000 demonstrators clad in colorful T-shirts gathered at the Capitol, which has been the focal point of the week's protests. They were ringed by a strong law enforcement presence a day after 27 teachers were arrested for refusing to leave the inside of the Capitol, a misdemeanor.



BUSINESS EXTRA

Speculators drive up the cost of oil

McClatchy Newspapers

WASHINGTON — Feel like you're being robbed every time you fill the gas tank? Not sure who to blame? Try Wall Street.

Usually analysts say today's high prices stem simply from "supply and demand." But global and U.S. supplies are plentiful and demand is stable, so that's not it.

Then the analysts say it's because the market's afraid that Middle East turmoil will interrupt oil supplies, so nervous buyers are bidding up prices to ensure they lock in a contract for oil now. But after five months of turmoil, there's been no significant impact on Middle East oil supplies, so that's not credible either.

Here's what's credible: Some 70 percent of contracts for future oil delivery are now bought by financial speculators — largely big investment banks and hedge funds — that flip the contract for a quick profit.

Only about 30 percent of oil contracts are bought by a purchaser that actually intends to use the oil, such as an airline. That's according to the Commodity Futures Trading Commission, which regulates trade in those contracts.

"It's harder and harder for any reasonable observer to dismiss the role of excessive speculation in this market," said Michael Masters, a professional Wall Street investor.

CHINA

From A13

once-a-week treat, though he tries to make sure his children eat it more often.

As a migrant laborer, Yao has been able to skirt China's strict birth limits, having three kids instead of the two most rural families are limited to. But his migrant status means he must pay school fees himself.

A recent and routine lunch for Yao and his wife and children was a bowl of simple noodles with greens. Yao's ginger and garlic stall earns him about 2,000 yuan, or $307, a month, of which about 600 yuan, or $92, goes on food for his five-person family.

"I need to save money but I feel like I am already scraping the bottom of the barrel," he said.

"At the same time, I know we have to feed ourselves and eat enough, otherwise our health is going to be affected."

A host of other factors are also blamed for food prices hikes in China and elsewhere in Asia, including too much money sloshing about the economy after stimulus policies that warded off the global recession, rising oil prices and shrinking land for cultivation because of pollution and encroachment by industry.

The U.N. Food and Agriculture Office's index of global prices for meat, cereals and dairy foods has surged 37 percent in the first three months of 2011. In many Asian countries, that has translated into a 10 percent increase in local food prices, which the Asian Development Bank estimates is enough to drag another 64 million people below the $1.25 a day poverty line.

Yet the changes in food and work preferences aren't all bad because they reflect the human and economic development taking place in China, said Scott Rozelle, an agricultural economist at Stanford University and an expert on China's food markets.

Rozelle says that China's scattered and small-scale farms are becoming more consolidated and mechanized, which could eventually raise productivity, but the changes probably won't stop food prices from rising. Economic development involves both increases in prices and incomes, he says.

Higher food prices have in fact lifted lagging rural incomes. The per capita net income for rural Chinese grew faster than urban incomes last year, jumping 10 percent to 5,919 yuan, or $902.

Rural Chinese are "going from grinding poor to poor," said Rozelle.

But the changes feel painful for many urban dwellers, particularly retirees, civil servants and migrants, like Yao, whose incomes haven't kept pace. And the discontent that a widening gap between privileged and poor can generate deeply worries China's communist leaders, who are mindful that the anti-government protests that toppled Egypt's government earlier this year were triggered in part by discontent over climbing food costs.

Yao says he envies people who can eat what they like without concern for cost, but tries not to dwell on it.

"Yes, it's unfair," he said. "But I know I just have to keep going. I have to work hard and it will get better."

Even those benefiting from China's rising prosperity such as Zhong, the Beijing architect, are concerned.

"Their incomes are not rising as fast so for them this is difficult," he said. "I think the government needs to find a way to help them raise that sector's incomes too, and take care of them."

The Associated Press

The lives of Yao Qizhong, above, and the Zhong household show a stark contrast as China emerges as an economic powerhouse. Food prices in China have soared in recent months. Yao left the countryside for Beijing two decades ago, but he still maintains the peasant eating habits of his boyhood. He spends about $92 a month to feed himself, his wife and three children. Below, Zhong Sheng, left, a Beijing architect, enjoys a dinner with his daughter, Chuhan, and wife, Li Mingxia, right. Zhong spends $307 a month on food for his family of three.

WYMER

From A13

more than 30 other hotels in California, Texas, the Midwest and Southeast.

The $25 million hotel would join others in the Ontario/Rancho Cucamonga market that primarily cater to business travelers.

Existing hotels include Hilton Ontario Airport — Embassy Suites is a Hilton Hotels brand — which is only a short distance north of the new Embassy site along Ontario's Haven Avenue.

Sun Development executives are confident the Ontario market is ready for another hotel, said Wymer, who discussed the process of opening a new hotel.

Question: There is a Hilton nearby. How was the decision made to bring an Embassy Suites to Ontario?

Answer: Primarily, the market was really in need of a full-service, all-suite product ... Really it was just one of these pieces that was missing in the marketplace out here. Our owners really like the Embassy Suites product, with all the amenities that are added.

Q: How are you marketing the property before opening?

(The hotel's sales director, Jennifer M. Keef, answered this question.)

A: Mostly through direct sales, office prospecting ... What we call blitzing.

We've been to 500 companies. We do both chambers of commerce, Ontario and Rancho Cucamonga.

Q: Who is your target customer?

A: During the week, it's going to be predominantly corporate clients. During the weekend, it's going to be your family and recreational markets. Your "SMERF." (Social/ Sports, Military, Education, Religious, Fraternal)

Q: Does the airport politics between Los Angeles and Ontario affect your business plan at all?

A: Not yet. Obviously, we would like it to be under the jurisdiction of the city of Ontario. Obviously, smaller, closer to home, but we're going to work with whoever operates the airport.

Q: Is it a concern that most of the surrounding land is undeveloped?

A: Not at all. It's an area of opportunity for us.

andrew.edwards@inlandnewspapers.com
909-483-8550

SHAPIRO

From A13

some he shakes his head at as he looks back. Thirty years later, Shapiro is an established Inland Empire personal-injury attorney and is far more picky.

He can afford to be. Last year, he clinched a $26 million verdict on a double fatal wrongful death case that he had been handling for a family from Hemet since 2004. In the case, a trucking company continued using a truck after its driver told the company the brakes were faulty. One day, the brakes failed and the truck plowed head-on into a van, killing the mother and one of her twin daughters.

"I loved helping this family," Shapiro said. "It was rewarding."

His business has not been affected by the economic downturn, he said, as tragedies still happen. Other areas of law, such as real estate and divorce, have seen significant dropoffs, said Thomas Dominick, a partner at Fullerton, Lemann, Schaefer & Dominick in San Bernardino.

Dominick said he has worked on cases with Shapiro. The longtime catastrophic-injury attorney brings his trial talent to the Newport Beach firm, Dominick said.

"He's one of the most down-to-earth litigators that you will ever see as far as how he's able to talk to juries," Dominick said. "He presents his case on a level that they understand."

Shapiro, a former president of the San Bernardino County Bar Association, now serves as a mentor to young attorneys. And he's looking forward to a greater variety in cases and collaboration with his new colleagues on national cases.

"It's interesting because when you become partners, it's like getting married," Shapiro said. "No longer am I the end-all ... (But) I wouldn't have done it if I didn't feel good about it and thought it would be a successful partnership."

rebecca.cho@inlandnewspapers.com
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STULL

From A13

fraction of the cost to buy new. While it took longer to get the business started, they were able to get the business started with their limited capital and ended up with custom-built production equipment that outperformed what they could buy from the manufacturer.

Have a problem-solving orientation. Successful entrepreneurs are consummate problem-solvers. They understand that each day will bring new problems and they relish the opportunity to solve them.

Strong belief system. I have asked almost every entrepreneur I have met, "Did you think you might fail?" Amazingly, nearly all have responded that failure never was really something they considered. Most knew that they did not want to fail, but never believed that they would not do well. Successful entrepreneurs focus on the opportunity before them and believe strongly that their dedication, hard work and creativity will pay off. Garner Holt, who founded Garner Holt Productions while in high school, says, "I never believed I wouldn't be successful." He turned his fledgling company into the world's leader in animatronics design and production based on that mindset.

Perseverance. Being an entrepreneur is not easy. There will be highs and lows, and even in the best of times growing and sustaining a business is demanding. Those that are determined and persevere in the face of the challenges are the ones more likely to be successful in the long run.

While not an exhaustive list, these factors should guide your thinking if you are considering starting a business. Being an entrepreneur is not for everyone, but for those that pursue that path in life the rewards are often great and the experience fulfilling.

Mike Stull is the director of the Inland Empire Center for Entrepreneurship at Cal State San Bernardino.

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DOWNTOWN SAN BERNARDINO
PASSENGER RAIL PROJECT

CALIFORNIA ENVIRONMENTAL QUALITY ACT
SCOPING MEETING NOTICE

JOIN US!
San Bernardino Associated Governments will host a public scoping meeting on the Downtown San Bernardino Passenger Rail Project on Tuesday, May 17, 2011. As part of the project, two Metrolink tracks, fully signaled, may be extended one mile from the Santa Fe Depot in San Bernardino to the planned San Bernardino Transit Center in the downtown area in Rialto Avenue and E Street.

The purpose of the scoping meeting is to solicit input from the public, which will assist SANBAG in determining the scope of the environmental issues that need to be addressed in the environmental impact report being prepared for the project. This process will help ensure issues are identified early and properly studied.

The meeting will be an opportunity for the public to learn about the purpose of the project, area, and timeline. A presentation and displays illustrating key parts of the projects will be available to review.

CONTACT INFORMATION
If you have questions, please contact Jane Dreher, San Bernardino Associated Governments Public Information Officer, at (909) 884-8276. Or, visit our website at www.sanbag.ca.gov.

Governments SANBAG Working Together

The meeting will be held at the following date, time and location:
Tuesday, May 17, 2011
5:00 - 7:00 p.m.
Presentation at 5:15 p.m.
Santa Fe Depot
1170 West 3rd Street
San Bernardino, CA 92410

SUPERVISOR NEIL DERRY TIENE RIVAL EN ELECCIONES

Neil Derry

James Ramos

CONDADO DE SAN BERNARDINO: El líder de la tribu San Manuel, James Ramos, anunció que se postula al cargo de supervisor del distrito.

POR IMRAN GHORI
THE PRESS-ENTERPRISE

Dando inicio a lo que se perfila como una polémica campaña electoral, James Ramos, presidente de la Tribu Indígena San Manuel, anunció que será el contrincante de Neil Derry, supervisor del distrito, en las elecciones que se harán el próximo año para elegir la junta del Condado de San Bernardino.

Ramos, miembro de la junta directiva de la Universidad Comunitaria San Bernardino, dijo que lleva algunos meses considerando la idea de participar en la contienda electoral pero que la decisión se tomó urgente cuando hace unas semanas supo de la acusación penal presentada contra Derry.

Ramos dijo que "el público no puede confiar en sus gobernantes cuando se dan acusaciones contra personas clave que ostentan cargos gubernamentales y estas deben excusarse de asumir importantes obligaciones o emitir su voto porque tienen problemas legales".

Hace unos días, Derry anunció que se evitará votar en asuntos que tienen que ver con fondos federales debido a la acusación penal que el fiscal del distrito presentó en su contra el 26 de abril.

Una disposición de la ley federal que permite que se retenga fondos federales cuando un miembro de un consejo de administración enfrenta cargos criminales ha aumentado la preocupación acerca de si la situación de Derry podría poner en peligro la asignación de los fondos.

Derry, que no ha sido arrestado y será instruido de cargos el 9 de junio, fue acusado de perjurio y de presentar una denuncia falsa, ambos delitos graves, y de un cargo menor por no reportar una contribución de campaña política.

Ramos será un oponente influyente y bien financiado contra Derry. Ramos está cumpliendo su segundo mandato de dos años como presidente de la Tribu San Manuel de la Misión de Indios, la cual opera un casino cerca de Highland. La tribu es uno de los principales donantes a los funcionarios electos a nivel estatal y un importante contribuyente a las instituciones de beneficencia.

A pesar de que describe la restauración de la fe en el gobierno como uno de los motivos para su candidatura, Ramos dijo que no tiene previsto centrarse en los escándalos de corrupción que han afectado al condado. Dijo que su primera prioridad será la creación de fuentes de empleo.

Ramos dijo que "de alguna manera tenemos que superar esta crisis y seguir adelante para hacer de nuestro condado lo que fue alguna vez".

Derry atacó de inmediato a Ramos en un comunicado de prensa. Describió a Ramos como un "jefe de casino" y cuestionó que si en su calidad de líder de una nación india soberana, podría realizar funciones de supervisor.

"Un funcionario electo no puede tener dos patronos", dijo Derry. "¿Cómo puede Ramos rendir cuentas de sus actos cuando está protegido por sus propios tribunales tribales y está recibiendo lucrativas exenciones de impuestos especiales que no están disponibles para casi nadie más en San Bernardino?".

Derry se pregunta si Ra
paga impuestos a la renta y
propiedad y pidió a su contrinc
que haga públicos sus pago
impuestos. Derry dijo que mo
ría los suyos también.

Dave Gilliard, consultor de
paña de Ramos, dijo que las ac
ciones de Derry son falsas y
éste es un camino muy ofens
que ha adoptado Neil Derr
hacer esas declaraciones".

Ramos paga impuestos a la
al gobierno federal y paga imp
to a las ventas y a la propieda
las casas que tiene en Big
Lake y Yucaipa, informó Gil
También tiene una casa e
reserva de su tribu, donde
registrado para votar.

Ramos estuvo acompañado
algunos funcionarios del Dist
al hacer su anuncio en la
exterior del Centro de Gobiern
condado. Entre ellos estaban
Morris, alcalde de San Bernar
Pedro Aguilar, alcalde de Redl
y Dick Riddell, alcalde de Yuc

El "Dream Act" vuelve al Congreso

INMIGRACION: Congresistas presentan un nuevo ley que permitiría la legalización de los estudiantes indocumentados que llegaron siendo niños.

AGENCIA EFE

Un grupo de legisladores demócratas presentó miércoles al Congreso de EEUU un nuevo proyecto de ley sobre el "Dream Act", que permitiría la legalización de los estudiantes indocumentados que llegaron a Estados Unidos siendo niños.

Así lo explicó hoy el líder de la mayoría demócrata del Senado, Harry Reid, en una conferencia de prensa en la que estuvo acompañado por el senador Dick Durbin, promotor de la ley, y los senadores Robert Menéndez y Richard Blumenthal, que apoyan la iniciativa.

El proyecto de ley del "Dream Act" ha sido impulsado una y otra vez desde 2001 sin éxito, de manera que una década después sigue pendiente la legalización de los estudiantes indocumentados en EEUU.

Este nuevo impulso a la ley llega justo el día después del discurso sobre inmigración del presidente Barack Obama en El Paso, en el que instó al Congreso a aprobar la reforma migratoria y reafirmó su compromiso de luchar por el "Dream Act".

De prosperar finalmente en esta ocasión, la ley regularizaría el estatus migratorio de decenas de miles de jóvenes indocumentados que han crecido en EEUU.

Para obtener la legalización, los jóvenes tienen que haber llegado al país con 15 años o menos, tener un "buen carácter moral", haberse graduado de secundaria, y llevar al menos dos años en la universidad o en las Fuerzas Armadas.

Asimismo, los jóvenes que aspiren a alcanzar la regularización tienen que acreditar que han vivido en EEUU de manera continua en los últimos cinco años.

"Lo que ocurre ahora es que hacemos grandes inversiones en su educación, y cuando llega la hora de que ellos comiencen a devolver ese dinero al país con su trabajo, les decimos que se vayan", lamentó Menéndez en su alocución.

Según estudios independientes, el "Dream Act" aportaría millones de dólares a las arcas del estado y contribuiría a reducir el déficit.

La economía y la seguridad son dos de los argumentos que emplean tanto los legisladores demócratas como el propio presidente Obama para intentar convencer a la oposición republicana y a los demócratas que rechazan esta medida de interés nacional de la misma.

Asimismo, los legisladores demócratas que promueven la ley se esfuerzan en subrayar que la norma contempla todas las restricciones para prevenir un eventual abuso.

"Esto no es una puerta abierta para que pase quien quiera. Es la oportunidad de que estos chicos, que no quieren estar en ningún otro país que no sea este, en el que han crecido, cumplan su sueños", afirmó Menéndez.

La cámara alta rechazó el pasado diciembre con 55 votos en contra y 41 a favor la ley, que sumó así una derrota más a una década de trayectoria sin éxito en el Congreso estadounidense.

El "Dream Act", acrónimo en inglés de "Fomento para el progreso, alivio y educación para menores extranjeros", está considerada como una de las piezas clave de la reforma migratoria.

Reid subrayó en su intervención que el debate sobre esta ley no es
"concurso entre demóc
y republicanos", por lo
instó a la oposición a qu
apoye en una iniciativa q
su juicio, "necesita el p

Durante la conferenc
prensa, se pudo oír el
monio de una joven
grante nigeriana que
ser la primera de su pr
ción durante sus estudi
quien representa, segú
legisladores, sólo un eje
de los miles de chicos
necesitan el "Dream
para continuar trabaj
por sus sueños.

El futuro de la ley que
ha vuelto al Congres
parece muy halagüeño
gún dijeron a Efe v
asociaciones hispanas,
que los republicanos co
lan la Cámara de R
sentantes y claman
mano dura con los in
mentados.

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APPENDIX B AIR QUALITY AND GREENHOUSE GAS TECHNICAL MEMORANDUM

DOWNTOWN SAN BERNARDINO PASSENGER RAIL PROJECT
Air Quality and Greenhouse Gas Technical Memorandum

San Bernardino, San Bernardino County, California

August 2012

Prepared for:

Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, CA 94105

San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92602

Prepared by:

ICF International
3550 Vine Street, Suite 100
Riverside, CA 92507

With technical assistance from:
HDR Engineering, Inc.
2280 Market Street, Suite 100
Riverside, CA, 92501

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Acronyms

$\mu g/m^3$	micrograms per cubic meter
AAQS	ambient air quality standards
AB	Assembly Bill
ACMs	asbestos-containing materials
ADT	average daily trips
APE	area of potential effects
AQMPs	air quality management plans
ARB	California Air Resources Board
BACT	Best Available Control Technology
BNSF	Burlington Northern Santa Fe
CAA	federal Clean Air Act
CAAQS	California's ambient air quality standards
CAFE	Corporate Average Fuel Economy
CAPCOA	California Air Pollution Control Officers Association
CCAA	California Clean Air Act
CH_4	methane
City	City of San Bernardino
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalents
CPUC	California Public Utilities Commission
cy	cubic yards
Depot	San Bernardino Metrolink Station/Santa Fe Depot
DPM	Diesel Particulate Matter
DSBPRP or Project	Downtown San Bernardino Passenger Rail Project
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
FR	Federal Register
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
g/bhp-hr	grams per brake-horsepower-hour
g/gallon	grams per gallon
GHG	greenhouse gas
GVWR	Gross Vehicle Weight Rating
H_2S	Hydrogen Sulfide
HAP	hazardous air pollutants
HC	Hydrocarbons

HFCs	Hydroflourocarbons
HHDT	Heavy-Heavy Duty Trucks
HI	hazard index
HRA	Health Risk Assessment
IRIS	Integrated Risk Information System
LOS	Level of Service
MATES III	Multiple Air Toxics Exposure Study III
mg/m^3	milligrams per cubic meter
MICR	maximum individual cancer risk
mph	miles per hour
MPO	metropolitan planning organization
MSAT	mobile source air toxics
MMT	million metric tons
MT	metric tons
$MTCO_2e$	metric tons of carbon dioxide equivalent
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NATA	National Air Toxics Assessment
NGOs	nongovernmental organizations
NHTSA	National Highway Traffic Safety Administration
NO	nitric oxide
NO_2	nitrogen dioxide
O_3	ozone
ODCs	Ozone Depleting Compounds
OEHHA	Office of Environmental Health Hazard Assessment
Pb	Lead
PFCs	Perfluorocarbons
PM	particulate matter
PM10	particulate matter less than 10 microns in diameter
PM2.5	particulate matter less than 2.5 microns in diameter
ppm	parts per million
PTC	positive train control
RCPG	Regional Comprehensive Plan and Guide
REL	reference exposure level
RfDs	reference doses
ROG	reactive organic gas
RTC	Rail Traffic Controller
RTIP	Regional Transportation Improvement Program
RTP	regional transportation plan

SANBAG	San Bernardino Associated Governments
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCRRA	Southern California Regional Rail Authority
SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
SRA	Source Receptor Area
TACs	toxic air contaminants
TCMs	transportation control measures
TIP	transportation improvement program
USDOT	U.S. Department of Transportation
V/C	vehicle to capacity
VMT	vehicle-miles traveled

EXECUTIVE SUMMARY

The Downtown San Bernardino Passenger Rail Project (DSBPRP or Project) would reconstruct rail infrastructure along the existing freight-only Redlands Subdivision to provide a double track for the route and grade-crossing improvements at five locations. In addition, the Project would extend the existing Metrolink service to new rail platforms at E Street and Rialto Avenue. North of the proposed rail platforms is the Omnitrans Bus Facility, which will be served by existing fixed-route bus services, and a bus rapid transit line.

The Project would increase regional mass transit opportunities that would provide an alternative to single-occupancy-vehicle travel within the region. The Project would result in increased diesel-powered train activity within the region and would result in motor vehicle trips to the park and ride lot. Additionally, by providing mass transit opportunities, the Project would remove a number of single-occupancy-vehicles within the transportation network, resulting in a decrease in regional vehicle miles traveled (VMT).

This report presents the results of the air quality and greenhouse gas impact analysis conducted for the Project, along with background information and a discussion of methodology. The analyses findings are as follows:

- The Project has conformity with portions of the Federal Transportation Improvement Program (FTIP) and Regional Transportation Improvement Program (RTIP). The rail portion of the project is listed in the Southern California Association of Governments (SCAG) 2011 FTIP, including the Rialto and E Street rail platforms and track improvements (project number 200809) and as part of the larger Redlands Passenger Rail Project (project number 20061012). The Project is listed in the 2008 RTIP as "Metrolink Commuter Rail" (project number 4CR04) and in the 2008 RTP as project ID 4TR0101, as part of the 10-mile "San Bernardino-Redlands Extension." Additionally, the Omnitrans portion of the project is included in the 2008 RTP Amendment #1 and 2008 RTIP Amendment #08-01 Project Listing as project ID 200625 with description "E Street Transit Corridor – from San Bernardino to Loma Linda." The Amendments were adopted by SCAG on December 4, 2008. The design concept and scope of the Omnitrans facility have not changed materially from what was analyzed in the adopted Amendments to 2008 RTP and 2008 RTIP. The 2008 RTP is currently being updated, and the Draft 2012 RTP and EIR were released and are currently undergoing public review. Therefore, since the Project is listed in a federally approved FTIP and RTP, and the design concept and scope of the proposed action have not changed from what was analyzed for air quality conformity, the Project is therefore considered a conforming transportation project.
- The Federal Highway Administration (FHWA) and U.S. Environmental Protection Agency (EPA) guidance identifies examples of projects that are most likely Projects of Air Quality Concern (POAQCs) and details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to generate new air quality violations, worsen existing violations, or delay attainment of national ambient air quality standards (NAAQS) for particulate matter (PM) less than 10 microns in diameter (PM10) and less than 2.5 microns in diameter (PM2.5). The proposed Project is not considered a POAQC for PM10/PM2.5, and the federal Clean Air Act (CAA) and 40 CFR 93.116 requirements were met without a hot-spot analysis. Confirmation of this determination was made during interagency consultation with the SCAG Transportation Conformity Group, and on July 24, 2012, the SCAG Transportation Conformity Group determined that the Project was not a POAQC.
- The Project would not exceed SCAQMD regional significance thresholds for any criteria pollutants during construction activities, and no mitigation is proposed.

- The Project would not exceed SCAQMD regional significance thresholds for any criteria pollutants during operations, and no mitigation is proposed.
- The Project would not exceed SCAQMD localized significance thresholds for any criteria pollutants during construction and operational activities, and no mitigation is proposed.
- The Project would not result in violations of carbon monoxide national ambient air quality standards (NAAQS) or California ambient air quality standards (CAAQS) during operations, and no mitigation is proposed.
- The Project would not expose nearby residents, workers, or recreationalists to increased health risk, and estimated cancer and non-cancer health risks are below SCAQMD thresholds. No mitigation is proposed.
- The Project would not generate a significant contribution of greenhouse gas (GHG) emissions towards climate change in excess of SCAQMD threshold levels or the CEQ reference point. No mitigation is proposed.

1.0 OVERVIEW

This technical air quality and greenhouse gas report describes the regulatory framework, existing air quality conditions, analysis approach, and the impact assessment and mitigation measures for the Downtown San Bernardino Passenger Rail Project (DSBPRP or Project).

1.1 PROJECT DESCRIPTION

SANBAG is proposing to extend Metrolink regional passenger rail service approximately 1 mile east from its current terminus at the existing Depot located at 1170 West 3rd Street to new Metrolink commuter rail platforms proposed near the intersection of Rialto Avenue and E Street in the City of San Bernardino, San Bernardino County, California (see Figures 1-1 and 1-2). The primary features of the proposed project include: construction of a second track, rail platforms, parking lots, a pedestrian overpass at the Depot, an Omnitrans Bus Facility, and grade crossing improvements; railroad signalization; and roadway closures. The proposed Project's secondary features include: construction of drainage improvements, utility accommodation, new parking facilities, and implementation of safety controls. Figure 1-3 depicts the area of potential effects (APE)/Project Study Area and primary project components. The project components include the following:

Track Improvements: Track improvements include realignment of the existing railroad track and construction of a second track parallel to the existing track, extending from the Depot to the proposed rail platforms near Rialto Avenue and E Street. The Project also includes realignment and reconstruction of the two mainline tracks at the Depot and improvements to the Burlington Northern Santa Fe (BNSF) Railway Short Way.

San Bernardino Metrolink Station/Santa Fe Depot: The Project involves track and platform, pedestrian access, and parking lot improvements at the Depot. An Americans with Disabilities Act–compliant pedestrian overpass bridge would be constructed at the Depot, possibly in the Mission Revival architectural style. Two new platforms would be constructed north of the Depot, with new benches, canopies, platform amenities, ticket vending machines, lighting, and closed-circuit television security cameras that would serve both Metrolink and Amtrak passengers. In addition, minor interior and exterior improvements are proposed for the Depot that include the following: (1) installation of new window awnings, (2) new exterior and interior wayfinding signage for bathrooms and SANBAG/SCAG/Whistle Stop Cafe/Museum, (3) new clock in the lobby, (4) new sign in the lobby that details the railroad's role in creating time zones, and (5) new monument sign and flagpole to be placed at the Depot entrance.

The parking lot located directly east of the Depot would be reconfigured to accommodate additional vehicles and landscaping, necessitating the realignment of 3rd Street.

Proposed Rail Platforms: The Project includes the installation of three new station platforms, canopies, platform amenities, ticket vending machines, lighting, and closed-circuit television security cameras near the intersection of Rialto Avenue and E Street. A new 245-space parking lot would be constructed directly south of the platforms to accommodate both train crews and Metrolink passengers. The vacant site to the north of the proposed rail platforms may be used as a staging area for the Project. A temporary Southern California Regional Rail Authority (SCRRA) crew building is also proposed for use during construction.

Omnitrans Bus Facility: The Omnitrans bus facility would include up to 22 bus bays and a bus circulation roadway with bus turnouts, as well as frontage street access improvements, pedestrian access improvements (e.g., crosswalks), and associated support facilities (e.g., security and lighting).

Pedestrian Connection to ~~the Arrowhead Credit Union Park~~ San Manuel Stadium: A lighted pedestrian pathway that would connect the proposed rail platforms to ~~Arrowhead Credit Union Park~~ San Manuel Stadium may be included as part of the Project. The following amenities would be provided: park benches, trash disposals, and bicycle racks.

Street Improvements:[1] The intersection of K Street and 3rd Street would be reconfigured as the west leg of a new T intersection. I Street at Rialto Avenue would be converted to a cul-de-sac on the south side, with the north leg of the intersection converted to a right-in/right-out configuration. Other improvements may be proposed.

Rail Alignment at I-215 Freeway: The I-215 freeway overpass was designed and constructed to accommodate the existing single track alignment within the Redlands Subdivision and would necessitate the use of compound horizontal curves in order to maintain a side clearance. The new corridor pier walls on the east side of the freeway constrict the overpass's opening width, which would necessitate the use of compound horizontal curves in order to maintain a side clearance.

Grade Crossings: Four existing at-grade crossings would be reconstructed to accommodate the second track, raised medians, and widened sidewalks (3rd Street, 2nd Street, Rialto Avenue/I Street, and G Street).

Parcel Acquisitions and Relocations: Acquisition of additional rights-of-way along the alignment would be required. This may require up to ~~70~~69 partial and full parcel acquisitions, as well as easements (i.e., roadway, temporary construction, sidewalk, utility, and alley vacations). Some of the parcels that would be acquired support active businesses and inhabited residences, which would require relocation.

Drainage Facility Improvements: A system of perforated underdrains and ditches would be constructed adjacent to the tracks to convey stormwater to the existing storm drain system. Catch basins at four crossings would also need to be relocated to accommodate proposed roadway improvements. Detention basins adjacent to the ~~Arrowhead Credit Union Park~~San Manuel Stadium are also proposed.

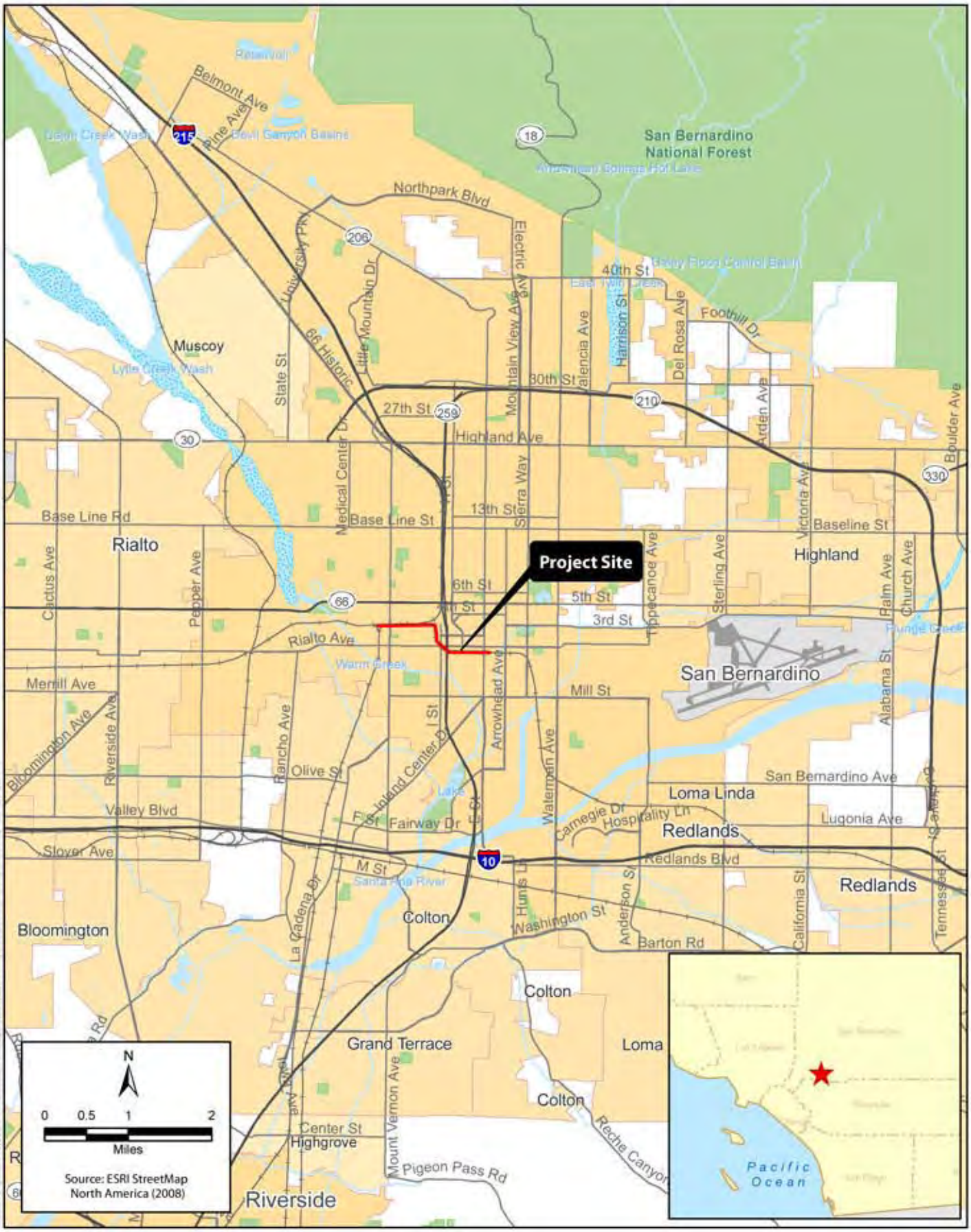
Utility Replacement and Relocation: Existing subsurface water, sewer, storm drain, power, gas, fiber optic, and telephone lines that cross the tracks would be evaluated for conformance with Metrolink engineering standards. Overhead utilities, such as power and communication lines, would be raised if they fail to meet Metrolink's overhead clearance requirements. Railroad signal houses and streetlights would be relocated to accommodate the second track.

Relocation of Monitoring Wells: Fourteen groundwater monitoring wells located within the project APE would remain in place. However, four existing groundwater monitoring wells located within the project APE may need to be closed and four may need to be relocated due to their location within the railway.

Operational Controls (Rail Signals): Safety controls, including new traffic signals, railroad signal equipment (compatible with Metrolink's and BNSF's new positive train control [PTC] systems), and railroad/pedestrian crossing equipment, would be provided at each at-grade railroad crossing.

Rail Operations: An operating plan has been developed using Rail Traffic Controller (RTC) modeling and an operational analysis based on input from SANBAG, Metrolink, Amtrak, and BNSF personnel. Metrolink operations between the Depot and the new rail platforms are projected to start in early 2014.

[1] The Interstate 215 widening project, under construction in 2010–2011, will convert I Street south of 3rd Street to a cul-de-sac. That project is separate from the proposed Project.

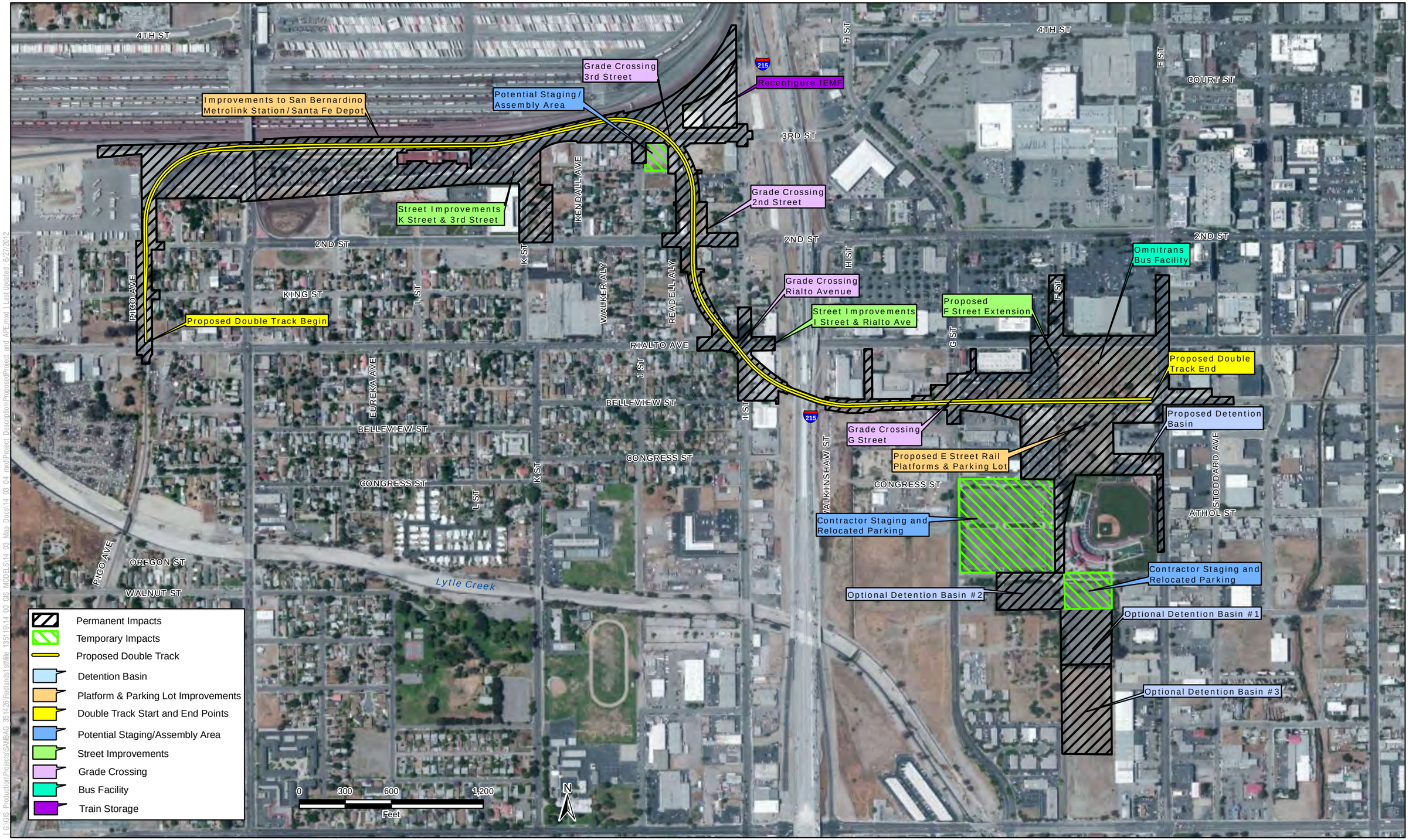


ICF INTERNATIONAL

Figure 1-1
Regional Location

Downtown San Bernardino Passenger Rail Project

Figure 1-2
Project Location
Downtown San Bernardino Passenger Rail Project



Source: HDR (2012), Bing (2012)

Figure 1-3
Project Study Area and Primary Project Components
Downtown San Bernardino Passenger Rail Project

Maintenance: Typical railroad maintenance and inspections would be conducted throughout the operational phase of the Project in accordance with SCRRA/Metrolink, BNSF, and Amtrak standard practices.

1.2 PROJECT DESIGN OPTIONS

This analysis includes the proposed Project in addition to three design options: Pedestrian Overpass Design Options 1A and 1B, Pedestrian Underpass Design Option 2, and 3rd Street Open Design Option 3. The Pedestrian Overpass Design Options 1A and 1B and the Pedestrian Underpass Design Option 2 would be designed to minimize visual effects on the Santa Fe Depot's historic façade. All other railway and station improvements proposed as part of the Project would remain the same. The 3rd Street Open Design Option 3 would not require 3rd Street to be closed and would instead upgrade the at-grade crossing between J Street and I Street. All other railway and station improvements proposed as part of the Project would remain the same.

The proposed Project and Project Design Options would all meet the project's objectives, purpose, and need, which is to extend Metrolink regional passenger rail service approximately 1 mile east to downtown San Bernardino. This would involve construction of a second track, rail platforms, parking lots, a pedestrian overpass at the Depot, a bus facility, and grade crossing improvements; railroad signalization; and roadway closures. However, after review of all adverse and beneficial environmental effects and upon review of the comments received during the public circulation period, SANBAG has chosen the proposed Project as the preferred alternative.

2.0 REGULATORY FRAMEWORK

The air quality in the United States is governed by the federal Clean Air Act (CAA). In addition to being subject to requirements of the CAA, air quality in California is also governed by more stringent regulations under the California Clean Air Act (CCAA). At the federal level, the CAA is administered by the U.S. Environmental Protection Agency (EPA). In California, the CCAA is administered by the California Air Resources Board (ARB) at the state level and by air districts at regional and local levels.

2.1 FEDERAL REGULATIONS

2.1.1 Federal Clean Air Act and Ambient Air Quality Standards

The CAA, enacted in 1963 and amended several times thereafter (including the 1990 amendments known as 1990 CAA, which are the current governing regulations for air quality), establishes the framework for modern air pollution control. The EPA has established national ambient air quality standards (NAAQS) for criteria pollutants (see Table 2-1). There are six criteria pollutants: carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); ozone (O_3); two subsets of particulate matter (PM), less than 10 microns in diameter (PM10) and less than 2.5 microns in diameter (PM2.5); and lead. The NAAQS are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety, and the latter to protect environmental values, such as plant and animal life.

Table 2-1. Federal and State Ambient Air Quality Standards

Pollutant	Average Time	California Standards	National Standards	
			Primary	Secondary
O_3	1-hour	0.09 ppm	None	None
	8–hour	0.070 ppm	0.075 ppm	0.075 ppm
PM10	24-hour	50 μg/m^3	150 μg/m^3	150 μg/m^3
	Annual arithmetic mean	20 μg/m^3	None	None
PM2.5	24-hour	None	35 μg/m^3	35 μg/m^3
	Annual arithmetic mean	12 μg/m^3	15.0 μg/m^3	15.0 μg/m^3
CO	8-hour	9.0 ppm	9 ppm	None
	1-hour	20 ppm	35 ppm	None
NO_2	Annual arithmetic mean	0.030 ppm	0.053 ppm	0.053 ppm
	1-hour	0.18 ppm	0.100 ppm	None
SO_2	Annual arithmetic mean	None	0.030 ppm[2]	None
	24-hour	0.04 ppm	0.014 ppm[2]	None
	3-hour	None	None	0.5 ppm
	1-hour	0.25 ppm	0.075 ppm	None

Pollutant	Average Time	California Standards	National Standards	
			Primary	Secondary
Lead (Pb)	30-day Average	1.5 μg/m^3	None	None
	Calendar quarter	None	1.5 μg/m^3	1.5 μg/m^3
	Rolling 3-month average	None	0.15 μg/m^3	0.15 μg/m^3
Visibility-reducing Particles	8-hour	[1]	None	None
Sulfates	24-hour	25 μg/m^3	None	None
Hydrogen Sulfide (H_2S)	1-hour	0.03 ppm	None	None
Vinyl Chloride	24-hour	0.01 ppm	None	None

[1] The California Ambient Air Quality Standards (CAAQS) for visibility-reducing particles is defined by an extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70%.

[2] The Annual and 24-Hour NAAQS for SO2 only apply for one year after designation of the new 1-hour standard to those areas that were previously nonattainment for 24-hour and Annual NAAQS.

Notes:

ppm= parts per million

μg/m^3 = micrograms per cubic meter

mg/m^3= milligrams per cubic meter

Source: ARB 2012a

Transportation Conformity

Under the 1990 CAA, the U.S. Department of Transportation (USDOT) cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP) for achieving the goals of the CAA requirements. Conformity with the CAA takes place on two levels—first at the regional level, and second at the project level. The proposed Project must conform at both levels to be approved.

At the regional level, EPA transportation conformity regulations require that the project be included in a currently conforming regional transportation plan (RTP) and transportation improvement program (TIP) at the time of project approval. Using the projects included in the RTP, an air quality model is run to determine whether the implementation of those projects would conform to emission budgets or other tests showing that federal CAA attainment requirements are met. If the conformity analysis is successful, metropolitan planning organizations (MPO), such as the Southern California Association of Governments (SCAG), and the appropriate federal agencies, such as the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), make the determination that the RTP and TIP are in conformity with the SIP for achieving NAAQS goals. Otherwise, the projects in the RTP and TIP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as those described in the RTP and TIP, the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project level requires hot-spot analysis if a region is designated nonattainment or maintenance for CO and/or PM. Hot-spot analysis is essentially the same, for technical purposes, as CO or PM analysis performed for NEPA purposes. In general, projects must not cause the CO or PM standards to be violated, and in nonattainment regions the project must not cause any increase in the number and severity of violations. If known CO or PM violations are located in the project vicinity, a project must include measures to reduce or eliminate the existing violations as well.

With respect to NAAQS, the Project is located in an area designated extreme nonattainment for ozone, serious nonattainment for PM10, nonattainment for PM2.5, serious maintenance for CO, and attainment for NO_2, SO_2, and lead (see Table 2-2). Therefore, conformity applies to the proposed Project.

Table 2-2. Federal and State Attainment Status for the San Bernardino County Portion of the South Coast Air Basin

Pollutants	Federal Classification	State Classification
O_3 (1-hour standard)	--	Nonattainment
O_3 (8-hour standard)	Extreme Nonattainment	--
PM10	Serious Nonattainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
CO	Serious Maintenance	Attainment
NO_2	Unclassified/Attainment	Nonattainment
SO_2	Attainment	Attainment
Pb	Attainment *	
*Note that while the Los Angeles portion of the South Coast Air Basin (SCAB) is considered nonattainment with respect to Pb, the San Bernardino County portion of the SCAB is considered attainment. Source: ARB 2011a, EPA 2011a.		

2.1.2 EPA Clean Air Nonroad Diesel Rule

To reduce emissions from off-road diesel equipment, the EPA established a series of increasingly strict emission standards for locomotive engines. In 2008, the EPA finalized a three part program that will dramatically reduce emissions from line-haul, switch, and passenger rail diesel locomotives based on the following compliance schedule:

- Tier 0-2 standards—More stringent emission standards for existing locomotives when they are remanufactured,
- Tier 3 standards—Near-term engine-out emission standards for newly-built and remanufactured locomotives. Tier 3 standards are to be met using engine technology. These standards were phased in starting in 2009.
- Tier 4 standards—Longer-term standards for newly-built and remanufactured locomotives. Tier 4 standards are expected to require the use of exhaust gas after-treatment technologies, such as particulate filters for PM control, and urea-based (diesel exhaust fluid)-selective catalytic reduction for nitrogen oxides (NO_X) emission control. These standards take effect in 2015.

2.1.3 Federal Hazardous Air Pollutant Regulations

The CAA identified 188 pollutants as being air toxics, which are also known as hazardous air pollutants (HAP). From this list, the EPA identified a group of 21 toxics as mobile source air toxics (MSAT) in its final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 *Federal Register* 17235) in March 2001. From this list of 21 MSATs, the EPA has identified seven MSATs (acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter) as being priority MSATs. To address emissions of MSATs, the EPA has issued a number of regulations that have and will continue to dramatically decrease MSATs through cleaner fuels and cleaner engines.

2.1.4 Federal Greenhouse Gas Regulations

Although there is currently no federal overarching law specifically related to climate change or the reduction of greenhouse gases (GHGs), the EPA is developing regulations under the CAA that may be adopted pursuant to the EPA's authority under the CAA in the next 2 years. Foremost among recent developments have been the settlement agreements between the EPA, several states, and nongovernmental organizations (NGOs) to address GHG emissions from electric generating units and refineries; the U.S. Supreme Court's decision in *Massachusetts v. EPA;* and the EPA's "Endangerment Finding," "Cause or Contribute Finding," and Mandatory Reporting Rule. Although periodically debated in Congress, no federal legislation concerning greenhouse gas limitations is likely until at least 2013, if then. Figure 2-1 displays a timeline of key state and federal regulatory activity.

Massachusetts, et al. vs. U.S. Environmental Protection Agency (2007)

Twelve U.S. states and cities, including California, in conjunction with several environmental organizations sued to force the EPA to regulate GHGs as a pollutant pursuant to the CAA in *Massachusetts, et al. v. Environmental Protection Agency* 549 US 497 (2007). The court ruled that the plaintiffs had standing to sue, GHGs fit within the CAA's definition of a pollutant, and the EPA's reasons for not regulating GHGs were insufficiently grounded in the CAA.

U.S. Environmental Protection Agency Mandatory Reporting Rule for GHGs (2009)

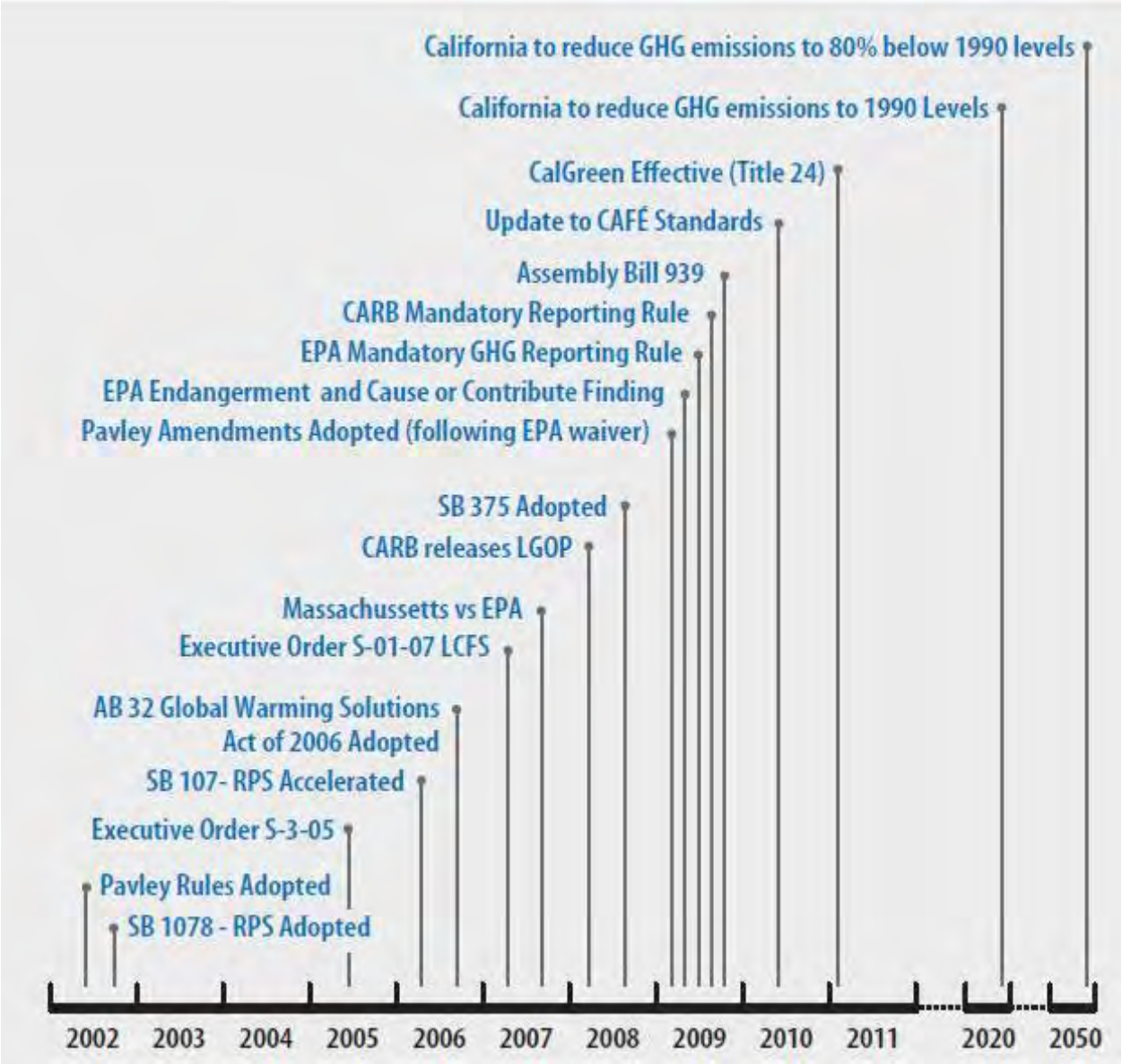
On September 22, 2009, EPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), which required EPA to develop "mandatory reporting of greenhouse gasses above appropriate thresholds in all sectors of the economy…" The Reporting Rule applies to most entities that emit 25,000 metric tons of CO_2e or more per year. Starting in 2010, facility owners from 41 industrial categories were required to submit annual GHG emissions report with detailed calculations of facility GHG emissions. An additional 12 categories begin reporting for calendar year 2011 emissions. The Reporting Rule mandates recordkeeping and administrative requirements in order for EPA to verify annual GHG emissions reports.

Update to Corporate Average Fuel Economy Standards (2009)

The new Corporate Average Fuel Economy (CAFE) standards incorporate stricter fuel economy standards promulgated by the State of California into one uniform standard. Additionally, automakers are required to cut GHG emissions in new vehicles by roughly 25% by 2016.

The EPA, National Highway Traffic Safety Administration (NHTSA), and ARB are currently working together to on a joint rulemaking to establish GHG emissions standards for 2017 to 2025 model year passenger vehicles, which require an industry-wide average of 54.5 miles per gallon. The Interim Joint Technical Assessment Report for the standards evaluated four potential future standards ranging from 47 and 62 miles per gallon in 2025 (EPA et al. 2010). The official proposal was released by both the EPA and NHTSA on December 1, 2011. The public comment period ended on January 30, 2012 (EPA et al. 2011b).

Figure 2-1. Key Milestones in Federal and State Climate Legislation



U.S. Environmental Protection Agency Endangerment Finding and Cause or Contribute Finding (2009)

On December 7, 2009, the EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the CAA.

1. Endangerment Finding: that that the current and projected concentrations of the greenhouse gases in the atmosphere threaten the public health and welfare of current and future generations.
2. Cause or Contribute Finding: that the combined emissions of greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing EPA's proposed new corporate average fuel economy standards for light-duty vehicles, which EPA proposed in a joint proposal including the Department of Transportation's proposed corporate average fuel-economy standards. The comment period for the updated light-duty standards was recently extended to February 13, 2012.

U.S. Environmental Protection Agency and National Highway Traffic Safety Administration National Program to Cut Greenhouse Gas Emissions and Improve Fuel Economy for Medium and Heavy Duty Engines and Vehicles

On August 9, 2011, the EPA and the National Highway Traffic Safety Administration (NHTSA) announced a new national program to reduce GHG emissions and improve fuel economy for new medium and heavy duty engines and vehicles sold in the U.S. The EPA and NHTSA finalized a joint rule that established a national program consisting of new standards for engines in model years 2014 through 2018. The agencies estimate that the combined standards will reduce carbon dioxide (CO_2) emissions by about 270 million metric tons (MMT) and save about 530 million barrels of oil over the life of vehicles built for the 2014 to 2018 model years.

Council on Environmental Quality Draft NEPA Guidance (2010)

On February 19, 2010, the Council on Environmental Quality (CEQ) issued draft National Environmental Policy Act (NEPA) guidance on the consideration of the effects of climate change and GHG emissions. This guidance advises federal agencies that they should consider opportunities to reduce GHG emissions caused by federal actions, adapt their actions to climate change effects throughout the NEPA process, and address these issues in their agency NEPA procedures. Where applicable, the scope of the NEPA analysis should cover the GHG emissions effects of a proposed action and alternative actions, as well as the relationship of climate change effects on a proposed action or alternatives. The guidance identified a reference point of 25,000 metric tons per year (mty) for direct CO_2e GHG emissions as an indicator that further NEPA review may be warranted. This reference point, however, is not intended to be used as a threshold for determining a significant impact or effect on the environment due to GHG emissions. The guidance also does not propose a reference point for indirect GHG emissions. The CEQ guidance is still considered draft as of the writing of this document. (Sutley 2010.)

2.2 CALIFORNIA REGULATIONS

2.2.1 Criteria Pollutants

California Clean Air Act and Ambient Air Quality Standards

In 1988, the state legislature adopted the California Clean Air Act (CCAA), which established a statewide air pollution control program. CCAA requires all air districts in the state to endeavor to meet the CAAQS by the earliest practical date. Unlike the federal CAA, the CCAA does not set precise attainment deadlines. Instead, the CCAA establishes increasingly stringent requirements for areas that will require more time to achieve the standards. CAAQS are generally more stringent than the NAAQS and incorporate additional standards for sulfates (SO_4), hydrogen sulfide (H_2S), and vinyl chloride (C_2H_3Cl), and visibility-reducing particles. The CAAQS and NAAQS are listed together in Table 2-1.

ARB and local air districts bear responsibility for achieving California's air quality standards, which are to be achieved through district-level air quality management plans that would be incorporated into the SIP. In California, EPA has delegated authority to prepare SIPs to ARB, which, in turn, has delegated that authority to individual air districts. ARB traditionally has established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs.

The CCAA substantially adds to the authority and responsibilities of air districts. The CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The CCAA also emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The CCAA gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCMs), which are defined in the CCAA as "any strategy to reduce trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing vehicle emissions."

California Diesel Fuel Regulations

With this rule, ARB set sulfur limitations for diesel fuel sold in California for use in on-road and off-road motor vehicles (ARB 2004). Under this rule, diesel fuel used in motor vehicles except harbor craft has been limited to 500 ppm sulfur since 1993. The sulfur limit was reduced to 15 ppm on September 1, 2006. The phase-in period was from June 1, 2006, to September 1, 2006. (A federal diesel rule similarly limited sulfur content nationwide to 15 ppm by October 15, 2006.) Diesel fuel used in harbor craft in the SCAQMD was limited to 500 ppm sulfur starting January 1, 2006, and 15-ppm sulfur starting September 1, 2006.

Carl Moyer Program

The Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) is a voluntary program that offers grants to owners of heavy-duty vehicles and equipment. The program is a partnership between ARB and the local air districts throughout the state to reduce ROG, NOX, and PM air pollution emissions from heavy-duty engines. Locally, the air districts administer the Carl Moyer Program (ARB 2011b).

2.2.2 Toxic Air Contaminants

California regulates toxic air contaminants (TACs) primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). In the early 1980s, the ARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

In August 1998, the ARB identified particulate emissions from diesel-fueled engines as TACs. In September 2000, the ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce diesel PM10 (respirable particulate matter) emissions and the associated health risk by 75% in 2010 and by 85% by 2020. The plan identifies 14 measures that the ARB will implement over the next several years. Because the ARB measures are enacted before any phase of construction, the proposed Project would be required to comply with applicable diesel control measures.

The Tanner Act sets forth a formal procedure for the ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before the ARB designates a substance as a TAC. To date, the ARB has identified 21 TACs, and has also adopted the EPA's list of HAPs as TACs. In August 1998, Diesel Particulate Matter (DPM) was added to the ARB list of TACs (ARB 1998).

The Hot Spots Act requires that existing facilities that emit toxic substances above specified levels (1) prepare a toxic emission inventory, (2) prepare a risk assessment if emissions are significant (i.e. 10 tons per year or on District's Health Risk Assessment [HRA] list), (3) notify the public of significant risk levels, and (4) prepare and implement risk reduction measures. The ARB's Diesel Risk Reduction Plan outlines a comprehensive and ambitious program that includes the development of numerous new control measures over the next several years aimed at substantially reducing emissions from new and existing on-road vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). The ARB has adopted several regulations that will reduce diesel emissions from in-use vehicles and engines throughout California (ARB 2010). In some cases, the particulate matter reduction strategies also reduce smog-forming emissions such as NO_X. As an ongoing process, the ARB reviews air contaminants and identifies those that are classified as TACs. The ARB also continues to establish new programs and regulations for the control of TACs, including diesel particulate matter, as appropriate.

2.2.3 Greenhouse Gases and Climate Change

California has adopted statewide legislation addressing various aspects of climate change and GHG emissions mitigation. Much of this establishes a broad framework for the state's long-term GHG reduction and climate change adaptation program. The Governor of California has also issued several executive orders related to the state's evolving climate change policy. Of particular importance to local governments is the direction provided by the AB 32 Scoping Plan, which recommends local governments reduce their GHG emissions by a level consistent with state goals (i.e., 15% below current levels).

In the absence of federal regulations, control of GHGs is generally regulated at the state level and is typically approached by setting emission reduction targets for existing sources of GHGs, setting policies to promote renewable energy and increase energy efficiency, and developing statewide action plans. Summaries of key policies, legal cases, regulations, and legislation at the state levels that are relevant to the City are provided below. Figure 2-1 displays a timeline of key state and federal regulatory activity. Key statewide GHG regulations that are directly applicable to the proposed Project include the following.

Executive Order S-3-05

Executive Order S-3-05 is designed to reduce California's GHG emissions to 1) 2000 levels by 2010, 2) 1990 levels by the 2020, and 3) 80% below the 1990 levels by the year 2050.

Executive orders are binding only on state agencies. Accordingly, EO S-03-05 will guide state agencies' efforts to control and regulate GHG emissions but will have no direct binding effect on local government or private actions. The Secretary of the California Environmental Protection Agency (CalEPA) is required to report to the Governor and state legislature biannually on the impacts of global warming on California, mitigation and adaptation plans, and progress made toward reducing GHG emissions to meet the targets established in this executive order.

Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006/2011 Update,

AB 32 codified the state's GHG emissions target by requiring that the state's global warming emissions be reduced to 1990 levels by 2020. Since being adopted, ARB, the California Energy Commission, the California Public Utilities Commission (CPUC), and the Building Standards Commission have been developing regulations that will help meet the goals of AB 32 and EO S-03-05. The Scoping Plan for AB 32 identifies specific measures to reduce GHG emissions to 1990 levels by 2020, and requires ARB and other state agencies to develop and enforce regulations and other initiatives for reducing GHGs. Specifically, the Scoping Plan articulates a key role for local governments, recommending they establish GHG reduction goals for both their municipal operations and the community consistent with those of the state (i.e., approximately 15% below current levels).

In March 2011, a San Francisco Superior Court enjoined the implementation of ARB's Scoping Plan, finding the alternatives analysis and public review process violated both CEQA and ARB's certified regulatory program (Association of Irritated Residents, et al v. California Air Resources Board, Case No. CPF-09-509562, March 18, 2011). In response to this litigation, the ARB adopted the new CEQA document (*Final Supplement to the AB32 Scoping Plan Functional Equivalent Document*) on August 24, 2011. ARB staff re-evaluated the baseline in light of the economic downturn and updated the projected 2020 emissions to 545 MMTCO2e. Two reduction measures (Pavley I and the Renewables Portfolio Standard (12% - 20%)) not previously included in the 2008 Scoping Plan baseline were incorporated into the updated baseline, further reducing the 2020 statewide emissions projection to 507 MMTCO2e. The updated forecast of 507 MMTCO2e is referred to as the AB 32 2020 baseline. Reduction of an estimated 80 MMTCO2e are necessary to reduce statewide emissions to the AB 32 Target of 427 MMTCO2e by 2020 (ARB 2011c).

SB 375 (Steinberg), Statutes of 2008

SB 375 requires regional transportation plans, developed by MPOs, to incorporate a "sustainable communities strategy" (SCS) in their regional transportation plans that will achieve GHG emission reduction targets set by the ARB. The ARB finalized the regional targets in February 2011. SB 375 also includes provisions for streamlined CEQA review for some infill projects such as transit-oriented development. However, those provisions will not become effective until an SCS is adopted. The final targets require SCAG to identify strategies that will reduce per capita GHG emissions from passenger vehicles by approximately 8% by 2020 and 13% by 2035 over base year 2005. The new RTP, which will incorporate the SCS, is expected to be drafted for public comment in December 2011 and adopted by SCAG in April 2012 (SCAG 2011a).

Other Vehicle Efficiency Measures from ARB

The ARB has adopted or is pursuing additional measures to promote vehicle efficiency in order to reduce GHG emissions. In 2008, ARB adopted a measure concerning heavy duty vehicle aerodynamics. In 2009, ARB adopted regulations for tire pressure. ARB is also evaluating hybridization of medium-heavy vehicles and cool car design.

State CEQA Guidelines

The State CEQA Guidelines require lead agencies to describe, calculate, or estimate the amount of GHG emissions that would result from a project. Moreover, the State CEQA Guidelines emphasize the necessity to determine potential climate change effects of the project and propose mitigation as necessary. The State CEQA Guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds, but require the preparation of an environmental impact report (EIR) if "there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with adopted regulations or requirements" (Section 15064.4).

State CEQA Guidelines section 15126.4 includes considerations for lead agencies related to feasible mitigation measures to reduce GHG emissions, which may include, among others, measures in an existing plan or mitigation program for the reduction of emissions that are required as part of the lead agency's decision; implementation of project features, project design, or other measures which are incorporated into the project to substantially reduce energy consumption or GHG emissions; off-site measures, including offsets that are not otherwise required, to mitigate a project's emissions; and, measures that sequester carbon or carbon-equivalent emissions.

ARB GHG Mandatory Reporting Rule Title 17 (2009)

In December of 2007, ARB approved a rule requiring mandatory reporting of GHG emissions from certain sources, pursuant to AB 32. Facilities subject to the mandatory reporting rule must have reported their emissions from the calendar year 2009 and have had those emissions verified by a third party in

2010. In general the rule applies to facilities emitting more than 25,000 MT CO_2e in any given calendar year or electricity generating facilities with a nameplate generating capacity greater than 1 megawatt (MW) and/or emitting more than 2,500 MT CO_2e per year. Additional requirements also apply to cement plants and entities that buy and sell electricity in the state.

Western Climate Initiative/California Cap-and-Trade (2010/2011)

The Western Climate Initiative (WCI) is a collaboration of seven western states (Washington, Oregon, California, Arizona, New Mexico, Utah, and Montana) and four Canadian provinces (British Columbia, Manitoba, Ontario, and Quebec) that are working together to identify, evaluate, and implement policies to tackle climate change at a regional level. On July 27, 2010, the Partner jurisdictions of the WCI released a comprehensive strategy designed to reduce climate-warming GHG emissions, stimulate development of clean-energy technologies, create green jobs, increase energy security and independence, and protect public health. The objective of the WCI Partner jurisdictions' plan is to reduce regional GHG emissions to 15% below 2005 levels by 2020 (similar to AB 32). The regional goal will be reached by creating a market-based system that caps GHG emissions and uses tradable permits to incent development of renewable and lower-polluting energy sources; encouraging GHG emissions reductions in industries not covered by the emissions cap, thus reducing energy costs region wide; and advancing policies that expand energy efficiency programs, reduce vehicle emissions, encourage energy innovation in high-emitting industries, and help individuals transition to new jobs in the clean-energy economy. The central component of the WCI Partner jurisdictions' comprehensive strategy is a flexible, market-based, regional cap-and-trade program that encourages the most cost-effective, reliable alternatives to reduce GHG emissions (WCI 2010)1. ARB is working closely with the other members of the WCI to design a regional cap-and-trade program that can deliver GHG emission reductions within the region at costs lower than could be realized through a California-only program.

To that end, pursuant to the directives of AB 32, ARB recently approved measures on December 16, 2010, to enact a GHG Cap-and-Trade program for the state of California. The California Cap-and-Trade program would create a carbon dioxide (CO_2) market system with a GHG emissions cap that will be decreased over time. Building on the data required by the 2007 California Mandatory GHG Reporting rule, only stationary sources that emit more than 25,000 metric tons (MT) of CO_2e per year would be affected by the Cap-and-Trade program. These sources include mostly large operations such as power plants, refineries, cement plants, hydrogen production facilities, and other large, stationary sources. Official rulemaking associated with achieving this emissions cap was adopted by January 1, 2011 and adopted the final cap-and-trade regulation and adaptive management plan on October 20, 2011. The program commenced in January 2012 and compliance is set to begin in January 2013.

2.3 Regional and Local Regulations

At the local level, responsibilities of air quality districts include overseeing stationary-source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality-related sections of environmental documents required by CEQA. The air quality districts are also responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws and for ensuring that NAAQS and CAAQS are met.

[1] In February 2010, per Executive Order 2010-06, Arizona pulled out of the cap and trade proposal, citing economic worries. However, Arizona remains a member of the WCI.

ARB's Climate Change Scoping Plan also states that local governments are "essential partners" in the effort to reduce GHG emissions. The Climate Change Scoping Plan also acknowledges that local governments have "broad influence and, in some cases, exclusive jurisdiction" over activities that contribute to significant direct and indirect GHG emissions through their planning and permitting processes, local ordinances, outreach and education efforts, and municipal operations. Many of the proposed measures to reduce GHG emissions rely on local government actions. The Climate Change Scoping Plan encourages local governments to reduce GHG emissions by approximately 15 percent from current levels by 2020.

The project area falls under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The following local policies related to air quality may apply to implementation to the proposed project.

The SCAQMD has jurisdiction over an area of approximately 10,743 square miles, including all of Orange County, all of Los Angeles County except for the Antelope Valley, the nondesert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County. The South Coast Air Basin (SCAB) is a subregion of the SCAQMD jurisdiction. While air quality in this area has improved, the SCAB requires continued diligence to meet air quality standards (SCAQMD 2007).

2.3.1 Criteria Pollutants

SCAQMD Air Quality Management Plan

SCAQMD has adopted a series of air quality management plans (AQMPs) to meet the CAAQS and NAAQS. To ensure continued progress toward clean air and to comply with state and federal requirements, SCAQMD, in conjunction with the ARB, SCAG, and the EPA, updates its AQMP every 3 years. These plans require, among other emissions-reducing activities, control technology for existing sources, control programs for area sources and indirect sources, a SCAQMD permitting system designed to allow no net increase in emissions from any new or modified (i.e., previously permitted) emission sources, and transportation control measures.

The most recent AQMP is the 2007 update, which was finalized on June 1, 2007 (SCAQMD 2007). The Final 2007 AQMP addresses several federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. The 2007 AQMP builds upon the approaches taken in the 2003 AQMP for the SCAB for the attainment of NAAQS. Additionally, the AQMP highlights the significant amount of reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet federal criteria pollutant standards within the timeframes allowed under federal CAA.

The 2007 AQMP employs the most up-to-date science and analytical tools and incorporates a comprehensive strategy aimed at controlling pollution from all sources, including stationary sources, on-road and off-road mobile sources, and area sources. The 2007 AQMP also addresses several federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes, and new air quality modeling tools. Additionally, the 2007 AQMP builds on the approaches taken in the 2003 AQMP for the SCAB for the attainment of the NAAQS. However, the 2007 AQMP highlights the significant amount of reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet all NAAQS within the timeframes allowed under the federal CAA. Specifically the 2007 AQMP was prepared because the federal CAA required an 8-hour ozone nonattainment area to prepare a SIP revision by June 2007 and a PM2.5 nonattainment area by April 2008.

The 2007 AQMP proposes attainment demonstration of the federal PM2.5 standards through a more focused control of sulfur oxides (SO_X), directly emitted PM2.5, and NO_X supplemented with VOCs by 2015. The 8-hour ozone control strategy builds on the PM2.5 strategy, augmented with additional NO_X and VOC reductions to meet the standard by 2024, assuming a bump-up is obtained. A bump-up means that SCAQMD is considering requesting a voluntary reclassification. The SCAB is currently classified as a Severe-17 nonattainment area for the federal 8-hour O_3 standard with an attainment date of 2021. "Bumping up" to extreme nonattainment classification for the SCAB would extend the attainment date to 2024 and allow for the attainment demonstration to rely on emission reductions from measures that anticipate the development of new technologies or improving of existing control technologies (CAA Section 182(e)(5) measures).

The 2007 AQMP concluded that substantial emission reductions from all sources are necessary. Without aggressive measures to reduce emissions, particularly of NO_X, SO_X, VOCs, and particulate matter, attaining the 8-hour O_3 NAAQS by 2023 and the PM2.5 standard by 2014 will be very difficult.

SCAQMD adopts rules and regulations to implement portions of the AQMP. Several of these may apply to construction or operation of future development projects consistent with the Project. For example, SCAQMD Rule 403 requires implementing the best available fugitive dust control measures during active operations capable of generating fugitive dust emissions from onsite earth-moving activities, construction/demolition activities, and construction equipment travel on paved and unpaved roads. SCAQMD has published the *CEQA Air Quality Handbook (*SCAQMD 1993) to help local governments analyze and mitigate project-specific air quality impacts. This handbook provides standards, methodologies, and procedures for conducting air quality analyses in environmental impact reports and was used extensively in the preparation of this analysis. In addition, SCAQMD has published two additional guidance documents (*Localized Significance Threshold Methodology for CEQA Evaluations*, June 2003, and *Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology*, October 2006) that provide guidance in evaluating localized effects from mass emissions during construction. Both were used in the preparation of this analysis.

As of February 2012, the SCAQMD is currently drafting an update to the 2007 AQMP, 2012 Air Quality Management Plan.

SCAQMD Rules and Regulations

Through the attainment planning process, the SCAQMD develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the SCAB (SCAQMD 2011a). The SCAQMD rules most pertinent to the proposed Project are listed below. The emission sources associated with the proposed Project are considered mobile sources and locomotives. Therefore, they are not subject to the SCAQMD rules that apply to stationary sources, such as Regulation XIII (New Source Review), Rule 1401 (New Source Review of Toxic Air Contaminants), or Rule 431.2 (Sulfur Content of Liquid Fuels).

SCAQMD Rule 402—Nuisance. This rule prohibits discharge of air contaminants or other material that

- Cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public.
- Endanger the comfort, repose, health, or safety of any such persons or the public.
- Cause, or have a natural tendency to cause, injury, or damage to business or property.

SCAQMD Rule 403—Fugitive Dust. This rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area that remains visible beyond the emission source property line. During construction of the proposed Project, best available control measures identified in

the rule would be required to minimize fugitive dust emissions from proposed earth-moving and grading activities. These measures would include site prewatering and rewatering as necessary to maintain sufficient soil moisture content. Additional requirements apply to construction projects on property with 50 or more acres of disturbed surface area, or for any earth-moving operation with a daily earth-moving or throughput volume of 5,000 cubic yards or more three times during the most recent 365-day period. These requirements include submittal of a dust control plan, maintaining dust control records, and designating a SCAQMD-certified dust control supervisor.

SCAQMD Regulation XIII. This regulation sets forth pre-construction review requirements for new, modified, or relocated facilities to ensure that the operation of such facilities does not interfere with progress in attainment of the national ambient air quality standards, and that future economic growth within the SCAQMD is not unnecessarily restricted. The specific air quality goal of this regulation is to achieve no net increases from new or modified permitted sources of nonattainment air contaminants or their precursors.

In addition to nonattainment air contaminants, this regulation will also limit emission increases of ammonia and ozone depleting compounds (ODCs) from new, modified, or relocated facilities by requiring the use of best available control technology (BACT).

SCAQMD Regulation XIV. This rule specifies limits for maximum individual cancer risk (MICR), cancer burden, and noncancer acute and chronic hazard index (HI) from new permit units, relocations, or modifications to existing permit units that emit toxic air contaminants. The rule establishes allowable risks for permit units requiring new permits.

SCAQMD Rule 1403—Asbestos Emissions from Demolition/Renovation Activities. The purpose of this rule is to limit emissions of asbestos, a TAC, from structural demolition/renovation activities. The rule requires people to notify the SCAQMD of proposed demolition/renovation activities and to survey these structures for the presence of asbestos-containing materials (ACMs). The rule also includes notification requirements for any intent to disturb ACM; emission control measures; and ACM removal, handling, and disposal techniques. All proposed structural demolition activities associated with proposed project construction would need to comply with the requirements of Rule 1403.

SCAQMD Regulation XXXV. This regulation sets forth rules for railroads and railroad operations, including requiring operators to keep a record of idling events of 30 minutes or more (Rule 3501), idling restriction on freight trains (Rule 3502), and requirements for health risk assessments at rail yards (Rule 3503).

Southern California Association of Governments

Southern California Association of Governments (SCAG) is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties. It addresses regional issues relating to transportation, the economy, community development, and the environment. SCAG is the federally designated MPO for the majority of the southern California region and is the largest MPO in the nation. With respect to air quality planning, SCAG has prepared the Regional Comprehensive Plan and Guide (RCPG) for the SCAG region, which includes Growth Management and Regional Mobility chapters. These chapters form the basis for the land use and transportation components of the AQMP, and are utilized in the preparation of air quality forecasts and the consistency analysis that is included in the AQMP.

SCAG also addresses regional issues relating to transportation, economy, community development, and the environment. With respect to air quality planning, SCAG prepares the RTP for the SCAG region every 3 years, which, along with the RCPG, forms the basis for the land use and transportation components of the AQMP, and is used to prepare the air quality forecasts and the consistency analysis that are included in the AQMP.

2.3.2 Greenhouse Gases

To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, the SCAQMD staff is convening an ongoing GHG CEQA Significance Threshold Working Group. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that provide input to the SCAQMD staff on developing GHG CEQA significance thresholds. To date, SCAQMD has only formally adopted a 10,000 metric tons of carbon dioxide equivalent ($MTCO_2e$) threshold for industrial facilities. Previously, in October 2008, SCAQMD identified a tiered approach for determining the significance of GHG impacts within its Draft Guidance Document – Interim CEQA Greenhouse Gas Significance Threshold (SCAQMD 2008a), as discussed below.

Tier 1. Consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA. If the project does not qualify for an exemption, then it would move to the next tier. This tier does not apply to the proposed Project since an EA/EIR has been prepared.

Tier 2. Consists of determining whether or not the project is consistent with a GHG reduction plan that may be part of a local general plan. If the project is consistent with the qualifying local GHG reduction plan, it is not significant for GHG emissions. In order for a GHG reduction plan to qualify, it must, at minimum, comply with AB 32 reduction goals, include emission estimates agreed upon by either ARB or SCAQMD, have been analyzed under CEQA, and have a certified final CEQA document. Additionally, the GHG reduction plan must include a GHG emissions inventory tracking mechanism, a process to monitor progress in achieving GHG emission reduction targets, and a commitment to remedy the excess emissions if GHG reduction goals are not met (enforcement). If the project is not consistent with a qualifying local GHG reduction plan, there is no approved plan, or the GHG reduction plan does not include all the components described above, the project would move to the next tier. At this time, there are no qualifying local GHG reduction or general plans applicable to the EA/EIR prepared for the Project.

Tier 3. Establishes a 10,000 metric ton (MT) screening significance threshold level for stationary/ industrial sources of. For the purposes of determining whether or not GHG emissions from affected projects are significant, SCAQMD specified that project emissions must include direct, indirect, and, to the extent information is available, life cycle emissions during construction and operation. Construction emissions would be amortized over the life of the project (defined as 30 years) added to the operational emissions, and compared to the applicable interim GHG significance threshold tier. If the project exceeds the GHG screening significance threshold and GHG emissions cannot be mitigated to less than the screening level, the project would move to the next tier.

Note that the SCAQMD has also drafted a 3,000 MT screening significance threshold level for commercial/residential projects, but this threshold level has not been formally adopted by the SCAQMD Governing Board.

Tier 4. Consists of a decision tree approach that would allow the lead agency to choose one of three compliance options based on performance standards. The SCAQMD excluded Tier 4 for consideration by their board due to policy and legal concerns.

Tier 5. Implements offsite mitigation (GHG reduction projects) to reduce GHG emission impacts to less than the proposed screening level. If the project proponent is unable to implement offsite GHG reduction mitigation measures to reduce GHG emission impacts to less than the screening level, the GHG emissions from the project would be considered significant and adverse.

SCAQMD expects Tier 3 to be the primary tier by which it will determine significance for projects where it is the lead agency.

3.0 Environmental Setting

Ambient air quality is affected by climatological conditions, topography, and the types and amounts of pollutants emitted. The area potentially affected by the proposed Project is located within the City of San Bernardino, within San Bernardino County, within the SCAB. The following discussion describes relevant characteristics of the air basin and offers an overview of conditions affecting pollutant ambient air pollutant concentration.

3.1 Regional Context

The SCAB, an area of approximately 6,745 square miles bounded by the Pacific Ocean to the west and south, and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The SCAB includes all of Orange County and the nondesert portions of Los Angeles, Riverside, and San Bernardino counties, in addition to the San Gorgonio Pass area in Riverside County. The terrain and geographical location determine the distinctive climate of the SCAB, which is a coastal plain with connecting broad valleys and low hills.

The Southern California region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the SCAB is a function of the area's natural physical characteristics (weather and topography) as well as human-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall, and topography all affect the accumulation and dispersion of pollutants throughout the SCAB, making it an area of high pollution potential.

The greatest air pollution impacts in the SCAB occur from June through September, mainly because of the combination of large amounts of pollutant emissions, light winds, and shallow vertical atmospheric mixing. This frequently reduces pollutant dispersion, causing elevated air pollution levels. Pollutant concentrations in the SCAB vary with location, season, and time of day. Ozone concentrations, for example, tend to be lower along the coast, higher in the near inland valleys, and lower in the far inland areas of the SCAB and adjacent desert.

3.2 Local Climate

Data from the Western Regional Climate Center's San Bernardino climate monitoring station was used to characterize project vicinity climate conditions because it is nearest to the Project with a full climate record. The mean annual temperature is 64.1°F. The average project-area summer (August) high and low temperatures are 93.7 and 57.6°F, respectively, while the average winter (January) high and low temperatures are 67.3 and 39.4, respectively. There is a wide range in seasonal temperatures, with temperatures exceeding 100°F an average 107 times per year and dropping below 32°F an average 19 times per year. The average annual rainfall is 16.12 inches, with the annual ranging for a 5.45 inch low in 1947 to 35.45 inch high in 1941 (WRCC 2011).

Wind monitoring data was obtained from the San Bernardino meteorological station, which is located just east of the project area. Wind patterns for 2005 through 2007 within the project vicinity display a nearly unidirectional flow, primarily from the southwest, at an average speed of 3.22 miles per hour (mph, or 1.44 meters per second) (SCAQMD 2009). A wind rose showing San Bernardino wind directions, speeds, and frequency is shown in Appendix F of this Technical Memorandum.

3.3 POLLUTANTS OF CONCERN

3.3.1 Ozone

O_3, a colorless toxic gas, is the chief component of urban smog. O_3 enters the bloodstream and interferes with the transfer of oxygen, depriving sensitive tissues in the heart and brain of oxygen. O_3 also damages vegetation by inhibiting growth. Although O_3 is not directly emitted, it forms in the atmosphere through a chemical reaction between reactive organic gas (ROG) and NO_X under sunlight. O_3 is present in relatively high concentrations within the SCAB, and the damaging effects of photochemical smog generally are related to the concentration of O_3. Meteorology and terrain play major roles in O_3 formation. Ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 is considered a regional pollutant; high levels often occur downwind of the emission source because of the length of time between when the ROGs form and when they react with light to change to ozone.

3.3.2 Organic Gases-Precursors to Ozone

There are several subsets of organic gases, including ROGs and VOCs. Hydrocarbons (HC) are organic gases that are formed solely of hydrogen and carbon. ROGs include all HC except those exempted by the ARB. Therefore, ROGs are a set of organic gases based on state rules and regulations. VOCs are similar to ROGs in that they include all organic gases except those exempted by federal law. Both VOCs and ROGs are emitted from incomplete combustion of HC or other carbon-based fuels. Combustion engine exhaust, oil refineries, and oil-fueled power plants are the primary sources of HC. Another source of HC is evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint. Generally speaking, and in this analysis, ROGs and VOCs are used interchangeably to refer to the HC that are a precursor to O_3 formation.

The primary health effects of HC result from the formation of O_3 and its related health effects. High levels of HC in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. There are no separate ambient air quality standards (AAQS) for ROGs. Carcinogenic forms of ROGs are considered to be TACs, which are described below. An example is benzene, which is a carcinogen.

3.3.3 Inhalable Particulate Matter

Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter also forms when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. Particulate matter less than 10 microns in diameter, about 1/7th the thickness of a human hair, is referred to as PM10. Particulate matter that is 2.5 microns or less in diameter, roughly 1/28th the diameter of a human hair, is referred to as PM2.5. Major sources of PM10 include motor vehicles; wood burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. PM2.5 results from fuel combustion (from motor vehicles, power generation, and industrial facilities), residential fireplaces, and wood stoves. In addition, PM10 and PM2.5 can be formed in the atmosphere from gases such as SO_2, NO_X, and VOCs.

PM10 and PM2.5 pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. PM10 and PM2.5 can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances, such as lead, sulfates, and nitrates, can cause lung damage directly. These substances can be absorbed into

the blood stream and cause damage elsewhere in the body; they can also transport absorbed gases such as chlorides or ammonium into the lungs and cause injury. Whereas particles 2.5 to 10 microns in diameter tend to collect in the upper portion of the respiratory system, particles 2.5 microns or less are so tiny that they can penetrate deeper into the lungs and damage lung tissues. Suspended particulates also damage and discolor surfaces on which they settle, and contribute to haze and reduce regional visibility.

3.3.4 Secondary PM2.5 Formation

PM2.5 particles are both directly emitted into the atmosphere (i.e., primary particles) and formed through atmospheric chemical reactions from precursor gases (i.e., secondary particles). Primary PM2.5 includes diesel soot, combustion products, road dust, and other fine particles. Secondary PM2.5, which includes products such as sulfates, nitrates, and complex carbon compounds, are formed from reactions with directly emitted NO_X, SO_X, VOCs, and ammonia. Emissions of NO_X, SO_X, and VOCs generated due to project-related construction and operations would contribute toward secondary PM2.5 formation some distance downwind of the emission sources. However, the air quality analysis herein focuses on the effects of direct PM2.5 emissions. This approach is consistent with the recommendations of the SCAQMD (SCAQMD 2006).

3.3.5 Carbon Monoxide

CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. In urban areas, motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains emit CO. Automobile exhaust releases most of the CO in urban areas. CO is a nonreactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor-vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas between November and February. Because motor vehicles are the dominant source of CO emissions, CO hot spots are normally located near roads and freeways with high traffic volume. The highest CO concentrations measured in the SCAB typically are recorded during the winter.

3.3.6 Nitrogen Dioxide

NO_2, a brownish gas, irritates the lungs. It can cause breathing difficulties at high concentrations. Like O_3, NO_2 is not directly emitted, but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as NO_X and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM10 (see the discussion of PM10). At atmospheric concentration, NO_2 is only potentially irritating. In high concentrations, the result is a brownish-red cast to the atmosphere and reduced visibility. There is some indication of a relationship between NO_2 and chronic pulmonary fibrosis. Some increase in bronchitis in children (2 and 3 years old) also has been observed at concentrations below 0.3 parts per million (ppm).

3.3.7 Sulfur Dioxide

SO_2 is a product of high-sulfur fuel combustion. Main sources of SO_2 are coal and oil used in power stations, in industries, and for domestic heating. Industrial chemical manufacturing is another source of SO_2, which is an irritant gas that attacks the throat and lungs. It can cause acute respiratory symptoms and diminished ventilator function in children. SO_2 also can cause plant leaves to turn yellow and can erode iron and steel. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary-source emissions of SO_2 and limits on the sulfur content of fuels. SO_2

concentrations have been reduced to levels well below the state and federal standards, but further reductions in emissions are needed to attain compliance with standards for sulfates and PM10, of which SO_2 is a contributor.

3.3.8 Lead

Lead is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used several decades ago to increase the octane rating in automotive fuel. Since gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels and the use of leaded fuel has been mostly phased out, the ambient concentrations of lead have dropped dramatically.

Short-term exposure to high levels of lead can cause vomiting, diarrhea, convulsions, coma, or even death. However, even small amounts of lead can be harmful, especially to infants, young children, and pregnant women. Symptoms of long-term exposure to lower lead levels may be less noticeable but are still serious. Anemia is common, and damage to the nervous system may cause impaired mental function. Other symptoms are appetite loss, abdominal pain, constipation, fatigue, sleeplessness, irritability, and headache. Continued excessive exposure, as in an industrial setting, can affect the kidneys.

Lead exposure is most serious for young children because they absorb lead more easily than adults and are more susceptible to its harmful effects. Even low-level exposure may harm the intellectual development, behavior, size, and hearing of infants. During pregnancy, especially in the last trimester, lead can cross the placenta and affect the fetus. Female workers exposed to high levels of lead have more miscarriages and stillbirths (ARB 2005).

3.3.9 Health Effects of Criteria Air Pollutants

Criteria air pollutants are recognized to have a variety of health effects on humans. Research by ARB shows that exposure to high concentrations of air pollutants can trigger cardiovascular diseases and respiratory diseases, such as asthma and bronchitis. A healthy person exposed to high concentrations of air pollutants may become nauseated or dizzy, may develop a headache or cough, or may experience eye irritation and/or a burning sensation in the chest. O_3 is a powerful irritant that attacks the respiratory system, leading to the damage of lung tissue. Inhaled particulate matter, NO_2, and SO_2 can directly irritate the respiratory tract, constrict airways, and interfere with the mucous lining of the airways. Exposure to CO, when absorbed into the bloodstream, can endanger the hemoglobin, the oxygen-carrying protein in blood, by reducing the amount of oxygen that reaches the heart, brain, and other body tissues. When air pollutant levels are high, a common occurrence in southern California, children, the elderly, and people with respiratory problems are advised to remain indoors. Outdoor exercise also is discouraged because strenuous activity may cause shortness of breath and chest pains. A brief discussion of the criteria pollutants and their effect on human health and the environment is provided in Table 3-1.

3.3.10 Toxic Air Contaminants/Mobile Source Air Toxics

Although AAQS exist for criteria pollutants, no ambient standards exist for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or because of their acute or chronic health risks. For TACs that are known or suspected carcinogens, the ARB has consistently found that there are no levels or thresholds below which exposure is risk-free. Individual TACs vary greatly in the risks they present. At a given level of exposure, one TAC may pose a hazard that is many times greater than another. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). TACs are a category of air pollutants that have been shown to have an impact on human health but are not classified as criteria pollutants.

Table 3-1. Health Effects Summary of the Major Criteria Air Pollutants

Pollutants	Sources	Primary Effects
O_3	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases Irritation of eyes Impairment of cardiopulmonary function Plant leaf injury
NO_2	Motor vehicle exhaust High temperature stationary combustion Atmospheric reactions	Aggravation of respiratory illness Reduced visibility Reduced plant growth Formation of acid rain
CO	Incomplete combustion of fuels and other carbon containing substances, such as motor exhaust Natural events, such as decomposition of organic matter	Reduced tolerance for exercise Impairment of mental function Impairment of fetal development Death at high levels of exposure Aggravation of some heart diseases (angina)
PM2.5 and PM10	Stationary combustion of solid fuels Construction activities Industrial processes Atmospheric chemical reactions	Reduced lung function Aggravation of the effects of gaseous pollutants Aggravation of respiratory and cardio-respiratory diseases Increased cough and chest discomfort Plant soiling Reduced visibility
SO_2	Combustion of sulfur-containing fossil fuels Smelting of sulfur bearing metal ores Industrial processes	Aggravation of respiratory diseases (asthma, emphysema) Reduced lung function Irritation of eyes Reduced visibility Plant injury Deterioration of metals, textiles, leather, finishes, coatings, etc.
Pb	Contaminated soil	Impairment of blood function and nerve construction Behavioral and hearing problems in children
Source: ARB 2005.		

Air toxics are generated by a number of sources, including: stationary sources, such as dry cleaners, gas stations, auto body shops, and combustion sources; mobile sources, such as diesel trucks, ships, and trains; and area sources, such as farms, landfills, and construction sites. Ten TACs have been identified through ambient air quality data as posing the greatest health risks in California. Adverse health effects of TACs can be carcinogenic (cancer-causing), short-term (acute) noncarcinogenic, and long-term (chronic) noncarcinogenic. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health risks, a similar factor, called a Hazard Index, is used to evaluate risk.

The CCAA made controlling air toxic emissions a national priority, by which Congress mandated that the EPA regulate 188 air toxics. These substances are also known as HAPs. In the EPA's latest rule on the control of hazardous air pollutants from mobile sources (72 Federal Register [FR] 8430), it identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System (IRIS). From this list of 93 compounds, the EPA has identified seven as priority MSATs. The high regulation priority of these seven MSATs was based on the EPA's 1999 National Air Toxics Assessment (NATA).

- Acrolein
- Benzene
- 1,3-Butadiene
- Diesel particulate matter/diesel exhaust organic gases
- Formaldehyde
- Naphthalene
- Polycyclic organic matter

The 2007 rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles traveled [VMT]) increases by 145% as assumed, a combined reduction of 72% in the total annual emission rate for the priority MSAT is projected from 1999 to 2050 (Federal Highway Administration 2009).

3.3.11 Greenhouse Gases

The principle anthropogenic GHGs contributing to global warming are CO_2, methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride (SF_6), hydroflourocarbons (HFCs), and perfluorocarbons (PFCs), as defined by California law and the State CEQA Guidelines contain a similar definition of GHGs (Health and Safety Code 38505(g); 14 CCR 15364.5). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its anthropogenic (human-made) sources.[2] Because construction and operation of transportation projects primarily generate CO_2, CH_4, N_2O, the following discussion focuses on these pollutants.

CO_2 is the most plentiful anthropogenic GHG, followed by CH_4 and N_2O. The IPCC estimates that CO_2 accounts for more than 75% of all anthropogenic GHG emissions. Three quarters of anthropogenic CO_2 emissions are the result of fossil fuel burning (and to a very small extent, cement production), and

[2] Although water vapor plays a substantive role in the natural greenhouse effect, the change in GHGs in the atmosphere due to anthropogenic actions is enough to upset the radiative balance of the atmosphere and result in global warming.

approximately one quarter of emissions are the result of land-use change (Intergovernmental Panel on Climate Change 2007). CH_4 is the second largest contributor of anthropogenic GHG emissions and is the result of growing rice, raising cattle, combusting natural gas, mining coal, and vehicle emissions (National Oceanic and Atmospheric Administration 2005). N_2O, while not as abundant as CO_2 or CH_4, is a powerful GHG. Sources of N_2O include agricultural processes, nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions.

To simplify reporting and analysis, GHGs are commonly defined in terms of a global warming potential (GWP). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2e. The GWP of CO_2 is, by definition, one. The GWP values used in this report are based on the IPCC Second Assessment Report (SAR) and United Nations Framework Convention on Climate Change (UNFCCC) reporting guidelines, and are defined in Table 3-2. Although the IPCC Fourth Assessment Report (AR4) presents different GWP estimates, the current inventory standard relies on SAR GWPs to comply with reporting standards and consistency with regional and national inventories (Intergovernmental Panel on Climate Change 2007a). As is the standard practice, project-level GHG inventories are presented in metric tons (MT) of CO_2 equivalent (CO_2e) herein.

Table 3-2 Lifetimes, Global Warming Potentials, and Abundances of Several Significant Greenhouse Gases[a]

Gas	Global Warming Potential (100 years)	Lifetime (years)b	Atmospheric Abundance
CO_2 (ppm)	1	50–200	379
CH_4 (ppb)	21	9–15	1,774
N_2O (ppb)	310	120	319
HFC-23 (ppt)	11,700	264	18
HFC-134a (ppt)	1,300	14.6	35
HFC-152a (ppt)	140	1.5	3.9
CF_4 (ppt)[c]	6,500	50,000	74
C_2F_6 (ppt)[c]	9,200	10,000	2.9
SF_6 (ppt)	23,900	3,200	5.6

[a] The GWP values presented are based on the IPCC SAR and UNFCCC reporting guidelines (IPCC 1996; UNFCCC 2006). Although the IPCC AR4 presents different GWP estimates, the current inventory standard relies on SAR GWPs to comply with reporting standards and consistency with regional and national inventories.

[b] Defined as the half life of the gas.

[c] CF4 and C2F6 are PFCs.

ppm = parts per million.

ppb = parts per billion.

ppt = parts per trillion.

Sources: Intergovernmental Panel on Climate Change 1996, 2001, 2007.

3.4 Existing Air Quality Conditions

The SCAQMD has divided the SCAB into air monitoring areas and maintains a network of air quality monitoring stations located throughout the SCAB. The project site is located in the Central San Bernardino Valley Monitoring Area (Source Receptor Area [SRA] 34). The nearest monitoring station is the San Bernardino-4th Street Monitoring Station (ARB 36203), in the City of San Bernardino,

approximately 2 miles east of the project area. Criteria pollutants monitored at the San Bernardino Station include O_3, CO, NO_2, PM10, and PM2.5. The nearest monitoring stations that monitors SO_2 is the Fontana-Arrow Highway Monitoring Station (SRA 34, ARB 36197), which is approximately 9 miles from the project area, also within the Central San Bernardino Monitoring Area.

Concentrations of pollutants from the two stations over the last three years (2008–2010) were compiled and are presented in Table 3-3. Monitoring pollutant concentrations display the follows trends during the three year period: 1-hour O_3 CAAQS was exceeded an average of 47 times per year; 8-hour O_3 exceeded CAAQS an average of 75 times per year; 8-hour O_3 NAAQS was exceeded an average of 54 times per year during the 3-year reporting period; 24-hour PM10 CAAQS was exceeded an estimated 103.7 times in 2008 and 12.8 times in 2010 (at the time of this analysis, exceedance data from 2009 was not available); 24-hour PM10 NAAQS was not exceeded during the 3year reporting period, and; 24-hour PM2.5 CAAQS was exceeded an estimated 7.2 times per year. SO_2 concentrations from the Fontana station did not result in any exceedances during the 3-year reporting period. Monitored CO and NO_2 concentrations are low, and recorded no exceedances during the 3-year reporting period.

Table 3-3. Ambient Background Concentrations from the San Bernardino 4th Street (ARB 36203) and Fontana Arrow Highway (ARB 36197) Monitoring Stations

Pollutant Standards		2008	2009	2010
1-Hour Ozone (O_3)				
	Maximum Concentration (ppm)	0.157	0.150	0.129
	4th Highest Concentration (ppm)	0.134	0.121	0.118
	California Designation Value	0.15	0.15	0.13
Number of Days Standard Exceeded				
	CAAQS 1-hour (>0.09 ppm)	62	53	27
8-Hour Ozone (O_3)				
	State Maximum Concentration (ppm)	0.122	0.127	0.105
	State 4th Highest Concentration (ppm)	0.112	0.101	0.096
	State Designation Value (ppm)	0.127	0.122	0.113
	National Maximum Concentration (ppm)	0.122	0.126	0.104
	National 4th Highest Concentration (ppm)	0.112	0.101	0.095
	National Design Value (ppm)	0.116	0.110	0.102
Number of days standard exceeded				
	CAAQS 8-hour (>0.070 ppm)	87	78	60
	NAAQS 8-hour (> 0.075 ppm)	62	61	40
Carbon Monoxide (CO)				
	Maximum Concentration 8-hour Period (ppm)	1.65	2.20	1.73
	Maximum Concentration 1-hour Period (ppm)	2	3	2
Number of days standard exceeded				
	NAAQS 8-hour (≥9 ppm)	0	0	0
	CAAQS 8-hour (≥9.0 ppm)	0	0	0
	NAAQS 1-hour (≥35 ppm)	0	0	0
	CAAQS 1-hour (≥20 ppm)	0	0	0

Pollutant Standards		2008	2009	2010
Nitrogen Dioxide (NO_2)				
	Maximum 1-hour Concentration	0.091	0.084	0.069
	Annual Average Concentration	0.022	0.020	0.019
Number of Days Standard Exceeded				
	CAAQS (0.18 ppm)	0	0	0
Suspended Particulates (PM10)				
	Maximum State 24-hour Concentration	73.0	64.0	61.0
	4th highest State 24-hour Concentration	67.0	56.0	47.0
	Maximum National 24-hour Concentration	76.0	66.0	63.0
	4th highest National 24-hour Concentration	70.0	56.0	48.0
	State Annual Average Concentration (CAAQS = 20 μg/m³)	41.1	NA	31.2
Number of Days Standard Exceeded (Estimated)				
	CAAQS 24-hour (>50 μg/m³)[f]	103.7	NA	12.8
	NAAQS 24-hour (>150 μg/m³)[f]	0.0	0.0	0.0
Suspended Particulates (PM2.5)				
	Maximum 24-hour Concentration (μg/m³)	43.5	37.8	39.3
	4th Highest 24-hour Concentration (μg/m³)	34.5	33.5	23.8
	24-hour Standard 98th Percentile (μg/m³)	40.0	35.2	29.7
	National Annual Average Concentration (μg/m³)	13.3	12.9	11.1
	State Annual Average Concentration (μg/m³)	NA	NA	NA
Number of Days Standard Exceeded (Estimated)				
	NAAQS 24-Hour (>35 μg/m³)	9.5	6.2	5.9
Sulfur Dioxide (SO_2) – Fontana				
	Highest maximum 24-hour concentration (ppm)	0.003	0.002	0.002
	Annual Average Concentration (ppm)	0.001	0.000	NA
Number of days standard exceeded				
	CAAQS 24-hour (>0.04ppm)	0	0	0
ppm = parts per million; μg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter; > = greater than; NA = data not available. Sources: ARB 2012b and EPA 2012: Data compiled by ICF.				

3.4.1 Existing Health Risk in the Project Vicinity

Ambient levels of selected TACs are measured by both ARB and SCAQMD at several locations throughout the SCAB. According to the most current SCAQMD inhalation cancer risk data (MATES III), the project area is located within a cancer risk zone of approximately 931 to 1,058 cases per million (SCAQMD 2008b). This cancer risk is largely due to the project area's proximity to I-215, which runs north-south through the project area; SR-66, which runs east-west just north of the project site; and the Depot/Amtrak/Metrolink station within the project APE. The highest cancer risks are located in areas just east of I-215, with slightly lower cancer risks located in the area west of I-215. For comparison, the average cancer risk in the SCAB is 1,194 per million. For perspective, one out of three Americans will eventually develop cancer, and one out four will die from cancer. Therefore, the national average background cancer incidence is equivalent to 333,000 chances in one million.

The SCAQMD has recently completed the Multiple Air Toxics Exposure Study III (MATES III), which was an ambient air monitoring and evaluation study conducted in the SCAB. MATES III was a follow up to previous air toxics studies in the SCAB and is part of the SCAQMD Governing Board Environmental Justice Initiative.

Compared to previous studies of air toxics in the SCAB, MATES III found a decreasing risk for air toxics exposure, with the population-weighted risk down by 17% from the analysis in MATES II. Therefore, there has been improvement in air quality regarding air toxics; however, the risks are still unacceptable and are higher near sources of emissions such as ports and transportation corridors. Diesel particulate continues to dominate the risk from air toxics, and the portion of air toxic risk attributable to diesel exhaust is increasing compared to the results in MATES II. The highest risks are found near the port area, central Los Angeles, and transportation corridors. The MATES III results underscore that a continued focus on reduction of toxic emissions, particularly from diesel engines, is needed to reduce air toxics exposure.

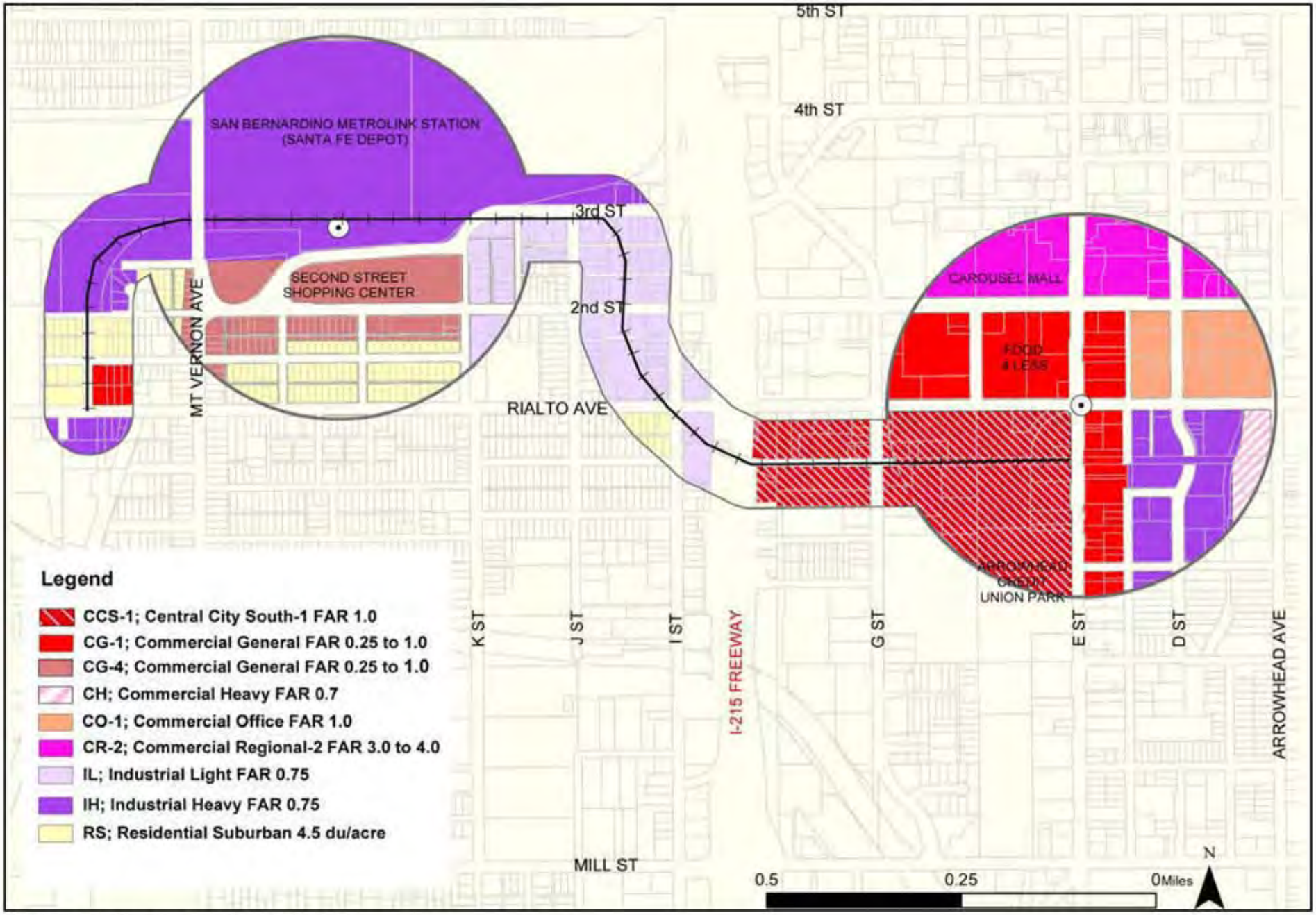
MATES III concluded that the average carcinogenic risk throughout the SCAB, attributed to toxic air contaminants, is approximately 1,194 in 1 million. This cancer risk has declined by more than 15% over the past 7 years but is still one of the highest in the nation. Mobile sources (e.g., cars, trucks, trains, ships, and aircraft) represent the greatest contributors. About 83.6% of all risk is attributed to DPM emissions. Therefore, health risk studies associated with freeway proximity are primarily concerned with DPM, as it comprises most of the associated health risk. Cancer health risks associated with exposures to diesel exhaust typically are associated with chronic exposure, in which a 70-year exposure period often is assumed. Although elevated cancer rates can result from exposure periods of less than 70 years, acute exposure (i.e., exposure periods of 2 to 3 years) is not anticipated to result in an increased health risk because typically exposure concentrations are too low.

In addition to the length of the exposure period, the locations of potential emissions sources and exposed sensitive receptors are major factors in determining the health risk of diesel exhaust. In general, diesel exhaust has a greater potential to harm people when the source of emissions is closer to sensitive populations (ARB 2005). However, even though sensitive receptors are at an increased risk to diesel exhaust, exposure can adversely affect all members of the population.

3.4.2 Sensitive Receptors

Some people are particularly sensitive to air pollution, including persons with respiratory illnesses or impaired lung function because of other illnesses, the elderly, and children. Facilities and structures where these people live or spend considerable amounts of time are known as sensitive receptors. Chapter 4 of the SCAQMD's Air Quality Analysis Guidance Handbook defines land uses considered to be sensitive receptors as long-term health care facilities, rehabilitation centers, convalescent centers, retirement homes, residences, schools, playgrounds, child care centers, and athletic facilities. The proposed Project is surrounded by a mix of residential, industrial, and recreational[3] land uses along the proposed Project corridor; residential and commercial land uses near the Depot; and commercial, residential, and recreation land uses near the proposed E Street rail platforms, with the closest sensitive receptors located within 25 meters of idling activities at the Depot. For purposes of analyzing long-term health effects of exposure to TACs, sensitive receptors also include places of employment (commercial/industrial land uses). Figure 3-1 shows land uses near the project corridor.

[3] The recreational land in question is the ~~Arrowhead Credit Union Park~~ San Manuel Stadium, which is considered a commercial recreational facility and not a public park open to the general public.



SOURCE: City of San Bernardino General Plan 2005

ICF INTERNATIONAL

Figure 3-1
City of San Bernardino General Plan Use Designations
Downtown San Bernardino Passenger Rail Project

3.5 SIGNIFICANCE THRESHOLDS

The following significance criteria are based, in part, on Appendix G of the CEQA Guidelines and provide the basis for determining significance of impacts associated with air quality and greenhouse gas resulting from the implementation of the proposed Project. The CEQA Guidelines state that the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the determinations of significance.

Further, the proposed Project is subject to EPA's transportation conformity rule, which requires both a regional and project-level analysis. At the regional level, the project must be shown to be included in a currently conforming RTP and TIP at the time of project approval. The project-level analysis requires a hot-spot analysis if a region is designated nonattainment or maintenance for CO and/or PM. The CO hot-spot analyses performed for CEQA are essentially the same, for technical purposes, project-level analysis performed for NEPA purposes. There are no PM hot-spot analyses requirements for CEQA, so the project-level analysis performed for NEPA purposes is also used to evaluate PM hot-spots under CEQA.

Therefore, given the above, the proposed Project would have a potentially significant and adverse effect on air quality if it would:

- Fail to be listed in a conforming RTP and/or TIP.
- Exceed PM10 or PM2.5 NAAQS at nearby receptor locations
- Exceed carbon monoxide NAAQS and CAAQS at nearby intersections
- Exceed the SCAQMD daily significance thresholds (Table 3-4) for criteria pollutants during project construction.
- Exceed the SCAQMD daily significance thresholds (Table 3-4) for criteria pollutants during project operations.
- Exceed the SCAQMD localized significance thresholds (Table 3-5) for criteria pollutants during project construction and operations
- Expose sensitive receptors to increased health risks.

Further, the proposed Project would have a potentially significant and adverse effect on greenhouse gases and climate change if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment and conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Specific criteria and approach used to make the determinations listed above are described in Sections 3.5.1 through 3.5.5.

3.5.1 Transportation Conformity

Regional Conformity

To conform regionally, the design and scope of the proposed transportation project must be the same as those described in the RTP and TIP, the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis. If the design and scope of the proposed transportation project are the same as those described in the RTP and TIP, the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis. In this case, the proposed project is compared to the project description within SCAG's most recent conforming RTP and TIP: the 2008 RTP and 2011 FTIP.

Project-Level Conformity

To conform at the project level, projects within designated nonattainment or maintenance for CO and/or PM areas must show that they would not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of the relevant CO and/or PM NAAQS or required interim milestones.

CO Hot-spots

The significance of CO emissions from vehicles was evaluated based on the following criteria: a significant impact would occur if (1) project-generated traffic degrades the level of service (LOS) at intersections to level D or worse, (2) sensitive receptors are nearby, and/or (3) CO hot-spot modeling indicates thresholds would be exceeded. The first criterion is based on whether the traffic associated with the proposed Project would change the LOS of an intersection, and thereby have the potential to generate CO hot spots. If the LOS remained unaffected, it would be assumed that vehicle emissions would not contribute to CO hot spots.

The significance of localized project-level impacts under both NEPA and CEQA depends on whether ambient CO levels in the vicinity of the project are above or below federal and state CO standards. With respects to NEPA, a project is considered conforming at the project-level if project-related CO concentrations would exceed 1- and 8- hour NAAQS at nearby receptor locations. With respects to CEQA, a project is considered to have a significant impact if project emissions would exceed of 1- and 8-hour CAAQS at nearby receptor locations. If ambient levels already exceed a state or federal standard, project emissions are considered significant if they increase 1-hour CO concentrations by 1.0 ppm or more or 8-hour CO concentrations by 0.45 ppm or more (SCAQMD 1993). The following are applicable local emission concentration standards for CO:

- California and National 1-hour CO standards of 20 and 35 ppm, respectively
- California and National 8-hour CO standard of 9.0 and 9 ppm, respectively

As in most urban areas, high short-term concentrations of CO, known as “hot spots,” can be a problem in San Bernardino County. Hot spots typically occur in areas of high motor vehicle use, such as in parking lots, at congested intersections, and along highways. Since elevated CO concentrations typically occur at locations with high traffic volumes and congestion, elevated CO concentrations are often correlated with LOS at intersections (SCAQMD 1993). LOS expresses the congestion level for an intersection and is designated by a letter from A to F, with LOS A representing the best operating conditions and LOS F the worst. Significant concentrations of CO sometimes occur (depending on temperature, wind speed, and other variables) at intersections where LOS is rated at D or worse.

PM10/PM2.5 Hot-Spots

All projects that are identified as a Project of Air Quality Concern (POAQC), based on the criteria in Section 4.1.2, must undergo quantitative PM10 and/or PM2.5 hot-spot conformity determination (O’Connor pers. comm.). Projects identified as not being a POAQC do not require PM2.5 and/or PM10 hot-spot analyses. However, because the proposed project would be located in an area classified as a nonattainment area for both the PM10 and PM2.5 standards, a determination must be made as to whether it would result in a PM hot spot.

3.5.2 Criteria Pollutants

Regional Significance Thresholds

Based on the SCAQMD’s regulatory role in the SCAB, the significance thresholds and analysis methodologies outlined in the SCAQMD CEQA *Air Quality Handbook* (as updated per their website). SCAQMD daily regional significance thresholds are presented in Table 3-4.

Table 3-4. SCAQMD Daily Regional Significance Thresholds

Criteria Air Pollutant	Construction Threshold (pounds per day)	Operational Threshold (pounds per day)
VOCs	75	55
NO_X	100	55
CO	550	550
SO_X	150	150
PM10	150	150
PM2.5	55	55
Pb	3	3
Source: SCAQMD 2011b.		

Localized Significance Thresholds

SCAQMD *Localized Significance Threshold Methodology for CEQA Evaluations* (SCAQMD 2008) and LST lookup tables are used to identify significance thresholds for identifying localized impacts of construction and operational emissions on nearby receptors. Based on the project location (SRA 34, Central San Bernardino Valley), project size that could be active on any given day (assumed to be 5 acres) and distance to the nearest receptor location (assumed to be 25 meters), the appropriate localized significance thresholds (LSTs) during construction and operation of presented in Table 3-5.

Note that localized thresholds have been developed only for those criteria pollutants of greatest concern during construction activities and operations within the Basin. As such, localized significance thresholds (LSTs) only include those localized pollutants that SCAQMD considers to be of greatest concern. No LSTs have been developed for emissions of VOC or SOx (SCAQMD 2008b).

Table 3-5. SCAQMD Localized Significance Thresholds

Criteria Air Pollutant	Construction Threshold (pounds per day)	Operational Threshold (pounds per day)
NO_X	270	270
CO	1746	1746
PM10	14	4
PM2.5	9	2
Source: SCAQMD 2008c.		

3.5.3 Toxic Air Contaminants

According to guidelines provided in the SCAQMD *CEQA Air Quality Handbook*, the project would have a significant impact from toxic air contaminants if:

- Some TACs increase non-cancer health risk due to short term (acute) or long term (chronic) exposures. The screening risk assessment for those TACs must estimate acute and/or chronic hazard index as applicable. Onsite stationary sources emit carcinogenic or toxic air contaminants that individually or cumulatively exceed the maximum incremental cancer risk (MICR) of 10 in 1 million (1.0×10^{-5}) or an acute or chronic hazard index of 1.0 (SCAQMD 2005, 2011b).[4]
- Hazardous materials associated with onsite stationary sources result in an accidental release of air toxic emissions or acutely hazardous materials, posing a threat to public health and safety.
- The project would be occupied primarily by sensitive individuals within 0.25 mile of any existing facility that emits air toxic contaminants, which could result in a health risk from pollutants identified in District Rule 1401 (SCAQMD 2005).

3.5.4 Greenhouse Gases

With respect to GHG emissions, CEQA Guidelines Section 15064.4 provides guidance to lead agencies for determining the significance of impacts from GHG emissions. Section 15064.4(a) provides that a lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a proposed project. Section 15064.4(a) further provides that a lead agency shall have the discretion to determine, in the context of a particular project, whether (1) to use a model or methodology to quantify GHG emissions resulting from a project and which model methodology to use, and/or (2) to rely on qualitative analysis or performance based standards.

Pursuant to CEQA Guidelines Section 15064.4(a), the analysis presented herein uses a model or methodology to quantify the GHG emissions resulting from the proposed Project. The analysis contained herein provides a "good-faith effort" to describe, calculate, and estimate GHG emissions resulting from the proposed Project, and compare those emissions to the chosen threshold level. A detailed description of models and modeling methodology used in this analysis is described in Chapter 4.

CEQA Guidelines Section 15064.4(b) also provides that, when assessing the significance of impacts from GHG emissions, a lead agency should consider (1) the extent to which the project may increase or reduce GHG emissions as compared to existing conditions, (2) whether the project's GHG emissions exceed a threshold of significance that the lead agency determines applies to the project, and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions. The analysis of the potential impacts from the project's GHG emissions follows this approach.

There are currently no adopted quantitative thresholds relevant to the proposed project. The SCAQMD has adopted 10,000 MT screening significance threshold level for industrial projects, and has also drafted a 3,000 MT screening significance threshold level for commercial/residential projects. The proposed project is a transportation project that does not fit into the industrial, commercial or residential project categories. The SCAQMD has not proposed or adopted a threshold level for transportation projects. Thus, for purposes of this analysis, both direct and indirect GHG emissions from the proposed project are discussed with respects to both the 10,000 and 3,000 MT threshold levels.

[4] SCAQMD Risk Assessment Procedures for Rules 1401 and 212, November 1998.

Further, while there are currently no adopted numeric thresholds at the Federal level, CEQs reference point of 25,000 MT is used herein in determining whether or not the project would result in a significant impact or effect on the environment due to GHG emissions (see Section 2.1.4).

Note that GHGs and climate change are exclusively cumulative impacts, and there is no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). Therefore, in accordance with scientific consensus regarding the cumulative nature of GHGs[5], the analysis herein analyzes the cumulative contribution of project-related GHG emissions. Therefore, while GHG emission are presented for existing 2009, opening year 2014, and forecast year 2035 conditions, significant and adverse effects are analyzed with respects to cumulative year 2035 emissions only. Existing year 2009 and opening year 2014 emissions are presented for informational purposes only.

3.5.5 Cumulative Impacts

Potential cumulative air quality impacts would result when cumulative projects' pollutant emissions would combine to degrade air quality conditions below acceptable levels. This could occur on a local level, such as through increases in vehicle emissions at congested intersections, or at sensitive receptor locations due to concurrent construction activities; at a regional level, such as the potential impact of multiple past, present, and reasonably foreseeable projects on O_3 within the SCAB; or globally, such as the potential impact of GHG emissions on global climate change.

The SCAB experiences chronic exceedance of NAAQS and CAAQS, and is currently in nonattainment status for various pollutants. These nonattainment conditions within the region are considered cumulatively significant. SCAQMD thresholds have been established to ensure attainment of NAAQS and CAAQS, therefore exceedance of SCAQMD threshold levels must be considered a significant cumulative impact and adverse cumulative consequence.

[5] Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors), which are primarily pollutants of regional and local concern. Given their long atmospheric lifetimes (see Table 3-2), GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless past, present, and future sources. Therefore, GHG impacts are inherently cumulative.

4.0 METHODOLOGY

4.1 TRANSPORTATION CONFORMITY

4.1.1 Regional Conformity

The proposed Project is located in an extreme nonattainment area with regards to the federal 8-hour ozone standard. Because ozone and its precursors are regional pollutants, the proposed Project must be evaluated under the transportation conformity requirements described earlier. An affirmative regional conformity determination must be made before the proposed Project can proceed. Such a determination is not required if the proposed Project is described in an approved RTP and/or TIP and the Project has not been altered in design concept or scope.

4.1.2 Project-Level Conformity

As stated above, if a project is located in a non-attainment or maintenance area, then a hot-spot analysis and possible emission reduction measures in regard to that pollutant are required. Project level hot-spot analyses are only required for localized pollutants (i.e., CO, PM10, and PM2.5).

Carbon Monoxide

The proposed Project is located in a serious maintenance area with regards to the federal CO standard. Consequently, the evaluation of transportation conformity for CO is required. The CO transportation conformity analysis is based on the Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis (Garza et al. 1997) and is consistent with the assumptions used in the RTP regional emissions analysis. This CO protocol details a step-by-step procedure to determine whether project-related CO concentrations have a potential to generate new air quality violations, worsen existing violations, or delay attainment of NAAQS and CAAQS for CO.

Vehicle emission rates were determined using the latest version of the ARB's EMFAC2007 (Version 2.3) emission rate program. Free-flow traffic speeds were adjusted to 1.0 mph to represent a worst-case scenario. EMFAC2007 modeling procedures followed the guidelines recommended by Caltrans (California Department of Transportation 2003).

Note that EMFAC2011 has not yet been officially made available for conformity analysis purposes by the EPA. Until the EPA announces availability in the Federal Register, conformity analysis will continue to use EMFAC 2007.

Project traffic during the operational phase of the Project would have the potential to create congestion at nearby intersections, thereby potentially leading to localized CO hot spots. SCAQMD recommends a localized hot-spot evaluation of potential localized CO impacts when a project's trips cause vehicle to capacity (V/C) ratios to increase by 2% or more at intersections with an LOS of C or worse. Thus, intersections were first screened using this LOS C or worse and 2% increase in V/C ratio criteria, and the intersections that had the three highest increases in V/C ratios were analyzed for localized CO hot-spot impacts. Secondly, to further account for those intersections that could create congested CO hot spots, intersections were ranked according to highest PM peak hour traffic volumes, and the intersections that

had the three highest peak hour traffic volumes were analyzed for localized CO hot-spot impacts. In total, the six chosen intersections represent the highest change in V/C ratio and highest traffic volumes of intersections in the vicinity of the proposed Project. The above screening analysis was completed for each alternative (SCAQMD 1993).[6]

CO hot-spot impacts were evaluated through CO dispersion modeling using EMFAC2007 , the CALINE4 model, and traffic data provided by the traffic engineers. CO emissions were modeled for existing (2009) and opening year (2014) with-project conditions at nearby affected intersections. Each intersection was modeled under existing and future no- and with-project traffic conditions to note the projected net change in concentrations. Existing and future year emission factors were generated from the EMFAC2007 model assuming a SCAQMD average fleet with a conservative 1 mph travel speed operating on the coldest winter day on record at the nearby San Bernardino meteorological station (17°F) with 50% humidity. The above method provides a conservative analysis because vehicle CO emissions rates are highest at both low travel speeds and in cold air temperatures.

Note that the traffic analysis did not present an “existing plus project” scenario. However, the “future with-project” scenarios were assumed to represent this “existing plus project” scenario, albeit with regional growth between existing and buildout years taken into account. Therefore, attributing changes in future year traffic to the proposed Project’s contribution is conservative in that the project’s net increase is likely exaggerated. In modeling CO contributions, the future with-project scenario was modeled assuming existing year (2009) emission factors, consistent with this existing plus project concept.

PM10 and PM2.5

The proposed action is located in a serious nonattainment area for the federal PM10 standard and nonattainment area for the PM2.5 standard (Table 2-2). Consequently, project level conformity determinations for PM10 and PM2.5 are required. In December 2010, the EPA finalized conformity guidance for determining which transportation projects must be analyzed for local air quality impacts in PM2.5 and PM10 nonattainment and maintenance areas. The final rule requires PM10 and PM2.5 hot-spot analyses to be performed for a Project of Air Quality Concern (POAQC) or any other project identified by the PM10 or PM2.5 SIP as a localized air quality concern.

The EPA finalized conformity guidance for quantifying local air quality impacts of transportation projects on the PM2.5 and PM10 NAAQS—*Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas* (Federal Highway Administration and U.S. Environmental Protection Agency 2010) in December 2010. This guidance requires lead agencies to conduct a quantitative hot-spot analysis for projects in PM2.5 and PM10 nonattainment and maintenance areas. The FHWA and EPA guidance identifies examples of projects that are most likely POAQCs and details a qualitative step-by-step screening procedure to determine whether project-related particulate emissions have a potential to generate new air quality violations, worsen existing violations, or delay attainment of NAAQS for PM2.5 or PM10.

[6] Changes to LOS with construction of the proposed bus facility, associated office building, and roadway reconfiguration of E Street and Rialto Avenue would involve changes to the functionality of the roadway network and result in the redistribution of vehicle trips. These changes would affect not only the 22 intersections previously analyzed in the Iteris Traffic Impact Study but also an additional eight intersections to be analyzed. Trip generation of the bus facility would likely involve a reduction in VMT due to transit usage. However, it would be anticipated that some intersections could result in an unacceptable LOS and additional mitigation would be required. This analysis would be provided at a later time once the analysis is complete.

POAQCs are certain highway and transit projects that involve significant levels of diesel traffic or any other project identified in the PM2.5 or PM10 SIP as a localized air quality concern. As noted in the EPA's March 2006 final rule, the following are examples of POAQCs.

- A project on a new highway or expressway that serves a significant volume of diesel truck traffic, such as facilities with greater than 125,000 annual average daily traffic (AADT) where 8 percent or more of such AADT is diesel truck traffic.
- New exit ramps and other highway facility improvements to connect a highway or expressway to a major freight, bus, or intermodal terminal.
- Expansion of an existing highway or other facility that affects a congested intersection (operated at level of service [LOS] D, E, or F) that has a significant increase in the number of diesel trucks.
- Similar highway projects that involve a significant increase in the number of diesel transit busses and/or diesel trucks.
- A major new bus or intermodal terminal that is considered to be a "regionally significant project" under 40 CFR 93.101.
- An existing bus or intermodal terminal that has a large vehicle fleet where the number of diesel buses increases by 50% or more as measured by bus arrivals.

As noted in the EPA's March 2006 final rule, the examples below are projects that are not an air quality concern:

- Any new or expanded highway project that primarily services gasoline vehicle traffic (i.e., does not involve a significant number or increase in the number of diesel vehicles), including such projects involving congested intersections operating at LOS D, E, or F.
- An intersection channelization project or interchange configuration project that involves either turn lanes or slots or lanes or movements that are physically separated. These kinds of projects improve freeway operations by smoothing traffic flow and vehicle speeds by improving weave and merge operations, which would not be expected to create or worsen PM2.5 or PM10 violations.
- Intersection channelization projects; traffic circles or roundabouts; intersection signalization projects at individual intersections; and interchange reconfiguration projects that are designed to improve traffic flow and vehicle speeds, do not involve any increases in idling, and would be expected to have a neutral or positive influence on PM2.5 or PM10 emissions as a result.
- A new or expanded bus terminal that is served by non-diesel vehicles (e.g. compressed natural gas) or hybrid-electric vehicles.
- A 50% increase in daily arrivals at a small terminal (e.g. a facility with 10 buses in the peak hour).

For projects identified as not being a POAQC, PM2.5 and PM10 (for regions without an approved conformity SIP) hot-spot analyses are not required. For these types of projects, state and local project sponsors should briefly document in their project-level conformity determinations that federal CAA and 40 CFR 93.116 requirements were met without a hot-spot analysis, because such projects have been found to not be of air quality concern under 40 CFR 93.123(b)(1).

For areas with an approved conformity SIP, the final rule does not apply (i.e., when a state withdraws the existing provisions from its approved conformity SIP and EPA approves the withdrawal, or when a state includes the revised PM10 hot-spot requirements in a SIP revision and EPA approves that SIP revision). For these areas, the assessment should continue to follow the PM10 hot-spot procedures in their existing conformity SIPs until the SIP is updated and subsequently approved by the EPA.

Although the guidance for conducting a PM10 hot-spot analysis for conformity purposes has separate requirements for PM10 nonattainment/maintenance areas with and without approved conformity SIPs, guidance from the EPA indicates that there are no areas within California where a conformity SIP has been approved (O'Connor pers. comm.). Consequently, all projects that are POAQCs must undergo PM10 (and PM2.5) hot-spot conformity determinations (O'Connor pers. comm.). Projects identified as not being a POAQC do not require qualitative PM2.5 and PM10 hot-spot analyses. Because the proposed project would be located in an area classified as a nonattainment area for the PM2.5 standard, a determination must be made as to whether it would result in a PM2.5 hot spot.

4.2 Criteria Pollutants, TAC, and GHG Emissions

4.2.1 Construction

Construction of proposed Project would begin in mid to late 2013 and would take approximately 78 weeks (1.5 years) to finish. Construction of the proposed Project would result in criteria pollutant, TAC, and GHG emissions. Criteria pollutant emissions would result from construction equipment exhaust; material delivery, haul truck, and worker commute vehicle exhaust; fugitive dust from earthwork (PM10 and PM2.5); and off-gassing from paving. TAC emissions would result from construction equipment and worker commute vehicle exhaust. GHG emissions would result from construction equipment exhaust as well as from material delivery, haul truck, and worker commute vehicle exhaust.

Emissions were estimated using project-specific construction inventory as well as a combination of emission factors from ARB modeling software (EMFAC2011 and OFFROAD2007), EPA road dust methodology (EPA 2011c), emission calculation methodologies for fugitive dust and paving within CalEEMod (version 2011.1.1). Emissions from off-road construction equipment (loaders, excavators, track ballasts, etc.) were estimated using emissions factors generated within ARB's OFFROAD2007 model. Emissions factors for each piece of equipment were calculated based on CalEEMod default horsepower ratings (where applicable) and from the nearby San Bernardino TAC Inventory (ARB 2008) or from research for equipment not contained within CalEEMOd defaults. OFFROAD2007 does not generate construction-related N_2O emission factors. Thus, N_2O emission factors were calculated based on the ratio of N_2O emission factor to the CO_2 emission factor from construction equipment within the most recent General Reporting Protocol (Climate Registry 2011). Load factors are based on revised Carl Moyer Program Guidelines defaults, which were approved by the ARB on April 28, 2011, and now supersede the load factors contained within CalEEMOd. The nearby San Bernardino Depot TAC Inventory (ARB 2008) was used for equipment not contained within the Carl Moyer Program Guidelines defaults.

Emissions from on-road mobile sources (dump trucks, flatbeds, asphalt transport, concrete trucks, employee commute) were estimated using exhaust emission factors from ARB's EMFAC2011 on-line web tool, re-entrained road dust methodology from the EPA, and vehicle activity data from the project engineers. Emission factors from the EMFAC2011 are based on construction year fleet mix operating at an average speed of 30 mph on public streets off-site and operating at an average speed of 5 mph within the project APE and potential construction staging areas. Emission factors were based on assumed EMFAC2011 vehicle categories, with all haul trucks and material deliveries assumed to be EMFAC Heavy-Heavy Duty Diesel Tractor Trucks (T7 Tractor), and employee commute were assumed to be EMFAC light duty fleet mix (average of Light Duty Auto and Light Duty Trucks). Information regarding

daily trips was based on activity data provided by the project engineer. On-road calculations for truck hauling and employee commutes assume a 20-mile round-trip distance, which is consistent with CalEEMod default trip lengths.

Fugitive dust emissions associated with earthwork activities were based on emissions from within CalEEMod and activity data provided by the project applicant. For earthwork/trenching, it was assumed that there would be 16,796 cubic yards (cy) of earthwork soil cut, 2 cy of earthwork soil fill, and 6,166 cy of roadway excavation on site. Dust emissions were calculated based on CalEEMod PM10 and PM2.5 emissions for 10,000 cy and scaled based on daily cy of earthwork. Unmitigated emissions were reduced by 61% from uncontrolled levels to reflect required compliance with SCAQMD Rule 403.[7] According to SCAQMD guidance, Rule 403 would reduce fugitive dust emissions by 61% (SCAQMD 2011a) by watering three times per day. The specific dust control methods for the proposed Project would be specified in the dust-control plan that must be submitted to the SCAQMD per Rule 403. Fugitive dust emissions from earth-moving activities are proportional to the amount of material handled.

Emissions associated with paving operations were calculated based on CalEEMod default off-gassing emission factor for paving (2.06 pounds of ROG per acre), assuming 5 acres of paving and a 5-day paving phase, which equates to 1 acre of paving per day.

4.2.2 Operations

The Project would become operational in the year 2014. Once operational, the Project would increase train activities as well as attract motor vehicle trips to the proposed 245-space parking lot. Also, because the Project would offer a non-automobile form of regional transportation, the Project would result in changes in traffic on the regional roadway network. Project-related criteria pollutant and GHG emission calculations consider both direct and indirect sources of emissions. Direct emissions include sources directly related to the project, including new park and ride trips and fuel combustion within the trains. Indirect sources, according to SCAQMD, include indirect physical change in the environment which is not immediately related to the project, but which is caused indirectly by the project (SCAQMD 2008). With respects to the proposed project, indirect sources of emission would be related to the availability of mass transit and subsequent reduction in single-occupancy passenger-vehicle trips.

Train Activity

Emissions of ozone precursors (ROG and NO_X), CO, PM10 (DPM), PM2.5, and GHGs associated with increased train operations with the approximate 1-mile extension would result from diesel fuel combustion within the train locomotives. Emissions were estimated based on the net increase in fuel consumption provided by the project engineer, based on 0.44 miles per gallon fuel efficiency estimate obtained from the National Transit Database for the year 2010 [8] (National Transit Database 2011), Metrolink train fleet by tier by operational year (as obtained from the project engineer), and default EPA emission factors by engine tier type (EPA 2009). EPA emission factors were converted from grams per brake-horsepower-hour (g/bhp-hr) into grams per gallon (g/gallon) using EPA conversion factor of 20.8 for large line haul and passenger trains. The SO_X emission factor was calculated using EPA methodology assuming a 15 ppm sulfur content, consistent with ARB and EPA requirements. CH_4 and N_2O emissions were estimated using CH_4 and N_2O emission factors for locomotives within the most recent General

[7] SCAQMD, *CEQA Handbook*, Table A11-9-A, p A11-77

[8] The fuel efficiency value of 0.44 miles per gallon (MPG) was calculated using data for the Southern California Regional Rail Authority (Metrolink) (ID 9151) from the NTD website. MPG was calculated by dividing annual train miles (2,520,801) in Table 20 (by gallons of diesel fuel consumed (5,714, 904) in Table 17 (http://www.ntdprogram.gov/ntdprogram/pubs/dt/2010/excel/DataTables.htm)

Reporting Protocol (Climate Registry 2011). Maximum daily criteria pollutant emissions were calculated based on a net increase of 176 gallons per day on an average weekday in opening year 2014, and 235 gallons per day on an average weekday in forecast year 2035, train fleet mix for both opening year 2014 and forecast year 2035, as well as default EPA emission factors for line haul and commuter rail locomotives. Annual DPM and GHG emissions were calculated based on a net increase of 45,795 gallons of fuel per year over existing conditions in opening year 2014 and 61,061 gallons of fuel per year over existing conditions in forecast year 2035, train fleet mix over time, and default EPA emission factors by engine tier.

Motor Vehicle Trips Associated with the Park and Ride Lot, New and Displaced Trips

Emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and GHGs associated with park and ride lot motor vehicle trips were estimated using the Caltrans' CT-EMFAC emissions model (version 4.1), re-entrained road dust methodology from the EPA, CalEEMod default trip length for commercial-customer trips in San Bernardino County, and trip data obtained from the Traffic Impact Analysis (Iteris 2012a). For purposes of analysis, it was assumed all motor vehicle trips would travel an average speed of 30 mph. Re-entrained paved road dust emission factors were calculated based on EPA methodology, ARB methodology for average vehicle weight, and precipitation data from WRCC.

According to data produced by SANBAG, only a small portion (5%) of trips associated with the Park and Ride lot would be "new" trips (trips that otherwise would not occur), while a majority of the trips would be "re-distributed" trips from passengers that currently commute to their destination in the region, such as Los Angeles. According to SANBAG's transit ridership information (Parsons Transportation Group 2007), existing commuter trips travel an average of 25 miles per one-way trip. For purposes of estimating VMT and emissions associated with these re-distributed trips, it was assumed that existing re-distributed trips that would otherwise drive 25 miles per one-way trip would under the No-Project condition would now drive a shorter distance, assumed to be 13.3 miles per one-way trip (based on CalEEMod default trip length for commercial-customer trips within the urban SCAB portion of San Bernardino County). Therefore, since there would be a reduction in VMT associated with these re-distributed trips over the No-Project conditions (i.e., the 25 miles per one-way trip for the No-Project Condition would be lowered to 13.3 miles per one-way trip for the build alternatives), these emissions are also treated as a net-negative for the build alternatives.

For purposes of estimating VMT and emissions associated with "new" trips, it was assumed that "new" trips (60 ADT, or 5% of 1193 ADT) would travel 13.3 miles per one-way trip (CalEEMod default trip length for commercial-customer trips within the urban SCAB portion of San Bernardino County).

Regional Vehicle Miles Traveled (VMT)

Emissions of ozone precursors (ROG and NO_X), CO, PM10, PM2.5, and GHGs associated with regional traffic were estimated using the Caltrans' CT-EMFAC emissions model (version 4.1), re-entrained road dust methodology from the EPA, and VMT data obtained from the traffic consultant (Iteris 2012b). The VMT data was provided in 5 mph speed bins (or ranges) for the existing, 2035 no project, and 2035 with-project scenarios for both peak and off-peak periods of the day. The traffic data used for CT-EMFAC emissions modeling is summarized in Table 4-1. Re-entrained road dust was calculated using the same methodology as for the park and ride lot, previously provided in Section 4.2.3.

Table 4-1. Speed Bin VMT for Project Scenarios

Speed Bins		Existing Year 2009				Opening Year 2014				Forecast Year 2035			
		Existing		Existing Plus Project		No Project		With Project		No Project		With Project	
Bin	Bin Range	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%
5	0.0 - 4.99	362,451	0.2%	340,177	0.2%	519,232	0.2%	487,323	0.2%	985,137	0.3%	924,597	0.3%
10	5.0 - 9.99	1,224,726	0.6%	1,225,663	0.6%	2,217,324	1.0%	2,219,020	1.0%	2,529,940	0.9%	2,531,875	0.9%
15	10.0 - 14.99	3,678,755	1.8%	3,716,215	1.8%	5,541,745	2.4%	5,598,175	2.4%	6,231,077	2.2%	6,294,526	2.2%
20	15.0 - 19.99	11,240,490	5.6%	11,549,900	5.7%	15,342,473	6.7%	15,764,796	6.8%	16,033,304	5.6%	16,474,643	5.8%
25	20.0 - 24.99	28,441,790	14.1%	28,126,703	13.9%	37,296,422	16.2%	36,883,240	16.0%	39,297,724	13.8%	38,862,371	13.6%
30	25.0 - 29.99	40,153,589	19.9%	40,205,457	19.9%	48,001,736	20.8%	48,063,742	20.8%	56,304,399	19.7%	56,377,130	19.7%
35	30.0 - 34.99	26,918,716	13.3%	26,840,051	13.3%	31,613,938	13.7%	31,521,552	13.7%	42,647,912	14.9%	42,523,281	14.9%
40	35.0 - 39.99	19,932,031	9.9%	19,949,206	9.9%	22,823,851	9.9%	22,843,518	9.9%	32,889,705	11.5%	32,918,046	11.5%
45	40.0 - 44.99	18,104,177	9.0%	18,166,121	9.0%	19,132,390	8.3%	19,197,852	8.3%	27,240,793	9.5%	27,333,998	9.6%
50	45.0 - 49.99	16,316,713	8.1%	16,281,688	8.1%	17,358,286	7.5%	17,321,025	7.5%	22,104,996	7.7%	22,057,546	7.7%
55	50.0 - 54.99	14,048,434	7.0%	13,954,046	6.9%	11,650,814	5.1%	11,572,535	5.0%	17,601,309	6.2%	17,483,050	6.1%
60	55.0 - 59.99	11,464,686	5.7%	11,564,391	5.7%	10,624,394	4.6%	10,716,791	4.6%	12,783,575	4.5%	12,894,750	4.5%
65	60.0 - 64.99	6,950,869	3.4%	6,928,635	3.4%	5,617,436	2.4%	5,599,467	2.4%	7,766,552	2.7%	7,741,709	2.7%
70	65.0 - 69.99	3,147,600	1.6%	3,149,420	1.6%	2,849,735	1.2%	2,851,383	1.2%	1,168,970	0.4%	1,169,646	0.4%

Speed Bins		Existing Year 2009				Opening Year 2014				Forecast Year 2035			
		Existing		Existing Plus Project		No Project		With Project		No Project		With Project	
Bin	Bin Range	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%
75	70.0 - 74.99	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
TOTAL PEAK VMT		*201,985,027*	*100%*	*201,997,673*	*100%*	*230,589,776*	*100%*	*230,640,420*	*100%*	*285,585,393*	*100%*	*285,587,168*	
5	0.0 - 4.99	106,239	0.06%	97,821	0.05%	118,890	0.06%	109,470	0.05%	165,097	0.06%	152,016	0.06%
10	5.0 - 9.99	181,657	0.10%	205,028	0.11%	245,380	0.12%	276,949	0.13%	295,941	0.11%	334,015	0.13%
15	10.0 - 14.99	584,805	0.32%	569,141	0.31%	738,181	0.35%	718,409	0.35%	937,454	0.36%	912,344	0.35%
20	15.0 - 19.99	3,227,575	1.77%	3,212,405	1.76%	3,846,385	1.85%	3,828,307	1.84%	4,473,196	1.73%	4,452,172	1.73%
25	20.0 - 24.99	13,213,075	7.23%	13,153,758	7.20%	15,570,191	7.48%	15,500,293	7.45%	16,737,781	6.49%	16,662,641	6.46%
30	25.0 - 29.99	27,308,644	14.94 %	27,366,387	14.98 %	32,258,338	15.50 %	32,326,547	15.53 %	34,663,730	13.43 %	34,737,025	13.47 %
35	30.0 - 34.99	21,429,763	11.72 %	21,451,357	11.74 %	25,687,509	12.34 %	25,713,393	12.35 %	29,317,625	11.36 %	29,347,167	11.38 %
40	35.0 - 39.99	13,836,202	7.57%	13,723,415	7.51%	17,825,345	8.56%	17,680,041	8.49%	22,502,452	8.72%	22,319,022	8.65%
45	40.0 - 44.99	14,276,291	7.81%	14,280,999	7.81%	18,052,531	8.67%	18,058,485	8.68%	22,162,185	8.59%	22,169,494	8.59%
50	45.0 - 49.99	15,326,085	8.38%	15,197,150	8.32%	16,583,321	7.97%	16,443,809	7.90%	25,117,383	9.73%	24,906,076	9.66%
55	50.0 - 54.99	14,773,862	8.08%	14,966,993	8.19%	17,667,766	8.49%	17,898,728	8.60%	23,867,284	9.25%	24,179,289	9.37%
60	55.0 - 59.99	23,064,125	12.62 %	23,073,061	12.63 %	25,666,075	12.33 %	25,676,019	12.34 %	33,921,202	13.15 %	33,934,345	13.16 %
65	60.0 - 64.99	26,497,589	14.50 %	26,487,030	14.49 %	24,475,682	11.76 %	24,465,929	11.76 %	34,294,500	13.29 %	34,280,834	13.29 %

Speed Bins		Existing Year 2009				Opening Year 2014				Forecast Year 2035			
		Existing		Existing Plus Project		No Project		With Project		No Project		With Project	
Bin	Bin Range	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%	VMT	%
70	65.0 - 69.99	8,961,356	4.90%	8,961,454	4.90%	9,427,699	4.53%	9,427,802	4.53%	9,567,180	3.71%	9,567,285	3.71%
75	70.0 - 74.99	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TOTAL OFF-PEAK VMT		*182,787,268*	*100%*	*182,746,001*	*100%*	*208,163,293*	*100%*	*208,124,180*	*100%*	*258,023,010*	*100%*	*257,953,725*	*100%*
TOTAL DAILY VMT		*384,772,295*		*384,743,674*		*438,753,069*		*438,764,600*		*543,608,403*		*543,540,893*	
Source: Iteris 2012													

4.3 TOXIC AIR CONTAMINANTS

Since diesel-related exhaust, specifically DPM, is considered a TAC by the ARB, a human health risk assessment was conducted to assess the risk associated with project-related activities. A health risk assessment consist of 3 parts: (1) a TAC emissions inventory, which is described in Section 4.2, (2) air dispersion modeling to evaluate off-site concentrations of TAC emissions, and (3) assessment of risks associated with predicted concentrations. The proposed Project would increase diesel-powered construction equipment and rail activity within the rail corridor. A variety of land uses are located adjacent to the approximately 1-mile long corridor, including single- and multi-family residential, recreational, commercial, office, storage/warehouse, industrial, and vacant parcels.

4.3.1 Health Risk Assessment

The HRA was conducted using the guidelines provided by the California OEHHA for the Air Toxics Hot Spots Program (OEHHA 2003) and the HRA guidelines developed by the California Air Pollution Control Officers Association (CAPCOA) and SCAQMD (CAPCOA 2009, SCAQMD 2003).

Consistent with EPA, ARB, and SCAQMD regulatory requirements, a human health risk assessment was conducted to determine the potential impacts of construction and operation of the proposed project on nearby land uses. First, a construction and operations-period TAC inventory was developed. The construction inventory used the same methodology as the mass emissions analysis for identifying mass daily criteria pollutant emissions as previously discussed in Section 3.2.1. With respect to construction activities, all PM10 exhaust from off-road equipment and onsite truck travel during construction was assumed to be DPM. With respect to train operations, PM10 exhaust was estimated using the net increase in annual fuel consumption and a weighted average emission factor based on Metrolink tiered trains over time. All PM10 exhaust was assumed to be DPM.

Air Dispersion Modeling

The HRA used EPA's AERSCREEN model, which is the screening-level model for AERMOD, to model maximum worst-case 1-hour concentrations at nearby receptors based on a single emissions source that are generally slightly more conservative than the AERMOD model. Modeling inputs for this screening assessment include emission rate (in grams per second), source characteristics (release height, stack diameter), and surface characteristics (albedo, Bowen ratio, surface roughness), assuming default worst-case meteorological conditions as generated by AERSCREEN in an urban setting. Emissions associated with both construction activities and train movement activities were treated as elevated area sources equal to the size of the entire project construction area. Emissions associated with train idling was treated as a point source at each location. Idling times at each location and train fuel consumption associated with movement were obtained from the project engineer.

A complete list of dispersion modeling and risk calculation inputs is provided in Appendix E of this report.

Risk Calculations

Generally, worst case for cancer risk is based on 70 years of exposure, but shorter exposure durations are acceptable for non-residential land uses. Worst case for acute adverse health effects is based on the hour with the highest emissions. Worst case for chronic adverse health effects is based on the annual average emissions (CAPCOA 2009).

Cancer Risk

Cancer risk is defined as the lifetime probability (chance) of developing cancer from exposure to a carcinogen, typically expressed as the increased chance in 1 million. The default cancer risk calculation for residents and workers is based on the 80th percentile breathing rate, as recommended by the OEHHA. In addition, OEHHA recommends a default cancer risk calculation for recreational land uses (as a more conservative approach) where children may be located, be based on the 95th percentile breathing rate.

Chronic Non-Cancer Risk

Noncancer chronic inhalation impacts are calculated by dividing the annual average concentration by the reference exposure level (REL) for that substance. The REL is defined as the concentration at which no adverse noncancer health effects are anticipated.

For non-inhalation pathways, hazard indices are calculated as the ratio of calculated doses to acceptable or "reference" doses (RfDs). If the reported concentration or dose of a given chemical is considered, it is assumed that multiple threshold exposures could result in an adverse health effect. Thus, chemical-specific hazard indices are summed. Typically, for a given set of chemicals, hazard indices are summed for each organ system that each chemical can affect. For any organ system, a total hazard index exceeding 1.0 indicates a potential adverse health effect, per SCAQMD guidelines. Diesel exhaust risk assessment assumes only an inhalation pathway.

Note that neither ARB nor OEHHA has identified acute health effects from diesel exhaust. Therefore, acute health effects are not included in this analysis.

Sensitive Receptors

A receptor is defined as a point where a person (resident or worker) may be located for a given period of time. With respect to cancer and chronic health effects, all locations where a person could be located for extended periods of time, such as a residence or workplace, need to be identified. For residential land uses, the exposure period is assumed to be 70 years. For sites where workers could be located, the exposure period is assumed to be 40 years. For other land uses, including recreational land uses, the exposure period is assumed to be 9 years.

4.4 GREENHOUSE GASES

The methods used in estimating project-related GHG emissions is described in Section 4.2.

4.5 ALTERNATIVES ANALYSIS

The analysis herein is specific to the proposed Project, except as noted. The remaining design options include the same project APE (except for the 3rd Street Open Design Option 3, which includes a reduced APE) and essentially the same or similar project components, with the differentiation involving a pedestrian egress at the Depot or the configuration of 3rd Street. Therefore, the assessment of air quality and GHG impacts would essentially be the same or similar for the proposed Project, the Pedestrian Overpass Design Options 1A and 1B, the Pedestrian Underpass Design Option 2, and 3rd Street Open Design Option 3, and no other alternatives analysis is included.

5.0 IMPACT DISCUSSION

Effect AQ-1: Included in a conforming RTP and FTIP

Under federal and state mandates, the Regional Council of SCAG is tasked with developing a Federal Transportation Improvement Program (FTIP) every 4 years. The improvements to the Rialto and E Street rail platforms and track improvements are listed as project number 200809 within SCAG's 2011 FTIP (SCAG 2011a). While the proposed Project is also listed in the SCAG 2011 FTIP under project number 20061012, the proposed Project is only listed as a part of the larger Redlands Passenger Rail Project. As such, the SCAG 2011 FTIP will be amended to reflect the DSBPRP as currently proposed, and separate from the Redlands Passenger Rail Project. In addition, SCAG lists the Project in the Regional Transportation Improvement Program (RTIP) as "Metrolink Commuter Rail" for rail service expansion in San Bernardino as project number 4CR04 (SCAG 2011b). Similarly, the project is listed in SCAG's 2008 RTP (RTP ID 4TR0101) as part of the 10-mile "San Bernardino-Redlands Extension". The 2008 RTP is currently being updated, and the Draft 2012 RTP and EIR were released and are currently undergoing public review. The Omnitrans portion of the project is included in the 2008 RTP Amendment #1 and 2008 RTIP Amendment #08-01 Project Listing as project ID 200625 with description "E Street Transit Corridor – from San Bernardino to Loma Linda". The Amendments were adopted by SCAG on December 4, 2008. The design concept and scope of the Omnitrans facility have not changed materially from what was analyzed in the adopted Amendments to 2008 RTP and 2008 RTIP. The Omnitrans portion is also listed in the financially-constrained Draft 2012 RTP as project ID 200625.

Air quality modeling conducted by SCAG has shown that emissions associated with the RTP and FTIP are within the allowable air pollutant emission budgets. Consequently, the proposed Project is considered a conforming transportation project.

Because this project conforms with the most recently adopted RTP and FTIP; has not significantly changed in design concept and scope; there has been less than 3 years since the from the last major conformity milestone, and a supplemental environmental document for air quality purposes has not been initiated, a new conformity determination is not required. Consequently, no adverse effect is anticipated. No mitigation is required.

Effect AQ-2: No Violations of Carbon Monoxide NAAQS or CAAQS

Tables 5-1 and 5-2 present the results of the CO hot-spot modeling for the years 2009 (Existing), Opening Year 2014, and Forecast Year 2035. Each table indicates that implementation of the proposed Project is not expected to result in violations of the state or federal 1- or 8-hour CO standards. Consequently, the project would not cause or contribute to new air quality violations, worsen existing violations, or delay timely attainment of CO NAAQS and the impact of traffic conditions from the proposed Project on ambient CO levels is considered less than significant and not adverse. No mitigation is required.

The EPA's transportation conformity rules stipulate that transportation projects considered a POAQC, or any other project that is identified by the PM2.5 or PM10 SIP as a localized air quality concern, must undergo hot-spot analysis in PM2.5 or PM10 nonattainment and maintenance areas. Because the proposed action area is located in a serious nonattainment area with regards to the PM10 standard and nonattainment area with regards to the PM2.5 standard (see Table 2-2), an evaluation must be made to determine whether a PM hot-spot analysis must be performed.

Table 5-1. Modeled CO Levels Measured at Receptors in the Vicinity of Affected Intersections during 2009 Existing, 2014 Opening Year, and 2035 Forecast Year Scenarios

Intersection	Receptor	PM Peak Hour									
		2009 Existing		2014 Future No-Project		2014 Future With-Project		2035 Future No-Project		2035 Future With-Project	
		1-Hr	8-Hr	1-Hr	8-Hr	1-Hr	8-hr	1-Hr	8-Hr	1-Hr	8-hr
K Street and 2nd Street	1	4.4	3.5	4.3	3.4	4.5	3.5	3.9	3.1	4.0	3.2
	2	4.5	3.5	4.1	3.3	4.5	3.5	3.8	3.0	4.0	3.2
	3	4.6	3.6	4.3	3.4	4.6	3.6	3.9	3.1	4.0	3.2
	4	4.7	3.7	4.3	3.4	4.5	3.5	3.9	3.1	4.0	3.2
K Street and Rialto Avenue	5	5.2	4.0	4.6	3.6	4.7	3.7	4.0	3.2	4.0	3.2
	6	5.2	4.0	4.5	3.5	4.5	3.5	3.9	3.1	3.9	3.1
	7	5.3	4.1	4.7	3.7	4.8	3.7	4.0	3.2	4.0	3.2
	8	5.2	4.0	4.5	3.5	4.7	3.7	3.9	3.1	4.0	3.2
E Street and 2rd Street	9	6.2	4.7	5.2	4.0	5.2	4.0	4.2	3.3	4.2	3.3
	10	6.4	4.9	5.3	4.1	5.3	4.1	4.2	3.3	4.2	3.3
	11	6.2	4.7	5.2	4.0	5.2	4.0	4.2	3.3	4.2	3.3
	12	6.4	4.9	5.3	4.1	5.3	4.1	4.2	3.3	4.2	3.3
E Street and Rialto Avenue	13	5.8	4.4	4.9	3.8	5.1	4.0	4.1	3.3	4.1	3.3
	14	5.8	4.4	4.9	3.8	5.1	4.0	4.1	3.3	4.1	3.3
	15	5.6	4.3	4.8	3.7	4.9	3.8	4.1	3.3	4.1	3.3
	16	5.7	4.4	4.9	3.8	5.0	3.9	4.1	3.3	4.1	3.3
H Street and 5th Street	17	6.2	4.7	5.2	4.0	5.2	4.0	4.2	3.3	4.3	3.4
	18	6.4	4.9	5.3	4.1	5.4	4.2	4.3	3.4	4.4	3.5
	19	6.1	4.7	5.1	4.0	5.0	3.9	4.2	3.3	4.2	3.3
	20	6.6	5.0	5.5	4.2	5.5	4.2	4.4	3.5	4.4	3.5
E Street/ Inland Center Drive and Mill Street	21	6.5	4.9	5.3	4.1	5.4	4.2	4.4	3.5	4.3	3.4
	22	6.3	4.8	5.1	4.0	5.3	4.1	4.6	3.6	4.3	3.4
	23	6.5	4.9	5.2	4.0	5.1	4.0	4.2	3.3	4.6	3.6
	24	6.3	4.8	5.4	4.2	5.4	4.2	4.4	3.5	4.3	3.4

[1] Background concentrations of 3.6 and 2.9 ppm were added to the modeling 1- and 8-hour results, respectively, based on SCAQMD projected future year concentrations for San Bernardino.

The federal and state 1-hour standards are 35 and 20 ppm, respectively.

The federal and state 8-hour standards are 9 and 9.0 ppm, respectively. The difference lies in the rounding convention.

Source: ICF 2011, EMFAC and CALINE4 modeling., Appendix D

Table 5-2. Modeled Construction-Period Criteria Pollutant Emissions

Construction Phase	Work Crew	Pounds Per Day					
		ROG	NO_X	CO	SO_X	PM10	PM2.5
Mobilization/demobilization	A1	0.5	4.1	8.5	0.00	0.6	0.3
Concrete work	C1	0.4	1.9	7.8	0.00	0.2	0.1
	C2	1.6	4.6	46.8	0.00	0.5	0.2
Demolition	D1	5.3	12.8	142.8	0.01	2.3	2.1
	D2	7.8	21.9	174.7	0.02	2.7	2.5
	D3	0.8	3.2	22.7	0.00	0.3	0.1
	D4	2.2	9.2	33.0	0.01	0.6	0.4
Electrical	E1	0.1	0.9	1.1	0.00	0.1	0.0
	E2	1.2	7.5	9.2	0.00	0.6	0.4
	E3	0.5	2.9	1.0	0.00	0.2	0.2
Iron work	IW1	2.0	5.8	46.8	0.01	0.2	0.2
Landscaping	L1	1.5	8.5	8.2	0.00	0.6	0.5
Miscellaneous	M1	1.2	6.5	12.7	0.00	0.5	0.4
	M2	1.5	5.5	33.9	0.00	0.4	0.3
	M3	0.6	1.3	21.2	0.00	0.2	0.1
	M4	0.4	1.4	9.5	0.00	0.2	0.1
Paving	P1	1.3	10.1	5.5	0.01	0.9	0.6
	P2	1.6	10.8	6.4	0.01	1.0	0.7
Signals	S1	0.4	1.6	7.6	0.00	0.1	0.0
	S2	0.7	4.3	12.4	0.00	0.4	0.2
Track work	T1	2.0	13.1	21.6	0.01	1.0	0.6
	T2	2.9	14.5	52.9	0.01	1.3	1.0
	T3	3.1	10.2	73.3	0.01	1.1	0.8
	T4	0.0	0.0	0.0	0.00	0.0	0.0
Utilities	U1	1.5	4.8	35.9	0.00	0.5	0.4
	U2	1.1	4.3	26.1	0.00	0.4	0.3
Precast block walls	W1	0.8	5.7	6.4	0.01	0.4	0.3

Construction Phase	Work Crew	Pounds Per Day					
		ROG	NO_X	CO	SO_X	PM10	PM2.5
Excavation/site prep	X1	1.6	11.3	7.9	0.01	0.7	0.6
	X2	1.2	7.9	6.1	0.00	0.6	0.5
	X3	0.9	4.2	15.1	0.00	0.5	0.4
	X4	1.0	8.1	4.4	0.01	0.5	0.4
Maximum Daily Emissions		16.5	53.6	352.4	0.1	5.2	4.6
SCAQMD Construction Thresholds		75	100	550	150	150	55
Significant?		No	No	No	No	No	No

[1] All work crews were assumed to work 5 weekdays per work week, except for work crews D2, P2, and T3, which were assumed to work 1 weekend day.

Maximum daily emissions occur when the following work crews are active overlap activities:

Week 34 of construction for VOC and CO: Work crews C1, C2, D1, E2, IW1, M1, S1, S2, T1, and T2. Weekend crews of P2 and T3 are also active this week, but those activities occur on the weekend and thus do not overlap with weekday activities.

Week 17 of construction for NO_X, SO_X, PM10, and PM2.5: C1, D1, P1, S2, T1, T2, W1, and X2. No weekend crews are active this week.

Source: ICF emissions modeling, Appendix B.

Effect AQ-3: No Violations of PM2.5/PM10 NAAQS

The proposed project is an extension of regional passenger rail service and involves the relocation of a previously-approved Omnitrans bus facility. The Omnitrans facility will result up approximately 8,49 daily bus trips, and would primarily be served by the entirely-CNG Omnitrans fleet. VVTA (which has 1 diesel bus) and MARTA (which has 8 diesel buses) would also serve the facility, but daily trips would be infrequent. The Omnitrans facility is a previously-approved but project that has yet to be constructed, and the proposed project is not expected to change the existing number, routes, and movements of diesel buses beyond the relocation of the bus bays closer to the proposed project terminus. The facility would not be considered to be a "regionally significant project[9]" under 40 CFR 93.101, nor would it result in a significant number of diesel vehicles that would congregate at a single location. Consequently, the proposed action is not considered a POAQC for PM10 /PM2.5 and the CAA and 40 CFR 93.116 requirements were met without a hot-spot analysis. Confirmation of this determination ~~will be~~was made during interagency consultation (IAC) with the ~~appropriate local, state, and federal agencies and the final analysis will be identified in the final environmental document.~~SCAG Transportation Conformity Group, and on July 24, 2012, the SCAG Transportation Conformity Group determined that the Project was not a POAQC.

Effect AQ-4: Emissions below SCAQMD Regional Significance Thresholds during Construction

Construction of the proposed Project has the potential to create air quality impacts through the use of heavy-duty construction equipment, construction worker vehicle trips, material delivery trips, and heavy-

[9] Regionally significant projects are those projects that serve regional transportation needs. Regionally significant projects can include projects that provide access to areas outside region, such as a highway, major activity centers in region, such as a sports complex, major planned developments, such as a new retail mall, and transportation terminals, such as a train depot.

duty haul truck trips generated from construction activities. In addition, earthwork activities would result in fugitive dust emissions, and paving operations would release ROGs from off-gassing. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. The assessment of construction air quality impacts considers each of these potential sources. Fugitive PM10 and PM2.5 emissions estimates take into account compliance with SCAQMD Rule 403.

Construction-related emissions are shown in Table 5-2. As shown therein, maximum daily criteria pollutant emissions would not exceed SCAQMD construction-period thresholds for any pollutant during construction activities. Therefore, no mitigation is proposed.

Effect AQ-5: Emissions Below SCAQMD Regional Significance Thresholds during Operations

Long-term operation of the proposed Project has the potential to create air quality impacts primarily associated with increased train activity and motor vehicle trips associated with the park and ride lot. In addition, by providing a regional alternative non-automobile form of transportation, the Project would thus indirectly alter regional on-road motor vehicle travel. Emissions of ROG, NO_X, CO, PM10, and PM2.5 for existing year (2009), opening year (2014), and forecast year (2035) with and without project conditions were evaluated with respect to train operations, new and displaced park and ride motor vehicle trips, and regional VMT on the roadway network. Table 5-3 summarizes the estimated daily emissions for the existing and existing plus project scenarios, which forms the basis of the CEQA impact determination. Table 5-4 summarizes the estimated daily emissions for the opening year 2014 no project and with-project conditions. Table 5-5 summarizes the estimated daily emissions for the forecast year 2035 no project and with-project conditions. The differences in emissions between the existing and existing plus project scenarios represent emissions generated directly as a result of implementation of the proposed Project. The differences in emissions between future year 2014 and 2035 with-project and without-project conditions are similar in that the net change in emissions represents emissions generated directly as a result of implementation of the proposed Project, albeit with ambient growth in the region between existing and forecast years factored in the scenario totals.

As shown in Table 5-3, implementation of the proposed project would decrease emissions of all criteria air pollutants but SOx relative to existing conditions. These decreases are attributable to the removal of single-occupant-vehicle trips from the regional network, as well as re-distributed trips associated with the park and ride lot that would otherwise driver further without the proposed project. Table 5-4 indicates emissions would increase for all criteria air pollutants except ROG under opening year conditions, although these increases would be below SCAQMD's operational thresholds of significance. Table 5-5 indicates emissions would decrease for all criteria air pollutants except NOx under forecast year conditions, although this increase in NO_X emissions would be below SCAQMD's operational thresholds of significance. There would be no adverse effect. No mitigation is required.

Effect AQ-6: Emissions Below SCAQMD Localized Significance Thresholds during Construction and Operations

The SCAQMD has developed a set of mass emissions rate look-up tables that can be used to evaluate localized impacts that may result from construction- and operations-period emissions. If the onsite emissions from proposed construction activities are below the LST emission levels found in the LST mass rate look-up tables for the project site's SRA, then project emissions would not have the potential to cause a significant localized air quality impact. When quantifying mass emissions for LST analysis, only emissions that occur on site are considered. Consistent with SCAQMD LST guidelines, emissions related to offsite delivery/haul truck activity and employee trips during construction are not considered in the evaluation of localized impacts. However, because emissions associated with project construction are almost entirely generated on-site, all construction-related emissions are considered in the localized analysis herein.

Table 5-3. Modeled Existing and Existing Plus Project Operational Emissions

Scenario	Project Element	Pounds Per Day					
		ROG	NOX	CO	SOX	PM10	PM2.5
Existing	On-Road VMT	232,720	911,363	2,827,734	3,926	471,369	138,056
Existing Plus Project	On-Road VMT	232,678	911,295	2,827,611	3,926	471,334	138,046
	Train Activity	2.57	45.65	10.34	0.04	1.67	1.66
	Parking Lot Motor Vehicle Trips (new trips)	0.33	1.16	3.90	0.01	0.95	0.27
	Parking Lot Motor Vehicle Trips (re-distributed trips)	-5.58	-19.32-	-65.10	-0.15	-0.91	-0.85
	Total Existing plus Project	232,675	911,322	2,827,560	3,926	471,336	138,047
Existing Plus Project Net Minus Existing		**-45.1**	**-40.8**	**-174.1**	**0.1**	**-32.9**	**-8.9**
SCAQMD Thresholds		55	55	550	150	150	55
Exceed Thresholds?		No	No	No	No	No	No
Source: ICF emissions modeling 2012, Appendix C.							

Table 5-4 Modeled Opening Year 2014 Operational Emissions

Scenario	Project Element	Pounds Per Day					
		ROG	NO_X	CO	SO_X	PM10	PM2.5
No Project	On-Road VMT	175,755	664,348	2,067,671	4,501	530,435	151,121
Proposed Project	On-Road VMT	175,733	664,370	2,067,851	4,502	530,451	151,128
	Train Activity	2.57	45.65	10.34	0.04	1.67	1.66
	Parking Lot Motor Vehicle Trips (new trips)	0.33	1.16	3.90	0.01	0.95	0.27
	Parking Lot Motor Vehicle Trips (re-distributed trips)	-5.58	-19.32	-65.10	-0.15	-0.91	-0.85
	Total Project	175,730	664,397	2,067,800	4,502	530,452	151,129
2014 Future With-Project Net Minus Future No Project		**-25.0**	**49.0**	**128.8**	**0.8**	**17.8**	**8.1**
SCAQMD Thresholds		55	55	550	150	150	55
Exceed Thresholds?		No	No	No	No	No	No
Source: ICF emissions modeling 2012, Appendix C.							

Table 5-5. Modeled Forecast Year 2035 Operational Emissions

Scenario	Project Element	Pounds Per Day					
		ROG	NO_X	CO	SO_X	PM10	PM2.5
No Project	On-Road VMT	92,815	271,841	975,868	5,833	645,999	176,881
Proposed Project	On-Road VMT	92,807	271,831	975,831	5,832	645,925	176,864
	Train Activity	2.95	53.31	13.78	0.05	1.94	1.92
	Parking Lot Motor Vehicle Trips (new trips)	0.15	0.40	1.50	0.01	0.94	0.25
	Parking Lot Motor Vehicle Trips (re-distributed trips)	-2.43	-6.75	-25.11	-0.15	-15.75	-4.3
	Total Project	92,807	271,878	975,822	5,832	645,912	176,862
2035 Future With-Project Net Minus Future No Project		**-7.5**	**36.8**	**-46.4**	**-0.7**	**-86.8**	**-19.0**
SCAQMD Thresholds		55	55	550	150	150	55
Exceed Thresholds?		No	No	No	No	No	No
Source: ICF emissions modeling 2012, Appendix C.							

In addition, during long-terms operations the only emissions that would occur onsite would be train-related fuel combustion. Other sources of regional operational emissions (motor vehicles operating on the regional network and park and ride lot, specifically) are not evaluated, per SCAQMD guidance, included in the LST analysis. As shown in Table 5-6, localized emissions during both construction and operations would not exceed LSTs for the project area. Impacts are less than significant and no mitigation is proposed.

Table 5-6. Modeled Localized Criteria Pollutant Emissions during Construction and Operations

Phase	NO_X	CO	PM10[a]	PM2.5[a]
Construction				
Max Daily Construction Emissions (Table 5-2)	53.6	352.4	5.2	4.6
Localized Significance Thresholds[b]	270	1,746	14	9
Exceed Threshold?	**No**	**No**	**No**	**No**
Operations				
Train Activity (Table 5-3)	45.65	10.34	1.67	1.66
Localized Significance Thresholds[b]	270	1,746	4	2
Exceed Threshold?	**No**	**No**	**No**	**No**

Notes:
Emissions calculation worksheets are included in Appendix A (Construction) and Appendix B (Operations).
[b] The project site is located in SCAQMD SRA No 34. These LSTs are based on the site location SRA, distance to nearest sensitive receptor location from the project site (25 meters), and project area that could be under construction or operation on any given day (five acres).

Effect AQ-7: Expose sensitive receptors to increased health risk

The Project would result in increased diesel-powered Metrolink train activity within the rail corridor. Mass construction- and train-related DPM emissions were quantified using the methodology starting with Section 4.0. EPA's AERSCREEN dispersion model, as described in the methodology within Section 4.2.4, was used to estimate pollutant concentrations at nearby receptor locations. The construction portion of this HRA includes DPM emissions from the sBx E Street Corridor BRT Project Re-Evaluations/Addendum (Parsons 2010). As shown in Table 5-7, health risk impacts associated with the sum of short-term construction and long-term operations would be below SCAQMD thresholds for identifying health risk impacts. As such, impacts are considered less than significant and not adverse.

Table 5-7. Summary of Health Risk Associated with Project Construction and Operations

Project Component	Cancer Risk (in a million)	Chronic Non-Cancer Hazard Index
Train Idling	4.81	0.0153
Train Movement	0.09	0.0001
Project Construction	1.05	0.0007
MICR	5.95	0.02
SCAQMD Risk Thresholds	10	1.0
Exceed Risk?	No	No
Source: ICF 2012, Appendix E		

Effect AQ-8: Significant Contribution of GHG emissions towards Global Climate Change

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations.

Construction Emissions

Short-term construction activities would result in GHG emissions from fuel combustion within off- and on-road construction equipment and vehicles. Emissions associated with the approximately 18-month construction period are summarized in Table 5-8. Consistent with SCAQMD draft guidelines, construction emissions are summed and amortized over a 30-year project life, and then added to operational emissions.

Table 5-8. Modeled Construction-Related GHG Emissions

Project Element		Metric Tons Per Year			
		CO_2	CH_4	N_2O	CO_2e
Construction	2012	584	0.04	0.02	592
	2013	151	0.01	0.01	154
	Total	736	0.06	0.03	746
	Amortized Total (30-year Average)	--	--	--	*24.9*
Source: ICF Emissions Modeling 2012, Appendices B and C.					

Operational Emissions

Implementation of the proposed Project would increase train activity and result in new motor vehicle trips to the park and ride lot. Additionally, as described in Section 4.2.2, availability of the park & ride lot would create new and re-distribute other trips from within the region. Further, the proposed Project would make available mass transit opportunities that would remove a number of single occupancy vehicles within the transportation network, resulting in a decrease in regional VMT. Operational emissions were calculated using the methodologies in Chapter 4.0. Annual operational emissions were summed and added to the amortized construction totals summarized in Table 5-8. Note that motor vehicle emission calculations herein do not account for reductions associated with implementation of national- and state-wide GHG reduction regulations and strategies, including Pavley, LCFS, among others (see Section 2.0).

As discussed in Section 3.5.4, significant and adverse impacts with respects to GHG emissions are analyzed only for the cumulative forecast year 2035, as GHG impacts are cumulative in nature. GHG emission associated with existing year 2009 and opening year 2014 are presented for informational purposes only.

As shown in Table 5-9, GHG emissions would decrease with implementation of the proposed project under Existing plus Project conditions when compared to existing conditions. The proposed Project will increase availability of regional mass transit and reduce regional VMT by approximately 28,621 (0.01% decrease) miles per day (see Table 4-1) and redistribute approximately 13,260 VMT associated with park and ride trips (see Section 4.2, which would more than offset emissions associated with increased train operations and new park and ride lot trips. Thus, the project would result in a reduction in GHG emissions over existing conditions and would thus result in a net regional benefit.

As shown in Table 5-10, GHG emissions would increase under the 2014 Opening Year with Project conditions when compared to No Project conditions. While the proposed Project will increase availability of regional mass transit, regional VMT would increase by approximately 11,531 (0.003% increase) miles per day (see Table 4-1). Increased regional VMT, coupled with new train emissions and new park and ride trips, would more than offset redistributed park and ride trips, which were assumed to be same amount as existing plus project conditions (13,260 VMT).

As shown in Table 5-11, GHG emissions would increase with implementation of the proposed Project during 2035 Forecast Year with Project conditions when compared to No Project conditions. While the proposed Project would reduce regional VMT by approximately 67,510 (0.012% decrease) miles per day (see Table 4-1) and redistribute approximately 13,260 VMT associated with park and ride trips (see Section 4.2), emissions associated with regional VMT would increase slightly over No Project conditions, as a result of increase traffic speeds, resulting in a slight increase in 2035 emissions over no project conditions.

Table 5-9. Modeled Existing and Existing plus Project GHG Emissions

Project Element		Metric Tons Per Year			
		CO_2	CH_4	N_2O	CO_2e
Existing	On-Road VMT	47,282,045	2,488,529		49,770,574
Existing Plus Project	On-Road VMT	47,280,680	2,488,457		49,769,137
	Train Fuel Use[1]	467	0.04	0.01	472
	New Park & Ride Lot Trips[2]	99	5.9		105
	Re-Distributed Park & Ride Lot Trips[2]	-1,660	-87		-1,747

Project Element		Metric Tons Per Year			
		CO_2	CH_4	N_2O	CO_2e
	Total Operations	47,279,587	2,488,375		49,767,967
	Total Existing Plus Project[3]	--	--	--	49,767,992
	Project Net over Existing	--	--	--	-2,582
	SCAQMD Threshold	--	--	--	3,000 / 10,000
	Exceed Threshold?[4]	--	--	--	--

[1] Train emissions based on 66 daily train trips at opening year 2014.

[2] Park and Ride emissions based on new and re-distributed methodology shown in Section 4.2.2 and year 2009 vehicle emission rates.

[3] Total project emissions are the sum of operational GHG emissions and amortized construction emissions summarized in Table 5-7.

[4] GHG impact determinations are made only for the 2035 forecast year

Source: ICF Emissions Modeling 2012, Appendices B and C.

Table 5-10. Modeled Opening Year 2014 No Project and With Project GHG Emissions

Project Element		Metric Tons Per Year			
		CO_2	CH_4	N_2O	CO_2e
No Project	On-Road VMT	55,009,115	2,895,217		57,904,332
With Project	On-Road VMT	55,015,525	2,895,554		57,911,079
	Train Fuel Use[1]	467	0.04	0.01	472
	New Park & Ride Lot Trips[2]	99	6		105
	Re-Distributed Park & Ride Lot Trips[2]	-1,660	-87		-1,747
	Total Operations	55,014,432	2,895,473		57,909,909
	Total With Project [3]	--	--	--	57,909,934
	Project Net over No Project	--	--	--	+5,602
	SCAQMD Threshold	--	--	--	3,000 / 10,000
	Exceed Threshold?[4]	--	--	--	--

[1]Train emissions based on 66 daily train trips at opening year 2014.

[2]Park and Ride emissions based on new and re-distributed methodology shown in Section 4.2.2 and year 2014 vehicle emission rates.

[3]Total with project emissions are the sum of operational GHG emissions and amortized construction emissions summarized in Table 5-7.

[4] GHG impact determinations are made only for the 2035 forecast year

Source: ICF Emissions Modeling 2012, Appendices B and C.

Table 5-11. Modeled Forecast Year 2035 No Project and With Project GHG Emissions

Project Element		Metric Tons Per Year			
		CO_2	CH_4	N_2O	CO_2e
No Project	On-Road VMT	72,114,791	3,795,515		75,910,306
With Project	On-Road VMT	72,116,620	3,795,612		75,912,232
	Train Fuel Use	623	0.05	0.02	629
	New Park & Ride Lot Trips	106	6		113
	Re-Distributed Park & Ride Lot Trips	-1,777	-94		-1,870
	Total Operations	72,115,573	3,795,525		75,911,104
	Total With Project *	--	--	--	75,911,129
	Project Net over No Project	--	--	--	+822
	SCAQMD Threshold	--	--	--	3,000 / 10,000
	Exceed Threshold?	--	--	--	No

Train emissions based on 88 daily train trips at forecast year 2035.

Park and Ride emissions based on new and re-distributed methodology shown in Section 4.2.2 and year 2035 vehicle emission rates.

Total with project emissions are the sum of operational GHG emissions and amortized construction emissions summarized in Table 5-7.

Source: ICF Emissions Modeling 2012, Appendices B and C.

As discussed in Section 3.5.3, SCAQMD currently has no adopted or drafted thresholds levels relevant for transportation projects, but has adopted a threshold level for industrial project (10,000 MT) and drafted a threshold level for commercial and residential projects (3,000 MT), which are used in this analysis to evaluate project significance under CEQA.

While the project would remove a number of single occupancy vehicles within the transportation network and re-distribute motor vehicle trips that would otherwise drive to their destination, GHG emissions under full buildout conditions in 2035 would increase over No Project conditions (822 MTCO2e/yr). However, this increase in emissions is well below adopted or drafted SCAQMD threshold levels. Therefore, this impact is considered less than significant under CEQA. Further, the net change in emissions under full buildout conditions in 2035 are not in excess of the CEQ reference point of 25,000 MTCO2e/yr. Consequently, there would be no adverse effect under NEPA.

Note that the Project would improve mobility opportunities for transit-dependent populations in the City of San Bernardino to employment centers in Los Angeles and Orange counties and support local and regional planning goals of SANBAG for the development of transit corridors in the Inland Empire. The Project would be consistent with statewide efforts by promoting alternative forms of transportation around existing and planned future transit-oriented development. For example, SB 375 calls on SCAG and other MPO's to integrate land use, housing, and transportation planning efforts to achieve the SB 375 regional GHG targets, consistent with the transportation goals of AB 32. SCAQMD has adopted and drafted numeric mass emissions thresholds as a method to close the gap between emissions reductions from land-use driven sectors that would occur at the state level (including Pavley, low carbon fuel standard, and Renewable Portfolio Standard, among others) and the emission reductions necessary from

land use development projects that have a lower carbon intensity within the region, consistent with the goals of AB 32. Future year project-related emissions would be below SCAQMD numeric thresholds that were adopted to help achieve the reduction goals of AB 32. Thus, the Proposed Project would not conflict with AB 32.

6.0 REFERENCES

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6.2 Personal Communications

Iteris Inc. 2012b. Email from Shaumik Pal of Iteris to ICF regarding daily VMT data on January 24, 2012.

Appendix A
Construction Emission Calculations

CONSTRUCTION SCHEDULE

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39
Date	1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012	7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012

Week	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
Date	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012	12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013

Phase	Activity	Area	Crew	Weeks marked "1"
1	001	ALL	A1	1, 2, 3, 4
1	003	ALL	U1	5, 6, 7, 8, 9, 10
1	004.01	ALL	U2	5, 6, 7, 8, 9, 10
1	004.02	5	X1	7
1	004.03	5	W1	8, 9
1	004.04	6	X1	8, 9, 10
1	004.05	6	W1	10, 11, 12, 13, 14
1	004.06	6	X1	11
1	004.07	6	W1	15
1	004.08	6	X1	12, 13, 14
1	004.09	6	W1	16, 17, 18, 19, 20
1	005.01	1	T1	15
1	006.01	4	T1	16
1	008.01	4	T1	17
1	008.01	4	T1	18
1	008.01	5	T1	19
1	008.01	2	D1	13
1	008.01	2	C1	13, 14, 15
1	008.01	2	P1	16, 17
1	008.01	2	S1	18
1	008.01	6	T1	20
1	010.01	1	T1	21
1	010.03	1	T1	22
1	008.01	4	D2	19
1	010.05	1	T1	23
1	008.01	4	P2	19
1	008.01	4	E1	18
1	008.01	4	C1	19, 20
1	008.01	4	P1	21
1	008.01	4	S1	22
1	008.01	5	D1	17
1	008.01	5	C1	17, 18
1	008.01	5	P1	19
1	008.01	5	S1	20
1	010.07	1	T1	24
2A	001	6	T1	25, 26
1	008.01	5	E1	19
1	008.01	5	D1	20
2B	004	5, 6	T1	27, 28
1	008.01	5	P2	20
2B	005	2	T1	30, 31
2B	005	2	T1	32, 33
3A	002	1	T1	34
3A	003	1	T1	34
3B	004	1	T1	35
4	002	6	T1	52, 53
4	003	6	T1	54
4	005	6	T1	56
1	005.02	1	T2	15
1	006.02	4	T2	16
1	007	3	T2	16
1	008.01	4	T2	17
1	008.01	5	T2	19
1	008.01	6	T2	20
1	011	1	D3	13
1	011	1	D4	14, 15
1	009	1	T2	20
1	010.02	1	T2	21
2A	001	6	E1	26
2A	001	6	D2	27
1	010.04	1	T2	22
2A	002	6	P2	27
1	010.06	1	T2	23
1	010.08	1	T2	24
2A	001	6	T2	26
2B	004	5	D1	30
2B	004	5, 6	T2	28, 29
2B	004	5	P2	30
2B	004	5	E1	29
2B	004	5	C1	19, 30, 31, 32
2B	004	5	P2	33, 34
2B	004	5	S1	35
2B	005	1	X2	15, 16, 17, 18, 19
2B	005	1	C2	18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31
2B	005	1	C1	33, 34, 35, 36, 37, 38, 39, 40
2B	005	1	X3	27, 28, 29, 30
2B	005	1	IW1	29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
2B	005	1	E2	32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43
2B	005	1	M1	31, 32, 33, 34, 37, 38, 39, 40, 44, 45, 46, 47
2B	005	1	M2	37, 38, 39
2B	005	1	P2	41, 42, 43
2B	005	1	S1	44
2B	005	1	L1	44, 45
2B	005	1	M3	40, 41, 42, 43, 48, 49
2B	005	2	T2	30, 31
2B	005	2	T2	32, 33
3A	001	1	T2	34
3A	002	1	T2	34
2B	006	6	D1	34
3B	005	6	T2	35
4	002	6	T2	53, 54
4	003	6	T2	55
2B	006	6	P2	34
2B	006	6	E1	32, 33
2B	006	6	C1	34, 35, 36
2B	006	6	P1	37, 38
2B	006	6	S1	34, 39
4	005	6	T2	56
4	006	6	T2	57
4	007	6	T2	57
1	008.01	4	T3	19
1	008.01	5	T3	20
1	011.01	1	T3	25
4	001	6	D4	26
4	001	6	X4	27, 28
4	001	6	X2	29, 30, 31, 32, 33
4	001	6	C2	32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51
4	001	6	C1	52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63
4	001	6	X3	48, 49, 50, 51
4	001	6	IW1	50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67
4	001	6	E2	54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67
4	001	6	M1	52, 53, 54, 55, 60, 61, 62, 63, 68, 69, 70, 71
4	001	6	P2	64, 65
4	001	6	S1	66
4	001	6	L1	66, 67
4	001	6	M3	67, 68, 69, 70, 71, 72, 73, 74
1	011.02	1	T3	25
1	011.03	1	T3	25
2A	002	6	T3	27
2B	004	5	T3	30
4	004	6	D1	56
2B	006	6	T3	34
4	004	6	P2	56
4	004	6	E1	55
4	004	6	C1	56, 57
4	004	6	P1	58, 59
4	004	6	S1	60
2B	006	6	T3	34
2B	006	6	T3	34
4	004	6	T3	56
2A	003	5, 6	T4	27
		ALL	S2	16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 53, 54, 55, 56, 57
		ALL	E3	48, 49, 50, 75, 76, 77, 78
		ALL	M4	48, 49, 50, 75, 76, 77, 78
		ALL	A1	75, 76, 77, 78

EMISSION SUMMARY TABLES

Max Daily Mass Emissions

Unmitigated	VOC	Nox	CO	SOx	PM10 Exhaust	PM10 Dust	PM10 Total	PM2.5 Exhaust	PM2.5 Dust	PM2.5 Total
2012	16	54	352	0.1	5	1	5	4	0	5
2013	14	15	323	0.1	4	0	4	4	0	4
SCAQMD Construction Thresholds	75	100	550	150	--	--	150	--	--	55
Significant?	No	No	No	No	--	--	No	--	--	No

GHG Emissions

	METRIC TONS				
	CO2	CH4	N2O	CO2eq	amortized total (30yr project life)
2012	550	0.045	0.027	559	18.63
2013	142	0.011	0.008	144	4.81
Total Overall GHG Emissions	691	0.0554132	0.03448017	703.1912	23.44
SCAQMD Threshold	-	-	-	-	10,000
Significant?					No

Max Daily By Crew (for Report)

		Pounds Per Day					
Phase	Crews	VOC	Nox	CO	SOx	PM10	PM2.5
Mobilization/demobilization	A1	0.5	4.1	8.5	0.00	0.6	0.3
Concrete work	C1	0.4	1.9	7.8	0.00	0.2	0.1
	C2	1.6	4.6	46.8	0.00	0.5	0.2
Demolition	D1	5.3	12.8	142.8	0.01	2.3	2.1
	D2	7.8	21.9	174.7	0.02	2.7	2.5
	D3	0.8	3.2	22.7	0.00	0.3	0.1
	D4	2.2	9.2	33.0	0.01	0.6	0.4
Electrical	E1	0.1	0.9	1.1	0.00	0.1	0.0
	E2	1.2	7.5	9.2	0.00	0.6	0.4
	E3	0.5	2.9	1.0	0.00	0.2	0.2
Iron work	IW1	2.0	5.8	46.8	0.01	0.2	0.2
Landscaping	L1	1.5	8.5	8.2	0.00	0.6	0.5
Miscellaneous	M1	1.2	6.5	12.7	0.00	0.5	0.4
	M2	1.5	5.5	33.9	0.00	0.4	0.3
	M3	0.6	1.3	21.2	0.00	0.2	0.1
	M4	0.4	1.4	9.5	0.00	0.2	0.1
Paving	P1	1.3	10.1	5.5	0.01	0.9	0.6
	P2	1.6	10.8	6.4	0.01	1.0	0.7
Signals	S1	0.4	1.6	7.6	0.00	0.1	0.0
	S2	0.7	4.3	12.4	0.00	0.4	0.2
Track work	T1	2.0	13.1	21.6	0.01	1.0	0.6
	T2	2.9	14.5	52.9	0.01	1.3	1.0
	T3	3.1	10.2	73.3	0.01	1.1	0.8
	T4	0.0	0.0	0.0	0.00	0.0	0.0
Utilities	U1	1.5	4.8	35.9	0.00	0.5	0.4
	U2	1.1	4.3	26.1	0.00	0.4	0.3
Precast block walls	W1	0.8	5.7	6.4	0.01	0.4	0.3
Excavation/site prep	X1	1.6	11.3	7.9	0.01	0.7	0.6
	X2	1.2	7.9	6.1	0.00	0.6	0.5
	X3	0.9	4.2	15.1	0.00	0.5	0.4
	X4	1.0	8.1	4.4	0.01	0.5	0.4
	MAX DAILY	16.5	53.6	352.4	0.1	5.2	4.6
SCAQMD Construction Thresholds		75	100	550	150	150	55
	Significant?	No	No	No	No	No	No

Pounds per Day emissions summary by crew by day/week (on a given day, a specific crew can be active in a couple of areas, and can also be active within couple of phases. Emissions from each crew are only counted

VOC (Pounds per Day)

		1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew	weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1	n	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	n	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	0.3	-	0.3	0.3	0.3	0.3	-	-	-	-	-	-
C2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
D1	n	-	-	-	-	-	-	-	-	-	-	-	-	5.2	-	-	-	5.2	-	-	5.2	-	-	-	-	-	-
D2	y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.7	-	-	-	-	-	-	-
D3	n	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	2.1	2.1	-	-	-	-	-	-	-	-	-	-	2.1
E1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	-	-	0.1
E2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.2	-	1.2	-	1.2	-	-	-	-	-
P2	y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.5	-	-	-	-	-	-
S1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	-	0.4	-	0.4	-	-	-	-
S2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
T1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
T2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.8	2.8	2.8	-	2.8	2.8	2.8	2.8	2.8	2.8	-	2.8
T3	y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.1	3.1	-	-	-	-	3.1	-
T4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	n	-	-	-	-	1.4	1.4	1.4	1.4	1.4	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	n	-	-	-	-	1.1	1.1	1.1	1.1	1.1	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	n	-	-	-	-	-	-	-	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	-	-	-	-	-	-
X1	n	-	-	-	-	-	-	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	-	-	-	-	-	-	-	-	-	-	-	-
X2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.1	1.1	1.1	1.1	-	-	-	-	-	-	-
X3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MAX	0.3	0.3	0.3	0.3	2.5	2.5	4.0	4.7	4.7	4.7	2.2	2.2	8.4	4.6	8.8	8.1	13.6	6.4	12.3	13.1	7.7	6.9	6.6	6.6	3.8	8.8

		7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew	weekend	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	n	-	-	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	0.3
C2	n	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	-
D1	n	-	-	-	5.2	-	-	-	5.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	y	7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	n	-	-	0.1	-	-	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	n	-	-	-	-	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-
E3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	-	-
IW1	n	-	-	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	-	-	-	-	-	-	-	-	-	1.9	1.9	1.9
L1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	-	-	-	-	-	-	-
M1	n	-	-	-	-	1.1	1.1	1.1	1.1	-	-	1.1	1.1	1.1	1.1	-	-	-	1.1	1.1	1.1	1.1	-	-	-	-	1.1
M2	n	-	-	-	-	-	-	-	-	-	-	1.4	1.4	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6	0.6	0.6	-	-	-	-	0.6	0.6	-	-	-
M4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	-	-
P1	n	-	-	-	-	-	-	-	-	-	-	1.2	1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	y	1.5	-	-	1.5	-	-	1.5	1.5	-	-	-	-	-	-	1.5	1.5	1.5	-	-	-	-	-	-	-	-	-
S1	n	-	-	-	-	-	-	-	0.4	0.4	-	-	-	0.4	-	-	-	-	0.4	-	-	-	-	-	-	-	-
S2	n	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	n	1.8	1.8	-	1.8	1.8	1.8	1.8	1.8	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.8
T2	n	-	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	y	3.1	-	-	3.1	-	-	-	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	n	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	n	-	-	1.1	1.1	1.1	1.1	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	n	0.8	0.8	0.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.8	0.8	0.8	-
X4	n	0.9	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MAX	12.3	8.3	8.6	15.9	11.0	12.1	12.1	16.5	10.2	4.7	8.3	8.3	7.5	6.4	3.0	3.0	3.0	4.2	3.8	2.5	2.5	3.5	3.5	4.8	4.1	5.2

		12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew	weekend	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	0.4
C1	n	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	n	-	-	-	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	y	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	n	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	n	-	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	-	-	-	-	-	-	-	-	-	-	-
E3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	0.4
IW1	n	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	-	-	-	-	-	-	-	-	-	-	-
L1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	-	-	-	-	-	-	-	-	-	-	-
M1	n	1.1	1.1	1.1	-	-	-	-	1.1	1.1	1.1	1.1	-	-	-	-	1.1	1.1	1.1	1.1	-	-	-	-	-	-	-
M2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	-	-	-	-
M4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	0.4	0.4
P1	n	-	-	-	-	-	1.1	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	y	-	-	-	1.4	-	-	-	-	-	-	-	1.4	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	n	-	-	-	-	-	-	-	0.3	-	-	-	-	-	0.3	-	-	-	-	-	-	-	-	-	-	-	-
S2	n	0.6	0.6	0.6	0.6	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	n	1.8	1.8	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T2	n	2.8	3.2	3.2	3.2	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	y	-	-	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	n	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	MAX	8.5	9.9	8.2	13.9	7.0	4.4	4.4	4.7	4.4	4.4	4.4	2.9	2.9	4.6	4.9	1.7	1.7	1.7	1.7	0.6	0.6	0.6	1.1	1.1	1.1	1.1

NOX (Pounds per Day)

		1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew	weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1		1.1	1.1	1.1	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1		-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	1.3	-	1.3	1.3	1.3	1.3	-	-	-	-	-	-
C2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
D1		-	-	-	-	-	-	-	-	-	-	-	-	11.0	-	-	-	11.0	-	-	11.0	-	-	-	-	-	-
D2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.1	-	-	-	-	-	-	-
D3		-	-	-	-	-	-	-	-	-	-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-
D4		-	-	-	-	-	-	-	-	-	-	-	-	-	7.4	7.4	-	-	-	-	-	-	-	-	-	-	7.4
E1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	-	-	-	-	-	-	0.3
E2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.2	7.2	-	7.2	-	7.2	-	-	-	-	-
P2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.4	8.4	-	-	-	-	-	-
S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.0	-	1.0	-	1.0	-	-	-	-
S2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
T1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
T2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.5	11.5	11.5	-	11.5	11.5	11.5	11.5	11.5	11.5	-	11.5
T3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	8.9	8.9	-	-	-	-	8.9	-
T4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1		-	-	-	-	3.6	3.6	3.6	3.6	3.6	3.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2		-	-	-	-	3.1	3.1	3.1	3.1	3.1	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1		-	-	-	-	-	-	-	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	-	-	-	-	-	-
X1		-	-	-	-	-	-	9.6	9.6	9.6	9.6	9.6	9.6	9.6	9.6	-	-	-	-	-	-	-	-	-	-	-	-
X2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.1	6.1	6.1	6.1	6.1	-	-	-	-	-	-	-
X3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		1.1	1.1	1.1	1.1	6.7	6.7	16.2	20.7	20.7	20.7	14.0	14.0	27.7	22.8	41.0	41.3	53.6	27.3	45.0	43.4	32.9	26.7	25.7	25.7	14.2	33.4

		7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew	weekend	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1		-	-	-	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	-	-	-	-	-	-	-	-	-	-	-	1.3
C2		2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	-
D1		-	-	-	11.0	-	-	-	11.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2		20.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1		-	-	0.3	-	-	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2		-	-	-	-	-	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	-	-	-	-	-	-	-	-	-
E3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.7	1.7	1.7	-	-
IW1		-	-	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	-	-	-	-	-	-	-	-	-	5.2	5.2	5.2
L1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.2	6.2	-	-	-	-	-	-	-
M1		-	-	-	-	4.1	4.1	4.1	4.1	-	-	4.1	4.1	4.1	4.1	-	-	-	4.1	4.1	4.1	4.1	-	-	-	-	4.1
M2		-	-	-	-	-	-	-	-	-	-	3.1	3.1	3.1	-	-	-	-	-	-	-	-	-	-	-	-	-
M3		-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	0.7	0.7	0.7	-	-	-	-	0.7	0.7	-	-	-
M4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.8	0.8	-	-
P1		-	-	-	-	-	-	-	-	-	-	7.2	7.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2		8.4	-	-	8.4	-	-	8.4	8.4	-	-	-	-	-	-	8.4	8.4	8.4	-	-	-	-	-	-	-	-	-
S1		-	-	-	-	-	-	-	1.0	1.0	-	-	-	1.0	-	-	-	-	1.0	-	-	-	-	-	-	-	-
S2		1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1		10.1	10.1	-	10.1	10.1	10.1	10.1	10.1	10.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.1
T2		-	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3		8.9	-	-	8.9	-	-	-	8.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4		0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2		-	-	6.1	6.1	6.1	6.1	6.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3		2.4	2.4	2.4	2.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	2.4	2.4	2.4	-
X4		7.0	7.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		37.4	35.0	29.5	51.7	42.4	46.6	46.6	52.2	37.1	12.6	27.0	27.0	20.8	17.5	8.4	8.4	8.4	13.4	12.4	6.3	6.3	7.8	7.8	12.3	9.7	20.7

		12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew	weekend	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1		-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
C1		1.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
C2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.5	1.5	1.5
D1		-	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3		-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3		-	-	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1		5.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	-	-	-	-	-	-	-	-	-	-	-
L1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	1.3	1.3
M1		4.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	-	-	-	-	-	-	-	-	-	-	-
M2		-	-	-	-	-	-	-	-	-	-	-	-	-	1.5	1.5	-	-	-	-	-	-	-	-	-	-	-
M3		-	0.6	0.6	-	-	-	-	0.6	0.6	0.6	0.6	-	-	-	-	0.6	0.6	0.6	0.6	-	-	-	-	-	-	-
M4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	-	-	-	-
P2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.4	1.4	1.4	1.4
S1		-	-	-	-	-	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S2		1.9	-	-	0.6	-	-	-	-	-	-	-	0.6	0.6	-	-	-	-	-	-	-	-	-	-	-	-	-
T1		10.1	-	-	-	-	-	-	1.8	-	-	-	-	-	1.8	-	-	-	-	-	-	-	-	-	-	-	-
T2		11.5	3.2	3.2	3.2	3.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3		-	3.3	-	3.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4		-	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1		-	-	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		34.1	12.6	13.0	14.8	12.0	9.1	9.1	11.2	9.4	9.4	9.4	4.4	4.4	7.0	6.3	2.4	2.4	2.4	2.4	1.8	1.8	1.8	3.5	3.5	3.5	3.5

Pounds per Day emissions summary by crew by day/week (on a given day, a specific crew can be active in a couple of areas, and can also be active within couple of phases. Emissions from each crew are only counted

CO (Pounds per Day)

	1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1	7.1	7.1	7.1	7.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	-	-	-	-	-	-	-	-	-	7.3	7.3	7.3	-	7.3	7.3	7.3	7.3	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5
D1	-	-	-	-	-	-	-	-	-	-	-	-	142.0	-	-	-	142.0	-	-	142.0	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	173.9	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	21.9	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	32.2	32.2	-	-	-	-	-	-	-	-	-	-	32.2
E1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.8	-	-	-	-	-	-	0.8
E2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.3	4.3	-	4.3	-	4.3	-	-	-	-	-
P2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.1	5.1	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.2	-	7.2	-	7.2	-	-	-	-
S2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5
T1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4	20.4
T2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	51.7	51.7	51.7	-	51.7	51.7	51.7	51.7	51.7	51.7	-	51.7
T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	72.6	72.6	-	-	-	-	72.6	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	35.2	35.2	35.2	35.2	35.2	35.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	25.5	25.5	25.5	25.5	25.5	25.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	-	-	-	-	-	-
X1	-	-	-	-	-	-	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.4	5.4	5.4	5.4	5.4	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7.1	7.1	7.1	7.1	60.7	60.7	68.0	73.9	73.9	73.9	13.2	13.2	184.4	52.7	123.0	99.2	248.5	104.1	251.6	291.6	133.3	136.3	129.1	129.1	77.4	162.0

	7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew weekend	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	-	-	-	-	-	-	-	-	-	-	-	7.3
C2	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	45.5	-
D1	-	-	-	142.0	-	-	-	142.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	173.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.8	-	-	0.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	-	-	-	-	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	0.7	0.7	-	-
IW1	-	-	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	46.5	-	-	-	-	-	-	-	-	-	46.5	46.5	46.5
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.4	7.4	-	-	-	-	-	-	-
M1	-	-	-	-	12.0	12.0	12.0	12.0	-	-	12.0	12.0	12.0	12.0	-	-	-	12.0	12.0	12.0	12.0	-	-	-	-	12.0
M2	-	-	-	-	-	-	-	-	-	-	33.2	33.2	33.2	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	20.9	20.9	20.9	20.9	-	-	-	-	20.9	20.9	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.1	9.1	9.1	-	-
P1	-	-	-	-	-	-	-	-	-	-	4.3	4.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	5.1	-	-	5.1	-	-	5.1	5.1	-	-	-	-	-	-	5.1	5.1	5.1	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	7.2	7.2	-	-	-	7.2	-	-	-	-	7.2	-	-	-	-	-	-	-	-
S2	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	11.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	20.4	20.4	-	20.4	20.4	20.4	20.4	20.4	20.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.4
T2	-	51.7	51.7	51.7	51.7	51.7	51.7	51.7	51.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	72.6	-	-	72.6	-	-	-	72.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	5.4	5.4	5.4	5.4	5.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	14.5	14.5	14.5	14.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.5	14.5	14.5	14.5	-
X4	3.9	3.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	251.6	147.5	175.9	344.8	200.3	209.3	209.3	352.4	198.4	107.6	157.1	157.1	160.1	140.5	74.7	74.7	74.7	72.2	65.0	57.5	57.5	90.7	90.7	116.3	106.5	86.2

	12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew weekend	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3	7.3	7.3	7.3
C1	7.3	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	-	-	-	141.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.6	0.6	0.6	0.6
IW1	46.5	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	47.3	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	7.3	7.3	-	-	-	-	-	-	-	-	-	-	-
M1	12.0	12.3	12.3	-	-	-	-	12.3	12.3	12.3	12.3	-	-	-	-	12.3	12.3	12.3	12.3	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.7	21.7	21.7	21.7	21.7	21.7	21.7	21.7	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.2	9.2	9.2	9.2
P1	-	-	-	-	-	4.1	4.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	4.9	-	-	-	-	-	-	-	4.9	4.9	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	7.1	-	-	-	-	-	7.1	-	-	-	-	-	-	-	-	-	-	-	-
S2	11.5	11.8	11.8	11.8	11.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	20.4	20.5	-	20.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T2	51.7	85.9	85.9	85.9	85.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	-	-	-	90.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	149.3	193.4	173.6	322.6	160.6	67.0	67.0	82.3	75.2	75.2	75.2	55.4	55.4	69.8	84.3	34.0	34.0	34.0	34.0	21.7	21.7	21.7	17.1	17.1	17.1	17.1

SOX (Pounds per Day)

	1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D1	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	0.0	-	-	0.0	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	0.0
E1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	0.0
E2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	0.0	-	0.0	-	-	-	-	-
P2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	-	0.0	-	-	-	-
S2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0
T3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	0.0	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-
X1	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew weekend	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0
C2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
D1	-	-	-	0.0	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
IW1	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-
M1	-	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0
M2	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
P1	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	0.0	-	-	0.0	-	-	0.0	0.0	-	-	-	-	-	-	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	0.0	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-
S2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0
T2	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	0.0	-	-	0.0	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-
X4	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

	12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew weekend	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
IW1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
M1	0.0	0.0	0.0	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
P1	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	0.0	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
S2	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.0	0.0	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T2	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Pounds per Day emissions summary by crew by day/week (on a given day, a specific crew can be active in a couple of areas, and can also be active within couple of phases. Emissions from each crew are only counted o

PM10 Exhaust (Pounds per Day)

		1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew	weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1		0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1		-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	-	0.1	0.1	0.1	0.1	-	-	-	-	-	-
C2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
D1		-	-	-	-	-	-	-	-	-	-	-	-	2.0	-	-	-	2.0	-	-	2.0	-	-	-	-	-	-
D2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-
D3		-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
D4		-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	-	-	-	-	-	-	-	-	-	-	0.3
E1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	0.0
E2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	-	0.5	-	0.5	-	-	-	-	-
P2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	-	-	-	-	-	-
S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	-	0.0	-	-	-	-
S2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
T1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
T2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.9	0.9	0.9	-	0.9	0.9	0.9	0.9	0.9	0.9	-	0.9
T3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.8	-	-	-	-	0.8	-
T4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1		-	-	-	-	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2		-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1		-	-	-	-	-	-	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-
X1		-	-	-	-	-	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	-	-	-	-	-	-	-	-	-	-	-	-
X2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-
X3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.1	0.1	0.1	0.1	0.5	0.5	1.0	1.2	1.2	1.2	0.7	0.7	2.9	1.2	2.5	2.6	4.7	1.4	3.6	4.0	2.1	1.6	1.6	1.6	0.8	2.0

	7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	0.1
C2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-
D1	-	-	-	2.0	-	-	-	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	-	-
IW1	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	-	-	-	-	-	-	-
M1	-	-	-	-	0.2	0.2	0.2	0.2	-	-	0.2	0.2	0.2	0.2	-	-	-	0.2	0.2	0.2	0.2	-	-	-	-	0.2
M2	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
P1	-	-	-	-	-	-	-	-	-	-	0.5	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	0.5	-	-	0.5	-	-	0.5	0.5	-	-	-	-	-	-	0.5	0.5	0.5	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	0.0	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-
S2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.5	0.5	-	0.5	0.5	0.5	0.5	0.5	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
T2	-	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	0.8	-	-	0.8	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	0.3	0.3	-
X4	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3.6	2.2	1.8	4.4	2.4	2.6	2.6	4.2	2.0	0.5	1.3	1.3	0.8	0.7	0.5	0.5	0.5	0.6	0.5	0.3	0.3	0.5	0.5	0.6	0.5	1.0

	12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1
C1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	-	-	-	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1
IW1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-
M1	0.2	0.2	0.2	-	-	-	-	0.2	0.2	0.2	0.2	-	-	-	-	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
P1	-	-	-	-	-	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	0.5	-	-	-	-	-	-	-	0.5	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
S2	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.5	0.5	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T2	0.9	0.9	0.9	0.9	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	-	-	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	2.0	2.0	1.5	3.8	1.3	0.8	0.8	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.2	0.2	0.2	0.2

PM2.5 Exhaust (Pounds per Day)

		1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew	weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1		0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1		-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	-	0.1	0.1	0.1	0.1	-	-	-	-	-	-
C2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
D1		-	-	-	-	-	-	-	-	-	-	-	-	1.9	-	-	-	1.9	-	-	1.9	-	-	-	-	-	-
D2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.3	-	-	-	-	-	-	-
D3		-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
D4		-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	-	-	-	-	-	-	-	-	-	-	0.3
E1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	0.0
E2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.4	0.4	-	0.4	-	0.4	-	-	-	-	-
P2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	-	-	-	-	-	-
S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	-	0.0	-	-	-	-
S2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
T1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
T2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	0.8	0.8	-	0.8	0.8	0.8	0.8	0.8	0.8	-	0.8
T3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	0.7	-	-	-	-	0.7	-
T4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1		-	-	-	-	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2		-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1		-	-	-	-	-	-	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-
X1		-	-	-	-	-	-	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-
X2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-
X3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.1	0.1	0.1	0.1	0.5	0.5	0.9	1.2	1.2	1.2	0.7	0.7	2.8	1.1	2.3	2.4	4.4	1.3	3.4	3.8	1.9	1.5	1.5	1.5	0.7	1.8

	7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	0.1
C2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-
D1	-	-	-	1.9	-	-	-	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	2.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	-	-	-	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	-	-
IW1	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	-	-	-	-	-	-	-
M1	-	-	-	-	0.2	0.2	0.2	0.2	-	-	0.2	0.2	0.2	0.2	-	-	-	0.2	0.2	0.2	0.2	-	-	-	-	0.2
M2	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
P1	-	-	-	-	-	-	-	-	-	-	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	0.5	-	-	0.5	-	-	0.5	0.5	-	-	-	-	-	-	0.5	0.5	0.5	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	0.0	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-
S2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.5	0.5	-	0.5	0.5	0.5	0.5	0.5	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5
T2	-	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	0.7	-	-	0.7	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	0.3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	0.3	0.3	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.3	0.3	0.3	0.3	-
X4	0.3	0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3.4	2.1	1.7	4.2	2.2	2.4	2.4	4.0	1.9	0.5	1.2	1.2	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.3	0.3	0.5	0.5	0.6	0.5	0.9

	12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1
C1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	-	-	-	1.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1
IW1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-
M1	0.2	0.2	0.2	-	-	-	-	0.2	0.2	0.2	0.2	-	-	-	-	0.2	0.2	0.2	0.2	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
P1	-	-	-	-	-	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	0.4	-	-	-	-	-	-	-	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
S2	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.5	0.5	-	0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T2	0.8	0.8	0.8	0.8	0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	-	-	-	0.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.8	1.9	1.4	3.6	1.2	0.7	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.1

Pounds per Day emissions summary by crew by day/week (on a given day, a specific crew can be active in a couple of areas, and can also be active within couple of phases. Emissions from each crew are only counted

PM10 Dust (Pounds per Day)

		1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew	weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1		0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1		-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	-	-	-	-
C2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
D1		-	-	-	-	-	-	-	-	-	-	-	-	0.1	-	-	-	0.1	-	-	0.1	-	-	-	-	-	-
D2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	-	-	-	-	-	-	-
D3		-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
D4		-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	-	-	-	-	-	-	0.1
E1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	0.0
E2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	0.1	-	0.1	-	-	-	-	-
P2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.2	0.2	-	-	-	-	-	-
S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	-	0.0	-	-	-	-
S2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
T1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
T2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	-	0.1	0.1	0.1	0.1	0.1	0.1	-	0.1
T3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	0.1	-
T4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1		-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2		-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1		-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-
X1		-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-
X2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-
X3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.3	0.2	0.3	0.3	0.5	0.4	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.3

	7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0
C2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-
D1	-	-	-	0.1	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
IW1	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	-	-	-
M1	-	-	-	-	0.1	0.1	0.1	0.1	-	-	0.1	0.1	0.1	0.1	-	-	-	0.1	0.1	0.1	0.1	-	-	-	-	0.1
M2	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
P1	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	0.2	-	-	0.2	-	-	0.2	0.2	-	-	-	-	-	-	0.2	0.2	0.2	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	0.0	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-
S2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.1	0.1	-	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1
T2	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	0.1	-	-	0.1	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-
X4	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.2	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

	12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	0.1	0.1
C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
IW1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-
M1	0.1	0.1	0.1	-	-	-	-	0.1	0.1	0.1	0.1	-	-	-	-	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
P1	-	-	-	-	-	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	0.2	-	-	-	-	-	-	-	0.2	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
S2	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.1	0.1	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T2	0.1	0.1	0.1	0.1	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	-	-	-	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.3	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1

PM2.5 Dust (Pounds per Day)

		1/2/2012	1/9/2012	1/16/2012	1/23/2012	1/30/2012	2/6/2012	2/13/2012	2/20/2012	2/27/2012	3/5/2012	3/12/2012	3/19/2012	3/26/2012	4/2/2012	4/9/2012	4/16/2012	4/23/2012	4/30/2012	5/7/2012	5/14/2012	5/21/2012	5/28/2012	6/4/2012	6/11/2012	6/18/2012	6/25/2012
Crew	weekend	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
A1		0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1		-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	-	-	-	-	-	-
C2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D1		-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	0.0	-	-	0.0	-	-	-	-	-	-
D2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-
D3		-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
D4		-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	0.0
E1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	0.0
E2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IW1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
L1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	0.0	-	0.0	-	-	-	-	-
P2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-
S1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	0.0	-	0.0	-	-	-	-
S2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
T2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0
T3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	0.0	-
T4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1		-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2		-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1		-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-
X1		-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-
X2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-
X3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1

	7/2/2012	7/9/2012	7/16/2012	7/23/2012	7/30/2012	8/6/2012	8/13/2012	8/20/2012	8/27/2012	9/3/2012	9/10/2012	9/17/2012	9/24/2012	10/1/2012	10/8/2012	10/15/2012	10/22/2012	10/29/2012	11/5/2012	11/12/2012	11/19/2012	11/26/2012	12/3/2012	12/10/2012	12/17/2012	12/24/2012
Crew	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C1	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	0.0
C2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
D1	-	-	-	0.0	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
IW1	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-
M1	-	-	-	-	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0
M2	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	-	-
P1	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	0.0	-	-	0.0	-	-	0.0	0.0	-	-	-	-	-	-	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	0.0	-	-	-	0.0	-	-	-	-	0.0	-	-	-	-	-	-	-	-
S2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0
T2	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	0.0	-	-	0.0	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	-
X4	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0

	12/31/2012	1/7/2013	1/14/2013	1/21/2013	1/28/2013	2/4/2013	2/11/2013	2/18/2013	2/25/2013	3/4/2013	3/11/2013	3/18/2013	3/25/2013	4/1/2013	4/8/2013	4/15/2013	4/22/2013	4/29/2013	5/6/2013	5/13/2013	5/20/2013	5/27/2013	6/3/2013	6/10/2013	6/17/2013	6/24/2013
Crew	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78
A1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
C2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D1	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E1	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E2	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
E3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
IW1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
L1	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-
M1	0.0	0.0	0.0	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-
M2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	-	-	-
M4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
P1	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
P2	-	-	-	0.0	-	-	-	-	-	-	-	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-
S1	-	-	-	-	-	-	-	0.0	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-
S2	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T1	0.0	0.0	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T2	0.0	0.0	0.0	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T3	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
T4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
U2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
X4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
A1	**Mobilization/demobilization**				8													
		Excavator - Rubber Tire	1	1.00		40	157	0.38	59.66	0.0	0.4	0.3	0.0	0.0	0.0	42.6	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	0.50		20	87	0.36	15.66	0.0	0.1	0.1	0.0	0.0	0.0	10.6	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas	1	0.50		20	6.5	0.55	1.7875	0.0	0.0	0.6	0.0	0.0	0.0	0.9	0.0	0.0
		Vibratory Plate - Gas	1	0.25		10	8	0.43	0.86	0.0	0.0	0.3	0.0	0.0	0.0	0.4	0.0	0.0
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	1.00		40	23	0.74	17.02	0.1	0.1	4.2	0.0	0.0	0.0	6.5	0.0	0.0
		Welding machine - portable					46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift	1	1.00		40	149	0.3	44.7	0.0	0.1	0.1	0.0	0.0	0.0	16.8	0.0	0.0
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	1.00		80	5	0.34	3.4	0.0	0.0	0.9	0.0	0.0	0.0	1.7	0.0	0.0
		A1 pieces of equipment	*8*							0.22	0.7	6.4	0.0	0.1	0.0	79.6	0.0	0.0
C1	**Concrete curb & gutter, sidewalks, misc**		2		35													
		Excavator - Rubber Tire	1	2.00		350	157	0.38	119.32	0.1	0.7	0.5	0.0	0.0	0.0	85.2	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	2.00		350	87	0.36	62.64	0.1	0.4	0.3	0.0	0.0	0.0	42.4	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas	1	1.00		175	6.5	0.55	3.575	0.0	0.0	1.1	0.0	0.0	0.0	1.9	0.0	0.0
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	1.00		175	23	0.74	17.02	0.1	0.1	4.2	0.0	0.0	0.0	6.5	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	1.00		350	5	0.34	3.4	0.0	0.0	0.9	0.0	0.0	0.0	1.7	0.0	0.0
		C1 pieces of equipment	*6*							0.29	1.2	7.0	0.0	0.1	0.1	137.7	0.0	0.0
C2	Concrete footings, walls, slabs				34													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	2.00		340	106	0.43	91.16	0.3	0.8	5.2	0.0	0.0	0.0	87.2	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	2	4.00		1360	23	0.74	136.16	0.8	0.5	33.9	0.0	0.0	0.0	52.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift	1	1.00		170	149	0.3	44.7	0.0	0.1	0.1	0.0	0.0	0.0	16.8	0.0	0.0
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	3	4.00		2040	5	0.34	20.4	0.1	0.1	5.5	0.0	0.0	0.0	10.4	0.0	0.0
		C2 pieces of equipment	*7*							1.2	1.5	44.7	0.0	0.0	0.0	166.4	0.1	0.1

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
D1	Demolition - Concrete & AC			*12*	6													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track	1	6.00		180	157	0.38	357.96	0.3	2.2	1.5	0.0	0.1	0.1	255.6	0.0	0.0
		Loader - Rubber Tire	1	4.00		120	87	0.36	125.28	0.1	0.8	0.5	0.0	0.0	0.0	84.8	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	2	4.00		240	106	0.43	364.64	1.2	3.3	21.0	0.0	0.0	0.0	348.7	0.1	0.1
		Jack Hammer	2	4.00		240	2	0.78	12.48	0.2	0.1	6.0	0.0	0.1	0.1	10.0	0.0	0.0
		Concrete or Asphalt Saw	1	4.00		120	81	0.78	252.72	2.9	2.1	111.5	0.0	1.6	1.6	186.6	0.2	0.2
		Excavator w/HoRam	1	2.00		60	157	0.38	119.32	0.1	0.7	0.5	0.0	0.0	0.0	85.2	0.0	0.0
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		D1 pieces of equipment	*8*							4.8	9.2	141.1	0.0	1.9	1.9	970.9	0.3	0.3
D2	Demolition - Roadway (only			*8*	2													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track	1	8.00		80	157	0.38	477.28	0.4	2.9	2.0	0.0	0.2	0.2	340.8	0.0	0.0
		Loader - Rubber Tire	1	6.00		60	87	0.36	187.92	0.2	1.2	0.8	0.0	0.1	0.1	127.1	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	3	6.00		180	106	0.43	820.44	2.7	7.3	47.2	0.0	0.1	0.1	784.5	0.2	0.2
		Jack Hammer	2	6.00		120	2	0.78	18.72	0.2	0.2	9.0	0.0	0.1	0.1	15.1	0.0	0.0
		Concrete or Asphalt Saw	1	4.00		40	81	0.78	252.72	2.9	2.1	111.5	0.0	1.6	1.6	186.6	0.2	0.2
		Excavator w/HoRam	1	4.00		40	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		D2 pieces of equipment	*9*							6.6	15.2	171.6	0.0	2.1	2.1	1,624.6	0.4	0.4
D3	Demolition - Metals, Elect,			*6*	1													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	1.00		5	87	0.36	31.32	0.0	0.2	0.1	0.0	0.0	0.0	21.2	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	0.50		3	106	0.43	22.79	0.1	0.2	1.3	0.0	0.0	0.0	21.8	0.0	0.0
		Jack Hammer	1	0.25		1	2	0.78	0.39	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch	2	1.00		10	5	0.34	3.4	0.0	0.0	0.9	0.0	0.0	0.0	1.7	0.0	0.0
		Generator - portable	2	2.00		20	23	0.74	68.08	0.4	0.2	17.0	0.0	0.0	0.0	26.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift	1	0.25		1	149	0.3	11.175	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	4	1.00		20	5	0.34	6.8	0.0	0.0	1.8	0.0	0.0	0.0	3.5	0.0	0.0
		D3 pieces of equipment	*12*							0.6	0.7	21.3	0.0	0.0	0.0	78.7	0.0	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
D4	Demolition - Reinforced			*9*	3													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	4.00		60	87	0.36	125.28	0.1	0.8	0.5	0.0	0.0	0.0	84.8	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	2	4.00		120	106	0.43	364.64	1.2	3.3	21.0	0.0	0.0	0.0	348.7	0.1	0.1
		Jack Hammer	2	4.00		120	2	0.78	12.48	0.2	0.1	6.0	0.0	0.1	0.1	10.0	0.0	0.0
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam	1	4.00		60	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Cutting Torch	2	3.00		90	5	0.34	10.2	0.0	0.0	2.7	0.0	0.0	0.0	5.2	0.0	0.0
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		D4 pieces of equipment	*8*							1.7	5.7	31.2	0.0	0.2	0.2	619.1	0.1	0.1
E1	Signals			*3*	7													
		Excavator - Rubber Tire	1	0.25		9	157	0.38	14.915	0.0	0.1	0.1	0.0	0.0	0.0	10.7	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch	1	0.25		9	69	0.5	8.625	0.0	0.1	0.6	0.0	0.0	0.0	9.7	0.0	0.0
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		E1 pieces of equipment	*2*							0.0	0.2	0.7	0.0	0.0	0.0	20.4	0.0	0.0
E2	Electrical			*3*	26													
		Excavator - Rubber Tire	1	0.25		33	157	0.38	14.915	0.0	0.1	0.1	0.0	0.0	0.0	10.7	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch	1	2.00		260	69	0.5	69	0.3	0.8	4.7	0.0	0.0	0.0	77.8	0.0	0.0
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas	1	2.00		260	6.5	0.55	7.15	0.1	0.0	2.3	0.0	0.0	0.0	3.7	0.0	0.0
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire	1	0.25		33	279	0.29	20.2275	0.0	0.1	0.0	0.0	0.0	0.0	10.9	0.0	0.0
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		E2 pieces of equipment	*4*							0.4	1.0	7.1	0.0	0.0	0.0	103.0	0.0	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
E3	Test & Startup			*8*	7													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		E3 pieces of equipment	*0*							0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IW1	Steel Canopy erection				30													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	6.00		900	106	0.43	273.48	0.9	2.4	15.7	0.0	0.0	0.0	261.5	0.1	0.1
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch	1	1.00		150	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		Generator - portable	1	6.00		900	23	0.74	102.12	0.6	0.3	25.4	0.0	0.0	0.0	39.0	0.0	0.0
		Welding machine - portable	1	1.00		150	46	0.43	19.78	0.1	0.1	2.0	0.0	0.0	0.0	17.4	0.0	0.0
		Asphalt Paver	1			0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire	1	6.00		900	208	0.29	361.92	0.2	1.7	0.6	0.0	0.1	0.1	195.0	0.0	0.0
		Forklift	1	1.00		150	149	0.3	44.7	0.0	0.1	0.1	0.0	0.0	0.0	16.8	0.0	0.0
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	2.00		600	5	0.34	6.8	0.0	0.0	1.8	0.0	0.0	0.0	3.5	0.0	0.0
		IW1 pieces of equipment	*9*							1.8	4.7	46.2	0.0	0.1	0.1	534.1	0.1	0.1
L1	Landscaping				4													
		Excavator - Rubber Tire	1	4.00		80	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	2.00		40	87	0.36	62.64	0.1	0.4	0.3	0.0	0.0	0.0	42.4	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch	1	2.00		40	69	0.5	69	0.3	0.8	4.7	0.0	0.0	0.0	77.8	0.0	0.0
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		L1 pieces of equipment	*3*							0.5	2.7	6.0	0.0	0.1	0.1	290.6	0.0	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
M1	Railings, Fence, Misc metals			*6*	24													
		Excavator - Rubber Tire	1	1.00		120	157	0.38	59.66	0.0	0.4	0.3	0.0	0.0	0.0	42.6	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	0.50		60	87	0.36	15.66	0.0	0.1	0.1	0.0	0.0	0.0	10.6	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	2.00		240	23	0.74	34.04	0.2	0.1	8.5	0.0	0.0	0.0	13.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	2.00		480	5	0.34	6.8	0.0	0.0	1.8	0.0	0.0	0.0	3.5	0.0	0.0
		M1 pieces of equipment	*5*							0.3	0.6	10.6	0.0	0.0	0.0	69.7	0.0	0.0
M2	Structural Steel Framing &			*6*	3													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	1.00		15	106	0.43	45.58	0.2	0.4	2.6	0.0	0.0	0.0	43.6	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch	1	1.00		15	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		Generator - portable	1	6.00		90	23	0.74	102.12	0.6	0.3	25.4	0.0	0.0	0.0	39.0	0.0	0.0
		Welding machine - portable	1	1.00		15	46	0.43	19.78	0.1	0.1	2.0	0.0	0.0	0.0	17.4	0.0	0.0
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift	1	0.25		4	149	0.3	11.175	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	2.00		60	5	0.34	6.8	0.0	0.0	1.8	0.0	0.0	0.0	3.5	0.0	0.0
		M2 pieces of equipment	*7*							0.9	0.9	32.4	0.0	0.0	0.0	108.6	0.0	0.0
M3	Tile & miscellaneous work			*5*	14													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	4.00		280	23	0.74	68.08	0.4	0.2	17.0	0.0	0.0	0.0	26.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	4.00		560	5	0.34	13.6	0.1	0.0	3.6	0.0	0.0	0.0	7.0	0.0	0.0
		M3 pieces of equipment	*3*							0.5	0.3	20.6	0.0	0.0	0.0	33.0	0.0	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
M4	Complete punchlist items			*6*	7													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	1.00		35	106	0.43	45.58	0.2	0.4	2.6	0.0	0.0	0.0	43.6	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	1.00		35	23	0.74	17.02	0.1	0.1	4.2	0.0	0.0	0.0	6.5	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift	1	0.25		9	149	0.3	11.175	0.0	0.0	0.0	0.0	0.0	0.0	4.2	0.0	0.0
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	2.00		140	5	0.34	6.8	0.0	0.0	1.8	0.0	0.0	0.0	3.5	0.0	0.0
		M4 pieces of equipment	*5*							0.3	0.5	8.7	0.0	0.0	0.0	57.8	0.0	0.0
P1	Roadway - Base Rock			*8*	**8**													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	2.00		80	87	0.36	62.64	0.1	0.4	0.3	0.0	0.0	0.0	42.4	0.0	0.0
		Dozer	1	2.00		80	358	0.4	286.4	0.3	2.3	1.2	0.0	0.1	0.1	211.7	0.0	0.0
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory	1	4.00		160	84	0.38	127.68	0.2	1.0	0.6	0.0	0.1	0.1	89.6	0.0	0.0
		Roller - Static	1	4.00		160	84	0.38	127.68	0.2	1.0	0.6	0.0	0.1	0.1	89.6	0.0	0.0
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver	1	3.00		120	89	0.42	112.14	0.2	1.1	0.6	0.0	0.1	0.1	87.1	0.0	0.0
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		P1 pieces of equipment	*5*							0.8	5.8	3.4	0.0	0.4	0.4	520.4	0.1	0.0
P2	Roadway - Weekend			*8*	**13**													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	2.00		130	87	0.36	62.64	0.1	0.4	0.3	0.0	0.0	0.0	42.4	0.0	0.0
		Dozer	1	2.00		130	358	0.4	286.4	0.3	2.3	1.2	0.0	0.1	0.1	211.7	0.0	0.0
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory	1	3.00		195	84	0.38	95.76	0.1	0.8	0.5	0.0	0.1	0.1	67.2	0.0	0.0
		Roller - Static	1	3.00		195	84	0.38	95.76	0.1	0.8	0.5	0.0	0.1	0.1	67.2	0.0	0.0
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver	1	4.00		260	89	0.42	149.52	0.2	1.5	0.9	0.0	0.1	0.1	116.1	0.0	0.0
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		P2 pieces of equipment	*5*							0.8	5.7	3.3	0.0	0.4	0.4	504.6	0.1	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
S1	Striping & Signs			*4*	9													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	2.00		90	106	0.43	91.16	0.3	0.8	5.2	0.0	0.0	0.0	87.2	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	2.00		180	5	0.34	6.8	0.0	0.0	1.8	0.0	0.0	0.0	3.5	0.0	0.0
		S1 pieces of equipment	*3*							0.3	0.8	7.1	0.0	0.0	0.0	90.6	0.0	0.0
S2	Striping & Signs			*4*	25													
		Excavator - Rubber Tire	1	2.00		90	157	0.38	119.32	0.1	0.7	0.5	0.0	0.0	0.0	85.2	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	2.00		90	23	0.74	34.04	0.2	0.1	8.5	0.0	0.0	0.0	13.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	2	2.00		180	5	0.34	6.8	0.0	0.0	1.8	0.0	0.0	0.0	3.5	0.0	0.0
		S2 pieces of equipment	*4*							0.3	0.9	10.8	0.0	0.1	0.0	101.7	0.0	0.0
T1	Grade / Subballast for Track			*8*	25													
		Excavator - Rubber Tire	1	3.00		375	157	0.38	178.98	0.1	1.1	0.8	0.0	0.1	0.1	127.8	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	2	6.00		1500	87	0.36	375.84	0.3	2.4	1.5	0.0	0.1	0.1	254.3	0.0	0.0
		Dozer	1	2.00		250	358	0.4	286.4	0.3	2.3	1.2	0.0	0.1	0.1	211.7	0.0	0.0
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory	1	2.00		250	84	0.38	63.84	0.1	0.5	0.3	0.0	0.0	0.0	44.8	0.0	0.0
		Roller - Static	1	2.00		250	84	0.38	63.84	0.1	0.5	0.3	0.0	0.0	0.0	44.8	0.0	0.0
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas	1	1.00		125	8	0.43	3.44	0.0	0.0	1.1	0.0	0.0	0.0	1.8	0.0	0.0
		Air Compressor	1	2.00		250	106	0.43	91.16	0.3	0.8	5.2	0.0	0.0	0.0	87.2	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	2.00		250	23	0.74	34.04	0.2	0.1	8.5	0.0	0.0	0.0	13.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader	1	3.00		375	162	0.41	199.26	0.2	1.5	0.9	0.0	0.1	0.1	152.3	0.0	0.0
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		T1 pieces of equipment	*10*							1.6	9.2	19.8	0.0	0.5	0.5	937.6	0.1	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
T2	Ties, Rail, Ballast, etc for Track			*12*	27													
		Excavator - Rubber Tire	1	1.00		135	157	0.38	59.66	0.0	0.4	0.3	0.0	0.0	0.0	42.6	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	6.00		810	87	0.36	187.92	0.2	1.2	0.8	0.0	0.1	0.1	127.1	0.0	0.0
		Dozer	1	2.00		270	358	0.4	286.4	0.3	2.3	1.2	0.0	0.1	0.1	211.7	0.0	0.0
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	2.00		270	106	0.43	91.16	0.3	0.8	5.2	0.0	0.0	0.0	87.2	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	2.00		270	23	0.74	34.04	0.2	0.1	8.5	0.0	0.0	0.0	13.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift	1	1.00		135	149	0.3	44.7	0.0	0.1	0.1	0.0	0.0	0.0	16.8	0.0	0.0
		Grader	1	3.00		405	162	0.41	199.26	0.2	1.5	0.9	0.0	0.1	0.1	152.3	0.0	0.0
		Speed Swing	1	2.00		270	190	0.34	129.2	0.1	0.9	0.5	0.0	0.1	0.0	82.6	0.0	0.0
		Rail Saw	1	1.00		135	81	0.78	63.18	0.7	0.5	27.9	0.0	0.4	0.4	46.7	0.0	0.0
		Rail Welder	1	2.00		270	46	0.43	39.56	0.1	0.2	4.0	0.0	0.0	0.0	34.8	0.0	0.0
		Riding Adzer	1	2.00		270	48	0.34	32.64	0.0	0.2	0.2	0.0	0.0	0.0	20.9	0.0	0.0
		Clip Machine	1	2.00		270	10	0.34	6.8	0.0	0.0	0.0	0.0	0.0	0.0	4.3	0.0	0.0
		Ballast Regulator	1	2.00		270	175	0.34	119	0.1	0.8	0.5	0.0	0.0	0.0	76.0	0.0	0.0
		Ballast Tamper	1	2.00		270	300	0.34	204	0.1	1.1	0.3	0.0	0.0	0.0	130.4	0.0	0.0
		Impact Wrench	1	0.50		68	5	0.34	0.85	0.0	0.0	0.2	0.0	0.0	0.0	0.4	0.0	0.0
		Pneumatic or Elec Tools	1	1.00		135	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		T2 pieces of equipment	*16*							2.4	10.2	51.0	0.0	0.8	0.8	1,047.7	0.2	0.1
T3	Track - Weekend Construction			*12*	11													
		Excavator - Rubber Tire	1	4.00		220	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	2.00		110	87	0.36	62.64	0.1	0.4	0.3	0.0	0.0	0.0	42.4	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory	1	2.00		110	84	0.38	63.84	0.1	0.5	0.3	0.0	0.0	0.0	44.8	0.0	0.0
		Roller - Static	1	2.00		110	84	0.38	63.84	0.1	0.5	0.3	0.0	0.0	0.0	44.8	0.0	0.0
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor	1	4.00		220	106	0.43	182.32	0.6	1.6	10.5	0.0	0.0	0.0	174.3	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable	1	6.00		330	23	0.74	102.12	0.6	0.3	25.4	0.0	0.0	0.0	39.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift	1	1.00		55	149	0.3	44.7	0.0	0.1	0.1	0.0	0.0	0.0	16.8	0.0	0.0
		Grader	1	1.00		55	162	0.41	66.42	0.1	0.5	0.3	0.0	0.0	0.0	50.8	0.0	0.0
		Speed Swing	1	1.00		55	190	0.34	64.6	0.1	0.4	0.2	0.0	0.0	0.0	41.3	0.0	0.0
		Rail Saw	1	1.00		55	81	0.78	63.18	0.7	0.5	27.9	0.0	0.4	0.4	46.7	0.0	0.0
		Rail Welder	1	2.00		110	46	0.43	39.56	0.1	0.2	4.0	0.0	0.0	0.0	34.8	0.0	0.0
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator	1	1.00		55	175	0.34	59.5	0.1	0.4	0.2	0.0	0.0	0.0	38.0	0.0	0.0
		Ballast Tamper	1	1.00		55	300	0.34	102	0.1	0.5	0.2	0.0	0.0	0.0	65.2	0.0	0.0
		Impact Wrench	1	1.00		55	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		Pneumatic or Elec Tools	1	1.00		55	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		T3 pieces of equipment	*15*							2.7	7.6	71.6	0.0	0.7	0.7	811.0	0.2	0.1
U1	Utility Installation/Casing			*5*	6													
		Excavator - Rubber Tire	1	4.00		120	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas	1	2.00		60	6.5	0.55	7.15	0.1	0.0	2.3	0.0	0.0	0.0	3.7	0.0	0.0
		Vibratory Plate - Gas	1	1.00		30	8	0.43	3.44	0.0	0.0	1.1	0.0	0.0	0.0	1.8	0.0	0.0
		Air Compressor	1	2.00		60	106	0.43	91.16	0.3	0.8	5.2	0.0	0.0	0.0	87.2	0.0	0.0
		Jack Hammer	1	0.25		8	2	0.78	0.39	0.0	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0
		Concrete or Asphalt Saw	1	0.25		8	81	0.78	15.795	0.2	0.1	7.0	0.0	0.1	0.1	11.7	0.0	0.0
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch	1	1.00		30	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		Generator - portable	1	4.00		120	23	0.74	68.08	0.4	0.2	17.0	0.0	0.0	0.0	26.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	1	1.00		30	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		U1 pieces of equipment	*9*							1.2	2.7	34.6	0.0	0.3	0.2	302.8	0.1	0.1

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
U2	Culvert extensions & headwalls			*6*	6													
		Excavator - Rubber Tire	1	4.00		120	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas	1	2.00		60	6.5	0.55	7.15	0.1	0.0	2.3	0.0	0.0	0.0	3.7	0.0	0.0
		Vibratory Plate - Gas	1	1.00		30	8	0.43	3.44	0.0	0.0	1.1	0.0	0.0	0.0	1.8	0.0	0.0
		Air Compressor	1	1.00		30	106	0.43	45.58	0.2	0.4	2.6	0.0	0.0	0.0	43.6	0.0	0.0
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch	1	1.00		30	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		Generator - portable	1	4.00		120	23	0.74	68.08	0.4	0.2	17.0	0.0	0.0	0.0	26.0	0.0	0.0
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools	1	1.00		30	5	0.34	1.7	0.0	0.0	0.5	0.0	0.0	0.0	0.9	0.0	0.0
		U2 pieces of equipment	*7*		Total weeks scheduled	Total hrs of operation (assumes 5-day week)				0.8	2.2	24.8	0.0	0.2	0.1	247.3	0.1	0.0
W1	Precast Concrete Block Ret			*6*	13													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track	1	6.00		390	157	0.38	357.96	0.3	2.2	1.5	0.0	0.1	0.1	255.6	0.0	0.0
		Loader - Rubber Tire	1	2.00		130	87	0.36	62.64	0.1	0.4	0.3	0.0	0.0	0.0	42.4	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas	1	2.00		130	6.5	0.55	7.15	0.1	0.0	2.3	0.0	0.0	0.0	3.7	0.0	0.0
		Vibratory Plate - Gas	1	1.00		65	8	0.43	3.44	0.0	0.0	1.1	0.0	0.0	0.0	1.8	0.0	0.0
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire	1	4.00		260	279	0.29	323.64	0.2	1.5	0.6	0.0	0.1	0.1	174.4	0.0	0.0
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		W1 pieces of equipment	*5*							0.6	4.1	5.7	0.0	0.3	0.2	477.9	0.1	0.0
X1	**Grade / Excavate for retaining walls**			*5*	8													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track	1	4.00		160	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Loader - Rubber Tire	1	4.00		160	87	0.36	125.28	0.1	0.8	0.5	0.0	0.0	0.0	84.8	0.0	0.0
		Dozer	1	4.00		160	358	0.4	572.8	0.5	4.6	2.4	0.0	0.2	0.2	423.4	0.0	0.0
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas	1	2.00		80	8	0.43	6.88	0.1	0.0	2.1	0.0	0.0	0.0	3.6	0.0	0.0
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		X1 pieces of equipment	*4*							0.9	6.9	6.1	0.0	0.4	0.3	682.2	0.1	0.0

CONSTRUCTION EMISSION CALCULATIONS

OFFROAD EQUIPMENT 2012

Crew	Phase		Units/ day	Hrs/day/ unit	Total weeks scheduled	Total hrs of operation (assumes 5-day week)	HP	LF	Daily hp-hrs	2012 Unmitigated Emissions VOC	NOx	CO	SO_2	PM_{10} ex	$PM_{2.5}$ exh	CO_2	CH_4	N_2O
X2	Grade / Excavate for platform			*5*	9													
		Excavator - Rubber Tire	1	4.00		180	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	4.00		180	87	0.36	125.28	0.1	0.8	0.5	0.0	0.0	0.0	84.8	0.0	0.0
		Dozer	1	1.00		45	358	0.4	143.2	0.1	1.2	0.6	0.0	0.0	0.0	105.9	0.0	0.0
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas	1	2.00		90	8	0.43	6.88	0.1	0.0	2.1	0.0	0.0	0.0	3.6	0.0	0.0
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		X2 pieces of equipment	*4*							0.5	3.5	4.3	0.0	0.2	0.2	364.6	0.0	0.0
X3	**Backfill platform walls**			*5*	8													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Loader - Rubber Tire	1	4.00		160	87	0.36	125.28	0.1	0.8	0.5	0.0	0.0	0.0	84.8	0.0	0.0
		Dozer				0	358	0.4	0	-	-	-	-	-	-	-	-	-
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas	2	4.00		320	6.5	0.55	28.6	0.2	0.2	9.0	0.0	0.1	0.1	14.9	0.0	0.0
		Vibratory Plate - Gas	2	2.00		160	8	0.43	13.76	0.1	0.1	4.3	0.0	0.1	0.1	7.2	0.0	0.0
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		X3 pieces of equipment	*5*							0.5	1.1	13.8	0.0	0.2	0.2	106.8	0.0	0.0
X4	Clear & Grub/General Site			*4*	2													
		Excavator - Rubber Tire				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Excavator - Track	1	4.00		40	157	0.38	238.64	0.2	1.5	1.0	0.0	0.1	0.1	170.4	0.0	0.0
		Loader - Rubber Tire				0	87	0.36	0	-	-	-	-	-	-	-	-	-
		Dozer	1	4.00		40	358	0.4	572.8	0.5	4.6	2.4	0.0	0.2	0.2	423.4	0.0	0.0
		Ditch Witch				0	69	0.5	0	-	-	-	-	-	-	-	-	-
		Roller - Vibratory				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Roller - Static				0	84	0.38	0	-	-	-	-	-	-	-	-	-
		Tamper - Gas				0	6.5	0.55	0	-	-	-	-	-	-	-	-	-
		Vibratory Plate - Gas				0	8	0.43	0	-	-	-	-	-	-	-	-	-
		Air Compressor				0	106	0.43	0	-	-	-	-	-	-	-	-	-
		Jack Hammer				0	2	0.78	0	-	-	-	-	-	-	-	-	-
		Concrete or Asphalt Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Excavator w/HoRam				0	157	0.38	0	-	-	-	-	-	-	-	-	-
		Cutting Torch				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Generator - portable				0	23	0.74	0	-	-	-	-	-	-	-	-	-
		Welding machine - portable				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Asphalt Paver				0	89	0.42	0	-	-	-	-	-	-	-	-	-
		Crane - 45 T Rubber Tire				0	279	0.29	0	-	-	-	-	-	-	-	-	-
		Crane - 100T Rubber Tire				0	208	0.29	0	-	-	-	-	-	-	-	-	-
		Forklift				0	149	0.3	0	-	-	-	-	-	-	-	-	-
		Grader				0	162	0.41	0	-	-	-	-	-	-	-	-	-
		Speed Swing				0	190	0.34	0	-	-	-	-	-	-	-	-	-
		Rail Saw				0	81	0.78	0	-	-	-	-	-	-	-	-	-
		Rail Welder				0	46	0.43	0	-	-	-	-	-	-	-	-	-
		Riding Adzer				0	48	0.34	0	-	-	-	-	-	-	-	-	-
		Clip Machine				0	10	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Regulator				0	175	0.34	0	-	-	-	-	-	-	-	-	-
		Ballast Tamper				0	300	0.34	0	-	-	-	-	-	-	-	-	-
		Impact Wrench				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		Pneumatic or Elec Tools				0	5	0.34	0	-	-	-	-	-	-	-	-	-
		X4 pieces of equipment	*2*							0.7	6.1	3.4	0.0	0.3	0.3	593.8	0.1	0.0

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

		3					2012											2013										
							Unmitigated Emissions (pounds per day)											Unmitigated Emissions (pounds per day)										
Crew	Phase	Units per day	Hrs/day/ unit	Speed (mph)	round-trip VMT	daily VMT	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O
A1	Mobilization / Demobilization																											
	Truck 3/4T pickup	4	2.0	30	20	80	0.02	0.05	0.55	0.00	0.00	0.14	0.00	0.03	75	0.00	0.00	0.01	0.21	0.09	0.00	0.01	0.14	0.01	0.03	61.09	0.00	0.00
	Truck 10-wheel Dump	1	0.0	30	20	20	0.03	0.59	0.17	0.00	0.02	0.03	0.02	0.01	83	0.00	0.00	0.04	0.47	0.17	0.00	0.02	0.03	0.02	0.01	0.00	0.00	0.00
	Truck 18-wheel Flatbd	2	0.1	30	20	40	0.07	1.18	0.34	0.00	0.04	0.07	0.04	0.02	166	0.00	0.00	0.07	0.94	0.34	0.00	0.04	0.07	0.03	0.02	169.69	0.00	0.00
	Truck Belly Dump&Pup	1	0.1	30	20	20	0.03	0.59	0.17	0.00	0.02	0.03	0.02	0.01	83	0.00	0.00	0.04	0.47	0.17	0.00	0.02	0.03	0.02	0.01	84.84	0.00	0.00
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	0.5	30	20	20	0.03	0.59	0.17	0.00	0.02	0.03	0.02	0.01	83	0.00	0.00	0.04	0.47	0.17	0.00	0.02	0.03	0.02	0.01	84.84	0.00	0.00
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.19	**2.99**	**1.40**	**0.00**	**0.10**	**0.31**	**0.09**	**0.08**	**491**	**0.00**	**0.00**	**0.20**	**2.56**	**0.95**	**0.00**	**0.11**	**0.31**	**0.09**	**0.08**	**400.47**	**0.00**	**0.00**
	Truck 3/4T pickup	4	2.0	5		40	0.04	0.04	0.55	0.00	0.00	0.07	0.00	0.02	116	0.00	0.00	0.04	0.04	0.55	0.00	0.00	0.07	0.00	0.02	115.85	0.00	0.00
	Truck 10-wheel Dump	1	0.0	5		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Truck 18-wheel Flatbd	2	0.1	5		1.3	0.03	0.11	0.04	0.00	0.00	0.00	0.00	0.00	11	0.00	0.00	0.02	0.08	0.04	0.00	0.00	0.00	0.00	0.00	10.60	0.00	0.00
	Truck Belly Dump&Pup	1	0.1	5		0.6	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	6	0.00	0.00	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	5.30	0.00	0.00
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	0.5	5		2.5	0.05	0.22	0.09	0.00	0.01	0.00	0.01	0.00	22	0.00	0.00	0.05	0.15	0.08	0.00	0.01	0.00	0.01	0.00	21.19	0.00	0.00
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.13	**0.43**	**0.70**	**0.00**	**0.02**	**0.08**	**0.02**	**0.02**	**155**	**0.00**	**0.00**	**0.12**	**0.31**	**0.69**	**0.00**	**0.02**	**0.08**	**0.02**	**0.02**	**152.94**	**0.00**	**0.00**
C1	Concrete curb & gutter, sidewalks, misc																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.01	0.03	0.28	0.00	0.00	0.07	0.00	0.02	38	0.00	0.00	0.01	0.10	0.05	0.00	0.01	0.07	0.00	0.02	30.55	0.00	0.00
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	1	0.1	30	20	20	0.03	0.59	0.17	0.00	0.02	0.03	0.02	0.01	83	0.00	0.00	0.04	0.47	0.17	0.00	0.02	0.03	0.02	0.01	84.84	0.00	0.00
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.04	**0.61**	**0.45**	**0.00**	**0.02**	**0.10**	**0.02**	**0.03**	**121**	**0.00**	**0.00**	**0.04**	**0.57**	**0.22**	**0.00**	**0.03**	**0.10**	**0.02**	**0.03**	**115.39**	**0.00**	**0.00**
	Truck 3/4T pickup	2	2.0	5		20	0.02	0.02	0.28	0.00	0.00	0.03	0.00	0.01	58	0.00	0.00	0.02	0.02	0.28	0.00	0.00	0.03	0.00	0.01	57.92	0.00	0.00
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	1	0.1	5		0.6	0.01	0.05	0.02	0.00	0.00	0.00	0.00	0.00	6	0.00	0.00	0.01	0.04	0.02	0.00	0.00	0.00	0.00	0.00	5.30	0.00	0.00
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.03	**0.08**	**0.30**	**0.00**	**0.00**	**0.04**	**0.00**	**0.01**	**63**	**0.00**	**0.00**	**0.03**	**0.06**	**0.30**	**0.00**	**0.00**	**0.04**	**0.00**	**0.01**	**63.22**	**0.00**	**0.00**
C2	Conc. footings, walls, slabs																											
	Truck 3/4T pickup	4	2.0	30	20	80	0.02	0.05	0.55	0.00	0.00	0.14	0.00	0.03	75	0.00	0.00	0.01	0.21	0.09	0.00	0.01	0.14	0.01	0.03	61.09	0.00	0.00
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	30	20	20	0.03	0.59	0.17	0.00	0.02	0.03	0.02	0.01	83	0.00	0.00	0.04	0.47	0.17	0.00	0.02	0.03	0.02	0.01	84.84	0.00	0.00
	Trck-readiy- mix conc	2	0.1	30	20	40	0.07	1.18	0.34	0.00	0.04	0.07	0.04	0.02	166	0.00	0.00	0.07	0.94	0.34	0.00	0.04	0.07	0.03	0.02	169.69	0.00	0.00
	Truck - Conc Boom Pump	1	0.3	30	20	20	0.03	0.59	0.17	0.00	0.02	0.03	0.02	0.01	83	0.00	0.00	0.04	0.47	0.17	0.00	0.02	0.03	0.02	0.01	84.84	0.00	0.00
							0.16	**2.40**	**1.23**	**0.00**	**0.08**	**0.28**	**0.07**	**0.07**	**408**	**0.00**	**0.00**	**0.16**	**2.09**	**0.78**	**0.00**	**0.09**	**0.28**	**0.07**	**0.07**	**400.47**	**0.00**	**0.00**
	Truck 3/4T pickup	4	2.0	5		40	0.04	0.04	0.55	0.00	0.00	0.07	0.00	0.02	116	0.00	0.00	0.04	0.04	0.55	0.00	0.00	0.07	0.00	0.02	115.85	0.00	0.00
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	5		5	0.10	0.44	0.17	0.00	0.02	0.01	0.02	0.00	44	0.00	0.00	0.10	0.30	0.16	0.00	0.02	0.01	0.02	0.00	42.39	0.00	0.00
	Trck-readiy- mix conc	2	0.1	5		1.3	0.03	0.11	0.04	0.00	0.00	0.00	0.00	0.00	11	0.00	0.00	0.02	0.08	0.04	0.00	0.00	0.00	0.00	0.00	10.60	0.00	0.00
	Truck - Conc Boom Pump	1	0.3	5		1.3	0.03	0.11	0.04	0.00	0.00	0.00	0.00	0.00	11	0.00	0.00	0.02	0.08	0.04	0.00	0.00	0.00	0.00	0.00	10.60	0.00	0.00
							0.19	**0.70**	**0.81**	**0.00**	**0.03**	**0.08**	**0.03**	**0.02**	**182**	**0.00**	**0.00**	**0.18**	**0.50**	**0.79**	**0.00**	**0.03**	**0.08**	**0.03**	**0.02**	**179.43**	**0.00**	**0.00**

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

		3					2012											2013										
							Unmitigated Emissions (pounds per day)											Unmitigated Emissions (pounds per day)										
Crew	Phase	Units per day	Hrs/day/ unit	Speed (mph)	round-trip VMT	daily VMT	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O
D1	**Demolition - Roadway, curb-gutter, sidewalk**																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	2	1.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiv- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.11269	1.78981	0.78307	0.00000	0.06005	0.17198	0.05524	0.04221	#######	0.00016	0.00077	0.11583	1.51387	0.55909	0.00265	0.06552	0.17198	0.05337	0.04221	#######	0.00016	0.00077
	Truck 3/4T pickup	2	2.0	5		20	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000
	Truck 10-wheel Dump	2	1.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiv- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.42709	1.77177	0.96764	0.00000	0.07960	0.06879	0.07323	0.01689	#######	0.00007	0.00028	0.40471	1.23375	0.91112	0.00163	0.07588	0.06879	0.06791	0.01689	#######	0.00007	0.00028
D2	**Demolition - Roadway (one 12-hr weekend shift)**																											
	Truck 3/4T pickup	2	3.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	2	4.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	3.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiv- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.11269	1.78981	0.78307	0.00000	0.06005	0.17198	0.05524	0.04221	#######	0.00016	0.00077	0.11583	1.51387	0.55909	0.00265	0.06552	0.17198	0.05337	0.04221	#######	0.00016	0.00077
	Truck 3/4T pickup	2	3.0	5		30	0.030	0.033	0.413	0.000	0.001	0.052	0.001	0.013	86.885	0.000	0.000	0.030	0.033	0.413	0.000	0.001	0.052	0.001	0.013	86.885	0.000	0.000
	Truck 10-wheel Dump	2	4.0	5		40	0.814	3.499	1.384	0.000	0.157	0.069	0.145	0.017	354.665	0.000	0.000	0.769	2.423	1.271	0.003	0.150	0.069	0.134	0.017	339.103	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	3.0	5		15	0.305	1.312	0.519	0.000	0.059	0.026	0.054	0.006	132.999	0.000	0.000	0.288	0.909	0.477	0.001	0.056	0.026	0.050	0.006	127.164	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiv- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							1.14927	4.84470	2.31660	0.00000	0.21781	0.14619	0.20038	0.03588	#######	0.00013	0.00068	1.08772	3.36515	2.16116	0.00449	0.20757	0.14619	0.18576	0.03588	#######	0.00013	0.00068
D3	**Demolition - Metals, Elect, Mech, Misc mat'ls**																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	1	0.3	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	0.000	0.000	0.000
	Truck 18-wheel Flatbd	1	0.3	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiv- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.11269	1.78981	0.78307	0.00000	0.06005	0.17198	0.05524	0.04221	#######	0.00016	0.00077	0.11583	1.51387	0.55909	0.00265	0.06552	0.17198	0.05337	0.04221	#######	0.00016	0.00077
	Truck 3/4T pickup	2	2.0	5		20	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000
	Truck 10-wheel Dump	1	0.3	5		1.3	0.025	0.109	0.043	0.000	0.005	0.002	0.005	0.001	11.083	0.000	0.000	0.024	0.076	0.040	0.000	0.005	0.002	0.004	0.001	10.597	0.000	0.000
	Truck 18-wheel Flatbd	1	0.3	5		1.3	0.025	0.109	0.043	0.000	0.005	0.002	0.005	0.001	11.083	0.000	0.000	0.024	0.076	0.040	0.000	0.005	0.002	0.004	0.001	10.597	0.000	0.000
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Trck-readiv- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.17277	0.67825	0.53507	0.00000	0.03040	0.04730	0.02796	0.01161	#######	0.00005	0.00015	0.16438	0.47649	0.51387	0.00061	0.02900	0.04730	0.02597	0.01161	#######	0.00005	0.00015
D4	**Demolition - Reinforced Concrete Structures**																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	2	1.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiv- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.11269	1.78981	0.78307	0.00000	0.06005	0.17198	0.05524	0.04221	#######	0.00016	0.00077	0.11583	1.51387	0.55909	0.00265	0.06552	0.17198	0.05337	0.04221	#######	0.00016	0.00077
	Truck 3/4T pickup	2	2.0	5		20	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000
	Truck 10-wheel Dump	2	1.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiv- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.42709	1.77177	0.96764	0.00000	0.07960	0.06879	0.07323	0.01689	#######	0.00007	0.00028	0.40471	1.23375	0.91112	0.00163	0.07588	0.06879	0.06791	0.01689	#######	0.00007	0.00028
E1	**Signals**																											
	Truck 3/4T pickup	1	1.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

		3					2012												2013										
							Unmitigated Emissions (pounds per day)												Unmitigated Emissions (pounds per day)										
Crew	Phase	Units per day	Hrs/day/ unit	Speed (mph)	round-trip VMT	daily VMT	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O
	Truck -Fltbd w/boom crane	1	0.3	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.03903	0.60090	0.30710	0.00000	0.02007	0.06879	0.01847	0.01689	########	0.00007	0.00028	0.03968	0.52175	0.19409	0.00093	0.02284	0.06879	0.01850	0.01689	########	0.00007	0.00028
	Truck 3/4T pickup	1	1.0	5		5	0.005	0.006	0.069	0.000	0.000	0.009	0.000	0.002	14.481	0.000	0.000	0.005	0.006	0.069	0.000	0.000	0.009	0.000	0.002	14.481	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	0.3	5		1.3	0.025	0.109	0.043	0.000	0.005	0.002	0.005	0.001	11.083	0.000	0.000	0.024	0.076	0.040	0.000	0.005	0.002	0.004	0.001	10.597	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.03048	0.11489	0.11214	0.00000	0.00514	0.01075	0.00473	0.00264	25.56417	0.00001	0.00003	0.02908	0.08126	0.10861	0.00010	0.00491	0.01075	0.00440	0.00264	25.07785	0.00001	0.00003
E2																												
	Truck 3/4T pickup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	3	2.0	30	20	60	0.104	1.764	0.507	0.000	0.060	0.103	0.055	0.025	249.309	0.000	0.001	0.109	1.411	0.513	0.002	0.060	0.103	0.049	0.025	254.533	0.000	0.001
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	3	0.3	30	20	60	0.104	1.764	0.507	0.000	0.060	0.103	0.055	0.025	249.309	0.000	0.001	0.109	1.411	0.513	0.002	0.060	0.103	0.049	0.025	254.533	0.000	0.001
							0.20777	3.52799	1.01325	0.00000	0.11941	0.20638	0.10985	0.05066	########	0.00013	0.00127	0.21879	2.82227	1.02541	0.00476	0.11905	0.20638	0.09818	0.05066	########	0.00013	0.00127
	Truck 3/4T pickup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	3	2.0	5		30	0.610	2.624	1.038	0.000	0.118	0.052	0.109	0.013	265.999	0.000	0.000	0.577	1.817	0.953	0.002	0.113	0.052	0.101	0.013	254.327	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	3	0.3	5		3.8	0.076	0.328	0.130	0.000	0.015	0.006	0.014	0.002	33.250	0.000	0.000	0.072	0.227	0.119	0.000	0.014	0.006	0.013	0.002	31.791	0.000	0.000
							0.68666	2.95251	1.16794	0.00000	0.13285	0.05804	0.12222	0.01425	########	0.00004	0.00036	0.64889	2.04460	1.07256	0.00275	0.12656	0.05804	0.11325	0.01425	########	0.00004	0.00036
E3																												
	Truck 3/4T pickup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	2	2.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.06926	1.17600	0.33775	0.00000	0.03980	0.06879	0.03662	0.01689	########	0.00004	0.00042	0.07293	0.94076	0.34180	0.00159	0.03968	0.06879	0.03273	0.01689	########	0.00004	0.00042
	Truck 3/4T pickup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	2	2.0	5		20	0.407	1.750	0.692	0.000	0.079	0.034	0.072	0.008	177.333	0.000	0.000	0.385	1.212	0.636	0.002	0.075	0.034	0.067	0.008	169.551	0.000	0.000
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.40691	1.74964	0.69211	0.00000	0.07872	0.03440	0.07243	0.00844	########	0.00002	0.00021	0.38453	1.21162	0.63559	0.00163	0.07500	0.03440	0.06711	0.00844	########	0.00002	0.00021
IW1	**t & Precast Concrete Panels**																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.03903	0.60090	0.30710	0.00000	0.02007	0.06879	0.01847	0.01689	########	0.00007	0.00028	0.03968	0.52175	0.19409	0.00093	0.02284	0.06879	0.01850	0.01689	########	0.00007	0.00028
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.11182	0.44848	0.31079	0.00000	0.02012	0.02580	0.01851	0.00633	73.29492	0.00003	0.00009	0.10622	0.31397	0.29666	0.00041	0.01919	0.02580	0.01718	0.00633	71.34962	0.00003	0.00009
L1	**Irrigation**																											
	Truck 3/4T pickup	1	1.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	2	2.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
							0.14292	2.36490	0.81372	0.00000	0.07978	0.17198	0.07339	0.04221	########	0.00013	0.00091	0.14908	1.93288	0.70680	0.00331	0.08236	0.17198	0.06759	0.04221	########	0.00013	0.00091
	Truck 3/4T pickup	1	1.0	5		5	0.005	0.006	0.069	0.000	0.000	0.009	0.000	0.002	14.481	0.000	0.000	0.005	0.006	0.069	0.000	0.000	0.009	0.000	0.002	14.481	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

							2012											2013										
							Unmitigated Emissions (pounds per day)											Unmitigated Emissions (pounds per day)										
Crew	Phase	Units per day	Hrs/day/ unit	Speed (mph)	round-trip VMT	daily VMT	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O	VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	2	2.0	5		20	0.407	1.750	0.692	0.000	0.079	0.034	0.072	0.008	177.333	0.000	0.000	0.385	1.212	0.636	0.002	0.075	0.034	0.067	0.008	169.551	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pumo	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
							0.81887	3.50481	1.45311	0.00000	0.15767	0.07739	0.14505	0.01900	########	0.00006	0.00044	0.77410	2.42877	1.34007	0.00326	0.15022	0.07739	0.13442	0.01900	########	0.00006	0.00044
M1	Misc metals																											
5	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	2	2.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
							0.13851	2.35199	0.67550	0.00000	0.07960	0.13759	0.07324	0.03377	########	0.00009	0.00085	0.14586	1.88151	0.68361	0.00317	0.07937	0.13759	0.06545	0.03377	########	0.00009	0.00085
	Truck 3/4T pickup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	2	2.0	5		20	0.407	1.750	0.692	0.000	0.079	0.034	0.072	0.008	177.333	0.000	0.000	0.385	1.212	0.636	0.002	0.075	0.034	0.067	0.008	169.551	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
							0.81382	3.49927	1.38423	0.00000	0.15745	0.06879	0.14485	0.01689	########	0.00004	0.00042	0.76906	2.42323	1.27119	0.00326	0.15000	0.06879	0.13422	0.01689	########	0.00004	0.00042
M2	hanical Work																											
	Truck 3/4T pickup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	2	0.5	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pumo	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
							0.13851	2.35199	0.67550	0.00000	0.07960	0.13759	0.07324	0.03377	########	0.00009	0.00085	0.14586	1.88151	0.68361	0.00317	0.07937	0.13759	0.06545	0.03377	########	0.00009	0.00085
	Truck 3/4T pickup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	2	0.5	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
							0.50864	2.18705	0.86514	0.00000	0.09841	0.04300	0.09053	0.01055	########	0.00003	0.00026	0.48066	1.51452	0.79449	0.00204	0.09375	0.04300	0.08389	0.01055	########	0.00003	0.00026
M3	eous work																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.03903	0.60090	0.30710	0.00000	0.02007	0.06879	0.01847	0.01689	########	0.00007	0.00028	0.03968	0.52175	0.19409	0.00093	0.02284	0.06879	0.01850	0.01689	########	0.00007	0.00028
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.11182	0.44848	0.31079	0.00000	0.02012	0.02580	0.01851	0.00633	73.29492	0.00003	0.00009	0.10622	0.31397	0.29666	0.00041	0.01919	0.02580	0.01718	0.00633	71.34962	0.00003	0.00009
M4	list items																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	0.5	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.04344	0.61381	0.44533	0.00000	0.02025	0.10319	0.01862	0.02533	########	0.00011	0.00034	0.04290	0.57311	0.21729	0.00106	0.02584	0.10319	0.02064	0.02533	########	0.00011	0.00034
	Truck 3/4T pickup	2	2.0	5		20	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	0.5	5		2.5	0.051	0.219	0.087	0.000	0.010	0.004	0.009	0.001	22.167	0.000	0.000	0.048	0.151	0.079	0.000	0.009	0.004	0.008	0.001	21.194	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.07104	0.24084	0.36204	0.00000	0.01072	0.03870	0.00986	0.00950	80.09011	0.00005	0.00009	0.06824	0.17359	0.35497	0.00020	0.01025	0.03870	0.00919	0.00950	79.11746	0.00005	0.00009

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

3

Crew	Phase	Units per day	Hrs/day/ unit	Speed (mph)	round-trip VMT	daily VMT	2012 Unmitigated Emissions (pounds per day) VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O	2013 Unmitigated Emissions (pounds per day) VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O
P1	ock & Asphalt Paving																											
	Truck 3/4T pickup	3	2.0	30	20	60	0.013	0.039	0.415	0.000	0.001	0.103	0.000	0.025	56.365	0.000	0.000	0.010	0.154	0.070	0.000	0.009	0.103	0.006	0.025	45.819	0.000	0.000
	Truck 10-wheel Dumo	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	2	0.5	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck - 2500 gal water	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	2	0.5	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.18635	2.97871	1.25905	0.00000	0.10003	0.27517	0.09202	0.06754	#######	0.00024	0.00126	0.19198	2.50599	0.92409	0.00437	0.10820	0.27517	0.08823	0.06754	#######	0.00024	0.00126
	Truck 3/4T pickup	3	2.0	5		30	0.030	0.033	0.413	0.000	0.001	0.052	0.001	0.013	86.885	0.000	0.000	0.030	0.033	0.413	0.000	0.001	0.052	0.001	0.013	86.885	0.000	0.000
	Truck 10-wheel Dumo	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	2	0.5	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck - 2500 gal water	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck - AC Tranport	2	0.5	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.33545	1.34543	0.93237	0.00000	0.06036	0.07739	0.05552	0.01900	#######	0.00008	0.00026	0.31866	0.94192	0.88998	0.00122	0.05757	0.07739	0.05154	0.01900	#######	0.00008	0.00026
P2	Const (one 12-hr shift)																											
	Truck 3/4T pickup	4	3.0	30	20	80	0.018	0.052	0.553	0.000	0.001	0.138	0.001	0.034	75.153	0.000	0.000	0.013	0.205	0.093	0.001	0.012	0.138	0.009	0.034	61.092	0.000	0.000
	Truck 10-wheel Dump	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	2	1.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.15613	2.40362	1.22840	0.00000	0.08030	0.27517	0.07387	0.06754	#######	0.00027	0.00111	0.15873	2.08698	0.77638	0.00370	0.09136	0.27517	0.07401	0.06754	#######	0.00027	0.00111
	Truck 3/4T pickup	4	3.0	5		60	0.061	0.066	0.827	0.000	0.003	0.103	0.002	0.025	173.771	0.000	0.000	0.061	0.066	0.827	0.000	0.003	0.103	0.002	0.025	173.771	0.000	0.000
	Truck 10-wheel Dump	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	2	1.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.67090	2.69086	1.86474	0.00000	0.12072	0.15478	0.11105	0.03799	#######	0.00017	0.00052	0.63733	1.88383	1.77996	0.00245	0.11514	0.15478	0.10308	0.03799	#######	0.00017	0.00052
S1	:																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	0.3	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.03903	0.60090	0.30710	0.00000	0.02007	0.06879	0.01847	0.01689	#######	0.00007	0.00028	0.03968	0.52175	0.19409	0.00093	0.02284	0.06879	0.01850	0.01689	#######	0.00007	0.00028
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	0.3	5		1.3	0.025	0.109	0.043	0.000	0.005	0.002	0.005	0.001	11.083	0.000	0.000	0.024	0.076	0.040	0.000	0.005	0.002	0.004	0.001	10.597	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.03552	0.12042	0.18102	0.00000	0.00536	0.01935	0.00493	0.00475	40.04506	0.00002	0.00005	0.03412	0.08679	0.17749	0.00010	0.00513	0.01935	0.00460	0.00475	39.55873	0.00002	0.00005
S2	mmunications																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	1	0.1	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	0.000	0.000	0.000
	Truck 18-wheel Flatbd	1	0.1	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	0.1	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.14732	2.37781	0.95195	0.00000	0.07995	0.20638	0.07355	0.05066	#######	0.00018	0.00098	0.15230	1.98425	0.72999	0.00344	0.08536	0.20638	0.06973	0.05066	#######	0.00018	0.00098
	Truck 3/4T pickup	2	2.0	5		20	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000
	Truck 10-wheel Dumo	1	0.1	5		0.3	0.006	0.026	0.010	0.000	0.001	0.001	0.001	0.000	2.660	0.000	0.000	0.006	0.018	0.010	0.000	0.001	0.001	0.001	0.000	2.543	0.000	0.000
	Truck 18-wheel Flatbd	1	0.1	5		0.7	0.013	0.057	0.022	0.000	0.003	0.001	0.002	0.000	5.763	0.000	0.000	0.012	0.039	0.021	0.000	0.002	0.001	0.002	0.000	5.510	0.000	0.000
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	0.1	5		0.3	0.006	0.026	0.010	0.000	0.001	0.001	0.001	0.000	2.660	0.000	0.000	0.006	0.018	0.010	0.000	0.001	0.001	0.001	0.000	2.543	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.24907	1.00631	0.66484	0.00000	0.04516	0.05374	0.04154	0.01319	#######	0.00006	0.00019	0.23648	0.70367	0.63304	0.00092	0.04307	0.05374	0.03855	0.01319	#######	0.00006	0.00019
T1	st for Track																											
	Truck 3/4T pickup	3	1.0	30	20	60	0.013	0.039	0.415	0.000	0.001	0.103	0.000	0.025	56.365	0.000	0.000	0.010	0.154	0.070	0.000	0.009	0.103	0.006	0.025	45.819	0.000	0.000
	Truck 10-wheel Dump	2	0.3	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	2	0.3	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck - 2500 gal water	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

Crew	Phase	Units per day	Hrs/day/ unit	Speed (mph)	round-trip VMT	daily VMT	2012 VOC	2012 NOx	2012 CO	2012 SO_2	2012 PM_{10} exh	2012 PM10 road dust	2012 $PM_{2.5}$ exh	2012 PM2.5 road dust	2012 CO_2	2012 CH_4	2012 N_2O	2013 VOC	2013 NOx	2013 CO	2013 SO_2	2013 PM_{10} exh	2013 PM10 road dust	2013 $PM_{2.5}$ exh	2013 PM2.5 road dust	2013 CO_2	2013 CH_4	2013 N_2O
		3										Unmitigated Emissions (pounds per day)											Unmitigated Emissions (pounds per day)					
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.18635	2.97871	1.25905	0.00000	0.10003	0.27517	0.09202	0.06754	########	0.00024	0.00126	0.19198	2.50599	0.92409	0.00437	0.10820	0.27517	0.08823	0.06754	########	0.00024	0.00126
	Truck 3/4T pickup	3	1.0	5		15	0.015	0.017	0.207	0.000	0.001	0.026	0.001	0.006	43.443	0.000	0.000	0.015	0.017	0.207	0.000	0.001	0.026	0.001	0.006	43.443	0.000	0.000
	Truck 10-wheel Dump	2	0.3	5		2.5	0.051	0.219	0.087	0.000	0.010	0.004	0.009	0.001	22.167	0.000	0.000	0.048	0.151	0.079	0.000	0.009	0.004	0.008	0.001	21.194	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	2	0.3	5		2.5	0.051	0.219	0.087	0.000	0.010	0.004	0.009	0.001	22.167	0.000	0.000	0.048	0.151	0.079	0.000	0.009	0.004	0.008	0.001	21.194	0.000	0.000
	Truck - 2500 gal water	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.21859	0.89142	0.55270	0.00000	0.04002	0.04300	0.03682	0.01055	########	0.00004	0.00016	0.20740	0.62241	0.52444	0.00082	0.03816	0.04300	0.03416	0.01055	########	0.00004	0.00016
T2	**t, etc for Track**																											
	Truck 3/4T pickup	3	1.0	30	20	60	0.013	0.039	0.415	0.000	0.001	0.103	0.000	0.025	56.365	0.000	0.000	0.010	0.154	0.070	0.000	0.009	0.103	0.006	0.025	45.819	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	1	0.5	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck Belly Dump&Pup	2	0.3	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	169.688	0.000	0.000
	Truck - 2500 gal water	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.18635	2.97871	1.25905	0.00000	0.10003	0.27517	0.09202	0.06754	########	0.00024	0.00126	0.19198	2.50599	0.92409	0.00437	0.10820	0.27517	0.08823	0.06754	########	0.00024	0.00126
	Truck 3/4T pickup	3	1.0	5		15	0.015	0.017	0.207	0.000	0.001	0.026	0.001	0.006	43.443	0.000	0.000	0.015	0.017	0.207	0.000	0.001	0.026	0.001	0.006	43.443	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	1	0.5	5		2.5	0.051	0.219	0.087	0.000	0.010	0.004	0.009	0.001	22.167	0.000	0.000	0.048	0.151	0.079	0.000	0.009	0.004	0.008	0.001	21.194	0.000	0.000
	Truck Belly Dump&Pup	2	0.3	5		2.5	0.051	0.219	0.087	0.000	0.010	0.004	0.009	0.001	22.167	0.000	0.000	0.048	0.151	0.079	0.000	0.009	0.004	0.008	0.001	21.194	0.000	0.000
	Truck - 2500 gal water	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.32032	1.32883	0.72573	0.00000	0.05970	0.05159	0.05492	0.01266	########	0.00005	0.00021	0.30353	0.92531	0.68334	0.00122	0.05691	0.05159	0.05094	0.01266	########	0.00005	0.00021
T3	**Const (one 12-hr shift)**																											
	Truck 3/4T pickup	3	2.0	30	20	60	0.013	0.039	0.415	0.000	0.001	0.103	0.000	0.025	56.365	0.000	0.000	0.010	0.154	0.070	0.000	0.009	0.103	0.006	0.025	45.819	0.000	0.000
	Truck 10-wheel Dump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.08247	1.21472	0.75243	0.00000	0.04032	0.17198	0.03709	0.04221	########	0.00018	0.00062	0.08259	1.09486	0.41138	0.00198	0.04868	0.17198	0.03914	0.04221	########	0.00018	0.00062
	Truck 3/4T pickup	3	2.0	5		30	0.030	0.033	0.413	0.000	0.001	0.052	0.001	0.013	86.885	0.000	0.000	0.030	0.033	0.413	0.000	0.001	0.052	0.001	0.013	86.885	0.000	0.000
	Truck 10-wheel Dump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.33545	1.34543	0.93237	0.00000	0.06036	0.07739	0.05552	0.01900	########	0.00008	0.00026	0.31866	0.94192	0.88998	0.00122	0.05757	0.07739	0.05154	0.01900	########	0.00008	0.00026
U1	**n/Casing Extensions**																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.07807	1.20181	0.61420	0.00000	0.04015	0.13759	0.03693	0.03377	########	0.00013	0.00056	0.07937	1.04349	0.38819	0.00185	0.04568	0.13759	0.03700	0.03377	########	0.00013	0.00056
	Truck 3/4T pickup	2	2.0	5		20	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000
	Truck 10-wheel Dump	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.22363	0.89695	0.62158	0.00000	0.04024	0.05159	0.03702	0.01266	########	0.00006	0.00017	0.21244	0.62794	0.59332	0.00082	0.03838	0.05159	0.03436	0.01266	########	0.00006	0.00017
U2	**ns & headwalls**																											
	Truck 3/4T pickup	2	2.0	30	20	40	0.009	0.026	0.276	0.000	0.000	0.069	0.000	0.017	37.577	0.000	0.000	0.006	0.103	0.046	0.000	0.006	0.069	0.004	0.017	30.546	0.000	0.000
	Truck 10-wheel Dump	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.07807	1.20181	0.61420	0.00000	0.04015	0.13759	0.03693	0.03377	########	0.00013	0.00056	0.07937	1.04349	0.38819	0.00185	0.04568	0.13759	0.03700	0.03377	########	0.00013	0.00056
	Truck 3/4T pickup	2	2.0	5		20	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000	0.020	0.022	0.276	0.000	0.001	0.034	0.001	0.008	57.924	0.000	0.000
	Truck 10-wheel Dump	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

3

Crew	Phase	Units per day	Hrs/day/ unit	Speed (mph)	round-trip VMT	daily VMT	2012 Unmitigated Emissions (pounds per day) VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O	2013 Unmitigated Emissions (pounds per day) VOC	NOx	CO	SO_2	PM_{10} exh	PM10 road dust	$PM_{2.5}$ exh	PM2.5 road dust	CO_2	CH_4	N_2O
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.22363	0.89695	0.62158	0.00000	0.04024	0.05159	0.03702	0.01266	########	0.00006	0.00017	0.21244	0.62794	0.59332	0.00082	0.03838	0.05159	0.03436	0.01266	########	0.00006	0.00017
X1	**for retaining walls**																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	2	2.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.10829	1.77690	0.64485	0.00000	0.05988	0.13759	0.05508	0.03377	########	0.00011	0.00070	0.11261	1.46250	0.53590	0.00251	0.06252	0.13759	0.05123	0.03377	########	0.00011	0.00070
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	2	2.0	5		20	0.407	1.750	0.692	0.000	0.079	0.034	0.072	0.008	177.333	0.000	0.000	0.385	1.212	0.636	0.002	0.075	0.034	0.067	0.008	169.551	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.62046	2.63552	1.17593	0.00000	0.11853	0.06879	0.10904	0.01689	########	0.00006	0.00035	0.58688	1.82849	1.09115	0.00245	0.11294	0.06879	0.10107	0.01689	########	0.00006	0.00035
X2	**for platform walls**																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	2	2.0	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.10829	1.77690	0.64485	0.00000	0.05988	0.13759	0.05508	0.03377	########	0.00011	0.00070	0.11261	1.46250	0.53590	0.00251	0.06252	0.13759	0.05123	0.03377	########	0.00011	0.00070
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	2	2.0	5		20	0.407	1.750	0.692	0.000	0.079	0.034	0.072	0.008	177.333	0.000	0.000	0.385	1.212	0.636	0.002	0.075	0.034	0.067	0.008	169.551	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.62046	2.63552	1.17593	0.00000	0.11853	0.06879	0.10904	0.01689	########	0.00006	0.00035	0.58688	1.82849	1.09115	0.00245	0.11294	0.06879	0.10107	0.01689	########	0.00006	0.00035
X3	**s walls**																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	2	0.5	30	20	40	0.069	1.176	0.338	0.000	0.040	0.069	0.037	0.017	166.206	0.000	0.000	0.073	0.941	0.342	0.002	0.040	0.069	0.033	0.017	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.10829	1.77690	0.64485	0.00000	0.05988	0.13759	0.05508	0.03377	########	0.00011	0.00070	0.11261	1.46250	0.53590	0.00251	0.06252	0.13759	0.05123	0.03377	########	0.00011	0.00070
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	2	0.5	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	2.0	5		10	0.203	0.875	0.346	0.000	0.039	0.017	0.036	0.004	88.666	0.000	0.000	0.192	0.606	0.318	0.001	0.038	0.017	0.034	0.004	84.776	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.31527	1.32330	0.65685	0.00000	0.05948	0.04300	0.05472	0.01055	########	0.00004	0.00019	0.29849	0.91978	0.61446	0.00122	0.05669	0.04300	0.05073	0.01055	########	0.00004	0.00019
X4	**ub/Grading**																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	0.000	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	1.0	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.07366	1.18890	0.47597	0.00000	0.03998	0.10319	0.03678	0.02533	########	0.00009	0.00049	0.07615	0.99212	0.36500	0.00172	0.04268	0.10319	0.03487	0.02533	########	0.00009	0.00049
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck 18-wheel Flatbd	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	1	1.0	5		5	0.102	0.437	0.173	0.000	0.020	0.009	0.018	0.002	44.333	0.000	0.000	0.096	0.303	0.159	0.000	0.019	0.009	0.017	0.002	42.388	0.000	0.000
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.21354	0.88589	0.48382	0.00000	0.03980	0.03440	0.03662	0.00844	########	0.00003	0.00014	0.20235	0.61688	0.45556	0.00082	0.03794	0.03440	0.03396	0.00844	########	0.00003	0.00014

CONSTRUCTION EMISSION CALCULATIONS

ONROAD MOTOR VEHICLE TRIPS

		3					2012											2013										
							Unmitigated Emissions (pounds per day)											Unmitigated Emissions (pounds per day)										
Crew	**Phase**	**Units per day**	**Hrs/day/ unit**	**Speed (mph)**	**round-trip VMT**	**daily VMT**	**VOC**	**NOx**	**CO**	**SO_2**	**PM_{10} exh**	**PM10 road dust**	**$PM_{2.5}$ exh**	**PM2.5 road dust**	**CO_2**	**CH_4**	**N_2O**	**VOC**	**NOx**	**CO**	**SO_2**	**PM_{10} exh**	**PM10 road dust**	**$PM_{2.5}$ exh**	**PM2.5 road dust**	**CO_2**	**CH_4**	**N_2O**
W1	**Block Ret Wall**																											
	Truck 3/4T pickup	1	2.0	30	20	20	0.004	0.013	0.138	0.000	0.000	0.034	0.000	0.008	18.788	0.000	0.000	0.003	0.051	0.023	0.000	0.003	0.034	0.002	0.008	15.273	0.000	0.000
	Truck 10-wheel Dump	1	0.5	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	0.000	0.000	0.000
	Truck 18-wheel Flatbd	1	0.3	30	20	20	0.035	0.588	0.169	0.000	0.020	0.034	0.018	0.008	83.103	0.000	0.000	0.036	0.470	0.171	0.001	0.020	0.034	0.016	0.008	84.844	0.000	0.000
	Truck Belly Dump&Pup	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	30	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.07366	**1.18890**	**0.47597**	**0.00000**	**0.03998**	**0.10319**	**0.03678**	**0.02533**	**#######**	**0.00009**	**0.00049**	**0.07615**	**0.99212**	**0.36500**	**0.00172**	**0.04268**	**0.10319**	**0.03487**	**0.02533**	**#######**	**0.00009**	**0.00049**
	Truck 3/4T pickup	1	2.0	5		10	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000	0.010	0.011	0.138	0.000	0.000	0.017	0.000	0.004	28.962	0.000	0.000
	Truck 10-wheel Dump	1	0.5	5		2.5	0.051	0.219	0.087	0.000	0.010	0.004	0.009	0.001	22.167	0.000	0.000	0.048	0.151	0.079	0.000	0.009	0.004	0.008	0.001	21.194	0.000	0.000
	Truck 18-wheel Flatbd	1	0.3	5		1.3	0.025	0.109	0.043	0.000	0.005	0.002	0.005	0.001	11.083	0.000	0.000	0.024	0.076	0.040	0.000	0.005	0.002	0.004	0.001	10.597	0.000	0.000
	Truck Belly Dump&Pup	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - 2500 gal water	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - AC Tranport	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck -Fltbd w/boom crane	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Trck-readiy- mix conc	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Truck - Conc Boom Pump	0	0.0	5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
							0.08638	**0.33912**	**0.26753**	**0.00000**	**0.01520**	**0.02365**	**0.01398**	**0.00580**	**62.21163**	**0.00003**	**0.00007**	**0.08219**	**0.23825**	**0.25694**	**0.00031**	**0.01450**	**0.02365**	**0.01298**	**0.00580**	**60.75265**	**0.00003**	**0.00007**

Earthwork activities

Earthwork Quantity

Earthwork, by Area	Short Way	Santa Fe Station	Redlands Sub	San Bernadino ITCS	
Earthwork Cut, cubic yards			16,796		
Earthwork Fill, cubic yards			2		
Roadway Excavation, cubic yards		384	5,707	75	6,166
Total		*384*	*22,505*	*75*	
				22,964	

Earthwork, by Phase

Phase 1	20,254
Phase 2A	2,634
Phases 2B	
Phase 3A	
Phase 4	75
	22,964

total CYD of earthwork **22,964**

Earthwork Phases and Distribution of Earthwork Activities

	Weeks eathwork occurs	days per phase	Total Days	
weedays	41	5	205	
weekends	10	2	20	
Total Earthwork phases (phases involving grading)	51		225	Total Earthwork Days

total CYD of earthwork			
CYD per phase	450.26	**102.06**	**CYD per day**

Emission Factor Calculation *10,000*

*ran CALEEMOD for 10,000 CYD of material exported (for dust only)

	PM10	PM2.5
Total pounds of dust (uncontrolled)	1.13	0.17
Reduction per Rule 403 (water 3x daily)	61%	61%
Total pounds of dust (controlled, unmitigated, with watering) *	0.44	0.07
pounds per cubic yard (use for calculations)	**0.000044**	**0.000007**

Paving

Emissions based on Calculation Details in CalEEMod Users Guide, Appendix A, pages 16-17

Eap = Efap x Aparking

	Unmitigated		
VOC Emissions (E)	2.62	pounds of VOC per day	
EF	2.62	lbs of VOC per acre paved	URBEMIS and CalEEMod default, based on SMAQMD
A	5.0	paving acreage	
	5.0	paving days	
	1.0	paving acreage per day	

SUMMARY OF EQUIPMENT AND EMISSION FACTORS

				19	4											24	25	26	27	28	28	29	30	31	
							Emission Factors																		
							2012									2013									
Type	RFM Equipment Name	ARB Equipment Match (OFFROAD or EMFAC)	Fuel (Diesel or Gas)	HP	LF	metric	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	CH4	N2O	*HP and LF Source*
Off-Road Exhaust	Excavator - Rubber Tire	Excavators	D	157	0.38	lbs/hp-hr	0.0008	0.0061	0.0042	0.0000	0.0004	0.0003	0.7141	0.0001	0.0000	0.00077	0.00568	0.00424	0.00001	0.00033	0.00030	0.71415	0.00007	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Excavator - Track	Excavators	D	157	0.38	lbs/hp-hr	0.00082	0.00612	0.00425	0.00001	0.00036	0.00033	0.71415	0.00007	0.00000	0.00077	0.00568	0.00424	0.00001	0.00033	0.00030	0.71415	0.00007	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Loader - Rubber Tire	Rubber Tired Loaders	D	87	0.36	lbs/hp-hr	0.00084	0.00645	0.00400	0.00001	0.00037	0.00034	0.67656	0.00008	0.00000	0.00079	0.00605	0.00399	0.00001	0.00034	0.00031	0.67656	0.00007	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Dozer	Rubber Tired Dozers	D	358	0.4	lbs/hp-hr	0.00093	0.00804	0.00425	0.00001	0.00034	0.00031	0.73920	0.00008	0.00000	0.00090	0.00762	0.00397	0.00001	0.00032	0.00029	0.73920	0.00008	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Ditch Witch	Trenchers	G	69	0.5	lbs/hp-hr	0.00391	0.01143	0.06829	0.00001	0.00009	0.00009	1.12694	0.00022	0.00029	0.00375	0.01078	0.06763	0.00001	0.00009	0.00009	1.12694	0.00021	0.00028	URBEMIS for HP, Carl Mover 2011 update for LF
	Roller - Vibratory	Rollers	D	84	0.38	lbs/hp-hr	0.00125	0.00787	0.00487	0.00001	0.00068	0.00063	0.70162	0.00011	0.00000	0.00117	0.00744	0.00483	0.00001	0.00063	0.00058	0.70162	0.00011	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Roller - Static	Rollers	D	84	0.38	lbs/hp-hr	0.00125	0.00787	0.00487	0.00001	0.00068	0.00063	0.70162	0.00011	0.00000	0.00117	0.00744	0.00483	0.00001	0.00063	0.00058	0.70162	0.00011	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Tamper - Gas	Tampers/Rammers	G	6.5	0.55	lbs/hp-hr	0.00844	0.00587	0.31526	0.00001	0.00437	0.00436	0.52071	0.00047	0.00057	0.00827	0.00590	0.31334	0.00001	0.00437	0.00436	0.52071	0.00046	0.00057	HP from: http://www.powerlandonline.com/product/PDR80/tamper-rammer-on-sale--jumping-jack-on-sale--free-shipping.html,
	Vibratory Plate - Gas	Plate Compactors	G	8	0.43	lbs/hp-hr	0.00820	0.00593	0.31237	0.00001	0.00437	0.00436	0.52071	0.00046	0.00060	0.00811	0.00595	0.31148	0.00001	0.00437	0.00436	0.52071	0.00046	0.00061	URBEMIS for HP, Carl Mover 2011 update for LF
	Air Compressor	Air Compressors	G	106	0.43	lbs/hp-hr	0.00330	0.00893	0.05758	0.00001	0.00007	0.00007	0.95619	0.00018	0.00024	0.00307	0.00814	0.05639	0.00001	0.00007	0.00007	0.95619	0.00017	0.00023	URBEMIS for HP, Carl Mover 2011 update for LF
	Jack Hammer	Crushine/Proc. Equipment	G	2	0.78	lbs/hp-hr	0.01245	0.00916	0.48092	0.00002	0.00675	0.00673	0.80474	0.00070	0.00072	0.01244	0.00916	0.48096	0.00002	0.00675	0.00673	0.80474	0.00070	0.00072	HP from: http://www.crowdersupply.com/eastools.htm. LF from Carl Mover 2011 update
	Concrete or Asphalt Saw	Concrete/Industrial Saws	G	81	0.78	lbs/hp-hr	0.01148	0.00845	0.44131	0.00002	0.00619	0.00618	0.73847	0.00064	0.00069	0.01148	0.00845	0.44135	0.00002	0.00619	0.00618	0.73847	0.00064	0.00069	URBEMIS for HP, Carl Mover 2011 update for LF
	Excavator w/HoRam	Excavators	D	157	0.38	lbs/hp-hr	0.00082	0.00612	0.00425	0.00001	0.00036	0.00033	0.71415	0.00007	0.00000	0.00077	0.00568	0.00424	0.00001	0.00033	0.00030	0.71415	0.00007	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Cutting Torch	Other General Industrial Equipmen	G	5	0.34	lbs/hp-hr	0.00443	0.00332	0.26746	0.00002	0.00024	0.00024	0.51125	0.00028	0.00046	0.00443	0.00332	0.26746	0.00002	0.00024	0.00024	0.51125	0.00028	0.00046	same as impact wrench
	Generator - portable	Generator Sets	G	23	0.74	lbs/hp-hr	0.00584	0.00340	0.24917	0.00001	0.00020	0.00020	0.38225	0.00033	0.00023	0.00710	0.00313	0.26092	0.00001	0.00020	0.00020	0.38225	0.00040	0.00022	Carl Moyer 2011 update for LF
	Welding machine - portable	Welders	G	46	0.43	lbs/hp-hr	0.00350	0.00576	0.10053	0.00001	0.00007	0.00007	0.88071	0.00020	0.00025	0.00327	0.00534	0.09968	0.00001	0.00007	0.00007	0.88071	0.00018	0.00024	URBEMIS for HP, Carl Mover 2011 update for LF
	Asphalt Paver	Pavers	D	89	0.42	lbs/hp-hr	0.00165	0.00987	0.00573	0.00001	0.00087	0.00080	0.77679	0.00015	0.00000	0.00156	0.00938	0.00568	0.00001	0.00082	0.00075	0.77679	0.00014	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Crane - 45 T Rubber Tire	Cranes	D	279	0.29	lbs/hp-hr	0.00049	0.00458	0.00170	0.00001	0.00017	0.00016	0.53874	0.00004	0.00000	0.00046	0.00426	0.00158	0.00001	0.00016	0.00014	0.53874	0.00004	0.00000	URBEMIS. http://www.bizee.com/crane-charts/#ATC
	Crane - 100T Rubber Tire	Cranes	D	208	0.29	lbs/hp-hr	0.00049	0.00458	0.00170	0.00001	0.00017	0.00016	0.53874	0.00004	0.00000	0.00046	0.00426	0.00158	0.00001	0.00016	0.00014	0.53874	0.00004	0.00000	URBEMIS, http://www.bizee.com/crane-charts/#ATC
	Forklift	Forklifts	D	149	0.3	lbs/hp-hr	0.00041	0.00310	0.00221	0.00000	0.00018	0.00017	0.37587	0.00004	0.00000	0.00038	1.00000	0.00222	0.00000	0.00016	0.00015	0.37587	0.00003	0.00000	URBEMIS for HP. Carl Mover 2011 update for LF
	Grader	Graders	D	162	0.41	lbs/hp-hr	0.00096	0.00736	0.00454	0.00001	0.00042	0.00039	0.76426	0.00009	0.00000	0.00090	0.00690	0.00453	0.00001	0.00039	0.00036	0.76426	0.00008	0.00000	URBEMIS for HP, Carl Mover 2011 update for LF
	Speed Swing	Other General Industrial Equipmen	D	190	0.34	lbs/hp-hr	0.00089	0.00658	0.00383	0.00001	0.00039	0.00036	0.63897	0.00008	0.00000	0.00443	0.00332	0.26746	0.00002	0.00024	0.00022	0.51125	0.00028	0.00046	HP from: http://www.gopettibone.com/speed-swing/, LF from Carl Moyer 2011 update
	Rail Saw	Concrete/Industrial Saws	D	81	0.78	lbs/hp-hr	0.01148	0.00845	0.44131	0.00002	0.00619	0.00570	0.73847	0.00064	0.00069	0.01148	0.00845	0.44135	0.00002	0.00619	0.00570	0.73847	0.00064	0.00069	URBEMIS for HP, Carl Mover 2011 update for LF
	Rail Welder	Welders	D	46	0.43	lbs/hp-hr	0.00350	0.00576	0.10053	0.00001	0.00007	0.00006	0.88071	0.00020	0.00025	0.00327	0.00534	0.09968	0.00001	0.00007	0.00006	0.88071	0.00018	0.00024	URBEMIS for HP, Carl Mover 2011 update for LF
	Riding Adzer	Other General Industrial Equipmen	D	48	0.34	lbs/hp-hr	0.00129	0.00742	0.00466	0.00001	0.00071	0.00066	0.63897	0.00012	0.00000	0.00119	0.00692	0.00461	0.00001	0.00065	0.00060	0.63897	0.00011	0.00000	OFFROAD
	Clip Machine	Other General Industrial Equipmen	D	10	0.34	lbs/hp-hr	0.00066	0.00466	0.00390	0.00001	0.00018	0.00017	0.63897	0.00006	0.00000	0.0007	0.0047	0.0039	0.0000	0.0002	0.0002	0.6390	0.0001	0.0000	HP from: http://www.imfsa.es/sheet/GEATECH General.pdf, LF from Carl Moyer 2011 update
	Ballast Regulator	Other General Industrial Equipmen	D	175	0.34	lbs/hp-hr	0.00089	0.00658	0.00383	0.00001	0.00039	0.00036	0.63897	0.00008	0.00000	0.00083	0.00614	0.00381	0.00001	0.00036	0.00033	0.63897	0.00007	0.00000	HP from: San Bernardino Emission Inventory, LF from Carl Moyer 2011 update
	Ballast Tamper	Other General Industrial Equipmen	D	300	0.34	lbs/hp-hr	0.00053	0.00531	0.00162	0.00001	0.00018	0.00017	0.63897	0.00005	0.00000	0.00051	0.00490	0.00152	0.00001	0.00016	0.00015	0.63897	0.00005	0.00000	HP from: San Bernardino Emission Inventory, LF from Carl Moyer 2011 update
	Impact Wrench	Other General Industrial Equipmen	G2	5	0.34	lbs/hp-hr	0.00443	0.00332	0.26746	0.00002	0.00024	0.00024	0.51125	0.00028	0.00046	0.00443	0.00332	0.26746	0.00002	0.00024	0.00024	0.51125	0.00028	0.00046	HP from: http://www.imfsa.es/sheet/GEATECH General.pdf, LF from Carl Moyer 2011 update
	Pneumatic or Elec Tools	Other General Industrial Equipmen	G	5	0.34	lbs/hp-hr	0.00443	0.00332	0.26746	0.00002	0.00024	0.00024	0.51125	0.00028	0.00046	0.00443	0.00332	0.26746	0.00002	0.00024	0.00024	0.51125	0.00028	0.00046	same as impact wrench

	Construction Truck Type	EMFAC Vehicle Class	Fuel	MPH	metric																			
Trucks Exhaust (On-site only)	Truck 3/4T pickup	Average of LDA/LDT1/LDT2	D	5	lbs/mi	0.00101	0.00111	0.01378	0.00000	0.00004	0.00004	2.89618	2.205E-06	3.307E-06	0.00043	0.00458	0.00472	0.00001	0.00032	0.00027	0.76365	2.20E-06	3.31E-06
	Truck 10-wheel Dump	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05
	Truck 18-wheel Flatbd	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05
	Truck Belly Dump&Pup	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05
	Truck - 2500 gal water	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05
	Truck - AC Tranport	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05
	Truck -Fltbd w/boom crane	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05
	Trck-readly- mix conc	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05
	Truck - Conc Boom Pump	Heavy Duty Trucks (T7 Tractor)	D	5	lbs/mi	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05	0.01923	0.06058	0.03178	0.00008	0.00375	0.00336	8.47757	1.12E-06	1.06E-05

	Construction Truck Type	EMFAC Vehicle Class	Fuel	MPH	metric																			
Trucks Exhaust (Regional only)	Truck 3/4T pickup	Average of LDA/LDT1/LDT2	D	30	lbs/mi	0.00022	0.00065	0.00691	0.00000	0.00001	0.00001	0.93942	0.00000	0.00000	0.0001609	0.0025684	0.0011596	6.614E-06	0.0001499	0.0001069	0.763646	2.205E-06	3.307E-06
	Truck 10-wheel Dump	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05
	Truck 18-wheel Flatbd	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05
	Truck Belly Dump&Pup	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05
	Truck - 2500 gal water	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05
	Truck - AC Tranport	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05
	Truck -Fltbd w/boom crane	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05
	Trck-readly- mix conc	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05
	Truck - Conc Boom Pump	Heavy Duty Trucks (T7 Tractor)	D	30	lbs/mi	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	0.00000	0.00001	0.0018232	0.0235189	0.0085451	3.968E-05	0.0009921	0.0008182	4.2422098	1.124E-06	1.058E-05

Re-Entrained Paved Road Dust	All Vehicles	ALL Vehicles	lbs/mi					0.00172	0.00042									0.00172	0.00042				Methodology from AP-42, Section 13.2.1, with WRCC and CARB variables
Fugitive Dust	Earthwork Activities	from URBEMIS	lbs/cyd			-	-	-	-	0.00004	0.00001	-	-	-	-	-	-	0.00004	0.00001	-	-	-	URBEMIS, unmitigated (but controlled) assuming 61% reduction per Rule 403

PM2.5 fraction of PM10

0.92	off-road equipment - diesel
0.998	off-road equipment - gasoline
0.92	on-road vehicles - diesel exhaust

Source: http://www.aqmd.gov/ceqa/handbook/PM2_5/PM2_5.html

Re-entrained Paved Road Dust Emission Factor Calculation

Methodology

Calculation Methodology and silt loading: USEPA AP-42, Paved Roads, Section 13.2.1, Revised January 2011

http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

Avg vehicle weight:

http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf

Precipitation Days >.254mm (.01in) for San Bernardino:

http://www.wrcc.dri.edu/cgi-bin/cliGCStP.pl?ca7723

Emission Factor Calculation

$$E_{ext} = [\, k\,(sL)^{0.91} \times (W)^{1.02} \,]\,(1 - P/4N)$$

Pollutant	Variables					
	k	sL	W	P	N	Emission Factor (lbs per VMT)
PM_{10}	0.0022	0.2	3.4	43	365	0.00172
$PM_{2.5}$	0.00054	0.2	3.4	43	365	0.00042

E = particulate emission factor (lbs of particulate matter/VMT)	--
k = particle size multiplier (lb/VMT)	*(AP-42 default)*
sL = roadway silt loading (g/m2)	*(ubiquitous baseline from AP-42, for roads with 500- 5000 ADT)*
W = average weight of vehicles on the road (tons)	*(ARB Methodology, for San Bernardino County portion of South Coast Air Basin)*
P = number of wet days with at least 0.254mm of precipitation	*(annual average for San Bernardino)*
N = number of days in the averaging period	*(annual)*

ONROAD TRUCK EXHAUST EMISSION FACTORS

POUNDS PER MILE

	MPH	ROG	Nox	CO	SOx	PM10	PM2.5	CO2	CH4	N2O
3/4T Truck (MDT)	5	0.00101	0.00111	0.01378	0.00000	0.00004	0.00004	2.89618	2.20E-06	3.31E-06
	30	0.00022	0.00065	0.00691	0.00000	0.00001	0.00001	0.93942	2.20E-06	3.31E-06
All other Trucks (HHDT)	5	0.02035	0.08748	0.03461	0.00000	0.00394	0.00362	8.86663	1.12E-06	1.06E-05
	30	0.00173	0.02940	0.00844	0.00000	0.00100	0.00092	4.15516	1.12E-06	1.06E-05

All but CH4 and N2O from EMFAC 2011 for a SB County/SCAQMD vehicle fleet mix, Annual Average emission rate

CH4 and N2O from General Reporting Protocol, Version 3.1, Table C.4, for diesel light duty (1996-present) and diesel heavy-duty trucks, converted from grams to pounds per mile

OFFROAD 2007 OUTPUT AND EMISSION FACTOR CALCULATIONS

2000

							Tons per day emissions (total SCAQMD) [1]									Emission factor (in pounds per horsepower-hour) [3]							
CY	Code	Equipment	Fuel	MaxHP	Class	Activity	ROG	CO	NOx	CO2	SO2	PM	N2O	CH4	Avg HP [2]	ROG	NOx	CO	SO2	PM	CO2	CH4	N2O [4]
2012	2265006015	Air Compressors	G4	120	Light Commercial Equipment	1.96E+03	2.26E-01	3.95E+00	6.12E-01	6.56E+01	6.33E-04	5.08E-03	1.67E-02	1.26E-02	70	3.30E-03	8.93E-03	5.76E-02	9.24E-06	7.41E-05	9.56E-01	1.84E-04	2.43E-04
2012	2265002039	Concrete/Industrial Saws	G4	15	Construction and Mining Equipment	2.52E+03	1.30E-01	5.00E+00	9.58E-02	8.37E+00	2.39E-04	7.02E-02	7.84E-03	7.31E-03	9	1.15E-02	8.45E-03	4.41E-01	2.11E-05	6.19E-03	7.38E-01	6.44E-04	6.92E-04
2012	2270002039	Concrete/Industrial Saws	D	25	Construction and Mining Equipment	8.02E+00	7.98E-05	2.72E-04	5.05E-04	6.60E-02	8.37E-07	2.02E-05	0.00E+00	7.20E-06	18	1.11E-03	7.00E-03	3.77E-03	1.16E-05	2.79E-04	9.15E-01	9.97E-05	0.00E+00
2012	2270002045	Cranes	D	500	Construction and Mining Equipment	1.15E+03	9.39E-02	3.27E-01	8.80E-01	1.03E+02	1.02E-03	3.28E-02	0.00E+00	8.47E-03	334	4.89E-04	4.58E-03	1.70E-03	5.29E-06	1.71E-04	5.39E-01	4.41E-05	0.00E+00
2012	2265002054	Crushing/Proc. Equipment	G4	15	Construction and Mining Equipment	2.58E+01	1.45E-03	5.58E-02	1.06E-03	9.34E-02	2.66E-06	7.83E-04	8.38E-05	8.11E-05	9	1.24E-02	9.16E-03	4.81E-01	2.29E-05	6.75E-03	8.05E-01	6.99E-04	7.22E-04
2012	2270002036	Excavators	D	175	Construction and Mining Equipment	3.52E+04	2.27E+00	1.17E+01	1.69E+01	1.97E+03	2.22E-02	1.00E+00	0.00E+00	2.04E-01	157	8.20E-04	6.12E-03	4.25E-03	8.04E-06	3.62E-04	7.14E-01	7.40E-05	0.00E+00
2012	2270003020	Forklifts	D	175	Industrial Equipment	6.55E+03	2.02E-01	1.08E+00	1.51E+00	1.83E+02	2.06E-03	9.02E-02	0.00E+00	1.82E-02	149	4.14E-04	3.10E-03	2.21E-03	4.23E-06	1.85E-04	3.76E-01	3.74E-05	0.00E+00
2012	2265006005	Generator Sets	G4	25	Light Commercial Equipment	1.66E+04	1.55E+00	6.61E+01	9.01E-01	1.01E+02	2.57E-03	5.35E-02	6.19E-02	8.67E-02	32	5.84E-03	3.40E-03	2.49E-01	9.69E-06	2.02E-04	3.82E-01	3.27E-04	2.33E-04
2012	2270002048	Graders	D	175	Construction and Mining Equipment	1.03E+04	7.98E-01	3.78E+00	6.13E+00	6.36E+02	7.16E-03	3.53E-01	0.00E+00	7.20E-02	162	9.59E-04	7.36E-03	4.54E-03	8.60E-06	4.24E-04	7.64E-01	8.65E-05	0.00E+00
2012	2260003040	Other General Industrial Equipmen	G2	15	Industrial Equipment	100.16	1.77E-03	1.07E-01	1.33E-03	2.05E-01	8.44E-06	9.54E-05	1.83E-04	1.10E-04	8	4.43E-03	3.32E-03	2.67E-01	2.11E-05	2.38E-04	5.11E-01	2.75E-04	4.58E-04
2012	2270003040	Other General Industrial Equipmen	D	15	Industrial Equipment	633.30	2.10E-03	1.24E-02	1.47E-02	2.02E+00	3.15E-05	5.72E-04	0.00E+00	1.89E-04	10	6.63E-04	4.66E-03	3.90E-03	9.94E-06	1.81E-04	6.39E-01	5.98E-05	0.00E+00
2012	2270003040	Other General Industrial Equipmen	D	120	Industrial Equipment	4204.75	2.64E-01	9.51E-01	1.51E+00	1.30E+02	1.53E-03	1.46E-01	0.00E+00	2.38E-02	97	1.29E-03	7.42E-03	4.66E-03	7.50E-06	7.14E-04	6.39E-01	1.17E-04	0.00E+00
2012	2270003040	Other General Industrial Equipmen	D	175	Industrial Equipment	4217.67	2.80E-01	1.21E+00	2.08E+00	2.02E+02	2.27E-03	1.25E-01	0.00E+00	2.53E-02	150	8.85E-04	6.58E-03	3.83E-03	7.19E-06	3.94E-04	6.39E-01	7.99E-05	0.00E+00
2012	2270003040	Other General Industrial Equipmen	D	250	Industrial Equipment	4200.44	2.56E-01	6.84E-01	2.69E+00	2.85E+02	3.20E-03	8.61E-02	0.00E+00	2.31E-02	212	5.75E-04	6.04E-03	1.54E-03	7.19E-06	1.93E-04	6.39E-01	5.19E-05	0.00E+00
2012	2270003040	Other General Industrial Equipmen	D	500	Industrial Equipment	4191.82	4.62E-01	1.41E+00	4.62E+00	5.56E+02	5.46E-03	1.57E-01	0.00E+00	4.17E-02	415	5.31E-04	5.31E-03	1.62E-03	6.27E-06	1.80E-04	6.39E-01	4.79E-05	0.00E+00
2012	2270002003	Pavers	D	120	Construction and Mining Equipment	2903.80	2.13E-01	7.41E-01	1.27E+00	1.00E+02	1.18E-03	1.13E-01	0.00E+00	1.92E-02	89	1.65E-03	9.87E-03	5.73E-03	9.11E-06	8.71E-04	7.77E-01	1.49E-04	0.00E+00
2012	2265002009	Plate Compactors	G4	15	Construction and Mining Equipment	3605.59	1.18E-01	4.51E+00	8.55E-02	7.51E+00	2.14E-04	6.30E-02	8.72E-03	6.63E-03	8	8.20E-03	5.93E-03	3.12E-01	1.48E-05	4.37E-03	5.21E-01	4.60E-04	6.05E-04
2012	2270002015	Rollers	D	120	Construction and Mining Equipment	10039.85	5.29E-01	2.06E+00	3.32E+00	2.96E+02	3.47E-03	2.88E-01	0.00E+00	4.77E-02	84	1.25E-03	7.87E-03	4.87E-03	8.23E-06	6.83E-04	7.02E-01	1.13E-04	0.00E+00
2012	2270002063	Rubber Tired Dozers	D	500	Construction and Mining Equipment	2080.53	3.48E-01	1.58E+00	3.00E+00	2.75E+02	2.70E-03	1.26E-01	0.00E+00	3.14E-02	358	9.33E-04	8.04E-03	4.25E-03	7.26E-06	3.38E-04	7.39E-01	8.42E-05	0.00E+00
2012	2270002060	Rubber Tired Loaders	D	175	Construction and Mining Equipment	13763.61	9.02E-01	4.32E+00	6.97E+00	7.31E+02	8.22E-03	4.01E-01	0.00E+00	8.14E-02	157	8.35E-04	6.45E-03	4.00E-03	7.61E-06	3.71E-04	6.77E-01	7.54E-05	0.00E+00
2012	2265002006	Tampers/Rammers	G4	15	Construction and Mining Equipment	81.81	3.11E-03	1.16E-01	2.16E-03	1.92E-01	5.47E-06	1.61E-03	2.09E-04	1.74E-04	9	8.44E-03	5.87E-03	3.15E-01	1.48E-05	4.37E-03	5.21E-01	4.74E-04	5.69E-04
2012	2265002030	Trenchers	G4	120	Construction and Mining Equipment	165.83	2.14E-02	3.74E-01	6.26E-02	6.17E+00	5.96E-05	4.78E-04	1.59E-03	1.20E-03	66	3.91E-03	1.14E-02	6.83E-02	1.09E-05	8.73E-05	1.13E+00	2.19E-04	2.90E-04
2012	2265006025	Welders	G4	50	Light Commercial Equipment	1356.66	1.07E-01	3.07E+00	1.76E-01	2.69E+01	3.27E-04	2.06E-03	7.54E-03	5.97E-03	45	3.50E-03	5.76E-03	1.01E-01	1.07E-05	6.75E-05	8.81E-01	1.96E-04	2.47E-04
2013	2265006015	Air Compressors	G4	120	Light Commercial Equipment	1966.76	2.11E-01	3.88E+00	5.60E-01	6.58E+01	6.36E-04	5.10E-03	1.57E-02	1.18E-02	70	3.07E-03	8.14E-03	5.64E-02	9.24E-06	7.41E-05	9.56E-01	1.71E-04	2.28E-04
2013	2265002039	Concrete/Industrial Saws	G4	15	Construction and Mining Equipment	2530.45	1.31E-01	5.03E+00	9.62E-02	8.41E+00	2.40E-04	7.05E-02	7.87E-03	7.34E-03	9	1.15E-02	8.45E-03	4.41E-01	2.11E-05	6.19E-03	7.38E-01	6.44E-04	6.91E-04
2013	2270002039	Concrete/Industrial Saws	D	25	Construction and Mining Equipment	8.15	8.09E-05	2.76E-04	5.12E-04	6.71E-02	8.51E-07	1.98E-05	0.00E+00	7.30E-06	18	1.10E-03	6.98E-03	3.77E-03	1.16E-05	2.71E-04	9.15E-01	9.96E-05	0.00E+00
2013	2270002045	Cranes	D	500	Construction and Mining Equipment	1167.55	9.05E-02	3.09E-01	8.30E-01	1.05E+02	1.03E-03	3.02E-02	0.00E+00	8.16E-03	334	4.64E-04	4.26E-03	1.58E-03	5.29E-06	1.55E-04	5.39E-01	4.19E-05	0.00E+00
2013	2265002054	Crushing/Proc. Equipment	G4	15	Construction and Mining Equipment	25.91	1.45E-03	5.61E-02	1.07E-03	9.38E-02	2.68E-06	7.87E-04	8.42E-05	8.14E-05	9	1.24E-02	9.16E-03	4.81E-01	2.29E-05	6.75E-03	8.05E-01	6.98E-04	7.22E-04
2013	2270002036	Excavators	D	175	Construction and Mining Equipment	35716.45	2.16E+00	1.19E+01	1.59E+01	2.00E+03	2.25E-02	9.14E-01	0.00E+00	1.95E-01	157	7.69E-04	5.68E-03	4.24E-03	8.04E-06	3.26E-04	7.14E-01	6.94E-05	0.00E+00
2013	2270003020	Forklifts	D	175	Industrial Equipment	6570.30	1.86E-01	1.08E+00	1.39E+00	1.84E+02	2.07E-03	7.98E-02	0.00E+00	1.68E-02	149	3.80E-04	2.83E-03	2.22E-03	4.23E-06	1.63E-04	3.76E-01	3.43E-05	0.00E+00
2013	2265006005	Generator Sets	G4	25	Light Commercial Equipment	8799.35	1.00E+00	3.67E+01	4.40E-01	5.38E+01	1.36E-03	2.81E-02	3.14E-02	5.59E-02	32	7.10E-03	3.13E-03	2.61E-01	9.69E-06	1.99E-04	3.82E-01	3.97E-04	2.23E-04
2013	2270002048	Graders	D	175	Construction and Mining Equipment	10434.50	7.65E-01	3.83E+00	5.84E+00	6.46E+02	7.27E-03	3.29E-01	0.00E+00	6.90E-02	162	9.05E-04	6.90E-03	4.53E-03	8.60E-06	3.89E-04	7.64E-01	8.16E-05	0.00E+00
2013	2260003040	Other General Industrial Equipmen	G2	15	Industrial Equipment	100.55	1.78E-03	1.08E-01	1.34E-03	2.06E-01	8.47E-06	9.58E-05	1.84E-04	1.11E-04	8	4.43E-03	3.32E-03	2.67E-01	2.11E-05	2.38E-04	5.11E-01	2.75E-04	4.58E-04
2013	2270003040	Other General Industrial Equipmen	D	15	Industrial Equipment	635.59	2.11E-03	1.24E-02	1.48E-02	2.03E+00	3.16E-05	5.78E-04	0.00E+00	1.90E-04	10	6.63E-04	4.66E-03	3.90E-03	9.94E-06	1.82E-04	6.39E-01	5.98E-05	0.00E+00
2013	2270003040	Other General Industrial Equipmen	D	120	Industrial Equipment	4219.99	2.44E-01	9.43E-01	1.42E+00	1.31E+02	1.53E-03	1.34E-01	0.00E+00	2.20E-02	97	1.19E-03	6.92E-03	4.61E-03	7.50E-06	6.53E-04	6.39E-01	1.08E-04	0.00E+00
2013	2270003040	Other General Industrial Equipmen	D	175	Industrial Equipment	4232.96	2.63E-01	1.21E+00	1.95E+00	2.03E+02	2.28E-03	1.14E-01	0.00E+00	2.37E-02	150	8.27E-04	6.14E-03	3.81E-03	7.19E-06	3.60E-04	6.39E-01	7.46E-05	0.00E+00
2013	2270003040	Other General Industrial Equipmen	D	250	Industrial Equipment	4215.67	2.44E-01	6.65E-01	2.49E+00	2.86E+02	3.21E-03	7.88E-02	0.00E+00	2.20E-02	212	5.47E-04	5.58E-03	1.49E-03	7.19E-06	1.76E-04	6.39E-01	4.93E-05	0.00E+00
2013	2270003040	Other General Industrial Equipmen	D	500	Industrial Equipment	4207.02	4.44E-01	1.33E+00	4.28E+00	5.58E+02	5.47E-03	1.43E-01	0.00E+00	4.00E-02	415	5.08E-04	4.90E-03	1.52E-03	6.27E-06	1.64E-04	6.39E-01	4.59E-05	0.00E+00
2013	2270002003	Pavers	D	120	Construction and Mining Equipment	2947.20	2.04E-01	7.45E-01	1.23E+00	1.02E+02	1.20E-03	1.07E-01	0.00E+00	1.84E-02	89	1.56E-03	9.38E-03	5.68E-03	9.11E-06	8.18E-04	7.77E-01	1.41E-04	0.00E+00
2013	2265002009	Plate Compactors	G4	15	Construction and Mining Equipment	3621.00	1.18E-01	4.51E+00	8.61E-02	7.54E+00	2.15E-04	6.32E-02	8.77E-03	6.59E-03	8	8.11E-03	5.95E-03	3.11E-01	1.48E-05	4.37E-03	5.21E-01	4.55E-04	6.06E-04
2013	2270002015	Rollers	D	120	Construction and Mining Equipment	10198.39	5.02E-01	2.07E+00	3.19E+00	3.01E+02	3.53E-03	2.72E-01	0.00E+00	4.53E-02	84	1.17E-03	7.44E-03	4.83E-03	8.23E-06	6.35E-04	7.02E-01	1.06E-04	0.00E+00
2013	2270002063	Rubber Tired Dozers	D	500	Construction and Mining Equipment	2111.08	3.39E-01	1.50E+00	2.88E+00	2.79E+02	2.74E-03	1.19E-01	0.00E+00	3.06E-02	358	8.96E-04	7.62E-03	3.97E-03	7.26E-06	3.16E-04	7.39E-01	8.09E-05	0.00E+00
2013	2270002060	Rubber Tired Loaders	D	175	Construction and Mining Equipment	13981.38	8.65E-01	4.38E+00	6.64E+00	7.43E+02	8.35E-03	3.74E-01	0.00E+00	7.80E-02	157	7.88E-04	6.05E-03	3.99E-03	7.61E-06	3.41E-04	6.77E-01	7.11E-05	0.00E+00
2013	2265002006	Tampers/Rammers	G4	15	Construction and Mining Equipment	82.16	3.06E-03	1.16E-01	2.18E-03	1.93E-01	5.49E-06	1.61E-03	2.11E-04	1.72E-04	9	8.27E-03	5.90E-03	3.13E-01	1.48E-05	4.37E-03	5.21E-01	4.64E-04	5.71E-04
2013	2265002030	Trenchers	G4	120	Construction and Mining Equipment	165.78	2.05E-02	3.70E-01	5.90E-02	6.17E+00	5.96E-05	4.78E-04	1.52E-03	1.15E-03	66	3.75E-03	1.08E-02	6.76E-02	1.09E-05	8.73E-05	1.13E+00	2.10E-04	2.78E-04
2013	2265006025	Welders	G4	50	Light Commercial Equipment	1362.06	1.00E-01	3.05E+00	1.64E-01	2.70E+01	3.28E-04	2.07E-03	7.22E-03	5.61E-03	45	3.27E-03	5.34E-03	9.97E-02	1.07E-05	6.75E-05	8.81E-01	1.83E-04	2.36E-04
			1	2	3	4	13	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

Notes:

[1] output from OFFROAD2007

[2] from "equip.csv"

[3] Pounds per hp-hr = (tons per day x 2000 pounds per ton) x (1/activity hours) x (1/average horsepower)

[4] if OFFROAD supplied no N2O emission factor, the N2O emission factor based on the ratio of CO2 and N2O EF's from Climate Registry General Reporting Protocol, January 2011 emission factor update (http://www.theclimateregistry.org/resources/protocols/general-reporting-protocol/)

N2O calculation

Diesel Fuel	CO2	CH4	N2O	
kg CO2/gal diesel	10.21	0.00058	0.00026	GRP, Table 13.1, US Default CO2 Emission Factors for Transport Fuels
g/gal diesel construction equip		0.58	0.26	GRP, Table 13.6, Default CH4 and N2O Emission Factors for Non-Highway Vehicles
ratio	1	5.6807E-05	2.5465E-05	

Gasoline Fuel	CO2	CH4	N2O	
kg CO2/gal diesel	8.78	0.0005	0.00022	GRP, Table 13.1, US Default CO2 Emission Factors for Transport Fuels
g/gal diesel construction equip		0.50	0.22	GRP, Table 13.6, Default CH4 and N2O Emission Factors for Non-Highway Vehicles
ratio	1	5.6948E-05	2.5057E-05	

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THE CARL MOYER PROGRAM GUIDELINES
Approved Revisions 2011
http://www.arb.ca.gov/msprog/moyer/guidelines/current.htm

OFF-ROAD PROJECTS AND NON-MOBILE AGRICULTURAL PROJECTS
Table D-10
Off-Road Diesel Engines Default Load Factors

Category	Equipment Type	Load Factor
Airport Ground Support	Aircraft Tug	0.54
	Air Conditioner	0.75
	Air Start Unit	0.9
	Baggage Tug	0.37
	Belt Loader	0.34
	Bobtail	0.37
	Cargo Loader	0.34
	Cargo Tractor	0.36
	Forklift	0.2
	Ground Power Unit	0.75
	Lift	0.34
	Passenger Stand	0.4
	Service Truck	0.2
	Other GSE	0.34
Mobile Agricultural	Agricultural Mowers	0.43
	Agricultural Tractors	0.7
	Balers	0.58
	Combines	0.7
	Hydro Power Units	0.48
	Sprayers	0.5
	Swathers	0.55
	Tillers	0.78
	Other Agricultural	0.51
Construction	Bore/Drill Rigs	0.5
	Cranes	0.29
	Crawler Tractors	0.43
	Crushing/Process Equipment	0.78
	Excavators	0.38
	Graders	0.41
	Off-Highway Tractors	0.44
	Off-Highway Trucks	0.38
	Pavers	0.42
	Other Paving	0.36
	Rollers	0.38
	Rough Terrain Forklifts	0.4
	Rubber Tired Dozers	0.4
	Rubber Tired Loaders	0.36
	Scrapers	0.48
	Signal Boards	0.78
	Skid Steer Loaders	0.37
	Surfacing Equipment	0.3
	Tractors/Loaders/Backhoes	0.37
	Trenchers	0.5
	Other Construction Equipment	0.42
Industrial	Aerial Lifts	0.31
	Forklifts	0.2
	Sweepers/Scrubbers	0.46
	Other General Industrial	0.34
	Other Material Handling	0.4
Logging	Fellers/Bunchers	0.71
	Skidders	0.74
Oil Drilling	Drill Rig	0.5
	Lift (Drilling)	0.6
	Swivel	0.6
	Workover Rig (Mobile)	0.5
	Other Workover Equipment	0.6
Cargo Handling	Container Handling Equipment	0.59
	Cranes	0.43
	Excavators	0.57
	Forklifts	0.3
	Other Cargo Handling Equipment	0.51
	Sweeper/Scrubber	0.68
	Tractors/Loaders/Backhoes	0.55
	Yard Trucks	0.65
Non-Mobile Agricultural Engines	Irrigation Pump	0.65
	Other	0.51
Other	All	0.43

Appendix B
Operational Emission Calculations

Project Operations

TRAIN EMISSION CALCULATIONS (for mass emissions)

Emissions based on fuel consumption, trip length, and train activity, as obtained from the project engineer

Fuel Use

	mpg	0.44	NTD program….		
	distance (mi)	1.17			
		11 trainsets (2013)	18 trainsets (2035)		
	train count	66	88	*5*	*52*
				weekly	annual
176.1	net change in max daily fuel consumption (gallons/day) - 2013 with 11 trainsets, 66 trips			880.68	45,795.45
234.8	net change in max daily fuel consumption (gallons/day) - 2035 with 18 trainsets, 88 trips			1,174.24	61,060.61
45,795	net change in annual fuel consumption (gallons/day) - 2013 with 11 trainsets, 66 trips				
61,061	net change in annual fuel consumption (gallons/day) - 2035 with 18 trainsets, 88 trips				

Locomotive Fleet Over Time

	Existing 2011	Opening Year 2014/15	2016-2020	2021-2025	2026-2030	2031-2083
Uncontrolled						
Tier 0	30	10				
Tier 0+						
Tier 1						
Tier 1+						
Tier 2	22	42	52	52	52	52
Tier 2+ & Tier 3						
Tier 4						
Total Fleet Size	*52*	*52*	*52*	*52*	*52*	*52*

conversions	
5	weekdays per week
52	weeks per year
86400	seconds per day
453.59236	g per lb
907184.74	g to Ton
1,000,000	g to MT
21	CH4 GWP
310	N2O GWP

Opening Year 2014

Weighted Emission Factor

Weighted Emission Factor = Tier 0 fleet % (x) Tier 0 emission factor + Tier 2 fleet % (x) Tier 2 emission factor

Emission Factors (g/gallon)

	Fleet amount	Fleet %	ROG	NOX	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Tier 0	10	19%	10.51	178.88	26.62	0.09	6.66	6.60	10208	0.80	0.26
Tier 2	42	81%	5.69	102.96	26.62	0.09	3.74	3.71	10208	0.80	0.26
opening year weighted EFs	*52*	*100%*	6.62	117.56	26.62	0.09	4.30	4.27	10208	0.80	0.26

Emissions

	ROG		NOX		CO		SOX		PM10		PM2.5		CO2		CH4		N2O	
	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual
g/yr		303224		5383714		1219258		4300		197104		195330		467480000		36636		11907
g/day	1,166.25		20,706.59		4,689.45		16.54		758.09		751.27		1,798,000.00		140.91		45.80	
metric tons/yr														467.48		0.04		0.01
tons/yr		0.33		5.93		1.34		0.00		0.22		0.22						
lbs/day	2.57		45.65		10.34		0.04		1.67		1.66		3,963.91		0.31		0.10	
g/sec	0.013	0.010	0.240	0.171	0.054	0.039	0.000	0.000	0.009	0.006	0.009	0.006	20.810	14.824	0.002	0.001	0.001	0.000

Forecast Year 2035

Weighted Opening Year Emission Factor

Weighted Emission Factor = Tier 0 fleet % (x) Tier 0 emission factor + Tier 2 fleet % (x) Tier 2 emission facto

Emission Factors (g/gallon)

	Fleet amount	Fleet %	ROG	NOX	CO	SO2	PM10	PM2.5	CO2	CH4	N2O
Tier 0	0	0%	10.51	178.88	26.62	0.09	6.66	6.60	10208	0.80	0.26
Tier 2	52	100%	5.69	102.96	26.62	0.09	3.74	3.71	10208	0.80	0.26
opening year weighted EFs	*52*	*100%*	5.69	102.96	26.62	0.09	3.74	3.71	10208	0.80	0.26

Emissions

	ROG		NOX		CO		SOX		PM10		PM2.5		CO2		CH4		N2O	
	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual	24-hour	Annual
g/yr		347717		6286800		1625678		5733		228611		226553		623306667		48848		15876
g/day	1,337.37		24,180.00		6,252.61		22.05		879.27		871.36		2,397,333.33		187.88		61.06	
metric tons/yr														623.31		0.05		0.02
tons/yr		0.38		6.93		1.79		0.01		0.25		0.25						
lbs/day	2.95		53.31		13.78		0.05		1.94		1.92		5,285.22		0.41		0.13	
g/sec	0.015	0.011	0.280	0.199	0.072	0.052	0.000	0.000	0.010	0.007	0.010	0.007	27.747	19.765	0.002	0.002	0.001	0.001

Project Operations

PASSENGER RAIL EMISSION FACTORS

All inputs from: EPA Emission Factors from Locomotives - Technical Highlights. EPA-420-F-09-025. April 2009.
http://www.epa.gov/oms/regs/nonroad/locomotv/420f09025.pdf
Fuel use from idling from : EPA Case Study: Chicago Locomotive Idle Reduction Project. EPA420-04-003. March 2004)
http://www.epa.gov/smartway/documents/420r04003.pdf
CH4 and N2O locomotive emission factors (in grams per gallon) from Table 13.6 of the Climate Registry January 2011 Emission Factor Update:
http://www.theclimateregistry.org/downloads/2009/05/2011-Emission-Factors.pdf

conversions		source
1.053	HC to ROG	EPA-420-F-09-025
0.991	PM10 to PM2.5	SCAQMD LST Methodology, Diesel

Line Haul Emission Rates (g/bhp-hr)

	PM10	HC	NOX	CO	ROG	PM2.5	SO2	CO2	CH4	N2O
uncontrolled	0.32	0.48	13.00	1.28	0.51	0.32	0.005	490.77	0.038	0.013
tier 0	0.32	0.48	8.60	1.28	0.51	0.32	0.005	490.77	0.038	0.013
tier 0+	0.20	0.30	7.20	1.28	0.32	0.20	0.005	490.77	0.038	0.013
tier 1	0.32	0.47	6.70	1.28	0.49	0.32	0.005	490.77	0.038	0.013
tier 1+	0.20	0.29	6.70	1.28	0.31	0.20	0.005	490.77	0.038	0.013
tier 2	0.18	0.26	4.95	1.28	0.27	0.18	0.005	490.77	0.038	0.013
tier 2+& tier 3	0.08	0.13	4.95	1.28	0.14	0.08	0.005	490.77	0.038	0.013
tier 4	0.015	0.04	1.00	1.28	0.04	0.01	0.005	490.77	0.038	0.013

Line Haul Emission Rates (g/gallon)

	PM10	HC	NOX	CO	ROG	PM2.5	SO2	CO2	CH4	N2O
uncontrolled	6.66	9.98	270.40	26.62	10.51	6.60	0.09	10208	0.8	0.26
tier 0	6.66	9.98	178.88	26.62	10.51	6.60	0.09	10208	0.8	0.26
tier 0+	4.16	6.24	149.76	26.62	6.57	4.12	0.09	10208	0.8	0.26
tier 1	6.66	9.78	139.36	26.62	10.29	6.60	0.09	10208	0.8	0.26
tier 1+	4.16	6.03	139.36	26.62	6.35	4.12	0.09	10208	0.8	0.26
tier 2	3.74	5.41	102.96	26.62	5.69	3.71	0.09	10208	0.8	0.26
tier 2+& tier 3	1.66	2.70	102.96	26.62	2.85	1.65	0.09	10208	0.8	0.26
tier 4	0.31	0.83	20.80	26.62	0.88	0.31	0.09	10208	0.8	0.26

conversion factors (bhp-hr/gal)

	conversion factor
large line haul & passenger	20.8
small line haul	18.2
switching	15.2

SO2 (g/gal) = 0.09

based on:

(fuel density) x (conversion factor) x (64 g SO2 / 32 g S) x (S content of fuel)

fuel density	3200	g/gal
conversion factor	0.978	(fraction of fuel sulfur convered to so2)
64 / 32	2	
S content of fuel	1.50E-05	15 ppm

http://www.arb.ca.gov/regact/carblohc/ruid.pdf

CO2 (g/gal) = 10208

based on:

(fuel density) x (44 g CO2 / 12 g C) x (C content of fuel)

fuel density	3200	g/gal
44 / 12	3.66666667	
C content of fuel	8.70E-01	87% by mass

ONROAD VMT SUMMARY

CT-EMFAC results

		Pounds Per Day						MT/yr		
	Daily VMT	ROG	NOX	CO	SOX	PM10	PM2.5	CO2	CH4	N2O
Existing	384,772,295	232,720	911,363	2,827,734	3,926	33,133	30,489	47,282,045		
Existing Plus Project	384,743,674	232,678	911,295	2,827,611	3,926	33,131	30,487	47,280,680		
2014 No Project	438,753,069	175,755	664,348	2,067,671	4,501	30,717	28,463	55,009,115		
2014 With Project	438,764,600	175,733	664,370	2,067,851	4,502	30,720	28,467	55,015,525		
2035 No Project	543,608,403	92,815	271,841	975,868	5,833	26,857	24,910	72,114,791		
2035 With Project	543,540,893	92,807	271,831	975,831	5,832	26,860	24,912	72,116,620		

Road Dust (outside of CT-EMFAC)

	PM10	PM2.5
Road Dust emission factors (lbs per VMT)	0.00114	0.00028
Existing	438,236	107,567
Existing Plus Project	438,203	107,559
2014 No Project	499,717	122,658
2014 With Project	499,730	122,661
2035 No Project	619,142	151,971
2035 With Project	619,065	151,952

5% Percent other GHGs (on road)

FINAL RESULTS

	Pounds Per Day (with Road Dust)								
	ROG	NOX	CO	SOX	PM10	PM2.5	CO2	non CO2	CO2e
Existing	232,720	911,363	2,827,734	3,926	471,369	138,056	47,282,045	2,488,529	49,770,574
Existing Plus Project	232,678	911,295	2,827,611	3,926	471,334	138,046	47,280,680	2,488,457	49,769,137
2014 No Project	175,755	664,348	2,067,671	4,501	530,435	151,121	55,009,115	2,895,217	57,904,332
2014 With Project	175,733	664,370	2,067,851	4,502	530,451	151,128	55,015,525	2,895,554	57,911,079
2035 No Project	92,815	271,841	975,868	5,833	645,999	176,881	72,114,791	3,795,515	75,910,306
2035 With Project	92,807	271,831	975,831	5,832	645,925	176,864	72,116,620	3,795,612	75,912,232
2009 EPP net over Existing	-42	-68	-123	0	-35	-10	-1,365	-72	-1,436
2014 WP net over Existing	-56,987	-246,993	-759,884	575	59,082	13,072	7,733,480	407,025	8,140,506
2014 WP net over No Project	-22	21	180	1	16	7	6,410	337	6,747
2035 WP net over Existing	-139,913	-639,532	-1,851,903	1,906	174,556	38,808	24,834,576	1,307,083	26,141,659
2035 WP net over No Project	-8	-10	-37	-1	-74	-17	1,830	96	1,926

PARK AND RIDE LOT VMT CALCS AND SUMMARY

Methods:

1193	ADT	Iteris 2012	59.65	
5%	new trips	PARSONS	1133.35	
95%	re-distributed trips	PARSONS		
25	No Project Trip Length	PARSONS		2000 lbs per ton
13.3	With Project Trip Length	CalEEMod default	-697.905	0.907184741 ton to MT
-11.7	*net new trip length*	*net trip length*		260 days per year
-697.905	No Project VMT (new trip	*net VMT*		
-13260.195	re-distributed VMT	*net VMT*		

new trips (5% of 1193 ADT x 13.3 mi/trip) -> net positive

CT-EMFAC results

	Pounds Per Day							MT/yr		
	Daily VMT	ROG	NOX	CO	SOX	PM10	PM2.5	CO2	CH4	N2O
Opening Year 2014 With Project net	698	0.29	1.02	3.43	0.01	0.05	0.04	87.36		
Forecast Year 2035 With Project net	698	0.13	0.36	1.32	0.01	0.03	0.03	93.51		

Road Dust (outside of CT-EMFAC)

	PM10	PM2.5
Road Dust emission factors (lbs per VMT)	0.00114	0.00028
Opening Year 2014 With Project net	0.79	0.20
Forecast Year 2035 With Project net	0.79	0.20

FINAL RESULTS

scaled for VMT = 793

	Pounds Per Day (with Road Dust)								
	ROG	NOX	CO	SOX	PM10	PM2.5	CO2	non CO2	CO2e
Opening Year 2014 With Project net	0.334	1.156	3.895	0.009	0.951	0.266	99.31	5.94	105.25
Forecast Year 2035 With Project net	0.145	0.404	1.502	0.009	0.937	0.254	106.30	6.36	112.66

95% of trips -> re-distrubted trips

CT-EMFAC results

	Pounds Per Day							MT/yr
	Daily VMT	ROG	NOX	CO	SOX	PM10	PM2.5	CO2
Opening Year 2014 With Project net	-13,260	-5.58	-19.32	-65.10	-0.15	-0.91	-0.85	-1659.91
Forecast Year 2035 With Project net	-13,260	-2.43	-6.75	-25.11	-0.15	-0.64	-0.61	-1776.69

Road Dust (outside of CT-EMFAC)

	PM10	PM2.5
Road Dust emission factors (lbs per VMT)	0.00114	0.00028
Opening Year 2014 With Project net	-15.10	-3.71
Forecast Year 2035 With Project net	-15.10	-3.71

FINAL RESULTS

	Pounds Per Day (with Road Dust)								
	ROG	NOX	CO	SOX	PM10	PM2.5	CO2	non CO2	CO2e
Opening Year 2014 With Project net	-5.6	-19.3	-65.1	-0.1	-16.0	-4.6	-1,659.9	-87.36	-1,747.3
Forecast Year 2035 With Project net	-2.4	-6.8	-25.1	-0.1	-15.7	-4.3	-1,776.7	-93.51	-1,870.2

Title : **SB County (SC) 2009 Existing Plus Project**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 01:41 PM
Alternative Year : 2009
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
201997673			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.17	.61	1.84	5.72	13.92	19.9	13.29	9.88	8.98	8.06	6.91	5.73	3.43	1.56	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
182746001			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.05	.11	.31	1.76	7.2	14.98	11.74	7.51	7.81	8.32	8.19	12.63	14.49	4.9	0

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.090000	434,769.04	0.11	473,898.258614
10	0.693000	1,433,206.41	0.37	993,212.039635
15	0.442000	4,283,269.79	1.11	1,893,205.245545
20	0.308000	14,770,596.51	3.84	4,549,343.726066
25	0.245000	41,275,788.15	10.73	10,112,568.097632
30	0.203000	67,572,887.88	17.56	13,717,296.238990
35	0.176000	48,299,871.26	12.55	8,500,777.341602
40	0.160000	33,681,594.77	8.75	5,389,055.162800
45	0.153000	32,411,853.71	8.42	4,959,013.618166
50	0.155000	31,485,479.73	8.18	4,880,249.357685
55	0.166000	28,924,936.69	7.52	4,801,539.489909
60	0.187000	34,655,286.59	9.01	6,480,538.592180
65	0.221000	33,408,415.73	8.68	7,383,259.876065
70	0.248000	12,105,717.75	3.15	3,002,218.001454
75	0.288000	0.00	0.00	0.000000
Total		384,743,674.00	100.00	77,136,175.046343

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	7.238000	434,769.04	0.11	3,146,858.344815
10	5.880000	1,433,206.41	0.37	8,427,253.669632
15	4.931000	4,283,269.79	1.11	21,120,803.316245

20	4.259000	14,770,596.51	3.84	62,907,970.549719
25	3.785000	41,275,788.15	10.73	156,228,858.161376
30	3.430000	67,572,887.88	17.56	231,775,005.417424
35	3.169000	48,299,871.26	12.55	153,062,292.020088
40	2.988000	33,681,594.77	8.75	100,640,605.165290
45	2.884000	32,411,853.71	8.42	93,475,786.109734
50	2.862000	31,485,479.73	8.18	90,111,442.978674
55	2.939000	28,924,936.69	7.52	85,010,388.920742
60	3.152000	34,655,286.59	9.01	109,233,463.329158
65	3.564000	33,408,415.73	8.68	119,067,593.657443
70	3.996000	12,105,717.75	3.15	48,374,448.120209
75	4.740000	0.00	0.00	0.000000
Total		384,743,674.00	100.00	1,282,582,769.760550

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	2.118000	434,769.04	0.11	920,840.836463
10	1.600000	1,433,206.41	0.37	2,293,130.250240
15	1.272000	4,283,269.79	1.11	5,448,319.168174
20	1.123000	14,770,596.51	3.84	16,587,379.884324
25	1.062000	41,275,788.15	10.73	43,834,887.019123
30	1.021000	67,572,887.88	17.56	68,991,918.522213
35	0.997000	48,299,871.26	12.55	48,154,971.645323
40	0.989000	33,681,594.77	8.75	33,311,097.225058
45	0.999000	32,411,853.71	8.42	32,379,441.859787
50	1.026000	31,485,479.73	8.18	32,304,102.199902
55	1.073000	28,924,936.69	7.52	31,036,457.064293
60	1.146000	34,655,286.59	9.01	39,714,958.431223
65	1.251000	33,408,415.73	8.68	41,793,928.076729
70	1.370000	12,105,717.75	3.15	16,584,833.314486
75	1.541000	0.00	0.00	0.000000
Total		384,743,674.00	100.00	413,356,265.497335

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012000	434,769.04	0.11	5,217.228535
10	0.009000	1,433,206.41	0.37	12,898.857658
15	0.007000	4,283,269.79	1.11	29,982.888504
20	0.006000	14,770,596.51	3.84	88,623.579079
25	0.005000	41,275,788.15	10.73	206,378.940768
30	0.005000	67,572,887.88	17.56	337,864.439384
35	0.004000	48,299,871.26	12.55	193,199.485036
40	0.004000	33,681,594.77	8.75	134,726.379070
45	0.004000	32,411,853.71	8.42	129,647.414854
50	0.004000	31,485,479.73	8.18	125,941.918908
55	0.004000	28,924,936.69	7.52	115,699.746745
60	0.005000	34,655,286.59	9.01	173,276.432946
65	0.005000	33,408,415.73	8.68	167,042.078644
70	0.005000	12,105,717.75	3.15	60,528.588739
75	0.005000	0.00	0.00	0.000000

Total		384,743,674.00	100.00	1,781,027.978870

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,249.354000	434,769.04	0.11	543,180,444.947189
10	952.788000	1,433,206.41	0.37	1,365,541,865.541040
15	753.613000	4,283,269.79	1.11	3,227,927,793.462900
20	619.211000	14,770,596.51	3.84	9,146,115,837.535090
25	532.760000	41,275,788.15	10.73	21,990,088,896.711900
30	474.360000	67,572,887.88	17.56	32,053,875,093.238900
35	436.500000	48,299,871.26	12.55	21,082,893,804.597200
40	414.734000	33,681,594.77	8.75	13,968,902,524.304300
45	406.705000	32,411,853.71	8.42	13,182,062,964.549000
50	411.659000	31,485,479.73	8.18	12,961,281,098.937100
55	430.297000	28,924,936.69	7.52	12,446,313,481.261800
60	464.913000	34,655,286.59	9.01	16,111,693,254.044700
65	519.879000	33,408,415.73	8.68	17,368,333,760.672800
70	528.722000	12,105,717.75	3.15	6,400,559,299.052310
75	542.570000	0.00	0.00	0.000000
Total		384,743,674.00	100.00	181,848,770,118.856000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.173000	434,769.04	0.11	75,215.044716
10	0.117000	1,433,206.41	0.37	167,685.149549
15	0.080000	4,283,269.79	1.11	342,661.582904
20	0.058000	14,770,596.51	3.84	856,694.597766
25	0.047000	41,275,788.15	10.73	1,939,962.043219
30	0.039000	67,572,887.88	17.56	2,635,342.627195
35	0.034000	48,299,871.26	12.55	1,642,195.622809
40	0.031000	33,681,594.77	8.75	1,044,129.437793
45	0.030000	32,411,853.71	8.42	972,355.611405
50	0.031000	31,485,479.73	8.18	976,049.871537
55	0.034000	28,924,936.69	7.52	983,447.847331
60	0.038000	34,655,286.59	9.01	1,316,900.890390
65	0.044000	33,408,415.73	8.68	1,469,970.292067
70	0.050000	12,105,717.75	3.15	605,285.887390
75	0.057000	0.00	0.00	0.000000
Total		384,743,674.00	100.00	15,027,896.506070

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.159000	434,769.04	0.11	69,128.278091
10	0.108000	1,433,206.41	0.37	154,786.291891
15	0.074000	4,283,269.79	1.11	316,961.964186
20	0.053000	14,770,596.51	3.84	782,841.615200
25	0.043000	41,275,788.15	10.73	1,774,858.890605
30	0.036000	67,572,887.88	17.56	2,432,623.963565

35	0.031000	48,299,871.26	12.55	1,497,296.009032
40	0.029000	33,681,594.77	8.75	976,766.248258
45	0.028000	32,411,853.71	8.42	907,531.903978
50	0.029000	31,485,479.73	8.18	913,078.912083
55	0.031000	28,924,936.69	7.52	896,673.037272
60	0.035000	34,655,286.59	9.01	1,212,935.030622
65	0.040000	33,408,415.73	8.68	1,336,336.629152
70	0.046000	12,105,717.75	3.15	556,863.016399
75	0.052000	0.00	0.00	0.000000
Total		384,743,674.00	100.00	13,828,681.790334

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.103446	434,769.04	0.11	44,975.118588
10	0.071694	1,433,206.41	0.37	102,752.300100
15	0.048573	4,283,269.79	1.11	208,051.263330
20	0.034965	14,770,596.51	3.84	516,453.907084
25	0.029295	41,275,788.15	10.73	1,209,174.213960
30	0.025074	67,572,887.88	17.56	1,694,322.590623
35	0.022176	48,299,871.26	12.55	1,071,097.945042
40	0.020538	33,681,594.77	8.75	691,752.593335
45	0.020160	32,411,853.71	8.42	653,422.970864
50	0.021042	31,485,479.73	8.18	662,517.464416
55	0.023058	28,924,936.69	7.52	666,951.190110
60	0.026334	34,655,286.59	9.01	912,612.317040
65	0.030744	33,408,415.73	8.68	1,027,108.333166
70	0.036351	12,105,717.75	3.15	440,054.945850
75	0.043155	0.00	0.00	0.000000
Total		384,743,674.00	100.00	9,901,247.153508

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.450891	434,769.04	0.11	196,033.449289
10	0.256473	1,433,206.41	0.37	367,578.746669
15	0.128142	4,283,269.79	1.11	548,866.756956
20	0.071127	14,770,596.51	3.84	1,050,588.218194
25	0.057582	41,275,788.15	10.73	2,376,742.433461
30	0.046935	67,572,887.88	17.56	3,171,533.492498
35	0.039060	48,299,871.26	12.55	1,886,592.971380
40	0.033957	33,681,594.77	8.75	1,143,725.913520
45	0.031500	32,411,853.71	8.42	1,020,973.391975
50	0.031752	31,485,479.73	8.18	999,726.952292
55	0.034587	28,924,936.69	7.52	1,000,426.785166
60	0.040005	34,655,286.59	9.01	1,386,384.740001
65	0.048069	33,408,415.73	8.68	1,605,909.135668
70	0.058716	12,105,717.75	3.15	710,799.323280
75	0.072009	0.00	0.00	0.000000
Total		384,743,674.00	100.00	17,465,882.310348

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.025594	434,769.04	0.11	11,127.478927
10	0.016503	1,433,206.41	0.37	23,652.205325
15	0.010763	4,283,269.79	1.11	46,100.832710
20	0.007642	14,770,596.51	3.84	112,876.898554
25	0.006100	41,275,788.15	10.73	251,782.307737
30	0.005087	67,572,887.88	17.56	343,743.280629
35	0.004426	48,299,871.26	12.55	213,775.230193
40	0.004038	33,681,594.77	8.75	136,006.279671
45	0.003889	32,411,853.71	8.42	126,049.699092
50	0.003952	31,485,479.73	8.18	124,430.615881
55	0.004247	28,924,936.69	7.52	122,844.206106
60	0.004803	34,655,286.59	9.01	166,449.341488
65	0.005718	33,408,415.73	8.68	191,029.321137
70	0.006443	12,105,717.75	3.15	77,997.139449
75	0.007533	0.00	0.00	0.000000
Total		384,743,674.00	100.00	1,947,864.836900

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000895	434,769.04	0.11	389.118295
10	0.000614	1,433,206.41	0.37	879.988734
15	0.000442	4,283,269.79	1.11	1,893.205246
20	0.000336	14,770,596.51	3.84	4,962.920428
25	0.000267	41,275,788.15	10.73	11,020.635437
30	0.000224	67,572,887.88	17.56	15,136.326884
35	0.000197	48,299,871.26	12.55	9,515.074638
40	0.000181	33,681,594.77	8.75	6,096.368653
45	0.000176	32,411,853.71	8.42	5,704.486254
50	0.000179	31,485,479.73	8.18	5,635.900871
55	0.000192	28,924,936.69	7.52	5,553.587844
60	0.000216	34,655,286.59	9.01	7,485.541903
65	0.000257	33,408,415.73	8.68	8,585.962842
70	0.000285	12,105,717.75	3.15	3,450.129558
75	0.000330	0.00	0.00	0.000000
Total		384,743,674.00	100.00	86,309.247587

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.035758	434,769.04	0.11	15,546.471497
10	0.020671	1,433,206.41	0.37	29,625.809627
15	0.010753	4,283,269.79	1.11	46,058.000012
20	0.006253	14,770,596.51	3.84	92,360.539997
25	0.005053	41,275,788.15	10.73	208,566.557540
30	0.004146	67,572,887.88	17.56	280,157.193137
35	0.003491	48,299,871.26	12.55	168,614.850566
40	0.003075	33,681,594.77	8.75	103,570.903910
45	0.002886	32,411,853.71	8.42	93,540.609817

50	0.002920	31,485,479.73	8.18	91,937.600803
55	0.003182	28,924,936.69	7.52	92,039.148535
60	0.003674	34,655,286.59	9.01	127,323.522929
65	0.004417	33,408,415.73	8.68	147,564.972274
70	0.005332	12,105,717.75	3.15	64,547.687031
75	0.006518	0.00	0.00	0.000000
Total		384,743,674.00	100.00	1,561,453.867675

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.077886	434,769.04	0.11	33,862.421808
10	0.045699	1,433,206.41	0.37	65,496.099566
15	0.024636	4,283,269.79	1.11	105,522.634455
20	0.014872	14,770,596.51	3.84	219,668.311344
25	0.011985	41,275,788.15	10.73	494,690.321021
30	0.009863	67,572,887.88	17.56	666,471.393129
35	0.008358	48,299,871.26	12.55	403,690.323984
40	0.007414	33,681,594.77	8.75	249,715.343606
45	0.006994	32,411,853.71	8.42	226,688.504872
50	0.007080	31,485,479.73	8.18	222,917.196467
55	0.007688	28,924,936.69	7.52	222,374.913244
60	0.008831	34,655,286.59	9.01	306,040.835869
65	0.010590	33,408,415.73	8.68	353,795.122568
70	0.012587	12,105,717.75	3.15	152,374.669292
75	0.015231	0.00	0.00	0.000000
Total		384,743,674.00	100.00	3,723,308.091225

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.004652	434,769.04	0.11	2,022.545595
10	0.003093	1,433,206.41	0.37	4,432.907415
15	0.002123	4,283,269.79	1.11	9,093.381756
20	0.001562	14,770,596.51	3.84	23,071.671754
25	0.001246	41,275,788.15	10.73	51,429.632039
30	0.001043	67,572,887.88	17.56	70,478.522056
35	0.000913	48,299,871.26	12.55	44,097.782460
40	0.000839	33,681,594.77	8.75	28,258.858010
45	0.000812	32,411,853.71	8.42	26,318.425215
50	0.000827	31,485,479.73	8.18	26,038.491734
55	0.000889	28,924,936.69	7.52	25,714.268714
60	0.001004	34,655,286.59	9.01	34,793.907736
65	0.001195	33,408,415.73	8.68	39,923.056796
70	0.001340	12,105,717.75	3.15	16,221.661782
75	0.001565	0.00	0.00	0.000000
Total		384,743,674.00	100.00	401,895.113062

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.045000	10,520,236.42	28,404,638.330626

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000442	10,520,236.42	278,996.669825

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	10,520,236.42	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	10,520,236.42	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	10,520,236.42	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000003	10,520,236.42	1,893.642555

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	105,540,813.376968	105,540.813377	116.338832350
CO	1,282,582,769.760550	1,282,582.769761	1,413.805494304
NOX	413,356,265.497335	413,356.265497	455.647286899

SO2	1,781,027.978870	1,781.027979	1.963247286
CO2	181,848,770,118.856000	181,848,770.118856	200,453.956179704
PM10	15,027,896.506070	15,027.896506	16.565420298
PM2.5	13,828,681.790334	13,828.681790	15.243512353
Diesel_PM	9,901,247.153508	9,901.247154	10.914256730
DEOG	17,465,882.310348	17,465.882310	19.252839626
BENZENE	2,226,861.506725	2,226.861507	2.454694627
ACROLEIN	86,309.247587	86.309248	0.095139660
ACETALDEHYDE	1,561,453.867675	1,561.453868	1.721208260
FORMALDEHYDE	3,723,308.091225	3,723.308091	4.104244623
BUTADIENE	403,788.755617	403.788756	0.445100913

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Title : **DSBPRP 2009 Existing**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 02:37 PM
Alternative Year : 2009
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
201985027			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.18	.61	1.82	5.57	14.08	19.88	13.33	9.87	8.95	8.07	6.96	5.68	3.44	1.56	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
182787268			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.06	.1	.32	1.77	7.23	14.94	11.72	7.57	7.81	8.38	8.08	12.62	14.5	4.9	0

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.090000	473,245.41	0.12	515,837.496246
10	0.693000	1,414,895.93	0.37	980,522.881361
15	0.442000	4,261,046.75	1.11	1,883,382.663058
20	0.308000	14,485,900.65	3.76	4,461,657.399430
25	0.245000	41,655,011.28	10.83	10,205,477.763110
30	0.203000	67,463,041.21	17.53	13,694,997.364980
35	0.176000	48,347,271.91	12.57	8,509,119.855931
40	0.160000	33,772,918.35	8.78	5,403,666.936400
45	0.153000	32,353,345.55	8.41	4,950,061.868737
50	0.155000	31,617,764.74	8.22	4,900,753.534282
55	0.166000	28,827,369.13	7.49	4,785,343.276178
60	0.187000	34,540,502.76	8.98	6,459,074.015222
65	0.221000	33,452,438.79	8.69	7,392,988.972325
70	0.248000	12,107,542.55	3.15	3,002,670.553194
75	0.288000	0.00	0.00	0.000000
Total		384,772,295.00	100.00	77,145,554.580454

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	7.238000	473,245.41	0.12	3,425,350.273237
10	5.880000	1,414,895.93	0.37	8,319,588.084276
15	4.931000	4,261,046.75	1.11	21,011,221.519319

20	4.259000	14,485,900.65	3.76	61,695,450.857703
25	3.785000	41,655,011.28	10.83	157,664,217.687230
30	3.430000	67,463,041.21	17.53	231,398,231.339324
35	3.169000	48,347,271.91	12.57	153,212,504.678670
40	2.988000	33,772,918.35	8.78	100,913,480.037270
45	2.884000	32,353,345.55	8.41	93,307,048.558413
50	2.862000	31,617,764.74	8.22	90,490,042.678153
55	2.939000	28,827,369.13	7.49	84,723,637.883650
60	3.152000	34,540,502.76	8.98	108,871,664.684390
65	3.564000	33,452,438.79	8.69	119,224,491.843283
70	3.996000	12,107,542.55	3.15	48,381,740.042587
75	4.740000	0.00	0.00	0.000000
Total		384,772,295.00	100.00	1,282,638,670.167510

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	2.118000	473,245.41	0.12	1,002,333.777109
10	1.600000	1,414,895.93	0.37	2,263,833.492320
15	1.272000	4,261,046.75	1.11	5,420,051.464728
20	1.123000	14,485,900.65	3.76	16,267,666.427143
25	1.062000	41,655,011.28	10.83	44,237,621.977236
30	1.021000	67,463,041.21	17.53	68,879,765.072143
35	0.997000	48,347,271.91	12.57	48,202,230.092974
40	0.989000	33,772,918.35	8.78	33,401,416.250623
45	0.999000	32,353,345.55	8.41	32,320,992.201753
50	1.026000	31,617,764.74	8.22	32,439,826.620470
55	1.073000	28,827,369.13	7.49	30,931,767.080353
60	1.146000	34,540,502.76	8.98	39,583,416.157459
65	1.251000	33,452,438.79	8.69	41,849,000.924789
70	1.370000	12,107,542.55	3.15	16,587,333.297884
75	1.541000	0.00	0.00	0.000000
Total		384,772,295.00	100.00	413,387,254.836982

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012000	473,245.41	0.12	5,678.944913
10	0.009000	1,414,895.93	0.37	12,734.063394
15	0.007000	4,261,046.75	1.11	29,827.327243
20	0.006000	14,485,900.65	3.76	86,915.403885
25	0.005000	41,655,011.28	10.83	208,275.056390
30	0.005000	67,463,041.21	17.53	337,315.206034
35	0.004000	48,347,271.91	12.57	193,389.087635
40	0.004000	33,772,918.35	8.78	135,091.673410
45	0.004000	32,353,345.55	8.41	129,413.382189
50	0.004000	31,617,764.74	8.22	126,471.058949
55	0.004000	28,827,369.13	7.49	115,309.476534
60	0.005000	34,540,502.76	8.98	172,702.513776
65	0.005000	33,452,438.79	8.69	167,262.193944
70	0.005000	12,107,542.55	3.15	60,537.712766
75	0.005000	0.00	0.00	0.000000

Total		384,772,295.00	100.00	1,780,923.101063

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,249.354000	473,245.41	0.12	591,251,045.215528
10	952.788000	1,414,895.93	0.37	1,348,095,865.925370
15	753.613000	4,261,046.75	1.11	3,211,180,223.654140
20	619.211000	14,485,900.65	3.76	8,969,829,025.839120
25	532.760000	41,655,011.28	10.83	22,192,123,808.467300
30	474.360000	67,463,041.21	17.53	32,001,768,226.857700
35	436.500000	48,347,271.91	12.57	21,103,584,188.147500
40	414.734000	33,772,918.35	8.78	14,006,777,520.005700
45	406.705000	32,353,345.55	8.41	13,158,267,400.814600
50	411.659000	31,617,764.74	8.22	13,015,737,413.992200
55	430.297000	28,827,369.13	7.49	12,404,330,456.080700
60	464.913000	34,540,502.76	8.98	16,058,328,757.428300
65	519.879000	33,452,438.79	8.69	17,391,220,425.082600
70	528.722000	12,107,542.55	3.15	6,401,524,113.813010
75	542.570000	0.00	0.00	0.000000
Total		384,772,295.00	100.00	181,854,018,471.324000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.173000	473,245.41	0.12	81,871.455826
10	0.117000	1,414,895.93	0.37	165,542.824126
15	0.080000	4,261,046.75	1.11	340,883.739920
20	0.058000	14,485,900.65	3.76	840,182.237555
25	0.047000	41,655,011.28	10.83	1,957,785.530066
30	0.039000	67,463,041.21	17.53	2,631,058.607065
35	0.034000	48,347,271.91	12.57	1,643,807.244896
40	0.031000	33,772,918.35	8.78	1,046,960.468928
45	0.030000	32,353,345.55	8.41	970,600.366419
50	0.031000	31,617,764.74	8.22	980,150.706856
55	0.034000	28,827,369.13	7.49	980,130.550542
60	0.038000	34,540,502.76	8.98	1,312,539.104698
65	0.044000	33,452,438.79	8.69	1,471,907.306707
70	0.050000	12,107,542.55	3.15	605,377.127660
75	0.057000	0.00	0.00	0.000000
Total		384,772,295.00	100.00	15,028,797.271264

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.159000	473,245.41	0.12	75,246.020095
10	0.108000	1,414,895.93	0.37	152,808.760732
15	0.074000	4,261,046.75	1.11	315,317.459426
20	0.053000	14,485,900.65	3.76	767,752.734318
25	0.043000	41,655,011.28	10.83	1,791,165.484954
30	0.036000	67,463,041.21	17.53	2,428,669.483445

35	0.031000	48,347,271.91	12.57	1,498,765.429170
40	0.029000	33,772,918.35	8.78	979,414.632223
45	0.028000	32,353,345.55	8.41	905,893.675324
50	0.029000	31,617,764.74	8.22	916,915.177382
55	0.031000	28,827,369.13	7.49	893,648.443142
60	0.035000	34,540,502.76	8.98	1,208,917.596432
65	0.040000	33,452,438.79	8.69	1,338,097.551552
70	0.046000	12,107,542.55	3.15	556,946.957447
75	0.052000	0.00	0.00	0.000000
Total		384,772,295.00	100.00	13,829,559.405640

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.103446	473,245.41	0.12	48,955.344621
10	0.071694	1,414,895.93	0.37	101,439.548999
15	0.048573	4,261,046.75	1.11	206,971.823739
20	0.034965	14,485,900.65	3.76	506,499.516140
25	0.029295	41,655,011.28	10.83	1,220,283.555389
30	0.025074	67,463,041.21	17.53	1,691,568.295219
35	0.022176	48,347,271.91	12.57	1,072,149.101847
40	0.020538	33,772,918.35	8.78	693,628.197124
45	0.020160	32,353,345.55	8.41	652,243.446234
50	0.021042	31,617,764.74	8.22	665,301.005602
55	0.023058	28,827,369.13	7.49	664,701.477483
60	0.026334	34,540,502.76	8.98	909,589.599555
65	0.030744	33,452,438.79	8.69	1,028,461.778123
70	0.036351	12,107,542.55	3.15	440,121.279351
75	0.043155	0.00	0.00	0.000000
Total		384,772,295.00	100.00	9,901,913.969426

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.450891	473,245.41	0.12	213,382.095890
10	0.256473	1,414,895.93	0.37	362,882.604547
15	0.128142	4,261,046.75	1.11	546,019.052510
20	0.071127	14,485,900.65	3.76	1,030,338.655355
25	0.057582	41,655,011.28	10.83	2,398,578.859410
30	0.046935	67,463,041.21	17.53	3,166,377.839041
35	0.039060	48,347,271.91	12.57	1,888,444.440754
40	0.033957	33,772,918.35	8.78	1,146,826.988496
45	0.031500	32,353,345.55	8.41	1,019,130.384740
50	0.031752	31,617,764.74	8.22	1,003,927.265939
55	0.034587	28,827,369.13	7.49	997,052.216224
60	0.040005	34,540,502.76	8.98	1,381,792.812722
65	0.048069	33,452,438.79	8.69	1,608,025.280139
70	0.058716	12,107,542.55	3.15	710,906.468554
75	0.072009	0.00	0.00	0.000000
Total		384,772,295.00	100.00	17,473,684.964320

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.025594	473,245.41	0.12	12,112.243008
10	0.016503	1,414,895.93	0.37	23,350.027577
15	0.010763	4,261,046.75	1.11	45,861.646159
20	0.007642	14,485,900.65	3.76	110,701.252748
25	0.006100	41,655,011.28	10.83	254,095.568796
30	0.005087	67,463,041.21	17.53	343,184.490619
35	0.004426	48,347,271.91	12.57	213,985.025468
40	0.004038	33,772,918.35	8.78	136,375.044307
45	0.003889	32,353,345.55	8.41	125,822.160833
50	0.003952	31,617,764.74	8.22	124,953.406242
55	0.004247	28,827,369.13	7.49	122,429.836710
60	0.004803	34,540,502.76	8.98	165,898.034733
65	0.005718	33,452,438.79	8.69	191,281.044994
70	0.006443	12,107,542.55	3.15	78,008.896670
75	0.007533	0.00	0.00	0.000000
Total		384,772,295.00	100.00	1,948,058.678867

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000895	473,245.41	0.12	423.554641
10	0.000614	1,414,895.93	0.37	868.746103
15	0.000442	4,261,046.75	1.11	1,883.382663
20	0.000336	14,485,900.65	3.76	4,867.262618
25	0.000267	41,655,011.28	10.83	11,121.888011
30	0.000224	67,463,041.21	17.53	15,111.721230
35	0.000197	48,347,271.91	12.57	9,524.412566
40	0.000181	33,772,918.35	8.78	6,112.898222
45	0.000176	32,353,345.55	8.41	5,694.188816
50	0.000179	31,617,764.74	8.22	5,659.579888
55	0.000192	28,827,369.13	7.49	5,534.854874
60	0.000216	34,540,502.76	8.98	7,460.748595
65	0.000257	33,452,438.79	8.69	8,597.276769
70	0.000285	12,107,542.55	3.15	3,450.649628
75	0.000330	0.00	0.00	0.000000
Total		384,772,295.00	100.00	86,311.164624

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.035758	473,245.41	0.12	16,922.309349
10	0.020671	1,414,895.93	0.37	29,247.313825
15	0.010753	4,261,046.75	1.11	45,819.035692
20	0.006253	14,485,900.65	3.76	90,580.336749
25	0.005053	41,655,011.28	10.83	210,482.771988
30	0.004146	67,463,041.21	17.53	279,701.768843
35	0.003491	48,347,271.91	12.57	168,780.326233
40	0.003075	33,772,918.35	8.78	103,851.723934
45	0.002886	32,353,345.55	8.41	93,371.755250

50	0.002920	31,617,764.74	8.22	92,323.873033
55	0.003182	28,827,369.13	7.49	91,728.688583
60	0.003674	34,540,502.76	8.98	126,901.807123
65	0.004417	33,452,438.79	8.69	147,759.422130
70	0.005332	12,107,542.55	3.15	64,557.416894
75	0.006518	0.00	0.00	0.000000
Total		384,772,295.00	100.00	1,562,028.549625

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.077886	473,245.41	0.12	36,859.191957
10	0.045699	1,414,895.93	0.37	64,659.329228
15	0.024636	4,261,046.75	1.11	104,975.147708
20	0.014872	14,485,900.65	3.76	215,434.314430
25	0.011985	41,655,011.28	10.83	499,235.310167
30	0.009863	67,463,041.21	17.53	665,387.975423
35	0.008358	48,347,271.91	12.57	404,086.498613
40	0.007414	33,772,918.35	8.78	250,392.416665
45	0.006994	32,353,345.55	8.41	226,279.298758
50	0.007080	31,617,764.74	8.22	223,853.774340
55	0.007688	28,827,369.13	7.49	221,624.813899
60	0.008831	34,540,502.76	8.98	305,027.179831
65	0.010590	33,452,438.79	8.69	354,261.326773
70	0.012587	12,107,542.55	3.15	152,397.638117
75	0.015231	0.00	0.00	0.000000
Total		384,772,295.00	100.00	3,724,474.215910

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.004652	473,245.41	0.12	2,201.537645
10	0.003093	1,414,895.93	0.37	4,376.273120
15	0.002123	4,261,046.75	1.11	9,046.202248
20	0.001562	14,485,900.65	3.76	22,626.976811
25	0.001246	41,655,011.28	10.83	51,902.144052
30	0.001043	67,463,041.21	17.53	70,363.951979
35	0.000913	48,347,271.91	12.57	44,141.059253
40	0.000839	33,772,918.35	8.78	28,335.478498
45	0.000812	32,353,345.55	8.41	26,270.916584
50	0.000827	31,617,764.74	8.22	26,147.891438
55	0.000889	28,827,369.13	7.49	25,627.531160
60	0.001004	34,540,502.76	8.98	34,678.664766
65	0.001195	33,452,438.79	8.69	39,975.664353
70	0.001340	12,107,542.55	3.15	16,224.107021
75	0.001565	0.00	0.00	0.000000
Total		384,772,295.00	100.00	401,918.398927

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.045000	10,523,890.92	28,414,505.495533

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000442	10,523,890.92	279,093.587312

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	10,523,890.92	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	10,523,890.92	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	10,523,890.92	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000003	10,523,890.92	1,894.300366

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	105,560,060.075987	105,560.060076	116.360048204
CO	1,282,638,670.167510	1,282,638.670168	1,413.867113955
NOX	413,387,254.836982	413,387.254837	455.681446799

SO2	1,780,923.101063	1,780.923101	1.963131678
CO2	181,854,018,471.324000	181,854,018.471324	200,459.741497993
PM10	15,028,797.271264	15,028.797271	16.566413222
PM2.5	13,829,559.405640	13,829.559406	15.244479758
Diesel_PM	9,901,913.969426	9,901.913969	10.914991768
DEOG	17,473,684.964320	17,473.684964	19.261440580
BENZENE	2,227,152.266179	2,227.152266	2.455015134
ACROLEIN	86,311.164624	86.311165	0.095141773
ACETALDEHYDE	1,562,028.549625	1,562.028550	1.721841738
FORMALDEHYDE	3,724,474.215910	3,724.474216	4.105530055
BUTADIENE	403,812.699294	403.812699	0.445127306

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Title : **DSBPRP 2014 No Project**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 05:13 PM
Alternative Year : 2014
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
230589776			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.23	.96	2.4	6.65	16.17	20.82	13.71	9.9	8.3	7.52	5.05	4.61	2.44	1.24	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
208163293			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.06	.12	.35	1.85	7.48	15.5	12.34	8.56	8.66	7.97	8.49	12.33	11.76	4.53	0

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.709000	655,254.46	0.15	464,575.412565
10	0.443000	2,463,457.80	0.56	1,091,311.805932
15	0.276000	6,262,726.15	1.43	1,728,512.417262
20	0.191000	19,185,241.02	4.37	3,664,381.035680
25	0.153000	52,856,981.10	12.05	8,087,118.107627
30	0.127000	80,274,101.78	18.30	10,194,810.925831
35	0.110000	57,301,208.65	13.06	6,303,132.951038
40	0.100000	40,647,165.70	9.26	4,064,716.570480
45	0.095000	37,165,892.58	8.47	3,530,759.795271
50	0.096000	33,930,965.61	7.73	3,257,372.698301
55	0.103000	29,317,847.26	6.68	3,019,738.268161
60	0.117000	36,296,722.70	8.27	4,246,716.555959
65	0.138000	30,106,393.79	6.86	4,154,682.343186
70	0.159000	12,289,110.40	2.80	1,953,968.552853
75	0.191000	0.00	0.00	0.000000
Total		438,753,069.00	100.00	55,761,797.440144

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	4.504000	655,254.46	0.15	2,951,266.090542
10	3.702000	2,463,457.80	0.56	9,119,720.780042
15	3.132000	6,262,726.15	1.43	19,614,858.300234

20	2.729000	19,185,241.02	4.37	52,356,522.755861
25	2.446000	52,856,981.10	12.05	129,288,175.759838
30	2.227000	80,274,101.78	18.30	178,770,424.660051
35	2.060000	57,301,208.65	13.06	118,040,489.810348
40	1.937000	40,647,165.70	9.26	78,733,559.970198
45	1.857000	37,165,892.58	8.47	69,017,062.524403
50	1.822000	33,930,965.61	7.73	61,822,219.336501
55	1.841000	29,317,847.26	6.68	53,974,156.812472
60	1.934000	36,296,722.70	8.27	70,197,861.702767
65	2.133000	30,106,393.79	6.86	64,216,937.956630
70	2.423000	12,289,110.40	2.80	29,776,514.487812
75	2.923000	0.00	0.00	0.000000
Total		438,753,069.00	100.00	937,879,770.947697

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.400000	655,254.46	0.15	917,356.244840
10	1.065000	2,463,457.80	0.56	2,623,582.558278
15	0.847000	6,262,726.15	1.43	5,304,529.048627
20	0.741000	19,185,241.02	4.37	14,216,263.599155
25	0.694000	52,856,981.10	12.05	36,682,744.880346
30	0.661000	80,274,101.78	18.30	53,061,181.275390
35	0.641000	57,301,208.65	13.06	36,730,074.741958
40	0.631000	40,647,165.70	9.26	25,648,361.559729
45	0.634000	37,165,892.58	8.47	23,563,175.896861
50	0.648000	33,930,965.61	7.73	21,987,265.713530
55	0.677000	29,317,847.26	6.68	19,848,182.597525
60	0.723000	36,296,722.70	8.27	26,242,530.512462
65	0.791000	30,106,393.79	6.86	23,814,157.488839
70	0.871000	12,289,110.40	2.80	10,703,815.154306
75	0.987000	0.00	0.00	0.000000
Total		438,753,069.00	100.00	301,343,221.271846

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012000	655,254.46	0.15	7,863.053527
10	0.009000	2,463,457.80	0.56	22,171.120211
15	0.007000	6,262,726.15	1.43	43,839.083047
20	0.006000	19,185,241.02	4.37	115,111.446147
25	0.005000	52,856,981.10	12.05	264,284.905478
30	0.005000	80,274,101.78	18.30	401,370.508891
35	0.004000	57,301,208.65	13.06	229,204.834583
40	0.004000	40,647,165.70	9.26	162,588.662819
45	0.004000	37,165,892.58	8.47	148,663.570327
50	0.004000	33,930,965.61	7.73	135,723.862429
55	0.004000	29,317,847.26	6.68	117,271.389055
60	0.005000	36,296,722.70	8.27	181,483.613503
65	0.005000	30,106,393.79	6.86	150,531.968956
70	0.005000	12,289,110.40	2.80	61,445.551977
75	0.005000	0.00	0.00	0.000000

Total		438,753,069.00	100.00	2,041,553.570949

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,263.187000	655,254.46	0.15	827,708,916.321932
10	964.196000	2,463,457.80	0.56	2,375,256,158.085840
15	762.871000	6,262,726.15	1.43	4,777,652,160.395210
20	626.913000	19,185,241.02	4.37	12,027,477,006.392400
25	540.174000	52,856,981.10	12.05	28,551,966,906.334600
30	481.469000	80,274,101.78	18.30	38,649,491,509.048200
35	443.319000	57,301,208.65	13.06	25,402,714,515.647400
40	421.299000	40,647,165.70	9.26	17,124,610,264.266500
45	413.063000	37,165,892.58	8.47	15,351,855,087.516100
50	417.867000	33,930,965.61	7.73	14,178,630,805.425600
55	436.411000	29,317,847.26	6.68	12,794,631,042.198600
60	470.989000	36,296,722.70	8.27	17,095,357,127.985800
65	525.967000	30,106,393.79	6.86	15,834,969,623.176100
70	535.531000	12,289,110.40	2.80	6,581,199,579.105400
75	550.451000	0.00	0.00	0.000000
Total		438,753,069.00	100.00	211,573,520,701.900000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.136000	655,254.46	0.15	89,114.606642
10	0.092000	2,463,457.80	0.56	226,638.117710
15	0.063000	6,262,726.15	1.43	394,551.747419
20	0.046000	19,185,241.02	4.37	882,521.087127
25	0.037000	52,856,981.10	12.05	1,955,708.300537
30	0.031000	80,274,101.78	18.30	2,488,497.155124
35	0.027000	57,301,208.65	13.06	1,547,132.633437
40	0.025000	40,647,165.70	9.26	1,016,179.142620
45	0.025000	37,165,892.58	8.47	929,147.314545
50	0.026000	33,930,965.61	7.73	882,205.105790
55	0.028000	29,317,847.26	6.68	820,899.723384
60	0.031000	36,296,722.70	8.27	1,125,198.403716
65	0.036000	30,106,393.79	6.86	1,083,830.176483
70	0.040000	12,289,110.40	2.80	491,564.415812
75	0.045000	0.00	0.00	0.000000
Total		438,753,069.00	100.00	13,933,187.930345

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.125000	655,254.46	0.15	81,906.807575
10	0.085000	2,463,457.80	0.56	209,393.913102
15	0.059000	6,262,726.15	1.43	369,500.842821
20	0.043000	19,185,241.02	4.37	824,965.364054
25	0.034000	52,856,981.10	12.05	1,797,137.357250
30	0.029000	80,274,101.78	18.30	2,327,948.951568

35	0.025000	57,301,208.65	13.06	1,432,530.216145
40	0.023000	40,647,165.70	9.26	934,884.811210
45	0.023000	37,165,892.58	8.47	854,815.529381
50	0.024000	33,930,965.61	7.73	814,343.174575
55	0.026000	29,317,847.26	6.68	762,264.028856
60	0.029000	36,296,722.70	8.27	1,052,604.958315
65	0.033000	30,106,393.79	6.86	993,510.995110
70	0.037000	12,289,110.40	2.80	454,697.084626
75	0.042000	0.00	0.00	0.000000
Total		438,753,069.00	100.00	12,910,504.034588

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.060258	655,254.46	0.15	39,484.323287
10	0.042504	2,463,457.80	0.56	104,706.810382
15	0.029502	6,262,726.15	1.43	184,762.946863
20	0.021780	19,185,241.02	4.37	417,854.549514
25	0.018480	52,856,981.10	12.05	976,797.010647
30	0.016104	80,274,101.78	18.30	1,292,734.135036
35	0.014586	57,301,208.65	13.06	835,795.429308
40	0.013926	40,647,165.70	9.26	566,052.429605
45	0.014058	37,165,892.58	8.47	522,478.117915
50	0.014982	33,930,965.61	7.73	508,353.726729
55	0.016698	29,317,847.26	6.68	489,549.413609
60	0.019140	36,296,722.70	8.27	694,719.272488
65	0.022308	30,106,393.79	6.86	671,613.432694
70	0.026268	12,289,110.40	2.80	322,810.351864
75	0.030954	0.00	0.00	0.000000
Total		438,753,069.00	100.00	7,627,711.949939

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.331056	655,254.46	0.15	216,925.920708
10	0.186318	2,463,457.80	0.56	458,986.530604
15	0.092598	6,262,726.15	1.43	579,915.915991
20	0.052866	19,185,241.02	4.37	1,014,246.952001
25	0.043428	52,856,981.10	12.05	2,295,472.975020
30	0.035904	80,274,101.78	18.30	2,882,161.350244
35	0.030228	57,301,208.65	13.06	1,732,100.934945
40	0.026268	40,647,165.70	9.26	1,067,719.748734
45	0.024156	37,165,892.58	8.47	897,779.301206
50	0.023628	33,930,965.61	7.73	801,720.855369
55	0.024882	29,317,847.26	6.68	729,486.675615
60	0.027786	36,296,722.70	8.27	1,008,540.736956
65	0.032340	30,106,393.79	6.86	973,640.775207
70	0.038610	12,289,110.40	2.80	474,482.552363
75	0.046530	0.00	0.00	0.000000
Total		438,753,069.00	100.00	15,133,181.224965

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.015726	655,254.46	0.15	10,304.531647
10	0.009895	2,463,457.80	0.56	24,375.914943
15	0.006241	6,262,726.15	1.43	39,085.673899
20	0.004355	19,185,241.02	4.37	83,551.724662
25	0.003478	52,856,981.10	12.05	183,836.580250
30	0.002894	80,274,101.78	18.30	232,313.250546
35	0.002512	57,301,208.65	13.06	143,940.636118
40	0.002295	40,647,165.70	9.26	93,285.245293
45	0.002195	37,165,892.58	8.47	81,579.134217
50	0.002232	33,930,965.61	7.73	75,733.915235
55	0.002397	29,317,847.26	6.68	70,274.879891
60	0.002718	36,296,722.70	8.27	98,654.492300
65	0.003252	30,106,393.79	6.86	97,905.992609
70	0.003797	12,289,110.40	2.80	46,661.752171
75	0.004635	0.00	0.00	0.000000
Total		438,753,069.00	100.00	1,281,503.723782

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000485	655,254.46	0.15	317.798413
10	0.000329	2,463,457.80	0.56	810.477617
15	0.000235	6,262,726.15	1.43	1,471.740645
20	0.000177	19,185,241.02	4.37	3,395.787661
25	0.000140	52,856,981.10	12.05	7,399.977353
30	0.000117	80,274,101.78	18.30	9,392.069908
35	0.000103	57,301,208.65	13.06	5,902.024491
40	0.000095	40,647,165.70	9.26	3,861.480742
45	0.000092	37,165,892.58	8.47	3,419.262118
50	0.000095	33,930,965.61	7.73	3,223.441733
55	0.000102	29,317,847.26	6.68	2,990.420421
60	0.000116	36,296,722.70	8.27	4,210.419833
65	0.000140	30,106,393.79	6.86	4,214.895131
70	0.000163	12,289,110.40	2.80	2,003.124994
75	0.000200	0.00	0.00	0.000000
Total		438,753,069.00	100.00	52,612.921060

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.026149	655,254.46	0.15	17,134.248890
10	0.014876	2,463,457.80	0.56	36,646.398251
15	0.007599	6,262,726.15	1.43	47,590.456010
20	0.004463	19,185,241.02	4.37	85,623.730692
25	0.003655	52,856,981.10	12.05	193,192.265904
30	0.003027	80,274,101.78	18.30	242,989.706083
35	0.002565	57,301,208.65	13.06	146,977.600176
40	0.002256	40,647,165.70	9.26	91,700.005830
45	0.002091	37,165,892.58	8.47	77,713.881389

50	0.002070	33,930,965.61	7.73	70,237.098807
55	0.002194	29,317,847.26	6.68	64,323.356897
60	0.002467	36,296,722.70	8.27	89,544.014902
65	0.002900	30,106,393.79	6.86	87,308.541994
70	0.003470	12,289,110.40	2.80	42,643.213072
75	0.004228	0.00	0.00	0.000000
Total		438,753,069.00	100.00	1,293,624.518897

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.055784	655,254.46	0.15	36,552.714830
10	0.032112	2,463,457.80	0.56	79,106.556912
15	0.016875	6,262,726.15	1.43	105,683.503773
20	0.010185	19,185,241.02	4.37	195,401.679835
25	0.008303	52,856,981.10	12.05	438,871.514037
30	0.006879	80,274,101.78	18.30	552,205.546132
35	0.005851	57,301,208.65	13.06	335,269.371787
40	0.005178	40,647,165.70	9.26	210,471.024019
45	0.004823	37,165,892.58	8.47	179,251.099922
50	0.004796	33,930,965.61	7.73	162,732.911053
55	0.005093	29,317,847.26	6.68	149,315.796114
60	0.005731	36,296,722.70	8.27	208,016.517797
65	0.006756	30,106,393.79	6.86	203,398.796453
70	0.008036	12,289,110.40	2.80	98,755.291137
75	0.009780	0.00	0.00	0.000000
Total		438,753,069.00	100.00	2,955,032.323800

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.002691	655,254.46	0.15	1,763.289753
10	0.001754	2,463,457.80	0.56	4,320.904983
15	0.001176	6,262,726.15	1.43	7,364.965952
20	0.000853	19,185,241.02	4.37	16,365.010594
25	0.000679	52,856,981.10	12.05	35,889.890164
30	0.000566	80,274,101.78	18.30	45,435.141606
35	0.000495	57,301,208.65	13.06	28,364.098280
40	0.000456	40,647,165.70	9.26	18,535.107561
45	0.000440	37,165,892.58	8.47	16,352.992736
50	0.000451	33,930,965.61	7.73	15,302.865489
55	0.000486	29,317,847.26	6.68	14,248.473770
60	0.000553	36,296,722.70	8.27	20,072.087653
65	0.000666	30,106,393.79	6.86	20,050.858265
70	0.000778	12,289,110.40	2.80	9,560.927888
75	0.000956	0.00	0.00	0.000000
Total		438,753,069.00	100.00	253,626.614695

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.032000	12,478,872.16	23,959,434.549150

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000320	12,478,872.16	239,594.345492

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	12,478,872.16	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	12,478,872.16	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	12,478,872.16	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000002	12,478,872.16	1,497.464659

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	79,721,231.989295	79,721.231989	87.877615743
CO	937,879,770.947697	937,879.770948	1,033.835479803
NOX	301,343,221.271846	301,343.221272	332.174041278

SO2	2,041,553.570949	2,041.553571	2.250427593
CO2	211,573,520,701.900000	211,573,520.701900	233,219.884961800
PM10	13,933,187.930345	13,933.187930	15.358710653
PM2.5	12,910,504.034588	12,910.504035	14.231394627
Diesel_PM	7,627,711.949939	7,627.711950	8.408113159
DEOG	15,133,181.224965	15,133.181225	16.681476835
BENZENE	1,521,098.069273	1,521.098069	1.676723607
ACROLEIN	52,612.921060	52.612921	0.057995818
ACETALDEHYDE	1,293,624.518897	1,293.624519	1.425976939
FORMALDEHYDE	2,955,032.323800	2,955.032324	3.257365555
BUTADIENE	255,124.079354	255.124079	0.281226158

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Title : **DSBPRP 2014 With Project**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 05:11 PM
Alternative Year : 2014
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
230640420			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.21	.96	2.43	6.84	15.99	20.84	13.67	9.9	8.31	7.51	5.02	4.65	2.43	1.24	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
208124180			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.05	.13	.35	1.84	7.45	15.53	12.35	8.49	8.68	7.9	8.6	12.34	11.76	4.53	0

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.709000	588,406.97	0.13	417,180.543148
10	0.443000	2,484,709.47	0.57	1,100,726.293438
15	0.276000	6,332,996.84	1.44	1,747,907.126736
20	0.191000	19,605,289.64	4.47	3,744,610.321240
25	0.153000	52,384,654.57	11.94	8,014,852.148904
30	0.127000	80,387,148.68	18.32	10,209,167.882614
35	0.110000	57,231,881.64	13.04	6,295,506.980840
40	0.100000	40,503,144.46	9.23	4,050,314.446200
45	0.095000	37,231,397.73	8.49	3,536,982.783970
50	0.096000	33,762,905.76	7.69	3,241,238.953152
55	0.103000	29,476,828.56	6.72	3,036,113.342092
60	0.117000	36,407,303.34	8.30	4,259,654.491014
65	0.138000	30,079,965.77	6.86	4,151,035.276812
70	0.159000	12,287,966.56	2.80	1,953,786.683358
75	0.191000	0.00	0.00	0.000000
Total		438,764,600.00	100.00	55,759,077.273518

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	4.504000	588,406.97	0.13	2,650,185.001888
10	3.702000	2,484,709.47	0.57	9,198,394.443132
15	3.132000	6,332,996.84	1.44	19,834,946.090352

20	2.729000	19,605,289.64	4.47	53,502,835.427560
25	2.446000	52,384,654.57	11.94	128,132,865.073328
30	2.227000	80,387,148.68	18.32	179,022,180.114814
35	2.060000	57,231,881.64	13.04	117,897,676.186640
40	1.937000	40,503,144.46	9.23	78,454,590.822894
45	1.857000	37,231,397.73	8.49	69,138,705.577182
50	1.822000	33,762,905.76	7.69	61,516,014.298364
55	1.841000	29,476,828.56	6.72	54,266,841.386324
60	1.934000	36,407,303.34	8.30	70,411,724.663428
65	2.133000	30,079,965.77	6.86	64,160,566.995942
70	2.423000	12,287,966.56	2.80	29,773,742.979726
75	2.923000	0.00	0.00	0.000000
Total		438,764,600.00	100.00	937,961,269.061574

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.400000	588,406.97	0.13	823,769.760800
10	1.065000	2,484,709.47	0.57	2,646,215.581290
15	0.847000	6,332,996.84	1.44	5,364,048.320092
20	0.741000	19,605,289.64	4.47	14,527,519.623240
25	0.694000	52,384,654.57	11.94	36,354,950.270192
30	0.661000	80,387,148.68	18.32	53,135,905.278802
35	0.641000	57,231,881.64	13.04	36,685,636.133804
40	0.631000	40,503,144.46	9.23	25,557,484.155522
45	0.634000	37,231,397.73	8.49	23,604,706.158284
50	0.648000	33,762,905.76	7.69	21,878,362.933776
55	0.677000	29,476,828.56	6.72	19,955,812.937828
60	0.723000	36,407,303.34	8.30	26,322,480.316266
65	0.791000	30,079,965.77	6.86	23,793,252.927234
70	0.871000	12,287,966.56	2.80	10,702,818.875502
75	0.987000	0.00	0.00	0.000000
Total		438,764,600.00	100.00	301,352,963.272632

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012000	588,406.97	0.13	7,060.883664
10	0.009000	2,484,709.47	0.57	22,362.385194
15	0.007000	6,332,996.84	1.44	44,330.977852
20	0.006000	19,605,289.64	4.47	117,631.737840
25	0.005000	52,384,654.57	11.94	261,923.272840
30	0.005000	80,387,148.68	18.32	401,935.743410
35	0.004000	57,231,881.64	13.04	228,927.526576
40	0.004000	40,503,144.46	9.23	162,012.577848
45	0.004000	37,231,397.73	8.49	148,925.590904
50	0.004000	33,762,905.76	7.69	135,051.623048
55	0.004000	29,476,828.56	6.72	117,907.314256
60	0.005000	36,407,303.34	8.30	182,036.516710
65	0.005000	30,079,965.77	6.86	150,399.828870
70	0.005000	12,287,966.56	2.80	61,439.832810
75	0.005000	0.00	0.00	0.000000

Total		438,764,600.00	100.00	2,041,945.811822

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,263.187000	588,406.97	0.13	743,268,037.739764
10	964.196000	2,484,709.47	0.57	2,395,746,928.279340
15	762.871000	6,332,996.84	1.44	4,831,259,629.276160
20	626.913000	19,605,289.64	4.47	12,290,810,944.081300
25	540.174000	52,384,654.57	11.94	28,296,828,396.614800
30	481.469000	80,387,148.68	18.32	38,703,920,088.773900
35	443.319000	57,231,881.64	13.04	25,371,980,538.536400
40	421.299000	40,503,144.46	9.23	17,063,934,258.696100
45	413.063000	37,231,397.73	8.49	15,378,912,838.894700
50	417.867000	33,762,905.76	7.69	14,108,404,142.049700
55	436.411000	29,476,828.56	6.72	12,864,012,230.443800
60	470.989000	36,407,303.34	8.30	17,147,439,393.745200
65	525.967000	30,079,965.77	6.86	15,821,069,358.253500
70	535.531000	12,287,966.56	2.80	6,580,587,020.914420
75	550.451000	0.00	0.00	0.000000
Total		438,764,600.00	100.00	211,598,173,806.299000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.136000	588,406.97	0.13	80,023.348192
10	0.092000	2,484,709.47	0.57	228,593.270872
15	0.063000	6,332,996.84	1.44	398,978.800668
20	0.046000	19,605,289.64	4.47	901,843.323440
25	0.037000	52,384,654.57	11.94	1,938,232.219016
30	0.031000	80,387,148.68	18.32	2,492,001.609142
35	0.027000	57,231,881.64	13.04	1,545,260.804388
40	0.025000	40,503,144.46	9.23	1,012,578.611550
45	0.025000	37,231,397.73	8.49	930,784.943150
50	0.026000	33,762,905.76	7.69	877,835.549812
55	0.028000	29,476,828.56	6.72	825,351.199792
60	0.031000	36,407,303.34	8.30	1,128,626.403602
65	0.036000	30,079,965.77	6.86	1,082,878.767864
70	0.040000	12,287,966.56	2.80	491,518.662480
75	0.045000	0.00	0.00	0.000000
Total		438,764,600.00	100.00	13,934,507.513968

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.125000	588,406.97	0.13	73,550.871500
10	0.085000	2,484,709.47	0.57	211,200.304610
15	0.059000	6,332,996.84	1.44	373,646.813324
20	0.043000	19,605,289.64	4.47	843,027.454520
25	0.034000	52,384,654.57	11.94	1,781,078.255312
30	0.029000	80,387,148.68	18.32	2,331,227.311778

35	0.025000	57,231,881.64	13.04	1,430,797.041100
40	0.023000	40,503,144.46	9.23	931,572.322626
45	0.023000	37,231,397.73	8.49	856,322.147698
50	0.024000	33,762,905.76	7.69	810,309.738288
55	0.026000	29,476,828.56	6.72	766,397.542664
60	0.029000	36,407,303.34	8.30	1,055,811.796918
65	0.033000	30,079,965.77	6.86	992,638.870542
70	0.037000	12,287,966.56	2.80	454,654.762794
75	0.042000	0.00	0.00	0.000000
Total		438,764,600.00	100.00	12,912,235.233674

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.060258	588,406.97	0.13	35,456.227319
10	0.042504	2,484,709.47	0.57	105,610.091143
15	0.029502	6,332,996.84	1.44	186,836.072656
20	0.021780	19,605,289.64	4.47	427,003.208359
25	0.018480	52,384,654.57	11.94	968,068.416417
30	0.016104	80,387,148.68	18.32	1,294,554.642375
35	0.014586	57,231,881.64	13.04	834,784.225659
40	0.013926	40,503,144.46	9.23	564,046.789778
45	0.014058	37,231,397.73	8.49	523,398.989232
50	0.014982	33,762,905.76	7.69	505,835.854126
55	0.016698	29,476,828.56	6.72	492,204.083362
60	0.019140	36,407,303.34	8.30	696,835.785966
65	0.022308	30,079,965.77	6.86	671,023.876486
70	0.026268	12,287,966.56	2.80	322,780.305651
75	0.030954	0.00	0.00	0.000000
Total		438,764,600.00	100.00	7,628,438.568528

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.331056	588,406.97	0.13	194,795.658522
10	0.186318	2,484,709.47	0.57	462,946.098286
15	0.092598	6,332,996.84	1.44	586,422.841020
20	0.052866	19,605,289.64	4.47	1,036,453.242108
25	0.043428	52,384,654.57	11.94	2,274,960.778579
30	0.035904	80,387,148.68	18.32	2,886,220.186279
35	0.030228	57,231,881.64	13.04	1,730,005.318335
40	0.026268	40,503,144.46	9.23	1,063,936.598728
45	0.024156	37,231,397.73	8.49	899,361.643469
50	0.023628	33,762,905.76	7.69	797,749.937345
55	0.024882	29,476,828.56	6.72	733,442.448329
60	0.027786	36,407,303.34	8.30	1,011,613.330661
65	0.032340	30,079,965.77	6.86	972,786.093131
70	0.038610	12,287,966.56	2.80	474,438.388959
75	0.046530	0.00	0.00	0.000000
Total		438,764,600.00	100.00	15,125,132.563751

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.015726	588,406.97	0.13	9,253.288042
10	0.009895	2,484,709.47	0.57	24,586.200166
15	0.006241	6,332,996.84	1.44	39,524.233253
20	0.004355	19,605,289.64	4.47	85,381.036382
25	0.003478	52,384,654.57	11.94	182,193.828588
30	0.002894	80,387,148.68	18.32	232,640.408286
35	0.002512	57,231,881.64	13.04	143,766.486690
40	0.002295	40,503,144.46	9.23	92,954.716540
45	0.002195	37,231,397.73	8.49	81,722.918009
50	0.002232	33,762,905.76	7.69	75,358.805661
55	0.002397	29,476,828.56	6.72	70,655.958068
60	0.002718	36,407,303.34	8.30	98,955.050484
65	0.003252	30,079,965.77	6.86	97,820.048697
70	0.003797	12,287,966.56	2.80	46,657.409036
75	0.004635	0.00	0.00	0.000000
Total		438,764,600.00	100.00	1,281,470.387900

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000485	588,406.97	0.13	285.377381
10	0.000329	2,484,709.47	0.57	817.469414
15	0.000235	6,332,996.84	1.44	1,488.254256
20	0.000177	19,605,289.64	4.47	3,470.136266
25	0.000140	52,384,654.57	11.94	7,333.851640
30	0.000117	80,387,148.68	18.32	9,405.296396
35	0.000103	57,231,881.64	13.04	5,894.883809
40	0.000095	40,503,144.46	9.23	3,847.798724
45	0.000092	37,231,397.73	8.49	3,425.288591
50	0.000095	33,762,905.76	7.69	3,207.476047
55	0.000102	29,476,828.56	6.72	3,006.636514
60	0.000116	36,407,303.34	8.30	4,223.247188
65	0.000140	30,079,965.77	6.86	4,211.195208
70	0.000163	12,287,966.56	2.80	2,002.938550
75	0.000200	0.00	0.00	0.000000
Total		438,764,600.00	100.00	52,619.849984

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.026149	588,406.97	0.13	15,386.253911
10	0.014876	2,484,709.47	0.57	36,962.538016
15	0.007599	6,332,996.84	1.44	48,124.442957
20	0.004463	19,605,289.64	4.47	87,498.407663
25	0.003655	52,384,654.57	11.94	191,465.912446
30	0.003027	80,387,148.68	18.32	243,331.899060
35	0.002565	57,231,881.64	13.04	146,799.776417
40	0.002256	40,503,144.46	9.23	91,375.093906
45	0.002091	37,231,397.73	8.49	77,850.852645

50	0.002070	33,762,905.76	7.69	69,889.214927
55	0.002194	29,476,828.56	6.72	64,672.161869
60	0.002467	36,407,303.34	8.30	89,816.817345
65	0.002900	30,079,965.77	6.86	87,231.900745
70	0.003470	12,287,966.56	2.80	42,639.243970
75	0.004228	0.00	0.00	0.000000
Total		438,764,600.00	100.00	1,293,044.515878

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.055784	588,406.97	0.13	32,823.694526
10	0.032112	2,484,709.47	0.57	79,788.990372
15	0.016875	6,332,996.84	1.44	106,869.321608
20	0.010185	19,605,289.64	4.47	199,679.874983
25	0.008303	52,384,654.57	11.94	434,949.786878
30	0.006879	80,387,148.68	18.32	552,983.195783
35	0.005851	57,231,881.64	13.04	334,863.739499
40	0.005178	40,503,144.46	9.23	209,725.282024
45	0.004823	37,231,397.73	8.49	179,567.031232
50	0.004796	33,762,905.76	7.69	161,926.896035
55	0.005093	29,476,828.56	6.72	150,125.487876
60	0.005731	36,407,303.34	8.30	208,650.255453
65	0.006756	30,079,965.77	6.86	203,220.248769
70	0.008036	12,287,966.56	2.80	98,746.099292
75	0.009780	0.00	0.00	0.000000
Total		438,764,600.00	100.00	2,953,919.904332

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.002691	588,406.97	0.13	1,583.403162
10	0.001754	2,484,709.47	0.57	4,358.180403
15	0.001176	6,332,996.84	1.44	7,447.604279
20	0.000853	19,605,289.64	4.47	16,723.312063
25	0.000679	52,384,654.57	11.94	35,569.180452
30	0.000566	80,387,148.68	18.32	45,499.126154
35	0.000495	57,231,881.64	13.04	28,329.781414
40	0.000456	40,503,144.46	9.23	18,469.433875
45	0.000440	37,231,397.73	8.49	16,381.814999
50	0.000451	33,762,905.76	7.69	15,227.070499
55	0.000486	29,476,828.56	6.72	14,325.738682
60	0.000553	36,407,303.34	8.30	20,133.238748
65	0.000666	30,079,965.77	6.86	20,033.257205
70	0.000778	12,287,966.56	2.80	9,560.037985
75	0.000956	0.00	0.00	0.000000
Total		438,764,600.00	100.00	253,641.179920

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.032000	12,475,013.97	23,952,026.816360

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000320	12,475,013.97	239,520.268164

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	12,475,013.97	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	12,475,013.97	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	12,475,013.97	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000002	12,475,013.97	1,497.001676

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	79,711,104.089878	79,711.104090	87.866451645
CO	937,961,269.061574	937,961.269062	1,033.925316096
NOX	301,352,963.272632	301,352.963273	332.184779996

SO2	2,041,945.811822	2,041.945812	2.250859965
CO2	211,598,173,806.299000	211,598,173.806299	233,247.060357628
PM10	13,934,507.513968	13,934.507514	15.360165245
PM2.5	12,912,235.233674	12,912.235234	14.233302947
Diesel_PM	7,628,438.568528	7,628.438569	8.408914119
DEOG	15,125,132.563751	15,125.132564	16.672604704
BENZENE	1,520,990.656064	1,520.990656	1.676605204
ACROLEIN	52,619.849984	52.619850	0.058003456
ACETALDEHYDE	1,293,044.515878	1,293.044516	1.425337595
FORMALDEHYDE	2,953,919.904332	2,953.919904	3.256139322
BUTADIENE	255,138.181596	255.138182	0.281241703

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Title : **DSBPRP 2035 No Project**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 05:26 PM
Alternative Year : 2035
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
285585393			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.34	.89	2.18	5.61	13.76	19.72	14.93	11.52	9.54	7.74	6.16	4.48	2.72	.41	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
258023010			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.06	.11	.36	1.73	6.49	13.43	11.36	8.72	8.6	9.74	9.25	13.15	13.29	3.71	0

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.280000	1,125,804.14	0.21	315,225.159816
10	0.171000	2,825,535.31	0.52	483,166.537788
15	0.104000	7,154,644.40	1.32	744,083.017954
20	0.072000	20,485,138.62	3.77	1,474,929.980662
25	0.060000	56,042,243.43	10.31	3,362,534.605548
30	0.051000	90,969,929.74	16.73	4,639,466.416873
35	0.045000	71,949,313.11	13.24	3,237,719.089991
40	0.042000	55,399,043.75	10.19	2,326,759.837315
45	0.040000	49,434,825.35	9.09	1,977,393.014088
50	0.040000	47,235,750.59	8.69	1,889,430.023688
55	0.043000	41,459,188.63	7.63	1,782,745.111253
60	0.048000	46,724,251.42	8.60	2,242,764.068227
65	0.057000	42,059,180.72	7.74	2,397,373.300960
70	0.068000	10,743,553.78	1.98	730,561.657196
75	0.086000	0.00	0.00	0.000000
Total		543,608,403.00	100.00	27,604,151.821358

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.641000	1,125,804.14	0.21	1,847,444.597350
10	1.355000	2,825,535.31	0.52	3,828,600.343289
15	1.152000	7,154,644.40	1.32	8,242,150.352717

20	1.018000	20,485,138.62	3.77	20,853,871.115465
25	0.930000	56,042,243.43	10.31	52,119,286.385994
30	0.859000	90,969,929.74	16.73	78,143,169.648893
35	0.802000	71,949,313.11	13.24	57,703,349.114942
40	0.758000	55,399,043.75	10.19	41,992,475.159165
45	0.728000	49,434,825.35	9.09	35,988,552.856402
50	0.712000	47,235,750.59	8.69	33,631,854.421646
55	0.714000	41,459,188.63	7.63	29,601,860.684533
60	0.740000	46,724,251.42	8.60	34,575,946.051836
65	0.805000	42,059,180.72	7.74	33,857,640.478473
70	0.955000	10,743,553.78	1.98	10,260,093.862097
75	1.215000	0.00	0.00	0.000000
Total		543,608,403.00	100.00	442,646,295.072802

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.516000	1,125,804.14	0.21	580,914.937375
10	0.403000	2,825,535.31	0.52	1,138,690.729406
15	0.323000	7,154,644.40	1.32	2,310,950.142298
20	0.274000	20,485,138.62	3.77	5,612,927.981962
25	0.250000	56,042,243.43	10.31	14,010,560.856450
30	0.231000	90,969,929.74	16.73	21,014,053.770541
35	0.217000	71,949,313.11	13.24	15,613,000.945065
40	0.207000	55,399,043.75	10.19	11,467,602.055339
45	0.203000	49,434,825.35	9.09	10,035,269.546497
50	0.203000	47,235,750.59	8.69	9,588,857.370217
55	0.209000	41,459,188.63	7.63	8,664,970.424464
60	0.221000	46,724,251.42	8.60	10,326,059.564129
65	0.240000	42,059,180.72	7.74	10,094,203.372464
70	0.265000	10,743,553.78	1.98	2,847,041.752310
75	0.302000	0.00	0.00	0.000000
Total		543,608,403.00	100.00	123,305,103.448517

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.013000	1,125,804.14	0.21	14,635.453849
10	0.010000	2,825,535.31	0.52	28,255.353087
15	0.008000	7,154,644.40	1.32	57,237.155227
20	0.006000	20,485,138.62	3.77	122,910.831722
25	0.006000	56,042,243.43	10.31	336,253.460555
30	0.005000	90,969,929.74	16.73	454,849.648713
35	0.005000	71,949,313.11	13.24	359,746.565555
40	0.004000	55,399,043.75	10.19	221,596.174982
45	0.004000	49,434,825.35	9.09	197,739.301409
50	0.004000	47,235,750.59	8.69	188,943.002369
55	0.004000	41,459,188.63	7.63	165,836.754535
60	0.005000	46,724,251.42	8.60	233,621.257107
65	0.005000	42,059,180.72	7.74	210,295.903593
70	0.005000	10,743,553.78	1.98	53,717.768912
75	0.006000	0.00	0.00	0.000000

Total		543,608,403.00	100.00	2,645,638.631614

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,334.680000	1,125,804.14	0.21	1,502,588,272.511500
10	1,021.945000	2,825,535.31	0.52	2,887,541,681.049420
15	809.424000	7,154,644.40	1.32	5,791,140,891.577640
20	665.492000	20,485,138.62	3.77	13,632,695,870.700700
25	576.198000	56,042,243.43	10.31	32,291,428,577.459100
30	515.340000	90,969,929.74	16.73	46,880,443,593.551500
35	475.425000	71,949,313.11	13.24	34,206,502,185.749600
40	452.024000	55,399,043.75	10.19	25,041,697,350.061100
45	442.797000	49,434,825.35	9.09	21,889,592,361.478100
50	446.999000	47,235,750.59	8.69	21,114,333,278.962800
55	465.336000	41,459,188.63	7.63	19,292,453,002.098000
60	500.108000	46,724,251.42	8.60	23,367,171,929.853500
65	555.695000	42,059,180.72	7.74	23,372,076,429.422400
70	567.309000	10,743,553.78	1.98	6,094,914,752.682830
75	585.268000	0.00	0.00	0.000000
Total		543,608,403.00	100.00	277,364,580,177.158000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.095000	1,125,804.14	0.21	106,951.393509
10	0.063000	2,825,535.31	0.52	178,008.724448
15	0.045000	7,154,644.40	1.32	321,958.998153
20	0.034000	20,485,138.62	3.77	696,494.713090
25	0.027000	56,042,243.43	10.31	1,513,140.572497
30	0.022000	90,969,929.74	16.73	2,001,338.454337
35	0.020000	71,949,313.11	13.24	1,438,986.262218
40	0.018000	55,399,043.75	10.19	997,182.787421
45	0.018000	49,434,825.35	9.09	889,826.856340
50	0.018000	47,235,750.59	8.69	850,243.510660
55	0.020000	41,459,188.63	7.63	829,183.772676
60	0.022000	46,724,251.42	8.60	1,027,933.531271
65	0.025000	42,059,180.72	7.74	1,051,479.517965
70	0.026000	10,743,553.78	1.98	279,332.398340
75	0.028000	0.00	0.00	0.000000
Total		543,608,403.00	100.00	12,182,061.492924

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.088000	1,125,804.14	0.21	99,070.764514
10	0.059000	2,825,535.31	0.52	166,706.583213
15	0.042000	7,154,644.40	1.32	300,495.064943
20	0.031000	20,485,138.62	3.77	635,039.297229
25	0.025000	56,042,243.43	10.31	1,401,056.085645
30	0.021000	90,969,929.74	16.73	1,910,368.524595

35	0.018000	71,949,313.11	13.24	1,295,087.635996
40	0.017000	55,399,043.75	10.19	941,783.743675
45	0.017000	49,434,825.35	9.09	840,392.030987
50	0.017000	47,235,750.59	8.69	803,007.760067
55	0.018000	41,459,188.63	7.63	746,265.395408
60	0.020000	46,724,251.42	8.60	934,485.028428
65	0.023000	42,059,180.72	7.74	967,361.156528
70	0.024000	10,743,553.78	1.98	257,845.290775
75	0.026000	0.00	0.00	0.000000
Total		543,608,403.00	100.00	11,298,964.362004

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012035	1,125,804.14	0.21	13,549.052851
10	0.010043	2,825,535.31	0.52	28,376.851105
15	0.008549	7,154,644.40	1.32	61,165.055005
20	0.007387	20,485,138.62	3.77	151,323.718988
25	0.006723	56,042,243.43	10.31	376,772.002552
30	0.006308	90,969,929.74	16.73	573,838.316816
35	0.006142	71,949,313.11	13.24	441,912.681127
40	0.006308	55,399,043.75	10.19	349,457.167947
45	0.006640	49,434,825.35	9.09	328,247.240339
50	0.007138	47,235,750.59	8.69	337,168.787727
55	0.007885	41,459,188.63	7.63	326,905.702378
60	0.008798	46,724,251.42	8.60	411,079.964005
65	0.009960	42,059,180.72	7.74	418,909.439957
70	0.011288	10,743,553.78	1.98	121,273.235095
75	0.012782	0.00	0.00	0.000000
Total		543,608,403.00	100.00	3,939,979.215892

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.158530	1,125,804.14	0.21	178,473.730663
10	0.088478	2,825,535.31	0.52	249,997.713043
15	0.044571	7,154,644.40	1.32	318,889.655704
20	0.027473	20,485,138.62	3.77	562,788.213316
25	0.023738	56,042,243.43	10.31	1,330,330.774442
30	0.020667	90,969,929.74	16.73	1,880,075.537990
35	0.018011	71,949,313.11	13.24	1,295,879.078440
40	0.015936	55,399,043.75	10.19	882,839.161130
45	0.014193	49,434,825.35	9.09	701,628.476224
50	0.012948	47,235,750.59	8.69	611,608.498668
55	0.012035	41,459,188.63	7.63	498,961.335208
60	0.011537	46,724,251.42	8.60	539,057.688649
65	0.011537	42,059,180.72	7.74	485,236.767950
70	0.011869	10,743,553.78	1.98	127,515.239842
75	0.012616	0.00	0.00	0.000000
Total		543,608,403.00	100.00	9,663,281.871268

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.005966	1,125,804.14	0.21	6,716.547512
10	0.003679	2,825,535.31	0.52	10,395.144401
15	0.002272	7,154,644.40	1.32	16,255.352085
20	0.001608	20,485,138.62	3.77	32,940.102901
25	0.001324	56,042,243.43	10.31	74,199.930296
30	0.001145	90,969,929.74	16.73	104,160.569555
35	0.001020	71,949,313.11	13.24	73,388.299373
40	0.000948	55,399,043.75	10.19	52,518.293471
45	0.000918	49,434,825.35	9.09	45,381.169673
50	0.000939	47,235,750.59	8.69	44,354.369806
55	0.001014	41,459,188.63	7.63	42,039.617275
60	0.001154	46,724,251.42	8.60	53,919.786140
65	0.001382	42,059,180.72	7.74	58,125.787753
70	0.001690	10,743,553.78	1.98	18,156.605892
75	0.002197	0.00	0.00	0.000000
Total		543,608,403.00	100.00	632,551.576134

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000152	1,125,804.14	0.21	171.122230
10	0.000104	2,825,535.31	0.52	293.855672
15	0.000075	7,154,644.40	1.32	536.598330
20	0.000057	20,485,138.62	3.77	1,167.652901
25	0.000046	56,042,243.43	10.31	2,577.943198
30	0.000040	90,969,929.74	16.73	3,638.797190
35	0.000036	71,949,313.11	13.24	2,590.175272
40	0.000034	55,399,043.75	10.19	1,883.567487
45	0.000034	49,434,825.35	9.09	1,680.784062
50	0.000037	47,235,750.59	8.69	1,747.722772
55	0.000042	41,459,188.63	7.63	1,741.285923
60	0.000050	46,724,251.42	8.60	2,336.212571
65	0.000062	42,059,180.72	7.74	2,607.669205
70	0.000079	10,743,553.78	1.98	848.740749
75	0.000105	0.00	0.00	0.000000
Total		543,608,403.00	100.00	23,822.127561

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.011940	1,125,804.14	0.21	13,442.101458
10	0.006731	2,825,535.31	0.52	19,018.678163
15	0.003461	7,154,644.40	1.32	24,762.224280
20	0.002171	20,485,138.62	3.77	44,473.235945
25	0.001872	56,042,243.43	10.31	104,911.079693
30	0.001629	90,969,929.74	16.73	148,190.015551
35	0.001428	71,949,313.11	13.24	102,743.619122
40	0.001270	55,399,043.75	10.19	70,356.785557
45	0.001148	49,434,825.35	9.09	56,751.179504

50	0.001068	47,235,750.59	8.69	50,447.781632
55	0.001023	41,459,188.63	7.63	42,412.749972
60	0.001018	46,724,251.42	8.60	47,565.287947
65	0.001063	42,059,180.72	7.74	44,708.909104
70	0.001156	10,743,553.78	1.98	12,419.548172
75	0.001324	0.00	0.00	0.000000
Total		543,608,403.00	100.00	782,203.196101

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.025001	1,125,804.14	0.21	28,146.229359
10	0.014218	2,825,535.31	0.52	40,173.461019
15	0.007463	7,154,644.40	1.32	53,395.111183
20	0.004753	20,485,138.62	3.77	97,365.863862
25	0.004072	56,042,243.43	10.31	228,204.015230
30	0.003538	90,969,929.74	16.73	321,851.611429
35	0.003107	71,949,313.11	13.24	223,546.515836
40	0.002778	55,399,043.75	10.19	153,898.543525
45	0.002536	49,434,825.35	9.09	125,366.717093
50	0.002390	47,235,750.59	8.69	112,893.443915
55	0.002334	41,459,188.63	7.63	96,765.746271
60	0.002378	46,724,251.42	8.60	111,110.269880
65	0.002548	42,059,180.72	7.74	107,166.792471
70	0.002839	10,743,553.78	1.98	30,500.949188
75	0.003347	0.00	0.00	0.000000
Total		543,608,403.00	100.00	1,730,385.270262

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000938	1,125,804.14	0.21	1,056.004285
10	0.000603	2,825,535.31	0.52	1,703.797791
15	0.000399	7,154,644.40	1.32	2,854.703117
20	0.000294	20,485,138.62	3.77	6,022.630754
25	0.000239	56,042,243.43	10.31	13,394.096179
30	0.000207	90,969,929.74	16.73	18,830.775457
35	0.000186	71,949,313.11	13.24	13,382.572239
40	0.000175	55,399,043.75	10.19	9,694.832655
45	0.000174	49,434,825.35	9.09	8,601.659611
50	0.000182	47,235,750.59	8.69	8,596.906608
55	0.000202	41,459,188.63	7.63	8,374.756104
60	0.000236	46,724,251.42	8.60	11,026.923335
65	0.000290	42,059,180.72	7.74	12,197.162408
70	0.000362	10,743,553.78	1.98	3,889.166469
75	0.000480	0.00	0.00	0.000000
Total		543,608,403.00	100.00	119,625.987014

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.016000	15,099,990.36	14,495,990.749935

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000166	15,099,990.36	150,395.904031

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	15,099,990.36	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	15,099,990.36	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	15,099,990.36	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000001	15,099,990.36	905.999422

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	42,100,142.571294	42,100.142571	46.407463348
CO	442,646,295.072802	442,646.295073	487.934017798
NOX	123,305,103.448517	123,305.103449	135.920610226

SO2	2,645,638.631614	2,645.638632	2.916317388
CO2	277,364,580,177.158000	277,364,580.177158	305,742.113979076
PM10	12,182,061.492924	12,182.061493	13.428424174
PM2.5	11,298,964.362004	11,298.964362	12.454976218
Diesel_PM	3,939,979.215892	3,939.979216	4.343083654
DEOG	9,663,281.871268	9,663.281871	10.651944907
BENZENE	782,947.480164	782.947480	0.863051863
ACROLEIN	23,822.127561	23.822128	0.026259401
ACETALDEHYDE	782,203.196101	782.203196	0.862231431
FORMALDEHYDE	1,730,385.270262	1,730.385270	1.907423256
BUTADIENE	120,531.986435	120.531986	0.132863772

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Title : **DSBPRP 2035 With Project**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 05:29 PM
Alternative Year : 2035
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
285587168			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.32	.89	2.2	5.77	13.61	19.74	14.89	11.53	9.57	7.72	6.12	4.52	2.71	.41	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
257953725			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	.06	.13	.35	1.73	6.46	13.47	11.38	8.65	8.59	9.65	9.37	13.16	13.29	3.71	0

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.280000	1,068,651.17	0.20	299,222.328328
10	0.171000	2,877,065.64	0.53	491,978.224047
15	0.104000	7,185,755.73	1.32	747,318.596284
20	0.072000	20,940,979.04	3.85	1,507,750.490599
25	0.060000	55,532,224.20	10.22	3,331,933.451988
30	0.051000	91,121,273.72	16.76	4,647,184.959756
35	0.045000	71,879,063.22	13.22	3,234,557.844909
40	0.042000	55,241,197.68	10.16	2,320,130.302682
45	0.040000	49,488,916.96	9.10	1,979,556.678204
50	0.040000	46,939,863.83	8.64	1,877,594.553284
55	0.043000	41,648,198.71	7.66	1,790,872.544706
60	0.048000	46,855,250.20	8.62	2,249,052.009773
65	0.057000	42,021,462.31	7.73	2,395,223.351402
70	0.068000	10,740,990.59	1.98	730,387.359868
75	0.086000	0.00	0.00	0.000000
Total		543,540,893.00	100.00	27,602,762.695830

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.641000	1,068,651.17	0.20	1,753,656.574237
10	1.355000	2,877,065.64	0.53	3,898,423.939084
15	1.152000	7,185,755.73	1.32	8,277,990.604992

20	1.018000	20,940,979.04	3.85	21,317,916.658750
25	0.930000	55,532,224.20	10.22	51,644,968.505814
30	0.859000	91,121,273.72	16.76	78,273,174.126081
35	0.802000	71,879,063.22	13.22	57,647,008.702600
40	0.758000	55,241,197.68	10.16	41,872,827.843638
45	0.728000	49,488,916.96	9.10	36,027,931.543313
50	0.712000	46,939,863.83	8.64	33,421,183.048455
55	0.714000	41,648,198.71	7.66	29,736,813.881867
60	0.740000	46,855,250.20	8.62	34,672,885.150664
65	0.805000	42,021,462.31	7.73	33,827,277.155767
70	0.955000	10,740,990.59	1.98	10,257,646.009917
75	1.215000	0.00	0.00	0.000000
Total		543,540,893.00	100.00	442,629,703.745178

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.516000	1,068,651.17	0.20	551,424.005062
10	0.403000	2,877,065.64	0.53	1,159,457.451993
15	0.323000	7,185,755.73	1.32	2,320,999.101921
20	0.274000	20,940,979.04	3.85	5,737,828.255891
25	0.250000	55,532,224.20	10.22	13,883,056.049950
30	0.231000	91,121,273.72	16.76	21,049,014.229482
35	0.217000	71,879,063.22	13.22	15,597,756.718783
40	0.207000	55,241,197.68	10.16	11,434,927.920360
45	0.203000	49,488,916.96	9.10	10,046,250.141885
50	0.203000	46,939,863.83	8.64	9,528,792.357916
55	0.209000	41,648,198.71	7.66	8,704,473.531247
60	0.221000	46,855,250.20	8.62	10,355,010.294996
65	0.240000	42,021,462.31	7.73	10,085,150.953272
70	0.265000	10,740,990.59	1.98	2,846,362.505370
75	0.302000	0.00	0.00	0.000000
Total		543,540,893.00	100.00	123,300,503.518128

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.013000	1,068,651.17	0.20	13,892.465244
10	0.010000	2,877,065.64	0.53	28,770.656377
15	0.008000	7,185,755.73	1.32	57,486.045868
20	0.006000	20,940,979.04	3.85	125,645.874217
25	0.006000	55,532,224.20	10.22	333,193.345199
30	0.005000	91,121,273.72	16.76	455,606.368604
35	0.005000	71,879,063.22	13.22	359,395.316101
40	0.004000	55,241,197.68	10.16	220,964.790732
45	0.004000	49,488,916.96	9.10	197,955.667820
50	0.004000	46,939,863.83	8.64	187,759.455328
55	0.004000	41,648,198.71	7.66	166,592.794856
60	0.005000	46,855,250.20	8.62	234,276.251018
65	0.005000	42,021,462.31	7.73	210,107.311527
70	0.005000	10,740,990.59	1.98	53,704.952932
75	0.006000	0.00	0.00	0.000000

Total		543,540,893.00	100.00	2,645,351.295822

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,334.680000	1,068,651.17	0.20	1,426,307,347.045770
10	1,021.945000	2,877,065.64	0.53	2,940,202,843.119330
15	809.424000	7,185,755.73	1.32	5,816,323,148.832500
20	665.492000	20,940,979.04	3.85	13,936,054,020.692300
25	576.198000	55,532,224.20	10.22	31,997,556,519.476400
30	515.340000	91,121,273.72	16.76	46,958,437,199.225500
35	475.425000	71,879,063.22	13.22	34,173,103,631.463600
40	452.024000	55,241,197.68	10.16	24,970,347,141.415200
45	442.797000	49,488,916.96	9.10	21,913,543,960.967400
50	446.999000	46,939,863.83	8.64	20,982,072,193.084900
55	465.336000	41,648,198.71	7.66	19,380,406,196.824400
60	500.108000	46,855,250.20	8.62	23,432,685,468.822000
65	555.695000	42,021,462.31	7.73	23,351,116,495.743700
70	567.309000	10,740,990.59	1.98	6,093,460,628.523270
75	585.268000	0.00	0.00	0.000000
Total		543,540,893.00	100.00	277,371,616,795.236000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.095000	1,068,651.17	0.20	101,521.861397
10	0.063000	2,877,065.64	0.53	181,255.135175
15	0.045000	7,185,755.73	1.32	323,359.008008
20	0.034000	20,940,979.04	3.85	711,993.287227
25	0.027000	55,532,224.20	10.22	1,499,370.053395
30	0.022000	91,121,273.72	16.76	2,004,668.021855
35	0.020000	71,879,063.22	13.22	1,437,581.264404
40	0.018000	55,241,197.68	10.16	994,341.558292
45	0.018000	49,488,916.96	9.10	890,800.505192
50	0.018000	46,939,863.83	8.64	844,917.548978
55	0.020000	41,648,198.71	7.66	832,963.974282
60	0.022000	46,855,250.20	8.62	1,030,815.504479
65	0.025000	42,021,462.31	7.73	1,050,536.557633
70	0.026000	10,740,990.59	1.98	279,265.755244
75	0.028000	0.00	0.00	0.000000
Total		543,540,893.00	100.00	12,183,390.035560

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.088000	1,068,651.17	0.20	94,041.303189
10	0.059000	2,877,065.64	0.53	169,746.872624
15	0.042000	7,185,755.73	1.32	301,801.740807
20	0.031000	20,940,979.04	3.85	649,170.350119
25	0.025000	55,532,224.20	10.22	1,388,305.604995
30	0.021000	91,121,273.72	16.76	1,913,546.748135

35	0.018000	71,879,063.22	13.22	1,293,823.137964
40	0.017000	55,241,197.68	10.16	939,100.360609
45	0.017000	49,488,916.96	9.10	841,311.588237
50	0.017000	46,939,863.83	8.64	797,977.685146
55	0.018000	41,648,198.71	7.66	749,667.576854
60	0.020000	46,855,250.20	8.62	937,105.004072
65	0.023000	42,021,462.31	7.73	966,493.633022
70	0.024000	10,740,990.59	1.98	257,783.774071
75	0.026000	0.00	0.00	0.000000
Total		543,540,893.00	100.00	11,299,875.379843

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012035	1,068,651.17	0.20	12,861.216862
10	0.010043	2,877,065.64	0.53	28,894.370199
15	0.008549	7,185,755.73	1.32	61,431.025766
20	0.007387	20,940,979.04	3.85	154,691.012140
25	0.006723	55,532,224.20	10.22	373,343.143295
30	0.006308	91,121,273.72	16.76	574,792.994630
35	0.006142	71,879,063.22	13.22	441,481.206298
40	0.006308	55,241,197.68	10.16	348,461.474984
45	0.006640	49,488,916.96	9.10	328,606.408582
50	0.007138	46,939,863.83	8.64	335,056.748034
55	0.007885	41,648,198.71	7.66	328,396.046861
60	0.008798	46,855,250.20	8.62	412,232.491291
65	0.009960	42,021,462.31	7.73	418,533.764561
70	0.011288	10,740,990.59	1.98	121,244.301738
75	0.012782	0.00	0.00	0.000000
Total		543,540,893.00	100.00	3,940,026.205241

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.158530	1,068,651.17	0.20	169,413.270392
10	0.088478	2,877,065.64	0.53	254,557.013492
15	0.044571	7,185,755.73	1.32	320,276.318798
20	0.027473	20,940,979.04	3.85	575,311.517059
25	0.023738	55,532,224.20	10.22	1,318,223.938055
30	0.020667	91,121,273.72	16.76	1,883,203.363986
35	0.018011	71,879,063.22	13.22	1,294,613.807659
40	0.015936	55,241,197.68	10.16	880,323.726275
45	0.014193	49,488,916.96	9.10	702,396.198344
50	0.012948	46,939,863.83	8.64	607,777.356898
55	0.012035	41,648,198.71	7.66	501,236.071524
60	0.011537	46,855,250.20	8.62	540,569.021599
65	0.011537	42,021,462.31	7.73	484,801.610616
70	0.011869	10,740,990.59	1.98	127,484.817269
75	0.012616	0.00	0.00	0.000000
Total		543,540,893.00	100.00	9,660,188.031966

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.005966	1,068,651.17	0.20	6,375.572896
10	0.003679	2,877,065.64	0.53	10,584.724481
15	0.002272	7,185,755.73	1.32	16,326.037027
20	0.001608	20,940,979.04	3.85	33,673.094290
25	0.001324	55,532,224.20	10.22	73,524.664841
30	0.001145	91,121,273.72	16.76	104,333.858410
35	0.001020	71,879,063.22	13.22	73,316.644485
40	0.000948	55,241,197.68	10.16	52,368.655403
45	0.000918	49,488,916.96	9.10	45,430.825765
50	0.000939	46,939,863.83	8.64	44,076.532138
55	0.001014	41,648,198.71	7.66	42,231.273496
60	0.001154	46,855,250.20	8.62	54,070.958735
65	0.001382	42,021,462.31	7.73	58,073.660906
70	0.001690	10,740,990.59	1.98	18,152.274091
75	0.002197	0.00	0.00	0.000000
Total		543,540,893.00	100.00	632,538.776963

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000152	1,068,651.17	0.20	162.434978
10	0.000104	2,877,065.64	0.53	299.214826
15	0.000075	7,185,755.73	1.32	538.931680
20	0.000057	20,940,979.04	3.85	1,193.635805
25	0.000046	55,532,224.20	10.22	2,554.482313
30	0.000040	91,121,273.72	16.76	3,644.850949
35	0.000036	71,879,063.22	13.22	2,587.646276
40	0.000034	55,241,197.68	10.16	1,878.200721
45	0.000034	49,488,916.96	9.10	1,682.623176
50	0.000037	46,939,863.83	8.64	1,736.774962
55	0.000042	41,648,198.71	7.66	1,749.224346
60	0.000050	46,855,250.20	8.62	2,342.762510
65	0.000062	42,021,462.31	7.73	2,605.330663
70	0.000079	10,740,990.59	1.98	848.538256
75	0.000105	0.00	0.00	0.000000
Total		543,540,893.00	100.00	23,824.651462

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.011940	1,068,651.17	0.20	12,759.695001
10	0.006731	2,877,065.64	0.53	19,365.528807
15	0.003461	7,185,755.73	1.32	24,869.900594
20	0.002171	20,940,979.04	3.85	45,462.865487
25	0.001872	55,532,224.20	10.22	103,956.323702
30	0.001629	91,121,273.72	16.76	148,436.554891
35	0.001428	71,879,063.22	13.22	102,643.302278
40	0.001270	55,241,197.68	10.16	70,156.321057
45	0.001148	49,488,916.96	9.10	56,813.276664

50	0.001068	46,939,863.83	8.64	50,131.774573
55	0.001023	41,648,198.71	7.66	42,606.107285
60	0.001018	46,855,250.20	8.62	47,698.644707
65	0.001063	42,021,462.31	7.73	44,668.814431
70	0.001156	10,740,990.59	1.98	12,416.585118
75	0.001324	0.00	0.00	0.000000
Total		543,540,893.00	100.00	781,985.694595

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.025001	1,068,651.17	0.20	26,717.347966
10	0.014218	2,877,065.64	0.53	40,906.119237
15	0.007463	7,185,755.73	1.32	53,627.295039
20	0.004753	20,940,979.04	3.85	99,532.473359
25	0.004072	55,532,224.20	10.22	226,127.216942
30	0.003538	91,121,273.72	16.76	322,387.066424
35	0.003107	71,879,063.22	13.22	223,328.249425
40	0.002778	55,241,197.68	10.16	153,460.047163
45	0.002536	49,488,916.96	9.10	125,503.893398
50	0.002390	46,939,863.83	8.64	112,186.274559
55	0.002334	41,648,198.71	7.66	97,206.895799
60	0.002378	46,855,250.20	8.62	111,421.784984
65	0.002548	42,021,462.31	7.73	107,070.685954
70	0.002839	10,740,990.59	1.98	30,493.672275
75	0.003347	0.00	0.00	0.000000
Total		543,540,893.00	100.00	1,729,969.022523

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000938	1,068,651.17	0.20	1,002.394800
10	0.000603	2,877,065.64	0.53	1,734.870580
15	0.000399	7,185,755.73	1.32	2,867.116538
20	0.000294	20,940,979.04	3.85	6,156.647837
25	0.000239	55,532,224.20	10.22	13,272.201584
30	0.000207	91,121,273.72	16.76	18,862.103660
35	0.000186	71,879,063.22	13.22	13,369.505759
40	0.000175	55,241,197.68	10.16	9,667.209595
45	0.000174	49,488,916.96	9.10	8,611.071550
50	0.000182	46,939,863.83	8.64	8,543.055217
55	0.000202	41,648,198.71	7.66	8,412.936140
60	0.000236	46,855,250.20	8.62	11,057.839048
65	0.000290	42,021,462.31	7.73	12,186.224069
70	0.000362	10,740,990.59	1.98	3,888.238592
75	0.000480	0.00	0.00	0.000000
Total		543,540,893.00	100.00	119,631.414968

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.016000	15,097,556.91	14,493,654.635414

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000166	15,097,556.91	150,371.666842

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	15,097,556.91	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	15,097,556.91	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	15,097,556.91	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000001	15,097,556.91	905.853415

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	42,096,417.331244	42,096.417331	46.403356974
CO	442,629,703.745178	442,629.703745	487.915728989
NOX	123,300,503.518128	123,300.503518	135.915539671

SO2	2,645,351.295822	2,645.351296	2.916000655
CO2	277,371,616,795.236000	277,371,616.795236	305,749.870522774
PM10	12,183,390.035560	12,183.390036	13.429888642
PM2.5	11,299,875.379843	11,299.875380	12.455980443
Diesel_PM	3,940,026.205241	3,940.026205	4.343135451
DEOG	9,660,188.031966	9,660.188032	10.648534533
BENZENE	782,910.443805	782.910444	0.863011038
ACROLEIN	23,824.651462	23.824651	0.026262183
ACETALDEHYDE	781,985.694595	781.985695	0.861991676
FORMALDEHYDE	1,729,969.022523	1,729.969023	1.906964421
BUTADIENE	120,537.268383	120.537268	0.132869594

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Title : **DSBPRP Forecast Year Park and Ride Re-distributed Net**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 27 January 2012 09:50 AM
Alternative Year : 2035
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
13260			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0	0	0	0	0	100	0	0		0	0	0	0	0	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%															

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.280000	0.00	0.00	0.000000
10	0.171000	0.00	0.00	0.000000
15	0.104000	0.00	0.00	0.000000
20	0.072000	0.00	0.00	0.000000
25	0.060000	0.00	0.00	0.000000
30	0.051000	13,260.00	100.00	676.260000
35	0.045000	0.00	0.00	0.000000
40	0.042000	0.00	0.00	0.000000
45	0.040000	0.00	0.00	0.000000
50	0.040000	0.00	0.00	0.000000
55	0.043000	0.00	0.00	0.000000
60	0.048000	0.00	0.00	0.000000
65	0.057000	0.00	0.00	0.000000
70	0.068000	0.00	0.00	0.000000
75	0.086000	0.00	0.00	0.000000
Total		13,260.00	100.00	676.260000

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.641000	0.00	0.00	0.000000
10	1.355000	0.00	0.00	0.000000
15	1.152000	0.00	0.00	0.000000

20	1.018000	0.00	0.00	0.000000
25	0.930000	0.00	0.00	0.000000
30	0.859000	13,260.00	100.00	11,390.340000
35	0.802000	0.00	0.00	0.000000
40	0.758000	0.00	0.00	0.000000
45	0.728000	0.00	0.00	0.000000
50	0.712000	0.00	0.00	0.000000
55	0.714000	0.00	0.00	0.000000
60	0.740000	0.00	0.00	0.000000
65	0.805000	0.00	0.00	0.000000
70	0.955000	0.00	0.00	0.000000
75	1.215000	0.00	0.00	0.000000
Total		13,260.00	100.00	11,390.340000

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.516000	0.00	0.00	0.000000
10	0.403000	0.00	0.00	0.000000
15	0.323000	0.00	0.00	0.000000
20	0.274000	0.00	0.00	0.000000
25	0.250000	0.00	0.00	0.000000
30	0.231000	13,260.00	100.00	3,063.060000
35	0.217000	0.00	0.00	0.000000
40	0.207000	0.00	0.00	0.000000
45	0.203000	0.00	0.00	0.000000
50	0.203000	0.00	0.00	0.000000
55	0.209000	0.00	0.00	0.000000
60	0.221000	0.00	0.00	0.000000
65	0.240000	0.00	0.00	0.000000
70	0.265000	0.00	0.00	0.000000
75	0.302000	0.00	0.00	0.000000
Total		13,260.00	100.00	3,063.060000

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.013000	0.00	0.00	0.000000
10	0.010000	0.00	0.00	0.000000
15	0.008000	0.00	0.00	0.000000
20	0.006000	0.00	0.00	0.000000
25	0.006000	0.00	0.00	0.000000
30	0.005000	13,260.00	100.00	66.300000
35	0.005000	0.00	0.00	0.000000
40	0.004000	0.00	0.00	0.000000
45	0.004000	0.00	0.00	0.000000
50	0.004000	0.00	0.00	0.000000
55	0.004000	0.00	0.00	0.000000
60	0.005000	0.00	0.00	0.000000
65	0.005000	0.00	0.00	0.000000
70	0.005000	0.00	0.00	0.000000
75	0.006000	0.00	0.00	0.000000

Total		13,260.00	100.00	66.300000

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,334.680000	0.00	0.00	0.000000
10	1,021.945000	0.00	0.00	0.000000
15	809.424000	0.00	0.00	0.000000
20	665.492000	0.00	0.00	0.000000
25	576.198000	0.00	0.00	0.000000
30	515.340000	13,260.00	100.00	6,833,408.400000
35	475.425000	0.00	0.00	0.000000
40	452.024000	0.00	0.00	0.000000
45	442.797000	0.00	0.00	0.000000
50	446.999000	0.00	0.00	0.000000
55	465.336000	0.00	0.00	0.000000
60	500.108000	0.00	0.00	0.000000
65	555.695000	0.00	0.00	0.000000
70	567.309000	0.00	0.00	0.000000
75	585.268000	0.00	0.00	0.000000
Total		13,260.00	100.00	6,833,408.400000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.095000	0.00	0.00	0.000000
10	0.063000	0.00	0.00	0.000000
15	0.045000	0.00	0.00	0.000000
20	0.034000	0.00	0.00	0.000000
25	0.027000	0.00	0.00	0.000000
30	0.022000	13,260.00	100.00	291.720000
35	0.020000	0.00	0.00	0.000000
40	0.018000	0.00	0.00	0.000000
45	0.018000	0.00	0.00	0.000000
50	0.018000	0.00	0.00	0.000000
55	0.020000	0.00	0.00	0.000000
60	0.022000	0.00	0.00	0.000000
65	0.025000	0.00	0.00	0.000000
70	0.026000	0.00	0.00	0.000000
75	0.028000	0.00	0.00	0.000000
Total		13,260.00	100.00	291.720000

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.088000	0.00	0.00	0.000000
10	0.059000	0.00	0.00	0.000000
15	0.042000	0.00	0.00	0.000000
20	0.031000	0.00	0.00	0.000000
25	0.025000	0.00	0.00	0.000000
30	0.021000	13,260.00	100.00	278.460000

35	0.018000	0.00	0.00	0.000000
40	0.017000	0.00	0.00	0.000000
45	0.017000	0.00	0.00	0.000000
50	0.017000	0.00	0.00	0.000000
55	0.018000	0.00	0.00	0.000000
60	0.020000	0.00	0.00	0.000000
65	0.023000	0.00	0.00	0.000000
70	0.024000	0.00	0.00	0.000000
75	0.026000	0.00	0.00	0.000000
Total		13,260.00	100.00	278.460000

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012035	0.00	0.00	0.000000
10	0.010043	0.00	0.00	0.000000
15	0.008549	0.00	0.00	0.000000
20	0.007387	0.00	0.00	0.000000
25	0.006723	0.00	0.00	0.000000
30	0.006308	13,260.00	100.00	83.644080
35	0.006142	0.00	0.00	0.000000
40	0.006308	0.00	0.00	0.000000
45	0.006640	0.00	0.00	0.000000
50	0.007138	0.00	0.00	0.000000
55	0.007885	0.00	0.00	0.000000
60	0.008798	0.00	0.00	0.000000
65	0.009960	0.00	0.00	0.000000
70	0.011288	0.00	0.00	0.000000
75	0.012782	0.00	0.00	0.000000
Total		13,260.00	100.00	83.644080

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.158530	0.00	0.00	0.000000
10	0.088478	0.00	0.00	0.000000
15	0.044571	0.00	0.00	0.000000
20	0.027473	0.00	0.00	0.000000
25	0.023738	0.00	0.00	0.000000
30	0.020667	13,260.00	100.00	274.044420
35	0.018011	0.00	0.00	0.000000
40	0.015936	0.00	0.00	0.000000
45	0.014193	0.00	0.00	0.000000
50	0.012948	0.00	0.00	0.000000
55	0.012035	0.00	0.00	0.000000
60	0.011537	0.00	0.00	0.000000
65	0.011537	0.00	0.00	0.000000
70	0.011869	0.00	0.00	0.000000
75	0.012616	0.00	0.00	0.000000
Total		13,260.00	100.00	274.044420

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.005966	0.00	0.00	0.000000
10	0.003679	0.00	0.00	0.000000
15	0.002272	0.00	0.00	0.000000
20	0.001608	0.00	0.00	0.000000
25	0.001324	0.00	0.00	0.000000
30	0.001145	13,260.00	100.00	15.182700
35	0.001020	0.00	0.00	0.000000
40	0.000948	0.00	0.00	0.000000
45	0.000918	0.00	0.00	0.000000
50	0.000939	0.00	0.00	0.000000
55	0.001014	0.00	0.00	0.000000
60	0.001154	0.00	0.00	0.000000
65	0.001382	0.00	0.00	0.000000
70	0.001690	0.00	0.00	0.000000
75	0.002197	0.00	0.00	0.000000
Total		13,260.00	100.00	15.182700

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000152	0.00	0.00	0.000000
10	0.000104	0.00	0.00	0.000000
15	0.000075	0.00	0.00	0.000000
20	0.000057	0.00	0.00	0.000000
25	0.000046	0.00	0.00	0.000000
30	0.000040	13,260.00	100.00	0.530400
35	0.000036	0.00	0.00	0.000000
40	0.000034	0.00	0.00	0.000000
45	0.000034	0.00	0.00	0.000000
50	0.000037	0.00	0.00	0.000000
55	0.000042	0.00	0.00	0.000000
60	0.000050	0.00	0.00	0.000000
65	0.000062	0.00	0.00	0.000000
70	0.000079	0.00	0.00	0.000000
75	0.000105	0.00	0.00	0.000000
Total		13,260.00	100.00	0.530400

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.011940	0.00	0.00	0.000000
10	0.006731	0.00	0.00	0.000000
15	0.003461	0.00	0.00	0.000000
20	0.002171	0.00	0.00	0.000000
25	0.001872	0.00	0.00	0.000000
30	0.001629	13,260.00	100.00	21.600540
35	0.001428	0.00	0.00	0.000000
40	0.001270	0.00	0.00	0.000000
45	0.001148	0.00	0.00	0.000000

50	0.001068	0.00	0.00	0.000000
55	0.001023	0.00	0.00	0.000000
60	0.001018	0.00	0.00	0.000000
65	0.001063	0.00	0.00	0.000000
70	0.001156	0.00	0.00	0.000000
75	0.001324	0.00	0.00	0.000000
Total		13,260.00	100.00	21.600540

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.025001	0.00	0.00	0.000000
10	0.014218	0.00	0.00	0.000000
15	0.007463	0.00	0.00	0.000000
20	0.004753	0.00	0.00	0.000000
25	0.004072	0.00	0.00	0.000000
30	0.003538	13,260.00	100.00	46.913880
35	0.003107	0.00	0.00	0.000000
40	0.002778	0.00	0.00	0.000000
45	0.002536	0.00	0.00	0.000000
50	0.002390	0.00	0.00	0.000000
55	0.002334	0.00	0.00	0.000000
60	0.002378	0.00	0.00	0.000000
65	0.002548	0.00	0.00	0.000000
70	0.002839	0.00	0.00	0.000000
75	0.003347	0.00	0.00	0.000000
Total		13,260.00	100.00	46.913880

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000938	0.00	0.00	0.000000
10	0.000603	0.00	0.00	0.000000
15	0.000399	0.00	0.00	0.000000
20	0.000294	0.00	0.00	0.000000
25	0.000239	0.00	0.00	0.000000
30	0.000207	13,260.00	100.00	2.744820
35	0.000186	0.00	0.00	0.000000
40	0.000175	0.00	0.00	0.000000
45	0.000174	0.00	0.00	0.000000
50	0.000182	0.00	0.00	0.000000
55	0.000202	0.00	0.00	0.000000
60	0.000236	0.00	0.00	0.000000
65	0.000290	0.00	0.00	0.000000
70	0.000362	0.00	0.00	0.000000
75	0.000480	0.00	0.00	0.000000
Total		13,260.00	100.00	2.744820

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.016000	442.00	424.320000

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000166	442.00	4.402320

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	442.00	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	442.00	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	442.00	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000001	442.00	0.026520

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	1,100.580000	1.100580	0.001213182
CO	11,390.340000	11.390340	0.012555701
NOX	3,063.060000	3.063060	0.003376446

SO2	66.300000	0.066300	0.000073083
CO2	6,833,408.400000	6,833.408400	7.532543371
PM10	291.720000	0.291720	0.000321566
PM2.5	278.460000	0.278460	0.000306950
Diesel_PM	83.644080	0.083644	0.000092202
DEOG	274.044420	0.274044	0.000302082
BENZENE	19.585020	0.019585	0.000021589
ACROLEIN	0.530400	0.000530	0.000000585
ACETALDEHYDE	21.600540	0.021601	0.000023811
FORMALDEHYDE	46.913880	0.046914	0.000051714
BUTADIENE	2.771340	0.002771	0.000003055

---------- END----------

Title : **DSBPRP Opening Year Park & Ride Re-Distributed Net**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 27 January 2012 09:49 AM
Alternative Year : 2014
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
13260			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
0			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0	0	0	0	0	0	0	0		0	0	0	0	0	0

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.709000	0.00	0.00	0.000000
10	0.443000	0.00	0.00	0.000000
15	0.276000	0.00	0.00	0.000000
20	0.191000	0.00	0.00	0.000000
25	0.153000	0.00	0.00	0.000000
30	0.127000	13,260.00	100.00	1,684.020000
35	0.110000	0.00	0.00	0.000000
40	0.100000	0.00	0.00	0.000000
45	0.095000	0.00	0.00	0.000000
50	0.096000	0.00	0.00	0.000000
55	0.103000	0.00	0.00	0.000000
60	0.117000	0.00	0.00	0.000000
65	0.138000	0.00	0.00	0.000000
70	0.159000	0.00	0.00	0.000000
75	0.191000	0.00	0.00	0.000000
Total		13,260.00	100.00	1,684.020000

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	4.504000	0.00	0.00	0.000000
10	3.702000	0.00	0.00	0.000000
15	3.132000	0.00	0.00	0.000000

20	2.729000	0.00	0.00	0.000000
25	2.446000	0.00	0.00	0.000000
30	2.227000	13,260.00	100.00	29,530.020000
35	2.060000	0.00	0.00	0.000000
40	1.937000	0.00	0.00	0.000000
45	1.857000	0.00	0.00	0.000000
50	1.822000	0.00	0.00	0.000000
55	1.841000	0.00	0.00	0.000000
60	1.934000	0.00	0.00	0.000000
65	2.133000	0.00	0.00	0.000000
70	2.423000	0.00	0.00	0.000000
75	2.923000	0.00	0.00	0.000000
Total		13,260.00	100.00	29,530.020000

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.400000	0.00	0.00	0.000000
10	1.065000	0.00	0.00	0.000000
15	0.847000	0.00	0.00	0.000000
20	0.741000	0.00	0.00	0.000000
25	0.694000	0.00	0.00	0.000000
30	0.661000	13,260.00	100.00	8,764.860000
35	0.641000	0.00	0.00	0.000000
40	0.631000	0.00	0.00	0.000000
45	0.634000	0.00	0.00	0.000000
50	0.648000	0.00	0.00	0.000000
55	0.677000	0.00	0.00	0.000000
60	0.723000	0.00	0.00	0.000000
65	0.791000	0.00	0.00	0.000000
70	0.871000	0.00	0.00	0.000000
75	0.987000	0.00	0.00	0.000000
Total		13,260.00	100.00	8,764.860000

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012000	0.00	0.00	0.000000
10	0.009000	0.00	0.00	0.000000
15	0.007000	0.00	0.00	0.000000
20	0.006000	0.00	0.00	0.000000
25	0.005000	0.00	0.00	0.000000
30	0.005000	13,260.00	100.00	66.300000
35	0.004000	0.00	0.00	0.000000
40	0.004000	0.00	0.00	0.000000
45	0.004000	0.00	0.00	0.000000
50	0.004000	0.00	0.00	0.000000
55	0.004000	0.00	0.00	0.000000
60	0.005000	0.00	0.00	0.000000
65	0.005000	0.00	0.00	0.000000
70	0.005000	0.00	0.00	0.000000
75	0.005000	0.00	0.00	0.000000

Total		13,260.00	100.00	66.300000

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,263.187000	0.00	0.00	0.000000
10	964.196000	0.00	0.00	0.000000
15	762.871000	0.00	0.00	0.000000
20	626.913000	0.00	0.00	0.000000
25	540.174000	0.00	0.00	0.000000
30	481.469000	13,260.00	100.00	6,384,278.940000
35	443.319000	0.00	0.00	0.000000
40	421.299000	0.00	0.00	0.000000
45	413.063000	0.00	0.00	0.000000
50	417.867000	0.00	0.00	0.000000
55	436.411000	0.00	0.00	0.000000
60	470.989000	0.00	0.00	0.000000
65	525.967000	0.00	0.00	0.000000
70	535.531000	0.00	0.00	0.000000
75	550.451000	0.00	0.00	0.000000
Total		13,260.00	100.00	6,384,278.940000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.136000	0.00	0.00	0.000000
10	0.092000	0.00	0.00	0.000000
15	0.063000	0.00	0.00	0.000000
20	0.046000	0.00	0.00	0.000000
25	0.037000	0.00	0.00	0.000000
30	0.031000	13,260.00	100.00	411.060000
35	0.027000	0.00	0.00	0.000000
40	0.025000	0.00	0.00	0.000000
45	0.025000	0.00	0.00	0.000000
50	0.026000	0.00	0.00	0.000000
55	0.028000	0.00	0.00	0.000000
60	0.031000	0.00	0.00	0.000000
65	0.036000	0.00	0.00	0.000000
70	0.040000	0.00	0.00	0.000000
75	0.045000	0.00	0.00	0.000000
Total		13,260.00	100.00	411.060000

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.125000	0.00	0.00	0.000000
10	0.085000	0.00	0.00	0.000000
15	0.059000	0.00	0.00	0.000000
20	0.043000	0.00	0.00	0.000000
25	0.034000	0.00	0.00	0.000000
30	0.029000	13,260.00	100.00	384.540000

35	0.025000	0.00	0.00	0.000000
40	0.023000	0.00	0.00	0.000000
45	0.023000	0.00	0.00	0.000000
50	0.024000	0.00	0.00	0.000000
55	0.026000	0.00	0.00	0.000000
60	0.029000	0.00	0.00	0.000000
65	0.033000	0.00	0.00	0.000000
70	0.037000	0.00	0.00	0.000000
75	0.042000	0.00	0.00	0.000000
Total		13,260.00	100.00	384.540000

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.060258	0.00	0.00	0.000000
10	0.042504	0.00	0.00	0.000000
15	0.029502	0.00	0.00	0.000000
20	0.021780	0.00	0.00	0.000000
25	0.018480	0.00	0.00	0.000000
30	0.016104	13,260.00	100.00	213.539040
35	0.014586	0.00	0.00	0.000000
40	0.013926	0.00	0.00	0.000000
45	0.014058	0.00	0.00	0.000000
50	0.014982	0.00	0.00	0.000000
55	0.016698	0.00	0.00	0.000000
60	0.019140	0.00	0.00	0.000000
65	0.022308	0.00	0.00	0.000000
70	0.026268	0.00	0.00	0.000000
75	0.030954	0.00	0.00	0.000000
Total		13,260.00	100.00	213.539040

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.331056	0.00	0.00	0.000000
10	0.186318	0.00	0.00	0.000000
15	0.092598	0.00	0.00	0.000000
20	0.052866	0.00	0.00	0.000000
25	0.043428	0.00	0.00	0.000000
30	0.035904	13,260.00	100.00	476.087040
35	0.030228	0.00	0.00	0.000000
40	0.026268	0.00	0.00	0.000000
45	0.024156	0.00	0.00	0.000000
50	0.023628	0.00	0.00	0.000000
55	0.024882	0.00	0.00	0.000000
60	0.027786	0.00	0.00	0.000000
65	0.032340	0.00	0.00	0.000000
70	0.038610	0.00	0.00	0.000000
75	0.046530	0.00	0.00	0.000000
Total		13,260.00	100.00	476.087040

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.015726	0.00	0.00	0.000000
10	0.009895	0.00	0.00	0.000000
15	0.006241	0.00	0.00	0.000000
20	0.004355	0.00	0.00	0.000000
25	0.003478	0.00	0.00	0.000000
30	0.002894	13,260.00	100.00	38.374440
35	0.002512	0.00	0.00	0.000000
40	0.002295	0.00	0.00	0.000000
45	0.002195	0.00	0.00	0.000000
50	0.002232	0.00	0.00	0.000000
55	0.002397	0.00	0.00	0.000000
60	0.002718	0.00	0.00	0.000000
65	0.003252	0.00	0.00	0.000000
70	0.003797	0.00	0.00	0.000000
75	0.004635	0.00	0.00	0.000000
Total		13,260.00	100.00	38.374440

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000485	0.00	0.00	0.000000
10	0.000329	0.00	0.00	0.000000
15	0.000235	0.00	0.00	0.000000
20	0.000177	0.00	0.00	0.000000
25	0.000140	0.00	0.00	0.000000
30	0.000117	13,260.00	100.00	1.551420
35	0.000103	0.00	0.00	0.000000
40	0.000095	0.00	0.00	0.000000
45	0.000092	0.00	0.00	0.000000
50	0.000095	0.00	0.00	0.000000
55	0.000102	0.00	0.00	0.000000
60	0.000116	0.00	0.00	0.000000
65	0.000140	0.00	0.00	0.000000
70	0.000163	0.00	0.00	0.000000
75	0.000200	0.00	0.00	0.000000
Total		13,260.00	100.00	1.551420

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.026149	0.00	0.00	0.000000
10	0.014876	0.00	0.00	0.000000
15	0.007599	0.00	0.00	0.000000
20	0.004463	0.00	0.00	0.000000
25	0.003655	0.00	0.00	0.000000
30	0.003027	13,260.00	100.00	40.138020
35	0.002565	0.00	0.00	0.000000
40	0.002256	0.00	0.00	0.000000
45	0.002091	0.00	0.00	0.000000

50	0.002070	0.00	0.00	0.000000
55	0.002194	0.00	0.00	0.000000
60	0.002467	0.00	0.00	0.000000
65	0.002900	0.00	0.00	0.000000
70	0.003470	0.00	0.00	0.000000
75	0.004228	0.00	0.00	0.000000
Total		13,260.00	100.00	40.138020

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.055784	0.00	0.00	0.000000
10	0.032112	0.00	0.00	0.000000
15	0.016875	0.00	0.00	0.000000
20	0.010185	0.00	0.00	0.000000
25	0.008303	0.00	0.00	0.000000
30	0.006879	13,260.00	100.00	91.215540
35	0.005851	0.00	0.00	0.000000
40	0.005178	0.00	0.00	0.000000
45	0.004823	0.00	0.00	0.000000
50	0.004796	0.00	0.00	0.000000
55	0.005093	0.00	0.00	0.000000
60	0.005731	0.00	0.00	0.000000
65	0.006756	0.00	0.00	0.000000
70	0.008036	0.00	0.00	0.000000
75	0.009780	0.00	0.00	0.000000
Total		13,260.00	100.00	91.215540

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.002691	0.00	0.00	0.000000
10	0.001754	0.00	0.00	0.000000
15	0.001176	0.00	0.00	0.000000
20	0.000853	0.00	0.00	0.000000
25	0.000679	0.00	0.00	0.000000
30	0.000566	13,260.00	100.00	7.505160
35	0.000495	0.00	0.00	0.000000
40	0.000456	0.00	0.00	0.000000
45	0.000440	0.00	0.00	0.000000
50	0.000451	0.00	0.00	0.000000
55	0.000486	0.00	0.00	0.000000
60	0.000553	0.00	0.00	0.000000
65	0.000666	0.00	0.00	0.000000
70	0.000778	0.00	0.00	0.000000
75	0.000956	0.00	0.00	0.000000
Total		13,260.00	100.00	7.505160

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.032000	442.00	848.640000

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000320	442.00	8.486400

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	442.00	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	442.00	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	442.00	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000002	442.00	0.053040

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	2,532.660000	2.532660	0.002791780
CO	29,530.020000	29.530020	0.032551275
NOX	8,764.860000	8.764860	0.009661604

SO2	66.300000	0.066300	0.000073083
CO2	6,384,278.940000	6,384.278940	7.037462888
PM10	411.060000	0.411060	0.000453116
PM2.5	384.540000	0.384540	0.000423883
Diesel_PM	213.539040	0.213539	0.000235386
DEOG	476.087040	0.476087	0.000524796
BENZENE	46.860840	0.046861	0.000051655
ACROLEIN	1.551420	0.001551	0.000001710
ACETALDEHYDE	40.138020	0.040138	0.000044245
FORMALDEHYDE	91.215540	0.091216	0.000100548
BUTADIENE	7.558200	0.007558	0.000008331

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Title : **DSBPRP Forecast Year 2035 Park and Ride New Trips**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 04:16 PM
Alternative Year : 2035
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
697.9			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
0			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.280000	0.00	0.00	0.000000
10	0.171000	0.00	0.00	0.000000
15	0.104000	0.00	0.00	0.000000
20	0.072000	0.00	0.00	0.000000
25	0.060000	0.00	0.00	0.000000
30	0.051000	697.90	100.00	35.592900
35	0.045000	0.00	0.00	0.000000
40	0.042000	0.00	0.00	0.000000
45	0.040000	0.00	0.00	0.000000
50	0.040000	0.00	0.00	0.000000
55	0.043000	0.00	0.00	0.000000
60	0.048000	0.00	0.00	0.000000
65	0.057000	0.00	0.00	0.000000
70	0.068000	0.00	0.00	0.000000
75	0.086000	0.00	0.00	0.000000
Total		697.90	100.00	35.592900

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.641000	0.00	0.00	0.000000
10	1.355000	0.00	0.00	0.000000
15	1.152000	0.00	0.00	0.000000

20	1.018000	0.00	0.00	0.000000
25	0.930000	0.00	0.00	0.000000
30	0.859000	697.90	100.00	599.496100
35	0.802000	0.00	0.00	0.000000
40	0.758000	0.00	0.00	0.000000
45	0.728000	0.00	0.00	0.000000
50	0.712000	0.00	0.00	0.000000
55	0.714000	0.00	0.00	0.000000
60	0.740000	0.00	0.00	0.000000
65	0.805000	0.00	0.00	0.000000
70	0.955000	0.00	0.00	0.000000
75	1.215000	0.00	0.00	0.000000
Total		697.90	100.00	599.496100

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.516000	0.00	0.00	0.000000
10	0.403000	0.00	0.00	0.000000
15	0.323000	0.00	0.00	0.000000
20	0.274000	0.00	0.00	0.000000
25	0.250000	0.00	0.00	0.000000
30	0.231000	697.90	100.00	161.214900
35	0.217000	0.00	0.00	0.000000
40	0.207000	0.00	0.00	0.000000
45	0.203000	0.00	0.00	0.000000
50	0.203000	0.00	0.00	0.000000
55	0.209000	0.00	0.00	0.000000
60	0.221000	0.00	0.00	0.000000
65	0.240000	0.00	0.00	0.000000
70	0.265000	0.00	0.00	0.000000
75	0.302000	0.00	0.00	0.000000
Total		697.90	100.00	161.214900

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.013000	0.00	0.00	0.000000
10	0.010000	0.00	0.00	0.000000
15	0.008000	0.00	0.00	0.000000
20	0.006000	0.00	0.00	0.000000
25	0.006000	0.00	0.00	0.000000
30	0.005000	697.90	100.00	3.489500
35	0.005000	0.00	0.00	0.000000
40	0.004000	0.00	0.00	0.000000
45	0.004000	0.00	0.00	0.000000
50	0.004000	0.00	0.00	0.000000
55	0.004000	0.00	0.00	0.000000
60	0.005000	0.00	0.00	0.000000
65	0.005000	0.00	0.00	0.000000
70	0.005000	0.00	0.00	0.000000
75	0.006000	0.00	0.00	0.000000

Total		697.90	100.00	3.489500

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,334.680000	0.00	0.00	0.000000
10	1,021.945000	0.00	0.00	0.000000
15	809.424000	0.00	0.00	0.000000
20	665.492000	0.00	0.00	0.000000
25	576.198000	0.00	0.00	0.000000
30	515.340000	697.90	100.00	359,655.786000
35	475.425000	0.00	0.00	0.000000
40	452.024000	0.00	0.00	0.000000
45	442.797000	0.00	0.00	0.000000
50	446.999000	0.00	0.00	0.000000
55	465.336000	0.00	0.00	0.000000
60	500.108000	0.00	0.00	0.000000
65	555.695000	0.00	0.00	0.000000
70	567.309000	0.00	0.00	0.000000
75	585.268000	0.00	0.00	0.000000
Total		697.90	100.00	359,655.786000

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.095000	0.00	0.00	0.000000
10	0.063000	0.00	0.00	0.000000
15	0.045000	0.00	0.00	0.000000
20	0.034000	0.00	0.00	0.000000
25	0.027000	0.00	0.00	0.000000
30	0.022000	697.90	100.00	15.353800
35	0.020000	0.00	0.00	0.000000
40	0.018000	0.00	0.00	0.000000
45	0.018000	0.00	0.00	0.000000
50	0.018000	0.00	0.00	0.000000
55	0.020000	0.00	0.00	0.000000
60	0.022000	0.00	0.00	0.000000
65	0.025000	0.00	0.00	0.000000
70	0.026000	0.00	0.00	0.000000
75	0.028000	0.00	0.00	0.000000
Total		697.90	100.00	15.353800

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.088000	0.00	0.00	0.000000
10	0.059000	0.00	0.00	0.000000
15	0.042000	0.00	0.00	0.000000
20	0.031000	0.00	0.00	0.000000
25	0.025000	0.00	0.00	0.000000
30	0.021000	697.90	100.00	14.655900

35	0.018000	0.00	0.00	0.000000
40	0.017000	0.00	0.00	0.000000
45	0.017000	0.00	0.00	0.000000
50	0.017000	0.00	0.00	0.000000
55	0.018000	0.00	0.00	0.000000
60	0.020000	0.00	0.00	0.000000
65	0.023000	0.00	0.00	0.000000
70	0.024000	0.00	0.00	0.000000
75	0.026000	0.00	0.00	0.000000
Total		697.90	100.00	14.655900

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012035	0.00	0.00	0.000000
10	0.010043	0.00	0.00	0.000000
15	0.008549	0.00	0.00	0.000000
20	0.007387	0.00	0.00	0.000000
25	0.006723	0.00	0.00	0.000000
30	0.006308	697.90	100.00	4.402353
35	0.006142	0.00	0.00	0.000000
40	0.006308	0.00	0.00	0.000000
45	0.006640	0.00	0.00	0.000000
50	0.007138	0.00	0.00	0.000000
55	0.007885	0.00	0.00	0.000000
60	0.008798	0.00	0.00	0.000000
65	0.009960	0.00	0.00	0.000000
70	0.011288	0.00	0.00	0.000000
75	0.012782	0.00	0.00	0.000000
Total		697.90	100.00	4.402353

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.158530	0.00	0.00	0.000000
10	0.088478	0.00	0.00	0.000000
15	0.044571	0.00	0.00	0.000000
20	0.027473	0.00	0.00	0.000000
25	0.023738	0.00	0.00	0.000000
30	0.020667	697.90	100.00	14.423499
35	0.018011	0.00	0.00	0.000000
40	0.015936	0.00	0.00	0.000000
45	0.014193	0.00	0.00	0.000000
50	0.012948	0.00	0.00	0.000000
55	0.012035	0.00	0.00	0.000000
60	0.011537	0.00	0.00	0.000000
65	0.011537	0.00	0.00	0.000000
70	0.011869	0.00	0.00	0.000000
75	0.012616	0.00	0.00	0.000000
Total		697.90	100.00	14.423499

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.005966	0.00	0.00	0.000000
10	0.003679	0.00	0.00	0.000000
15	0.002272	0.00	0.00	0.000000
20	0.001608	0.00	0.00	0.000000
25	0.001324	0.00	0.00	0.000000
30	0.001145	697.90	100.00	0.799096
35	0.001020	0.00	0.00	0.000000
40	0.000948	0.00	0.00	0.000000
45	0.000918	0.00	0.00	0.000000
50	0.000939	0.00	0.00	0.000000
55	0.001014	0.00	0.00	0.000000
60	0.001154	0.00	0.00	0.000000
65	0.001382	0.00	0.00	0.000000
70	0.001690	0.00	0.00	0.000000
75	0.002197	0.00	0.00	0.000000
Total		697.90	100.00	0.799096

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000152	0.00	0.00	0.000000
10	0.000104	0.00	0.00	0.000000
15	0.000075	0.00	0.00	0.000000
20	0.000057	0.00	0.00	0.000000
25	0.000046	0.00	0.00	0.000000
30	0.000040	697.90	100.00	0.027916
35	0.000036	0.00	0.00	0.000000
40	0.000034	0.00	0.00	0.000000
45	0.000034	0.00	0.00	0.000000
50	0.000037	0.00	0.00	0.000000
55	0.000042	0.00	0.00	0.000000
60	0.000050	0.00	0.00	0.000000
65	0.000062	0.00	0.00	0.000000
70	0.000079	0.00	0.00	0.000000
75	0.000105	0.00	0.00	0.000000
Total		697.90	100.00	0.027916

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.011940	0.00	0.00	0.000000
10	0.006731	0.00	0.00	0.000000
15	0.003461	0.00	0.00	0.000000
20	0.002171	0.00	0.00	0.000000
25	0.001872	0.00	0.00	0.000000
30	0.001629	697.90	100.00	1.136879
35	0.001428	0.00	0.00	0.000000
40	0.001270	0.00	0.00	0.000000
45	0.001148	0.00	0.00	0.000000

50	0.001068	0.00	0.00	0.000000
55	0.001023	0.00	0.00	0.000000
60	0.001018	0.00	0.00	0.000000
65	0.001063	0.00	0.00	0.000000
70	0.001156	0.00	0.00	0.000000
75	0.001324	0.00	0.00	0.000000
Total		697.90	100.00	1.136879

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.025001	0.00	0.00	0.000000
10	0.014218	0.00	0.00	0.000000
15	0.007463	0.00	0.00	0.000000
20	0.004753	0.00	0.00	0.000000
25	0.004072	0.00	0.00	0.000000
30	0.003538	697.90	100.00	2.469170
35	0.003107	0.00	0.00	0.000000
40	0.002778	0.00	0.00	0.000000
45	0.002536	0.00	0.00	0.000000
50	0.002390	0.00	0.00	0.000000
55	0.002334	0.00	0.00	0.000000
60	0.002378	0.00	0.00	0.000000
65	0.002548	0.00	0.00	0.000000
70	0.002839	0.00	0.00	0.000000
75	0.003347	0.00	0.00	0.000000
Total		697.90	100.00	2.469170

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000938	0.00	0.00	0.000000
10	0.000603	0.00	0.00	0.000000
15	0.000399	0.00	0.00	0.000000
20	0.000294	0.00	0.00	0.000000
25	0.000239	0.00	0.00	0.000000
30	0.000207	697.90	100.00	0.144465
35	0.000186	0.00	0.00	0.000000
40	0.000175	0.00	0.00	0.000000
45	0.000174	0.00	0.00	0.000000
50	0.000182	0.00	0.00	0.000000
55	0.000202	0.00	0.00	0.000000
60	0.000236	0.00	0.00	0.000000
65	0.000290	0.00	0.00	0.000000
70	0.000362	0.00	0.00	0.000000
75	0.000480	0.00	0.00	0.000000
Total		697.90	100.00	0.144465

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.016000	23.26	22.332800

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000166	23.26	0.231703

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	23.26	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	23.26	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	23.26	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000001	23.26	0.001396

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	57.925700	0.057926	0.000063852
CO	599.496100	0.599496	0.000660831
NOX	161.214900	0.161215	0.000177709

SO2	3.489500	0.003490	0.000003847
CO2	359,655.786000	359.655786	0.396452641
PM10	15.353800	0.015354	0.000016925
PM2.5	14.655900	0.014656	0.000016155
Diesel_PM	4.402353	0.004402	0.000004853
DEOG	14.423499	0.014423	0.000015899
BENZENE	1.030798	0.001031	0.000001136
ACROLEIN	0.027916	0.000028	0.000000031
ACETALDEHYDE	1.136879	0.001137	0.000001253
FORMALDEHYDE	2.469170	0.002469	0.000002722
BUTADIENE	0.145861	0.000146	0.000000161

---------- END----------

Title : **DSBPRP Opening Year 2014 Park and Ride New Trips**
Version : CT-EMFAC Version 4.1.0.0
Run Date : 26 January 2012 04:13 PM
Alternative Year : 2014
Season : Annual
Temperature : 68F
Relative Humidity : 50%
Area : San Bernardino (SC) County

Peak User Input :

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
697.9			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0

Offpeak User Input:

Total VMT	Volume (vph)	Road Length(mi)	Number of Hours
0			

VMT Distribution(%) by Speed(mph)

(mph)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	>75
%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

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Running Exhaust Emissions (grams)

Pollutant Name : TOG_exh

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.709000	0.00	0.00	0.000000
10	0.443000	0.00	0.00	0.000000
15	0.276000	0.00	0.00	0.000000
20	0.191000	0.00	0.00	0.000000
25	0.153000	0.00	0.00	0.000000
30	0.127000	697.90	100.00	88.633300
35	0.110000	0.00	0.00	0.000000
40	0.100000	0.00	0.00	0.000000
45	0.095000	0.00	0.00	0.000000
50	0.096000	0.00	0.00	0.000000
55	0.103000	0.00	0.00	0.000000
60	0.117000	0.00	0.00	0.000000
65	0.138000	0.00	0.00	0.000000
70	0.159000	0.00	0.00	0.000000
75	0.191000	0.00	0.00	0.000000
Total		697.90	100.00	88.633300

Pollutant Name : CO

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	4.504000	0.00	0.00	0.000000
10	3.702000	0.00	0.00	0.000000
15	3.132000	0.00	0.00	0.000000

20	2.729000	0.00	0.00	0.000000
25	2.446000	0.00	0.00	0.000000
30	2.227000	697.90	100.00	1,554.223300
35	2.060000	0.00	0.00	0.000000
40	1.937000	0.00	0.00	0.000000
45	1.857000	0.00	0.00	0.000000
50	1.822000	0.00	0.00	0.000000
55	1.841000	0.00	0.00	0.000000
60	1.934000	0.00	0.00	0.000000
65	2.133000	0.00	0.00	0.000000
70	2.423000	0.00	0.00	0.000000
75	2.923000	0.00	0.00	0.000000
Total		697.90	100.00	1,554.223300

Pollutant Name : NOX

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1.400000	0.00	0.00	0.000000
10	1.065000	0.00	0.00	0.000000
15	0.847000	0.00	0.00	0.000000
20	0.741000	0.00	0.00	0.000000
25	0.694000	0.00	0.00	0.000000
30	0.661000	697.90	100.00	461.311900
35	0.641000	0.00	0.00	0.000000
40	0.631000	0.00	0.00	0.000000
45	0.634000	0.00	0.00	0.000000
50	0.648000	0.00	0.00	0.000000
55	0.677000	0.00	0.00	0.000000
60	0.723000	0.00	0.00	0.000000
65	0.791000	0.00	0.00	0.000000
70	0.871000	0.00	0.00	0.000000
75	0.987000	0.00	0.00	0.000000
Total		697.90	100.00	461.311900

Pollutant Name : SO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.012000	0.00	0.00	0.000000
10	0.009000	0.00	0.00	0.000000
15	0.007000	0.00	0.00	0.000000
20	0.006000	0.00	0.00	0.000000
25	0.005000	0.00	0.00	0.000000
30	0.005000	697.90	100.00	3.489500
35	0.004000	0.00	0.00	0.000000
40	0.004000	0.00	0.00	0.000000
45	0.004000	0.00	0.00	0.000000
50	0.004000	0.00	0.00	0.000000
55	0.004000	0.00	0.00	0.000000
60	0.005000	0.00	0.00	0.000000
65	0.005000	0.00	0.00	0.000000
70	0.005000	0.00	0.00	0.000000
75	0.005000	0.00	0.00	0.000000

Total		697.90	100.00	3.489500

Pollutant Name : CO2

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	1,263.187000	0.00	0.00	0.000000
10	964.196000	0.00	0.00	0.000000
15	762.871000	0.00	0.00	0.000000
20	626.913000	0.00	0.00	0.000000
25	540.174000	0.00	0.00	0.000000
30	481.469000	697.90	100.00	336,017.215100
35	443.319000	0.00	0.00	0.000000
40	421.299000	0.00	0.00	0.000000
45	413.063000	0.00	0.00	0.000000
50	417.867000	0.00	0.00	0.000000
55	436.411000	0.00	0.00	0.000000
60	470.989000	0.00	0.00	0.000000
65	525.967000	0.00	0.00	0.000000
70	535.531000	0.00	0.00	0.000000
75	550.451000	0.00	0.00	0.000000
Total		697.90	100.00	336,017.215100

Pollutant Name : PM10

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.136000	0.00	0.00	0.000000
10	0.092000	0.00	0.00	0.000000
15	0.063000	0.00	0.00	0.000000
20	0.046000	0.00	0.00	0.000000
25	0.037000	0.00	0.00	0.000000
30	0.031000	697.90	100.00	21.634900
35	0.027000	0.00	0.00	0.000000
40	0.025000	0.00	0.00	0.000000
45	0.025000	0.00	0.00	0.000000
50	0.026000	0.00	0.00	0.000000
55	0.028000	0.00	0.00	0.000000
60	0.031000	0.00	0.00	0.000000
65	0.036000	0.00	0.00	0.000000
70	0.040000	0.00	0.00	0.000000
75	0.045000	0.00	0.00	0.000000
Total		697.90	100.00	21.634900

Pollutant Name : PM2.5

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.125000	0.00	0.00	0.000000
10	0.085000	0.00	0.00	0.000000
15	0.059000	0.00	0.00	0.000000
20	0.043000	0.00	0.00	0.000000
25	0.034000	0.00	0.00	0.000000
30	0.029000	697.90	100.00	20.239100

35	0.025000	0.00	0.00	0.000000
40	0.023000	0.00	0.00	0.000000
45	0.023000	0.00	0.00	0.000000
50	0.024000	0.00	0.00	0.000000
55	0.026000	0.00	0.00	0.000000
60	0.029000	0.00	0.00	0.000000
65	0.033000	0.00	0.00	0.000000
70	0.037000	0.00	0.00	0.000000
75	0.042000	0.00	0.00	0.000000
Total		697.90	100.00	20.239100

Pollutant Name : Diesel_PM

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.060258	0.00	0.00	0.000000
10	0.042504	0.00	0.00	0.000000
15	0.029502	0.00	0.00	0.000000
20	0.021780	0.00	0.00	0.000000
25	0.018480	0.00	0.00	0.000000
30	0.016104	697.90	100.00	11.238982
35	0.014586	0.00	0.00	0.000000
40	0.013926	0.00	0.00	0.000000
45	0.014058	0.00	0.00	0.000000
50	0.014982	0.00	0.00	0.000000
55	0.016698	0.00	0.00	0.000000
60	0.019140	0.00	0.00	0.000000
65	0.022308	0.00	0.00	0.000000
70	0.026268	0.00	0.00	0.000000
75	0.030954	0.00	0.00	0.000000
Total		697.90	100.00	11.238982

Pollutant Name : DEOG

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.331056	0.00	0.00	0.000000
10	0.186318	0.00	0.00	0.000000
15	0.092598	0.00	0.00	0.000000
20	0.052866	0.00	0.00	0.000000
25	0.043428	0.00	0.00	0.000000
30	0.035904	697.90	100.00	25.057402
35	0.030228	0.00	0.00	0.000000
40	0.026268	0.00	0.00	0.000000
45	0.024156	0.00	0.00	0.000000
50	0.023628	0.00	0.00	0.000000
55	0.024882	0.00	0.00	0.000000
60	0.027786	0.00	0.00	0.000000
65	0.032340	0.00	0.00	0.000000
70	0.038610	0.00	0.00	0.000000
75	0.046530	0.00	0.00	0.000000
Total		697.90	100.00	25.057402

Pollutant Name : BENZENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.015726	0.00	0.00	0.000000
10	0.009895	0.00	0.00	0.000000
15	0.006241	0.00	0.00	0.000000
20	0.004355	0.00	0.00	0.000000
25	0.003478	0.00	0.00	0.000000
30	0.002894	697.90	100.00	2.019723
35	0.002512	0.00	0.00	0.000000
40	0.002295	0.00	0.00	0.000000
45	0.002195	0.00	0.00	0.000000
50	0.002232	0.00	0.00	0.000000
55	0.002397	0.00	0.00	0.000000
60	0.002718	0.00	0.00	0.000000
65	0.003252	0.00	0.00	0.000000
70	0.003797	0.00	0.00	0.000000
75	0.004635	0.00	0.00	0.000000
Total		697.90	100.00	2.019723

Pollutant Name : ACROLEIN

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.000485	0.00	0.00	0.000000
10	0.000329	0.00	0.00	0.000000
15	0.000235	0.00	0.00	0.000000
20	0.000177	0.00	0.00	0.000000
25	0.000140	0.00	0.00	0.000000
30	0.000117	697.90	100.00	0.081654
35	0.000103	0.00	0.00	0.000000
40	0.000095	0.00	0.00	0.000000
45	0.000092	0.00	0.00	0.000000
50	0.000095	0.00	0.00	0.000000
55	0.000102	0.00	0.00	0.000000
60	0.000116	0.00	0.00	0.000000
65	0.000140	0.00	0.00	0.000000
70	0.000163	0.00	0.00	0.000000
75	0.000200	0.00	0.00	0.000000
Total		697.90	100.00	0.081654

Pollutant Name : ACETALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.026149	0.00	0.00	0.000000
10	0.014876	0.00	0.00	0.000000
15	0.007599	0.00	0.00	0.000000
20	0.004463	0.00	0.00	0.000000
25	0.003655	0.00	0.00	0.000000
30	0.003027	697.90	100.00	2.112543
35	0.002565	0.00	0.00	0.000000
40	0.002256	0.00	0.00	0.000000
45	0.002091	0.00	0.00	0.000000

50	0.002070	0.00	0.00	0.000000
55	0.002194	0.00	0.00	0.000000
60	0.002467	0.00	0.00	0.000000
65	0.002900	0.00	0.00	0.000000
70	0.003470	0.00	0.00	0.000000
75	0.004228	0.00	0.00	0.000000
Total		697.90	100.00	2.112543

Pollutant Name : FORMALDEHYDE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.055784	0.00	0.00	0.000000
10	0.032112	0.00	0.00	0.000000
15	0.016875	0.00	0.00	0.000000
20	0.010185	0.00	0.00	0.000000
25	0.008303	0.00	0.00	0.000000
30	0.006879	697.90	100.00	4.800854
35	0.005851	0.00	0.00	0.000000
40	0.005178	0.00	0.00	0.000000
45	0.004823	0.00	0.00	0.000000
50	0.004796	0.00	0.00	0.000000
55	0.005093	0.00	0.00	0.000000
60	0.005731	0.00	0.00	0.000000
65	0.006756	0.00	0.00	0.000000
70	0.008036	0.00	0.00	0.000000
75	0.009780	0.00	0.00	0.000000
Total		697.90	100.00	4.800854

Pollutant Name : BUTADIENE

speed(mph)	Emission Factor(grams/mile)	VMT by Speed	VMT-Speed Distribution (%)	Emissions by Speed
5	0.002691	0.00	0.00	0.000000
10	0.001754	0.00	0.00	0.000000
15	0.001176	0.00	0.00	0.000000
20	0.000853	0.00	0.00	0.000000
25	0.000679	0.00	0.00	0.000000
30	0.000566	697.90	100.00	0.395011
35	0.000495	0.00	0.00	0.000000
40	0.000456	0.00	0.00	0.000000
45	0.000440	0.00	0.00	0.000000
50	0.000451	0.00	0.00	0.000000
55	0.000486	0.00	0.00	0.000000
60	0.000553	0.00	0.00	0.000000
65	0.000666	0.00	0.00	0.000000
70	0.000778	0.00	0.00	0.000000
75	0.000956	0.00	0.00	0.000000
Total		697.90	100.00	0.395011

Idling Emissions (grams) (Currently NOT Available)

Evaporative Running Loss Emissions (grams)

Pollutant Name : TOG_los

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.032000	23.26	44.665600

Pollutant Name : BENZENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000320	23.26	0.446656

Pollutant Name : ACROLEIN

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	23.26	0.000000

Pollutant Name : ACETALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	23.26	0.000000

Pollutant Name : FORMALDEHYDE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000000	23.26	0.000000

Pollutant Name : BUTADIENE

Emission Factor(grams/min)	total running time(hrs)	Emissions
0.000002	23.26	0.002792

Total Emissions

Pollutant Name	Total Emissions (grams)	Total Emissions (Kilograms)	Total Emissions (US Tons)
TOG	133.298900	0.133299	0.000146937
CO	1,554.223300	1.554223	0.001713238
NOX	461.311900	0.461312	0.000508509

SO2	3.489500	0.003490	0.000003847
CO2	336,017.215100	336.017215	0.370395577
PM10	21.634900	0.021635	0.000023848
PM2.5	20.239100	0.020239	0.000022310
Diesel_PM	11.238982	0.011239	0.000012389
DEOG	25.057402	0.025057	0.000027621
BENZENE	2.466379	0.002466	0.000002719
ACROLEIN	0.081654	0.000082	0.000000090
ACETALDEHYDE	2.112543	0.002113	0.000002329
FORMALDEHYDE	4.800854	0.004801	0.000005292
BUTADIENE	0.397803	0.000398	0.000000439

---------- END----------

Re-entrained Paved Road Dust

Methodology

Calculation Methodology and silt loading: USEPA AP-42, Paved Roads, Section 13.2.1, Revised January 2011

http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

Avg vehicle weight:

http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf

Precipitation Days >.254mm (.01in) for San Bernardino:

http://www.wrcc.dri.edu/cgi-bin/cliGCStP.pl?ca7723

Emission Factor Calculation

$$E_{ext} = \left[k\,(sL)^{0.91} \times (W)^{1.02} \right] (1 - P/4N)$$

Pollutant	Variables					
	k	sL	W	P	N	Emission Factor (lbs pe
PM_{10}	0.0022	0.127159	3.4	43	365	0.00114
$PM_{2.5}$	0.00054	0.127159	3.4	43	365	0.00028

for SB county of South Coast

http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9.pdf

	fwy	major	collector	local	
sL (table 3)	0.2	0.037	0.037	0.24	
travel fractions (table 2)	0.445	0.385	0.082	0.087	
weighted silt by travel fractions	*0.089*	*0.014245*	*0.003034*	*0.02088*	*0.127159*

E = particulate emission factor (lbs of particulate matter/VMT)	--
k = particle size multiplier (lb/VMT)	*(AP-42 default)*
sL = roadway silt loading (g/m2)	*(weighted, based on CARB 1997)*
W = average weight of vehicles on the road (tons)	*ARB methodology, San Bernardino County portion of South Coast Air Basin*
P = number of wet days with at least 0.254mm of precipitation	*(annual average for San Bernardino)*
N = number of days in the averaging period	*(annual)*

Appendix C
Carbon Monoxide Hot-Spot Analysis

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2009 Existing PM
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= .0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link A	0	0	-750	0	AG	646	9.6	1.8	13.4
B. Link B	0	0	750	0	AG	631	9.6	1.8	13.4
C. Link C	0	0	0	750	AG	88	9.6	1.8	13.4
D. Link D	0	0	0	-750	AG	131	9.6	1.8	13.4
E. Link E	1000	1000	250	1000	AG	963	9.6	1.8	13.4
F. Link F	1000	1000	1750	1000	AG	1124	9.6	1.8	13.4
G. Link G	1000	1000	1000	1750	AG	122	9.6	1.8	13.4
H. Link H	1000	1000	1000	250	AG	381	9.6	1.8	13.4
I. Link I	-1000	-1000	-1750	-1000	AG	1885	9.6	1.8	13.4
J. Link J	-1000	-1000	-250	-1000	AG	1668	9.6	1.8	13.4
K. Link K	-1000	-1000	-1000	-250	AG	974	9.6	1.8	13.4
L. Link L	-1000	-1000	-1000	-1750	AG	937	9.6	1.8	13.4
M. Link M	2000	2000	1250	2000	AG	1042	9.6	1.8	13.4
N. Link N	2000	2000	2750	2000	AG	983	9.6	1.8	13.4
O. Link O	2000	2000	2000	2750	AG	1028	9.6	1.8	13.4
P. Link P	2000	2000	2000	1250	AG	1263	9.6	1.8	13.4
Q. Link Q	-2000	-2000	-2750	-2000	AG	2051	9.6	1.8	13.4
R. Link R	-2000	-2000	-1250	-2000	AG	1439	9.6	1.8	13.4
S. Link S	-2000	-2000	-2000	-1250	AG	700	9.6	1.8	13.4
T. Link T	-2000	-2000	-2000	-2750	AG	1178	9.6	1.8	13.4

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. Recpt 1	-10	10	1.8
2. Recpt 2	10	10	1.8
3. Recpt 3	-10	-10	1.8
4. Recpt 4	10	-10	1.8
5. Recpt 5	990	1010	1.8
6. Recpt 6	1010	1010	1.8
7. Recpt 7	990	990	1.8
8. Recpt 8	1010	990	1.8
9. Recpt 9	-1010	-990	1.8
10. Recpt 10	-990	-990	1.8
11. Recpt 11	-1010	-1010	1.8
12. Recpt 12	-990	-1010	1.8
13. Recpt 13	1990	2010	1.8

14. Recpt 14	2010	2010	1.8
15. Recpt 15	1990	1990	1.8
16. Recpt 16	2010	1990	1.8
17. Recpt 21	-2010	-1990	1.8
18. Recpt 22	-1990	-1990	1.8
19. Recpt 23	-2010	-2010	1.8
20. Recpt 24	-1990	-2010	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Recpt 1	227.	.8	.4	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	227.	.9	.2	.2	.0	.0	.0	.0	.0	.0
3. Recpt 3	86.	1.0	.0	1.0	.0	.0	.0	.0	.0	.0
4. Recpt 4	274.	1.1	1.0	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	94.	1.6	.0	.0	.0	.0	.0	1.6	.0	.0
6. Recpt 6	94.	1.6	.0	.0	.0	.0	.0	1.6	.0	.0
7. Recpt 7	86.	1.7	.0	.0	.0	.0	.0	1.6	.0	.2
8. Recpt 8	274.	1.6	.0	.0	.0	.0	1.4	.0	.0	.2
9. Recpt 9	94.	2.6	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	266.	2.8	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	86.	2.6	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	274.	2.8	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	176.	2.2	.0	.0	.0	.0	.0	.0	.0	.0
14. Recpt 14	184.	2.2	.0	.0	.0	.0	.0	.0	.0	.0
15. Recpt 15	86.	2.0	.0	.0	.0	.0	.0	.0	.0	.0
16. Recpt 16	274.	2.1	.0	.0	.0	.0	.0	.0	.0	.0
17. Recpt 21	176.	2.6	.0	.0	.0	.0	.0	.0	.0	.0
18. Recpt 22	266.	2.8	.0	.0	.0	.0	.0	.0	.0	.0
19. Recpt 23	86.	2.5	.0	.0	.0	.0	.0	.0	.0	.0
20. Recpt 24	274.	3.0	.0	.0	.0	.0	.0	.0	.0	.0

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Recpt 1	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Recpt 4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Recpt 6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. Recpt 8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. Recpt 9	.0	2.2	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	2.4	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	.0	2.2	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	2.4	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	.0	.0	.0	.0	.5	.0	.0	1.7	.0	.0	.0	.0
14. Recpt 14	.0	.0	.0	.0	.0	.5	.0	1.7	.0	.0	.0	.0
15. Recpt 15	.0	.0	.0	.0	.0	1.4	.0	.6	.0	.0	.0	.0
16. Recpt 16	.0	.0	.0	.0	1.5	.0	.0	.6	.0	.0	.0	.0
17. Recpt 21	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	1.6
18. Recpt 22	.0	.0	.0	.0	.0	.0	.0	.0	2.5	.0	.3	.0
19. Recpt 23	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.9	.0	.5
20. Recpt 24	.0	.0	.0	.0	.0	.0	.0	.0	2.5	.0	.0	.5

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2014 No Project PM
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= .0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link A	0	0	-750	0	AG	702	5.6	1.8	13.4
B. Link B	0	0	750	0	AG	715	5.6	1.8	13.4
C. Link C	0	0	0	750	AG	111	5.6	1.8	13.4
D. Link D	0	0	0	-750	AG	148	5.6	1.8	13.4
E. Link E	1000	1000	250	1000	AG	993	5.6	1.8	13.4
F. Link F	1000	1000	1750	1000	AG	1162	5.6	1.8	13.4
G. Link G	1000	1000	1000	1750	AG	134	5.6	1.8	13.4
H. Link H	1000	1000	1000	250	AG	411	5.6	1.8	13.4
I. Link I	-1000	-1000	-1750	-1000	AG	1945	5.6	1.8	13.4
J. Link J	-1000	-1000	-250	-1000	AG	1724	5.6	1.8	13.4
K. Link K	-1000	-1000	-1000	-250	AG	1004	5.6	1.8	13.4
L. Link L	-1000	-1000	-1000	-1750	AG	975	5.6	1.8	13.4
M. Link M	2000	2000	1250	2000	AG	1124	5.6	1.8	13.4
N. Link N	2000	2000	2750	2000	AG	1075	5.6	1.8	13.4
O. Link O	2000	2000	2000	2750	AG	1065	5.6	1.8	13.4
P. Link P	2000	2000	2000	1250	AG	1290	5.6	1.8	13.4
Q. Link Q	-2000	-2000	-2750	-2000	AG	2201	5.6	1.8	13.4
R. Link R	-2000	-2000	-1250	-2000	AG	1545	5.6	1.8	13.4
S. Link S	-2000	-2000	-2000	-1250	AG	752	5.6	1.8	13.4
T. Link T	-2000	-2000	-2000	-2750	AG	1264	5.6	1.8	13.4

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. Recpt 1	-10	10	1.8
2. Recpt 2	10	10	1.8
3. Recpt 3	-10	-10	1.8
4. Recpt 4	10	-10	1.8
5. Recpt 5	990	1010	1.8
6. Recpt 6	1010	1010	1.8
7. Recpt 7	990	990	1.8
8. Recpt 8	1010	990	1.8
9. Recpt 9	-1010	-990	1.8
10. Recpt 10	-990	-990	1.8
11. Recpt 11	-1010	-1010	1.8
12. Recpt 12	-990	-1010	1.8
13. Recpt 13	1990	2010	1.8
14. Recpt 14	2010	2010	1.8
15. Recpt 15	1990	1990	1.8

16. Recpt 16	2010	1990	1.8
17. Recpt 21	-2010	-1990	1.8
18. Recpt 22	-1990	-1990	1.8
19. Recpt 23	-2010	-2010	1.8
20. Recpt 24	-1990	-2010	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Recpt 1	94.	.7	.0	.6	.0	.0	.0	.0	.0	.0
2. Recpt 2	227.	.5	.1	.1	.0	.0	.0	.0	.0	.0
3. Recpt 3	86.	.7	.0	.6	.0	.0	.0	.0	.0	.0
4. Recpt 4	274.	.7	.6	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	94.	1.0	.0	.0	.0	.0	.0	.9	.0	.0
6. Recpt 6	94.	.9	.0	.0	.0	.0	.0	.9	.0	.0
7. Recpt 7	86.	1.1	.0	.0	.0	.0	.0	.9	.0	.1
8. Recpt 8	274.	.9	.0	.0	.0	.0	.8	.0	.0	.1
9. Recpt 9	94.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	266.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	86.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	274.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	176.	1.3	.0	.0	.0	.0	.0	.0	.0	.0
14. Recpt 14	184.	1.3	.0	.0	.0	.0	.0	.0	.0	.0
15. Recpt 15	86.	1.2	.0	.0	.0	.0	.0	.0	.0	.0
16. Recpt 16	274.	1.3	.0	.0	.0	.0	.0	.0	.0	.0
17. Recpt 21	176.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
18. Recpt 22	266.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
19. Recpt 23	86.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
20. Recpt 24	274.	1.9	.0	.0	.0	.0	.0	.0	.0	.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Recpt 1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Recpt 4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Recpt 6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. Recpt 8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. Recpt 9	.0	1.3	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	1.4	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	.0	1.3	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	1.4	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	.0	.0	.0	.0	.3	.0	.0	1.0	.0	.0	.0	.0
14. Recpt 14	.0	.0	.0	.0	.0	.3	.0	1.0	.0	.0	.0	.0
15. Recpt 15	.0	.0	.0	.0	.0	.9	.0	.4	.0	.0	.0	.0
16. Recpt 16	.0	.0	.0	.0	.9	.0	.0	.4	.0	.0	.0	.0
17. Recpt 21	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	1.0
18. Recpt 22	.0	.0	.0	.0	.0	.0	.0	.0	1.5	.0	.2	.0
19. Recpt 23	.0	.0	.0	.0	.0	.0	.0	.0	.0	1.2	.0	.3
20. Recpt 24	.0	.0	.0	.0	.0	.0	.0	.0	1.5	.0	.0	.3

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2014 With Project PM
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= .0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link A	0	0	-750	0	AG	957	5.6	1.8	13.4
B. Link B	0	0	750	0	AG	1111	5.6	1.8	13.4
C. Link C	0	0	0	750	AG	74	5.6	1.8	13.4
D. Link D	0	0	0	-750	AG	238	5.6	1.8	13.4
E. Link E	1000	1000	250	1000	AG	1139	5.6	1.8	13.4
F. Link F	1000	1000	1750	1000	AG	1267	5.6	1.8	13.4
G. Link G	1000	1000	1000	1750	AG	358	5.6	1.8	13.4
H. Link H	1000	1000	1000	250	AG	572	5.6	1.8	13.4
I. Link I	-1000	-1000	-1750	-1000	AG	1945	5.6	1.8	13.4
J. Link J	-1000	-1000	-250	-1000	AG	1732	5.6	1.8	13.4
K. Link K	-1000	-1000	-1000	-250	AG	1108	5.6	1.8	13.4
L. Link L	-1000	-1000	-1000	-1750	AG	1087	5.6	1.8	13.4
M. Link M	2000	2000	1250	2000	AG	1225	5.6	1.8	13.4
N. Link N	2000	2000	2750	2000	AG	1148	5.6	1.8	13.4
O. Link O	2000	2000	2000	2750	AG	1177	5.6	1.8	13.4
P. Link P	2000	2000	2000	1250	AG	1472	5.6	1.8	13.4
Q. Link Q	-2000	-2000	-2750	-2000	AG	2233	5.6	1.8	13.4
R. Link R	-2000	-2000	-1250	-2000	AG	1565	5.6	1.8	13.4
S. Link S	-2000	-2000	-2000	-1250	AG	782	5.6	1.8	13.4
T. Link T	-2000	-2000	-2000	-2750	AG	1314	5.6	1.8	13.4

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. Recpt 1	-10	10	1.8
2. Recpt 2	10	10	1.8
3. Recpt 3	-10	-10	1.8
4. Recpt 4	10	-10	1.8
5. Recpt 5	990	1010	1.8
6. Recpt 6	1010	1010	1.8
7. Recpt 7	990	990	1.8
8. Recpt 8	1010	990	1.8
9. Recpt 9	-1010	-990	1.8
10. Recpt 10	-990	-990	1.8
11. Recpt 11	-1010	-1010	1.8
12. Recpt 12	-990	-1010	1.8
13. Recpt 13	1990	2010	1.8
14. Recpt 14	2010	2010	1.8

15. Recpt 15	1990	1990	1.8
16. Recpt 16	2010	1990	1.8
17. Recpt 21	-2010	-1990	1.8
18. Recpt 22	-1990	-1990	1.8
19. Recpt 23	-2010	-2010	1.8
20. Recpt 24	-1990	-2010	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Recpt 1	94.	.9	.0	.9	.0	.0	.0	.0	.0	.0
2. Recpt 2	94.	.9	.0	.9	.0	.0	.0	.0	.0	.0
3. Recpt 3	86.	1.0	.0	.9	.0	.0	.0	.0	.0	.0
4. Recpt 4	86.	.9	.0	.9	.0	.0	.0	.0	.0	.0
5. Recpt 5	94.	1.1	.0	.0	.0	.0	.0	1.0	.0	.0
6. Recpt 6	224.	.9	.0	.0	.0	.0	.2	.2	.0	.0
7. Recpt 7	86.	1.2	.0	.0	.0	.0	.0	1.0	.0	.2
8. Recpt 8	274.	1.1	.0	.0	.0	.0	.9	.0	.0	.2
9. Recpt 9	94.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	266.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	86.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	274.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	176.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
14. Recpt 14	184.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
15. Recpt 15	86.	1.3	.0	.0	.0	.0	.0	.0	.0	.0
16. Recpt 16	274.	1.4	.0	.0	.0	.0	.0	.0	.0	.0
17. Recpt 21	176.	1.6	.0	.0	.0	.0	.0	.0	.0	.0
18. Recpt 22	266.	1.8	.0	.0	.0	.0	.0	.0	.0	.0
19. Recpt 23	46.	1.4	.0	.0	.0	.0	.0	.0	.0	.0
20. Recpt 24	274.	1.9	.0	.0	.0	.0	.0	.0	.0	.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Recpt 1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Recpt 4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Recpt 6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. Recpt 8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. Recpt 9	.0	1.3	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	1.4	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	.0	1.3	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	1.4	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	.0	.0	.0	.0	.3	.0	.0	1.1	.0	.0	.0	.0
14. Recpt 14	.0	.0	.0	.0	.0	.3	.0	1.1	.0	.0	.0	.0
15. Recpt 15	.0	.0	.0	.0	.0	.9	.0	.4	.0	.0	.0	.0
16. Recpt 16	.0	.0	.0	.0	1.0	.0	.0	.4	.0	.0	.0	.0
17. Recpt 21	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	1.0
18. Recpt 22	.0	.0	.0	.0	.0	.0	.0	.0	1.5	.0	.2	.0
19. Recpt 23	.0	.0	.0	.0	.0	.0	.0	.0	.4	.3	.1	.2
20. Recpt 24	.0	.0	.0	.0	.0	.0	.0	.0	1.5	.0	.0	.4

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2035 No Project PM
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= .0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link A	0	0	-750	0	AG	938	1.8	1.8	13.4
B. Link B	0	0	750	0	AG	1067	1.8	1.8	13.4
C. Link C	0	0	0	750	AG	209	1.8	1.8	13.4
D. Link D	0	0	0	-750	AG	218	1.8	1.8	13.4
E. Link E	1000	1000	250	1000	AG	1081	1.8	1.8	13.4
F. Link F	1000	1000	1750	1000	AG	1326	1.8	1.8	13.4
G. Link G	1000	1000	1000	1750	AG	186	1.8	1.8	13.4
H. Link H	1000	1000	1000	250	AG	497	1.8	1.8	13.4
I. Link I	-1000	-1000	-1750	-1000	AG	2363	1.8	1.8	13.4
J. Link J	-1000	-1000	-250	-1000	AG	2123	1.8	1.8	13.4
K. Link K	-1000	-1000	-1000	-250	AG	1211	1.8	1.8	13.4
L. Link L	-1000	-1000	-1000	-1750	AG	1235	1.8	1.8	13.4
M. Link M	2000	2000	1250	2000	AG	1494	1.8	1.8	13.4
N. Link N	2000	2000	2750	2000	AG	1509	1.8	1.8	13.4
O. Link O	2000	2000	2000	2750	AG	1322	1.8	1.8	13.4
P. Link P	2000	2000	2000	1250	AG	1491	1.8	1.8	13.4
Q. Link Q	-2000	-2000	-2750	-2000	AG	3251	1.8	1.8	13.4
R. Link R	-2000	-2000	-1250	-2000	AG	2065	1.8	1.8	13.4
S. Link S	-2000	-2000	-2000	-1250	AG	1231	1.8	1.8	13.4
T. Link T	-2000	-2000	-2000	-2750	AG	1455	1.8	1.8	13.4

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. Recpt 1	-10	10	1.8
2. Recpt 2	10	10	1.8
3. Recpt 3	-10	-10	1.8
4. Recpt 4	10	-10	1.8
5. Recpt 5	990	1010	1.8
6. Recpt 6	1010	1010	1.8
7. Recpt 7	990	990	1.8
8. Recpt 8	1010	990	1.8
9. Recpt 9	-1010	-990	1.8
10. Recpt 10	-990	-990	1.8
11. Recpt 11	-1010	-1010	1.8
12. Recpt 12	-990	-1010	1.8
13. Recpt 13	1990	2010	1.8
14. Recpt 14	2010	2010	1.8
15. Recpt 15	1990	1990	1.8

16. Recpt 16	2010	1990	1.8
17. Recpt 21	-2010	-1990	1.8
18. Recpt 22	-1990	-1990	1.8
19. Recpt 23	-2010	-2010	1.8
20. Recpt 24	-1990	-2010	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Recpt 1	94.	.3	.0	.3	.0	.0	.0	.0	.0	.0
2. Recpt 2	227.	.2	.0	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	86.	.3	.0	.3	.0	.0	.0	.0	.0	.0
4. Recpt 4	86.	.3	.0	.3	.0	.0	.0	.0	.0	.0
5. Recpt 5	94.	.4	.0	.0	.0	.0	.0	.3	.0	.0
6. Recpt 6	224.	.3	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	86.	.4	.0	.0	.0	.0	.0	.3	.0	.0
8. Recpt 8	274.	.3	.0	.0	.0	.0	.3	.0	.0	.0
9. Recpt 9	94.	.6	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	266.	.6	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	86.	.6	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	274.	.6	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	176.	.5	.0	.0	.0	.0	.0	.0	.0	.0
14. Recpt 14	184.	.5	.0	.0	.0	.0	.0	.0	.0	.0
15. Recpt 15	86.	.5	.0	.0	.0	.0	.0	.0	.0	.0
16. Recpt 16	274.	.5	.0	.0	.0	.0	.0	.0	.0	.0
17. Recpt 21	176.	.6	.0	.0	.0	.0	.0	.0	.0	.0
18. Recpt 22	266.	.7	.0	.0	.0	.0	.0	.0	.0	.0
19. Recpt 23	274.	.6	.0	.0	.0	.0	.0	.0	.0	.0
20. Recpt 24	274.	.8	.0	.0	.0	.0	.0	.0	.0	.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Recpt 1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Recpt 4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Recpt 6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. Recpt 8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. Recpt 9	.0	.5	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	.5	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	.0	.5	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	.5	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	.0	.0	.0	.0	.1	.0	.0	.4	.0	.0	.0	.0
14. Recpt 14	.0	.0	.0	.0	.0	.1	.0	.4	.0	.0	.0	.0
15. Recpt 15	.0	.0	.0	.0	.0	.4	.0	.1	.0	.0	.0	.0
16. Recpt 16	.0	.0	.0	.0	.4	.0	.0	.1	.0	.0	.0	.0
17. Recpt 21	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0	.0	.4
18. Recpt 22	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.1	.0
19. Recpt 23	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	.0
20. Recpt 24	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2035 With Project PM
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= .0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link A	0	0	-750	0	AG	1305	1.8	1.8	13.4
B. Link B	0	0	750	0	AG	1663	1.8	1.8	13.4
C. Link C	0	0	0	750	AG	143	1.8	1.8	13.4
D. Link D	0	0	0	-750	AG	383	1.8	1.8	13.4
E. Link E	1000	1000	250	1000	AG	1317	1.8	1.8	13.4
F. Link F	1000	1000	1750	1000	AG	1456	1.8	1.8	13.4
G. Link G	1000	1000	1000	1750	AG	516	1.8	1.8	13.4
H. Link H	1000	1000	1000	250	AG	789	1.8	1.8	13.4
I. Link I	-1000	-1000	-1750	-1000	AG	2363	1.8	1.8	13.4
J. Link J	-1000	-1000	-250	-1000	AG	2131	1.8	1.8	13.4
K. Link K	-1000	-1000	-1000	-250	AG	1285	1.8	1.8	13.4
L. Link L	-1000	-1000	-1000	-1750	AG	1317	1.8	1.8	13.4
M. Link M	2000	2000	1250	2000	AG	1595	1.8	1.8	13.4
N. Link N	2000	2000	2750	2000	AG	1554	1.8	1.8	13.4
O. Link O	2000	2000	2000	2750	AG	1434	1.8	1.8	13.4
P. Link P	2000	2000	2000	1250	AG	1645	1.8	1.8	13.4
Q. Link Q	-2000	-2000	-2750	-2000	AG	3283	1.8	1.8	13.4
R. Link R	-2000	-2000	-1250	-2000	AG	2085	1.8	1.8	13.4
S. Link S	-2000	-2000	-2000	-1250	AG	1261	1.8	1.8	13.4
T. Link T	-2000	-2000	-2000	-2750	AG	1505	1.8	1.8	13.4

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. Recpt 1	-10	10	1.8
2. Recpt 2	10	10	1.8
3. Recpt 3	-10	-10	1.8
4. Recpt 4	10	-10	1.8
5. Recpt 5	990	1010	1.8
6. Recpt 6	1010	1010	1.8
7. Recpt 7	990	990	1.8
8. Recpt 8	1010	990	1.8
9. Recpt 9	-1010	-990	1.8
10. Recpt 10	-990	-990	1.8
11. Recpt 11	-1010	-1010	1.8
12. Recpt 12	-990	-1010	1.8
13. Recpt 13	1990	2010	1.8
14. Recpt 14	2010	2010	1.8

15. Recpt 15	1990	1990	1.8
16. Recpt 16	2010	1990	1.8
17. Recpt 21	-2010	-1990	1.8
18. Recpt 22	-1990	-1990	1.8
19. Recpt 23	-2010	-2010	1.8
20. Recpt 24	-1990	-2010	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Recpt 1	94.	.4	.0	.4	.0	.0	.0	.0	.0	.0
2. Recpt 2	94.	.4	.0	.4	.0	.0	.0	.0	.0	.0
3. Recpt 3	86.	.4	.0	.4	.0	.0	.0	.0	.0	.0
4. Recpt 4	86.	.4	.0	.4	.0	.0	.0	.0	.0	.0
5. Recpt 5	94.	.4	.0	.0	.0	.0	.0	.4	.0	.0
6. Recpt 6	224.	.3	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	86.	.4	.0	.0	.0	.0	.0	.4	.0	.0
8. Recpt 8	274.	.4	.0	.0	.0	.0	.3	.0	.0	.0
9. Recpt 9	94.	.6	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	266.	.6	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	86.	.6	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	274.	.6	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	176.	.5	.0	.0	.0	.0	.0	.0	.0	.0
14. Recpt 14	184.	.5	.0	.0	.0	.0	.0	.0	.0	.0
15. Recpt 15	86.	.5	.0	.0	.0	.0	.0	.0	.0	.0
16. Recpt 16	274.	.5	.0	.0	.0	.0	.0	.0	.0	.0
17. Recpt 21	176.	.7	.0	.0	.0	.0	.0	.0	.0	.0
18. Recpt 22	266.	.8	.0	.0	.0	.0	.0	.0	.0	.0
19. Recpt 23	44.	.6	.0	.0	.0	.0	.0	.0	.0	.0
20. Recpt 24	274.	.8	.0	.0	.0	.0	.0	.0	.0	.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Recpt 1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Recpt 4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Recpt 6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. Recpt 8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. Recpt 9	.0	.5	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	.5	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	.0	.5	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	.5	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	.0	.0	.0	.0	.1	.0	.0	.4	.0	.0	.0	.0
14. Recpt 14	.0	.0	.0	.0	.0	.1	.0	.4	.0	.0	.0	.0
15. Recpt 15	.0	.0	.0	.0	.0	.4	.0	.1	.0	.0	.0	.0
16. Recpt 16	.0	.0	.0	.0	.4	.0	.0	.1	.0	.0	.0	.0
17. Recpt 21	.0	.0	.0	.0	.0	.0	.0	.0	.3	.0	.0	.4
18. Recpt 22	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.1	.0
19. Recpt 23	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0
20. Recpt 24	.0	.0	.0	.0	.0	.0	.0	.0	.6	.0	.0	.1

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Int27 E/Inland Ctr/Mill Street all PM
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= .5 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= .0 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Link A	0	0	-750	0	AG	1576	9.6	1.8	13.4
B. Link B	0	0	750	0	AG	1748	9.6	1.8	13.4
C. Link C	0	0	0	750	AG	1344	9.6	1.8	13.4
D. Link D	0	0	0	-750	AG	1342	9.6	1.8	13.4
E. Link E	1000	1000	250	1000	AG	1757	5.6	1.8	13.4
F. Link F	1000	1000	1750	1000	AG	1471	5.6	1.8	13.4
G. Link G	1000	1000	1000	1750	AG	1393	5.6	1.8	13.4
H. Link H	1000	1000	1000	250	AG	1655	5.6	1.8	13.4
I. Link I	-1000	-1000	-1750	-1000	AG	1765	5.6	1.8	13.4
J. Link J	-1000	-1000	-250	-1000	AG	1518	5.6	1.8	13.4
K. Link K	-1000	-1000	-1000	-250	AG	1489	5.6	1.8	13.4
L. Link L	-1000	-1000	-1000	-1750	AG	1696	5.6	1.8	13.4
M. Link M	2000	2000	1250	2000	AG	2246	1.8	1.8	13.4
N. Link N	2000	2000	2750	2000	AG	1963	1.8	1.8	13.4
O. Link O	2000	2000	2000	2750	AG	1725	1.8	1.8	13.4
P. Link P	2000	2000	2000	1250	AG	2172	1.8	1.8	13.4
Q. Link Q	-2000	-2000	-2750	-2000	AG	2254	1.8	1.8	13.4
R. Link R	-2000	-2000	-1250	-2000	AG	2010	1.8	1.8	13.4
S. Link S	-2000	-2000	-2000	-1250	AG	1821	1.8	1.8	13.4
T. Link T	-2000	-2000	-2000	-2750	AG	2213	1.8	1.8	13.4

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. Recpt 1	-10	10	1.8
2. Recpt 2	10	10	1.8
3. Recpt 3	-10	-10	1.8
4. Recpt 4	10	-10	1.8
5. Recpt 5	990	1010	1.8
6. Recpt 6	1010	1010	1.8
7. Recpt 7	990	990	1.8
8. Recpt 8	1010	990	1.8
9. Recpt 9	-1010	-990	1.8
10. Recpt 10	-990	-990	1.8
11. Recpt 11	-1010	-1010	1.8
12. Recpt 12	-990	-1010	1.8
13. Recpt 13	1990	2010	1.8
14. Recpt 14	2010	2010	1.8
15. Recpt 15	1990	1990	1.8

16. Recpt 16	2010	1990	1.8
17. Recpt 21	-2010	-1990	1.8
18. Recpt 22	-1990	-1990	1.8
19. Recpt 23	-2010	-2010	1.8
20. Recpt 24	-1990	-2010	1.8

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D	E	F	G	H
1. Recpt 1	94.	2.9	.0	2.2	.6	.0	.0	.0	.0	.0
2. Recpt 2	266.	2.7	2.1	.0	.6	.0	.0	.0	.0	.0
3. Recpt 3	86.	2.9	.0	2.2	.0	.6	.0	.0	.0	.0
4. Recpt 4	274.	2.7	2.1	.0	.0	.6	.0	.0	.0	.0
5. Recpt 5	176.	1.7	.0	.0	.0	.0	.5	.0	.0	1.3
6. Recpt 6	224.	1.5	.0	.0	.0	.0	.3	.3	.2	.3
7. Recpt 7	86.	1.6	.0	.0	.0	.0	.0	1.1	.0	.4
8. Recpt 8	274.	1.8	.0	.0	.0	.0	1.3	.0	.0	.4
9. Recpt 9	176.	1.8	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	266.	1.7	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	46.	1.5	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	274.	1.8	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	225.	.8	.0	.0	.0	.0	.0	.0	.0	.0
14. Recpt 14	224.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
15. Recpt 15	86.	.6	.0	.0	.0	.0	.0	.0	.0	.0
16. Recpt 16	225.	.8	.0	.0	.0	.0	.0	.0	.0	.0
17. Recpt 21	45.	.7	.0	.0	.0	.0	.0	.0	.0	.0
18. Recpt 22	184.	.7	.0	.0	.0	.0	.0	.0	.0	.0
19. Recpt 23	46.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
20. Recpt 24	45.	.7	.0	.0	.0	.0	.0	.0	.0	.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE) (CONT.)

RECEPTOR	CONC/LINK (PPM) I	J	K	L	M	N	O	P	Q	R	S	T
1. Recpt 1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Recpt 2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. Recpt 3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Recpt 4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5. Recpt 5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
6. Recpt 6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7. Recpt 7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8. Recpt 8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9. Recpt 9	.5	.0	.0	1.3	.0	.0	.0	.0	.0	.0	.0	.0
10. Recpt 10	1.3	.0	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
11. Recpt 11	.3	.3	.2	.3	.0	.0	.0	.0	.0	.0	.0	.0
12. Recpt 12	1.3	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
13. Recpt 13	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0
14. Recpt 14	.0	.0	.0	.0	.1	.1	.0	.1	.0	.0	.0	.0
15. Recpt 15	.0	.0	.0	.0	.0	.5	.0	.2	.0	.0	.0	.0
16. Recpt 16	.0	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.0
17. Recpt 21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0
18. Recpt 22	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0	.5
19. Recpt 23	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1	.0	.1
20. Recpt 24	.0	.0	.0	.0	.0	.0	.0	.0	.0	.2	.0	.0

Title : South Coast AQMD Avg Annual 3 CYrs 2009 to 2035 Default Title
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2011/10/12 14:58:00
Scen Year: 2009 -- All model years in the range 1965 to 2009 selected
Season : Annual
Area : South Coast AQMD
****
****

Year: 2009 -- Model Years 1965 to 2009 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Carbon Monoxide Temperature: 17F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	6.802	9.340	12.135	26.756	35.668	63.740	9.556

Year: 2014 -- Model Years 1970 to 2014 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Carbon Monoxide Temperature: 17F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	3.510	5.653	7.867	15.224	31.297	46.298	5.620

Year: 2035 -- Model Years 1991 to 2035 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average South Coast AQMD

Table 1: Running Exhaust Emissions (grams/mile)

Pollutant Name: Carbon Monoxide Temperature: 17F Relative Humidity: 50%

Speed MPH	LDA	LDT	MDT	HDT	UBUS	MCY	ALL
1	0.955	1.679	2.148	5.055	9.827	35.529	1.814

Appendix D
Health Risk Assessment

HEALTH RISK CALCULATIONS FROM TRAIN ACTIVITY

Methods

DPM through inhalation patyhway only
ALL PM10 exhaust from trains assumed to be DPM
Methodology based on Cancer Risk and Hazard Quotient procedures in:
Attachment 1 of CAPCOA, July 2009. Health Risk Assessments for Proposed Land Use Projects
http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf
Breathing Rates,Exposure Frequency, and Exposure Duration based on: Assessment and Stochastic Analysis"
OEHHA September 2000 Guidance "Technical Support Document for Exposure Assessment and Stochastic Analysis"
http://oehha.ca.gov/air/hot_spots/finalStoc.html

Calculation Methodology:

Cancer Risk:

$$\text{Cancer Risk} = S_i * C_i * DBR * A * EF * ED * 10^{-6} / AT$$

Where:

S_i = Slope Factor for substance i
C_i = Concentration in the air of substance i
DBR = Daily Breathing Rate:

Residential Receptors = 302 L/kg-day (default 80th %ile)
= 393 L/kg-day (95th %ile)

Worker Receptors = 149 L/kg-day

A = Inhalation Absorption Rate = 1

EF = Exposure Frequency:

Residential Receptors = 350 days

Worker Receptors = 245 days

ED = Exposure Duration:

See Section 1.3

AT = Averaging Time = 25,550 days

The result will be cancer risk for each source and receptor combination modeled.

Hazard Quotient:

$$\text{Hazard Quotient} = C_i/REL_i$$

Where:
C_i = Concentration in the air of substance i
REL_i = Chronic noncancer Reference Exposure Level for substance i

For multiple substances, the Hazard Index (HI) is calculated. The HI is calculated by summing the HQs from all substances that affect the same organ system. HQs for different organ systems are not added, for example, do not sum respiratory irritation HQs with cardiovascular effects. The following equation is used to calculate the Hazard Index for the eye irritation endpoint:

source: CAPCOA, HRA Guidance, July 2009, pages 74 and 75 of 75

E Street

	IDLING			MOVEMENT			
	Resident	Worker	Recreational	Resident	Worker	Recreational	
Cancer Risk (per million) =	3.062	4.813	2.225	0.087	0.017	0.011	(different receptors)
Si	1.1	1.1	1.1	1.1	1.1	1.1	(cancer potency for DPM, from OEHHA)
Ci	0.009613	0.076565	0.054899	0.000272	0.000272	0.000272	annual avg concentration from above, based on 1hr->annual conversion, adjusted for daily exposure based on daily onsite hours)
DBR	302	149	581	302	149	581	(Daily Breathing Rate. 302 for residential (80th %ile), 149 for workers, 581 for schools (95th %ile. Assumed same for playing field)
A	1	1	1	1	1	1	(inhalation absorption rate. Default for all)
EF	350	245	180	350	245	180	(Exposure Frequency, Days per Year)
ED	70	40	9	70	40	9	(Exposure Duration, Years)
AT	25550	25550	25550	25550	25550	25550	(Averaging Time)
Chronic Hazard Quotient (noncancer chronic inhalation) =	0.00192	0.01531	0.01098	0.00005	0.00005	0.00005	
Ci	0.009613	0.076565	0.054899	0.000272	0.000272	0.000272	annual avg concentration from above, based on 1hr->annual conversion, adjusted for daily exposure based on daily onsite hours)
RELi	5	5	5	5	5	5	Non Cancer Chronic Inhalation factor, from OEHAA

HRA CALCULATIONS FROM CONSTRUCTION ACTIVITIES

Methods

DPM only through inhalation pathway
ALL PM10 exhaust from construction assumed to be DPM
9, 40, and 70-year cancer risk scaled based on the fraction of time of construction (1.5 years) over presumed exposure duration (9,40,70 years)
Methodology based on Cancer Risk and Hazard Quotient procedures in:
Attachment 1 of CAPCOA, July 2009. Health Risk Assessments for Proposed Land Use Projects
http://www.capcoa.org/wp-content/uploads/downloads/2010/05/CAPCOA_HRA_LU_Guidelines_8-6-09.pdf
Breathing Rates,Exposure Frequency, and Exposure Duration based on: Assessment and Stochastic Analysis"
OEHHA September 2000 Guidance "Technical Support Document for Exposure Assessment and Stochastic Analysis"
http://oehha.ca.gov/air/hot_spots/finalStoc.html

Calculation Methodology:

Cancer Risk:

Cancer Risk = S_i * C_i * DBR * A * EF * ED * 10^{-6} / AT

Where:

S_i = Slope Factor for substance i
C_i = Concentration in the air of substance i
DBR = Daily Breathing Rate:

Residential Receptors = 302 L/kg-day (default 80th%ile)
= 303 L/kg-day (95th%ile)

Worker Receptors = 149 L/kg-day

A = Inhalation Absorption Rate = 1

EF = Exposure Frequency:

Residential Receptors = 350 days

Worker Receptors = 245 days

ED = Exposure Duration:

See Section 1.3

AT = Averaging Time = 25,550 days

The result will be cancer risk for each source and receptor combination modeled

Hazard Quotient:

Hazard Quotient = C_i/REL_i

Where:
C = Concentration in the air of substance i
REL_i = Chronic noncancer Reference Exposure Level for substance i

For multiple substances, the Hazard Index (HI) is calculated. The HI is calculated by summing the HQs from all substances that affect the same organ system. HQs for different organ systems are not added, for example, do not sum respiratory irritation HQs with cardiovascular effects. The following equation is used to calculate the Hazard Index for the eye irritation endpoint:

source: CAPCOA, HRA Guidance, July 2009, pages 74 and 75 of 75

Construction emissions (total tons of PM10 exhaust):

	2012	*2013*
DSBPRP (see Appendix A)	0.1977	0.0371
sBx (2010 addendum)	0.12	
	0.3177	0.0371

Construction DPM Emissions

	PM10 Exhaust only
2012 total tons of PM10 exhaust	0.3177
grams per ton	907184.74
total grams of PM10 exhaust	288225
onds per 2012 (construction time period)	31536000
2012 grams per second	9.14E-03
2013 total tons of PM10 exhaust	0.0371
grams per ton	907184.74
total grams of PM10 exhaust	33690
onds per 2012 (construction time period)	15768000
2013 grams per second	2.14E-03
	6.81E-03 = DSBPRP construction emission rate (g/s)

Emission Rate and Concentration

4.83371	1-hr max concentration from AERSCREEN (at 800M)
6.81E-03	*DSBPRP construction emission rate (g/s)*
0.1	1-hour --> annual conversion (from AERSCREEN Guidance)
0.003289	annual concentration (micrograms/meter3)

		Resident	**Worker**	**Recreational**	
Cancer Risk (per million) =		1.047847	0.007755	0.022216	
	Si	1.1	1.1	1.1	cancer potency for DPM, from OEHHA
	Ci	0.003289	0.003289	0.003289	annual avg concentration from above, based on 1hr->annual conversion
	DBR	302	149	581	Daily Breathing Rate. 302 for residential (80th %ile), 149 for workers, 581 for schools (95th %
	A	1	1	1	inhalation absorption rate. Default for all
	EF	350	245	180	Exposure Frequency, Days per Year
	ED	70	40	9	Exposure Duration, 1.5 years construction duration
	AT	25550	25550	25550	Averaging Time
	1.5 scaling ofconstruction leng	2.14%	3.75%	16.67%	scaling factor, based on construction period of 1.5 years
Chronic Hazard Quotient (noncancer chronic inhalation) =		0.000658	0.000658	0.000658	
	Ci	0.003289	0.003289	0.003289	annual avg concentration from above, based on 1hr->annual conversion
	RELi	5	5	5	Non Cancer Chronic Inhalation factor, from OEHAA

AERSCREEN/AERMOD inputs for Train Movement

AERSCREEN/AERMOD inputs	input	metric
Source Type	Area	
source release height	4.52	
larger side length	1609.34	
smaller side length	8.6868	
initial vertical dimension	2.06	
Urban or Rural	U	
Urban Area Population	2,015,355	
min distance to ambient air	default (1m)	
NO2/NO chemistry	1, No	
max distance to probe	default (5000m)	
discrete receptors	Yes	
flagpole receptors	no	
source elevation	default (0m)	
min temp (K)	264.82	17 http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca7723
max temp (K)	320.37	117 http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca7723
min wind speed (m/s)	0.5 (default)	
anemometer height (m)	10 (default)	
Surface characteristics		
single user specified values:		
albedo	0.18	
Bowen Ratio	1.0	
surface roughness	0.357	

AERMOD OUTPUT
Train Movement

**BEE-Line	Software:	BEEST	for	Windows	(Version	9.90a)	data	input	file				
**	Model:	AERMOD.E	Input	File	Creation	Date:	########	Time:	11:16:56 AM				
**	ECHO												
	**	CONC	OF	OTHER	IN	MICROGRA	**						
	X-COORD	(M)	Y-COORD	(M)	CONC	(YYMMDDI	X-COORD	(M)	Y-COORD	(M)	CONC	(YYMMDDHH)	
	-	-	-	-	-	-	-	-	-	-	-	-	-
	804.7	0	358.0068	-1E+07	805	0	358.008	-1E+07			edge	804.7	
@1g/s	810	0	652.9955	-1E+07	815	0	534.9269	-1E+07				5.3	m distance from edge
	820	0	568.6901	-1E+07	825	0	598.8043	-1E+07				15.3	
	850	0	394.7565	-1E+07	875	0	322.0117	-1E+07				45.3	
	900	0	272.1765	-1E+07	925	0	233.9911	-1E+07				95.3	
	950	0	210.333	-1E+07	975	0	196.0819	-1E+07				145.3	
	1000	0	179.4022	-1E+07	1025	0	165.7479	-1E+07				195.3	
	1050	0	154.2856	-1E+07	1075	0	144.4767	-1E+07				245.3	
	1100	0	135.9508	-1E+07	1125	0	128.4475	-1E+07				295.3	
	1150	0	113.3325	-1E+07	1175	0	108.628	-1E+07				345.3	
	1200	0	104.2756	-1E+07	1225	0	100.2376	-1E+07				395.3	
	1250	0	96.48155	-1E+07	1275	0	92.9793	-1E+07					
	1300	0	89.70627	-1E+07	1325	0	86.64095	-1E+07					
	1350	0	83.76441	-1E+07	1375	0	81.05995	-1E+07					
	1400	0	78.51276	-1E+07	1425	0	76.10969	-1E+07					
	1450	0	73.83898	-1E+07	1475	0	71.69013	-1E+07					
	1500	0	69.65372	-1E+07	1525	0	67.72126	-1E+07					
	1550	0	65.8851	-1E+07	1575	0	64.1383	-1E+07					
	1600	0	62.4746	-1E+07	1625	0	60.88827	-1E+07					
	1650	0	59.37413	-1E+07	1675	0	57.92743	-1E+07					
	1700	0	56.54383	-1E+07	1725	0	55.21934	-1E+07					
	1750	0	53.95033	-1E+07	1775	0	52.73344	-1E+07					
	1800	0	51.56556	-1E+07	1825	0	50.44385	-1E+07					
	1850	0	49.36567	-1E+07	1875	0	48.32858	-1E+07					
	1900	0	47.33031	-1E+07	1925	0	46.36877	-1E+07					
	1950	0	45.44199	-1E+07	1975	0	44.54818	-1E+07					
	2000	0	43.68563	-1E+07	2025	0	42.85276	-1E+07					
	2050	0	42.04809	-1E+07	2075	0	41.27026	-1E+07					
	2100	0	40.51796	-1E+07	2125	0	39.78999	-1E+07					
	2150	0	39.08521	-1E+07	2175	0	38.40255	-1E+07					
	2200	0	37.74101	-1E+07	2225	0	37.09965	-1E+07					
	2250	0	36.47759	-1E+07	2275	0	35.87397	-1E+07					
	2300	0	35.28802	-1E+07	2325	0	34.71899	-1E+07					
	2350	0	34.16617	-1E+07	2375	0	33.6289	-1E+07					
	2400	0	33.10655	-1E+07	2425	0	32.59851	-1E+07					
	2450	0	32.10424	-1E+07	2475	0	31.62318	-1E+07					
	2500	0	31.15483	-1E+07	2525	0	30.69871	-1E+07					
	2550	0	28.71602	-1E+07	2575	0	28.33531	-1E+07					
	2600	0	27.96326	-1E+07	2625	0	27.59958	-1E+07					
	2650	0	27.24402	-1E+07	2675	0	26.89632	-1E+07					

AERSCREEN/AERMOD inputs for Train Idling

	input	metric	source
emissions rate	1	g/s	
Source release height	4.52	m	BNSF SB Rail Yard HRA
stack inside diameter	0.62	m	BNSF SB Rail Yard HRA
stack gas exity temp (K)	373.22		BNSF SB Rail Yard HRA
Option	1		
stack gas exit velocity	5.48	m/s	BNSF SB Rail Yard HRA
urban/rural setting?	U		
urban pop	2,015,355		http://www.aqmd.gov/smog/metdata/AERMOD_ModelingGuidance.html
min distance to ambient air	1m	default	
No NO2 chem	1		
building downash?	N		
terrain heights	N		
max distance to probe	efault (5000m)		
use discrete receptors?	Y		*then enter receptor file path*
flagpole receptors	no		
min temp (K)	264.82		http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca7723
max temp (K)	320.37		http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca7723
min wind speed (m/s)	0.5 (default)		
anemometer height (m)	10 (default)		
Surface characteristics			
single user specified values:			
albedo	0.18		http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
Bowen Ratio	1.0		http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
surface roughness	0.357		http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html

AERMOD OUTPUT
Train Idling

**BEE-Line	Software:	BEEST	for	Windows	(Version	9.90a)	data	input	file			
**	Model:	AERMOD.E>	Input	File	Creation	Date:	10/14/2011	Time:	9:29:57	AM		
**	ECHO											
	**	CONC	OF	OTHER	IN	MICROGRA	**					
	X-COORD	(M)	Y-COORD	(M)	CONC	(YYMMDDH	X-COORD	(M)	Y-COORD	(M)	CONC	(YYMMDDH
	-	-	-	-	-	-	-	-	-	-	-	-
	1	0	0.00002	-10010212	25	0	630.51333	-10051501				
	50	0	364.70247	-10050901	75	0	256.88166	-10042701				
	85	0	225.70691	-10042701	100	0	186.59015	-10042701				85
	107	0	171.37366	-10042701	125	0	139.55151	-10042701				107
	130	0	132.266	-10042701	150	0	116.15845	-10041701				130
	175	0	103.8477	-10041701	200	0	99.413	-10040301				
	225	0	99.54788	-10040301	250	0	97.78859	-10040301				
	270	0	95.54543	-10040301	275	0	94.90661	-10040301				
	300	0	92.07545	-10032501	325	0	88.94647	-10032501				
	350	0	85.59039	-10032501	375	0	82.16617	-10030101				
	400	0	79.41784	-10030101	425	0	76.6299	-10030101				
	450	0	73.85924	-10030101	475	0	71.14371	-10030101				
	500	0	68.5078	-10030101	525	0	65.96654	-10030101				
	550	0	63.52842	-10030101	575	0	61.19731	-10030101				
	600	0	58.97394	-10030101	625	0	56.8569	-10030101				
	650	0	54.84338	-10030101	675	0	52.92965	-10030101				
	700	0	51.11144	-10030101	725	0	49.38418	-10030101				
	750	0	47.74323	-10030101	775	0	46.18391	-10030101				
	800	0	44.70169	-10030101	825	0	43.29214	-10030101				
	850	0	41.95107	-10030101	875	0	40.67445	-10030101				
	900	0	39.45849	-10030101	925	0	38.2996	-10030101				
	950	0	37.19442	-10030101	975	0	36.1398	-10030101				
	1000	0	35.13276	-10030101	1025	0	34.17055	-10030101				
	1050	0	33.25058	-10030101	1075	0	32.37043	-10030101				
	1100	0	31.52783	-10030101	1125	0	30.72068	-10030101				
	1150	0	29.94701	-10030101	1175	0	29.20497	-10030101				
	1200	0	28.49285	-10030101	1225	0	27.80902	-10030101				
	1250	0	27.15199	-10030101	1275	0	26.52034	-10030101				
	1300	0	25.91276	-10030101	1325	0	25.328	-10030101				
	1350	0	24.76491	-10030101	1375	0	24.22241	-10030101				
	1400	0	23.69947	-10030101	1425	0	23.19513	-10030101				
	1450	0	22.70849	-10030101	1475	0	22.23871	-10030101				
	1500	0	21.785	-10030101	1525	0	21.34659	-10030101				
	1550	0	20.92278	-10030101	1575	0	20.51291	-10030101				
	1600	0	20.11636	-10030101	1625	0	19.73252	-10030101				
	1650	0	19.36083	-10030101	1675	0	19.00078	-10030101				
	1700	0	18.65185	-10030101	1725	0	18.31357	-10030101				
	1750	0	17.9855	-10030101	1775	0	17.66722	-10030101				
	1800	0	17.35831	-10030101	1825	0	17.0584	-10030101				
	1850	0	16.76713	-10030101	1875	0	16.48415	-10030101				

AERSCREEN/AERMOD inputs for Construction

input		metric	source
Source Type	Area		
emissions rate	1	g/s	
Source height	5	m	http://aqmd.gov/ceqa/handbook/LST/Method_final.pdf
length larger side	1609.34	m	
length smaller side	21.082	m	
initial vertical dimension	1		http://aqmd.gov/ceqa/handbook/LST/Method_final.pdf
urban/rural setting?	U		
Urban Area Population	2,015,355		http://www.aqmd.gov/smog/metdata/AERMOD_ModelingGuidance.ht
min distance to ambient air	1m (default)		
NO2 Chemistry	1	no chem or pollutant	
max distance to probe	5000m	default	
discrete receptors	N		
flagpole receptors	N		
source elevation	0	default	
min temperature	264.82	k	http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca7723
max temp	320.37	k	http://www.wrcc.dri.edu/cgi-bin/cliGCStT.pl?ca7723
min wind speed	0.5	m/s default	(1.1 mph)
anemometer height	10	m default	
Surface characteristics			
single user specified values:			
albedo	0.18		http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
Bowen Ratio	1.0		http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
surface roughness	0.357		http://www.aqmd.gov/smog/metdata/AERMOD_Table2.html
receptor height above ground	0	m	

AERMOD OUTPUT
Construction

**BEE-Line	Software:	BEEST	for	Windows	(Version	9.90a)	data	input	file
**	Model:	AERMOD.E	Input	File	Creation	Date:	########	Time:	3:35:31 PM
**	ECHO								

**	CONC	OF	OTHER	IN	MICROGRA	**							
X-COORD	(M)	Y-COORD	(M)	CONC	(YYMMDDI	X-COORD	(M)	Y-COORD	(M)	CONC	(YYMMDDHH)		
-	-	-	-	-	-	-	-	-	-	-	-	-	-
804.7	0	511.66	-1E+07	810	0	511.945	-1E+07		(fenceline)	511.66	0	m	
820	0	435.7318	-1E+07	825	0	462.0732	-1E+07			511.945	5.3	m	804.7
850	0	380.6238	-1E+07	875	0	308.2187	-1E+07			462.0732	25	m	829.7
900	0	261.1747	-1E+07	925	0	229.0562	-1E+07			261.1747	100	m	904.7
950	0	205.3193	-1E+07	975	0	189.151	-1E+07						
1000	0	173.2765	-1E+07	1025	0	160.2025	-1E+07						
1050	0	149.1966	-1E+07	1075	0	139.7702	-1E+07						
1100	0	131.5745	-1E+07	1125	0	124.3621	-1E+07						
1150	0	109.8185	-1E+07	1175	0	105.2744	-1E+07						
1200	0	101.0697	-1E+07	1225	0	97.16839	-1E+07						
1250	0	93.5391	-1E+07	1275	0	90.15469	-1E+07						
1300	0	86.99147	-1E+07	1325	0	84.02869	-1E+07						
1350	0	81.24812	-1E+07	1375	0	78.63364	-1E+07						
1400	0	76.17098	-1E+07	1425	0	73.84744	-1E+07						
1450	0	71.64704	-1E+07	1475	0	69.56246	-1E+07						
1500	0	67.58692	-1E+07	1525	0	65.71221	-1E+07						
1550	0	63.9309	-1E+07	1575	0	62.23627	-1E+07						
1600	0	60.62223	-1E+07	1625	0	59.08324	-1E+07						
1650	0	57.61428	-1E+07	1675	0	56.21073	-1E+07						
1700	0	54.86838	-1E+07	1725	0	53.58338	-1E+07						
1750	0	52.35219	-1E+07	1775	0	51.17155	-1E+07						
1800	0	50.03847	-1E+07	1825	0	48.95017	-1E+07						
1850	0	47.90409	-1E+07	1875	0	46.89788	-1E+07						
1900	0	45.92932	-1E+07	1925	0	44.99639	-1E+07						
1950	0	44.0972	-1E+07	1975	0	43.22997	-1E+07						
2000	0	42.39308	-1E+07	2025	0	41.58498	-1E+07						
2050	0	40.80424	-1E+07	2075	0	40.04953	-1E+07						
2100	0	39.3196	-1E+07	2125	0	38.61326	-1E+07						
2150	0	37.92942	-1E+07	2175	0	37.26705	-1E+07						
2200	0	36.62517	-1E+07	2225	0	36.00286	-1E+07						
2250	0	35.39927	-1E+07	2275	0	34.81358	-1E+07						
2300	0	34.24503	-1E+07	2325	0	33.69289	-1E+07						
2350	0	33.15649	-1E+07	2375	0	32.63516	-1E+07						
2400	0	32.12832	-1E+07	2425	0	31.63536	-1E+07						
2450	0	31.15575	-1E+07	2475	0	30.68897	-1E+07						
2500	0	30.23451	-1E+07	2525	0	29.79192	-1E+07						
2550	0	29.36075	-1E+07	2575	0	28.94056	-1E+07						
2600	0	28.53096	-1E+07	2625	0	28.13157	-1E+07						
2650	0	27.74202	-1E+07	2675	0	27.36196	-1E+07						

Emission Rate Calculations

Construction

AERSCREEN/AERMOD results

Receptor Distance	max concentration (1g/s)
0	511.66001
5	511.94497
25	462.07319
100	261.17467
contruction emission rate	#REF!

Scaled Emission Concentrations

All Construction	Residential	Commerical	Recreational
assume worst case distance	5	5	5
1-hr max concentration from AERSCREEN (assuming 1 g/s)	511.94497	511.94497	511.94497
Metrolink fleet average emission rate (g/s)	#REF!	#REF!	#REF!
new concentration	#REF!	#REF!	#REF!
1-hour --> annual conversion	0.1	0.1	0.1
fraction of year of construction (8hrs/day)	0.33333	1.00000	1.00000
annual concentration (micrograms/meter3)	#REF!	#REF!	#REF!

Emission Rate Calculations

Idling

AERSCREEN/AERMOD results

Receptor Distance	max concentration	
85	225.70691	
107	171.37366	
130	132.266	
270	95.54543	
500	68.5078	
2400	11.99565	
25	630.51333	max overall concentration

Metrolink emission rate 0.00801 g/s

Scaled Emission Concentrations

E Street	Residential	Commerical	Recreational
Distance from idling (ft)	2400	270	500
1-hr max concentration from AERSCREEN (assuming 1 g/s)	11.996	95.545	68.508
Metrolink fleet average emission rate (g/s)	0.008	0.008	0.008
new concentration	0.096	0.766	0.549
1-hour --> annual conversion	0.1	0.1	0.1
annual concentration (micrograms/meter3)	0.010	0.077	0.055

Emission Rate Calculations

Train Movement

AERSCREEN/AERMOD results

Receptor Distance	max concentration
0	358.00684
5	652.99546
15	568.69013
45	394.75647
95	272.17647
145	210.33299
195	179.40222

Metrolink emission rate 4.17E-06 g/s

Scaled Emission Concentrations

E Street	Residential	Commerical	Recreational
assume worst case distance from alignment	5	5	5
1-hr max concentration from AERSCREEN (assuming 1 g/s)	652.99546	652.99546	652.99546
Metrolink fleet average emission rate (g/s)	4.17E-06	4.17E-06	4.17E-06
new concentration	0.00272	0.00272	0.00272
1-hour --> annual conversion	0.1	0.1	0.1
annual concentration (micrograms/meter3)	0.00027	0.00027	0.00027

Appendix E
Climate and Monitoring Data

SAN BERNARDINO, CALIFORNIA

Period of Record General Climate Summary - Temperature

Station:(047723) SAN BERNARDINO													
From Year=1893 To Year=2004													
	Monthly Averages			Daily Extremes				Monthly Extremes				Max. Temp.	
	Max.	Min.	Mean	High	Date	Low	Date	Highest Mean	Year	Lowest Mean	Year	>= 90 F	< 32
	F	F	F	F	dd/yyyy or yyyymmdd	F	dd/yyyy or yyyymmdd	F	-	F	-	# Days	# Da
January	66.2	38.5	52.3	94	19/1971	17	22/1937	58.3	1986	40.0	1937	0.0	(
February	68.1	40.9	54.5	93	25/1921	21	15/1942	60.8	1977	47.7	1894	0.2	(
March	70.4	43.0	56.7	97	10/1916	26	02/1903	63.5	1997	51.1	1962	0.5	(
April	75.6	46.3	60.9	103	23/1910	20	26/2003	66.9	1987	52.5	1967	2.6	(
May	80.4	50.6	65.5	112	29/1984	33	04/1899	74.6	1997	59.3	1933	5.6	(
June	88.6	54.3	71.5	116	17/1917	37	04/1908	80.4	1981	65.6	1894	14.7	(
July	96.2	59.1	77.7	116	27/1934	42	23/1903	84.1	1931	72.4	1932	26.9	(
August	96.2	59.4	77.8	116	12/1933	40	11/1894	83.3	1967	71.1	1900	26.6	(
September	92.1	55.9	74.0	117	13/1971	36	26/1934	82.5	1984	66.2	1900	18.9	(
October	83.2	49.7	66.4	111	01/1980	29	31/1935	73.9	2003	59.9	1916	9.2	(
November	74.6	42.4	58.5	99	14/1906	24	29/1908	64.1	1949	52.6	1994	1.7	(
December	67.7	38.6	53.2	93	06/1938	18	30/2002	60.0	1980	47.9	1932	0.1	(
Annual	79.9	48.2	64.1	117	19710913	17	19370122	68.1	1984	61.0	1894	107.0	(
Winter	67.3	39.4	53.3	94	19710119	17	19370122	59.3	1981	46.9	1949	0.3	(
Spring	75.5	46.7	61.1	112	19840529	20	20030426	67.5	1997	56.6	1917	8.7	(
Summer	93.7	57.6	75.7	116	19170617	37	19080604	81.6	1981	70.8	1932	68.1	(
Fall	83.3	49.3	66.3	117	19710913	24	19081129	71.0	1995	60.6	1893	29.8	(

Table updated on Mar 24, 2011
For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons
Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May
Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

Western Regional Climate Center, wrcc@dri.edu

SAN BERNARDINO, CALIFORNIA

Period of Record General Climate Summary - Precipitation

Station:(047723) SAN BERNARDINO														
From Year=1893 To Year=2004														
	Precipitation											Total Snowfall		
	Mean	High	Year	Low	Year	1 Day Max.		>= 0.01 in.	>= 0.10 in.	>= 0.50 in.	>= 1.00 in.	Mean	High	Year
	in.	in.	-	in.	-	in.	dd/yyyy or yyyymmdd	# Days	# Days	# Days	# Days	in.	in.	-
January	3.22	15.51	1916	0.00	1947	5.29	17/1916	7	5	2	1	0.1	6.6	1949
February	3.25	15.03	1998	0.00	1900	3.89	28/1991	7	5	2	1	0.0	0.5	1903
March	2.86	10.10	1938	0.00	1959	4.46	02/1938	7	5	2	1	0.0	1.5	1953
April	1.29	9.35	1926	0.00	1934	3.85	05/1926	5	3	1	0	0.0	0.0	1910
May	0.47	3.34	1921	0.00	1910	1.24	25/1931	3	1	0	0	0.0	0.0	1911
June	0.09	0.95	1899	0.00	1893	1.02	15/1918	1	0	0	0	0.0	0.0	1910
July	0.04	0.42	1938	0.00	1896	0.42	22/1938	0	0	0	0	0.0	0.0	1912
August	0.15	3.72	1983	0.00	1893	2.50	17/1983	1	0	0	0	0.0	0.0	1893
September	0.33	5.12	1976	0.00	1902	2.83	11/1976	1	1	0	0	0.0	0.0	1928
October	0.71	4.63	1936	0.00	1905	2.31	20/1979	3	1	0	0	0.0	0.0	1916
November	1.32	8.47	1965	0.00	1903	2.66	11/1954	4	2	1	0	0.0	0.0	1918
December	2.38	10.62	1921	0.00	1900	4.23	05/1966	5	4	2	1	0.0	2.0	1915
Annual	16.12	35.45	1941	5.45	1947	5.29	19160117	43	27	11	4	0.2	6.6	1949
Winter	8.85	27.97	1993	0.92	1961	5.29	19160117	19	13	6	3	0.1	6.6	1949
Spring	4.62	13.72	1941	0.00	1997	4.46	19380302	14	9	3	1	0.0	1.5	1953
Summer	0.29	2.43	1977	0.00	1905	2.50	19830817	2	1	0	0	0.0	0.0	1928
Fall	2.37	9.05	1965	0.01	1999	2.83	19760911	8	5	2	1	0.0	0.0	1928

Table updated on Jan 17, 2012
For monthly and annual means, thresholds, and sums:
Months with 5 or more missing days are not considered
Years with 1 or more missing months are not considered
Seasons are climatological not calendar seasons
Winter = Dec., Jan., and Feb. Spring = Mar., Apr., and May
Summer = Jun., Jul., and Aug. Fall = Sep., Oct., and Nov.

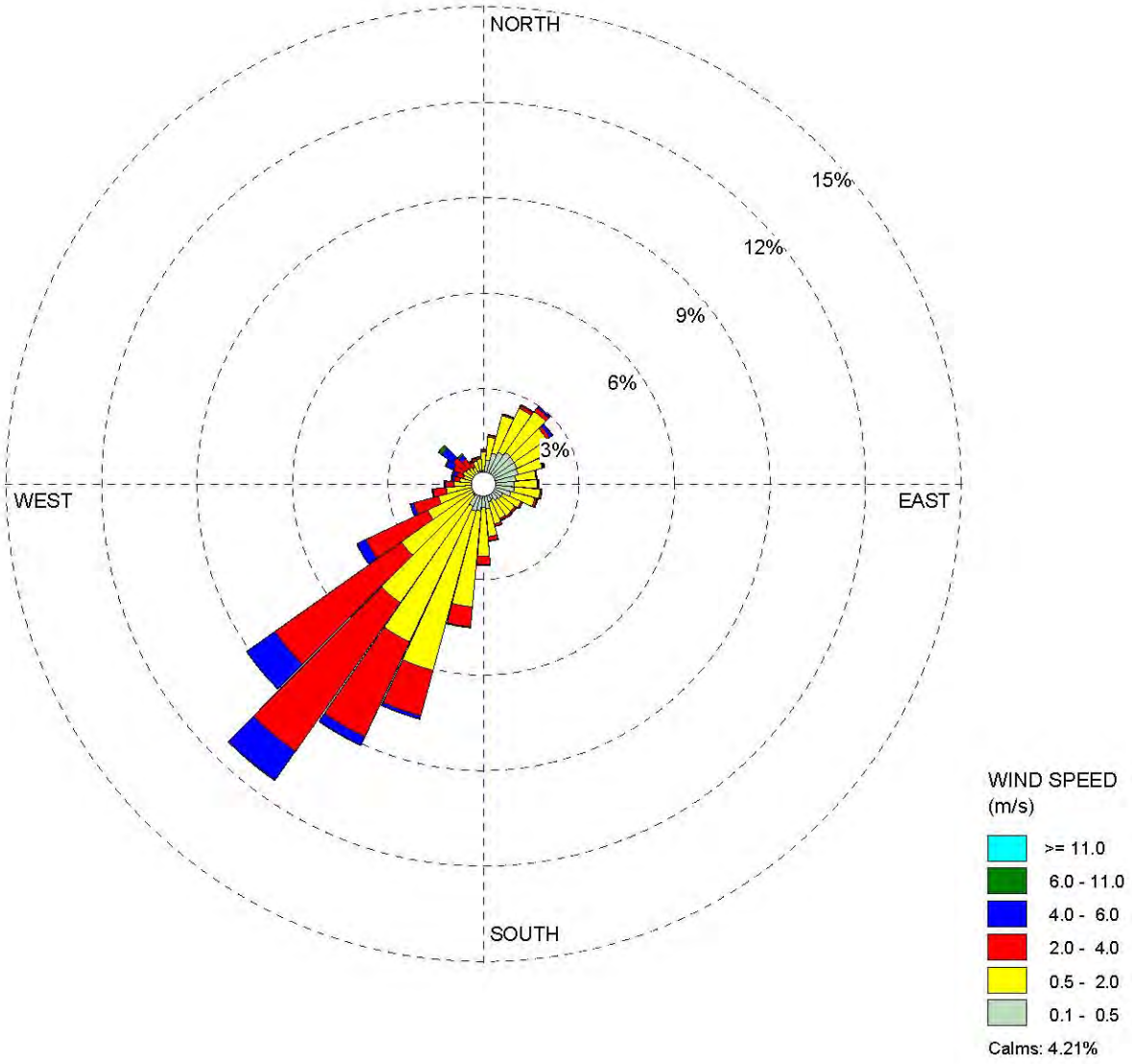
Western Regional Climate Center, wrcc@dri.edu

WIND ROSE PLOT:

snbo

DISPLAY:

Wind Speed
Direction (blowing from)



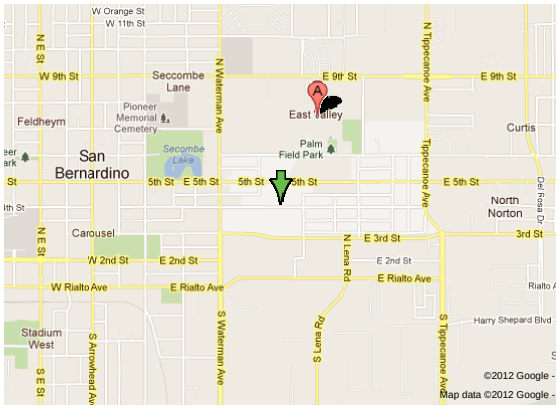
COMMENTS:	DATA PERIOD:	COMPANY NAME:	
	2005-2007 **Jan 1 - Dec 31** **00:00 - 23:00**	MODELER:	
	CALM WINDS: **4.21%**	TOTAL COUNT: **26126 hrs.**	
	AVG. WIND SPEED: **1.44 m/s**	DATE: **1/28/2009**	PROJECT NO.:

WRPLOT View - Lakes Environmental Software

Quality Assurance Air Monitoring Site Information

This page last reviewed on November 21, 2011

Site Information for



View Larger Map

AIRS Number	ARB Number	Site Start Date	Reporting Agency and Agency Code
060719004	36203	5/1/86	South Coast AQMD (061)

Site Address	County	Air Basin	Latitude (N)	Longitude (W)	Elevation (m)
24302 E. 4th St, San Bernardino CA 92410	San Bernardino	South Coast	34.10667	-117.27361	305

Pollutants Monitored (click on parameter link for real-time data) Note: multiple monitors may be available through the AQMIS query tool.
CO, NO_2, O_3, PM_{10}, $TEOM_{PM10}$, $PM_{2.5}$, TSP, Relative Humidity, Wind Direction, Horizontal Wind Speed

Site Photos	Photo Sequences	Site Surveys
--Select Photos--	--Select Position And Direction--	--Select Survey--

Other ARB Database Information	Real-Time Met Data	Aerial Photos and Topo Maps Of Site
--Select Database--	--Select Data Server--	--Select External Map--

Site Information Menu Top Page Quality Assurance Programs Search QA Site Information Database

For real-time air quality data visit: Air Quality and Meteorological Information System (AQMIS)

For further information contact:
Mrs. Merrin Wright, Manager
Quality Assurance Section

Welcome to California

Air Resources Board

iADAM

Highest 4 Daily Maximum Hourly Ozone Measurements

San Bernardino-4th Street

FAQs

Year:	2008		2009		2010	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Jun 18	0.157	Jul 18	0.150	Jun 5	0.129
Second High:	Jun 20	0.156	Aug 29	0.134	Sep 25	0.123
Third High:	Jul 4	0.147	Jun 27	0.123	Jul 10	0.122
Fourth High:	Aug 2	0.134	Jul 21	0.121	Jul 16	0.118
# Days Above State Standard:		62		53		27
California Designation Value:		0.15		0.15		0.13
Expected Peak Day Conc.:		0.153		0.146		0.142
# Days Above Nat'l Standard:		*11*		*2*		*1*
National Design Value:		*0.153*		*0.150*		*0.147*
Year Coverage:		94		98		96

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in parts per million.
The national 1-hour ozone standard was revoked in June 2005 and is no longer in effect. Statistics related to the revoked standard are shown in *italics* or *italics* .
State exceedances are shown in **yellow** . Exceedances of the revoked national 1-hour standard are shown in *orange* .
An exceedance is not necessarily a violation.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* There was insufficient (or no) data available to determine the value.

Switch: 8-Hour Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | Sulfur Dioxide | Hydrogen Sulfide

Go to: Data Statistics Home Page | Top 4 Summaries Start Page

Welcome to California

Air Resources Board

iADAM

Highest 4 Daily Maximum 8-Hour Ozone Averages

San Bernardino-4th Street

FAQs

Year:	2008		2009		2010	
	Date	8-Hr Average	Date	8-Hr Average	Date	8-Hr Average
National:						
First High:	Jul 4	0.122	Jul 18	0.126	Jun 5	0.104
Second High:	Sep 14	0.113	Aug 29	0.102	Jul 10	0.099
Third High:	Jun 18	0.112	Jun 28	0.101	Jul 24	0.095
Fourth High:	Aug 14	0.112	Aug 28	0.101	Aug 15	0.095
California:						
First High:	Jul 4	0.122	Jul 18	0.127	Jun 5	0.105
Second High:	Aug 14	0.113	Aug 29	0.103	Jul 10	0.100
Third High:	Sep 14	0.113	Jun 28	0.101	Jul 24	0.096
Fourth High:	Jun 18	0.112	Aug 28	0.101	Aug 15	0.096
National:						
# Days Above '08 Nat'l Std.:		62		61		40
'08 Nat'l Std. Design Value:		0.116		0.110		0.102
National Year Coverage:		98		97		95
California:						
# Days Above State Standard:		87		78		60
California Designation Value:		0.127		0.122		0.113
Expected Peak Day Conc.:		0.135		0.125		0.120
California Year Coverage:		94		97		93

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All averages are expressed in parts per million.
National exceedances are shown in **orange** . State exceedances are shown in **yellow** .
An exceedance is not necessarily a violation.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* There was insufficient (or no) data available to determine the value.

Switch: Hourly Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | Sulfur Dioxide | Hydrogen Sulfide

Go to: Data Statistics Home Page | Top 4 Summaries Start Page

Welcome to California

Air Resources Board

iADAM

Highest 4 Daily Maximum 8-Hour Carbon Monoxide Averages

San Bernardino-4th Street

FAQs

Year:	2008		2009		2010	
	Date	8-Hr Average	Date	8-Hr Average	Date	8-Hr Average
National:						
First High:	Nov 23	1.65	Jan 1	1.90	Dec 5	1.73
Second High:	Dec 2	1.64	Dec 27	1.63	Dec 4	1.67
Third High:	Dec 4	1.53	Feb 22	1.45	Dec 10	1.38
Fourth High:	Jan 11	1.43	Jan 9	1.40	Dec 11	1.36
California:						
First High:	Nov 22	1.65	Jan 1	2.20	Dec 4	1.73
Second High:	Dec 1	1.64	Dec 27	1.63	Dec 3	1.63
Third High:	Dec 31	1.63	Feb 22	1.45	Jan 1	1.46
Fourth High:	Dec 3	1.53	Jan 8	1.40	Dec 10	1.37
# Days Above Nat'l Standard:		0		0		0
# Days Above State Standard:		0		0		0
Year Coverage:		97		93		88

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All averages are expressed in parts per million.
National exceedances are shown in **orange** . State exceedances are shown in **yellow** .
An exceedance is not necessarily a violation.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* There was insufficient (or no) data available to determine the value.

Switch: Hourly Ozone | 8-Hour Ozone | PM2.5 | PM10 | Nitrogen Dioxide | Sulfur Dioxide | Hydrogen Sulfide

Go to: Data Statistics Home Page | Top 4 Summaries Start Page

Monitor Values Report

Geographic Area: San Bernardino County, CA
Pollutant: CO
Year: 2008
Exceptional Events: Included (if any)

Duration Description=1 HOUR

Duration Description	Obs	First Max	Second Max	Actual Exc	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
1 HOUR	8297	1	1	0	None	1	060710001	200 E. Buena Vista, Barstow	Barstow	San Bernardino	CA	09
1 HOUR	8349	1	1	0	None	1	060710306	14306 Park Ave., Victorville, Ca	Victorville	San Bernardino	CA	09
1 HOUR	8279	2	2	0	None	1	060711004	1350 San Bernardino Rd., Upland	Upland	San Bernardino	CA	09
1 HOUR	8246	2	2	0	None	1	060712002	14360 Arrow Blvd., Fontana	Fontana	San Bernardino	CA	09
1 HOUR	8345	2	2	0	None	1	060719004	24302 4th St., San Bernardino, Ca.	San Bernardino	San Bernardino	CA	09

Get detailed information about this report, including column descriptions, at http://www.epa.gov/airquality/airdata/ad_about_reports.html#mon

AirData reports are produced from a direct query of the AQS Data Mart. The data represent the best and most recent information available to EPA from state agencies. However, some values may be absent due to incomplete reporting, and some values may change due to quality assurance activities. The AQS database is updated daily by state, local, and tribal organizations who own and submit the data. Please contact the appropriate air quality monitoring agency to report any data problems. <http://www.epa.gov/airquality/airdata/ad_contacts.html>

Readers are cautioned not to rank order geographic areas based on AirData reports. Air pollution levels measured at a particular monitoring site are not necessarily representative of the air quality for an entire county or urban area.

Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 12, 2012

Monitor Values Report

Geographic Area: San Bernardino County, CA
Pollutant: CO
Year: 2008
Exceptional Events: Included (if any)

Duration Description=8-HR RUN AVG END HOUR

Duration Description	Obs	First Max	Second Max	Actual Exc	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8-HR RUN AVG END HOUR	8712	1	1	0	None	1	060710001	200 E. Buena Vista, Barstow	Barstow	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8683	1	1	0	None	1	060710306	14306 Park Ave., Victorville, Ca	Victorville	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8611	2	2	0	None	1	060711004	1350 San Bernardino Rd., Upland	Upland	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8563	2	2	0	None	1	060712002	14360 Arrow Blvd., Fontana	Fontana	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8662	2	2	0	None	1	060719004	24302 4th St., San Bernardino, Ca.	San Bernardino	San Bernardino	CA	09

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 12, 2012

Monitor Values Report

Geographic Area: San Bernardino County, CA
Pollutant: CO
Year: 2009
Exceptional Events: Included (if any)

Duration Description=1 HOUR

Duration Description	Obs	First Max	Second Max	Actual Exc	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
1 HOUR	8358	1	1	0	None	1	060710001	200 E. Buena Vista, Barstow	Barstow	San Bernardino	CA	09
1 HOUR	8342	2	2	0	None	1	060710306	14306 Park Ave., Victorville, Ca	Victorville	San Bernardino	CA	09
1 HOUR	8279	2	2	0	None	1	060711004	1350 San Bernardino Rd., Upland	Upland	San Bernardino	CA	09
1 HOUR	8298	2	2	0	None	1	060712002	14360 Arrow Blvd., Fontana	Fontana	San Bernardino	CA	09
1 HOUR	8261	3	2	0	None	1	060719004	24302 4th St., San Bernardino, Ca.	San Bernardino	San Bernardino	CA	09

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 12, 2012

Monitor Values Report

Geographic Area: San Bernardino County, CA
Pollutant: CO
Year: 2009
Exceptional Events: Included (if any)

Duration Description=8-HR RUN AVG END HOUR

Duration Description	Obs	First Max	Second Max	Actual Exc	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8-HR RUN AVG END HOUR	8717	1	1	0	None	1	060710001	200 E. Buena Vista, Barstow	Barstow	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8692	1	1	0	None	1	060710306	14306 Park Ave., Victorville, Ca	Victorville	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8580	2	1	0	None	1	060711004	1350 San Bernardino Rd., Upland	Upland	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8616	2	1	0	None	1	060712002	14360 Arrow Blvd., Fontana	Fontana	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8581	2	2	0	None	1	060719004	24302 4th St., San Bernardino, Ca.	San Bernardino	San Bernardino	CA	09

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 12, 2012

Monitor Values Report

Geographic Area: San Bernardino County, CA
Pollutant: CO
Year: 2010
Exceptional Events: Included (if any)

Duration Description=1 HOUR

Duration Description	Obs	First Max	Second Max	Actual Exc	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
1 HOUR	8353	1	1	0	None	1	060710001	200 E. Buena Vista, Barstow	Barstow	San Bernardino	CA	09
1 HOUR	7673	16	13	0	None	1	060710306	14306 Park Ave., Victorville, Ca	Victorville	San Bernardino	CA	09
1 HOUR	7711	2	2	0	None	1	060711004	1350 San Bernardino Rd., Upland	Upland	San Bernardino	CA	09
1 HOUR	7707	3	2	0	None	1	060712002	14360 Arrow Blvd., Fontana	Fontana	San Bernardino	CA	09
1 HOUR	7174	2	2	0	None	1	060719004	24302 4th St., San Bernardino, Ca.	San Bernardino	San Bernardino	CA	09

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 12, 2012

Monitor Values Report

Geographic Area: San Bernardino County, CA
Pollutant: CO
Year: 2010
Exceptional Events: Included (if any)

Duration Description=8-HR RUN AVG END HOUR

Duration Description	Obs	First Max	Second Max	Actual Exc	Exc Events	Monitor Number	Site ID	Address	City	County	State	EPA Region
8-HR RUN AVG END HOUR	8695	1	1	0	None	1	060710001	200 E. Buena Vista, Barstow	Barstow	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8011	5	5	0	None	1	060710306	14306 Park Ave., Victorville, Ca	Victorville	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8090	2	2	0	None	1	060711004	1350 San Bernardino Rd., Upland	Upland	San Bernardino	CA	09
8-HR RUN AVG END HOUR	8161	1	1	0	None	1	060712002	14360 Arrow Blvd., Fontana	Fontana	San Bernardino	CA	09
8-HR RUN AVG END HOUR	7620	2	2	0	None	1	060719004	24302 4th St., San Bernardino, Ca.	San Bernardino	San Bernardino	CA	09

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Source: U.S. EPA AirData <http://www.epa.gov/airdata>
Generated: February 12, 2012

Welcome to California

Air Resources Board

iADAM

Highest 4 Daily 24-Hour PM10 Averages

San Bernardino-4th Street

FAQs

Year:	2008		2009		2010	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Oct 13	144.2	Oct 27	89.0	Dec 10	63.0
Second High:	Jul 4	76.8	Sep 1	65.2	Jul 7	53.0
Third High:	Jul 5	70.4	Jul 5	64.4	Aug 24	52.0
Fourth High:	Oct 28	68.5	May 15	61.9	Apr 26	48.0
California:						
First High:	Feb 18	73.0	May 14	64.0	Dec 10	61.0
Second High:	Oct 21	69.0	Sep 4	61.0	Jul 7	51.0
Third High:	Oct 27	68.0	Mar 20	57.0	Aug 24	50.0
Fourth High:	Jun 17	67.0	Jan 1	56.0	Apr 26	47.0
Measured:						
# Days Above Nat'l Standard:		0		0		0
# Days Above State Standard:		17		10		2
Estimated:						
3-Yr Avg # Days Above Nat'l Std:		*		*		*
# Days Above Nat'l Standard:		0.0		0.0		0.0
# Days Above State Standard:		103.7		*		12.8
State 3-Yr Maximum Average:		52		52		31
State Annual Average:		41.1		*		31.2
National 3-Year Average:		*		*		*37*
National Annual Average:		*37.3*		*32.7*		*32.4*
Year Coverage:		0		0		98

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.
The national annual average PM10 standard was revoked in December 2006 and is no longer in effect.
Statistics related to the revoked standard are shown in *italics* or *italics* .
National exceedances are shown in **orange** . State exceedances are shown in **yellow** .
An exceedance is not necessarily a violation.
Statistics may include data that are related to an exceptional event.
State and national statistics may differ for the following reasons:
State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.
State and national statistics may therefore be based on different samplers.
State statistics for 1998 and later are based on *local* conditions (except for sites in the South Coast Air Basin, where State statistics for 2002 and later are based on *local* conditions).
National statistics are based on *standard* conditions.
State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
Measurements are usually collected every six days. Measured days counts the days that a measurement was greater than the level of the standard; Estimated days mathematically estimates how many days concentrations would have been greater than the level of the standard had each day been monitored.
3-Year statistics represent the listed year and the 2 years before the listed year.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* There was insufficient (or no) data available to determine the value.

Switch: Hourly Ozone | 8-Hour Ozone | PM2.5 | Carbon Monoxide | Nitrogen Dioxide | Sulfur Dioxide | Hydrogen Sulfide

Go to: Data Statistics Home Page | Top 4 Summaries Start Page

Welcome to California

Air Resources Board

iADAM

Highest 4 Daily 24-Hour PM2.5 Averages

San Bernardino-4th Street

FAQs

Year:	2008		2009		2010	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
National:						
First High:	Feb 18	43.5	Jan 1	37.8	Nov 19	39.3
Second High:	Dec 2	41.3	Feb 27	36.2	Dec 10	38.3
Third High:	Nov 23	40.0	Nov 6	35.2	Oct 14	29.7
Fourth High:	Mar 1	34.5	Mar 20	33.5	Jul 7	23.8
California:						
First High:	Feb 18	43.5	Jan 1	37.8	Nov 19	39.3
Second High:	Dec 2	41.3	Feb 27	36.2	Dec 10	38.3
Third High:	Nov 23	40.0	Nov 6	35.2	Oct 14	29.7
Fourth High:	Mar 1	34.5	Mar 20	33.5	Jul 7	23.8
Estimated Days > Nat'l 24-Hr Std:		9.5		6.2		5.9
Measured Days > Nat'l 24-Hr Std:		3		2		2
Nat'l 24-Hr Std Design Value:		53		49		35
Nat'l 24-Hr Std 98th Percentile:		40.0		35.2		29.7
National Annual Std Design Value:		16.3		14.7		12.5
National Annual Average:		13.3		12.9		11.1
State Ann'l Std Designation Value:		*		*		*
State Annual Average:		*		*		*
Year Coverage:		95		91		97

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All concentrations are expressed in micrograms per cubic meter.
National exceedances are shown in **orange** . State exceedances are shown in **yellow** .
An exceedance is not necessarily a violation.
State and national statistics may differ for the following reasons:
State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods.
State and national statistics may therefore be based on different samplers.
State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* There was insufficient (or no) data available to determine the value.

Switch: Hourly Ozone | 8-Hour Ozone | PM10 | Carbon Monoxide | Nitrogen Dioxide | Sulfur Dioxide | Hydrogen Sulfide

Go to: Data Statistics Home Page | Top 4 Summaries Start Page

Welcome to California

Air Resources Board

iADAM

Highest 4 Daily Maximum Hourly Nitrogen Dioxide Measurements

San Bernardino-4th Street

FAQs

Year:	2008		2009		2010	
	Date	Measurement	Date	Measurement	Date	Measurement
First High:	Oct 27	0.091	Nov 2	0.084	Nov 18	0.069
Second High:	Nov 19	0.073	Jan 8	0.070	Sep 28	0.064
Third High:	Jun 18	0.070	Nov 3	0.068	Sep 25	0.061
Fourth High:	Oct 28	0.070	Nov 17	0.065	Sep 24	0.057
# Days Above State Standard:		0		0		0
Annual Average:		0.022		0.020		0.019
Year Coverage:		97		98		78

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All averages are expressed in parts per million.
National exceedances are shown in **orange** . State exceedances are shown in **yellow** .
An exceedance is not necessarily a violation.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* There was insufficient (or no) data available to determine the value.

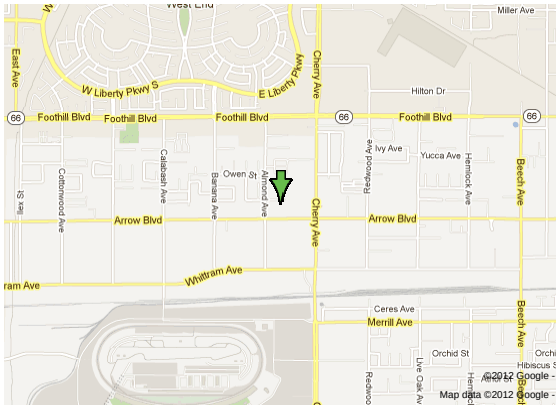
Switch: Hourly Ozone | 8-Hour Ozone | PM2.5 | PM10 | Carbon Monoxide | Sulfur Dioxide | Hydrogen Sulfide

Go to: Data Statistics Home Page | Top 4 Summaries Start Page

Quality Assurance Air Monitoring Site Information

This page last reviewed on November 21, 2011

Site Information for



View Larger Map

AIRS Number	ARB Number	Site Start Date	Reporting Agency and Agency Code
060712002	36197	8/1/81	South Coast AQMD (061)

Site Address	County	Air Basin	Latitude (N)	Longitude (W)	Elevation (m)
14360 Arrow Highway, Fontana CA 92335	San Bernardino	South Coast	34.10028	-117.49194	283

Pollutants Monitored (click on parameter link for real-time data) Note: multiple monitors may be available through the AQMIS query tool.
CO, SO_2, NO_2, O_3, PM_{10}, $PM_{2.5}$, TSP, Outdoor Temperature, Relative Humidity, Wind Direction, Horizontal Wind Speed, Barometric Pressure

Site Photos	Photo Sequences	Site Surveys
--Select Photos--	--Select Position And Direction--	--Select Survey--

Other ARB Database Information	Real-Time Met Data	Aerial Photos and Topo Maps Of Site
--Select Database--	--Select Data Server--	--Select External Map--

Site Information Menu Top Page Quality Assurance Programs Search QA Site Information Database

For real-time air quality data visit: Air Quality and Meteorological Information System (AQMIS)

For further information contact:
Mrs. Merrin Wright, Manager
Quality Assurance Section

Welcome to California

Air Resources Board

iADAM

Highest 4 Daily Maximum State 24-Hour Sulfur Dioxide Averages

Fontana-Arrow Highway

FAQs

Year:	2008		2009		2010	
	Date	24-Hr Average	Date	24-Hr Average	Date	24-Hr Average
First High:	Jul 4	0.003	May 1	0.002	Jan 8	0.002
Second High:	Jun 17	0.003	Mar 2	0.002	Jan 5	0.002
Third High:	Aug 14	0.003	Apr 22	0.002	Jan 15	0.002
Fourth High:	Jun 19	0.003	Jan 8	0.002	Feb 24	0.002
Annual Average:		0.001		0.000		*
Year Coverage:		96		95		73

Go Backward One Year | New Top 4 Summary | Go Forward One Year

Notes: All averages are expressed in parts per million.
State exceedances are shown in **yellow** .
An exceedance is not necessarily a violation.
Year Coverage indicates the extent to which available monitoring data represent the time of the year when concentrations are expected to be highest. 0 means that data represent none of the high period; 100 means that data represent the entire high period. A high Year Coverage does not mean that there was sufficient data for annual statistics to be considered valid.
* There was insufficient (or no) data available to determine the value.

Switch: Hourly Ozone | 8-Hour Ozone | PM2.5 | PM10 | Carbon Monoxide | Nitrogen Dioxide | Hydrogen Sulfide

Go to: Data Statistics Home Page | Top 4 Summaries Start Page

APPENDIX C BIOLOGICAL TECHNICAL MEMORANDUM

DOWNTOWN SAN BERNARDINO PASSENGER RAIL PROJECT

Biological Technical Memorandum

San Bernardino, San Bernardino County, California

~~January~~ June 2012

Prepared for:

San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92602

Prepared by:

HDR Engineering, Inc.
8690 Balboa Avenue, Suite 200
San Diego, CA 92123

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Acronyms

AMSL	Above Mean Sea Level
BTM	Biological Technical Memorandum
BUOW	burrowing owl
CBOC	California Burrowing Owl Consortium
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CPUC	California Public Utilities Commission
CWHRS	California Wildlife Habitat Relationships System
DH	Disturbed habitat
DMU	Diesel Multiple Unit
DSBPRP	Downtown San Bernardino Passenger Rail Project
ESA	Endangered Species Act
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HDR	HDR Engineering, Inc.
HCP	Habitat Conservation Plan
I-215	Interstate 215
MBTA	Migratory Bird Treaty Act
MOU	Memoranda of Understanding
NEPA	National Environmental Policy Act
NNG	Non-native grasslands
NRCS	Natural Resources Conservation Service
OHWM	Ordinary High Water Mark
ROW	Right-of-Way
RWQCB	Regional Water Quality Control Board
SANBAG	San Bernardino County Associated Governments
SBKR	San Bernardino kangaroo rat
UD	Urban developed
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WBWG	Western Bat Working Group

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EXECUTIVE SUMMARY

At the request of the San Bernardino Associated Governments (SANBAG), HDR Engineering, Inc. (HDR) conducted a general biological survey, vegetation mapping, and habitat assessments for western burrowing owl and San Bernardino Kangaroo Rat for the Downtown San Bernardino Passenger Rail Project (project). This Biological Technical Memorandum (BTM) has been prepared for the proposed project with the Federal Transit Administration (FTA) as the lead agency under the National Environmental Policy Act (NEPA), and SANBAG as lead agency under the California Environmental Quality Act (CEQA). The BTM addresses the federal Endangered Species Act (ESA), California ESA, NEPA, CEQA, and other applicable federal, state, and local requirements for analysis of potential impacts on biological resources resulting from the construction of the proposed project. The project proposes the construction of a double track for passenger and freight service from the San Bernardino Depot to Rialto Avenue and E Street, east of Interstate 215 (I-215). Construction of the double track would occur in the City of San Bernardino in the southwest portion of San Bernardino County.

This BTM integrates information collected from a variety of literature sources and field surveys to describe the biological resources within the vicinity of the project area. Information was gathered from publicly available literature, data provided by relevant land management agencies, reviews of aerial photography and U.S. Geological Survey (USGS) topographic maps, data from the State of California, data from the U.S. Fish and Wildlife Service (USFWS), and the results of field surveys conducted in 2010. The purpose of the data collection and analysis for this report is to: (1) assemble a vascular plant and vertebrate animal inventory of the site; (2) determine whether any sensitive species or habitats could be significantly impacted by development of the proposed project; and (3) propose mitigation measures that could avoid or minimize impacts of construction, and maintenance and operation of the proposed project.

Various field surveys have been conducted for the proposed project and include: vegetation community classification and mapping, jurisdictional wetland and waterway assessment, and a sensitive species habitat assessment. The survey area (approximately 281.56 acres) includes the proposed project footprint (approximately 84.95 acres) and the surrounding buffer area that was surveyed for biological resources. Results and analysis of these efforts are included in the BTM.

Although over 80 federally and/or state sensitive plant and animal species are known to occur within the project vicinity, due to the developed/ disturbed nature of the project area, only two special-status species have the potential to occur within the survey area: the western yellow bat (*Lasiurus xanthinus*) and smooth tarplant (*Centromadia pungens*). However, neither of these species was observed or is anticipated to occur within the project footprint. Should the proposed project be constructed during the avian nesting season, potential impacts to breeding birds may occur.

Drainages subject to U.S. Army Corps of Engineers (USACE) (Clean Water Act Section 404), California Department of Fish and Game (CDFG) (Fish and Game Code 1602 Streambed Alteration Agreement), and Regional Water Quality Control Board (RWQCB, Clean Water Act Section 401), do not occur within the project footprint and would not be impacted by project implementation.

1.0 PROJECT DESCRIPTION AND LOCATION

1.1 PROJECT DESCRIPTION

The San Bernardino Associated Governments (SANBAG) is proposing to extend Metrolink regional passenger rail service approximately one mile east from its current terminus at the existing San Bernardino Metrolink Station/Santa Fe Depot (Depot) to new Metrolink commuter rail platforms proposed near the intersection of Rialto Avenue and E Street in the City of San Bernardino, California (Figure 1). The Project is known as the Downtown San Bernardino Passenger Rail Project (DSBPRP). The project's primary features include construction of a second track, rail platforms, parking lots, a pedestrian overpass at the Depot, grade crossing improvements, railroad signalization, detention basins, and roadway closures. The Project's secondary features include construction of drainage improvements, utility accommodation, and implementation of safety controls.

1.1.1 Definitions

The following definitions are used to describe the location of the various survey activities conducted during on-site fieldwork:

- *Project area* is defined as the limits of impacts associated with full build-out of the proposed project. The proposed project footprint is approximately 84.95acres.
- *Survey area* is defined as the area within 500 feet on either side of the centerline of the proposed double track alignment that was mapped and evaluated for potential direct and indirect impacts to biological resources. The survey area for the project is approximately 266 acres.

1.2 PROJECT LOCATION

The project is located in the City of San Bernardino within the County of San Bernardino, California (Figure 1). The project limits include the existing track and right-of-way (ROW) beginning at the Santa Fe Depot/San Bernardino Metrolink Station, just west of North Mt. Vernon Avenue, east and south through a residential and commercial area terminating at Rialto Avenue and E Street.

1.2.1 Project Soils and Topography

Soils within the survey boundary were mapped using the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2008). The proposed project crosses two different soil types (Figure 2), including:

- ***Grangeville Fine Sandy Loam —*** This nearly level soil occurs on alluvial fans and alluvial plains and is used for pasture, truck crops, tomatoes, and flowers. It is a poorly drained, very deep fine sandy loam derived from granitic alluvium. The available water holding capacity is 6 to 8.5 inches. Runoff is very slow, and the erosion hazard is slight. The elevation ranges from 50 to 200 feet.
- ***Tujunga Gravelly Loamy San –*** This soil occurs on alluvial fans and flood plains and is used mainly for grazing. Tujunga series consists of very deep, somewhat excessively drained soils formed in alluvium weathered mostly from granitic sources. The soils formed in sandy alluvium derived mostly from granitic sources. Runoff is very low or negligible and permeability is rapid. The elevation ranges from 5 to 4,300 feet.

The project area's general topographic character is flat to gently sloping land (Figure 3). Elevation within the survey area ranges from 1100 to 1080 feet above mean sea level (AMSL).

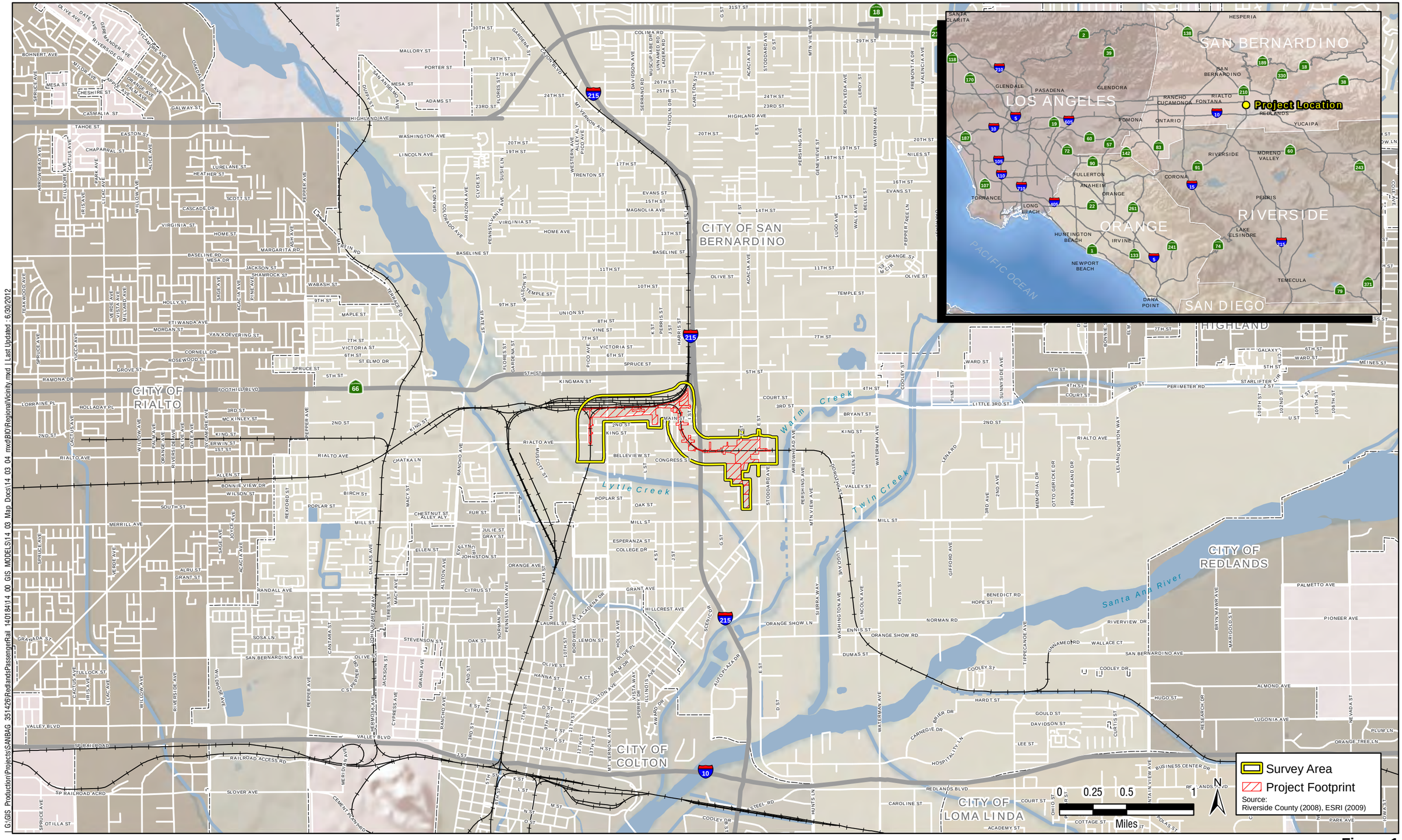

Figure 1
Regional\Vicinity and Survey Area
Downtown San Bernardino Passenger Rail Project

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Figure 2
Soil Map
Downtown San Bernardino Passenger Rail Project

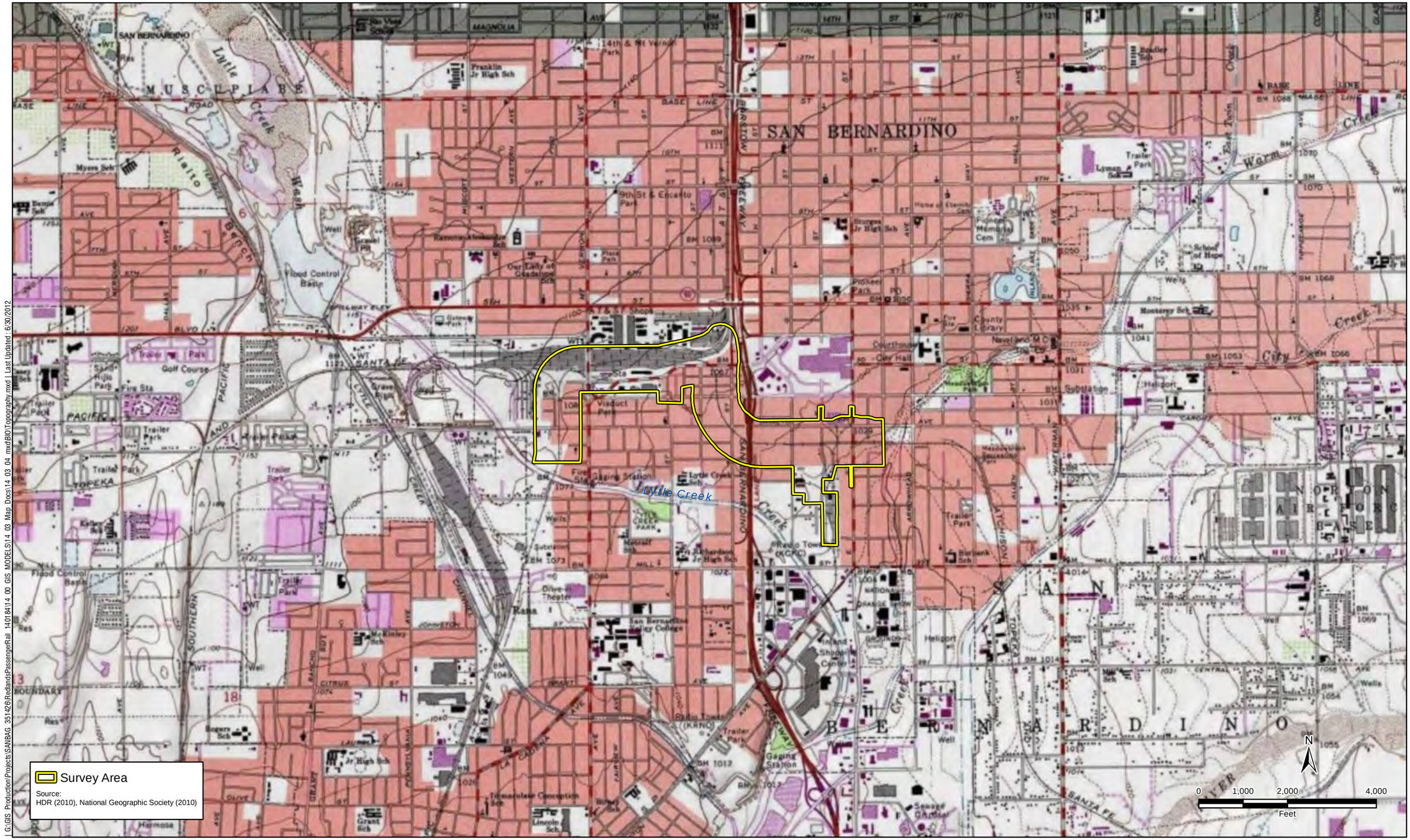

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Figure 3
NGS Topography
Downtown San Bernardino Passenger Rail Project

2.0 SURVEY METHODS AND LIMITATIONS

The purpose of the survey was to identify and map existing vegetation communities, wildlife habitats, and sensitive biological resources. It was assumed that biological resources located within 500 feet of the proposed centerline of the double track alignment may be impacted by project-related construction activities (project boundary). In order to assess the adjacent, off-site biological resources, vegetation communities were mapped 500 feet from the centerline of the proposed double track alignment.

A general biological survey, vegetation mapping, jurisdictional waters/wetlands assessment, and habitat assessments for the California species of concern western burrowing owl (*Athene cunicularia hypugaea;* BUOW) and the federally endangered San Bernardino kangaroo rat (*Dipodomys merriami parvus;* SBKR) were conducted within the 500-foot survey area. The general biological survey, vegetation mapping, and jurisdictional assessment was conducted by HDR biologists Allegra Simmons and Brynne Mulrooney on May 24, 2010 and June 30, 2010, under mostly clear skies with temperatures ranging from 70 to 92 degrees Fahrenheit and light winds (1-4 mph). The entire railroad ROW within the survey area was surveyed on foot to identify biological resources occurring, or with the potential to occur, on-site. Within the survey area, biologists surveyed areas outside of the ROW (e.g., commercial, private, etc) when access was feasible. General site photos are located in Appendix A.

Prior to field surveys, a California Natural Diversity Data Base (CNDDB) electronic search was conducted on nine USGS 7.5' Quadrangles (El Casco, Harrison Mountain, Keller Peak, Redlands, Riverside East, San Bernardino North, San Bernardino South, Sunnymead, and Yucaipa) which surround and include the project area (Appendix B). The CNDDB search was used to identify sensitive plant and animal species that may occur within the project area (Figure 4). A complete list of plant and animal species observed within the project area (on and off-site) is located in Appendix C.

The habitat assessment for BUOW and SBKR was conducted by ICF biologist, Phil Brylski, on July 8, 2010. The assessment was based on a pedestrian survey of the railroad ROW for each segment, and on a review of known occurrences in the CNDDB for burrowing owl and SBKR, and Manis (for the SBKR), an on-line database of mammal specimen records.

A survey and assessment of potential federal and state jurisdictional areas (i.e., wetlands and waters) was conducted within the survey area during the May 2010 general biological survey. United States Army Corps of Engineers (USACE) Waters of the U.S. and Regional Water Quality Control Board (RWQCB) Waters of the State were delineated according to the methods outlined in the USACE Wetland Delineation Manual (USACE 1987), the Interim Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region (USACE 2008c), and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (USACE 2008b). Evaluation of California Department of Fish and Game (CDFG) jurisdiction followed guidance in the Fish and Game Code and A Field Guide to Lake and Streambed Alteration Agreements (CDFG 1994).

2.1 LITERATURE SEARCH

Prior to surveying the project area, background research was performed to identify any sensitive species that may occur within the survey area. This was conducted using the CNDDB RareFind Version 3.1.0, the U.S. Fish and Wildlife Service (USFWS) website, the California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Vascular Plants (CNPS 2010), and other pertinent scientific literature.

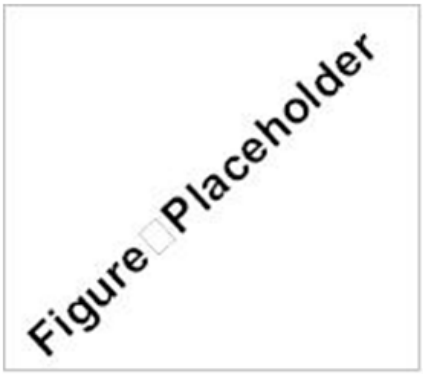

Figure 4. CNDDB Result

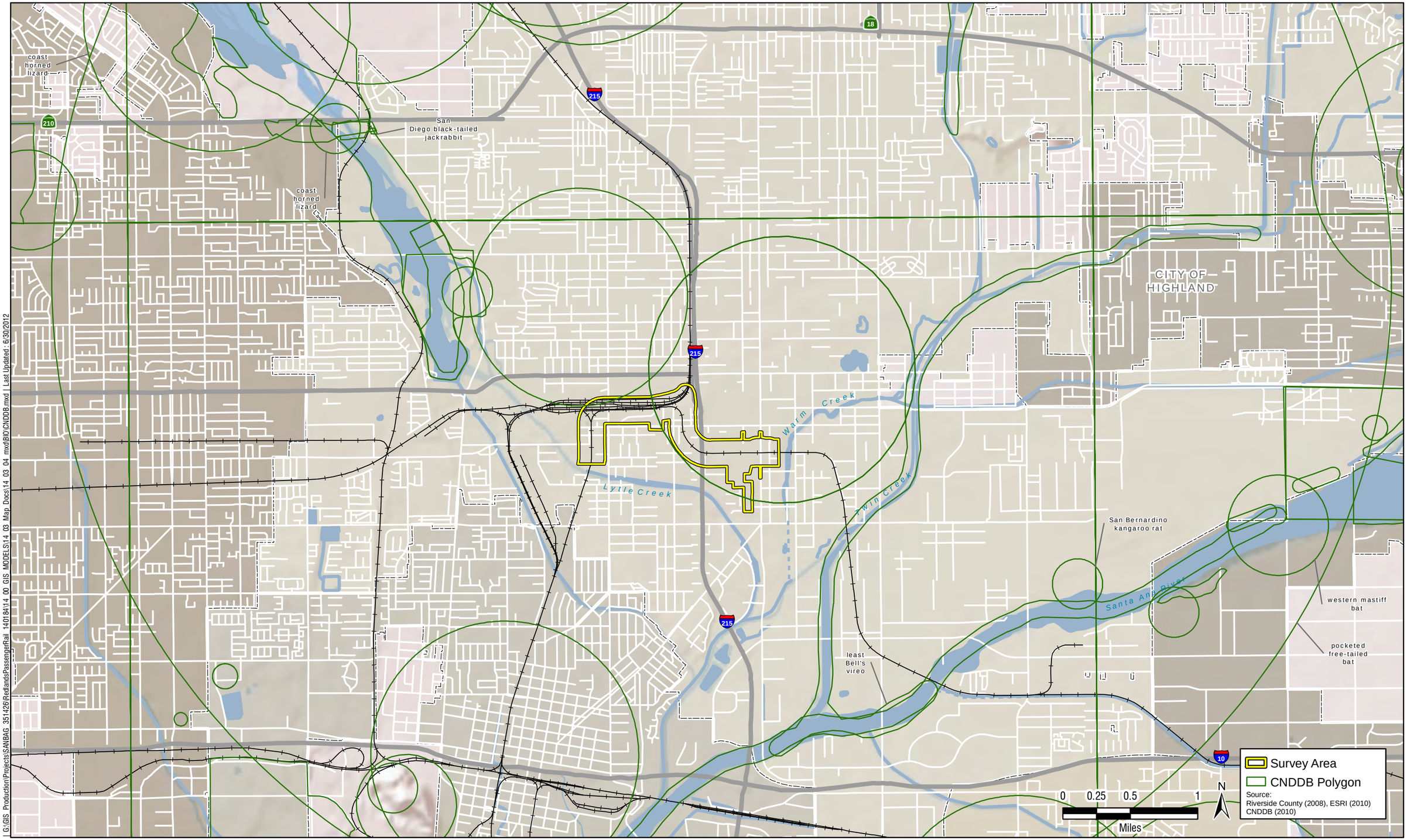

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Figure 4
CNDDB Result
Downtown San Bernardino Passenger Rail Project

development, water resource projects (e.g., dams and levees), infrastructure development (e.g., highways and airports), and conversion of wetlands to uplands for farming and forestry. Either an individual 404b permit or authorization to use an existing USACE Nationwide Permit will need to be obtained if any portion of the construction requires fill into a river, stream, or stream bed that has been determined to be a jurisdictional waterway. When applying for a permit a company or organization must show that they would avoid wetlands when practicable, minimize wetland impacts, and provide compensation for any unavoidable destruction of wetlands (CWIS 2007).

Section 401 Water Quality Certification (Clean Water Act)

The Clean Water Act protects water quality by regulating the dumping or flow of pollutants into streams, lakes, and rivers. A water quality certification, obtainable through California RWQCB, must be obtained in order to receive a 404 permit or be authorized under the 404 nationwide permits (USEPA 2011).

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 (42 United States Code Section 4321-4347) is a Federal statute requiring the identification and analysis of potential environmental effects associated with proposed Federal actions before those actions are taken. The intent of NEPA is to help decision makers make well-informed decisions based on an understanding of the potential environmental consequences and take actions to protect, restore, or enhance the environment. The process for implementing NEPA is outlined in Title 40 of the Code of Federal Regulations (CFR), Parts 1500-1508, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*.

NEPA established the Council on Environmental Quality (CEQ) that was charged with the development of implementing regulations and ensuring Federal agency compliance with NEPA. The CEQ regulations define major Federal actions to include adoption of official policy (i.e., rules and regulations), adoption of formal plans, adoption of programs, and approval of specific projects (40 CFR 1508.18). The CEQ regulations mandate that all Federal agencies use a prescribed structured approach to environmental impact analysis.

The proposed project has two lead agencies, the FTA and SANBAG. The FTA is a federal agency and therefore the proposed project is subject to NEPA. As a federal agency, the FTA must meet NEPA requirements whenever it is the FTA's decision that would result in an impact on the human environment, even if the impact would be beneficial and regardless of who proposes the action or where it would take place (40 CFR 1508.18). Other entities (i.e., non-federal organizations and individuals; federal, state, and local agencies) that submit applications or proposals to the FTA for use or development of resources on FTA regulated lands are subject to NEPA analysis.

2.2.2 State

California Endangered Species Act

The California ESA prohibits the *take* of listed species, except as otherwise provided in state law. The *take* for the California ESA is defined as it is in the federal ESA; however, unlike the federal ESA, the California ESA also applies the *take* prohibitions to species petitioned for listing as state candidates rather than only those listed species. State lead agencies are required to consult with the CDFG to ensure that any actions undertaken by the lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of required habitat. CDFG is authorized to enter into a Memorandum of Understanding (MOU) with individuals, public agencies, universities, zoological gardens, and scientific or educational institutions to import, export, take, or possess listed species for scientific, educational, or management purposes.

Due to the potential presence of state-listed rare, threatened, endangered, or candidate species within the project area (e.g., SBKR), compliance with the California ESA was considered in the evaluation of the proposed project.

3.2.2.2 Section 2080 and 2081 of the State Fish and Game Code

Section 2080 of the State Fish and Game Code (Code) states:

> No person shall import into this state [California], export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the commission [State Fish and Game Commission] determines to be an endangered species or threatened species, or attempt any of those acts, except as otherwise provided in this chapter [Chapter 1.5, Endangered Species], or the Native Plant Protection Act, or the California Desert Native Plants Act (Justia 2010).

Pursuant to Section 2081 of the Code, the CDFG may authorize individuals or public agencies to import, export, take, or possess, any state-listed endangered, threatened, or candidate species. These otherwise prohibited acts may be authorized through permits or MOUs: (1) if the *take* is incidental to an otherwise lawful activity, (2) if impacts of the authorized *take* are minimized and fully mitigated, (3) if the permit is consistent with any regulations adopted pursuant to any recovery plan for the species, and (4) if the applicant ensures adequate funding to implement the measures required by CDFG. CDFG shall make this determination based on available scientific information and shall include consideration of the ability of the species to survive and reproduce.

Due to the potential presence of state-listed rare, threatened, endangered, or candidate species within the project area, Sections 2080 and 2081 of the Code were considered in the evaluation of the proposed project.

Sections 3503 and 3503.5 of the State Fish and Game Code

These sections of the Code provide regulatory protection to resident and migratory birds and all birds of prey within the State of California, including the prohibition of the taking of nests and eggs, unless otherwise provided for by the Code. Specifically, these sections of the Code make it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code.

Due to the presence of resident and migratory nesting birds within the proposed project area, Sections 3503 and 3503.5 of the Code were considered in the evaluation of the proposed project.

Sections 1600 to 1603 of the State Fish and Game Code

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California are subject to the regulatory authority of the CDFG pursuant to Sections 1600 through 1603 of the State Fish and Game Code (Code) and require preparation of a Streambed Alteration Agreement. Pursuant to the Code, a *stream* is defined as a body of water that flows at least periodically, or intermittently, through a bed or channel having banks and supporting fish or other aquatic life. Based on this definition, a watercourse with surface or subsurface flows that support or have supported riparian vegetation is a stream and is subject to CDFG jurisdiction.

Altered or artificial waterways valuable to fish and wildlife are subject to CDFG jurisdiction. Due to the presence of ephemeral streams within the project area, Sections 1600 through 1603 of the Code were considered in the evaluation of the proposed project.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires state and local agencies to identify impacts to the environment that might be caused by their actions. Projects undertaken by public or private agencies must comply with this act if there is any approval given by a state agency (CEQA 2009). CEQA is a self-regulating statute; however, agencies that do not comply may face litigation from the public. CEQA is a statute that requires state agencies to provide information about environmental impacts of their actions and requires that actions be taken to avoid, minimize, or mitigate those impacts. All listed species are protected as well as candidates and those listed by the CNPS (Lists 1A, 1B, and 2) and CDFG (CEQA 2009). Any plants listed by the CNPS existing within the proposed project area will be avoided if possible.

3.0 SURVEY RESULTS

The following discussion identifies biological resources (e.g., vegetation communities, botanical and zoological species, and jurisdictional areas) observed during the general biological survey.

3.1 VEGETATION COMMUNITIES

Vegetation types or plant communities are assemblages of plant species that usually coexist in the same area. The classification of vegetation communities is based upon the life form of the dominant species within that community and the associated flora. Vegetation classification systems used in this technical memorandum follow those of Holland (1986). Nomenclature follows Hickman (1993) and Roberts, et al. (2004).

Currently, the project area generally supports three vegetation communities: non-native grassland, disturbed habitat, and urban/developed, as illustrated in Figure 5. These communities are described below.

Non-native Grassland

Non-native grasslands (NNG) are often associated with numerous species of wildflowers and a dense to sparse cover of introduced annual grasses. Characteristic plant species of NNG found within the survey area include rip gut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*), red brome *(Bromus madritensis* ssp. *rubens)*, four-spot clarkia *(Clarkia purpurea)*, sierra shooting star (*Dodecatheon clevelandii*), and California melica (*Melica californica*). NNG often occurs as an understory within interstices of vegetation communities or in areas where previous disturbance has taken place.

Two small areas of NNG (1.13 acre) occur within the survey area adjacent to residential/ commercial land uses and within vacant lots (Figure 5). Indicators of NNG within the survey area include various bromes (*Bromus spp.*), barley (*Hordium sp*.) and wild oat (*Avena fatua*).

Disturbed Habitat

Disturbed habitat (DH) is usually associated with areas of previous development resulting in compacted soils. DH generally consists of areas that are vegetated by weedy species such as brome grasses, tocalote (*Centaurea melitensis*), horseweed (*Conyza candensis*), sow thistle (*Sonchus* sp.), and others. Areas that are denuded (i.e., bare ground) but not otherwise developed, such as dirt roads, are also designated within this vegetation community.

Approximately ~~21~~ 25 acres of DH occurs throughout the survey area primarily as disturbed ROW and vacant lots (Appendix A – Photographs 1 and 2, and Figure 5). Indicators include cheeseweed (*Malva parviflora*), shortpod mustard (*Brassica geniculata*), puncture vine (*Tribulus terrestrius*), and bromes. Planted ornamentals, mature eucalyptus (*Eucalyptus* sp), and palm trees occur within DH.

Urban/Developed

Urban developed (UD) refers to areas that have been manipulated by grading and compacting soils to build infrastructure such as roads, buildings, parks, fields, etc. These areas have no biological function or value. Ornamental landscaping associated with developed areas is also considered UD.

The survey area is comprised primarily of UD (~~259.6~~260.08 acres) (Figure 5). In general, UD occurs as the existing railroad track, roads, landscaped vegetation, and residential and commercial development and related parking (Appendix A – Photographs 3 and 4).

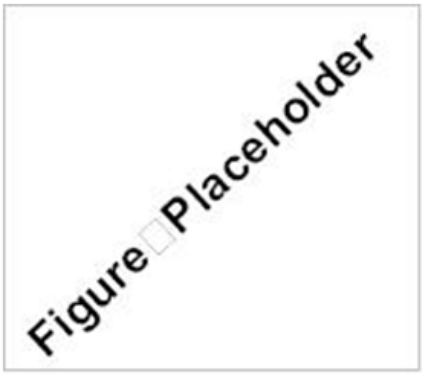

Figure 5. Impacts to Vegetation Communities

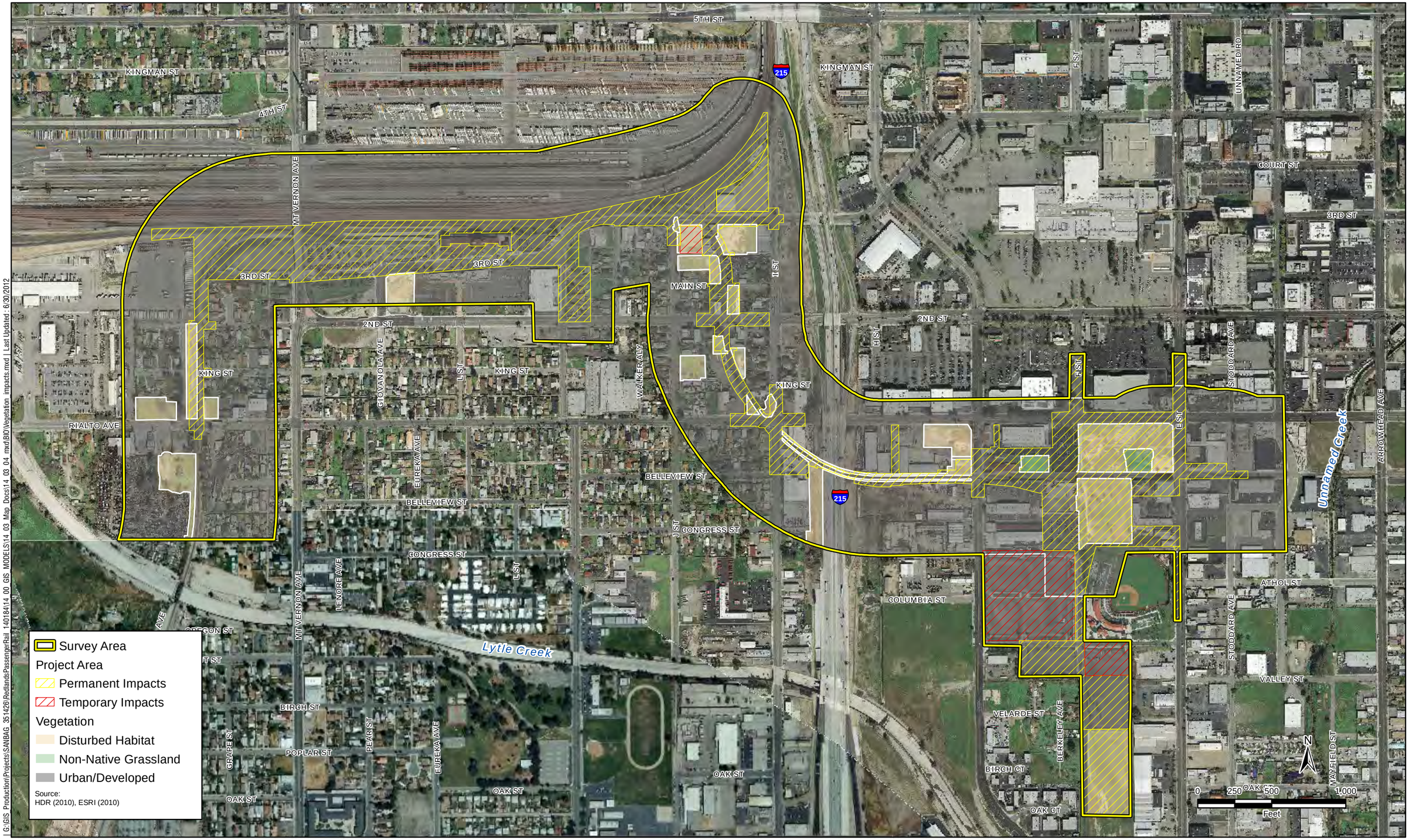

Figure 5
Impacts to Vegetation Communities
Downtown San Bernardino Passenger Rail Project

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4.0 SENSITIVE BIOLOGICAL RESOURCES

This section documents the potential occurrence within the survey area of sensitive plant and animal species. Sensitive species are those recognized by the USFWS (or other federal agencies) and/or CDFG as sensitive due to their declining, limited, or threatened populations.

4.1 SENSITIVE BOTANICAL SPECIES

Sensitive plants include those listed by USFWS and CDFG as threatened or endangered, candidates for listing by the USFWS and CDFG, and/or are considered sensitive by the CDFG and/or the CNPS. CNDDB record searches indicated 43 known occurrences of rare or sensitive botanical species within nine quadrangles surrounding the project area (Appendix B). Of the 43 species, the survey area supports suitable habitat for only one sensitive botanical species: smooth tarplant (*Centromadia pungens ssp. laevis*). Smooth tarplant is a CNPS List 1B.1 species which are known to occur in dry open and sometimes disturbed habitat. ICF observed an individual of smooth tarplant located off-site within the ROW during an unrelated survey. Sensitive plant species were not observed within the survey area during biological surveys, and it should be noted that focused rare plant surveys were conducted within the survey area during the blooming season for smooth tarplant. Sensitive botanical species not known to occur in UD, DH, and NNG were eliminated from consideration (Appendix E).

4.2 SENSITIVE ZOOLOGICAL SPECIES

Sensitive animals are species or subspecies listed as threatened, endangered, or being evaluated (proposed) for listing by the USFWS or by the CDFG, and/or are considered sensitive by the CDFG. A sensitive designation includes those listed as rare or of "Special Concern," and includes a number of migratory bird species protected under the MBTA. CNDDB record searches indicated 56 known occurrences of rare or sensitive botanical species within nine quadrangles surrounding the project area (Appendix B). Species not considered federally or state sensitive were eliminated from consideration (Appendix F).

A habitat assessment was conducted within the survey buffer for western burrowing owl (BUOW) and San Bernardino kangaroo rat (SBKR). Species descriptions and results of the habitat assessment are identified and discussed below. Sensitive zoological species with potential to occur on-site are discussed in Appendix F.

Western Burrowing Owl

The western burrowing owl (*Athene cunicularia hypugaea;* BUOW) is a federal Species of Concern and State of California Species of Special Concern. Based upon the species' rarity status, any unmitigated impacts to BUOW would be considered a "significant effect on the environment" pursuant to §21068 of the CEQA Statutes and §15382 of the CEQA Guidelines. When BUOW occur on a project site, mitigation requirements are generally mandated in the conditions of project approval by the CEQA lead agency.

BUOW has a broad distribution that includes open country throughout the Midwest, western United States, Texas, southern Florida, parts of central Canada, Mexico, and the drier regions of Central and South America. In southern California, the species is known from lowlands over much of the region, particularly in agricultural areas. In California, the BUOW has been extirpated as a breeding species during the last 10-15 years from approximately 8 percent of its former range (Klute 2003). Primary threats across the North American range of the BUOW are habitat loss and fragmentation primarily due to intensive agricultural and urban development, and habitat degradation due to declines in populations of

colonial burrowing mammals (Grant 1965, Konrad and Gilmer 1984, Ratcliff 1986, Haug et al. 1993, Dundas and Jensen 1994/95, Rodriguez- Estrella et al. 1998, Sheffield 1997a, Dechant et al. 1999).

The Burrowing Owl is primarily a grassland species, but it persists and even thrives in some landscapes highly altered by human activity (Shuford and Gardali 2008, references found therein). The overriding characteristics of suitable habitat appear to be burrows for roosting and nesting and relatively short vegetation with only sparse shrubs and taller vegetation (Green and Anthony 1989, Haug et al. 1993). Owls in agricultural environments nest along roadsides and water conveyance structures (open canals, ditches, drains) surrounded by crops (DeSante et al. 2004, Rosenberg and Haley 2004). Burrowing Owls often nest near and under runways and associated structures (Thomsen 1971, Gervais et al. 2003). Individual Burrowing Owls have moderate to high site fidelity to general breeding areas, prairie dog colonies, and even to particular nest burrows (Klute 2003). Burrow fidelity has been reported in some areas; however, more frequently, Burrowing Owls reuse traditional nesting areas without necessarily using the same burrow (Haug et al. 1993, Dechant et al. 1999). Occupancy of suitable habitat can be verified at a site by observing owls during the spring and summer months or, alternatively, the presence of molted feathers, cast pellets, prey remains, eggshell fragments, or excrement (white wash) at or near a burrow entrance.

BUOW follow a crepuscular habit, being most active during the early morning and evening hours. Their diet consists predominantly of large insects and small rodents, but they will also take small birds, reptiles, amphibians, fish, scorpions, and other available prey.

Migratory individuals arrive on the breeding areas either singly or paired. Non-migratory owls retain pair bonds throughout the year (Haug et al. 1993). The breeding season for BUOW generally begins in the month of April.

Potential within the Project Area

The project area is within the historic range of the BUOW (DeSante et al. 1996). There are no records for the project area, but the CNDDB contains two records from the project region:

- Northeast of the intersection of Wildrose Avenue and Wood Pine Avenue, north of I-10, West Colton (approximately 3.5 miles southwest of the project area). Four individuals were observed in 1998.
- East end of the main runway, Norton Air Force Base (approximately 4.5 miles east of the project area). An undetermined number of owls utilized this burrow site in 1983.

Within the project area, a number of vacant parcels occur adjacent to the ROW and are separated by developed urban land uses. These vacant parcels are flat and mowed/disced, with sparse ruderal vegetation (i.e., DH), and range in size from less than 0.5 acres to 4.5 acres. The largest vacant parcel, situated between F Street and E Street, is approximately 4.5 acres. Much of this site is an abandoned parking lot, which would not be considered potential habitat. The southeastern corner of this site contains active burrows of California ground squirrels in a small borrow pile. No BUOW or their sign were observed on the site, or elsewhere within the project area and adjoining areas.

No potential nesting sites for BUOW were observed within the project area. Although BUOW can persist in fragmented habitats, the small disturbed habitat patches within the project area occur within a fully urbanized area, and do not provide sufficient foraging habitat to sustain BUOW. Therefore, the project area does not contain suitable habitat for BUOW and the project would not impact this species.

San Bernardino Kangaroo Rat

The historical range of the San Bernardino kangaroo rat (*Dipodomys merriami parvus*; SBKR) extends from the San Bernardino Valley in San Bernardino County to the Menifee Valley in Riverside County (Lidicker 1960). SBKR occur on sandy soils and sandy loam soils within relatively open vegetation, generally along rivers, streams and drainages. While the general habitat preference for the species is alluvial scrub, it mainly occurs in early and intermediate seral stages of this plant community (McKernan 1997).

Potential within the Project Area

The project area is within the outline of the historical range of SBKR (Lidicker 1960). The USFWS' designation of critical habitat for the SBKR includes the Lytle and Cajon washes, which are known or expected to be occupied by this species (FWS 2008). However, the SBKR critical habitat in Lytle Creek/Cajon Wash occurs only north of Interstate-210, which would be outside of the impact area of the proposed project.

There are no SBKR records for the project area, but the CNDDB and Manis contain several records from the project vicinity. These include:

- East from the south end of Lytle Creek wash, about three miles north of Colton. These UCLA specimens were collected April 1, 1917 by L.M. Huey. This locality is about one mile NNW of the train depot.
- Herron's Ranch, Reche Canyon, four miles SE Colton, 1909. This is about three miles SSW of the train depot.

SBKR records nearest to the project area are from the early 20th century, when the Santa Ana River and Lytle Creek/Cajon areas experienced far fewer impacts from surrounding development. The project area is now fully urbanized and separated from Lytle Creek floodplain habitats where SBKR occurred. The project area lacks suitable habitat for SBKR, and the project would not impact this species.

Other Species of Concern

According to the CNDDB search, the project area contains suitable habitat for western yellow bat (*Lasiurus xanthinus*). This species has a moderate potential to occur onsite (i.e., palm trees) but were not observed during the general biological survey. In general, the western yellow bat roosts individually and are thought to be non-colonial (Bolster 1998). Should the species occur within the survey area, it is anticipated that it would occur in low numbers based on limited available habitat and preferred roosting densities. Additionally, the survey area does not support suitable habitat for any other sensitive bat species. Therefore, focused bat surveys were not conducted. The following is a life history summary of the western yellow bat.

Western Yellow Bat

The western yellow bat is uncommon in California, known primarily in Los Angeles and San Bernardino Counties south to the Mexican border (CWHRS 2008). The bat is a migratory species that occurs from Central America to North America (distributed as far north as the Muddy River in Nevada) and are present in California throughout the spring, summer, and fall months. They are found to exclusively roost in fan and other ornamental palm trees that have not been trimmed of their dead fronds (Schmidly 1991) and are also known to roost in urban areas. Western yellow bats feed on flying insects and forage over water and among trees. Pregnant females are known from April through June and lactation occurs in June and July (WBWG 2005b). The species may form small maternity groups in trees and palms (CWHRS 2008). Maternal colonies are generally active from April through July. Threats to the species include trimming/removal of palm trees and predation by domestic cats, raptors, and snakes.

4.2.1 Migratory Birds

As previously discussed in **Section 2.2.1**, migratory birds are protected under the MBTA. Several migratory bird species were observed in the project area and include: house finch, northern mockingbird, and American crow (Appendix D). Suitable habitat that would support nesting, roosting, and foraging migratory birds occurs throughout the project area, on and off-site. Suitable habitat includes mature trees (>24-inch diameter), ornamental vegetation, utility poles, and building rafters and eves (Appendix A – Photographs 7 and 8). An inactive songbird nest was observed under the eve of the Santa Fe Depot/San Bernardino Metrolink Station during the May 24, 2010 survey (Appendix A – Photograph 8).

4.3 WILDLIFE DISPERSAL CORRIDORS OR LINKAGES

Wildlife movement corridors, also called dispersal corridors or landscape linkages, are linear features primarily connecting at least two significant habitat areas. Wildlife corridors and linkages are important features in the landscape, and the viability and quality of a corridor or linkage are dependent upon site-specific factors. Topography and vegetative cover are important factors for corridors and linkages. These factors should provide cover for both predator and prey species. They should direct animals to areas of contiguous open space or resources and away from humans and development. The corridor or linkage should be buffered from human encroachment and other disturbances (e.g., light, loud noises, domestic animals) associated with developed areas that have caused the habitat fragmentation (Schweiger et al. 2000). Wildlife corridors and linkages may function at various levels depending upon these factors and, as such, the most successful wildlife corridors and linkages will accommodate all or most of the necessary life requirements of predator and prey species.

The survey area is surrounded by urban development and consists primarily of UD and DH. The project area does not function as a wildlife corridor or linkage.

5.0 DIRECT AND INDIRECT IMPACTS

5.1 GUIDELINES FOR THE DETERMINATION OF SIGNIFICANCE

The significance criteria for impacts to special status species are based on CEQA Guidelines (AEP 2010). When determining significance of the effects of the proposed project, consideration was given to whether the project will have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a sensitive or special status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.

Specifically, Section 15065(a) states that a project may have a significant effect where:

> *"The project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or wildlife community, reduce the number or restrict the range of an endangered, rare, or threatened species, ..."*

Appendix G of the 2011 State CEQA Guidelines indicate that a project may be deemed to have a significant effect on the environment if the project is likely to:

a) *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.*

b) *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service (including protections provided pursuant to Section 1600 et seq.).*

c) *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.*

d) *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.*

e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.*

f) *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

Impacts to biological resources from the proposed project include direct and indirect impacts. Direct impacts are changes in the environment caused by the project that are immediately related to the project; they occur in the same time and place as the project (e.g., direct mortality, dust, noise, and heavy equipment traffic associated with construction of a project, etc.). Indirect impacts are changes in the environment that are not immediately related to the project but that are caused indirectly by the project and are reasonably foreseeable. Indirect impacts are changes to the environment that occur later in time or

farther removed in distance than direct impacts. Both direct and indirect impacts may be considered temporary or permanent depending upon the situation.

5.2 DIRECT IMPACTS

5.2.1 Vegetation Communities

Construction of the double track alignment would occur primarily within the railroad ROW and is anticipated to impact the following vegetation communities: DH, UD, and NNG, none of which are considered sensitive (Figure 5, Table 1). All construction activities, including staging and laydown areas, would occur within the project area. Under CEQA, project implementation would not result in significant impacts to sensitive vegetation communities.

Table 1. Potential Impacts to Vegetation Communities within the Survey Area

Vegetation Communities	Survey Area Acreage	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)
Disturbed Habitat	2~~0.83~~4.71	0.60	~~10.83~~14.97	~~11.43~~15.56
Non-Native Grassland	1.13	0.00	1.13	1.13
Urban/Developed	~~259.6~~260.08	10.37~~12.37~~	~~60.02~~60.96	~~72.4~~71.33
Total	~~**281.56**~~**285.92**	~~**12.97**~~**10.97**	~~**71.98**~~**77.06**	~~**84.95**~~**88.02**

5.2.2 Sensitive Botanical Species

One sensitive plant species, smooth tarplant, has potential to occur within the project area; however, it was not observed during general biological surveys which were conducted during the blooming season for the species (Appendix E). Given that the species was not observed, the site is not expected to support a significant population of smooth tarplant, if at all. Under CEQA, project implementation would not result in a significant impact to sensitive plant species. No mitigation is proposed.

5.2.3 Sensitive Zoological Species and Migratory Birds

Of the 57 listed sensitive species identified by the CNDDB, only western yellow bat has a moderate potential to occur within the project area (Appendix F). Although the proposed project area is located within a highly urbanized area, suitable habitat that would potentially support roosting and maternal roosts for these species (e.g., palm trees, buildings, etc) occur within the project area. The proposed project has potential to remove individual trees that may be periodically used for roosting. However, the potential impacts would be less than significant due to the small amount of habitat that would be removed relative to the species range and available habitat, and the few, if any, individuals that would be disturbed during construction. Under CEQA, project implementation would not result in a significant impact to sensitive zoological species. No mitigation is proposed.

The project would not impact BUOW or SBKR.

Suitable nesting, roosting and/or foraging habitat for avian species protected under the MBTA, occur within the project area. Should construction activities occur during the avian breeding season (February 15-August 31), the proposed project would permanently and directly impact suitable nesting, roosting and/or foraging habitat (e.g., mature eucalyptus, palm, and ornamental trees, etc) and potentially cause direct harm to nestlings for these species. Direct impacts to these species are considered significant and would require mitigation. Under CEQA, project implementation during the breeding season may

result in a significant impact to MBTA-covered avian species prior to mitigation. Mitigation for direct impacts to MBTA-covered species is further discussed in **Section 6.1.2**.

5.2.4 USACE and CDFG Jurisdictional Areas

USACE and CDFG jurisdictional areas do not occur within the project area and would not be impacted by project implementation. Under CEQA, project implementation would not result in a significant impact to jurisdictional areas. No mitigation is proposed.

5.3 INDIRECT IMPACTS

5.3.1 Vegetation Communities

Sensitive vegetation communities do not occur within or adjacent to the project area. Therefore, no indirect impacts to sensitive vegetation communities would occur as a result of project implementation. Under CEQA, project implementation would not result in a significant impact to sensitive vegetation communities. No mitigation is proposed.

5.3.2 Sensitive Botanical Species

Land within and adjacent to the project area is developed and/or disturbed and would not support sensitive botanical species. Implementation of the project would not result in significant indirect impacts (i.e., future modification of adjacent land use, type, etc) to any sensitive botanical species. Under CEQA, project implementation would not result in a significant impact to sensitive botanical species. No mitigation is proposed.

5.3.3 Sensitive Zoological Species and Migratory Birds

Land use within and adjacent to the project area is highly urbanized and implementation of the project would not result in significant indirect impacts (i.e., future modification of adjacent land use, type, etc.) to any sensitive zoological species. Under CEQA, project implementation would result in a significant impact to sensitive zoological species. No mitigation is proposed.

5.3.4 USACE and CDFG Jurisdictional Areas

USACE and CDFG jurisdictional areas do not occur within or adjacent to the project area. Therefore, no indirect impacts to jurisdictional areas would occur as a result of project implementation. Under CEQA, project implementation would not result in a significant impact on jurisdictional areas. No mitigation is proposed.

6.0 MITIGATION

6.1 VEGETATION COMMUNITIES

Implementation of the proposed project and related construction activities would not result in direct impacts to sensitive vegetation communities. Therefore, mitigation is not required.

6.1.1 Sensitive Botanical Species

The site is not expected to support smooth tarplant. Therefore, potential direct impacts to smooth tarplant would not be considered significant and no mitigation is proposed.

6.1.2 Sensitive Zoological Species and Migratory Birds

MBTA Covered Species

Should construction activities occur during the avian breeding season (February 15-August 31), the proposed project would impact suitable nesting habitat for avian species protected under the MBTA. Impacts to active bird nests of species protected by the MBTA are not permitted. It is recommended that construction activities occur outside of the nesting season to avoid impacts.

However, should construction occur during the avian nesting season, the following would be required:

- Prior to habitat removal during the avian breeding season, a pre-construction nest survey for migratory birds shall be conducted within 10 days of the onset of construction by a qualified biologist. Verification surveys will be conducted if the project has not commenced within 10 days of the original pre-construction survey.
- Should an active nest of any MBTA covered species occur within or adjacent to the project impact area, a 100-foot buffer (300 feet for raptors) shall be established around the nest and no construction shall occur within this area until the young have fledged. A qualified biologist shall determine when the nest is no longer active or the young have fledged.
- SANBAG shall clearly delineate the boundaries of the proposed project area by posting stakes, flags and/or rope or cord, as directed by the project biologist. Signs will be posted and installation of fencing as necessary to exclude vehicle traffic unrelated to the proposed project construction. All parking and equipment storage related to the proposed project will be confined to the construction area or to previously disturbed off-site areas. Undisturbed areas and off-site species habitat will not be used for parking or equipment storage. Proposed project related vehicle traffic will be restricted to established roads, construction areas, storage areas, and staging and parking areas.

Implementation of the above mitigation measures reduce potential impacts to nesting birds below a level of significance.

6.1.3 Jurisdictional Areas

Project implementation would not result in impacts to jurisdictional areas, and therefore, no mitigation is required.

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Appendix A

Site Photographs

Photograph 1. Disturbed habitat adjacent to railroad tracks.

Photograph 2. Disturbed habitat adjacent to railroad ROW.

Photograph 3. Urban developed land uses adjacent to project area.

Photograph 4. Planted ornamentals associated with urban developed land uses.

Photograph 5. Northerly view of where the railroad tracks transect Lytle Creek (off-site).

Photograph 6. Southerly view of unnamed drainage where it transects the railroad tracks. Railroad bridge in foreground.

Photograph 7. Mature trees occur throughout the project and survey areas.

Photograph 8. Inactive songbird nest located under an eve at the Santa Fe Depot/ San Bernardino Metrolink Station.

Appendix B

CNDDB Results

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Name (Scientific/Common)	CNDDB Ranks	Listing Status (Fed/State)	Other Lists	Elev. Range (ft.)	Total EO's	Element Occ. Ranks						Population Status		Presence		
						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Accipiter cooperii Cooper's hawk	G5 S3	None None	DFG_WL-Watch List IUCN_LC-Least Concern	790 1,680	102 S:3	0	1	1	0	0	1	0	3	3	0	0
Agelaius tricolor tricolored blackbird	G2G3 S2	None None	ABC_WLBCC-Watch List of Birds of Conservation Concern BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_EN-Endangered USFWS_BCC-Birds of Conservation Concern	1,100 1,960	427 S:4	1	0	0	0	0	3	1	3	4	0	0
Aimophila ruficeps canescens southern California rufous-crowned sparrow	G5T2T4 S2S3	None None	DFG_WL-Watch List	2,120 2,261	180 S:5	0	3	1	0	0	1	0	5	5	0	0
Ambrosia monogyra singlewhorl burrobrush	G5 S2.2	None None	Rare Plant Rank - 2.2	1,400 1,400	16 S:1	0	0	0	0	0	1	1	0	1	0	0
Amphispiza belli belli Bell's sage sparrow	G5T2T4 S2?	None None	ABC_WLBCC-Watch List of Birds of Conservation Concern DFG_WL-Watch List USFWS_BCC-Birds of Conservation Concern	2,120 2,120	56 S:1	0	0	0	0	0	1	0	1	1	0	0
Anniella pulchra pulchra silvery legless lizard	G3G4T3T4Q S3	None None	DFG_SSC-Species of Special Concern USFS_S-Sensitive	1,515 2,110	91 S:4	0	1	0	2	0	1	0	4	4	0	0
Antrozous pallidus pallid bat	G5 S3	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive WBWG_H-High Priority	1,360 1,360	402 S:1	0	0	0	0	0	1	1	0	1	0	0
Arenaria paludicola marsh sandwort	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,000 1,000	15 S:1	0	0	0	0	1	0	1	0	0	0	1
Aspidoscelis hyperythra orangethroat whiptail	G5 S2	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern	900 2,200	338 S:19	0	0	2	2	0	15	14	5	18	1	0
Aspidoscelis tigris stejnegeri coastal whiptail	G5T3T4 S2S3	None None		1,060 2,418	110 S:5	0	1	2	0	0	2	0	5	5	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Astragalus hornii var. hornii Horn's milk-vetch	G4G5T2T3 S1S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	1,000 1,000	14 S:1	0	0	0	0	1	0	1	0	0	0	1
Athene cunicularia burrowing owl	G4 S2	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,100 1,700	1535 S:10	0	3	0	0	1	6	4	6	9	0	1
Atriplex coronata var. notatior San Jacinto Valley crownscale	G4T1 S1.1	Endangered None	Rare Plant Rank - 1B.1	1,420 1,425	16 S:3	1	2	0	0	0	0	0	3	3	0	0
Batrachoseps gabrieli San Gabriel slender salamander	G2 S2	None None	IUCN_DD-Data Deficient USFS_S-Sensitive	3,200 3,200	8 S:1	0	0	0	0	0	1	0	1	1	0	0
Berberis nevinii Nevin's barberry	G2 S2.2	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,020 5,200	34 S:5	0	0	1	1	1	2	3	2	4	0	1
Brodiaea filifolia thread-leaved brodiaea	G2 S2.1	Threatened Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,900 1,900	79 S:3	0	0	1	0	0	2	1	2	3	0	0
Buteo regalis ferruginous hawk	G4 S3S4	None None	DFG_WL-Watch List IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,936 1,936	76 S:1	0	0	1	0	0	0	0	1	1	0	0
Calochortus palmeri var. palmeri Palmer's mariposa-lily	G2T2 S2.1	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	6,000 6,450	81 S:3	0	0	0	0	0	3	1	2	3	0	0
Calochortus plummerae Plummer's mariposa-lily	G3 S3	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	1,200 5,000	208 S:26	0	7	0	0	1	18	6	20	25	1	0
Canyon Live Oak Ravine Forest Canyon Live Oak Ravine Forest	G3 S3.3	None None		3,400 3,400	50 S:1	0	0	0	0	0	1	1	0	1	0	0
Carex comosa bristly sedge	G5 S2?	None None	Rare Plant Rank - 2.1	1,000 1,000	14 S:1	0	0	0	0	1	0	1	0	0	1	0
Carolella busckana Busck's gallmoth	G1G3 SH	None None		1,160 1,160	4 S:1	0	0	0	0	1	0	1	0	0	0	1
Castilleja cinerea ash-gray paintbrush	G2 S2.2	Threatened None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	6,700 6,700	45 S:1	1	0	0	0	0	0	0	1	1	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Castilleja lasiorhyncha San Bernardino Mountains owl's-clover	G2 S2.2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	5,100 6,800	40 S:5	0	1	0	0	1	3	4	1	4	0	1
Catostomus santaanae Santa Ana sucker	G1 S1	Threatened None	AFS_TH-Threatened DFG_SSC-Species of Special Concern IUCN_VU-Vulnerable	838 2,600	27 S:3	0	1	1	0	0	1	1	2	3	0	0
Caulanthus simulans Payson's jewel-flower	G3 S3.2	None None	Rare Plant Rank - 4.2 USFS_S-Sensitive	2,000 2,000	39 S:1	0	0	0	0	0	1	1	0	1	0	0
Centromadia pungens ssp. laevis smooth tarplant	G3G4T2 S2.1	None None	Rare Plant Rank - 1B.1	1,000 1,900	87 S:9	0	1	1	0	0	7	5	4	9	0	0
Ceratochrysis longimala A cuckoo wasp	G1 S1	None None		900 900	2 S:1	0	0	0	0	1	0	1	0	0	1	0
Chaetodipus fallax fallax northwestern San Diego pocket mouse	G5T3 S2S3	None None	DFG_SSC-Species of Special Concern	1,150 2,200	94 S:22	0	7	5	4	0	6	0	22	22	0	0
Charina trivirgata rosy boa	G4G5 S3S4	None None	IUCN_LC-Least Concern USFS_S-Sensitive	1,767 2,700	46 S:3	0	2	0	0	0	1	0	3	3	0	0
Charina umbratica southern rubber boa	G5T2T3 S2S3	None Threatened	USFS_S-Sensitive	5,400 7,240	45 S:23	0	1	0	0	0	22	22	1	23	0	0
Chorizanthe parryi var. parryi Parry's spineflower	G3T2 S2	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive USFS_S-Sensitive	1,000 3,280	94 S:24	1	1	2	0	1	19	7	17	23	1	0
Chorizanthe xanti var. leucotheca white-bracted spineflower	G4T2 S2	None None	Rare Plant Rank - 1B.2	2,300 2,300	34 S:1	0	0	0	0	0	1	0	1	1	0	0
Cladium californicum California saw-grass	G4 S2.2	None None	Rare Plant Rank - 2.2	7,000 7,000	14 S:1	0	0	0	0	0	1	1	0	1	0	0
Coccyzus americanus occidentalis western yellow-billed cuckoo	G5T3Q S1	Candidate Endangered	BLM_S-Sensitive USFS_S-Sensitive USFWS_BCC-Birds of Conservation Concern	1,000 1,690	117 S:2	0	1	0	0	1	0	1	1	1	1	0
Cordylanthus maritimus ssp. maritimus salt marsh bird's-beak	G4?T2 S2.1	Endangered Endangered	Rare Plant Rank - 1B.2	1,000 1,000	29 S:1	0	0	0	0	1	0	1	0	0	1	0
Crotalus ruber red-diamond rattlesnake	G4 S2?	None None	DFG_SSC-Species of Special Concern	900 2,280	113 S:6	0	0	0	0	0	6	6	0	6	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Dendroica petechia brewsteri yellow warbler	G5T3? S2	None None	DFG_SSC-Species of Special Concern USFWS_BCC-Birds of Conservation Concern	1,460 1,460	48 S:1	0	0	0	0	0	1	0	1	1	0	0
Diadophis punctatus modestus San Bernardino ringneck snake	G5T2T3 S2?	None None	USFS_S-Sensitive	3,137 4,797	10 S:3	1	2	0	0	0	0	0	3	3	0	0
Dipodomys merriami parvus San Bernardino kangaroo rat	G5T1 S1	Endangered None	DFG_SSC-Species of Special Concern	1,030 2,200	47 S:24	3	2	6	2	1	10	4	20	23	1	0
Dipodomys stephensi Stephens' kangaroo rat	G2 S2	Endangered Threatened	IUCN_EN-Endangered	1 2,500	214 S:33	1	6	11	3	4	3	22	11	29	1	3
Dodecahema leptoceras slender-horned spineflower	G1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,100 2,200	35 S:9	0	1	1	0	3	4	5	4	6	1	2
Elanus leucurus white-tailed kite	G5 S3	None None	BLM_S-Sensitive DFG_FP-Fully Protected IUCN_LC-Least Concern	2,760 2,760	156 S:1	0	0	1	0	0	0	0	1	1	0	0
Empidonax traillii extimus southwestern willow flycatcher	G5T1T2 S1	Endangered Endangered	ABC_WLBCC-Watch List of Birds of Conservation Concern	790 3,400	62 S:4	1	1	1	0	0	1	0	4	4	0	0
Eremophila alpestris actia California horned lark	G5T3Q S3	None None	DFG_WL-Watch List IUCN_LC-Least Concern	1,100 2,430	76 S:4	0	0	1	2	0	1	0	4	4	0	0
Eriastrum densifolium ssp. sanctorum Santa Ana River woolly star	G4T1 S1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	840 2,300	23 S:18	0	2	7	4	2	3	5	13	16	1	1
Euchloe hyantis andrewsi Andrew's marble butterfly	G3G4T1 S1	None None		4,800 6,000	6 S:4	0	0	0	0	0	4	4	0	4	0	0
Eumops perotis californicus western mastiff bat	G5T4 S3?	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern WBWG_H-High Priority	1,380 2,470	293 S:6	0	0	0	1	0	5	3	3	6	0	0
Fimbristylis thermalis hot springs fimbristylis	G4 S2.2	None None	Rare Plant Rank - 2.2	1,900 1,900	14 S:1	0	0	0	1	0	0	0	1	1	0	0
Galium californicum ssp. primum Alvin Meadow bedstraw	G5T1Q S1	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	1,180 1,180	4 S:1	0	0	0	0	0	1	1	0	1	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Gila orcuttii arroyo chub	G2 S2	None None	AFS_VU-Vulnerable DFG_SSC-Species of Special Concern USFS_S-Sensitive	838 880	49 S:2	0	0	1	1	0	0	0	2	2	0	0
Glaucomys sabrinus californicus San Bernardino flying squirrel	G5T2T3 S2S3	None None	DFG_SSC-Species of Special Concern USFS_S-Sensitive	4,600 5,300	11 S:5	1	0	2	0	0	2	2	3	5	0	0
Helianthus nuttallii ssp. parishii Los Angeles sunflower	G5TH SH	None None	Rare Plant Rank - 1A USFS_S-Sensitive	1,000 1,000	9 S:1	0	0	0	0	1	0	1	0	0	1	0
Horkelia cuneata ssp. puberula mesa horkelia	G4T2 S2.1	None None	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,100 1,100	58 S:1	0	0	0	0	1	0	1	0	0	1	0
Icteria virens yellow-breasted chat	G5 S3	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern	1,460 1,690	84 S:2	0	1	0	0	0	1	0	2	2	0	0
Imperata brevifolia California satintail	G2 S2.1	None None	Rare Plant Rank - 2.1 USFS_S-Sensitive	1,100 3,800	29 S:4	0	0	0	0	1	3	2	2	3	1	0
Ivesia argyrocoma var. argyrocoma silver-haired ivesia	G2T2 S2.2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	5,620 5,620	37 S:1	0	0	0	1	0	0	0	1	1	0	0
Lampropeltis zonata (parvirubra) California mountain kingsnake (San Bernardino population)	G4G5 S2?	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	3,460 3,460	9 S:1	0	1	0	0	0	0	0	1	1	0	0
Lanius ludovicianus loggerhead shrike	G4 S4	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,460 1,700	71 S:2	0	0	0	0	0	2	0	2	2	0	0
Lasiurus xanthinus western yellowbat	G5 S3	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_H-High Priority	1,050 2,600	57 S:8	0	0	0	0	0	8	2	6	8	0	0
Lasthenia glabrata ssp. coulteri Coulter's goldfields	G4T3 S2.1	None None	Rare Plant Rank - 1B.1 BLM_S-Sensitive	1,430 1,460	87 S:5	2	1	0	0	0	2	0	5	5	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Lepidium virginicum var. robinsonii Robinson's pepper-grass	G5T2? S2.2	None None	Rare Plant Rank - 1B.2	1,150 1,840	53 S:7	0	0	0	0	0	7	6	1	7	0	0
Lepus californicus bennettii San Diego black-tailed jackrabbit	G5T3? S3?	None None	DFG_SSC-Species of Special Concern	1,060 2,745	96 S:12	0	3	8	0	0	1	0	12	12	0	0
Lilium parryi lemon lily	G3 S2	None None	Rare Plant Rank - 1B.2 USFS_S-Sensitive	5,500 7,400	72 S:5	1	2	0	0	0	2	2	3	5	0	0
Lycium parishii Parish's desert-thorn	G3? S2S3	None None	Rare Plant Rank - 2.3	1,600 1,600	4 S:1	0	0	0	0	1	0	1	0	0	0	1
Malacothamnus parishii Parish's bush-mallow	GHQ SH	None None	Rare Plant Rank - 1A	1,290 1,290	1 S:1	0	0	0	0	0	1	1	0	1	0	0
Monardella macrantha ssp. hallii Hall's monardella	G5T3 S3	None None	Rare Plant Rank - 1B.3 USFS_S-Sensitive	3,500 5,000	28 S:6	0	5	0	0	0	1	0	6	6	0	0
Monardella pringlei Pringle's monardella	GX SX	None None	Rare Plant Rank - 1A	1,000 1,000	2 S:1	0	0	0	0	0	1	1	0	1	0	0
Nama stenocarpum mud nama	G4G5 S1S2	None None	Rare Plant Rank - 2.2	1,400 1,400	22 S:1	0	0	0	0	0	1	0	1	1	0	0
Nasturtium gambelii Gambel's water cress	G1 S1	Endangered Threatened	Rare Plant Rank - 1B.1 USFS_S-Sensitive	1,000 1,000	12 S:1	0	0	0	0	1	0	1	0	0	0	1
Neotamias speciosus speciosus lodgepole chipmunk	G4T2T3 S2S3	None None		6,800 7,300	24 S:3	0	0	0	0	0	3	3	0	3	0	0
Neotoma lepida intermedia San Diego desert woodrat	G5T3? S3?	None None	DFG_SSC-Species of Special Concern	1,200 1,630	115 S:5	0	2	2	0	0	1	0	5	5	0	0
Nyctinomops femorosaccus pocketed free-tailed bat	G4 S2S3	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern WBWG_M-Medium Priority	1,200 1,600	90 S:2	0	0	0	0	0	2	2	0	2	0	0
Onychomys torridus ramona southern grasshopper mouse	G5T3? S3?	None None	DFG_SSC-Species of Special Concern	1,180 2,000	26 S:3	0	0	0	0	0	3	3	0	3	0	0
Peridridia parishii ssp. parishii Parish's yampah	G4T3T4 S2.2?	None None	Rare Plant Rank - 2.2	5,600 7,480	37 S:8	0	0	1	0	0	7	2	6	8	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Perognathus alticolus alticolus white-eared pocket mouse	G1G2TH SH	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_EN-Endangered USFS_S-Sensitive	5,500 6,153	3 S:3	0	0	0	0	3	0	3	0	0	3	0
Perognathus longimembris brevinasus Los Angeles pocket mouse	G5T1T2 S1S2	None None	DFG_SSC-Species of Special Concern USFS_S-Sensitive	1,000 2,000	49 S:16	1	3	4	1	0	7	4	12	16	0	0
Phrynosoma blainvillii coast horned lizard	G4G5 S3S4	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	1,000 4,600	618 S:20	1	3	0	0	2	9	12	8	18	0	2
Plegadis chihi white-faced ibis	G5 S1	None None	DFG_WL-Watch List IUCN_LC-Least Concern	1,425 1,425	20 S:1	0	0	0	0	0	1	0	1	1	0	0
Polioptila californica californica coastal California gnatcatcher	G3T2 S2	Threatened None	ABC_WLBCC-Watch List of Birds of Conservation Concern DFG_SSC-Species of Special Concern	1,100 2,180	800 S:14	0	3	2	0	1	8	7	7	13	0	1
Rana draytonii California red-legged frog	G4T2T3 S2S3	Threatened None	DFG_SSC-Species of Special Concern IUCN_VU-Vulnerable	2,600 2,600	1322 S:1	0	1	0	0	0	0	1	0	1	0	0
Rana muscosa Sierra Madre yellow-legged frog	G1 S1	Endangered Candidate Endangered	DFG_SSC-Species of Special Concern IUCN_EN-Endangered USFS_S-Sensitive	1,800 6,680	165 S:4	0	1	0	0	3	0	3	1	1	1	2
Rhaphiomidas terminatus abdominalis Delhi Sands flower-loving fly	G1T1 S1	Endangered None		1,000 1,180	13 S:6	0	1	3	0	1	1	0	6	5	1	0
Rhinichthys osculus ssp. 3 Santa Ana speckled dace	G5T1 S1	None None	AFS_TH-Threatened DFG_SSC-Species of Special Concern USFS_S-Sensitive	1,525 2,080	14 S:3	0	3	0	0	0	0	0	3	3	0	0
Ribes divaricatum var. parishii Parish's gooseberry	G4TH SH	None None	Rare Plant Rank - 1A	1,000 1,000	4 S:1	0	0	0	0	1	0	1	0	0	1	0
Riversidian Alluvial Fan Sage Scrub Riversidian Alluvial Fan Sage Scrub	G1 S1.1	None None		1,300 2,900	30 S:4	0	1	1	0	1	1	4	0	3	0	1

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Schoenus nigricans black bog-rush	G4 S2.2	None None	Rare Plant Rank - 2.2	1,950 1,950	11 S:1	0	0	0	0	0	1	0	1	1	0	0
Sidalcea hickmanii ssp. parishii Parish's checkerbloom	G3T1 S1.2	None Rare	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	4,600 4,600	17 S:1	0	0	0	0	0	1	1	0	1	0	0
Sidalcea neomexicana Salt Spring checkerbloom	G4? S2S3	None None	Rare Plant Rank - 2.2	1,050 1,050	15 S:1	0	0	0	0	0	1	1	0	1	0	0
Sidalcea pedata bird-foot checkerbloom	G1 S1.1	Endangered Endangered	Rare Plant Rank - 1B.1 USFS_S-Sensitive	6,040 6,040	23 S:1	0	0	0	0	1	0	1	0	0	0	1
Southern Coast Live Oak Riparian Forest Southern Coast Live Oak Riparian Forest	G4 S4	None None		1,780 1,820	246 S:2	0	0	0	0	0	2	2	0	2	0	0
Southern Cottonwood Willow Riparian Forest Southern Cottonwood Willow Riparian Forest	G3 S3.2	None None		860 2,840	111 S:3	0	0	0	0	0	3	3	0	3	0	0
Southern Mixed Riparian Forest Southern Mixed Riparian Forest	G2 S2.1	None None		1,980 1,980	14 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Riparian Forest Southern Riparian Forest	G4 S4	None None		2,160 2,160	20 S:1	0	0	0	0	0	1	1	0	1	0	0
Southern Riparian Scrub Southern Riparian Scrub	G3 S3.2	None None		1,360 1,840	56 S:2	0	0	0	0	0	2	2	0	2	0	0
Southern Sycamore Alder Riparian Woodland Southern Sycamore Alder Riparian Woodland	G4 S4	None None		1,100 3,000	230 S:16	0	0	0	0	0	16	16	0	16	0	0
Southern Willow Scrub Southern Willow Scrub	G3 S2.1	None None		2,200 2,200	45 S:1	0	0	0	0	0	1	1	0	1	0	0
Spea hammondii western spadefoot	G3 S3	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_NT-Near Threatened	1,510 2,525	407 S:7	0	1	2	0	0	4	1	6	7	0	0
Sphenopholis obtusata prairie wedge grass	G5 S2.2	None None	Rare Plant Rank - 2.2	800 1,000	19 S:2	0	0	0	0	0	2	2	0	2	0	0

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						A	B	C	D	X	U	Historic > 20 yr	Recent <= 20 yr	Extant	Poss. Extirp.	Extirp.
Spinus lawrencei Lawrence's goldfinch	G3G4 S3	None None	ABC_WLBCC-Watch List of Birds of Conservation Concern IUCN_LC-Least Concern USFWS_BCC-Birds of Conservation Concern	1,690 1,690	3 S:1	0	1	0	0	0	0	0	1	1	0	0
Streptanthus bernardinus Laguna Mountains jewel-flower	G3 S3.3	None None	Rare Plant Rank - 4.3 USFS_S-Sensitive	5,990 7,100	22 S:7	0	3	1	0	0	3	5	2	7	0	0
Streptanthus campestris southern jewel-flower	G2 S2.3	None None	Rare Plant Rank - 1B.3 USFS_S-Sensitive	4,000 6,200	40 S:4	0	0	0	1	0	3	3	1	4	0	0
Symphyotrichum defoliatum San Bernardino aster	G2 S2	None None	Rare Plant Rank - 1B.2 BLM_S-Sensitive USFS_S-Sensitive	2,000 2,000	76 S:3	0	0	0	0	1	2	3	0	2	0	1
Taxidea taxus American badger	G5 S4	None None	DFG_SSC-Species of Special Concern IUCN_LC-Least Concern	1,040 5,200	446 S:3	0	0	0	0	0	3	3	0	3	0	0
Thamnophis hammondii two-striped garter snake	G3 S2	None None	BLM_S-Sensitive DFG_SSC-Species of Special Concern IUCN_LC-Least Concern USFS_S-Sensitive	1,955 3,460	143 S:7	2	2	1	0	1	1	0	7	6	1	0
Thelypteris puberula var. sonorensis Sonoran maiden fern	G5T3 S2.2?	None None	Rare Plant Rank - 2.2 USFS_S-Sensitive	2,000 2,000	21 S:1	0	0	1	0	0	0	0	1	1	0	0
Trichocoronis wrightii var. wrightii Wright's trichocoronis	G4T3 S1.1	None None	Rare Plant Rank - 2.1	1,420 1,420	9 S:1	0	0	0	0	0	1	1	0	1	0	0
Vireo bellii pusillus least Bell's vireo	G5T2 S2	Endangered Endangered	ABC_WLBCC-Watch List of Birds of Conservation Concern IUCN_NT-Near Threatened	790 2,000	226 S:7	1	1	3	0	0	2	1	6	7	0	0

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Appendix C

Botanical Species Observed

APPENDIX C

Botanical Species Observed

Scientific Name	Common Name
Vascular Plants	
Cupressaceae	**Cypress Family**
**Cupressus sempervirens*	Italian cypress
Asteraceae	**Sunflower Family**
Baccharis salicifolia	mulefat
**Centaurea melitensis*	tocalote
Conyza canadensis	common horseweed
Helianthus annuus	common sunflower
**Lactuca serriola*	prickly lettuce
**Sonchus oleraceus*	common sow thistle
Brassicaceae	**Mustard Family**
**Hirschfeldia incana*	shortpod mustard
**Lepidium sp*	peppergrass
**Sisymbrium irio*	London rocket
Chenopodiaceae	**Goosefoot Family**
**Salsola tragus*	Russian thistle
Cucurbitaceae	**Gourd Family**
**Cucurbita foetidissima*	coyote melon
Euphorbiaceae	**Spurge Family**
**Ricinus communis*	castor bean
Fabaceae	**Legume Family**
**Acacia redolans*	bank catclaw
**Cercidium microphyllum*	palo verde
Geraniaceae	**Geranium Family**
**Erodium cicutarium*	red-stemmed filaree
Malvaceae	**Mallow Family**
**Malva parviflora*	cheeseweed
**Malvella leprosa*	alkali-mallow
Myrtaceae	**Myrtle Family**
**Eucalyptus* sp.	eucalyptus
Oleaceae	**Olive Family**
**Olea europaea*	olive
Solanaceae	**Nightshade Family**
Datura wrightii	jimson weed
**Nicotiana glauca*	tree tobacco
Tamaricaceae	**Tamarisk Family**
**Tamarix* sp.	tamarisk
Vitaceae	**Grape Family**
Vitis girdiana	desert wild grape

Scientific Name	Common Name
Zygophyllaceae	**Caltrop Family**
**Tribulus terrestris*	puncture vine
Arecaceae	**Palm Family**
**Phoenix canariensis*	Canary Island date palm
**Washingtonia robusta*	Mexican fan palm
Poaceae	**Grass Family**
**Avena fatua*	wild oat
**Bromus diandrus*	ripgut brome
**Bromus madritensis* ssp. *rubens*	red brome
**Cynodon dactylon*	Bermuda grass
**Hordeum murinum*	false barley
**Setaria viridis*	green bristlegrass
**Sorghum halepense*	Johnsongrass

* indicates a non-native species

Appendix D

Zoological Species Observed

APPENDIX D

Zoological Species Observed

Common Name	Scientific Name
Class: Aves (Birds)	
Apodidae	
White-throated swift	*Aeronautes saxatalis*
Trochilidae	
Anna's hummingbird	*Calypte anna*
Corvidae	
American crow	*Corvus brachyrhynchos*
Mimidae	
Northern mockingbird	*Mimus polyglottos*
Sturnidae	
European starling	*Sturnus vulgaris*
Fringillidae	
House finch	*Carpodacus mexicanus*
Passeridae	
House sparrow	*Passer domesticus*
Class: Mammalia (Mammals)	
Rodentia (Rodents)	
California ground squirrel	*Spermophilus beecheyi*
Carnivora (Carnivores)	
Domestic cat	*Felis domesticus*
Domestic dog	*Canis domesticus*

Appendix E

Potential Sensitive Botanical Species

APPENDIX E

Potential Sensitive Botanical Species

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Thelypteridaceae			
Sonoran maiden fern *Thelypteris puberula var. sonorensis*	Federal: None State: None CNPS: 2.2	Fern. Occurs in riparian-wetland, seeps, and meadows. From 160 to 1,800 feet in elevation	None – project area does not support suitable habitat
Apiaceae			
Parish's yampah *Perideridia parishii ssp. parishii*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in meadows, wetland-riparian. From 6,500 to 9,900 feet in elevation	None – project area does not support suitable habitat
Asteraceae			
singlewhorl burrobrush *Ambrosia monogyra*	Federal: None State: None CNPS: 2.2	Shrub. Occurs in chaparral, Sonoran desert scrub, washes, and dry riverbeds. From 33 to 1,640 feet in elevation	None – project area does not support suitable habitat
smooth tarplant *Centromadia pungens ssp. laevis*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in valley and foothill grasslands, particularly near alkaline locales. Sites with minimal shrub cover. From 0 to 1,600 feet in elevation	Moderate – suitable habitat occurs within the project area. An individual plant was observed offsite within the ROW approximately 5 miles east of the project area. Not observed during general biological surveys.
Los Angeles sunflower *Helianthus nuttallii ssp. parishii*	Federal: None State: None CNPS: 1A	Perennial herb. Occurs in freshwater-marsh, salt-marsh, coastal, and wetland-riparian. Wide elevation range	None – project area does not support suitable habitat
Coulter's goldfields *Lasthenia glabrata ssp. coulteri*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in Salt-marsh, playas, vernal pools, wetlands, and non-wetlands. Elevation range unknown	None – project area does not support suitable habitat
San Bernardino aster *Symphyotrichum defoliatum*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in coastal scrub, cismontane woodland, lower montane coniferous forest, meadows and seeps, marshes and swamp and vernally mesic valley and foothill grasslands.	None – project area does not support suitable habitat
Wright's trichocoronis *Trichocoronis wrightii var. wrightii*	Federal: None State: None CNPS: 2.1	Annual herb. Occurs on the edges of ponds, streams, ditches, and wet depressions in clay and sandy soils. Elevation range unknown	None – project area does not support suitable habitat

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Berberidaceae			
Nevin's barberry *Berberis nevinii*	Federal: FT State: SE CNPS: 1B.2	Shrub. Occurs in sandy slopes and washes in chaparral, coastal scrub, and riparian scrub. From 800 - 2,700 feet in elevation	None – project area does not support suitable habitat
Brassicaceae			
Payson's jewel-flower *Caulanthus simulans*	Federal: None State: None CNPS: 4.2	Annual herb. Occurs in chaparral, coastal sage scrub, and open, dry areas. From 1,500 to 8,300 feet in elevation	None – project area does not support suitable habitat
Robinson's pepper-grass *Lepidium virginicum var. robinsonii*	Federal: None State: None CNPS: 1B.2	Annual herb. Occurs in chaparral and sage scrub below 2,000 feet in elevation	None – project area does not support suitable habitat
Gambel's water cress *Nasturtium gambelii*	Federal: FE State: ST CNPS: 1B.1	Perennial herb. Occurs in marshes, streambanks, and lake margins below 4,800 feet in elevation	None – project area does not support suitable habitat
Laguna Mountains jewel-flower *Streptanthus bernardinus*	Federal: None State: None CNPS: 4.3	Perennial herb. Occurs in chaparral and montane coniferous forest. From 4,500 to 9,500 feet in elevation	None – project area does not support suitable habitat
southern jewel-flower *Streptanthus campestris*	Federal: None State: None CNPS: 1B.3	Perennial herb. Occurs in chaparral, yellow pine forest, and pinyon-juniper woodland. From 3,400 to 8,800 feet in elevation	None – project area does not support suitable habitat
Caryophyllaceae			
marsh sandwort *Arenaria paludicola*	Federal: FE State: SE CNPS: 1B.1	Perennial herb. Occurs in boggy marshes and meadows below 1,200 feet in elevation	None – project area does not support suitable habitat
Chenopodiaceae			
San Jacinto Valley crownscale *Atriplex coronata var. notatior*	Federal: FE State: None CNPS: 1B.1	Annual herb. Occurs in alkali sink scrub, alkali playa, vernal pool, and annual grassland located on alkali and silty-clay soils. From 1,500 to 1,900 feet in elevation	None – project area does not support suitable habitat
Fabaceae			
Horn's milk-vetch *Astragalus hornii var. hornii*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in salty flats, lake shores, alkali sink, wetland-riparian. From 190 to 500 feet in elevation.	None – project area does not support suitable habitat

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Grossulariaceae			
Parish's gooseberry *Ribes divaricatum var. parishii*	Federal: None State: None CNPS: 1A	Deciduous shrub. Occurs in riparian woodland. From 200 to 1,000 feet in elevation. (Presumed extinct).	None – project area does not support suitable habitat
Hydrophyllaceae			
mud nama *Nama stenocarpum*	Federal: None State: None CNPS: 2.2	Annual or perennial herb. Occurs in intermittently wet areas, freshwater wetlands, and wetland-riparian. From below 1,900 feet in elevation.	None – project area does not support suitable habitat
Lamiaceae			
Pringle's monardella *Monardella pringlei*	Federal: None State: None CNPS: 1A	Annual herb. Occurs in sandy areas and coastal sage scrub. From 1,100 to 1,600 feet in elevation. Presumed extinct.	None – project area does not support suitable habitat
Hall's monardella *Monardella macrantha ssp. hallii*	Federal: None State: None CNPS: 1B.3	Perennial herb. Occurs in chaparral, foothill woodlands, yellow pine forest, mixed evergreen forest, and grasslands. Elevation range unknown.	None – project area does not support suitable habitat
Malvaceae			
Parish's bush-mallow *Malacothamnus parishii*	Federal: None State: None CNPS: 1A	Shrub. Occurs in chaparral and coastal sage scrub. From below 2,300 feet in elevation.	None – project area does not support suitable habitat
Parish's checkerbloom *Sidalcea hickmanii ssp. parishii*	Federal: None State: Rare CNPS: 1B.2	Perennial herb. Occurs in chaparral and open conifer forest. From 190 to 8,400 feet in elevation.	None – project area does not support suitable habitat
Salt Spring checkerbloom *Sidalcea neomexicana*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in creosote bush scrub, chaparral, sage scrub, yellow pine forest, alkali sink, and wetland riparian. From below 5,700 feet in elevation.	None – project area does not support suitable habitat
bird-foot checkerbloom *Sidalcea pedata*	Federal: FE State: SE CNPS: 1B.1	Perennial herb. Occurs in moist meadows in open woodlands and wetland-riparian areas. From 6,080 to 9,500 feet in elevation.	None – project area does not support suitable habitat
Polemoniaceae			
Santa Ana River woollystar *Eriastrum densifolium ssp. sanctorum*	Federal: FE State: SE CNPS: 1B.1	Perennial herb. Occurs in gravelly riverbeds and dry washes. From below 1,900 feet in elevation.	None – project area does not support suitable habitat

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Polygonaceae			
Parry's spineflower *Chorizanthe parryi var. parryi*	Federal: None State: None CNPS: 1B.1	Annual herb. Occurs in sandy, dry places, coastal or desert scrub. From 1,100 to 4,600 feet in elevation.	None – project area does not support suitable habitat
slender-horned spineflower *Dodecahema leptoceras*	Federal: FE State: SE CNPS: 1B.1	Annual herb. Occurs in alluvial sand and coastal scrub. From 700 to 2,700 feet in elevation.	None – project area does not support suitable habitat
Rosaceae			
mesa horkelia *Horkelia cuneata ssp. puberula*	Federal: None State: None CNPS: 1B.1	Perennial herb. Occurs in dry, sandy, coastal chaparral. From 250 to 2,700 feet in elevation.	None – project area does not support suitable habitat
Rubiaceae			
Alvin Meadow bedstraw *Galium californicum ssp. primum*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in chaparral and pine forest. From 4,400 to 5,600 feet in elevation.	None – project area does not support suitable habitat
silver-haired ivesia *Ivesia argyrocoma*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in pebble plains, dry meadows, mountain coniferous forest, and San Bernardino Mountains. From 6,500 to 7,500 feet in elevation.	None – project area does not support suitable habitat
Scrophulariaceae			
ash-gray paintbrush *Castilleja cinerea*	Federal: FT State: None CNPS: 1B.2	Perennial herb. Occurs in creosote bush scrub, pinyon-juniper woodland, meadows, and pebble-plain. From 6,800 to 10,650 feet in elevation.	None – project area does not support suitable habitat
San Bernardino Mountains owl's-clover *Castilleja lasiorhyncha*	Federal: None State: None CNPS: 1B.2	Annual herb. Occurs in meadows, flats, open forest, and wetlands. From 5,000 to 8,750 feet in elevation.	None – project area does not support suitable habitat
salt marsh bird's-beak *Cordylanthus maritimus ssp. maritimus*	Federal: FE State: SE CNPS: 1B.2	Annual herb (hemiparasitic). Occurs in coastal salt-marsh, dunes, and wetlands. From below 38 feet in elevation.	None – project area does not support suitable habitat
Solanaceae			
Parish's desert-thorn *Lycium parishii*	Federal: None State: None CNPS: 2.3	Shrub. Occurs in sandy to rocky slopes, and canyons. From below 3,800 feet in elevation.	None – project area does not support suitable habitat

Species	Sensitivity Status	Habitat and Distribution	Potential for Occurrence
Cyperaceae			
bristly sedge *Carex comosa*	Federal: None State: None CNPS: 2.1	Perennial herb. Occurs in wetlands below 1,550 feet in elevation.	None – project area does not support suitable habitat
California saw-grass *Cladium californicum*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in alkali and freshwater marsh, and in swamps. From below 7,600 feet in elevation.	None – project area does not support suitable habitat
hot springs fimbristylis *Fimbristylis thermalis*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in freshwater marsh, springs, and meadows. From below 1,900 feet in elevation.	None – project area does not support suitable habitat
black bog-rush *Schoenus nigricans*	Federal: None State: None CNPS: 2.2	Perennial herb. Occurs in marshes, swamps, springs, and alkaline soils. From below 7,600 feet in elevation.	None – project area does not support suitable habitat
Liliaceae			
thread-leaved brodiaea *Brodiaea filifolia*	Federal: FT State: SE CNPS: 1B.1	Perennial herb. Occurs in grasslands and vernal pools. From 220 to 1,200 feet in elevation.	None – project area does not support suitable habitat
Plummer's mariposa-lily *Calochortus plummerae*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in dry, rocky chaparral, and sage scrub. From 6,460 feet in elevation.	None – project area does not support suitable habitat
lemon lily *Lilium parryi*	Federal: None State: None CNPS: 1B.2	Perennial herb. Occurs in wetland-riparian areas. From 5,000 to 9,900 feet in elevation.	None – project area does not support suitable habitat
Poaceae			
California satintail *Imperata brevifolia*	Federal: None State: None CNPS: 2.1	Perennial herb. Occurs in wet springs, meadows, streamsides, and flood plains. Will also occur in non-wetlands. From below 1,900 feet in elevation.	None – project area does not support suitable habitat

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
CNPS = California Native Plant Society listing.
List 1B.2 = List 1b: Rare, threatened, or endangered in California and elsewhere. 0.2: Fairly endangered in California.
List 2.3 = List 2: Rare, threatened, or endangered in California, but more common elsewhere. O.3: Not very endangered in California.
List 4.2 = Limited distribution (Watch list). 0.2: Fairly endangered in California.
List 4.3 = Limited distribution (Watch list). 0.3: Not very endangered in California.
List A = Plants rare, threatened or endangered in California and elsewhere.
List B = Plants rare, threatened or endangered in California but more common elsewhere.

Appendix F

Potential Sensitive Zoological Species

APPENDIX F

Potential Sensitive Zoological Species

Species	Sensitivity Status	Preferred Habitat	Observed On Site	Potential for Occurrence
Invertebrates				
Delhi Sands flower-loving fly *Rhaphiomidas terminatus abdominalis*	FE	Fine, sandy soils, often with wholly or partly consolidated dunes. Restricted to a particular soil type classified as the 'Delhi' series.	NO	None- The project site lacks appropriate soils.
Fish				
Santa Ana sucker *Catostomus santaanae*	FT, SSC	Shallow, freshwater streams.	NO	None- The project site lacks suitable habitat for this species.
Santa Ana speckled dace *Rhinichthys osculus ssp. 3*	SSC	Permanent, freshwater streams.	NO	None- The project site lacks suitable habitat for this species.
Arroyo chub *Gila orcuttii*	SSC	Permanent, small to moderate-sized, moderate to high gradient streams with runs and pools.	NO	None- The project site lacks suitable habitat for this species.
Amphibians				
Western spadefoot toad *Spea hammondii*	SSC	Vernal swales, grasslands and pools. Burrows in loose soils during dry season.	NO	None – The project site lacks suitable habitat for this species.
California red-legged frog *Rana draytonii*	FT, SSC	Quiet, permanent streams, marshes, ponds or lakes.	NO	None – The project site lacks suitable habitat for this species.
Sierra Madre yellow-legged frog *Rana muscosa*	FE, SSC	Rocky stream courses.	NO	None – The project site lacks suitable habitat for this species.
Foothill yellow-legged frog *Rana boylii*	SSC	Partially shaded, rocky streams at low to moderate elevations.	NO	None – The project site lacks suitable habitat for this species.
Reptiles				
Coast horned lizard *Phrynosoma blainvillii*	SSC	Coastal sage scrub, grasslands, chaparral, oak woodland, riparian woodland and coniferous forest.	NO	None- marginal, fragmented habitat exists within the project area. Not observed during the general biological survey.
Orangethroat whiptail *Aspidoscelis hyperythra*	SSC	Coastal sage scrub, chaparral, edges of riparian habitats, washes and sandy areas.	NO	None – The project site lacks suitable habitat for this species.

Species	Sensitivity Status	Preferred Habitat	Observed On Site	Potential for Occurrence
Silvery legless lizard *Anniella pulchra pulchra*	SSC	Semi-stabilized sand dunes, sandy soils in areas vegetated with oak or pine-oak woodland, or chaparral; also wooded stream edges, and occasionally desert-scrub.	NO	None – The project site lacks suitable habitat for this species.
Southern rubber boa *Charina umbratica*	ST	Oak-conifer and mixed-conifer forests at elevations between roughly 5,000 to 8,200 ft.	NO	None – The project site lacks suitable habitat for this species.
California mountain kingsnake (San Bernardino population) *Lampropeltis zonata (parvirubra)*	SSC	Coniferous forest, oak-pine woodlands, riparian woodland, chaparral, manzanita, and coastal sage scrub.	NO	None – The project site lacks suitable habitat for this species.
San Bernardino ringneck snake *Diadophis punctatus modestus*	SSC	Prefers moist habitats, including wet meadows, rocky hillsides, gardens, farmland, grassland, chaparral, mixed coniferous forests, woodlands.	NO	None – The project site lacks suitable habitat for this species.
Two-striped garter snake *Thamnophis hammondii*	SSC	Found in or near permanent fresh water, often along streams with rocky beds.	NO	None – The project site lacks suitable habitat for this species.
Northern red-diamond rattlesnake *Crotalus ruber ruber*	SSC	Rocky areas of desertscrub, thornscrub, open chaparral, mesquite/cactus, and pine-oak woodland.	NO	None – The project site lacks suitable habitat for this species.
Birds				
White-tailed kite *Elanus caeruleus*	CFP	Grasslands and farmlands, occasionally forage over highway medians	NO	None –foraging habitat not large enough to sustain this species. Not detected during general biological survey.
Northern goshawk *Accipiter gentilis*	SSC	Deciduous, coniferous, and mixed forests.	NO	None – The project site lacks suitable habitat for this species.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	Federal candidate for listing, SE	Deciduous riparian woodland, especially including dense stands of cottonwood and willow, but also including mesquite and tamarisk in some areas.	NO	None – The project site lacks suitable habitat for this species.

Species	Sensitivity Status	Preferred Habitat	Observed On Site	Potential for Occurrence
Western burrowing owl *Athene cunicularis hypugaea*	SSC	Grassland habitats, desert mesquite hummocks, and agricultural lands with canals. Often uses manmade structures for cover.	NO	None- marginal, fragmented habitat exists within the project area. Inadequate foraging habitat. Not observed during the general biological survey.
Southwestern willow flycatcher *Empidonax traillii extimus*	FE, SE	Riparian willow thickets.	NO	None – The project site lacks suitable habitat for this species.
Loggerhead shrike *Lanius ludovicianus*	SSC	Open habitats with scattered shrubs, trees, posts, fences, utility lines or other perches.	NO	Low – appropriate perching habitat however site is highly urbanized. Not detected during general biological survey.
Least Bell's vireo *Vireo bellii pusillus*	FE, SE	Dense brush and mesquite associated with riparian systems, willow-cottonwood forest, and streamside thickets.	NO	None – The project site lacks suitable habitat for this species.
Coastal California gnatcatcher *Polioptila californica californica*	FT, SSC	Coastal sage scrub dominated by *Artemesia californica* (California sagebrush).	NO	None – The project site lacks suitable habitat for this species.
Yellow warbler *Dendroica petechia brewsteri*	SSC	Riparian woodlands.	NO	None – The project site lacks suitable habitat for this species.
Yellow-breasted chat *Icteria virens*	SSC	Second growth, shrubby old pastures, thickets, bushy areas, scrub, woodland undergrowth, including low wet places near streams, pond edges, or swamps.	NO	None – The project site lacks suitable habitat for this species.
Bell's sage sparrow *Amphispiza belli belli*	BCC	Chaparral dominated by chamise and/or California sagebrush.	NO	None – The project site lacks suitable habitat for this species.
Tricolored blackbird *Agelaius tricolor*	SSC	Fresh-water marshes of cattails, tule, bulrushes and sedges.	NO	None – The project site lacks suitable habitat for this species.
Lawrence's goldfinch *Spinus lawrencei*	BCC	Oak woodland, chaparral, riparian woodland, and pinyon-juniper association.	NO	None – The project site lacks suitable habitat for this species.
Mammals				
San Bernardino flying squirrel *Glaucomys sabrinus californicus*	SSC	Coniferous forests.	NO	None – The project site lacks suitable habitat for this species.

Species	Sensitivity Status	Preferred Habitat	Observed On Site	Potential for Occurrence
Northwestern San Diego pocket mouse *Chaetodipus fallax fallax*	SSC	Open, sandy, areas in low desert and foothills.	NO	None – The project site lacks suitable habitat for this species.
White-eared pocket mouse *Perognathus alticolus alticolus*	SSC	Open grassy/weedy/dry bracken areas among sagebrush and other shrubs in ponderosa/Jeffrey pine, pinyon/juniper, or montane hardwood-conifer associations.	NO	None – The project site lacks suitable habitat for this species.
Los Angeles pocket mouse *Perognathus longimembris brevinasus*	SSC	Sandy soil in valleys; firm sandy soil, overlain with pebbles, on slopes with widely spaced shrubs; sagebrush, creosote bush, and cactus communities.	NO	None – The project site lacks suitable habitat for this species.
Stephens' kangaroo rat *Dipodomys stephensi*	FE, ST	Annual grassland and coastal sage scrub with sparse shrub cover.	NO	None – The project site lacks suitable habitat for this species.
San Bernardino kangaroo rat *Dipodomys merriami parvus*	FE, SSC	Alluvial sage scrub on alluvial fans, flood plains, along washes, and in adjacent upland areas.	NO	None – The project site lacks suitable habitat for this species.
Southern grasshopper mouse *Onychomys torridus ramona*	SSC	Coastal chaparral.	NO	None – The project site lacks suitable habitat for this species.
San Diego desert woodrat *Neotoma lepida intermedia*	SSC	Sagebrush scrub and chaparral.	NO	None – The project site lacks suitable habitat for this species.
San Diego black-tailed jackrabbit *Lepus californicus bennettii*	SSC	Open areas or semi-open country, typically in grasslands, agricultural fields or sparse coastal scrub.	NO	None – The project site lacks suitable habitat for this species.
Western yellow bat *Lasiurus xanthinus*	SSC	Roosts and feeds in, and near, palm oases and riparian habitats. Known to occur in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats. Generally roost in palms.	NO	Moderate – Appropriate roosting habitat on-site. Not detected during biological surveys.
Pallid bat *Antrozous pallidus*	SSC	Abandoned buildings for roosting and arid habitat types for foraging.	NO	Low – Appropriate roosting habitat on-site. however, the species is not typically found in heavily developed areas and the nearest CNDDB record was from 1929.

Species	Sensitivity Status	Preferred Habitat	Observed On Site	Potential for Occurrence
Pocketed free-tailed bat *Nyctinomops femorosaccus*	SSC	Prominent cliffs and cliff faces.	NO	None – lack of appropriate habitat.
Western mastiff bat *Eumops parotis californicus*	SSC	Cliffs and cliff faces for roosting.	NO	None – lack of appropriate habitat.
Pacific fisher *Martes pennanti (pacifica) DPS*	SSC, federal candidate for listing	Upland and lowland forests, including coniferous, mixed, and deciduous forests.	NO	None – lack of appropriate habitat.
American badger *Taxidea taxus*	SSC	Arid, open habitats, grasslands, savannahs, mountain meadows, and desert scrub openings; needs friable soils for digging and open, uncultivated ground.	NO	None - marginal, fragmented habitat exists within the project area. Not detected during general biological survey.

FE = Federally Endangered.
FT = Federally Threatened
SE = State Endangered
ST = State Threatened
SSC = State Species of Concern
CFP = California Department of Fish and Game Fully Protected
BCC = USFWS Birds of Conservation Concern

APPENDIX D CULTURAL RESOURCES TECHNICAL MEMORANDUM

DOWNTOWN SAN BERNARDINO PASSENGER RAIL PROJECT

Cultural Resources Technical Memorandum

San Bernardino, San Bernardino County, California

August 2012

Prepared for:

Federal Transit Administration
201 Mission Street, Suite 1650
San Francisco, CA 94105-1839

San Bernardino Associated Governments
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92602

Prepared by:

ICF International
811 West 7th Street, Suite 800
Los Angeles, CA 90017

With technical assistance from:
HDR Engineering, Inc.
2280 Market Street, Suite 100
Riverside, CA, 92501

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Acronyms

A.D.	Anno Domini (In the year of the Lord)
ACHP	Advisory Council on Historic Preservation
amsl	above mean sea level
AT&SF	Atchison Topeka & Santa Fe Railway
APE	area of potential effects
B.C.	Before Christ
BNSF	Burlington Northern Santa Fe Railroad
c.	circa
California Register	California Register of Historical Resources
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CSRR	California Southern Railroad
Depot	San Bernardino Metrolink/Santa Fe Depot
DSBPRP	Downtown San Bernardino Passenger Rail Project
DPR	Department of Parks and Recreation
ICF	ICF International
NAHC	Native American Heritage Commission
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
PRC	Public Resources Code
RTIP	Regional Transportation Improvement Program
SANBAG	San Bernardino Associated Governments
SBAIC	San Bernardino Archaeological Information Center
SCAG	Southern California Association of Governments
SCRRA	Southern California Regional Rail Authority
SHPO	State Historic Preservation Officer
SPRR	Southern Pacific Railroad
TOD	Transit-oriented Development
T&P	Texas and Pacific
USGS	U.S. Geological Survey

EXECUTIVE SUMMARY

PROJECT DESCRIPTION

The San Bernardino Associated Governments (SANBAG) is proposing to extend Metrolink regional passenger rail service approximately 1 mile east from its current terminus at the existing San Bernardino Metrolink Station/Santa Fe Depot (Depot) located at 1170 West 3rd Street to new Metrolink commuter rail platforms proposed near the intersection of Rialto Avenue and E Street in the City of San Bernardino, San Bernardino County, California. The primary features of the Downtown San Bernardino Passenger Rail Project (DSBPRP or Project) include construction of a second track, rail platforms, parking lots, and a pedestrian overpass at the Depot; an Omnitrans bus facility; grade crossing improvements; railroad signalization; and roadway closures. The proposed Project's secondary features include: construction of drainage improvements, utility accommodation, and implementation of safety controls.

The DSBPRP is included in SANBAG's Short Range Transit Plan for Fiscal Year 2008–2012, the Southern California Association of Government's (SCAG's) 2008 Regional Transportation Plan, the SCAG 2011 Federal Transportation Improvement Program (FTIP), and the SCAG 2011 Regional Transportation Improvement Program (RTIP). The proposed Project is listed in the FTIP for improvements to rail platforms and track improvements as project number 200809 and is also listed under project number 20061012 as a part of the larger Redlands Passenger Rail Project (SCAG 2011a). The Project is listed in the RTIP as "Metrolink Commuter Rail" for rail service expansion in San Bernardino as project number 4CR04 (SCAG 2011b).

Section 106 of the National Historic Preservation Act (NHPA) applies to proposed projects that involve funding, licensing, permitting, or approval by a federal agency. This technical report documents SANBAG's compliance with Section 106, including evaluation of architectural and archaeological resources within the area of potential effects (APE) using the National Register of Historic Places (National Register) Criteria for Evaluation (36 Code of Federal Regulations [CFR] Part 60) and evaluates the potential effects on those properties using the Section 106 Criteria for Adverse Effect (36 CFR §800.5).

FINDINGS

The current survey began along the railway at its western point at the intersection of Pico Avenue and Rialto Avenue, continued to the Depot and then along the railroad right-of-way, and ended approximately halfway between South E Street and South D Street in the City of San Bernardino, California. This survey area was based upon an APE diagram produced by ICF International (ICF) that considered all parcels in which any portion would be potentially affected by the proposed Project (Figure ES-1). Henceforth, unless otherwise indicated, any mention of a project APE refers to the APE map produced by ICF.

Within the project APE, one property, the Depot, is listed in the National Register (a 1S California Historic Resource status code). In addition, one property was identified that appears individually eligible for listing in the National Register, the Southern California Gas Company Plant at 155 South G Street (a 3S California Historic Resource status code). Twenty-two properties, all architectural, were identified in the APE that required application of the National Register Criteria for Evaluation. None of these 22 properties were determined eligible for listing in the National Register. For Section 106 purposes, only the Depot and the Southern California Gas Company Plant would be affected by the proposed Project. (Please see Table 4.2).

Of the various elements of the proposed Project, the proposed pedestrian overpass that would be constructed adjacent to the Depot would potentially introduce visual elements that would diminish the integrity of the Depot's significant historic features. Following a careful analysis, it was found that of the seven aspects of integrity, only the Depot's integrity of setting would potentially be diminished. However, the level of diminished integrity of setting caused by obscured views would not rise to a level of significance to qualify as an adverse effect.

It should be noted that in addition to the Depot and the Southern California Gas Company Plant, 15 properties within the APE are considered historical resources pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15064.5(a). This is because these properties were previously identified in the "Historic Resources Reconnaissance Survey, San Bernardino, California" that was prepared by architect Milford Wayne Donaldson, A.I.A., Inc. for the City of San Bernardino Department of Planning and Building Services, dated April 30, 1991 (1991 survey). A tabular listing of these resources is included as an appendix to the 1991 survey.[1] Because San Bernardino has yet to adopt a historic preservation ordinance, the 1991 survey has been used by the City as a de facto list of its historic resources.[2]

In addition, a portion of the project APE cuts through the Santa Fe Railroad Workers Overlay Zone, a potential historic district identified in the 1991 survey that "consists of a residential neighborhood developed between 1900 and the 1920s, and [was] originally occupied by Santa Fe Railroad workers and their families."[3] Nine historic resources within the APE are also contributors to this overlay zone. As a result, properties within the APE that are on the 1991 survey list are identified in the current assessment recordation documents as either a) individually eligible for local listing or b) both individually eligible and a contributor to the Santa Fe Railroad Workers Overlay Zone. The removal of these structures is a potentially significant impact in terms of the CEQA guidance.

No new archaeological or paleontological resources were identified within the project area, and none of the previously recorded archaeological resources within the APE ~~is~~ are eligible for the National Register listing. However, this portion of San Bernardino was developed early in the city's history, and the potential for uncovering buried archaeological deposits during construction-related ground-disturbing activities is considered to be moderate, especially in the location of the Omnitrans bus facility and Optional Detention Basin #3. Therefore, mitigation is recommended prior to construction.

This technical report is to be submitted to the State Historic Preservation Officer (SHPO) for concurrence with the determinations of National Register eligibility and the Section 106 finding of "no adverse effect" with regard to architectural resources. No archaeological resources are known to be present in the APE; however, SHPO will be asked for concurrence regarding potential effects on these resources and the proposed mitigation measures.

[1] Donaldson, Milford Wayne A.I.A. "Historic Resources Reconnaissance Survey San Bernardino, California" prepared for the City of San Bernardino Department of Planning and Building Services, April 30, 1991. Volume 1, pages 20 and 21

[2] City of San Bernardino General Plan, Chapter 15.37 Historic Building Demolition Ordinance. Under 15.37.020 Definitions, the term "Survey" is defined as "Historic Resources Reconnaissance survey (Volumes 1-5 and Attachments, April 30, 1991 and all subsequent revisions), a Citywide survey of buildings and structures constructed prior to December 31, 1941 which provides baseline information regarding the types and locations of resources, approximate construction dates, representative architectural styles, construction materials, and contextual historical themes."

[3] Ibid. Volume 2.

Legend

Cultural Resources Area of Potential Effects

Parcel Boundary

Source: ESRI StreetMap North America (2008), HDR(2012), ICF International (2012)

0 200 400
Feet

N

Figure ES-1
Area of Potential Effects
Downtown San Bernardino Passenger Rail Project

1.0 INTRODUCTION

1.1 PROJECT PURPOSE

The purpose of the Project is to provide an extension of Metrolink regional passenger rail service, provide a centralized bus facility for existing fixed-route and planned rapid bus transit service, promote strategies for the revitalization and redevelopment of downtown San Bernardino, provide new commuter rail service and intermodal opportunities to the downtown area, help bolster economic development opportunities in San Bernardino's Central Business District, maximize transit-oriented development opportunities in downtown San Bernardino and the region, reduce greenhouse gas emissions, and develop more efficient communities by reducing sprawl and providing commuters with alternatives to single-occupant vehicles. Therefore, the San Bernardino Associated Governments (SANBAG) is proposing to extend Metrolink regional passenger rail service from its current terminus at the San Bernardino Metrolink Station/Santa Fe Depot (Depot) to new Metrolink commuter rail platforms proposed near the intersection of Rialto Avenue and E Street. The Project proposes to achieve the following objectives:

1. Construct a second track and associated railroad improvements to extend regional Metrolink passenger rail service between the existing Depot and downtown San Bernardino.
2. Encourage the integration of current and future passenger rail operations with other forms of transit in the region by providing a Metrolink passenger rail connection to downtown San Bernardino.
3. Accommodate forecasted ridership between the Depot and downtown San Bernardino by providing a convenient and efficient transit alternative to automobile travel.
4. Improve the mobility opportunities for transit-dependent populations in the City of San Bernardino to employment centers in Los Angeles and Orange Counties and support local and regional planning goals of SANBAG for the development of transit corridors in the Inland Empire.
5. Improve safety and accessibility at the existing Depot by constructing a pedestrian bridge that will connect the station's two reconstructed platforms, thereby eliminating existing at-grade pedestrian crossings.
6. Facilitate intermodal transit opportunities by constructing the Omnitrans bus facility close to Metrolink passenger rail service.

The Project would achieve SANBAG's mission of improving the quality of life for its San Bernardino County residents through increased efficiencies in a multi-modal transportation plan. San Bernardino County will benefit from the increased ridership and a revitalized downtown community with transit-oriented development (TOD).

1.2 PROJECT BACKGROUND

In 1992, SANBAG purchased a freight rail corridor that extends from San Bernardino to Redlands from the Atchison Topeka & Santa Fe Railroad (AT&SF), predecessor to the Burlington Northern Santa Fe Railway (BNSF). BNSF continues to operate freight service on the line and retains a perpetual easement for freight service. SANBAG's intent to purchase the corridor was to use all or a portion of the rail line for the implementation of passenger rail service to Redlands and beyond.

In 2001, the Southern California Association of Governments (SCAG) initiated a visioning process, known as the Compass Blueprint Program, resulting in a regional strategy to accommodate projected

growth in southern California. The program seeks to accommodate growth through the development of demonstration projects that capitalize on the collaboration of regional planning agencies, local communities, and jurisdictions. As part of this visioning program, SANBAG completed the *Redlands Rail Feasibility Study* and the *Redlands Passenger Rail Station Area Plans*. These studies explored the feasibility of establishing passenger rail service between the City of San Bernardino and the City of Redlands, while identifying transportation alternatives, potential station locations, and multi-modal transit development opportunities.

In 2001, the initial track and grade crossing infrastructure for the future DSBPRP was constructed. At that time, the corridor was envisioned to be served by diesel multiple units running on a single track with passing sidings. In addition, the initial project upgraded five at-grade crossings with new automatic warning devices, crossing surfaces, and raised medians. Since 2001, the vision for the DSBPRP has been modified to its current concept as described below in Section 1.3. A number of studies and reports have been conducted to date that identify a locally preferred alternative consisting of extending Metrolink passenger rail service approximately 1 mile east to downtown San Bernardino.

1.3 PROJECT DESCRIPTION

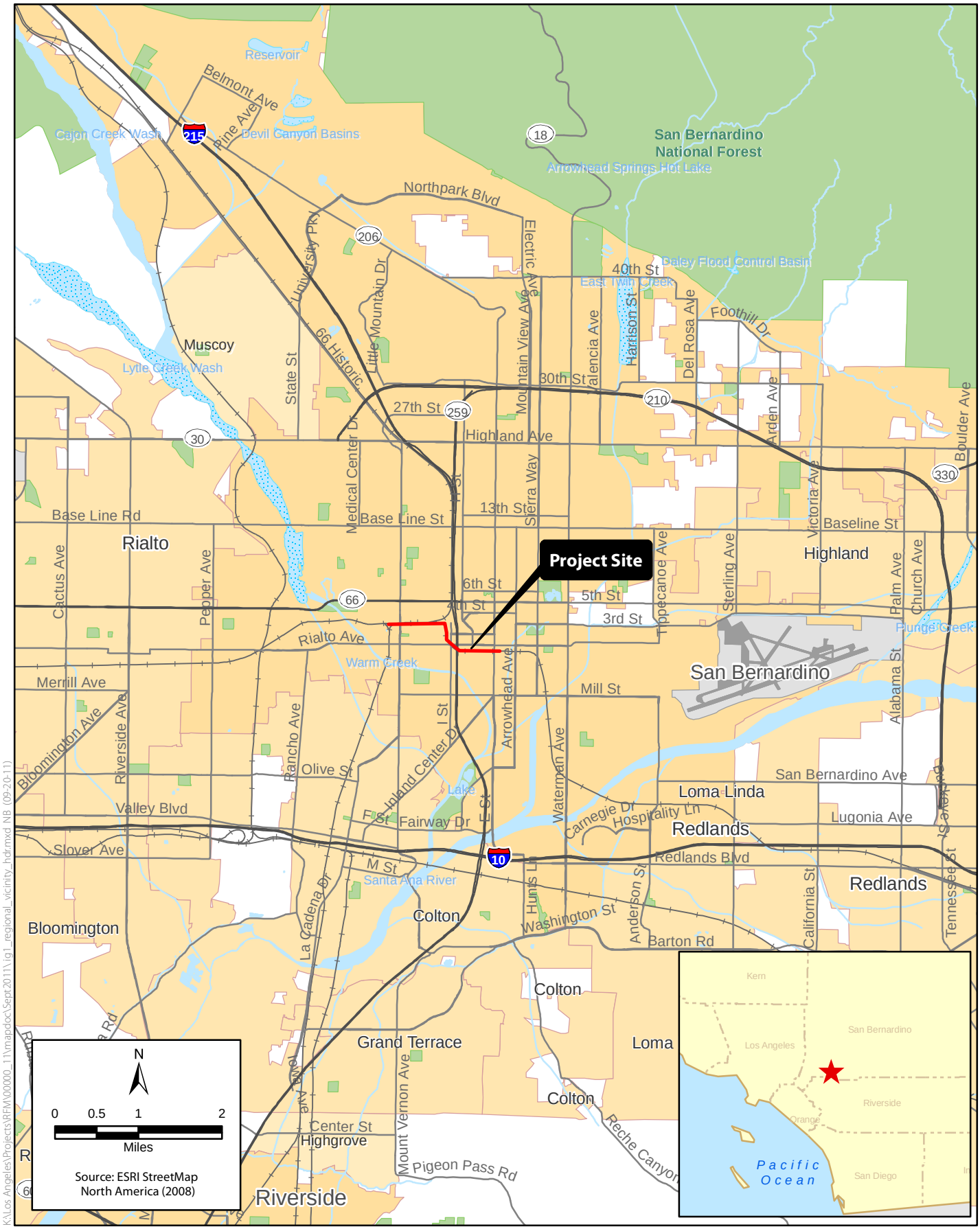
SANBAG is proposing to extend Metrolink regional passenger rail service approximately 1 mile east from its current terminus at the existing Depot located at 1170 West 3rd Street to new Metrolink commuter rail platforms proposed near the intersection of Rialto Avenue and E Street in the City of San Bernardino, San Bernardino County, California (see Figures 1-1 and 1-2). ~~The primary features of the proposed project include: construction of a second track, rail platforms, parking lots, a pedestrian overpass at the Depot, an Omnitrans Bus Facility, and grade crossing improvements; railroad signalization; and roadway closures. The proposed Project's secondary features include: construction of drainage improvements, utility accommodation, new parking facilities, and implementation of safety controls.~~ Figure 1-3 depicts the area of potential effects (APE) and primary project components.

The project components include the following:

Track Improvements: Track improvements include realignment of the existing railroad track and construction of a second track parallel to the existing track, extending from the Depot to the proposed rail platforms near Rialto Avenue and E Street. The Project also includes realignment and reconstruction of the two mainline tracks at the Depot and improvements to the Burlington Northern Santa Fe (BNSF) Railway Short Way.

San Bernardino Metrolink Station/Santa Fe Depot: The Project involves track and platform, pedestrian access, and parking lot improvements at the Depot. An Americans with Disabilities Act–compliant pedestrian overpass bridge would be constructed at the Depot, possibly in the Mission Revival architectural style. Two new platforms would be constructed north of the Depot, with new benches, canopies, platform amenities, ticket vending machines, lighting, and closed-circuit television security cameras that would serve both Metrolink and Amtrak passengers. In addition, minor interior and exterior improvements are proposed for the Depot that include the following: (1) installation of new window awnings, (2) new exterior and interior wayfinding signage for bathrooms and SANBAG/SCAG/Whistle Stop Cafe/Museum, (3) a new clock in the lobby, (4) a new sign in the lobby that details the railroad's role in creating time zones, and (5) a new monument sign and flagpole to be placed at the Depot entrance.

The parking lot located directly east of the Depot would be reconfigured to accommodate additional vehicles and landscaping, necessitating the realignment of 3rd Street.



ICF INTERNATIONAL

Figure 1-1
Regional Location

Figure 1-2
Project Location
Downtown San Bernardino Passenger Rail Project

Source: ESRI StreetMap North America (2008), HDR(2012), ICF International (2012)

0 200 400
Feet

N

Figure 1-3
Area of Potential Effects
Downtown San Bernardino Passenger Rail Project

Proposed Rail Platforms: The Project includes the installation of three new station platforms, canopies, platform amenities, ticket vending machines, lighting, and closed-circuit television security cameras near the intersection of Rialto Avenue and E Street. A new 265-space parking lot would be constructed directly south of the platforms to accommodate both train crews and Metrolink passengers. The vacant site to the north of the proposed rail platforms may be used as a staging area for the Project. A temporary Southern California Regional Rail Authority (SCRRA) crew building is also proposed for use during construction.

Omnitrans Bus Facility: The Omnitrans bus facility would include up to 22 bus bays and a bus circulation roadway with bus turnouts, as well as frontage street access improvements, pedestrian access improvements (e.g., crosswalks), and associated support facilities (e.g., security and lighting).

Pedestrian Connection to the ~~Arrowhead Credit Union Park~~San Manuel Stadium: A lighted pedestrian pathway that would connect the proposed rail platforms to ~~Arrowhead Credit Union Park~~San Manuel Stadium may be included as part of the Project. The following amenities would be provided: park benches, trash disposals, and bicycle racks.

Street Improvements:[4] The intersection of K Street and 3rd Street would be reconfigured as the west leg of a new T intersection. I Street at Rialto Avenue would be converted to a cul-de-sac on the south side, with the north leg of the intersection converted to a right-in/right-out configuration. Other improvements may be proposed. The changes to the roadway system would require approval of a General Plan Amendment to the City's Circulation Map of the 2005 General Plan Update.

Rail Alignment at I-215 Freeway: The I-215 freeway overpass was designed and constructed to accommodate the existing single track alignment within the Redlands Subdivision and would necessitate the use of compound horizontal curves in order to maintain a side clearance. The new corridor pier walls on the east side of the freeway would constrict the overpass's opening width, which would necessitate the use of compound horizontal curves in order to maintain a side clearance.

Grade Crossings: Four existing at-grade crossings would be reconstructed to accommodate the second track, raised medians, and widened sidewalks (3rd Street, 2nd Street, Rialto Avenue/I Street, and G Street).

Parcel Acquisitions and Relocations: Acquisition of additional rights-of-way along the alignment would be required. This may require up to 70 partial and full parcel acquisitions, as well as easements (i.e., roadway, temporary construction, sidewalk, utility, and alley vacations). Some of the parcels that would be acquired support active businesses and inhabited residences, which would require relocation.

Drainage Facility Improvements: A system of perforated underdrains and ditches would be constructed adjacent to the tracks to convey stormwater to the existing storm drain system. Catch basins at four crossings would also need to be relocated to accommodate proposed roadway improvements. Detention basins adjacent to the ~~Arrowhead Credit Union Park~~ San Manuel Stadium are also proposed.

Utility Replacement and Relocation: Existing subsurface water, sewer, storm drain, power, gas, fiber optic, and telephone lines that cross the tracks would be evaluated for conformance with Metrolink engineering standards. Overhead utilities, such as power and communication lines, would be raised if they fail to meet Metrolink's overhead clearance requirements. Railroad signal houses and streetlights would be relocated to accommodate the second track. Billboards may be removed and relocated.

Relocation of Monitoring Wells: Fourteen wells within the project area of potential effects (APE) would remain in place. Four wells may need to be closed, and four wells may need to be relocated.

[4] The Interstate 215 widening project, under construction in 2010–2011, will convert I Street south of 3rd Street to a cul-de-sac. That project is separate from the proposed Project.

Operational Controls (Rail Signals): Safety controls, including new traffic signals, railroad signal equipment (compatible with Metrolink's and BNSF's new positive train control [PTC] systems), and railroad/pedestrian crossing equipment, would be provided at each at-grade railroad crossing.

Rail Operations: An operating plan has been developed using Rail Traffic Controller (RTC) modeling and an operational analysis based on input from SANBAG, Metrolink, Amtrak, and BNSF personnel. Metrolink operations between the Depot and the new rail platforms are projected to start in early 2014.

Maintenance: Typical railroad maintenance and inspections would be conducted throughout the operational phase of the Project in accordance with SCRRA/Metrolink, BNSF, and Amtrak standard practices.

1.4 PROJECT ALTERNATIVES

This analysis includes the proposed Project in addition to three design options: Pedestrian Overpass Pedestrian Overpass Design Options 1A and 1B, Pedestrian Underpass Design Option 2, and 3rd Street Open Design Option 3. Pedestrian Overpass Pedestrian Overpass Design Options 1A and 1B and the Pedestrian Underpass Design Option 2 would be designed to minimize visual effects on the Santa Fe Depot's historic façade. All other railway and station improvements proposed as part of the Project would remain the same. The 3rd Street Open Design Option 3 would not require 3rd Street to be closed but instead would upgrade the at-grade crossing between J Street and I Street. All other railway and station improvements proposed as part of the Project would remain the same.

The proposed Project and Project Design Options would all meet the project's objectives, purpose, and need, which is to extend Metrolink regional passenger rail service approximately 1 mile east to downtown San Bernardino. This would involve construction of a second track, rail platforms, parking lots, a pedestrian overpass at the Depot, a bus facility, and grade crossing improvements; railroad signalization; and roadway closures. However, after review of all adverse and beneficial environmental effects and upon review of the comments received during the public circulation period, SANBAG has chosen the proposed Project as the preferred alternative.

2.0 ENVIRONMENTAL SETTING

2.1 PHYSICAL ENVIRONMENT

The proposed project area is located within the San Bernardino Basin, bounded to the north by the San Bernardino and San Gabriel Mountains and to the south by the Badlands and San Jacinto Mountain structural blocks. The basin is dominated by Quaternary-age alluvial deposition associated with the Santa Ana River system. These alluvial fan deposits variously consist of sand, gravel, and cobbles as well as strongly eroded gravel and pebbly sands (Morton and Miller 2006; Smith et al. 2008).

The proposed project site is located in a heavily developed urban setting, with few ground exposures and limited natural vegetation. Elevation ranges from 1020 to 1060 feet above mean sea level (amsl). Lytle Creek, now channelized, is located one-quarter to one half-mile south and east of the proposed Project. Town Creek, a tributary of Warm Creek, is located about three blocks east of E Street, and this tributary and the main stem of Warm Creek flow into Lytle Creek about a mile south of the project area. The project area is located in an unsectioned portion of Township 1 South, Range 4 West, as depicted on the San Bernardino South, CA 7.5-minute U.S. Geological Survey (USGS) quadrangle map.

2.2 PREHISTORY

Building on early studies and focusing on data synthesis, Wallace (1955, 1978) developed a prehistoric chronology for the southern California coastal region that is still widely used today and is applicable to coastal and many inland areas. Four periods are presented in Wallace's prehistoric sequence: Early Man, Milling Stone, Intermediate, and Late Prehistoric. In addition to Wallace's classic summary, a regional synthesis developed by Warren (1968) is referred to in the following discussion.

2.2.1 Early Man Period/San Dieguito (circa [c.] 10,000–6,000 B.C.)

When Wallace defined the Early Man Period in the mid-1950s, there was little evidence of human presence on the southern California coast prior to 6000 B.C. Archaeological work in the intervening years has identified numerous older sites dating prior to 10,000 years ago, including ones on the coast and Channel Islands (e.g., Erlandson 1991; Rick et al. 2001:609; Johnson et al. 2002; Moratto 1984). The earliest accepted dates for occupation are from two of the northern Channel Islands, located off the coast from Santa Barbara. On San Miguel Island, Daisy Cave clearly establishes the presence of people in this area about 10,000 years ago (Erlandson 1991). On Santa Rosa Island, human remains have been dated from the Arlington Springs site to approximately 13,000 years ago (Johnson et al. 2002; Smith et al. 2008).

Recent data from inland as well as coastal sites during this period indicate that the economy was a diverse mixture of hunting and gathering. At near-coastal and inland sites, it appears that an emphasis on hunting may have been greater during the Early Man Period than in later periods; numerous Clovis-like or Folsom-like fluted points have been found in San Bernardino County along shorelines of Pleistocene lakes in the desert portion of the County. Common elements in many San Dieguito Tradition sites include leaf-shaped bifacial projectile points and knives, stemmed or shouldered projectile points (e.g., Silver Lake and Lake Mojave series), scrapers, engraving tools, and crescents (Warren 1967:174–177; Warren and True 1961:251–254). Use of the atlatl during this period facilitated launching spears with greater power and distance. Subsistence patterns shifted around 6000 B.C. coincident with the gradual desiccation associated with the onset of the Altithermal, a warm and dry period that lasted for about 3,000 years (Smith et al. 2008).

2.2.2 Milling Stone/Encinitas Period (c. 6000–3000/1000 B.C.)

The Milling Stone Period of Wallace (1955, 1978) and Encinitas Tradition of Warren (1968) are characterized by an ecological adaptation to collecting, and by the dominance of small seed grinding. Milling stones, such as metates and slabs, and handstones, such as manos and mullers, occurred in large numbers for the first time, and were even more numerous near the end of this period. As indicated by their toolkits, people during this period practiced a mixed food procurement strategy. Subsistence patterns varied somewhat as groups became better adapted to their regional or local environments (Smith et al. 2008). Milling Stone period sites are common in the southern California at many inland locations, including Prado Basin in western Riverside County and the Pauma Valley in northeastern San Diego County (e.g., True 1958; Herring 1968; Langenwalter and Brock 1985; Sutton 1993; Sawyer and Brock 1999).

During the Milling Stone Period and Encinitas Tradition, stone chopping, scraping, and cutting tools were abundant, and generally made from locally available raw material. Projectile points, which are rather large and generally leaf-shaped, and bone tools such as awls were generally rare. The large points are associated with the spear, and probably with an atlatl. Items made from shell, including beads, pendants, and abalone dishes, are generally rare as well. Evidence of weaving or basketry is present at a few sites. Kowta (1969) attributes the presence of numerous scraper-planes in Milling Stone sites to the preparation of agave or yucca for food or fiber. The mortar and pestle, associated with the vertical motion of pounding foods, such as acorns, were introduced during the Milling Stone Period, but were not common (Smith et al. 2008).

Two types of artifacts that are considered diagnostic of the Milling Stone Period are the cogged stone and discoidal, most of which have been found within sites dating between 4000 and 1000 B.C. (Moratto 1984:149). The cogged stone is a ground stone object that has gear-like teeth on the perimeter and is produced from a variety of materials. The function of cogged stones is unknown, but they have been attributed to ritualistic or ceremonial uses by several scholars (Eberhart 1961:367; Dixon 1968:64–65). Similar to cogged stones, discoidals are found in the archaeological record subsequent to the introduction of the cogged stone. Cogged stones and discoidals were often purposefully buried or “cached.”

Koerper and Drover (1983) suggest that Milling Stone Period sites reflect migratory settlement patterns of hunters and gatherers who used marine resources during the winter and inland resources the remainder of the year. More recent research indicates that residential bases or camps were moved to resources in a seasonal round (de Barros 1996; Mason et al. 1997; Koerper et al. 2002), or that some sites were occupied year-round, with portions of the village population leaving at certain times of the year to exploit available resources (Cottrell and Del Chario 1981). Regardless of settlement system, it is clear that subsistence strategies during the Milling Stone Period included hunting small and large terrestrial mammals, marine mammals, and birds; collecting shellfish and other shore species; extensive use of seed and plant products; the processing of yucca and agave; and near-shore fishing (Reinman 1964; Kowta 1969).

Characteristic mortuary practices during the Milling Stone Period or Encinitas Tradition included extended and loosely flexed burials interred beneath cobble or milling stone cairns. Some burials contain red ochre and few grave goods, such as shell beads and milling stones. “Killed” milling stones, exhibiting purposely made holes, may occur in the cairns.

2.2.3 Intermediate Period (c. 3000/1000 B.C.–A.D. 500)

Wallace’s Intermediate Period and Warren’s Campbell Tradition date from approximately 3000 B.C. to A.D. 500. This era is characterized by a shift toward a hunting and maritime subsistence strategy along with a wider use of plant foods. During the Intermediate Period, there was a pronounced trend toward

greater adaptation to regional or local resources. For example, chipped stone tools suitable for hunting were more abundant and diversified, and shell fishhooks became part of the toolkit during this period. Larger knives, a variety of flake scrapers, and drill-like implements are common in deposits dating to this period. Projectile points include large side-notched, stemmed, and lanceolate or leaf-shaped forms. Koerper and Drover (1983) consider Gypsum Cave and Elko series points, which have a wide distribution in the Great Basin and Mojave Deserts between c. 2000 B.C. and A.D. 500, to be diagnostic of this period. Bone tools, including awls, were more numerous than in the preceding period, and the use of asphaltum adhesive was common as well (Smith et al. 2008).

Mortars and pestles, used for processing acorns, became more common during this period, gradually replacing manos and metates as the most abundant milling stone implements. In addition, hopper mortars and stone bowls, including steatite vessels, appear to have entered the toolkit at this time. This shift appears to be a correlate of a diversification in subsistence resources. Many archaeologists believe this change in milling stone signals a shift away from the processing and consuming of hard seed resources to the increasing importance of the acorn (e.g., Glassow et al. 1988; True 1993).

Characteristic mortuary practices during the Intermediate Period include fully flexed burials placed face down or face up and oriented toward the north or west (Warren 1968:2–3). Red ochre is common, and abalone shell dishes are infrequent. Internments sometimes occur beneath cairns or broken artifacts. Shell, bone, and stone ornaments, including charmstones, were more common than in the preceding Encinitas Tradition. Some later sites include olive shell (*Olivella* spp.) and steatite beads, mortars with flat bases and flaring sides, and a few small points. The broad distribution of steatite from the Channel Islands and obsidian from distant inland regions, among other items, attests to the growth of trade, particularly during the later part of this period (Smith et al. 2008).

2.2.4 Late Prehistoric Period (c. A.D. 500–A.D. 1769)

Wallace (1955, 1978) places the beginning of the Late Prehistoric Period around A.D. 500. In all chronological schemes for southern California, the Late Prehistoric Period lasts until European contact occurred in A.D. 1769.

During the Late Prehistoric Period, there was an increase in the use of plant food resources and an increase in land and marine mammal hunting. There was a concurrent increase in the diversity and complexity of material culture during this period, demonstrated by more classes of artifacts. The recovery of a greater number of small, finely chipped projectile points, usually stemless with convex or concave bases, indicates an increased use of the bow and arrow—rather than the atlatl and dart—for hunting. Cottonwood series triangular projectile points in particular are diagnostic of this period (Koerper and Drover 1983). Other items include steatite cooking vessels and containers, the increased presence of smaller bone and shell circular fishhooks, perforated stones, arrow shaft straighteners made of steatite, a variety of bone tools, and personal ornaments made from shell, bone, and stone (Smith et al. 2008). Ceramics were introduced during this time period, and pottery jugs, bowls, and smoking pipes become increasingly common.

Late Prehistoric Period sites contain complex objects of utility, art, and decoration. Ornaments include drilled whole Venus clam (*Chione* spp.) and drilled abalone. Steatite effigies become more common, with scallop (*Pecten* spp. and *Argopecten* spp.) shell rattles common in middens. Another feature typical of Late Prehistoric Period occupation is an increase in the frequency of obsidian in site assemblages, especially imported from the Obsidian Butte source in Imperial County. Much of the rock art found today is thought to date to this period (Whitley 2000:41). Mortuary customs were elaborate, including cremation and interment, with abundant grave goods (Smith et al. 2008).

During this period, there was an increase in population size accompanied by the advent of larger, more permanent villages (Wallace 1955:223). Large populations and, in places, high population densities were characteristic, with some coastal and near-coastal settlements containing as many as 1,500 people. Many of the larger settlements were permanent villages where people resided year-round. The populations of these villages may have also increased seasonally (Smith et al. 2008).

In Warren's (1968) cultural ecological scheme, the period between A.D. 500 and European contact is divided into three regional patterns. The Chumash Tradition is present mainly in the region of Santa Barbara and Ventura Counties; the Takic or Numic Tradition is present in the Los Angeles, Orange, western Riverside, and southwestern San Bernardino Counties region; and the Yuman Tradition is present in the San Diego region. The seemingly abrupt changes in material culture, burial practices, and subsistence focus at the beginning of the Late Prehistoric Period are considered to be the result of a migration to the coast of peoples from inland desert regions to the east. In addition to the small triangular and triangular side-notched points similar to those found in the desert regions in the Great Basin and Lower Colorado River, Colorado River pottery and the introduction of cremation in the archaeological record are diagnostic of the Yuman Tradition in the San Diego region. This combination certainly suggests a strong influence from the Colorado Desert region (Smith et al. 2008).

In Los Angeles, Orange, western Riverside and southwestern San Bernardino Counties, similar changes (introduction of cremation, pottery, and small triangular arrow points) are thought to have resulted from Takic migration to the coast from inland desert regions. This Takic or Numic Tradition was formerly referred to as the "Shoshonean wedge" or "Shoshonean intrusion" (Warren 1968).

2.3 ETHNOGRAPHY

The project area is located within an ethnographic transition zone between the Gabrielino/Tongva, Serrano, and Cahuilla Native American groups. All three groups are speakers of Takic languages, which are part of the Uto-Aztecan linguistic stock. Since the project area occupies a transitional zone among Gabrielino/Tongva, Serrano, and Cahuilla, it is necessary to consider all three groups to fully understand the occupation history of the project area.

2.3.1 Gabrielino/Tongva

The Gabrielino/Tongva are characterized as one of the most complex societies in native southern California, second perhaps only to the Chumash, their coastal neighbors to the northwest (Bean and Smith 1978a:538; Kroeber 1925:621). The Gabrielino/Tongva language, as well as that of the Juaneno and Luiseno to the south, was derived from the Takic family. The Takic family is part of the Uto-Aztecan linguistic stock, and can be traced to the Great Basin (Mithun 2001:539). This language group represents an origin quite different from that of the Chumash to the north and Ipai and Tipai farther south. Linguistic analysis suggests that Takic-speaking immigrants from the Great Basin moved into southern California around 500 B.C. (Kroeber 1925:579). This migration may have displaced both Chumashan-and Yuman-speaking peoples. The timing and extent of the migrations and their impact on indigenous peoples is poorly understood.

The Gabrielino/Tongva established large, permanent villages in the fertile lowlands along rivers and streams, and in sheltered areas along the coast that stretched from the foothills of the San Gabriel Mountains to the Pacific Ocean. The tribal population at contact is estimated to be at least 5,000 (Bean and Smith 1978a:540), though recent ethnohistoric work suggests a number approaching 10,000 is more likely (O'Neil 2002).

Houses constructed by the Gabrielino/Tongva were large, circular, domed structures made of willow poles thatched with tule that could hold up to 50 people (Bean and Smith 1978a). Other structures served as sweathouses, menstrual huts, ceremonial enclosures, and communal granaries. Cleared fields for races and games, such as lacrosse and pole throwing, were created adjacent to villages (McCawley 1996:27).

The fundamental economy of the Gabrielino/Tongva was one of subsistence gathering and hunting. The surrounding environment was rich and varied, and the tribe exploited mountains, foothills, valleys, deserts, riparian, estuarine, and open and rocky coastal environmental zones. With a large portion of their territory situated inland, they had access to juniper, yucca, and other vegetation from higher and drier areas than exclusively coastal peoples. As with most Native American Californians, acorns were the staple food, supplemented by the roots, leaves, seeds, and fruit of a wide variety of flora. Fresh and saltwater fish, shellfish, birds, and insects, as well as large and small mammals, were also exploited (Smith et al. 2008). Numerous other plants were used as medicines; as twine for the production of baskets, ornaments, and tools; and in religious ceremonies (O'Neil 2001; Smith et al. 2008).

A wide variety of tools and implements were used by the Gabrielino/Tongva to gather and collect food resources. These included the bow and arrow, traps, nets, blinds, throwing sticks and slings, spears, harpoons, and hooks. Groups residing near the ocean used ocean-going plank canoes and tule balsa canoes for fishing, travel, and trade between the mainland and the Channel Islands (McCawley 1996:7). Foods were processed with a variety of tools, including hammer stones and anvils, mortars and pestles, manos and metates, strainers, leaching baskets and bowls, knives, bone saws, and wooden drying racks. Food was consumed from a variety of vessels. Catalina Island steatite was used to make ollas and cooking vessels (Kroeber 1925:629).

Deceased individuals were either buried or cremated (Harrington 1942; McCawley 1996). Cremation was the standard practice for the mainland Gabrielino/Tongva during the contact period. Cremation ashes have been recovered from various archaeological contexts, including being buried within stone bowls and in shell dishes (Ashby and Winterbourne 1966:27). Archaeological and ethnographic data describe a wide variety of grave offerings, including seeds, stone grinding tools, otter skins, baskets, wood tools, shell beads, bone and shell ornaments, and projectile points and knives. Offerings varied with the sex and status of the deceased. Graves were sometimes marked, and in the San Pedro area headstones or boards were etched with figures (Smith et al. 2008).

The Gabrielino/Tongva were apparently first contacted by Europeans in 1542 when Juan Rodríguez Cabrillo entered the area. Following subsequent Spanish visits to the region, colonization began in 1769, precipitating the establishment of Missions San Gabriel (1771) and San Fernando (1797). Due in part to the introduction of Euro-American diseases and the harsh effects of mission life, the Gabrielino/Tongva population and culture suffered a gradual deterioration. Following the secularization of the missions, most surviving Gabrielino/Tongva became wage laborers on the ranchos of Mexican California. In the early 1860s, a smallpox epidemic nearly wiped out the remaining Gabrielino/Tongva. The combination of disease, forceful reduction, and poor diet contributed to the disappearance of the Gabrielino/Tongva as a culturally identifiable group in the 1900 federal census (Bean and Smith 1978a). However, persons of Gabrielino/Tongva descent have continued to live in the Los Angeles area to the present time.

2.3.2 Serrano

The Serrano were originally a relatively small group located within the San Bernardino and Sierra Madre Mountains, and the term "Serrano" has come to be ethnically defined as the name of the people in the San Bernardino Mountains (Kroeber 1925:611). The Vanyume, who lived along the Mojave River and associated Mojave Desert areas, also referred to as the Desert Serrano, spoke either a dialect of Serrano or a closely related language (Mithun 2001:543).

The Serrano language is part of the Serran division of a branch of the Takic family of the Uto-Aztecan linguistic stock (Mithun 2001:539, 543). The two Serran languages, Kitanemuk and Serrano, are closely related. Kitanemuk ethnographic lands were located to the northwest of the Serrano (Smith et al. 2008).

The Serrano occupied an area in and around the San Bernardino Mountains between approximately 1,500 and 11,000 feet amsl. Their territory extended west into the Cajon Pass, east as far as Twentynine Palms, north past Victorville, and south to the Yucaipa Valley. Year-round habitation tended to be located out on the desert floor, at the base of the mountains, and up into the foothills, with all habitation areas requiring year-round water sources (Kroeber 1908a; Bean and Smith 1978b).

Most Serrano lived in small villages located near water sources (Bean and Smith 1978b:571). Houses measuring 12 to 14 feet in diameter were domed and constructed of willow branches and tule thatching. The interiors were encircled with tule mats. Each house was occupied by a single extended family, comprising a husband, wife (or wives), children, grandparents, and perhaps a widowed aunt or uncle, and was a central family unit gathering place for sleeping and storage.

Much of the daily routine occurred outdoors in the open or under square armadas constructed of at least four posts, cross-beams, and tule-thatched roofs. Many of the villages had a ceremonial house, used both as a religious center and the residence of the lineage leaders. When hunting, the men would sometimes construct individual dwellings away from the village. Additional structures within a village might include granaries and a large circular subterranean sweathouse. The sweathouses were typically built along streams or pools (Smith et al. 2008).

Serrano territory was a trade nexus between inland tribes and coastal tribes. Ethnohistory also suggests that the Serrano played a role in the trade of horses from the southwest to the California coast (Bean and Vane 2002). The subsistence economy of the Serrano was one of subsistence hunting and collecting plant goods, with occasional fishing (Bean and Smith 1978b:571). Large and small animals were hunted, including mountain sheep, deer, antelope, rabbits, small rodents, and various birds, particularly quail. Plant staples consisted of seeds; acorn nuts of the black oak; pinon nuts; bulbs and tubers; and shoots, blooms, and roots of various plants, including yucca, berries, barrel cacti, and mesquite. Fire was used as a management tool to increase yields of specific plants, particularly chia (Smith et al. 2008).

Trade and exchange was an important aspect of the Serrano economy. Those living in the lower-elevation desert floor villages traded foodstuffs with people living in the foothill villages who had access to a different variety of edible resources. In addition to intervillage trade, ritualized communal food procurement events—such as rabbit and deer hunts and pinon, acorn, and mesquite nut-gathering events—integrated the economy and helped distribute resources that were available in different ecozones (Smith et al. 2008).

A variety of materials were used for hunting, gathering, and processing food, many of which were also used for shelter, clothing, and ceremonial items. Shell, wood, bone, horn, stone, plant materials, animal skins, and feathers were used for making money, baskets, rabbit skin blankets, mats, nets, and bags. The Serrano made pottery and used it daily to carry and store water or foodstuffs; ceramics were also used as ceremonial objects. They also made awls, sinew-backed bows, arrows, arrow straighteners, throwing sticks (for hunting), traps, fire drills, stone pipes, musical instruments of various types (rattles, rasps, whistles, and bull-roarers), yucca fiber cordage for snares, nets and carrying bags, and clothing (Bean and Smith 1978b:571; Bean and Vane 2002). A strong tradition of basket weaving incorporated the use of juncus sedge, deergrass, and yucca fiber. Foods were cooked either in earth ovens, in watertight baskets using heated cooking rocks and constant stirring, or by parching through use of hot embers and a constant tossing motion of shallow trays containing the grains. Animal bones were boiled and then cracked for access to the marrow. A variety of methods were used in the drying and preserving of foods for later consumption (Smith et al. 2008).

Mainly due to the inland territory that Serrano occupied beyond Cajon Pass, contact between Serrano and Europeans was relatively minimal prior to the early 1800s. As early as 1790, Serrano began to be drawn into mission life (Bean and Vane 2002). More Serrano were relocated to Mission San Gabriel in 1811 after a failed indigenous attack on that mission. Most of the remaining western Serrano were moved to an *asistencia* built near Redlands in 1819 (Bean and Smith 1978b:573). By 1834, most western Serrano had been moved to the missions, with some Serrano possibly moved to the mission at San Fernando Rey (Kroeber 1908b). Only small groups of Serrano remained in the area northeast of the San Gorgonio Pass and were able to preserve some their native culture (Smith et al. 2008).

In the 1860s, a smallpox epidemic decimated many indigenous southern Californians, including the Serrano (Bean and Vane 2002). Surviving Serrano sought shelter at Morongo with their Cahuilla neighbors; Morongo later became a reservation (Bean and Vane 2002). Other survivors followed the Serrano leader Santos Manuel down from the mountains and toward the valley floors, and eventually settled what later became the San Manuel Band of Mission Indians Reservation. This reservation was established in 1891 (Smith et al. 2008).

2.3.3 Cahuilla

The Cahuilla settled in a territory that extended west to east from the present-day City of Riverside to the central portion of the Salton Sea in the Colorado Desert, and south to north from the San Jacinto Valley to the San Bernardino Mountains. Evidence suggests the Cahuilla migrated to southern California about 2,000 to 3,000 years ago, most likely from the southern Sierra Nevada ranges of east-central California with other related socio-linguistic (Takic-speaking) groups (Moratto 1984:559).

Cahuilla villages were usually located in canyons or on alluvial fans near accessible water such as springs or where large wells could be dug. Each family and lineage had houses (*kish*) and granaries for the storage of food, and armadas for work and cooking. Sweat houses and song houses (for nonreligious music) were typically present within the villages, and each community constructed a separate house for the lineage or clan leader. Major religious ceremonies of the clan were held in a separate ceremonial house. Houses and ancillary structures were often spaced apart, and villages typically spread over a mile or two (Smith et al. 2008).

The Cahuilla used more than 200 desert and mountain plants (Bean and Saubel 1972). Though 60% of Cahuilla territory was in the Lower Sonoran Desert environment, 75% of their diet came from plant resources acquired in Upper Sonoran and Transition environmental zones (Bean 1978). Key plant foods included acorns, screwbean and honey mesquite, pinon nuts, prickly-pear cactus fruit and leaves, and yucca blossoms and stalks.

The Cahuilla employed a wide variety of tools and implements to gather and collect food resources. Hunting was achieved using the bow and arrow, traps, nets, slings, and blinds for land mammals and birds and nets for fish when Lake Cahuilla was filled. Throwing sticks were used to procure individual rabbits and hares, whereas clubs and large nets were used during communal rabbit drives. Food processing was achieved using a variety of tools: portable and bedrock mortars, basket hopper mortars, pestles, manos and mutates, bedrock grinding slicks, hammerstones and anvils, woven strainers and winnowers, leaching baskets and bowls, woven parching trays, knives, bone saws, and wooden drying racks. Food was consumed from woven, carved wood, and pottery vessels. Ground meal and unprocessed hard seeds were stored in large, finely woven baskets, whereas unprocessed mesquite beans were stored in large granaries woven from willow branches and placed on raised platforms to protect them from vermin.

Pottery was initially introduced to the Cahuilla during the Late Prehistoric Period, and the art of ceramic production was later adopted by the Cahuilla, who used the paddle and anvil technique. Typical culinary wares included jars, cooking vessels, and ladles. Ceramic pipes were also commonly manufactured.

Ceramic ollas (large, round pots with small necks) were used for storing seeds, and sealed ollas with foodstuffs were sometimes cached in caves and rock shelters for consumption during hunting and gathering forays (Bean 1978:578–579).

Asistencias were established near Cahuilla territory at San Bernardino and San Jacinto by 1819. Interaction with Europeans was less intense in the Cahuilla region than for coastal groups because the topography and paucity of water rendered the inland area inhabited by the Cahuilla unattractive to colonists. By the 1820s, however, the Pass Cahuilla experienced consistent contact with the ranchos of Mission San Gabriel, whereas the Mountain Cahuilla frequently received employment from private rancheros and were recruited to Mission San Luis Rey (Smith et al. 2008).

Mexican ranchos were located near Cahuilla territory along the upper Santa Ana and San Jacinto Rivers by the 1830s, providing the opportunity for the Cahuilla to earn money ranching and to learn new agricultural techniques. The Bradshaw Trail, established in 1862, was the first major east-west stage and freight route through the Coachella Valley. Traversing the San Gorgonio Pass, the trail connected gold mines on the Colorado River to the coast. Bradshaw developed his trail using the model employed for the Cocomaricopa trail, which had maps and guides provided by local Native Americans. Journals by early travelers along the Bradshaw Trail described encounters with Cahuilla villages and walk-in wells as they journeyed through the Coachella Valley (Smith et al. 2008).

The expansion of immigrants into the region introduced the Cahuilla to European diseases. The single worst recorded event was a smallpox epidemic in 1862–1863. By 1891, only 1,160 Cahuilla remained within what was left of their territory, down from an aboriginal population estimated at 6,000 to 10,000 (Bean 1978:583–584). By 1974, approximately 900 people claimed Cahuilla descent, most of who resided on reservations.

Between 1875 and 1891, the United States established ten reservations for the Cahuilla within their territory: Agua Caliente, Augustine, Cabazon, Cahuilla, Los Coyotes, Morongo, Ramona, Santa Rosa, Soboba, and Torres-Martinez (Bean 1978:585). Four of these reservations are shared with other Native American groups, including the Chemehuevi, Cupeno, and Serrano. The Cahuilla on the Morongo Reservation established the Malki Museum in 1965 (Smith et al. 2008).

2.4 Archaeological Context

Archaeological resources are the physical remains of past human activities and can be either prehistoric or historic in origin. Archaeological sites are locations that contain significant evidence of human activity. Generally, a site is defined by a significant accumulation or the presence of one or more of the following: food remains, waste from manufacturing tools, tools, concentrations or alignments of stones, modification of rock surfaces, unusual discoloration or accumulation of soil, or human skeletal remains. Archaeological sites are often located along creek areas, ridgelines, and vistas (City of San Bernardino 2005). The Project site has been previously disturbed and is currently developed as a rail corridor.

2.5 Historic Context

History for the State of California is generally divided into three periods: the Spanish Period (1769–1822), Mexican Period (1822–1848), and American Period (1848–present). Some researchers subdivide the American Period in various phases, such as 19th century (1848–1900), Early 20th century (1900–1950), and Modern Period (1950–present).

2.5.1 Spanish Period (1769–1822)

Spanish explorers made sailing expeditions along the coast of southern California between the mid-1500s and mid-1700s, although more than 200 years would pass before Spain would begin the colonization and inland exploration of Alta California. In the 18th century, the Spanish colonized present-day California, establishing a tripartite system consisting of missions, presidios, and pueblos (Bean and Rawls 1968). Franciscan Fr. Junipero Serra founded Mission San Diego de Alcala at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823 (Smith et al. 2008).

The string of 21 California missions paralleled the coastline between San Diego and Sonoma. Approximately 30 miles or a day's ride by horseback typically separated the missions. Near-coastal locations were preferred by the Spaniards for colonization since they were easier to defend and supply from ships, and were also bordered by populous Native American villages with potential converts (Smith et al. 2008). A major emphasis during the Spanish Period in California was the construction of these missions and associated presidios to integrate the Native American population into Christianity and communal enterprise. Several factors kept growth within California to a minimum, including the threat of foreign invasion, political dissatisfaction, and unrest among the indigenous population.

History records the Spaniard Pedro Fages as the first white person to pass through the San Bernardino Valley in 1772. Four years later, Fr. Francisco Hermenegildo Garces, "the famous and revered Franciscan missionary-explorer-martyr," entered the valley, seeking to plot a road that would connect Monterey with Sonora (Beattie and Beattie 1939:3). It would be another 30 years before the Spanish returned to the region (Smith et al. 2008).

All of the missions contained churches, workshops, storehouses, soldier's barracks, and quarters for Native American neophytes. These new converts were used as labor, establishing and nurturing the mission orchards, gardens, vineyards, and pastures. In San Diego, for example, 1,400 Native Americans were associated with the mission by 1797. Initially, cattle and horses were raised on the pastures adjacent to that first mission. Sheep, goats, and pigs were later added to the repertoire of animals raised on mission lands. These animals ultimately provided meat, wool, tallow for candles and soap, and leather for clothing, among other uses. Ranching eventually expanded to other areas and missions within San Diego County and beyond (Smith et al. 2008).

As the chain of missions prospered, their livestock holdings increased and became vulnerable to theft. The Spaniards responded by planning inland missions that could provide additional security and establish a presence beyond the coast. By 1806, a formal expedition to find potential locations was mounted to the San Bernardino Valley and on May 10, 1810, Fr. Francisco Dumetz established a religious site or *capilla* at a Cahuilla *rancheria* called Guachama (Beattie and Beattie 1939:5). The valley received its name from this site, which Fr. Dumetz dedicated to San Bernardino de Siena in honor of the saint's feast day, traditionally celebrated on May 10 (Federal Writer's Project 1939). The Guachama *rancheria* was located in the Bryn Mawr area, southwest of Redlands, and is now listed as California State Historical Landmark No. 95 (Smith et al. 2008).

Efforts to colonize and evangelize were continued by Mission San Gabriel Arcangel, which established an *estancia* (rancho) at Puente at least by 1816 and further expanded its scope of operations by establishing the San Bernardino *estancia* at a site located 1.5 miles east of Guachama in 1819 (Smith et al. 1969:23). Other *estancias* in San Bernardino County soon followed at Agua Caliente and at the ranchos of Jucumba and Yucaipa (Beattie and Beattie 1939:12). The *estancia* at Guachama was intended to serve several purposes, one of which was to develop farming and teach the Cahuilla Indians about European agricultural methods. To that end, a *zanja*, or irrigation ditch (now California State Historical Landmark

No. 43) was constructed in 1820 that originated several miles to the *estancia*. According to Beattie, as many as 1,000 Native Americans were involved in learning how to cultivate crops by the spring of that year. By 1821, mail was being carried between Sonora and California on the Cocomaricopa Trail, which passed through the San Bernardino Valley (Smith et al. 2008).

2.5.2 Mexican Period (1822–1848)

Mexico proclaimed its independence from Spain in 1821 and became a federal republic in 1824, with both Baja and Alta California classified as territories (Starr 2005). The Mexican Republic began to grant private land to citizens to encourage immigration to California. Huge land grant ranchos took up large sections of land in California. Between 1835 and 1846, more than 600 land grants were made in California by the Mexican government. The dons dominated the economy and defined the society of Mexican California (Robinson 1948; Starr 2005). These men, often referred to as "Californios," practiced an agricultural pattern that included mixed stock raising and commercial agriculture on their vast landholdings. (Jelinek 1999; Starr 2005).

During the early years of the Mexican Republic, the San Bernardino *estancia* became an *asistencia*. Although San Bernardino never had a resident priest, it did expand, and several adobe buildings were constructed by the Franciscans between 1830 and 1834 (Smith et al. 1969:23). The site is now listed as California Historical Landmark No. 42.

In 1833, Mexico adopted the Secularization Act of 1833, by which the Mexican government privatized most of the Franciscan's landholdings, including their California missions. By 1836, this sweeping process effectively reduced the California missions to parish churches and released their vast properties. Although earlier secularization plans had called for redistribution of lands to the Native American neophytes, who were responsible for construction of the mission empire, the mission lands and livestock holdings were instead redistributed by the Mexican government through land grants to Mexican ranchers (Langum 1985:15–18). The Mexican citizens who received the ranchos subsequently released their neophyte "workers" to fend for themselves.

Subsequent to the abandonment of San Bernardino by the Franciscans, three brothers, Jose del Carmen, Jose Maria, and Vicente Lugo, settled the former mission lands with the intention of starting a colony. Slover Mountain, also known as El Cerrito Solo, was the natural landmark used for establishing the boundaries of the Lugos' land grant in the San Bernardino Valley (State of California Resources Agency 1973). The colony was not a success, however, but with some effort they were able to retain the land, which by early 1840s they held in common with Diego Sepulveda. Sepulveda's adobe at Yucaipa remains the oldest home in San Bernardino County and is listed as California Historical Landmark No. 528 (Smith et al. 1969:37).

A small band of New Mexicans settled nearby at Politana during the same period, in 1842. Their presence was intended to help forestall attacks by Native Americans, and members of the group eventually established La Placita and Agua Mansa along the Santa Ana River. Their cemetery at Agua Mansa remains as the oldest cemetery in San Bernardino County and is listed as California State Historical Landmark No. 121.

During the supremacy of the ranchos (1834–1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of nonnative inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population unfortunately contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated

immunities. Large numbers of native peoples in the Central Valley, for example, died from disease between 1830 and 1833, and disease exterminated whole tribes along the American, Merced, Tuolumme, and Yuba Rivers. The Central Valley was hit by a second epidemic in 1837, which further decimated indigenous Californians (Cook 1955; Smith et al. 2008).

2.5.3 The American Period (1848–Present)

In 1848, at the end of the war between Mexico and the United States, the Treaty of Guadalupe Hidalgo was signed, giving control of California to the United States. The acquisition of California by the United States and the discovery of gold in 1849 drew many Euro-Americans into California (Robinson 1948). In 1850 California became a state and was subsequently divided into 27 counties. However, the great population influx was limited primarily to central California, San Francisco, and the Gold Rush region of the Sierra Nevada. Southern California grew slowly during this time.

Horticulture and livestock, based primarily on cattle as the currency and staple of the rancho system, continued to dominate the southern California economy through the 1850s. Cattle were no longer desired mainly for their hides, but also as a source of meat and other goods. During the 1850s cattle boom, rancho vaqueros drove large herds from southern to northern California to feed that region's burgeoning mining and commercial boom. Cattle were at first driven along major trails or roads such as the Gila Trail or Southern Overland Trail, then were transported by trains where available. The cattle boom ended for southern California as neighbor states and territories drove herds to northern California at reduced prices. Operation of the huge ranchos became increasingly difficult, and droughts severely reduced their productivity (Cleland 1941:102–103).

San Bernardino County

Following the secularization of the missions, Rancho San Bernardino was purchased by Jose de Carmen Lugo in 1842 and then sold to Mormon missionaries in the 1850s (Mission Tour. n.d.). Mormon pioneers, under the aegis of Brigham Young, arrived in the San Bernardino Valley in 1851 and purchased 35,000 acres of Rancho San Bernardino. However, the missionaries were recalled to Salt Lake City by Brigham Young in 1857, leaving behind schools, roads, and a local government (City of San Bernardino 2010). After the departure of the Mormon missionaries, Dr. Benjamin Barton bought Rancho San Bernardino, which became the property of San Bernardino County in 1925. The historic complex was restored in 1937 (Mission Tour. n.d.).

The population of San Bernardino County as of 1860 was 5,000, including 3,200 Native Americans. Cattle and other livestock continued to sustain the economy, as did agriculture, primarily consisting of wheat, barley, corn, and hay (Beattie and Beattie 1939:354–355). Gold was found in Holcomb and Bear Valley in the early 1860s, giving rise to boomtowns (most notably, Belleville) and intensive mining efforts. In 1867, violence among Native Americans and European-Americans led to an organized effort to suppress Indian resistance. By the end of the decade, Native American population in the area had been effectively crushed (Beattie and Beattie 1939:421; Smith et al. 2008).

While the southwestern part of the county remained primarily an agricultural and logging area throughout the 19th century, commercial interests were served by the Southern Pacific Railroad (SPRR), which arrived in Colton in 1875, and the California Southern Railroad (CSRR), which arrived in San Bernardino in 1883 (Myra L. Frank & Associates, Inc. 1993:8). San Bernardino County is an important regional economic center and the "gateway" to the San Bernardino mountain resorts, including Lake Arrowhead (Stone 1966:409).

City of San Bernardino

When the City of San Bernardino was officially incorporated in 1854, two-thirds of the population was Mormon. Their influence ensured that San Bernardino would be a "temperance town," with no drinking or gambling allowed. Growth in San Bernardino faltered when, in 1874, townspeople initially refused to accommodate railroad interests. However, by the late 19th century, Colton, a small city to the southwest, eventually became the regional hub of the SPRR, the first transnational railroad through the Inland Empire area.

Following the Civil War, overland stage services to and from southern California resumed in 1868 with the Holladay and Wells Fargo operations (Stein 1994; Nevin 1974). The antebellum national initiative for a southern transcontinental railroad route resumed during the 1870s. In 1871 the Texas and Pacific (T&P) Railway Company received a federal charter and conducted transcontinental surveys to pursue the initiative. In 1873, however, western construction of the T&P stalled in north-central Texas. The resulting delay was critical, allowing San Francisco investors to extend their own SPRR through Imperial Valley to the Colorado River in 1877, bridging the river at Yuma into present-day Arizona along the T&P survey in 1878 (Yenne 1985).

The arrival of the SPRR and AT&SF Railway in the 1870s and 1880s, which had connecting lines throughout southern California, brought economic opportunity and exponentially increased the state's population. This socioeconomic phenomenon has been widely identified as "the Boom of the 'Eighties'" by historians such as Glenn Dumke. According to Dumke, "In general, coupled with large transfers of land and the platting of several new additions to the city, the boom in San Bernardino reflected itself largely in local railway extensions and in a sharp rise in prices and property values" (Dumke 1944:120). Like other parts of the west, both water and railroads would be keys to future development. Beginning in 1887, Major George H. Bonebrake and F.C. Howes formed the Semi-Tropic Land and Water Company, purchased 28,000 acres and the water rights to Lytle Creek, and laid out the town sites of Rosena (now known as Fontana), Rialto, Bloomington, and San Sevaine (Hansen 2006). Bloomington was established in 20-acre blocks and developed slowly as settlers came first to farm the surrounding land, and later went to work in the cement industry and in steel plants (Smith et al. 2008).

Citrus trees were introduced to San Bernardino County in 1857 by Anson Van Leuven, who purchased several orange trees from the Mission San Gabriel and planted them near the *asistencia*. The citrus industry grew dramatically within the next century and became San Bernardino County's most important agricultural product (Robinson 1958:47). In 1911 the city instituted the National Orange Show, an annual citrus fair celebrating the citrus industry. The celebration has grown to become a regional, 5-day event. The exposition grounds adjoin south E Street and include more than 120 acres with exhibit buildings, a speedway, a conference center, and facilities for 40,000 visitors (National Orange Show 2008). The National Orange Show grounds are California Point of Historical Interest No. 259.

By 1910, the citrus and railroad industries dominated the local economy and included growing, packing, and shipping fruit products. Other industries in the San Bernardino area included cattle ranching, sugar beet cultivation, and viticulture and enology (Southern California Panama Expositions Commission 1914). According to the U.S. Census, the population of San Bernardino County had risen to 56,700 by the end of the first decade of the 20th century. The Santa Fe Railway was a major employer; its expansive shops and freight yards in San Bernardino were said to be the largest outside Topeka, Kansas. Multiple generations worked at the yard, affording working- and middle-class lifestyles to more than half the adult population of the community at times. Train cars and equipment were built and locomotives repaired at those shops from the late 1880s until its closing in 1992 (Duke 1995). Although there is no trace of the miles of track, distinctive roundhouse, or heroically scaled shop buildings, the nearly 200-foot high steam plant smokestack remains at the side of a BNSF multi-modal yard. The exotic Santa Fe Railway Depot, built in 1918, is listed in the National Register and now houses the offices of SANBAG (Smith et al. 2008).

San Bernardino came to include sizable populations of Japanese- and African Americans during the first half of the 20th century. Residential and commercial development mirrored the southern California boom years of the 1920s and associated with post-World War I residential and industrial activities. Downtown San Bernardino reflected the prosperity of the times with the construction of large, imposing buildings, including the California Hotel, the Frank C. Platt Building, the second Andreson Building, and the Harris Company during the 1920s. From the 1920s onward, the automobile came to play a preeminent role in shaping the landscape of San Bernardino. "The Mother Road" Route 66, established in 1926, passed through San Bernardino. Business Route 66 was located along Kendall Drive and E Street. The rise of the car culture pushed commercial buildings in the city back from the roadside to allow for surface parking. It was also reflected in the appearance of new types of architecture, such as the drive-in restaurant (Longstreth 1998; Hess 2004; Smith et al. 2008).

The city's first institution of higher learning was San Bernardino Valley College, a junior college founded in 1926. California State University, San Bernardino is presently the main institution of higher learning in San Bernardino. Originally called San Bernardino-Riverside State College, the now 430-acre location near Kendall Drive was acquired in 1963 for use as the campus. The official name of the college was subsequently changed to California State College at San Bernardino. Two years later, a small campus of three buildings accommodated the fewer than 300 matriculating students. The first class of 59 students graduated in 1967. In 1970, a mid-rise library was built, and the construction of dormitories followed in 1972. The state college entity became the California State University and Colleges system in 1972. In 1984, the San Bernardino campus earned university status, and was named California State University, San Bernardino (California State University San Bernardino 2008; Smith et al. 2008).

With the arrival of the automobile in the early 20th century, San Bernardino became a popular resort community, and the area thrived as a result of citrus, grape, and steel industries (Schuiling 1984:100–101). The community also acquired a large military presence during World War II with the establishment of San Bernardino Air Material Command, later renamed Norton Air Force Base, on the outskirts of San Bernardino. World War II also brought the construction of a Kaiser Steel Plant, the first of the area ventures into heavy manufacturing (Schuiling 1984:142; Smith et al. 2008). Since World War II, San Bernardino has experienced both economic and population growth, with suburban development replacing former agricultural land. Also in the mid-20th century, the first McDonald's restaurant was opened by Richard and Maurice McDonald at 1398 North E Street in San Bernardino in 1948 (Cataldo 2002:97). The building is no longer extant. During the mid- to late-1950s, Interstate 10 was constructed through the heart of Bloomington, a Census-Designated Place, effectively bisecting the community. A major urban renewal project was undertaken in the late 1960s; many older buildings in downtown San Bernardino were razed and the Central City Mall (now Carousel Mall) was constructed, incorporating the Harris Company building within it and closing off 3rd Street in a pedestrian mall west of E Street. While this trend has affected the historic core of downtown San Bernardino, residents have recently begun to return to the area as a result of redevelopment efforts (Schwartz 2005).

Transportation History

San Bernardino and the Santa Fe Railway

In large part because of its strong railroad presence, at the turn of the century San Bernardino was seen not just as a center for the Inland Empire's citrus industry but as the gateway to southern California.

However, within the Inland Empire, it was neighboring town of Colton that in January of 1883 first became the regional home to a transnational line. The SPRR established the city itself after San Bernardino had rejected SPRR's conditions and overtures for laying track through that city. On September 13, 1883, after a Supreme Court decision ruled that it could cross Colton's SPRR tracks, the

CSRR, a subsidiary the AT&SF Railway, arrived at its San Bernardino depot (Robinson 1958:50). Though this first depot was basically a boxcar, the train's arrival officially connected San Bernardino to the transcontinental railroad, and the wealth and means that came with it. At one point just a few years prior, the presence of the CSRR in this vicinity was unimaginable to the SPRR. But San Bernardino resident and CSRR Chief Engineer Fred Perris engineered, surveyed, and supervised the construction of the CSRR through the Cajon Pass, a feat that the larger and more dominant SPRR failed to see possible (Stoebe 1986:8). In 1886 Santa Fe Railway constructed a large wood and brick depot and began work just north of the tracks on a massive complex of shops that continued expanding until the 1950s. This second depot burned in 1916, and was replaced with the current, Moorish Revival depot—a National Register listed property—2 years later. The complex as a whole of depot, shops, plus numerous alignments of tracks together made San Bernardino the Santa Fe Railway's primary hub in the western United States. By 1900, 85% of all San Bernardino citizens directly or indirectly worked for the Santa Fe Railway, and San Bernardino had become a "railroad town" (Raup 1940:39). Simultaneously with the advent of a massive Santa Fe Railway growth in San Bernardino was the boom of 1887–1888, when price wars between SPRR and the Santa Fe Railway lured tens of thousands of visitors and new residents primarily from the Midwest to southern California. San Bernardino, like many other southern California communities of this time, saw a massive jump in its population.

Development near the Santa Fe Depot

One of southern California's oldest cities, San Bernardino saw its first European residents in the 1850s in the form of a Mormon Colony. As originally subdivided in 1866, the town was originally 72 blocks and was due east of the Depot. The construction of the Santa Fe Depot shifted the city's general development trend westward toward it. Numerous light industrial properties began to develop near the tracks, primarily west of the former H Street—now the SR-215 freeway. Within the project area a few examples remain, and appear to have been constructed between c.1900 and 1950. Additionally, this westward shift in development included a great degree of residential construction, much of which was for the railroad workers themselves. The focus of this development, which included both single- and multiple family dwellings, occurred just south of the Depot, and much of it was constructed between 1885 and 1920. Within the present project APE, the residential subdivisions below the Depot included 1) Carter's Sub-Division, with two blocks originally subdivided in 1884, then increased to four in 1887; and 2) Elizabeth M. Wallace's Subdivision of July 1886, which ran five lots west of I Street on 2nd street and along the west side of I Street between 2nd and 3rd Streets. Carter's four units were bounded by 3rd Street to the north, I Street to the east, 2nd Street to the south, and either side of Carter Avenue (J Street) for one block between 2nd and 1st Streets (Rialto Avenue).

The styles of these homes reflect broader trends popular between 1885 and 1920, the period in which many of these homes were built. The earliest houses appear to have been constructed prior to 1895 and reference Second Empire Baroque and Italianate styles—revivalist, "picturesque" design systems focused upon aesthetically pleasing exterior imagery that referenced a Romanticized past. In residential architecture, picturesque design systems were a reaction against the new mechanization of the industrial revolution and were often used in worker housing, particularly in company towns of the latter 19th century.

Within the project area, the Folk Victorian style and the simpler National style were vernaculars commonly seen in other parts of the Western U.S. between 1880 and 1915. Usually consisting of square or rectangular plan houses with simple, gabled massing, both of these styles were dispersed across the country largely by and in-tandem with the railroad itself (McAlester 2003:310). It was along rail lines that the prefabricated, pre-cut components of these homes, including their often standardized applied ornamental details, were shipped to the railroad's new destinations. In this regard, these styles as seen

within the worker housing near the Santa Fe Depot are highly contextual. The best remaining example of houses from this era within the project APE is a row of 2-story folk Victorians along the west side of I Street within the original Elizabeth Wallace subdivision.

Within the project area, a second wave of construction appears to be present that consists primarily of Craftsman homes constructed from c.1915 to c.1925. Originating c.1905, Craftsman architecture is a southern California product first refined by the Greene brothers in Pasadena (McAlester 2003:454). Among its influences were the English Arts and Crafts movement, which itself, like the picturesque styles mentioned above, was a reaction against the industrial revolution—the demise of its products compared to the handcrafted, and a hearkening back to earlier, non-mechanized vernacular styles. The Greenes added to this an emphasis on integrating indoors and outdoors, and also referencing nature through the generous use of wood in the aesthetic. Both of these ideas come from traditional Japanese architecture, and the southern California climate lent itself well to such a focus on nature.

Redlands and the San Bernardino Valley Railway Company

The arrival of the CSRR/Santa Fe Railway also stimulated the growth of other nearby communities besides San Bernardino. Among those that indirectly benefitted was the community of Redlands, which was the cultural center of the Inland Empire and itself had a robust citrus industry. On January 12, 1887, just 4 months after the Santa Fe Railway's arrival in San Bernardino, a consortium of Redlands businessmen established the San Bernardino Valley Railway Company (Beattie 2009). Their San Bernardino Valley line is the branch from the San Bernardino Depot to Redlands that is the focus of the proposed Project. With $42,750 they purchased all right-of-way and Redlands Depot grounds (Beattie 2009). By December 31, 1887 the company was consolidated into the California Central Railway Company, which finished the alignment to the town of Mentone, due east/northeast of Redlands (Robertson 1986-c1998:87). Fred T. Perris, the CSRR engineer who supervised its completion through the Cajon Pass, also supervised the construction of this segment. This line, next to which the proposed Project will add a second set of tracks, began operation in 1888—the same year that Redlands was incorporated. On November 7, 1889 the California Central Railway along with the CSRR both went under the operation of the AT&SF Railway, which, now known as BNSF, continues to operate this segment to the present time (Robertson 1986-c1998:237).[5]

The Kite-Shaped Track

Aside from being significant contributor to Redlands' growth and development, this branch is also notable for being a segment of the "Kite-Shaped Track," a popular southern California excursion route at the turn of the century. Named for a figure-8–shaped 19th century horseracing track, Santa Fe Railway's Kite-Shaped Track was a figure-8–shaped 166-mile continuum of preexisting segment across the greater Los Angeles Basin. Began in 1891, the line, which was also called "The Loop," was highly promoted, and was itself a promotional tool for southern California life. The line was marketed as a recreational excursion for both residents and visitors. Much of the line's focus was upon the sensory imagery of the southern California citrus industry and the beautiful natural terrain surrounding it. Additionally, the line served as a means for citrus farmers themselves to market their fruit, and it is credited with stimulating the development of many communities along its path.

To board, tickets were purchased at La Grande Station (1893–1939), the Los Angeles predecessor to Union Station, which had a sidewalk in the shape of the Kite-Shaped Track embedded in its landscaping. The line passed through numerous towns and areas, including Pasadena, the San Gabriel foothills, Riverside, Orange County, Redlands, San Bernardino, and Mentone, which served as the far eastern edge of the route. Aside from Los Angeles, all of the areas were citrus and agriculture communities at that

[5] Though BNSF presently operates light freight on this line, SANBAG has owned the line since 1993.

time. People were encouraged to get off at certain stops for a couple hours to take in given localities, then board back on again. Though the motto of the line was "No Scene Twice Seen," the San Bernardino Depot served as the crux of the figure 8, and was passed twice.

A 1914 *Santa Fe Magazine* article about the Kite-Shaped Track twice discussed the original setting between San Bernardino and Redlands, albeit in slightly contradictory terms. The first write-up states, "The ride from San Bernardino to Redlands is very short, too short in fact for a wealth of scenery. The mountains showed up behind the dark green of the orchards, and as the train sped along they seemed to grow higher and higher every moment….." (Breene 1914:51). But then later in the same article, "From San Bernardino to Redlands is perhaps the most beautiful part of the trip. It lies in the orange belt, and along almost all the distance there is nothing but miles of orange groves, with the fruit in all stages of maturity…..the line of green is unbroken." (Breene 1914:52.) A diminutive scaled 25x35 passenger depot originally built for the line stood at the northwest corner of E Street and the tracks, across the street from the present Greenwoods store (Landis 2008:9). The building, which no longer exists, was constructed in 1888 and was relocated off the property around 1926 to the Santa Fe Depot property (Landis 2008:9).

Before the wide ownership of the automobile in southern California, the Kite-Shaped Track presaged the regional trait of mobility itself as recreation. With the advent of the mass-produced autos beginning in 1915, the Kite-Shaped Track quickly decreased in popularity. By 1917 the excursion had faded into obscurity (Landis 2008:2). The route would be formally discontinued by Santa Fe in 1938. The track alignment between Bernardino and Redlands is all that remains of the Kite Shaped Track's eastern loop (Landis 2008:2).

3.0 METHODOLOGY

ICF staff consulted national, state, and local inventories of architectural and historic resources to determine the location of previously documented historic and architectural resources near the proposed Project.

The following standard sources of information were consulted in the process of compiling this report:

- National Register (http://www.cr.nps.gov/nr).
- California Historical Landmarks (State of California 1996) .
- California Points of Historical Interest (State of California 1992).
- California Register of Historical Resources (California Register).

Staff also conducted archival research to establish a context for resource significance and to identify local historical events, individuals, and development patterns.

Additional resources consulted in the process of compiling this report included:

- ProQuest digital archives for the *Los Angeles Times.*
- Sanborn maps.
- Original tract maps.
- A c. 1930 right-of-way map for the rail right-of-way.
- The Spence Historic Aerials Collection at the UCLA Geology Department.
- Improvement records from San Bernardino County Archives.
- TRW/Experian.
- California History Room at the San Bernardino Library.
- San Bernardino Department of Building and Safety.

A literature and records search was conducted at the San Bernardino Archaeological Information Center (SBAIC) at the San Bernardino County Museum, Redlands on May 21, 2010. The search included a review of all recorded archaeological sites within a 1-mile radius of the project site as well as a review of the on-file cultural resource reports. In addition, records from the California Points of Historical Interest, California Historical Landmarks, the California Register of Historical Resources, the National Register, and the California State Historic Resources Inventory were reviewed. The historic USGS quadrangle maps, Redlands, CA (1899 and 1901) and San Bernardino, CA (1896, 1901) were inspected as well.

3.1 RECORDS SEARCH RESULTS

The results of the records search indicated that 52 surveys have been conducted within a 1-mile radius of the project area and three of these surveys investigated a portion of the project area. Fifty-five cultural resource sites have been recorded in a 1-mile radius of the project site. Of these recorded sites there are five prehistoric archaeological sites, one multi-component archaeological site (prehistoric and historic), and 49 historic sites. Of these recorded sites, the current project route, the former AT&SF Railroad line also known as the “Old Kite Route” is recorded as a historic resource (36-006847). The Santa Fe Railway Passenger and Freight Depot located at the project route’s west end is recorded as an historic resource

(36-017975), is listed in the National Register (01000025), and is a California Point of Historical Interest (No. 53). There are three other recorded historic sites along the project site that are associated with the former AT&SF Railroad. A railroad spur of the former Pacific Electric Railway line (36-006101) crosses the project site, while the site of the former Pacific Electric Substation No. 24 (36-013886) that was demolished sometime between 1991 and 2008 and a segment of the San Bernardino, Arrowhead, and Waterman Railroad—also known as the Harlem Motor Road (36-010820)—are located just north of the project site at E Street and Rialto Avenue. Three National Register properties, one California Historical Landmark property, and 17 California Points of Historical Interest sites have been recorded within a 1-mile radius of the project area.

National Register Sites within a 1-Mile Radius

Santa Fe Railway Passenger and Freight Depot, San Bernardino
National Register #01000025

United States Post Office, San Bernardino
National Register #85000136

San Bernardino County Court House
National Register #97001632

California Historic Landmark within a 1-Mile Radius

Site of Mormon Stockade, 1851
California Historical Landmark #44

California Points of Historical Interest within a 1-Mile Radius

No. 7: National Orange Show Grounds
No. 15: Bella Union Hotel Site
No. 24: Pioneer Cemetery
No. 44: Home of Eternity Cemetery
No. 53: Santa Fe Railway Passenger and Freight Depot at San Bernardino
No. 60: Fred T. Perris House Site
No. 62: Mormon Schools Site
No. 63: Mormon Flour Mill Site
No. 67: Confederate Attack Marker Site
No. 88: Home of Neighborly Service, National Missions of the Presbyterian Church
No. 90: The Andreson Building
No. 100: Sturges Auditorium
No. 102: Heritage House, Judge George E. Otis
No. 103: California Theater
No. 106: St. Bernardine of Sienna Catholic Church
No. 111: Martin Adobe Site
No. 112: Cox-Bradley Adobe Site

Sites Located within the Project APE

Santa Fe Railway Passenger and Freight Depot at San Bernardino (36-017975)

This building was recorded and evaluated in 1999 (Miller and Starzak), is listed in the National Register, and is a California Point of Historical Interest. According to the National Register nomination, the National Register boundary of the Santa Fe Depot is the building and landscaping directly adjacent (see Figure 3-1). According to the site record, the Depot was constructed between 1916 and 1918. It is the sole surviving building associated with AT&SF Railway's Los Angeles Division headquarters. Prior to

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Figure 3-1
1170 West 3rd Street
Santa Fe Railway Passenger and Freight Depot, San Bernardino
National Register Boundary

Santa Fe's purchase of the CSRR in 1884, operational headquarters for the CSRR were located in National City. Once the Santa Fe Railway connected with the former CSRR by completing the 81 miles of track between Barstow and San Bernardino, the Santa Fe elected to move its regional headquarters to a more centralized location. Since the Harvey House expansion between 1921 and 1922, no other major alterations have been made at the Depot other than some windows and doors on the upper floor that were in-filled during the 1960s as part of a facility remodel (Miller and Starzak 1999). The Depot was restored in 2002–2004 and the building was repainted in 2010–2011 (SANBAG 2011).

Old Kite Route (36-006847)

The Old Kite Route is a portion of the BNSF Railway (formerly the AT&SF) that runs from Los Angeles along the foothills to Redlands, and loops back into Los Angeles via the Santa Ana Canyon and the Fullerton Valley. The route was completed in 1892. It was primarily intended to transport citrus fruits to and from packing houses in the area, but it soon became a popular weekend excursion for tourists. In 1892, AT&SF advertised the route to tourists calling it the "Kite Route Trip." The scenic train ride was just over 166 miles long and offered tourists a glimpse of classic southern California images that were commonly featured on postcards. The route included miles of orange groves and never repeated a single mile or view along the way, a unique feature for a scenic train ride at the time. "No scene twice seen on the kite-shaped track" became a popular slogan for the route. By the end of World War II, rail traffic became less popular; trucks became the primary method of transport for citrus packaging houses. Passenger train use also dwindled and eventually disappeared from the "loop." In 1956, the portion between Highland Junction and Del Rosa was closed. In 1967, more tracks were closed toward Patton, and by 1980 the Redlands loop was closed to Mentone. As of 1995, the Redlands area had one branch line train that serviced various industries along the line. The railroad grade's ballast and wood ties have been replaced with concrete (Harper 2008a).

Union Pacific Railroad Spur (36-006101)

This site is the location of a former railroad spur of the Pacific Electric line. The spur was located north of the main tracks and consisted of three tracks—one continuing north and two curved tracks. One of the curved tracks curved to the northeast, and the other curved to the northwest where the Pacific Electric Substation No. 24 (36-013886) used to be located. All three spurs terminated at Rialto Avenue. The tracks were removed in 1951 when all electric lines were removed from San Bernardino lines (Hatheway 1991). The Pacific Electric line merged with the Southern Pacific and later the Union Pacific Railroad lines (Harper 2008b).

3.2 Public Participation

In accordance with 36 Code of Federal Regulations (CFR) §800.4(a)(3), on July 29, 2010, letters were sent to consulting and interested parties who may have knowledge or concerns with historic properties in the area, and to request information regarding any historic buildings, districts, sites, objects, or archeological sites of significance within the project area. The letters were sent to the following recipients:

California Historical Society
678 Mission Street
San Francisco, CA 94105

San Bernardino County Museum
2024 Orange Tree Lane
Redlands, CA 92374

California Preservation Foundation
Cyndi Heitzman, Executive Director
1611 Telegraph Avenue, Suite 820
Oakland, CA 94612

City of San Bernardino Planning Department
385 North Arrowhead Avenue
San Bernardino, CA 92415-0103

Orange Empire Railway Museum
2201 South A Street
Perris, CA 92370

Riverside Historical Society
Attn: Kevin Halloran
P. O. Box 246
Riverside, CA 92502

San Bernardino History & Railroad Museum
1170 W. 3rd Street
San Bernardino, CA 92408

San Bernardino Historical and Pioneer Society
796 N. D Street
San Bernardino, CA 92401-1112

San Bernardino Railroad Historical Society
PO Box 2878
San Bernardino, CA 92406

3.2.1 Responses Received

On August 19, 2010, a message was left by Mike Botemo of the San Bernardino Historical Society. A message was left on the organization's voicemail the following day.

On August 31, 2010, a letter from Thomas Jacobson, President and Chief Executive Officer of the Orange Empire Railway Museum, was received (see Appendix B) and stated: "Orange Empire Railway Museum is in receipt of your letter dated July 29, 2010. As you probably have also been advised, there are several historical artifacts in the area outlined by the project site, including a crossing on Rialto Avenue with the former Pacific Electric San Bernardino line and another crossing leading into the former San Bernardino Pacific Electric Station. The Pacific Electric also crossed the line at E Street and adjacent to the line at E Street was the former San Bernardino Valley Traction Company Car House. If you need any further information, please do not hesitate to contact me at (951) 314-4258."

On August 3, 2010, an email from Glen Icanberry, Director of the San Bernardino History and Railroad Museum was received by Elizabeth Hilton of ICF (see Appendix B). The email stated that there are no railroad buildings left along the portion of the right-of-way associated with the proposed Project.

As of September 1, 2011, no other responses from the above-listed interested parties were received.

Additionally, email correspondence was initiated, primarily for historic context research purposes, with the following individuals and entities:

- Mark Landis, Historian.
- Roger Hatheway, Architectural Historian, Hatheway and Associates.

Phone correspondence occurred between consultants and Valerie Ross, planner at the City of San Bernardino the week of June 14, 2010.

3.3 Native American Consultation

ICF contacted the Native American Heritage Commission (NAHC) and requested a review of the sacred lands files. The NAHC responded on July 29, 2010, stating that a search of their sacred lands database did

not yield any sacred lands or traditional cultural properties within the immediate project area. The NAHC provided a list of eleven Native American contacts.

Letters describing the project area and indicating the project location were sent to the following Native American representatives on August 9, 2010:

- Anne Brierty, Policy/Cultural Resources Department, San Manual Band of Mission Indians.
- Michael Contreras, Cultural Heritage Program Manager, Morongo Band of Mission Indians.
- Sam Dunlap, Chairperson, Gabrielino/Tongva Nation.
- Joseph Hamilton, Chairman, Ramona Band of Cahuilla Mission Indians.
- Paul Macarro, Cultural Coordinator, Pechanga Band of Mission Indians.
- Anthony Morales, Chairperson, Gabrielino/Tongva San Gabriel Band of Mission Indians.
- Joseph Ontiveros, Cultural Resources Department, Soboba Band of Luiseno Indians.
- Pauma & Yuima, Attn EPA, Luiseno Indians.
- James Ramos, Chairperson, San Manual Band of Mission Indians.
- Ernest H. Siva, Tribal Elder, Morongo Band of Mission Indians.
- Goldie Walker, Serrano Nation of Indians.

As of September 1, 2011, no responses have been received from the above-listed Native American entities.

3.4 FIELD SURVEY

An architectural field survey of the resources in the APE was conducted by ICF architectural historians Daniel Paul and Elizabeth Hilton on June 2 and June 23, 2010. A subsequent architectural field survey of the resources in the March 25, 2010, project area map was conducted by ICF architectural historians Daniel Paul and Peter Moruzzi on April 15, 2011. A final architectural field survey of properties included in the May 31, 2011 project area map was conducted by ICF architectural historian Peter Moruzzi on June 23, 2011. Paul, Hilton, and Moruzzi meet the Secretary of the Interior's professional qualifications, under 36 CFR Part 61, as architectural historians. These architectural field surveys evaluated architectural resources within the historic context presented in this technical memorandum. The built environment surveys focused on those areas where construction work is proposed for the new expanded railway and adjacent affected areas.

An archaeological pedestrian survey of the project APE was conducted on May 24, 2010, by ICF archeologist Cate M. Wood. Ms. Wood meets the Secretary of the Interior's professional qualifications, under 36 CFR Part 61, as an archaeologist. One additional field survey of the project APE for the Optional Detention Basin #3 site was conducted by ICF archeologists Karen Crawford and Karolina Chmiel on June 28, 2012. The project area is mostly in a mixed residential, industrial, and commercial setting. The ground surface visibility was poor throughout the APE, limited by development. The railroad grade and areas of residential and commercial development were disturbed with paved sidewalks, paved storm drainage channels, and landscape vegetation. During the survey it was observed that construction activities involving the I-215 Freeway overpass and widening project were taking place within the project area.

Open lots are present in the project APE, both north and south of the rail line between F Street and E Street at the eastern extent of the APE. The block north of the rail line, which may be used as a staging

area, encompasses the remains of the Pacific Electric Substation # 24 (36-013886), including concrete foundations and grade beds for tracks (36-006101.) This substation was built in 1921 and demolished sometime after 1991. The open parcels south of the rail line, which will be developed by the Project for the E Street Rail Platform and Parking Lot, also encompass foundation remains. None of these structures appear on the 1906 Sanborn maps, which refers to the area south of E street at Rialto as "Vacant." Building depicted on Sanborn maps (1906-1950) call out these structures as those of the Engineering Department and Line Department of the Pacific Electric. Demolition and grading has seriously impacted the integrity of these structural remains.

4.0 SURVEY RESULTS

4.1 ARCHITECTURAL RESOURCES

The proposed project area is located in the City of San Bernardino, California. As shown previously in Figures 1-1 and 1-2, the project APE begins along the railway at its western point at the intersection of Pico Avenue and Rialto Avenue, continues to and through the Depot, at the railroad tracks, moving east until the spur is located north of 3rd Street and just east of J Street. Then, the APE follows the railroad tracks south, curving to the east below Rialto Avenue, and paralleling Rialto Avenue to the south. The APE boundary ends at the intersection of D Street and the railroad tracks. (See Figure 1-3.) It is a predominately flat site that contains residential buildings, commercial buildings, industrial buildings, and vacant lots, as well as railroad tracks and two bridges.

The following two properties located within the built environment APE have either already been listed in the National Register or appear eligible for listing in the National Register:

Table 4-1. Properties Included in or Determined Eligible for the National Register and Listed in the California Register

Name	Address/Location	Community	Status
Santa Fe Depot	1170 West 3rd Street	San Bernardino, CA	1S. National Register and California Register listed.
Southern California Gas Company Plant*	155 South G Street	San Bernardino, CA	3S. Appears eligible for National Register 5S3. Listed as local historic resource.

*The National Register boundary of the Southern California Gas Company Plant is its historical parcel boundary (see Figure 4-1).

There are 22 parcels within the APE that contain buildings older than 50 years of age, with construction dates ranging from 1904 to 1955. There is one landscape feature with trees that were originally planted c. 1886. In addition, the AT&SF Railway Kite-Shaped Track is a resource associated with the original train route that began c. 1891. All of these properties are listed in Table 4-2 and have been evaluated as ineligible for National Register listing on Department of Parks and Recreation Historical Resources Inventory Forms (series DPR 523) (Appendix A).

Table 4-2. Properties Determined Ineligible for the National Register

Name/Address/Location	Community	Status
Atchison, Topeka & Santa Fe Railway Depot Tree Grouping, UTM: 11S, 471802.83 E, 3773809.07 N	San Bernardino, CA	6Y. Not eligible for National Register.
AT&SF Kite-Shaped Track	San Bernardino, CA	6Y. Not eligible for National Register.
106 North I Street, Toman's Machine Shop	San Bernardino, CA	6Y. Not eligible for National Register. 5S3. Listed as local historic resource.
271 North K Street	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.
263 North K Street	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.
221–229 North K Street	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.
203 North K Street	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.
111 South I Street	San Bernardino, CA	6Y. Not eligible for National Register. 5S3. Listed as local historic resource.
131 South I Street, Jenco Productions, Inc.	San Bernardino, CA	6Y. Not eligible for National Register. 5S3. Listed as local historic resource.
134 South E Street, Bekins Storage	San Bernardino, CA	6Y. Not eligible for National Register.
170 South E Street	San Bernardino, CA	6Y. Not eligible for National Register. 5S3. Listed as local historic resource.
174 South E Street	San Bernardino, CA	6Y. Not eligible for National Register.
961 West 2nd Street	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.
1056-1066 West 2nd Street	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.

Name/Address/Location	Community	Status
971 West 3rd Street, Valley Linen Supply	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.
981 West 3rd Street, Valley Linen Supply Offices (Allgood Shower Door Company)	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor.
950 West 2nd Street	San Bernardino, CA	6Y. Not eligible for National Register.
777 West Rialto Avenue, Richfield Oil Company Building	San Bernardino, CA	6Y. Not eligible for National Register. 5S3. Listed as local historic resource.
907 West Rialto Avenue	San Bernardino, CA	6Y. Not eligible for National Register. 5B. Listed as local historic resource; district contributor
958 West Rialto Avenue	San Bernardino, CA	6Y. Not eligible for National Register.
123 South G Street	San Bernardino, CA	6Y. Not eligible for National Register. 5S3. Listed as local historic resource.
144 South G Street	San Bernardino, CA	6Y. Not eligible for National Register.

4.2 ARCHAEOLOGICAL RESOURCES

No new archaeological resources were identified within the project area, since visibility was extremely limited. No visual evidence of buried archaeological features was observed during field surveys for the Omnitrans bus facility, parking lot, and Optional Detention Basin #3 sites. None of the previously recorded archaeological resources within the APE are eligible for the National Register. Vacant parcels on the eastern end of the APE encompass the degraded foundation remains of now demolished 20th century structures and railroad grades, previously recorded as sites (36-006101) and (36-013886). No archeological resource remains were identified at the Optional Detention Basin #3 site.

ICF INTERNATIONAL

Figure 4-1
155 South G Street
Southern California Gas Company Plant
National Register Boundary

5.0 ASSESSMENT OF EFFECTS

In this section, the effects of the proposed Project on *historic properties* found within the project APE are evaluated. The National Historic Preservation Act and federal regulations define both the criteria to determine if a cultural resource is a *historic property* as well as the effects and adverse effects on *historic properties.*

5.1 SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

Section 106 requires federal agencies, or those they fund or permit, to consider the effects of their actions on *historic properties*. *Historic properties* are defined by Advisory Council on Historic Preservation (ACHP) regulations (36 CFR Part 800) for implementing Section 106 as follows:

> *Historic property* means any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (National Register or NRHP) maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria [36 CFR Section 800.16(l)].

To determine whether an undertaking/project could affect National Register-eligible properties, cultural resources (including archaeological, historical, and architectural properties) must be inventoried and evaluated for listing in the National Register.

For projects involving a federal agency, cultural resource significance is evaluated in terms of eligibility for listing in the National Register. For a property to be considered for inclusion in the National Register, it must be at least 50 years old and meet the criteria for evaluation set forth in 36 CFR Part 60.4, as follows:

> The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of design, setting, materials, workmanship, feeling, and association and
>
> (a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) that are associated with the lives of persons significant in our past; or
>
> (c) that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) that have yielded, or may be likely to yield, information important in prehistory or history.

If a particular resource meets one of these criteria, it is considered as an eligible *historic property* for listing in the National Register. Among other criteria considerations, a property that has achieved significance within the last 50 years is not considered eligible for inclusion in the National Register unless certain exceptional conditions are met.

Title 36 CFR Part 800 defines effects and adverse effects on *historic properties* as follows:

- **Section 800.9(a)** Criterion of Effect indicates that an undertaking has an effect on an historic property when the undertaking may alter characteristics of the property that may qualify it for inclusion in the National Register. For the purpose of determining effect, alteration of features of a property's location, setting, or use may be relevant depending on a property's significant characteristics.
- **Section 800.9(b)** Criteria of Adverse Effect indicates an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.[6]

There are seven examples of adverse effects identified in the Section 106 regulations that include, but are not limited to:[7]

(i) Physical destruction of or damage to all or part of the property.

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines.

(iii) Removal of the property from its historic location.

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.

(vii) Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

5.2 Assessment of Adverse Effects

5.2.1 No-Build/No-Project Alternative

There is no APE for architectural historic properties or prehistoric or historical archeological resources associated with the No-Build/No-Project Alternative. There would be no construction, operation, or adverse effects.

5.2.2 Downtown San Bernardino Passenger Rail Alternative

Santa Fe Depot

The proposed Project would extend Metrolink service from the existing San Bernardino Metrolink Station/Santa Fe Depot located at 1170 West 3rd Street to proposed new rail platforms near the southwest corner of Rialto Avenue and E Street. An important component of the Project is the proposed construction of an Americans with Disabilities Act (ADA)-compliant overpass that would be constructed at the

[6] 36 CFR Part 800.5
[7] 36 CFR Part 800.5(a)(2)

existing Depot. The proposed overpass would be designed in a Contemporary Mission Revival architectural style. New platforms would also be built north of the Depot to access the additional rail lines. Minor interior and exterior improvements are also proposed for the Depot that would include the following: (1) installation of new window awnings, (2) new exterior and interior way finding signage for SANBAG/SCAG/Whistle Stop Cafe/Museum, (3) a new clock in the lobby, (4) a new sign in the lobby that details the railroad's role in creating time zones, (5) a new portable Metrolink and Amtrak map and brochure case, (6) new bathroom signage and (7) a new monument sign and flagpole to be placed at the Depot entrance.

Assessment of Adverse Effects on the Santa Fe Depot

As stated above in Section 5.1, an adverse effect is found when a project may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.[8]

Below is an assessment of the Depot in light of the seven examples of adverse effects identified in the Section 106 regulations listed in Section 5.1 above.

(i) Physical destruction of or damage to all or part of the property.

The proposed Project would not cause physical destruction or damage to the Depot.

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines.

The proposed Project, including the proposed interior and exterior improvements, would not alter the Depot in any manner inconsistent with the Secretary's Standards.

(iii) Removal of the property from its historic location.

The proposed Project would not remove the Depot from its historic location.

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.

The proposed Project would not change the character of the Depot's use or physical features. A new structure, a pedestrian overcrossing, would be constructed within the property's setting.

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.

The proposed Project includes components that might potentially introduce such visual elements.

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.

The proposed Project would not cause the Depot's deterioration; it would continue to be used as a depot.

[8] 36 CFR Part 800.5

(vii) Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

The property is not under federal control.

The Santa Fe Depot is listed on the National Register and, therefore, is considered an important historic property. The distinctive characteristics of the Depot that qualify it for the National Register include its history as an important element of the Santa Fe Railway system and its association with the economic development of San Bernardino and the Inland Empire. In addition, the overall massing and form, fenestration, Mission Revival–style parapets, red tiled roof, and domed towers are distinctive physical characteristics that qualify it for the National Register.

The proposed Project would not directly or indirectly alter the Depot's distinctive physical or historical characteristics, nor would it alter the Depot's integrity of location, design, materials, workmanship, feeling, or association.

The proposed Project and its various alternatives all include the following proposed interior and exterior improvements for the Depot including: (1) installation of new window awnings, (2) new exterior and interior wayfinding signage for bathrooms and SANBAG/SCAG/Whistle Stop Cafe/Museum, (3) a new clock in the lobby, (4) a new sign in the lobby that details the railroad's role in creating time zones, and (5) a new monument sign & flagpole to be placed at the Depot entrance.

Using the Secretary of the Interior's Standards for Rehabilitation, three of the standards directly apply to the proposed improvements:

- **Standard 6**. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
- **Standard 9.** New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
- **Standard 10.** New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

<u>Installation of new awnings.</u> In meeting the Secretary of the Interior's Standards for Rehabilitation as related to the replacement of missing features such as window awnings, a historic photograph of the interior of the Depot's Harvey House Restaurant was obtained. The photograph confirms the existence of exterior awnings that sheltered the large windows at the east end of the restaurant (Appendix C, Figure 1). Based on this photograph, several awning designs were proposed for the ground floor of the east elevation and first and second stories of the south elevation (Appendix C, Figures 2 and 3). All three of these designs appear to be compatible with the historic materials, features, size, scale, and proportion of the original. In addition, the new awnings, if removed in the future, would leave the essential form and integrity of the Depot and its environment unimpaired.

<u>New exterior and interior wayfinding signage for bathrooms and SANBAG/SCAG/Whistle Stop Cafe/Museum.</u> As related to size, typeface, or supporting metal hardware (where applicable), the proposed wayfinding signage is not based on specific documentary evidence, which was apparently

unavailable following a search for such material, photographic or otherwise. Nonetheless, as indicated in the various photographic simulations and elevations (Appendix C, Figures 4, 5, 6, and 7), it appears that the proposed designs are consistent with the Secretary of the Interior's Standards for Rehabilitation in terms of compatibility with historic materials, features, size, scale, and reversibility.

New clock in the lobby. The design of the proposed clock is not based on specific documentary evidence, which was apparently unavailable following a search for relevant historic photographs. Nonetheless, as indicated in the photographic simulation (Appendix C, Figure 8), it appears that the proposed clock design is consistent with the Secretary of the Interior's Standards for Rehabilitation in terms of compatibility with historic materials, features, size, scale, and reversibility.

New sign in the lobby that details the railroad's role in creating time zones. Similar to the wayfinding signage, the proposed lobby sign recounting the history of time zones and the railroad (Appendix C, Figure 9) is not based on specific documentary evidence. In this case, the information and display is contemporary. As indicated in the photographic simulation (Appendix C, Figure 10), it appears that the proposed design and its placement adjacent to the double doors along the east elevation of the main lobby is consistent with the Secretary of the Interior's Standards for Rehabilitation in terms of compatibility with historic materials, features, size, scale, and reversibility.

New monument sign and flagpole to be placed at the Depot entrance. The proposed exterior entrance monument sign (Appendix C, Figure 11) is not based on documentary evidence because it appears that such a sign did not originally exist at the Depot. However, the proposed design and its placement at the Depot entrance appears to be consistent with the Secretary of the Interior's Standards for Rehabilitation in terms of compatibility with historic materials, features, size, scale, and reversibility. For similar reasons, the design and placement of the proposed flagpole (Appendix C, Figure 12) appears consistent with the standards.

As related to the proposed overpass, because it would not physically touch the Depot, the new construction, if removed in the future, would not impair the essential form and integrity of the historic property and its environment. However, there is the potential that the proposed Project would introduce a visual element (the overpass) that might indirectly diminish the setting of the Depot.

The Downtown San Bernardino Passenger Rail Project Santa Fe Depot Passenger Egress Alternatives Report, October 2010 depicts the proposed overpass in visual simulations as viewed from three vantage points (Figures 5-1, 5-2, and 5-3).

Figure 5-1. Overpass Alternative (Proposed Project): Contemporary Mission Revival Style, Looking East

Figure 5-1 depicts a southeast view toward the Depot that appears to be from the raised vantage point of the nearby vehicular bridge west of the Depot. From this perspective, the south half of the Depot's west elevation is visible, as are the building's overall massing and form, fenestration, Mission Revival–style parapets, red tiled roof, and domed towers. However, the Depot's north (track-facing) elevation and the north end of the west elevation are obscured from view.

Figure 5-2 represents the eye-level perspective of a passenger standing on the east end of the north rail platform looking west toward the Depot. From this vantage point, the Depot's east and north elevations are fully visible with the overpass in the far distance.

Figure 5-2. Overpass Alternative (Proposed Project): Contemporary Mission Revival Style, Looking West

Figure 5-3. Overpass Alternative (Proposed Project): Contemporary Mission Revival Style, Close-Up Looking East

The perspective of Figure 5-3 is at eye-level as seen by a passenger standing on the west end of the north rail platform looking east toward the Depot. From this view, the overpass's south elevator/stair tower would sit prominently three bays wide and three stories tall near the Depot's west elevation. The overpass bridge would cross the south railroad tracks, connecting to a 3-story north tower that sits on the north rail platform. From this perspective, the overpass' south tower would block the view of the north half of the Depot's west elevation, including some of its fenestration and parts of the roof and north parapet. In addition, the visual simulation suggests that the overpass' south tower would be near the Depot's west elevation, potentially blocking views. The overpass bridge itself would obscure views of the Depot's north elevation, including its domed towers.

The historic setting of the Santa Fe Depot is that of a freestanding building with substantial open space adjacent to its various elevations that affords visibility from all directions. Such visibility is important to appreciating the significance of the property. Indeed, the proposed Project would allow full visibility of the Depot's south, east, and north elevations and the south half of the west elevation when approaching the property from these directions. However, when viewed solely from the perspective of a passenger standing on the west end of the rail platform looking east, as shown in Figure 5-3, the north elevation and portions of the west elevation would be obscured by the proposed overpass and the integrity of the Depot's historic setting would be somewhat diminished. Yet, in applying the criteria associated with 36 CFR Part 800.5(a)(1) and (2), the level of diminished integrity of setting arising from obscured views, as seen by a passenger standing on the west end of the rail platforms looking east toward the Depot, would not rise to a level of significance to qualify as an adverse effect.

As it relates to the closure of 3rd Street that would occur as a component of the proposed Project, there would be no effect on the Santa Fe Depot because of the substantial distance between the Depot and K Street (approximately 550 feet from the Depot's east elevation) and the Depot and the 3rd Street closure (approximately 800 feet from the Depot's east elevation). The distances are such that there would be no effect on any aspect of the Depot's physical or historical integrity. Therefore, the proposed Project would have no effect on the significance of the historic resource.

Southern California Gas Company Plant

The proposed Project would use a very small part of the north portion of a large parcel that contains the Southern California Gas Company Plant at 155 South G Street. The southwest portion of the proposed E Street Rail Platform would encroach up to 73 feet onto the northeast corner of the gas company plant parcel that is currently used for employee parking.

As related to the closure of 3rd Street that would occur as a component of this Project, there would be no effect on the Southern California Gas Company Plant because of the substantial distance between the plant and the 3rd Street Closure/K Street (approximately .61 miles from the plant). The distance is such that there would be no effect on any aspect of the plant's physical or historical integrity. Therefore, the proposed Project would have no effect on the significance of the historic resource.

Assessment of Adverse Effects on Southern California Gas Company Plant

As noted above in Section 5.1, an adverse effect is found when a project may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.[9] The historic Southern California Gas Company buildings are located substantially south of the proposed encroachment on the northeast corner of the property's parking lot. Given the scope of the proposed Project, it does not appear that such an

[9] 36 CFR Part 800.5

encroachment would directly or indirectly alter the buildings' distinctive physical or historical characteristics, nor would it alter their integrity of location, design, materials, workmanship, feeling, or association. Therefore, the proposed Project would have no effect on the significance of the historic resource.

Archaeological Resources

No new archaeological resources were identified within the project APE during survey, and none of the previously recorded archaeological resources within the APE are eligible for the National Register. No visual evidence of buried archaeological features was observed during field surveys for the Omnitrans bus facility, parking lot, and Optional Detention Basin #3 sites. Therefore, there no known archaeological resources within the APE that meet the criteria for *historic properties*.

In terms of prehistoric archaeology, the presence or absence of water is a crucial predictor of site location in southern California. Prehistoric camps or villages are usually are located adjacent to permanent water sources, often at springs or along rivers. The project APE is located on an alluvial fan, near the junction of Lytle Creek and Warm Creek, two moderately substantial streams that flow from the nearby mountains. Prehistorically, these intermittent streams probably supported riparian vegetation which would have attracted Native Americans of plant products or for the hunting of game. However, the project area is at some distance from these small flows, and it is unlikely that project APE was attractive to Native American occupation and use, being a dry, open alluvial surface. Therefore, the potential for the Project APE to yield buried prehistoric archaeological resources is considered to be low.

In terms of historic period archaeological resources, the APE is urbanized, occupied by structures and roads built primarily in the 20th century. Sanborn fire insurance maps from 1906 depict for the Project area as partially occupied by scattered buildings along the streets and AT&SF railroad line. Approximately one third of the lots adjacent to the project APE are depicted as occupied by buildings on the 1906 Sanborn maps; the remainder are open lots, or what the Sanborn maps label "Vacant." This depicts what was a typical pattern in expanding towns, indicating that the area was being developed at the time the fire insurance maps were first prepared. This indicates that the area of San Bernardino being developed, which encompasses the project APE, was open land prior to about 1906. The 1896 and 1901 USGS maps depict this area as open land with the railroad lines and a few main streets present.

Because the rail corridor was developed in the early 20th century, some hollow fill historic features such as privy pits (a few appear to be depicted on the Sanborn maps) or trash deposits may exist within the Project APE. However, as the City of San Bernardino likely developed modern trash and sewer disposal at about the same time, this potential is considered to be low.

The proposed Project would require a significant amount of ground disturbance for construction of the Omnitrans bus facility at the intersection of Rialto Avenue and E Street as well as at the parking lot and Optional Detention Basin #3 sites. Therefore, ground-disturbing activity for the proposed Project could disturb, damage, or degrade unknown, intact, and potentially significant archaeological resources, although this potential is considered to be low. If these impacts were unmitigated, this could result in an adverse effect. To mitigate this potential adverse effect, preparation and implementation of a CRMMP in consultation with the SHPO is recommended prior to construction to ensure appropriate mitigation of any unanticipated discoveries. Additionally, this CRMMP will define areas requiring archaeological monitoring by a qualified archaeologist during ground-disturbing construction-related activities.

In general, this plan will specify that if additional cultural materials (prehistoric or historic artifacts) are encountered during construction, work should stop in the vicinity of the find until a qualified archaeologist can assess the material and recommend further action if necessary. Treatment measures

typically include development of avoidance strategies, capping with fill material, or mitigation of impacts through data recovery programs, such as excavation or detailed documentation, or other mitigation measures, following standard archaeological procedures. With these measures, the proposed Project would be unlikely to adversely affect archaeological resources.

No documented cemeteries or burial sites occur within the APE. If human remains are exposed during construction, State Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code (PRC) 5097.98. Construction must halt in the area of the discovery of human remains, the area must be protected, and consultation and treatment would occur as prescribed by law. In this context, no adverse effects would occur to known human remains.

5.2.3 Pedestrian Overpass Design Options 1A and 1B

Santa Fe Depot

Pedestrian Overpass Design Options 1A and 1B are being considered to allow efficient use of the Metrolink system during daily use, as well as to aid in the orderly, safe egress of platforms in the event of station emergencies. These alternatives are situated just west of the Depot building to minimize visual impacts to the Depot, to maximize circulation space around the new structures, and to maintain fire truck access to the track side of the Depot.

Pedestrian Overpass Design Options 1A and 1B may include open-to-air steel structure variations for a pedestrian overpass. Though not in the style of the Depot, the truss structure and exposed, painted steel would reflect the ingenuity and robustness of rail construction and American rail networks. The alternatives would have one stair entering and exiting a protected and covered elevated passageway. All other railway and station improvements proposed as part of the Project would remain the same.

The prominent differences between Pedestrian Overpass Design Options 1A and 1B are the railing design and elevator enclosure design. Design Option 1A contains glass railings and translucent glass elevator enclosures. Design Option 1B presents a more industrial aesthetic with metal bar railings and minimized glass elevator enclosure. Both design options would have a security booth at the base of the stair tower on Platform A. Massing would be reduced in comparison with the pedestrian overpass bridge design proposed as part of the Project. Pedestrian Overpass Design Options 1A and 1B would achieve the goals and objectives of the proposed Project.

Assessment of Adverse Effects

As with the proposed Project, the proposed Pedestrian Overpass Design Options 1A and 1B would not directly or indirectly alter the Depot's distinctive physical or historical characteristics, nor would it alter the Depot's integrity of location, design, materials, workmanship, feeling, or association. Further, because the proposed overpass would not physically touch the Depot, the new construction, if removed in the future, would not impair the essential form and integrity of the historic property and its environment. However, there is the potential that these proposed design options would introduce a visual element (the overpass) that might indirectly diminish the setting of the Depot.

The Downtown San Bernardino Passenger Rail Project Santa Fe Depot Passenger Egress Alternatives Report, dated October 2010, depicts the proposed Pedestrian Overpass Design Options 1A and 1B in visual simulations as viewed from three vantage points (Figures 5-4, 5-5, and 5-6 for Design Option 1A and Figures 5-7, 5-8, and 5-9 for Design Option 1B). These vantage points are identical to those discussed above for the Downtown San Bernardino Passenger Rail Alternative (Figures 5-1, 5-2, and 5-3).

Figure 5-4. Overpass Design Option 1A:
Contemporary Open-to-Air Structure, Looking East

Figure 5-5. Overpass Design Option 1A:
Contemporary Open-to-Air Structure, Looking West

Figure 5-6. Overpass Design Option 1A:
Contemporary Open-to-Air Structure, Close-Up Looking East

Figure 5-7. Overpass Design Option 1B:
Contemporary Open-to-Air Structure, Looking East

Figure 5-8. Overpass Design Option 1B:
Contemporary Open-to-Air Structure, Looking West

Figure 5-9. Overpass Design Option 1B:
Contemporary Open-to-Air Structure, Close-Up Looking East

Figures 5-4 (Design Option 1A) and 5-7 (Design Option 1B) depict a southeast view toward the Depot that appears to be from the raised vantage point of the nearby vehicular bridge west of the Depot. From this perspective, the south half of the Depot's west elevation is visible, as is the building's overall massing and form, fenestration, Mission Revival–style parapets, red tiled roof, and domed towers.

However, in contrast with the proposed Project, as represented in Figure 5-1, the blocky mass of the north and south overpass towers is substantially broken up by removing the outer skin surrounding the staircases. Specifically, the Depot's north (track-facing) elevation and the north end of the west elevation are much more visible under Design Options 1A and 1B.

When comparing Design Options 1A and 1B, the latter achieves a more industrial aesthetic with metal bar railings and minimized glass elevator enclosure. The result is that more of the Depot's north and west elevations are visible under Design Option 1B than under Design Option 1A.

The same is true for the overpass itself where, under Design Options 1A and 1B, the solid railing depicted in Figure 5-1 is replaced by a perforated railing. Together, these designs would result in an open-to-air structure that is far less dense. As a result, Design Option 1A provides more visibility to the Santa Fe Depot as seen from this perspective than the proposed Project. Design Option 1B results in still greater visibility to the Depot than Design Option 1A.

Just as with Figure 5-2, Figures 5-5 (Design Option 1A) and 5-8 (Design Option 1B) represent the eye-level perspective of a passenger standing on the east end of Platform A looking west toward the Depot. From this vantage point, the Depot's east and north elevations are fully visible with the overpass in the far distance under all three pedestrian overpass design options.

The perspective of Figures 5-6 (Design Option 1A) and 5-9 (Design Option 1B) are eye-level, as seen by a passenger standing on the west end of Platform A looking east towards the Depot. When comparing Figures 5-6 and 5-9 with Figure 5-3, the overpass' south elevator/stair tower is noticeably less prominent.

Comparing Design Option 1A with the proposed Project, at least two more of the Depot's first- and second-story windows are visible because the elevator/stair tower does not extend as far south. Similarly, the open-to-air design of the south tower and overpass under Design Option 1A reveals substantially more of the Depot's north and west elevations, and more of the roof and north parapet.

Comparing Design Option 1A with 1B, still greater visibility of the Depot is achieved under Design Option 1B via increased transparency of the tower and stairs. As a result, almost all of the fenestration along the Depot's west elevation and more of the Depot's north elevation become visible under Design Option 1B.

In summary, the historic setting of the Santa Fe Depot is that of a freestanding building with substantial open space adjacent to its various elevations that affords visibility from all directions. Such visibility is important to appreciating the significance of the property. Design Options 1A and 1B would allow full visibility of the Depot's south, east, and north elevations and the south half of the west elevation when approaching the property from these directions. However, in comparison with the proposed Project when viewed from the perspective of a passenger standing on the west end of the rail platform looking east, as in Figures 5-6 and 5-9, substantially more of the Depot's north and west elevations are visible under Design Option 1A, and more still under Design Option 1B.

In applying the criteria associated with 36 CFR Part 800.5(a)(1) and (2), the loss of integrity under Design Option 1A would be substantially less than with the proposed Project, resulting in no adverse effect. Under Design Option 1B, the loss of integrity is minimized even further than under Design Option 1A with the result of no adverse effect.

Southern California Gas Company Plant

Under Pedestrian Overpass Design Options 1A and 1B, the effects associated with the Southern California Gas Company Plant would be the same as those for the proposed Project. Therefore, the proposed Design Options 1A and 1B would have no effect on the significance of the historic resource.

Archaeological Resources

As described above, construction-related ground-disturbing activities, including the construction of the Omnitrans bus facility, could result in the destruction of unknown significant archaeological resources, which would result in an adverse effect. Design Options 1A and 1B would have the same impact and effect on archaeological resources as the proposed Project. Preparation and implementation of a CRMMP would mitigate this potential adverse effect.

5.2.4 Pedestrian Underpass Design Option 2

Santa Fe Depot

The Pedestrian Underpass Design Option 2 is being considered to minimize potential visual impacts that could detract from the aesthetic value of the historic Depot structure. The Pedestrian Underpass Design Option 2 would serve to both protect the welfare of pedestrians and to facilitate efficient operation of the Metrolink and Amtrak stations housed at the Depot. The Pedestrian Underpass Design Option 2 would allow efficient use of the Metrolink system during daily use, as well as aid in the orderly, safe egress of platforms in the event of station emergencies.

This option would result in less constriction to the train platform at the stair locations. The Pedestrian Underpass Design Option 2 stairs can be minimized to 8 feet wide, or approximately 9 feet with curb. This would leave a larger clearance, as compared to Pedestrian Overpass Design Options 1A and 1B, of 7 feet to the Metrolink platform edge and 10 feet to the platform edge. The Pedestrian Underpass Design Option 2 would have two stairwells entering the passageway at Platform A and a combined stair exiting just west of the Depot. See Figures 5-10, 5-11, and 5-12. The Pedestrian Underpass Design Option would have a stand-alone security booth situated along Platform A. All other railway and station improvements proposed as part of the Project would remain the same. The Pedestrian Underpass Design Option 32 would achieve the goals and objectives of the proposed Project.

Assessment of Adverse Effects

As with the proposed Project and Pedestrian Overpass Design Options 1A and 1B, the Pedestrian Underpass Design Option 2 would not directly or indirectly alter the Depot's distinctive physical or historical characteristics, nor would it alter the Depot's integrity of location, design, materials, workmanship, feeling, or association. However, in contrast with the other design option, the Pedestrian Underpass Design Option 2 would not directly or indirectly diminish the setting of the Depot because the introduced visual elements would be small above-ground shelters covering the entrances to the stairwells (one on each end) descending into the underground passageway.

Specifically, the shelter to be constructed just west of the Depot would be approximately 51 feet high with a north-south width of 50 feet, and an east-west width of up to 20 feet. Its minimal overall mass would be such that there would be no substantive impediment to viewing the Depot's distinctive physical characteristics from any direction. As a result, there would be no adverse effect on the historic resource.

The proposed shelter/security booth on Platform A would be up to 10 feet in height, less than 13 feet in length, and less than 4 feet in width. For the same reasons as noted above, the proposed shelter/security booth would result in no substantive impediment to viewing the Depot's distinctive physical characteristics from any direction. Similarly, there would be no adverse effect on the historic resource.

Figure 5-10. Underpass Design Option 2: Contemporary Mission Revival Style, Looking East

Figure 5-11. Underpass Design Option 2: Contemporary Mission Revival Style, Looking West

Figure 5-12. Underpass Design Option 2: Contemporary Mission Revival Style, Looking East

Southern California Gas Company Plant

Under the Pedestrian Underpass Design Option 2, the effects associated with the Southern California Gas Company Plant would be the same as those for the proposed Project. Therefore, the proposed Pedestrian Underpass Design Option 2 would have no effect on the significance of the historic resource.

Archaeological Resources

Under the Pedestrian Underpass Design Option 2, there would be a slightly greater potential effect on archaeological resources. The greater extent of ground disturbance associated with the Pedestrian Underpass Design Option 2 increases the potential for destruction of as yet unknown significant archaeological resources. Preparation and implementation of a CRMMP would mitigate this potential adverse effect.

5.2.5 3rd Street Open Design Option 3

The 3rd Street Open Design Option 3 is being considered to minimize potential disruptions to existing traffic circulation patterns and corresponding safety concerns. This design option would result in upgrades to the existing at-grade crossing between J Street and I Street. Vehicular and pedestrian traffic along 3rd Street between the J Street intersection and North I Street intersection would remain.

The 3rd Street Open Design Option 3 would require the following infrastructure improvements:

- 3rd Street would be open between J Street and the rail line, and the existing grade crossing would remain.
- The existing at-grade crossing would be redesigned in accordance with the latest SCRRA *Highway Grade Crossing Manual* guidelines.

- The street improvements at the intersection of Rialto Avenue and I Street would be the same as those for the proposed Project.
- K Street would not be widened on the east side as proposed for the proposed Project, and properties along K Street would not be affected.

With 3rd Street open at the grade crossing, traffic using 3rd Street to access the Depot or Mount Vernon Avenue (via West 2nd Street) would not be rerouted to access the Depot using West 2nd Street. The 3rd Street Open Design Option 3 would achieve the goals and objectives of the proposed Project.

Santa Fe Depot

The 3rd Street Open Design Option 3 would have no effect on the Depot because there would be no change as compared to the proposed Project. As a result, there would be no difference in effect than of that resulting from the Downtown San Bernardino Passenger Rail Alternative on any aspect of the Depot's physical or historical integrity. Therefore, the proposed 3rd Street Open Design Option 3 would have no effect on the significance of the historic resource.

Southern California Gas Company Plant

The 3rd Street Open Design Option 3 would have no effect on the Southern California Gas Company Plant because there would be no change as compared to the proposed Project. As a result, the effects associated with the Southern California Gas Company Plant's physical or historical integrity would be the same as those for the proposed Project. Therefore, the proposed 3rd Street Open Design Option 3 would have no effect on the significance of the historic resource.

Archaeological Resources

The 3rd Street Open Design Option 3 has the least potential to have an adverse effect on archaeological resources. The lesser extent of ground disturbance associated with this alternative and use of a smaller area of the APE decreases the potential for destruction of as yet unknown significant archaeological resources. However, preparation and implementation of a CRMMP would still be recommended to mitigate any potential adverse effects.

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Appendix A
DPR 523 Forms

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer Peter Moruzzi Date _____

*** Resource Name or #:** AT & SF Kite Shaped Track

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address _____ **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Originally part of the network of tracks developed by the Atchison Topeka and Santa Fe Railroad, the segment known as the "Kite Shaped Track" consisted of a 166-mile continuum of railroad track arranged in a rough figure-eight pattern. The Kite Shaped Track route traveled across the greater Los Angeles basin with its crossing point in San Bernardino. It was officially in operation from 1891 until 1938. Although no longer identified as the Kite Shaped Track, a portion of the original eastern route between San Bernardino and Redlands is located within the boundaries of the APE. While the location of the Kite Shaped Track within the APE is the same as it was 100 years ago, the integrity of the route's design, workmanship, and materials has been compromised by ongoing routine maintenance that includes periodic replacement of original track and associated materials as necessary. Railroad ties are now concrete, which replaced wood ties. In addition, the economic development of the area on either side of the route has negatively affected integrity of setting and the feeling of the mixed residential and agricultural region that it once was during the route's heyday. Further, the association with a popular tourist attraction has been lost due to the cessation of passenger service along the route. As a result, the overall integrity of the railroad segment has been substantially degraded.

*** P3b. Resource Attributes:** (List attributes and codes) HP39 Other

*** P4. Resources Present:** ☐ Building ☑ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
Portion of Kite-shaped track, 3/25/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1891 circa

*** P7. Owner and Address:**
BNSF

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/23/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

* NRHP Status Code 6Y

* Resource Name or #: AT & SF Kite Shaped Track

B1. Historic Name: AT&SF Kite Shaped Track

B2. Common Name _____

B3. Original Use: Railroad track B4. Present Use: Railroad track

* B5. Architectural Style: N/A

* B6. Construction History: (Construction date, alterations, and date of alterations.)
AT&SF completed kite shaped track route in 1891.

* B7. Moved? ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

* B8. Related Features:

B9a. Architect: N/A b. Builder: Atchison Topeka & Santa Fe Railroad

* B10. Significance: Them Transportation Area San Bernardino
Period of Significance 1891-1938 Property Type Railroad Track Applicable Criteria N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The "Kite Shaped Track" was a popular Southern California excursion route at the turn of the last century. Named for a figure-8 shaped 19th century horseracing track, the Atchison, Topeka & Santa Fe's Kite Shaped Track was a similarly figure-8 shaped 166-mile continuum across the greater Los Angeles basin. The line's focus was the idealized imagery of Southern California's citrus industry and the beautiful natural terrain surrounding it. Began in 1891, the line, which was also called "The Loop," was highly promoted by the railroad to increase passenger traffic of residents and tourists. It also served as a powerful promotional tool for the Southern California lifestyle.

To board, tickets were purchased at AT&SF's La Grande Station in Los Angeles (1893-1939). The line passed through numerous towns and areas including Pasadena, the San Gabriel foothills, Riverside, Orange County, Redlands, San Bernardino, and Mentone, which served as the far eastern edge of the Route. Aside from Los Angeles itself, all of the areas were citrus and agriculture communities at that time. People were encouraged to disembark at certain stops for a couple of hours to soak in the local color. Though the motto of the line was "No Scene Twice Seen," the San Bernardino Depot served as the crux of the figure 8, and was passed twice.
(continued on page 3)

B11. Additional Resource Attributes: (List attributes and codes): _____

* B12. References:
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
Robertson, Donald B. "Encyclopedia of Western Railroad History," Caldwell, Idaho: Caxtox. 1986.

B13. Remarks:

(Sketch map with north arrow required.)

* B14. Evaluator: Peter Moruzzi
Date of Evaluation: 3/23/2011

(This space reserved for official comments.)

B10. Significance (continued).

A 1914 Santa Fe Magazine article about the Kite Shaped line twice discussed the original setting between San Bernardino and Redlands, albeit in slightly contradictory terms. The first states, “The ride from San Bernardino to Redlands is very short, too short in fact for a wealth of scenery. The mountains showed up behind the dark green of the orchards, and as the train sped along they seemed to grow higher and higher every moment…..” But then later in the same article, “From San Bernardino to Redlands is perhaps the most beautiful part of the trip. It lies in the orange belt, and along almost all the distance there is nothing but miles of orange groves, with the fruit in all stages of maturity…..the line of green is unbroken.” A diminutive scaled 25'x35' passenger depot originally built for the line stood at the northwest corner of E street and the tracks. The building, which no longer exists, was constructed in 1888 and was relocated off the property around 1926 to the Santa Fe Depot property.

The Kite Shaped Track presaged the regional trait of mobility itself as recreation. With the advent of the mass produced automobile, the Kite Shaped Track quickly decreased in popularity. By 1917 the excursion had faded into obscurity. The route would be formally discontinued by Santa Fe in 1938. The track alignment between San Bernardino and Redlands is all that remains of the Kite Shaped Track’s eastern loop.

Due to substantial degradation of the area's integrity of setting, feeling and association since the line was discontinued in1938, the portion of the Kite Shaped Track that corresponds with the route of Downtown San Bernardino Passenger Rail Project does not meet the requirements for listing in the National Register under Criterion A for historic associations. In addition, under National Register Criterion B, current research did not reveal information suggesting that a specific historic personage was directly associated with the Kite Shaped Track, particularly the portion located within the boundaries of the APE. Finally, due to the loss of integrity arising from the replacement of the original track, wood ties, and other related materials associated with the Kite Shaped Track, integrity of design, workmanship, and materials has been substantially compromised. Therefore, the requirements for designation under National Register Criterion C have not been met.

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** AT & SF Railroad Depot Tree Grouping

P1. Other Identifier: AT & SF San Bernardino Depot Railroad Park

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address _____ **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-231-11-0000

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The Santa Depot Tree Grouping consists of 19 mature Washingtonia robusta, Washingtonia filifera, and Phoenix canariensis palm trees in addition to one bottle tree (Brachychiton populneus). The trees are located on a 400' long sliver of property running parallel to 3rd street, roughly 850' northeast of the Depot building. The sliver is 40 feet wide, and is bounded by the arcing tracks of the BNSF Redlands Subdivision ROW. 10 of the 19 Palm Trees, subspecies Washingtonia robusta, are 75 to 100 feet tall. These taller trees are located at the eastern portion of the sliver. The shorter Washingtonia filifera variety is predominately located at the western portion of the sliver, as is the sole Bottle tree. The two Phoenix canariensis are located near the middle of the grouping. Additional crated Washingtonia filfera trees are present, and these appear to be recently relocated to the property. Beneath the trees are smaller specimens that are young and not from the historic period (1885-1916). The trees are arranged in an irregular line, and no other landscaping is present. A metal, mesh fence separates the grouping from 3rd street.

*** P3b. Resource Attributes:** (List attributes and codes) HP29 Landscape architecture

*** P4. Resources Present:** ☐ Building ☐ Structure ☐ Object ☑ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
View north/northwest

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1886-1916

*** P7. Owner and Address:**
SANBAG
1170 W. 3rd Street, 2nd Floor
San Bernardino, CA 92410-1715

*** P8. Recorded by:** (Name, affiliation, address)
Daniel Paul
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/30/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

*** NRHP Status Code** 6Y

*** Resource Name or #:** AT & SF Railroad Depot Tree Grouping

B1. Historic Name: AT & SF San Bernardino Depot Railroad Park

B2. Common Name AT & SF San Bernardino Depot Railroad Park

B3. Original Use: Park B4. Present Use: Park

*** B5. Architectural Style:** N/A

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

The trees were planted circa 1886 with numerous alterations and removal due to later development.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: N/A

*** B10. Significance:** Them Railroad Architecture and Landscape Area San Bernardino

Period of Significance 1886-1916 Property Type Landscape Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Based upon early aerial imagery, postcards, and Sanborn Fire Insurance Maps, the Atchison, Topeka & Santa Fe Railroad Depot Tree Grouping appears to have originally been a park dating from c. 1886, the year that a pre-existing depot, which burned in 1915, first opened. This original depot was located east of the present one, and was nearly adjacent to the tree grouping. The Washingtonia Robusta palm trees in the goruping are nearly 100 feet tall, and appear to date from the historic period (c.1886-1915). An early Sanborn Fire Insurance Map reveals a "R.R. Park" at nearly the present location (the Sanborn image cuts off at the exact spot), and aerial imagery confirms that the present grouping was extant in 1926. Such parks and landscape features contributed to the excursion and recreational aspects of train travel in Southern California at the end of the 19th century. Travelers were encouraged to stop at various train destinations for the purpose of strolling and taking in the sights of a given locale. This was particularly true of the Kite-Shaped track alignment: a 166-mile figure 8 across Southern California of which the San Bernardino Dept was the crux. For what was a highly significant stop along the Kite Shaped Route excursion, this park likely served as the landscaped strolling grounds, though it predates the route itself. Palm specimens of various types grew in the region's warm, Mediterranean climate, and were seen as novel and exotic unlike those of the Midwestern and Eastern hometowns of Southern California's many visitors at that time. At present the boundaries of the original park have been severely altered, the majority of its trees removed. The portion of the Railroad Park originally east of the BNSF Redlands Branch is now completely redeveloped.

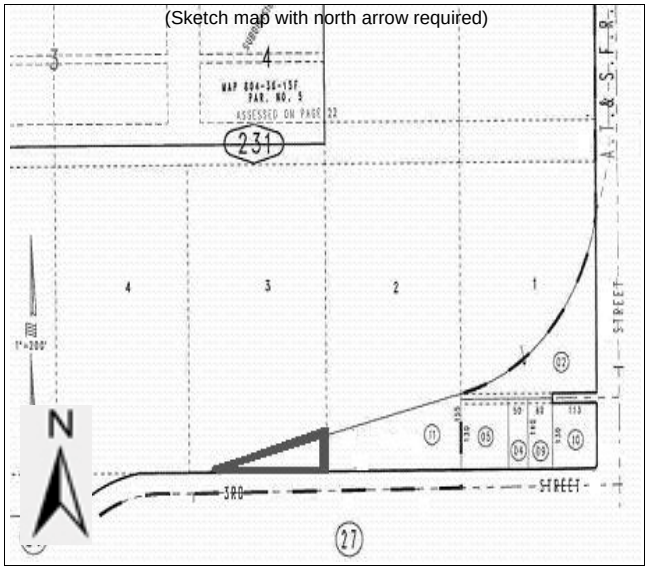
(See continuation sheet.)

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

UCLA Geography Air Photo Archives: 1926, 1933. Postcard image c. 1900, Sanborn Maps.

(Sketch map with north arrow required)



B13. Remarks:

*** B14. Evaluator:** Daniel Paul

Date of Evaluation: 3/30/2011

(This space reserved for official comments.)

B10. Significance, continued:

Although the grouping appears to be very early, because of numerous alterations and tree removal, the grouping does not adequately represent the densely landscaped recreational park it was once part of, and appears ineligible for the National Register of Historic Places under Criterion C. Likewise the grouping does not possess the integrity to convey the broad social pattern of regional railroad-related recreation, and is therefore ineligible for National Register Criterion A. Research yielded no known persons of historic significance are associated with the Park, and the resource appears ineligible for National Register Criterion B. This evaluation is for Section 106 purposes, and the Atchison, Topeka & Santa Fe Railroad Depot Tree Grouping was not evaluated for California Register or Municipal Listing.

CONTINUATION SHEET

Primary #
HR #
Trinomial

Page 4 **of** 4 *** Resource Name or #:** (Assigned by recorder AT & SF Railroad Depot Tree Grouping

*** Recorded by:** Daniel Paul *** Date:** 3/30/2011

☑ **Continuation** ☐ **Update**

c.1900 postcard of previous depot with park on right.

1933 aerial image. Park on left with trees. (UCLA archives)

1926 aerial image. Park at left of building (UCLA archive)

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5S3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 106 North I Street

P1. Other Identifier: Toman's Machine Shop

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 106 N I St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-312-37-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

106 North I Street is a one-story, irregular plan utilitarian building constructed as a machine shop. The building's rear elevation is angled, following the railroad tracks that border the parcel. The building is clad in corrugated metal siding and has an off-center, medium-pitched front-gable roof with overhanging eaves and corrugated metal roofing. The building is asymmetrically composed. The primary elevation faces east and contains two garage bays. One has a corrugated metal sliding door and the second has been converted into a pedestrian entry. An additional pedestrian entry with a non-original single panel door is also present. Flanking the garage door to the south is a square window opening boarded with plywood. Three six-light metal frame windows are also present. Several additions have been made to the building, to the rear and south elevations, which are also clad in corrugated metal. Mature tree specimens are present upon the property.

*** P3b. Resource Attributes:** (List attributes and codes) HP08 Industrial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
East elevation, view west, 6/7/2010.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1924 Tax Assessor Records

*** P7. Owner and Address:**
James W. Seifert
333 W Base Line Street
San Bernardino, CA 92410

*** P8. Recorded by:** (Name, affiliation, address)
Elizabeth Hilton, Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/7/2010

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

*** NRHP Status Code** 6Y, 5S3

*** Resource Name or #:** 106 North I Street

B1. Historic Name: Toman's Machine Shop

B2. Common Name 106 North I Street, Toman's Machine Shop

B3. Original Use: Industrial B4. Present Use: Industrial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed in 1924. Alterations include a garage door with wood surround, a pedestrian entrance, and a window that has been replaced with plywood.

In early 2011 the entirety of the building's contents (all machinery) was removed and the interior gutted.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Mechanical design Area San Bernardino

Period of Significance 1948-1955 Property Type Light Industrial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit for this property was not available from the City. In the late 1940s, the McDonald brothers were operating their original McDonald's drive-in restaurant at 1396 North E Street in San Bernardino. In refining their "Speedee Service System" of self-service food delivery the brothers commissioned the design and manufacture of a mechanical device for delivering identical quantities of ketchup and mustard for their hamburgers. They chose Toman's Machine Shop (the subject property) for the task. Owner Florian A.J. Toman invented a stainless steel condiment dispenser, which he patented in 1950, that performed as specified by the McDonald brothers. In doing so, Toman had created the tool that allowed kitchen workers to dress a hamburger with the exact same amount of ketchup and mustard every time so that consistency of product was assured. Toman's condiment dispenser was used in all McDonalds restaurants, continuing into the Ray Kroc era after Kroc's purchase of the McDonald's business in 1961. As a result, Toman's invention helped usher in the fast food industry that would soon dominate the restaurant business nationwide. A variation of Toman's dispenser is still being used at McDonalds and other fast food restaurants worldwide today. Unfortunately, in 2010 the entire contents of Toman's Machine Shop, including original prototypes of the dispenser, were removed and scapped. The interior was then gutted and new drywall, drop ceiling, and a pedestrian entrance installed.

(Continued on page 3)

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
City of San Bernardino Tax Assessor Records.
City Directories, U.S. Patent Office, McDonald's Museum

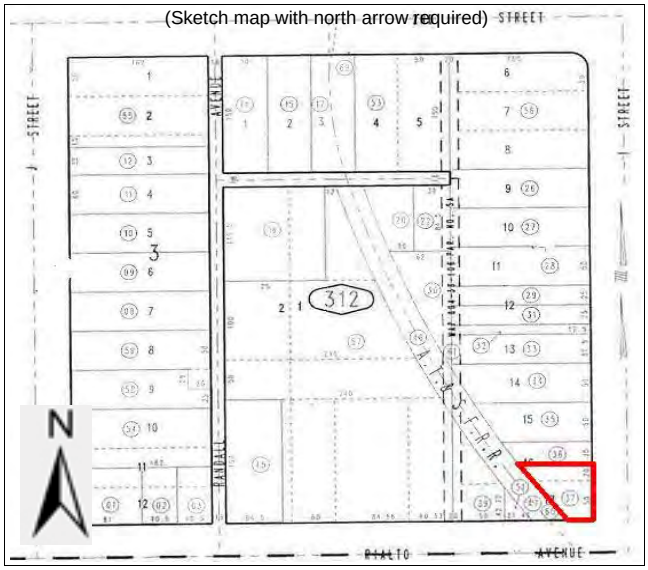
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 3/22/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



B10. Significance (continued)

The period of significance for the property is 1948-1950 corresponding with the time when Toman designed and patented his stainless steel condiment dispenser at the subject property. Unfortunately, the loss of all machinery and prototypes associated with the invention and manufacture of the condiment dispenser within the building has resulted in a substantial loss of integrity of feeling and association, which are key to understanding the significance of the property within the context of the invention of an important tool. Therefore, the property does not meet National Register Criterion A for historic associations. Although Florian Toman invented the condiment dispenser discussed above, as a historic personage his importance does not rise to a level of significance for the property to appear eligible for National Register listing under Criterion B. As for architectural merit, the property retains moderate integrity of design, materials, and workmanship as an early twentieth century example of vernacular light industrial design. However, it does not appear that the property is especially signficant for its style and type to be considered eligible for the National Register under Criterion C.

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. (a 5S3 CHRC status code).

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 2

*** Resource Name or #:** 110 South D Street

P1. Other Identifier: U-Haul

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 110 S D St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-032-22-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

110 South D Street is a large, single-story, commercial building. Rectangular in plan, it is of concrete block construction and has a flat roof with metal coping. The primary (north) elevation is asymmetrically divided and multiple bays wide. This elevation includes three large, full-height window bays with tinted glass and metal framing. To the south is a pedestrian entrance with a metal and glass door, and it is adjacent to a band of metal and glass windows. The building appears to have had numerous alterations, including the concrete infilling of what formerly were numerous loading docks at the east and south elevations. Next to the building is an asphalt parking lot, and no landscaping is visible. The chain link security fencing at the property appears to be a recent addition.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
North elevation, view south, 6/7/2010.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1926 TRW/Experian

*** P7. Owner and Address:**
27 SAC Self-Storage LP
1250 E Missouri Avenue
Phoenix, AZ 85014

*** P8. Recorded by:** (Name, affiliation, address)
Elizabeth Hilton
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/7/2010

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y

*** Resource Name or #:** 110 South D Street

B1. Historic Name: _____

B2. Common Name 110 South D Street

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed in 1926. Alterations include new primary entrance doors, enclosed glass and metal garage bays, and cyclone fence.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial Architecture Area San Bernardino

Period of Significance 1926 Property Type Commercial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This property is not eligible for either the National Register of Historic Places (National Register) under any criteria. This building exhibits an undistinguished example of utilitarian architectural design from the first half of the twentieth century. The building lacks integrity of design and materials, through alterations that include new primary entrance doors, enclosed glass and metal garage bays, and cyclone fence. It does not embody characteristics of a method of construction that warrant special recognition. No information has been uncovered to suggest that it is associated with a significant designer or craftsman. Within the context of utilitarian architecture and development, the property does not appear eligible under the National Register Criterion C. No known persons or events of local, state, or national significance are associated with the resource, including Motor Service Express, SoCal Fruit Lines, Foster Meat Company, and Freeman & Foster Meat Company. This makes the building ineligible for the National Register under Criteria A or B. In addition, the property is ineligible for listing in the National Register under Criterion D, because the building does not appear to be, or have been, an important source of information.

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian

San Bernardino City Directories: 1930, 1940, 1951, 1959.

B13. Remarks:

*** B14. Evaluator:** Daniel Paul

Date of Evaluation: 6/7/2010

(This space reserved for official comments.)

(Sketch map with north arrow required)

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5S3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 111 South I Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 111 S I St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-011-04-0000

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The subject property is a one-story industrial building of concrete block construction capped by a truss roof with Mission Revival-influenced parapet. The primary (west) elevation is sheathed in stucco and features a large center freight opening flanked by large windows on either side. Of these, the south window is fronted by a concrete block screen and the top portion of the north window is infilled with bricks. Similar infill characterizes the window on the north elevation. A blank, backlit sign is centered above the garage bay. The property exhibits a moderate level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
Northwest elevation, view southeast, 6/7/2010.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1930 TRW/Experian

*** P7. Owner and Address:**
Dorothy A. Ericson
12737 Lantana Avenue
Yucaipa, CA 92399

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/7/2010

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y, 5S3

*** Resource Name or #:** 111 South I Street

B1. Historic Name: _____

B2. Common Name 111 South I Street

B3. Original Use: Industrial B4. Present Use: Industrial

*** B5. Architectural Style:** Mission Revival-influenced

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed in 1930.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Industrial Architecture Area San Bernardino

Period of Significance 1930 Property Type Industrial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit was not available for this property. Sanborn maps and city directory research reveal that the building was originally owned by United Parcel Service.

The subject property represents an undistinguished example of a Mission Revival-influenced industrial building from the first half of the twentieth century that, due to the infill or covering of its windows, does not rise to the level of significance necessary to meet eligibility requirements for listing in the National Register under Criterion C. Further, no information has been uncovered to suggest that it is associated with a significant designer or craftsman. Athough associated with United Parcel Service, the importance of that business to the industrial development of San Bernardino appears limited. Further, current research did not identify any specific person associated with the property who achieved local, state, or national significance. Therefore, the building appears ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. (a 5S3 CHRC status code).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
Sanborn Maps, City Directories.

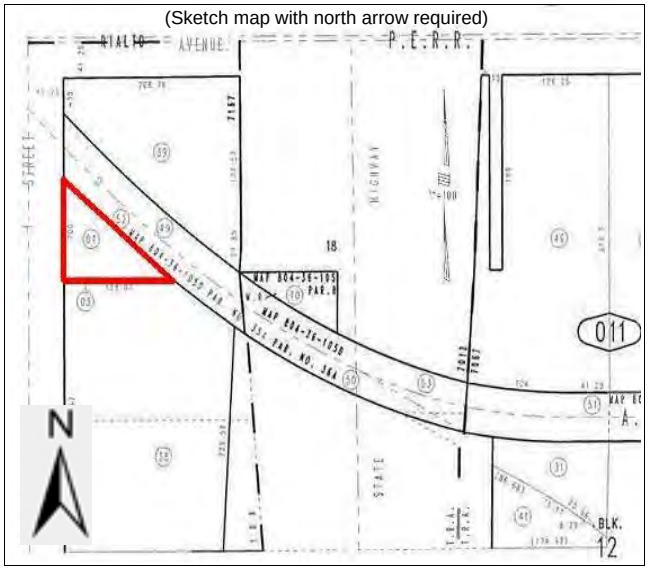
B13. Remarks:

*** B14. Evaluator:** Daniel Paul, Peter Moruzzi

Date of Evaluation: 6/7/2010

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5S3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 123 South G Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 123 S G St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-021-16-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The subject property is a two-story utilitarian warehouse that is capped by a medium-pitch front gable roof. The building's lower portion is sheathed in a rough textured stucco finish that appears to have been applied later; its upper portion is of wood board-and-batten siding. A large freight opening on its primary (west) elevation is fronted by a raised concrete loading dock. The property exhibits a moderate level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
North and west elevs, looking southeast, 6/23/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1954 TRW/Experian

*** P7. Owner and Address:**
George & Gloria Mantzoros
146 Palmyra Drive
San Bernardino, CA 92404

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/28/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y, 5S3

*** Resource Name or #:** 123 South G Street

B1. Historic Name: _____

B2. Common Name 123 South G Street, JG Wholesale Product

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed in 1954.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial Architecture Area San Bernardino

Period of Significance 1954 Property Type Commercial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Original building permits for this property were not available from the City. Sanborn maps and city directories indicate that the building makes its appearance on the parcel circa 1954 when it is listed as Ray Snell Wholesale Produce. In 1958, Ray Snell occupied the front of the building and Batchelor & Livacich Fruits occupied the rear. By 1968, Ray Snell continued to occupy the front while the rear was the home of Glenn Shuey Restaurant Supply Company. This property is not eligible for either the National Register of Historic Places (National Register) under any criteria. This building represents an undistinguished example of utilitarian architectural design from the middle decades of the twentieth century. Although the building retains integrity of design and materials, aside from stucco cladding, it lacks quality of significance in architecture as a commercial building with minimal character defining features. It does not embody characteristics of a method of construction that warrant special recognition. No information has been uncovered to suggest that it is associated with a significant designer or craftsman. Within the context of utilitarian architecture and development, the property does not appear eligible under the National Register Criterion C. No known persons or events of local, state, or national significance are associated with the resource, including Ray Snell Wholesale Produce. This makes the building ineligible for the National Register under Criteria A or B (a 6Y status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. (a 5S3 status code).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
San Bernardino City Directories: multiple years. Sanborn maps.

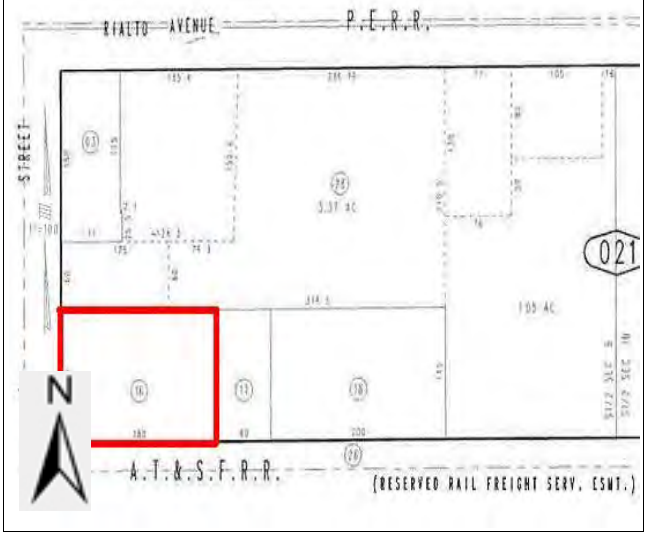
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 6/28/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5S3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 131 South I Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 131 S I St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-011-38-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

This large one-story industrial building is utilitarian in style and rectangular in plan. Of concrete construction, the building is comprised of an office portion located on the property's north side that is capped by a flat roof. The warehouse portion occupies the center of the building and is crowned by a pair of side-gabled truss roofs. The east portion is a loading area and features a shed roof. Fenestration consists of steel-framed windows fronted by metal screens. A pair of double-door entrances center the primary (west) elevation and are located within the only part of the building with any architectural character, namely a front gabled parapet with cornice and molded fascia. Beneath a deep metal canopy on the south elevation is a row of freight bays. The building is surrounded on the north and south elevations by a large parking lot. Overall, the property exhibits and moderate to high level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
West elevation, lkg east. 6/28/2010

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1940 TRW/Experian

*** P7. Owner and Address:**
Jennifer De Gorter
401 South J Street
San Bernardino, CA 92410

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/7/2010

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y, 5S3

*** Resource Name or #:** 131 South I Street

B1. Historic Name: Southern California Edison Co. Warehouse

B2. Common Name 131 South I Street, Jenco Productions Inc.

B3. Original Use: Industrial B4. Present Use: Industrial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

Erected in 1940.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Industrial architecture Area San Bernardino

Period of Significance 1940 Property Type Industrial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit was not available for this property. Sanborn maps and city directory research reveal that the building was originally the Southern California Edison Co. Warehouse.

Although relatively unaltered, the subject property represents an undistinguished example of a utilitarian industrial building from the first half of the twentieth century that does not rise to the level of significance necessary to meet eligibility requirements for listing in the National Register under Criterion C. Further, no information has been uncovered to suggest that it is associated with a significant designer or craftsman. As relates to the property's association with Southern California Edison, as a warehouse building for the utility its historic significance is minimal in comparison with the highly ornate revival style buildings typically constructed for the company, including in San Bernardino. Current research did not identify any specific person associated with the property who achieved local, state, or national significance. Therefore, the building appears ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. (a 5S3 CHRC status code).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Sanborn Maps. City Directories.
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

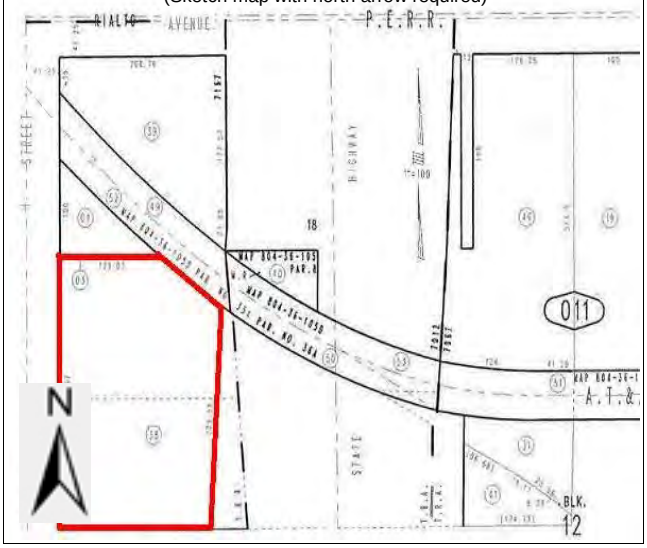
B13. Remarks:

*** B14. Evaluator:** Daniel Paul, Peter Moruzzi

Date of Evaluation: 6/7/2010

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 134 South E Street

P1. Other Identifier: Bekins Building

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 134 S E St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-111-01-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Designed as a storage facility for the Bekins moving company, this is a large, flat roofed, four-story commercial building that is rectangular in plan. The building is Vernacular Modern in design with an asymmetrical entrance on the primary (east) elevation. Fenestration consists of steel-framed, multi-paned windows shelted by a deep cantilevered canopy. The canopy also shelters the pedestrian entrance. Small, unadorned square windows are present at all four levels of the north-facing elevation. The building abuts the concrete sidewalk of E Street and the railroad right-of-way to the north. The rear of the building is dominated by a large raised freight platform sheltered by an expansive corrugated metal shed roof. The storage building exhibits a high level of integrity.

At the rear of the property is a modest one-story warehouse building of concrete brick construction featuring a ghost sign with "lumber co." barely visible on its parapet. It is capped by a flat roof with parapet and appears to have been constructed circa 1930 based on a review of Sanborn maps. The maps also indicate that it was one of a number of buildings associated with the Gibson Lumber Co. Freight openings punctuate the building's south elevation that faces an asphalt parking area. A non-original wood-framed structure with corrugated metal sides that serve as a parapet fronts the building on its east elevation. The small warehouse exhibits a moderate level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP07 3+ story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
East and north elevations, lkg southwest, 6/15/2010.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1930, 1948

*** P7. Owner and Address:**
Ramon & Irma Gonzalez
15257 Proctor Avenue
City of Industry, CA 91745

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/7/2010

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y

*** Resource Name or #:** 134 South E Street

B1. Historic Name: _____

B2. Common Name 134 South E Street

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Vernacular Modern

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

The rear warehouse building appears to have been constructed circa 1930.
The Bekins Storage Building was erected in 1948 according to the tax assessor.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial Architecture Area San Bernardino

Period of Significance 1930, 1950 Property Type Storage Facility Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

City directories and Sanborn maps indicate that the large four-story building was erected for Bekins Storage Company in 1948. It represents a typical if unexceptional example of the Vernacular Modern style applied to a storage building. As such, it does not rise to a level of architectural significance to meet Criterion C of the National Register of Historic Places (National Register). Bekins constructed numerous large store facilities similar to the subject property throughout Southern California that are still in existence. Current research did not uncover any evidence to suggest that this Bekins facility was associated with any events or personages important to the history of the city, state, or nation under National Register Criteria A and B.

As for the rear warehouse building, it appears to be the only remaining building associated with the former Gibson Lumber Company that previously occupied the parcel prior to the construction of the Bekins storage facility. Yet, despite its status as the last remnant of the lumberyard, by itself it does not evoke the feeling or association of its original purpose. As such, it does not meet National Register Criterion A for historic associations. The same is true for National Register Criterion B because the building has no known association with historic personages. Further, as a utilitarian warehouse building its architectural significance does not rise to a level to be considered eligible for the National Register under Criterion C. Therefore, the property receives a 6Y status code.

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

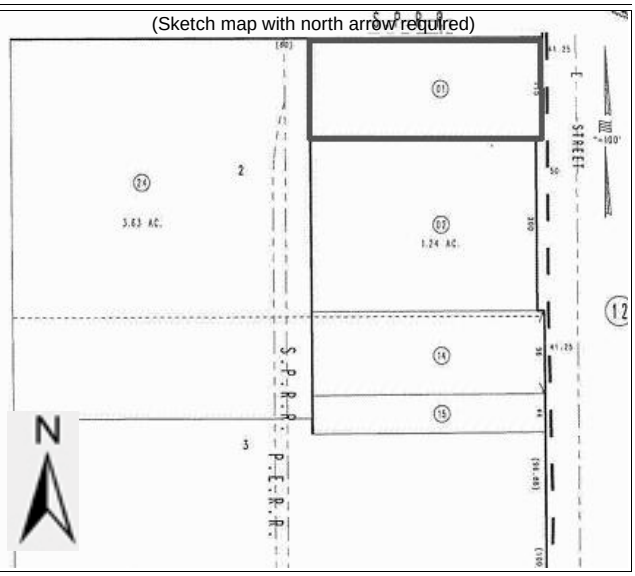
TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
Sanborn Maps. City Directories.

B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi
Date of Evaluation: 3/18/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 144 South G Street

P1. Other Identifier: San Bernardino Recycling Center

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 144 S G St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-091-11-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The subject property consists of a one-story utilitarian commercial building originally built as an automobile wrecking facility. It is of steel frame construction with corrugated metal walls and a hipped metal roof. It is open on its east and west sides with a broad metal shelter along its east elevation. The building is surrounded by a large asphalt parking lot bounded by a tall metal fence. The property exhibits a moderate level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
East elevation, looking west, 6/23/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1942 TRW/Experian

*** P7. Owner and Address:**
Jong & Bok Byun
2203 S Alameda Street
Vernon, CA 90058

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/28/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y

*** Resource Name or #:** 144 South G Street

B1. Historic Name: Hyman-Weisser Auto Wrecker

B2. Common Name: San Bernardino Recycling Center

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed in 1942.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial Architecture Area San Bernardino

Period of Significance 1942 Property Type Commercial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

This property is not eligible for either the National Register of Historic Places (National Register) under any criteria. This building is an undistinguished example of a utilitarian commercial building. Although the property retains a moderate level of integrity, it does not rise to a level of architectural merit to warrant listing in the National Level under Criterion C. Although the original building permit was not located, current city directory research reveals that the building was erected in 1942 and its original occupant was Hyman-Weisser Auto Wrecker. In 1951, it was renamed National Auto Wrecking & Pipe Company. Seven years later, in 1958, it was known as San Bernardino Iron & Metal Company, a name the property retained as late as 1968. As a result of this research, it can be concluded that no known persons or events of local, state, or national significance are associated with the property. Therefore, the subject property is ineligible for the National Register under Criteria A or B. (a 6Y status code)

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian

Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

San Bernardino City Directories: multiple years. Sanborn maps.

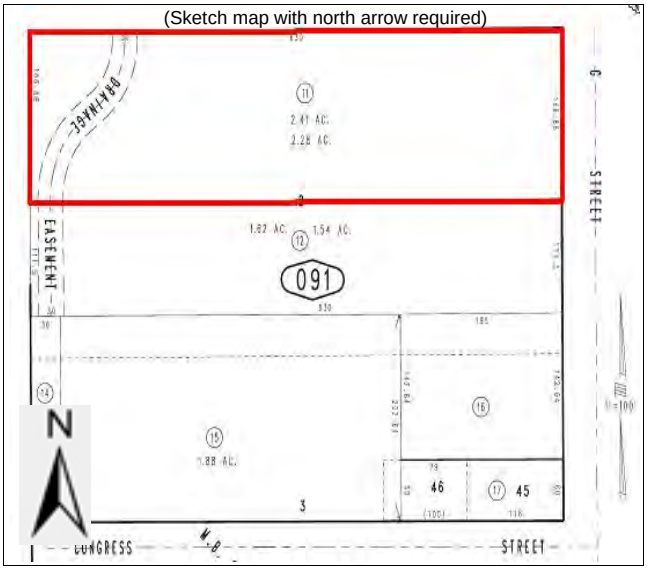
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 6/28/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 3S, 5S3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 155 South G Street

P1. Other Identifier: Southern California Gas Company Plant

*** P2. Location:** ☐ Not for Publication ☑ Unrestricted **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 155 S G St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-101-21-0000

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

This expansive property utilized as a plant for the Southern California Gas Company contains two large buildings, a one-and-two story North Building and a one-story South Building. The architectural style of both buildings is Streamline Moderne, which is reflected in the flat roofs with parapets, curved corners facing the street, stucco finish, and broad horizontality of the connected sills and lintels that form belt courses along each façade. At the rear of the North Building is a two-story portion that is utilitarian in design. Fenestration along the primary elevations consists of a band of multiple four-light aluminum frame windows that most likely replaced original steel frame windows. Above the street-facing windows of the North Building are the words "SOUTHERN CALIFORNIA GAS COMPANY" in period lettering. On the South Building, the word "AUDITORIUM" in similar lettering tops the original corner metal and glazed double doors of the main northwest-facing entrance. To the rear of the South Building is a long, low utilitarian shed-like portion capped by a low-pitched gabled roof apparently used for storage and to shelter vehicles. Most likely, it is this portion that building permits indicate was added in 1952. Landscaping consists of narrow lawns fronting both buildings, clipped hedges, and a few mature trees. A prominent metal security fence surrounds the property at the sidewalk. The remainder of the parcel is paved for surface parking. Alterations include the aforementioned window replacements and the application of a rough-textured stucco finish over the original smooth stucco.Overall, the buildings exhibit a moderate to high level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP09 Public utilities building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
West and south elevs, looking northeast, 6/23/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1938 Circa

*** P7. Owner and Address:**
Southern California Gas Company

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/27/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

BUILDING, STRUCTURE, AND OBJECT RECORD

* NRHP Status Code 3S, 5S3

* **Resource Name or #:** 155 South G Street

B1. Historic Name: Southern California Gas Company Plant

B2. Common Name: Southern California Gas Company Plant

B3. Original Use: Public Utilities B4. Present Use: Public Utilities

* **B5. Architectural Style:** Streamline Moderne

* **B6. Construction History:** (Construction date, alterations, and date of alterations.)

Erected circa 1938 based upon city directory research.
Addition of storage building in 1952 according to building permit #12570. Cost: $8000

* **B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

* **B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

* **B10. Significance:** Them Architecture Area San Bernardino

Period of Significance 1938 Property Type Public Utilities Applicable Criteria C

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit was not located; however, a subsequent permit indicates that a storage building was erected in 1952. The 1937 San Bernardino city directory does not include the subject address and, unfortunately, the 1938 and 1939 city directories were not available. By 1940, however, the subject property appears in the city directory as Southern California Gas Company. Given the buildings' Streamline Moderne architectural style, it can be surmised that the property has a circa 1938 construction date. The property's North and South Buildings are highly representative of the Streamline Moderne architectural style that was popular during the 1930s. Specifically, the style's character-defining features incorporated into the design of the two buildings include flat roofs with parapets, curved corners, stucco finish, broad horizontality utilizing extended sills/lintels that form belt courses, and period lettering on the façade. Alterations include the original steel frame windows that have been replaced with aluminum-framed windows, the smooth stucco finish resurfaced with rough-textured stucco, and a storage area added to the rear of the South Building (but not visible from the street). Nonetheless, the overall integrity of design, materials, feeling and workmanship remains relatively high. In addition, integrity of location, setting, and association is high because the property has been in continuous use as the Southern California Gas Company's plant since it was constructed. A windshield survey of San Bernardino suggest that the Streamline Moderne architectural style is relatively uncommon in the City. As such, the subject property represents a rare example of the style in San Bernardino.

(Continued on page 3)

B11. Additional Resource Attributes: (List attributes and codes): _____

* **B12. References:**

TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
San Bernardino City Directories: multiple years. Sanborn maps.

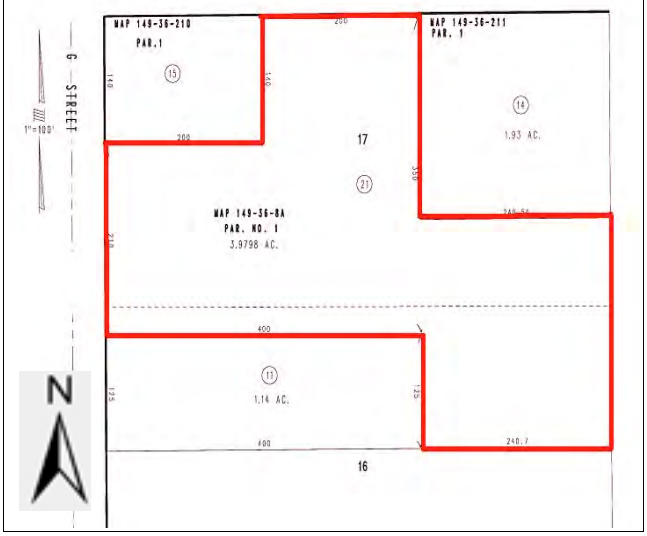
B13. Remarks:

* **B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 6/27/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



B10. Significance (continued)

Therefore, it appears that the subject property achieves a level of architectural merit necessary for listing in the National Register under Criterion C at the local level of significance (a 3S status code). However, because no known persons or events of local, state, or national significance appear to be associated with the resource, and because its association with the Southern California Gas Company does not appear to be especially noteworthy, the property does not warrant National Register listing under Criteria A or B.

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it was found eligible for the National Register and because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. (a 5S3 status code)

South Building, west and south elevations

South Building, north and west elevations

South Building, Auditorium, northwest corner

North Building, north and west elevations

North Building, west and south elevations

North Building, west elevation

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5S3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 170 South E Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 170 S E St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-111-14-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Rectangular in plan and constructed primarily of brick, this one-story industrial building rests on a concrete foundation. The building is comprised of two elements, a utilitarian rear portion of multiple bays capped by a sawtooth corrugated metal roof, and a front portion that is Moderne in style with a flat roof with parapet. The front east-facing portion is symmetrical in composition and consists of three bays separated by brick pilasters with stepped bases and chevron-like capitals. The stepped parapet originally had a zig-zag design that has since been infilled with concrete, creating a flat parapet for seismic strengthening. Fenestration consists of narrow slit windows with non-original metal-framed glazing. The center pedestrian entrance features a non-original metal-framed glazed door. The much deeper rear portion consists of nine bays with buttressed pilasters and narrow metal-framed windows. A large freight opening occupies one of the bays on the south elevation. A sawtooth corrugated metal roof with north-facing windows caps the composition. The building exhibits a moderate level of integrity due to the replacement of fenestration.

*** P3b. Resource Attributes:** (List attributes and codes) HP08 Industrial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
East elev, lkg southwest. 3/17/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1930 Tax assessor

*** P7. Owner and Address:**
Private

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/22/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y, 5S3

*** Resource Name or #:** 170 South E Street

B1. Historic Name: _____

B2. Common Name 170 South E Street

B3. Original Use: Industrial B4. Present Use: Industrial

*** B5. Architectural Style:** Moderne

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

Erected in 1930 based upon city directory research.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Industrial Architecture Area San Bernardino

Period of Significance 1930 Property Type Industrial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit was not available for this property. Sanborn maps and city directory research reveal that the building was originally a machine shop owned by Fred G. Walter. It specialized in welding, metal spraying, and engine rebuilding.

The subject property represents an undistinguished example of the Moderne architectural style as applied to an industrial building from the first half of the twentieth century. Because of the replacement of fenestration, the building lacks integrity of design and materials. No information has been uncovered to suggest that it is associated with a significant designer or craftsman. As a result, the property does not appear eligible for listing in the National Register Criterion C. In addition, no information was uncovered during the current survey process to suggest that Mr. Walter or his machine shop achieved local, state, or national significance. Therefore, the building appears ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. (a 5S3 CHRC status code).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
City Directories, Sanborn Maps

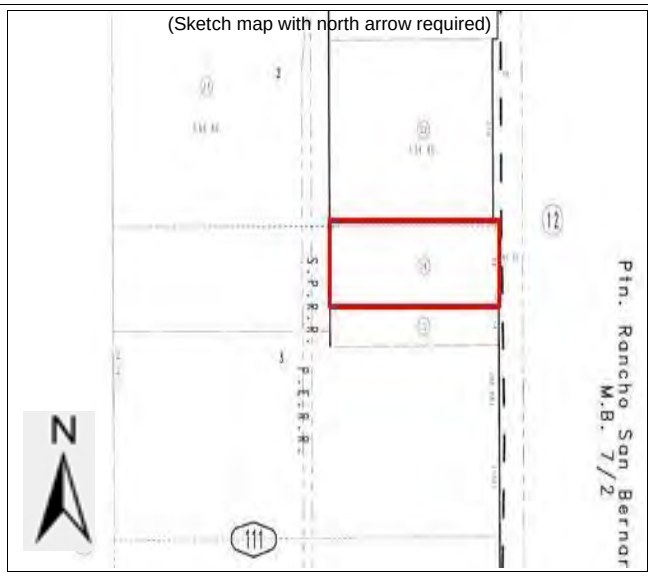
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 3/22/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 174 South E Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 174 S E St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-111-15-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Of masonry construction and Vernacular Modern in style, this one-story commercial building is capped by a flat roof with parapet. The primary east-facing storefront is two bays wide with each bay containing a pair of plate glass windows flanking a glazed center entrance. A red brick water table enhances each storefront beneath the windows. A full-width cantilevered canopy shelters the façade above which is a tall parapet that was once used as a signboard. Fenestration on secondary elevations consists of small rectangular windows fronted by metal bars. Non-original expandable security grills protect the storefronts. The property exhibits a high level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP08 Industrial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
East elev, lkg northwest. 3/17/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1948 Tax Assessor

*** P7. Owner and Address:**
Private

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/22/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y

*** Resource Name or #:** 174 South E Street

B1. Historic Name: _____

B2. Common Name 174 South E Street

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Vernacular Modern

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

Erected in 1948

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial Architecture Area San Bernardino

Period of Significance 1948 Property Type Commercial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit was not available for this property. Sanborn maps and city directory research reveal that the building was originally the Reliable Bearing & Supply Company.

Although exhibiting a high level of integrity, the subject property represents an undistinguished example of the Vernacular Modern architectural style as applied to a commercial building from 1948. In addition, no information has been uncovered to suggest that it is associated with a significant designer or craftsman. As a result, the property does not appear eligible for listing in the National Register Criterion C. Further, no information was uncovered during the current survey process to suggest that the Reliable Bearing & Supply Company achieved local, state, or national significance. Therefore, the building appears ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian

City Directories, Sanborn Maps

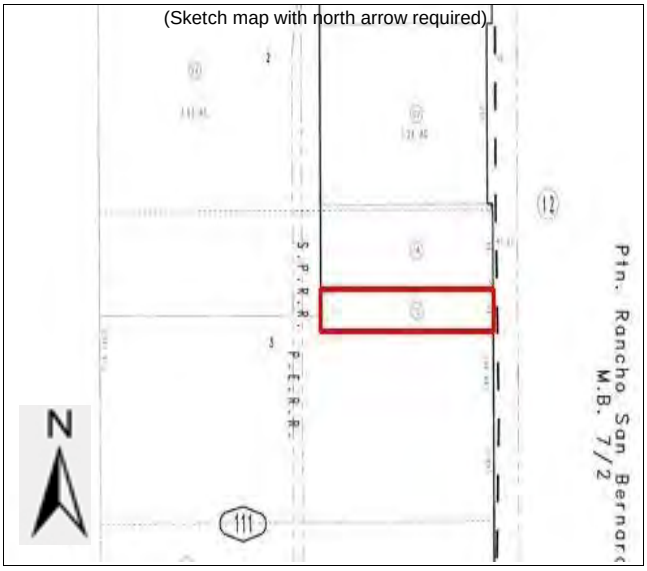
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 3/22/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 203 North K Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 203 N K St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-271-16-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Capped by a side-gabled roof with exposed rafter tails, this one-story Craftsman style single-family dwelling is sheahted in non-original rough-textured stucco. Fenestration consists of non-original vinyl sash within resized openings. A projecting front gabled porch roof centers the primary (west) elevation that is supported by non-original posts. Concrete steps lead to the entrance within the porch area that is fronted by a non-original metal security door. A pair of single car garages are carved into the slope beneath the dwelling, which is raised above the street. A metal fence surrounds the property. Landscaping consists of shrubs and a few trees. The property exhibits a low level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP02 Single family property

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
West elev, lkg east. 3/17/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1924 Tax assessor

*** P7. Owner and Address:**
Antonio Martinez
5014 Stewart Ave.
Baldwin Park, CA 91706

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/22/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 3 *** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** 203 North K Street

B1. Historic Name: _____

B2. Common Name 203 North K Street

B3. Original Use: Residential B4. Present Use: Residential

*** B5. Architectural Style:** Craftsman

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

Erected in 1924.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Residential Architecture Area San Bernardino

Period of Significance 1924 Property Type Residential Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit for this property was not available from the City. In addition, the Sanborn maps for this area do not include most of North K Street and 2nd Street containing this and other properties constructed around the same time. City directory research reveals that the property was occupied by Melvin Darton, and Leon and Jessie Ritter in 1924. Mr. Ritter was a carpenter. No occupation for Mr. Darton was listed.

This property is located within "Santa Fe Railroad Workers Overlay Zone" identified in 1991 as part of a reconnaissance survey conducted for the City of San Bernardino. According to the report "this area consists of a residential neighborhood developed between 1900 and the 1920s, and originally occupied by Santa Fe Railroad workers and their families. Most of the homes in this neighborhood are small, wood frame residences built in the California Bungalow and Neoclassic Cottage Styles. The zone retains its cohesive character as an exemplar of working class neighborhoods of single family homes, developed early in [the last] century as an improvement over the older 19th Century urban tenement neighborhoods of the East. Although some homes in the zone have been altered by intent or by deterioration, a large proportion of the homes retain their architectural integrity. This zone has been proposed in response to its significance in the context of industry and the turn of the [twentieth] century labor movements that were in part responsible for the creation of suburban style residences for working class families."
(Continued on page 3).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
City Directories, Sanborn Maps

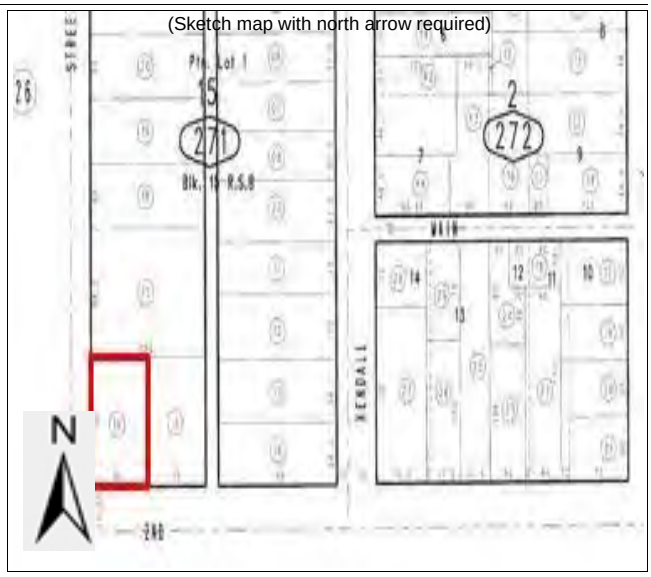
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 3/22/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



B10. Significance (continued).

Since the 1991 survey there have been substantial alterations to the grouping of dwellings located between North K Street and the rear alley to the west and east, respectively, and West 3rd and West 2nd streets to the north and south. The subject property is one of these residences and has experienced the replacement of its original windows with vinyl sash in resized openings, an applied coat of non-original rough-textured stucco, the replacement of porch roof posts, and the installation of a metal security door over the entrance. As a result of these modifications the property does not exhibit sufficient integrity of design, materials, workmanship, feeling and association to be eligible as a contributor to a National Register district or individually eligible for listing under Criterion C due to lack of architectural merit. In addition, no known persons or events of local, state, or national significance are associated with the property, including original occupants Melvin Darton, and Leon and Jessie Ritter. Therefore, the property is ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. In addition, the property was identified in the 1991 survey as a contributor to a potential "Santa Fe Railroad Workers Overlay Zone" (a 5B CHRC status code).

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 221-229 North K Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 229 N K St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-271-17-0000.

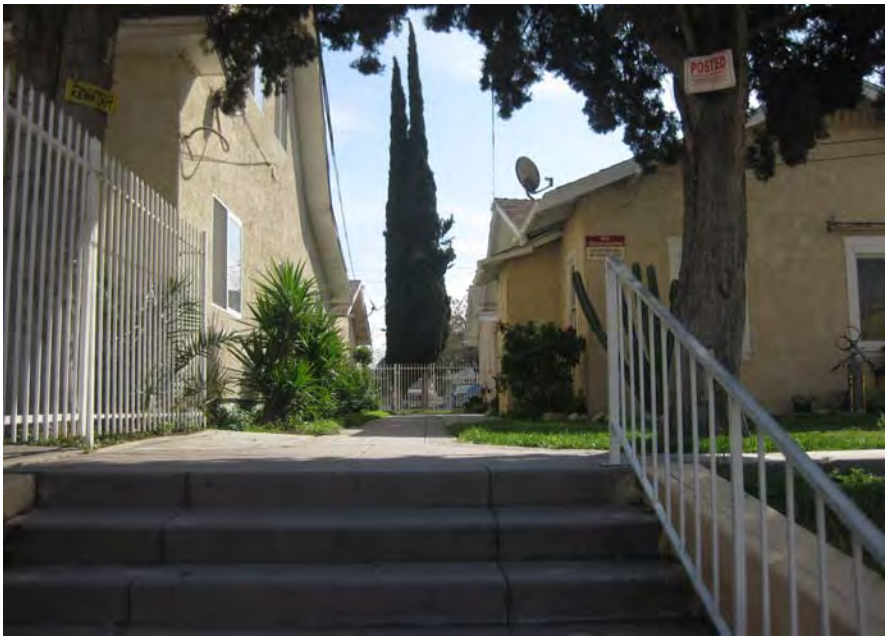
P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

This fairly large parcel contains four residential buildings that have all experienced substantial alterations. The largest dwelling is a two-story house that is vaguely Colonial Revival in inspiration based upon its massing, clipped gable roof, wide dormers, and front porch configuration. However, it has been almost completely stripped of its original character-defining features. Specifically, all wood-framed fenestration has been replaced with vinyl windows, many of which are within resized openings. Exterior surfaces have been sheathed with non-original rough-textured stucco. The projecting front entry porch has also been altered and the entrance fronted by a metal security door. Overall, the dwelling exhibits a low level of integrity. The other three dwellings are Craftsman in style and similar in arrangement with side-gabled roofs, exposed rafters, and rough-textured stucco finishing exterior surfaces. All windows have been replaced with vinyl and entrances are now fronted by metal security doors. Concrete paths connect the various buildings. Landscaping consists of a lawn, shrubs, and a row of mature Cypress trees near the front porch of the two-story house. The property exhibits a low level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP03 Multifamily property

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)



P5b. Description of Photo: (View, date, etc.)
West elevation, lkg east. 3/17/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1912, 1925 Tax assessor

*** P7. Owner and Address:**
Antonio Martinez
5014 Stewart Ave.
Baldwin Park, CA 91706

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/22/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

*** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** 221-229 North K Street

B1. Historic Name: _____

B2. Common Name 221 North K Street

B3. Original Use: Residential B4. Present Use: Residential

*** B5. Architectural Style:** Colonial Revival and Craftsman

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)
Erected between 1912 and 1925.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Residential Architecture Area San Bernardino
Period of Significance 1912-1925 Property Type Residential Applicable Criteria N/A
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit for this multi-family property was not available from the City. In addition, the Sanborn maps for this area do not include most of North K Street and 2nd Street containing this and other properties constructed around the same time. City directory research reveals that the property, consisting of a two-story Colonial Revival style residence and three single-story Craftsman bungalows, was occupied in 1924 by Harold L. and Mabel Koch with Mr. Koch's occupation listed as train man; laborer Alvin M. Johnson; Lester Patterson, a carpenter, and his wife Zaka; Claude Harkness, a laborer, and his wife Bertha; and Robert R. and Beulah Watts. Mr. Watts was a blacksmith.

This property is located within "Santa Fe Railroad Workers Overlay Zone" identified in 1991 as part of a reconnaissance survey conducted for the City of San Bernardino. According to the report "this area consists of a residential neighborhood developed between 1900 and the 1920s, and originally occupied by Santa Fe Railroad workers and their families. Most of the homes in this neighborhood are small, wood frame residences built in the California Bungalow and Neoclassic Cottage Styles. The zone retains its cohesive character as an exemplar of working class neighborhoods of single family homes, developed early in [the last] century as an improvement over the older 19th Century urban tenement neighborhoods of the East. Although some homes in the zone have been altered by intent or by deterioration, a large proportion of the homes retain their architectural integrity. This zone has been proposed in response to its significance in the context of industry and the turn of the [twentieth] century labor movements that were in part responsible for the creation of suburban style residences for working class families."
(Continued on page 3).

B11. Additional Resource Attributes: (List attributes and codes): _____

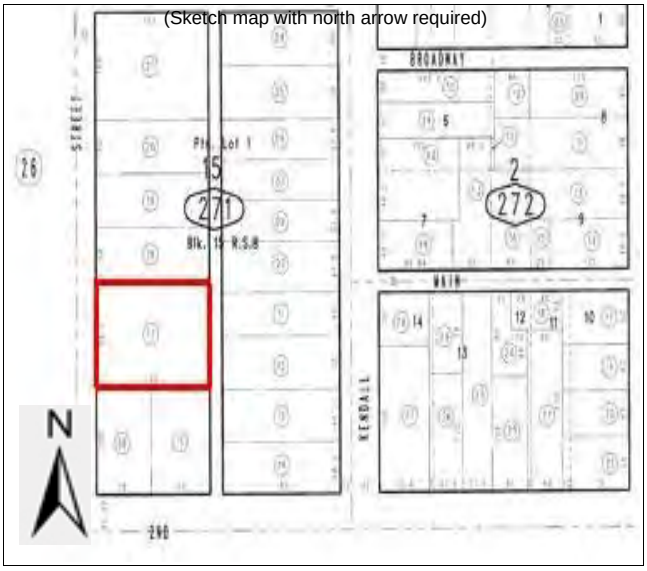
*** B12. References:**
TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
City Directories, Sanborn Maps

B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi
Date of Evaluation: 3/22/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



B10. Significance (continued).

Since the 1991 survey there have been substantial alterations to the grouping of dwellings located between North K Street and the rear alley to the west and east, respectively, and West 3rd and West 2nd streets to the north and south. The subject property is one example with the two-story dwelling having experienced the replacement of its original windows with vinyl sash within non-original openings, the application of non-original rough-textured stucco to its exterior surfaces, and modifications to its entry porch and front entrance. Similarly, there have been window replacements with vinyl sash and rough-textured stucco finish applied to the three bungalows located on the parcel. As a result of these modifications the property does not exhibit sufficient interity of design, materials, workmanship, feeling and association to be eligible as a contributor to a National Register district or individually eligible for listing under Criterion C due to lack of architectural merit. In addition, no known persons or events of local, state, or national significance are associated with the property, including the occupants identified above. Therefore, the property is ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. In addition, the property was identified in the 1991 survey as a contributor to a potential "Santa Fe Railroad Workers Overlay Zone" (a 5B CHRC status code).

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 263 North K Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 263 N K St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-271-19-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

This parcel contains two buildings, a one-story duplex situated close to K Street and a smaller single-family dwelling at the rear. Both are Craftsman in style. The duplex is capped by a medium pitched cross-gabled roof with triagular braces beneath the eaves with exteriors clad in asbestos shingles. Windows have all been replaced with vinyl sliders or single-hung vinyl sash. Partly recessed entry porches are located on the northwest and southwest corners of the duplex with shed porch roofs supported by square wood posts. Each entrance is fronted by a non-original metal security door. The building exhibits a poor level of integrity. The rear building is side-gabled with asbestos siding and vinyl windows. Its entrance beneath a shed porch roof is also fronted by a metal security door. Landscaping consists of a lawn, clipped bushes and a few trees. The property exhibits a low level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP03 Multifamily property

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1920 circa

*** P7. Owner and Address:**
Melvon Investments LLC
1455 S Campus Ave. #E
Ontario, CA 91761

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/22/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

*** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** 263 North K Street

B1. Historic Name: _____

B2. Common Name 261-265 North K Street

B3. Original Use: Residential B4. Present Use: Residential

*** B5. Architectural Style:** Craftsman

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

Constructed circa 1920

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Residential Architecture Area San Bernardino

Period of Significance 1920 Property Type Residential Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit for this multi-family property was not available from the City. In addition, the Sanborn maps for this area do not include most of North K Street and 2nd Street containing this and other properties constructed around the same time. City directory research reveals that the property, consisting of a duplex and a single-family residence, was occupied in 1920 by Mrs. Laura Jones, a matron with the Santa Fe Depot (a matron was the Senior Nurse associated with the railway); Archie Cudy (occupation not listed); and Peter J. and Sarah Amadisto. Mr. Amadisto was a pipefitter with the Santa Fe Railroad. By 1924, all of the above had vacated the dwellings and others were listed as residing there, including fireman Charles M. Murray and his wife Lea; Fred M. and Mabel Roberts with Mr. Roberts identified as an engineer; and Marion L. James (no occupation listed).

This property is located within "Santa Fe Railroad Workers Overlay Zone" identified in 1991 as part of a reconnaissance survey conducted for the City of San Bernardino. According to the report "this area consists of a residential neighborhood developed between 1900 and the 1920s, and originally occupied by Santa Fe Railroad workers and their families. Most of the homes in this neighborhood are small, wood frame residences built in the California Bungalow and Neoclassic Cottage Styles. The zone retains its cohesive character as an exemplar of working class neighborhoods of single family homes, developed early in [the last] century as an improvement over the older 19th Century urban tenement neighborhoods of the East. Although some homes in the zone have been altered by intent or by deterioration, a large proportion of the homes retain their architectural integrity. This zone has been proposed in response to its significance in the context of industry and the turn of the [twentieth] century labor movements that were in part responsible for the creation of suburban style residences for working class families." (Continued on page 3).

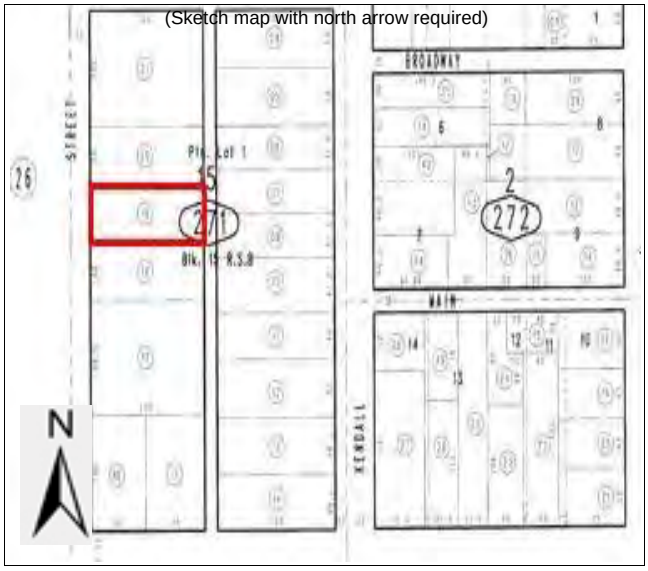
B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
City Directories, Sanborn Maps

B13. Remarks:

(Sketch map with north arrow required)



*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 3/22/2011

(This space reserved for official comments.)

B10. Significance (continued).

Since the 1991 survey there have been substantial alterations to the grouping of dwellings located between North K Street and the rear alley to the west and east, respectively, and West 3rd and West 2nd streets to the north and south. The subject property is one example with the two dwellings having experienced the replacement of original windows with vinyl sash, the cladding of exterior surfaces with asbestos siding, and modifications to main entrances. As a result of these modifications the property does not exhibit sufficient interity of design, materials, workmanship, feeling and association to be eligible as a contributor to a National Register district or individually eligible for listing under Criterion C due to lack of architectural merit. In addition, no known persons or events of local, state, or national significance are associated with the property, including the occupants identified above. Therefore, the property is ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. In addition, the property was identified in the 1991 survey as a contributor to a potential "Santa Fe Railroad Workers Overlay Zone" (a 5B CHRC status code).

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 271 North K Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 271 N K St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-271-21-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

This one-story commercial building is utilitarian in design with a flat roof and parapet. Of concrete block construction, it features entrances on its west and north elevations that have been covered with plywood. A wide clerestory window, also fronted by plywood, punctuates the north elevation adjacent to the entrance. The building is surrounded by tall grass. It exhibits a moderate level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1955 circa

*** P7. Owner and Address:**
Edward L. Holly
3114 Peck Road
El Monte, CA 91731

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/22/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

*** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** 271 North K Street

B1. Historic Name: _____

B2. Common Name 271 North K Street

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

Erected circa 1955.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial Architecture Area San Bernardino

Period of Significance c. 1955 Property Type Commercial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit for this multi-family property was not available from the City. However, the Sanborn maps exist for this parcel. Inspection of the archival Sanborn books available at the City's main branch of its public library reveal that the six unit "Ideal Hotel" apartment building was originally located on this site. However, by 1951, Sanborn maps show that it had already been demolished. It appears that the small commercial building currently located on the parcel was erected circa 1955.

This property is located within "Santa Fe Railroad Workers Overlay Zone" identified in 1991 as part of a reconnaissance survey conducted for the City of San Bernardino. According to the report "this area consists of a residential neighborhood developed between 1900 and the 1920s, and originally occupied by Santa Fe Railroad workers and their families. Most of the homes in this neighborhood are small, wood frame residences built in the California Bungalow and Neoclassic Cottage Styles. The zone retains its cohesive character as an exemplar of working class neighborhoods of single family homes, developed early in [the last] century as an improvement over the older 19th Century urban tenement neighborhoods of the East. Although some homes in the zone have been altered by intent or by deterioration, a large proportion of the homes retain their architectural integrity. This zone has been proposed in response to its significance in the context of industry and the turn of the [twentieth] century labor movements that were in part responsible for the creation of suburban style residences for working class families."
(Continued on page 3).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian

Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

City Directories, Sanborn Maps

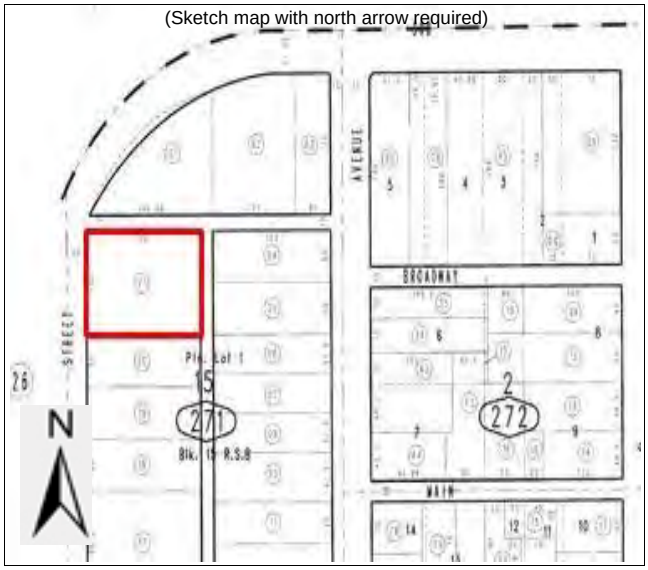
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 3/22/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



B10. Significance (continued).

Since the 1991 survey there have been substantial alterations to the grouping of dwellings located between North K Street and the rear alley to the west and east, respectively, and West 3rd and West 2nd streets to the north and south. In the case of the subject property, the original "Ideal Hotel" that had existed on the site had already been replaced with a small commercial building circa 1955. As for architectural merit, the utilitarian building is a non-descript example of the type that is ineligible for listing in the National Register under Criterion C. In addition, no known persons or events of local, state, or national significance are associated with the property. Therefore, the property is ineligible for the National Register under Criteria A and B (a 6Y CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. In addition, the property was identified in the 1991 survey as a contributor to a potential "Santa Fe Railroad Workers Overlay Zone" (a 5B CHRC status code).

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5S3
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 777 West Rialto Avenue

P1. Other Identifier: _____

*** P2. Location:** ☐ Not for Publication ☑ Unrestricted **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 777 W Rialto Ave **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0136-011-20-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The subject property consists of a one-story commercial building designed in the Spanish Colonial Revival style with Mission Revival style elements. Symmetrically arranged and rectangular in plan, it is crowned by a medium pitched side gabled roof with the flanking stepped parapets clearly influenced by the Mission Revival style. Red clay tiles clad the roof, which features extremely shallow eaves. Exterior surfaces are finished with smooth stucco. Windows consist of rectangular openings (since covered by plywood) within incised round-arched designs typical of the Spanish Colonial Revival style. The parapeted secondary elevations boast identical window designs; in addition, round vents punctuate the upper portions of the stepped parapets. Centering the façade is the raised entrance that is accessed by broad concrete steps with concrete railings. The main entry door is covered by plywood. Slumpstone block walls topped by chain link fencing and concertina wire enclose the property on both sides of the building. The property contains an asphalt parking lot to the south and east with a dirt lawn fronting the commercial building. The property exhibits a relatively high level of integrity although the integrity of the windows behind the plywood is undetermined.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
North and west elevs, looking southeast, 6/23/2011.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1925 TRW/Experian

*** P7. Owner and Address:**
Greg Dineen Construction
6418 Malachite Avenue
Rancho Cucamonga, CA 91737

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/27/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y, 5S3

*** Resource Name or #:** 777 West Rialto Avenue

B1. Historic Name: Richfield Oil Company Building

B2. Common Name 777 West Rialto Avenue

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Spanish Colonial/Mission Revival

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

The building was constructed in 1925.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial Architecture Area San Bernardino

Period of Significance 1925 Property Type Commercial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Original building permits for this property were not available. Sanborn maps and city directories show that the subject property was constructed for the Richfield Oil Company as an office building in 1925. The 1926 city directory indicates that R.A. Owen was the manager of the location at that time. The company continued to occupy the property until approximately 1958 when it was listed as unoccupied through at least 1961. However, the 1968 city directory shows that C.S. Older Construction Company had become the occupant. No additional information regarding the Richfield Oil Company's operations in San Bernardino was located during the current research process, including a search of the Los Angeles Times via Proquest. Although the subject property exhibits a relatively high level of physical integrity (despite the presence of plywood covering all fenestration) the former office building does not attain a level of architectural refinement and display an attention to detail that would make it an excellent example of the Spanish Colonial Revival/Mission Revival style. In addition, there is no information to suggest that a master architect or designer was associated with the property. As a result, the property does not rise to a level of architectural merit to qualify for listing in the National Register under Criterion C. As relates to historic associations, current research did not uncover any evidence to suggest that the Richfield Oil Company's ownership/occupancy of the property would be considered historically important at the local, state or national levels of significance. That, combined with an apparent lack of association with historic personages, leads to the conclusion that the property does not meet Criteria A or B for National Register listing (a 6Y status code). Note that the property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. (a 5S3 status code).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian

Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

San Bernardino City Directories: multiple years. Sanborn maps.

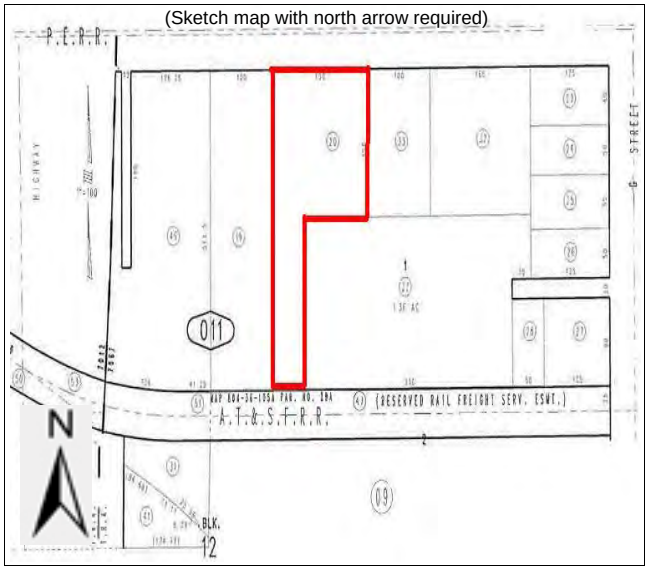
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 6/27/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 907 West Rialto Avenue

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 907 W Rialto Ave **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0137-043-26-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The subject property is a two-story single-family residence designed in the Transitional Arts and Crafts style. Rectangular in plan, the residence is sheathed in wide clapboard siding and features a steeply-pitched side-gable roof with slightly curved overhanging eaves, exposed rafter tails, and triangular braces. Two large front gabled dormers emerge on the primary (north) elevation with designs that mirror the main roof (one of which has a large evaporative cooling unit imbedded in the window). Fenestration consists of a mix of original wood-framed double-hung sash, and non-original aluminum sliders and vinyl windows. A squared bay capped by a shed roof centers the east elevation. Asymmetrically divided and three bays wide, the façade features a full width front porch sheltered by the main roof that is supported by battered wood posts on clinker brick pedestals. Within the porch area is a diagonally positioned primary entrance with a non-original door, sidelights, and a pair of wood-framed windows. The entry porch is accessed via concrete steps. A thin wood belt course spanning the entire elevation forms a water table. A clinker brick exterior chimney is located on the west elevation. At the rear of the dwelling are several alterations including a two story shed-roofed addition accessed by a non-original exterior staircase and several non-original windows. The house was converted into a multi-unit dwelling in the 1940s. Landscaping consists of a grass covered lawn with mature bushes and a large pine tree. A cyclone fence bounds the property.

*** P3b. Resource Attributes:** (List attributes and codes) HP02 Single family property

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
East and north elevs, looking southwest, 6/23/2011.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1915

*** P7. Owner and Address:**
Varp Inc.
1100 N D Street
San Bernardino, CA 92410

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/27/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

*** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** 907 West Rialto Avenue

B1. Historic Name: _____

B2. Common Name 907 West Rialto Avenue

B3. Original Use: Single-family Residential B4. Present Use: Multi-family Residential

*** B5. Architectural Style:** Transitional Arts and Crafts

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This dwelling was constructed in 1915.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Residential Architecture Area San Bernardino

Period of Significance 1915 Property Type SF Residence Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit for this property was not available from the City. Sanborn maps, tax assessor records and city directories confirm that the dwelling was erected in 1915. City directories indicate that Damon G. Cooley, the proprietor of White Auto Machine Shop located at 378 3rd Street, was the first occupant of the home, living there until approximately 1920 when William J. and Belle Gillard became the householders. Mr. Gillard was a foreman with the Santa Fe Railroad. In 1922, William and Belle Gillard continued to reside at the address along with Etta Gillard, a signal operator with the Santa Fe Railroad. Two years later, in 1924,the Gillards were joined by Geraldine Gillard who was an assistant to doctor Willard O. Rife a local optometrist. The property was vacant in 1926 but by 1928 Edward H. and Geraldine Townsend lived there (it can be assumed that Geraldine Gillard married Mr. Townsend, who was a mechanic with Western Motor Transportation Equipment Company). The 1930 city directory has Thomas E. Booth, a mechanic with White Garage, residing at the house. Three years later, in 1933, Mr. Booth occupied the house with his wife Blanche. In 1937, the house was again occupied by William J. Gillard and his wife, and Lee and Irene Braswell (Mr. Braswell was a brakeman). The reappearance of Mr. Gillard at the address suggests that the house had served as his rental property for a number of years. Indeed, the 1940 city directory shows four individuals or couples residing at the dwelling. During the 1940s, a number of different people appear as householders. In 1955, the property is referred to as apartments 1, 2 and 3. In 1968, there are 4 apartments. Today, the subject property is utilized as an after-care inpatient/outpatient facility with a capacity of 22 people for sober living for 90 days to 6 months.

(continued on page 3)

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian

Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

San Bernardino City Directories: multiple years. Sanborn maps.

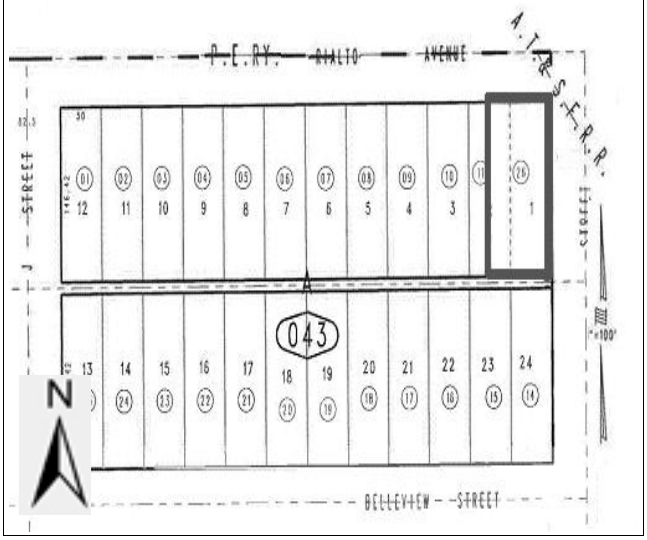
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 6/27/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



B10. Significance (continued)

Proquest Los Angeles Times research reveals that Damon Cooley, as the proprietor of White Auto Machine Shop, was involved in organizing stock car auto contests one of which occurred in 1917 on the 'Rim of the World' at Waterman Canyon in San Bernardino. No additional information regarding Mr. Cooley was uncovered, nor was any information regarding longtime dwelling owner William J. Gillard found during the current research process. The same is true of the other residents listed in the city directories.

Architecturally, the subject property represents a good but not stellar example of the Transitional Arts and Crafts style because of a number of harmful alterations. Specifically, window replacements, front door replacement, additions to the rear of the house, and conversion into a multi-family dwelling appear to have rendered it ineligible for the National Register under criteria related to architectural merit (Criterion C). As relates to historic associations, current research suggests that the property was not the residence of a notable personage nor does it appear that any important event of local, state or national significance occurred there. Therefore, the property does not meet Criteria A or B required for National Register listing. (a 6Y status code)

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. In addition, the property was identified in the 1991 survey as a contributor to a potential "Santa Fe Railroad Workers Overlay Zone" (a 5B status code).

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 950 West Second Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 950 W Second St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-273-24-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

This one-story utilitarian industrial building is rectangular in plan on a concrete foundation and capped by a front gabled roof sheathed with metal. A pair of gabled vents appear along the ridgeline. Exterior surfaces are clad in wood board-and-batten siding or non-original stucco. Primary entrances and several windows are located on the west elevation. Other openings are visible on the south elevation but have since been covered by stucco. The east elevation originally included a loading dock and a large freight opening to access the railroad spur that would have paralleled the building when it was first constructed. A metal chain link fence surrounds the property, which exhibits a low level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP08 Industrial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
South and west elevations, view northeast 6/23/2011

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1942 Circa

*** P7. Owner and Address:**
Habitat for Humanity San Bern.
PO Box 1550
Redlands, CA 92373

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/27/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y

*** Resource Name or #:** 950 West Second Street

B1. Historic Name: _____

B2. Common Name 950 West Second Street

B3. Original Use: Industrial B4. Present Use: Commercial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed circa 1942. Alterations include boarded openings and a rough textured stucco finish.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Industrial Architecture Area San Bernardino

Period of Significance 1942 Property Type Industrial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Original building permits were not located for the subject property. However, city directories and Sanborn maps indicate that this industrial building was erected circa 1942 with Pestco Laboraties, Inc. as the initial occupant. In 1944, the property had been renamed Archie Ruttan Fumigator; in 1949 the property was once again Pestco Company Fumigator. However, in 1951, the building took on a new use when the Inland Neon Company became the owner or tenant. By 1958, the Own Neon Company appeared at the address. Ten years later, in 1968, the Color-Ad Sign Company was located there.
Current research did not uncover any evidence to suggest that this building was associated with any events or personages important to the history of the city, state, or nation under National Register Criteria A and B. As relates to architectural merit, this utilitarian building has undergone substantial alterations, particularly to its primary (south) elevation that have negatively affected the property's physical integrity. As a result, the property does not appear eligible for listing in the National Register under Criterion C. (a 6Y status code).

Note that the subject property was NOT included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc.

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

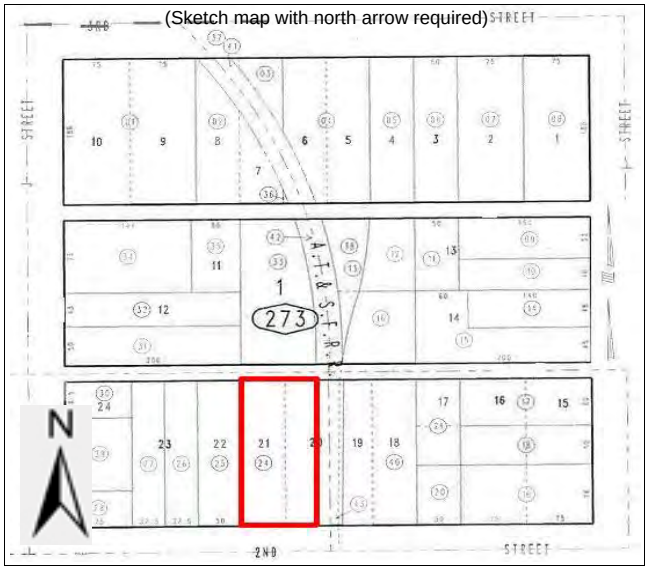
TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
San Bernardino City Directories: multiple years. Sanborn maps.

B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi
Date of Evaluation: 6/27/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** 958 West Rialto Avenue

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 958 W Rialto Ave **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-312-57-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

The subject property contains a large one-story industrial building that is rectangular in plan with a smaller, recessed addition located at the north end of the east elevation. Both elements are utilitarian in style. The older portion is capped by a medium-pitched front gabled roof while the newer portion features a low-pitched front gable. The older portion is clad in corrugated metal with a metal roof while the newer portion is sheathed with common metal siding. A pair of nine-light metal frame windows, each topped by a milled aluminum vent, flank the large south-facing freight opening of the original portion; similar windows (without vents) punctuate its east and west elevations. The newer portion is raised on a concrete foundation with a large freight opening facing south and three similar openings facing east. The entire blacktopped property is bounded by a chain link fence. The older building exhibits a relatively high level of physical integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP08 Industrial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
South elevation, view north, 6/23/2011.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1949 Circa

*** P7. Owner and Address:**
Tue Le & Nikie Nguyen
10297 Sorenstam Drive
Sacramento, CA 95829

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/27/2011

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y

*** Resource Name or #:** 958 West Rialto Avenue

B1. Historic Name: _____

B2. Common Name 958 West Rialto Avenue

B3. Original Use: Industrial B4. Present Use: Industrial

*** B5. Architectural Style:** Utilitarian

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed circa 1949 based upon city directory research.
An addition to the east side of the building was erected circa 1980.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Industrial Architecture Area San Bernardino

Period of Significance 1949 Property Type Industrial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Building permit information on the property was not available from the City. However, city directories and Sanborn maps indicate that this industrial building was erected circa 1949 with Belfast Bottling Company as the initial occupant. In subsequent years, city directories show that there were a number of other occupants including Certified Beverage Company, Vernors Ginger Ale Company, and, by 1968, Los Angeles City Express Trucking. As relates to architectural merit, the subject building represents an unremarkable example of a utilitarian industrial building with a later addition. As such, it does not rise to a level of architectural significance to meet Criterion C of the National Register. Current research did not uncover any evidence to suggest that this building was associated with any events or personages important to the history of the city, state, or nation including its various uses over the years. Therefore, the property does not meet National Register Criteria A or B. (a 6Y status code)

Note that although the subject property is within the boundaries of the Railroad Workers Overlay Zone, it was NOT included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. Therefore, the property is not a historic resource under CEQA.

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.
San Bernardino City Directories: multiple years. Sanborn maps.

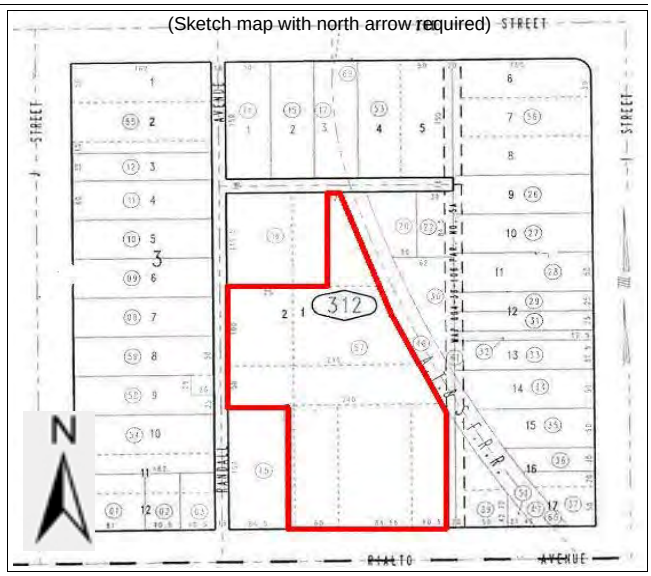
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 6/27/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 2

*** Resource Name or #:** 961 West Second Street

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 961 W Second St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-312-15-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

961 West Second Street is a one-story duplex designed in the Craftsman style. Rectangular in plan, the residence is clad in wood-lap siding and capped by a medium-pitched front-gabled roof with overhanging eaves and a wood lattice attic vent beneath the gable peak. The primary (north) elevation is symmetrically arranged and features a projecting porch that is sheltered by a second front gable peak supported by square tapered posts atop concrete pedestals. Concrete steps lead to the two entrances and large windows within the porch area. These windows have been replaced with non-original sliders. Landscaping consists of a front lawn with a mature tree and small shrubs. The dwelling exhibits a moderate to high level of integrity.

A modest one-story single-family vernacular cottage is located at the rear of the property. Rectangular in plan, it is capped by a medium pitched front-gable roof with slightly overhanging eaves. The building is clad in wood lap siding and the fenestration features wood frame windows. The primary façade faces west and features a front porch with square wood supports and balustrade. Within the porch area is the primary entrance fronted by a metal security door and a single window also secured with metal bars. The building is surrounded by natural vegetation and an asphalt driveway and exhibits a moderate to high level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP02 Single family property

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
Northwest elevation, view southeast, 6/7/2010.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1915, 1904

*** P7. Owner and Address:**
James & Kathryn McHenry
4630 Campus Drive #200
Newport Beach, CA 92660

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/7/2010

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☑ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** 961 West Second Street

B1. Historic Name: _____

B2. Common Name 961 West Second Street

B3. Original Use: Residential B4. Present Use: Residential

*** B5. Architectural Style:** Craftsman, Vernacular cottage

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

The rear dwelling was constructed in 1904, according to the tax assessor.
The street-facing dwelling was erected circa 1915. Alterations include replaced windows and applied metal security bars.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Residential Architecture Area San Bernardino

Period of Significance 1904-1915 Property Type Residence Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The original building permit was not available for this property. City directory research reveals that in 1918 William Egerton resided at the address. In 1940, O.H. Crow was listed there. By 1951, Erwin and J.M. Watterson were living at the address. And in 1959, W. Macias and E. Muller were listed.

The Craftsman duplex at the front of the property represents an undistinguished example of the style. In addition, due to the replacement of fenestration on the primary elevation, the building lacks integrity of design and materials. No information has been uncovered to suggest that it is associated with a significant designer. As relates to the rear dwelling, as a vernacular cottage it does not appear to rise to the level of architectural importance to be considered an excellent example of the type or style. As a result, the property as a whole does not appear eligible for listing in the National Register Criterion C. In addition, no information was uncovered during the current survey process to suggest that the property's various residents achieved local, state, or national significance. Therefore, the property appears ineligible for the National Register under Criteria A and B (a 6Y CHRC status code). Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc. In addition, the property was identified in the 1991 survey as a contributor to a potential "Santa Fe Railroad Workers Overlay Zone" (a 5B CHRC status code).

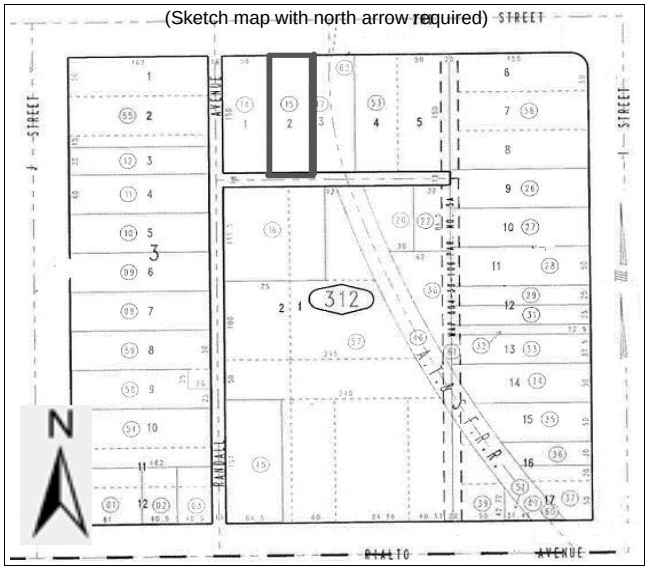
B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Sanborn Maps. San Bernardino City Directories
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

B13. Remarks:

(Sketch map with north arrow required)



*** B14. Evaluator:** Daniel Paul, Peter Moruzzi

Date of Evaluation: 6/7/2010

(This space reserved for official comments.)

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 **of** 2

*** Resource Name or #:** Valley Linen Supply

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 971 W Third St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
Assessor Parcel Number: 0138-273-02-0000.

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Located at the rear of this parcel, 971 West Third Street is a two-story industrial building designed in a vernacular expression of the early 20th century style. Rectangular in plan, the building is of masonry construction with a truss roof and peaked parapet. The primary (north) façade is symmetrically divided and four bays wide. The first floor features two central delivery openings on its north elevation that are slightly recessed sheltered by a metal roof. The second floor is punctuated by steel-framed multi-pane windows on all elevations. The rear of the building is characterized by one- and two-story elements that appear original to the design. The building's east elevation features an exterior staircase and a one-story portion capped by a shed roof. The building exhibits a high level of integrity.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)
North elevation, lkg southeast, 6/7/2010.

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1925 TRW/Experian

*** P7. Owner and Address:**
Bruce W. Hefftner
4801 N Mountain View Avenue
San Bernardino, CA 92407

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 6/7/2010

*** P10. Survey Type:** (Describe)
Intensive

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2 *** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** Valley Linen Supply

B1. Historic Name: Valley Linen Supply

B2. Common Name _____

B3. Original Use: Industrial B4. Present Use: Industrial

*** B5. Architectural Style:** Vernacular early 20th century

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed in 1925.

*** B7. Moved?** ☑ No ☐ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Industrial Architecture Area San Bernardino

Period of Significance 1925 Property Type Industrial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Original building permits were not available for this property. However, the 1951 Sanborn map reveals that this was the location of Valley Linen Supply steam laundry. This property represents a very good example of a 1920s era industrial building of masonry construction that exhibits a high level of physical integrity. Specifically, Sanborn maps reveal that the building's footprint has not markedly changed and visual inspection confirms that the steel-framed multi-pane windows are original. Given its proximity to the Santa Fe depot and the fact of the building's loading dock being adjacent to the railroad tracks, there is a high probability that Valley Linen Supply had some relationship with the railroad's operations. A windshield survey of the vicinity suggests that the subject property is unusual in its high level of integrity and potential association with the Santa Fe railroad. However, it does not appear to reach a level of significance required for listing in the National Register or California Register under any criteria. Nonetheless, the property may satisfy local designation criteria for architectural merit and historic associations. As a result, the property appears individually eligible for local listing and remains a contributor to the previously identified "Santa Fe Railroad Workers Overlay Zone" (a 5B CHRC status code).

Note that the subject property is considered a historical resource pursuant to CEQA guidelines section 15064.5(a) because it is included in the tabular listing of the City's surveyed historic resources found in the "Historic Resources Reconnaissance Survey San Bernardino, California" dated April 30, 1991 prepared by Milford Wayne Donaldson A.I.A., Inc.

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian
Sanborn Maps. San Bernardino City Directories
Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

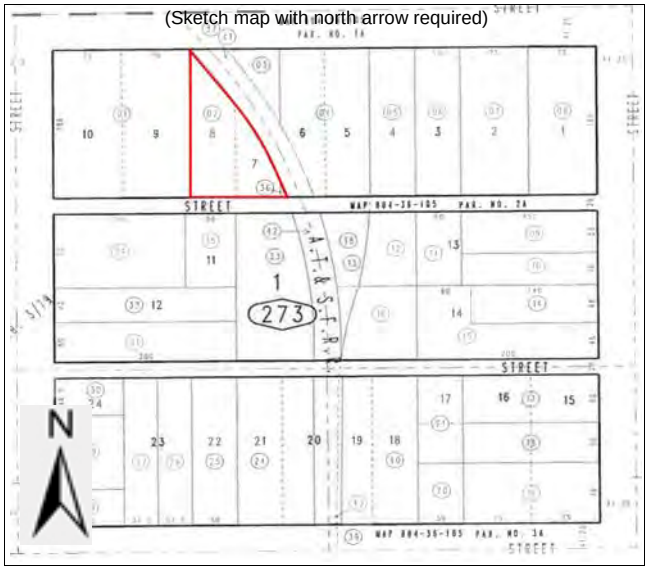
B13. Remarks:

*** B14. Evaluator:** Daniel Paul, Peter Moruzzi

Date of Evaluation: 3/23/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary # _____
HR # _____
Trinomial _____
NRHP Status Code 6Y, 5B
Other Listings _____
Review Code _____ Reviewer _____ Date _____

*** Resource Name or #:** _____

P1. Other Identifier: _____

*** P2. Location:** ☐ **Not for Publication** ☑ **Unrestricted** **a. County** San Bernardino

b. USGS 7.5' Quad _____ **Date** _____ **T**____; **R**____; ____ **1/4 of** ____ **1/4 of Sec**____; _____ **B.M.**

c. Address 981 W Third St **City** San Bernardino **Zip** 92410

d. UTM: (Give more than one for large and/or linear feature) **Zone** _____, _____ **mE/** _____ **mN**

e. Other Locational Data: (e.g. parcel #, legal description, directions to resource, elevation, additional UTMs, etc. as app
APN 0138-273-03-0000

P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries.)

Situated at the north streetside portion of the parcel, 981 West Third Street is a one-story commercial office building designed in the Moderne style. The building is irregular in plan with its west elevation contouring to the curving railroad right of way. Capped by a flat roof with parapet, a distinguishing feature is a tall round tower (or former smokestack) located on the building's northwest corner. Non-original rough-textured stucco sheathes exterior surfaces. The façade is asymmetrically arranged and five bays wide. Steel-framed multi-pane fixed and awning-type windows punctuate the façade's three center bays. Flanking the window bays on either end are pedestrian entrances that are recessed with and curved, fluted walls typical of the style. The westernmost entrance is sheltered by an awning, and the easternmost entrance features original lighting below the soffit. The northeast corner is highlighted by a slightly tiered pylon that extends above the roof line. A low band of original blue tiles is located below the window bays along the façade. The building abuts the concrete sidewalk.

*** P3b. Resource Attributes:** (List attributes and codes) HP06 1-3 story commercial building

*** P4. Resources Present:** ☑ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects)

P5b. Description of Photo: (View, date, etc.)

*** P6. Date Constructed/Age and Sources:**
☐ Prehistoric ☑ Historic ☐ Both
1930

*** P7. Owner and Address:**
Private

*** P8. Recorded by:** (Name, affiliation, address)
Peter Moruzzi
ICF International
811 W 7th ST, Suite 800
Los Angeles, CA 90017

*** P9. Date Recorded:** 3/23/2011

*** P10. Survey Type:** (Describe)

*** P11. Report Citation:** (Cite survey report/other sources or "none")
Historic Resources Technical Report, Downtown San Bernardino Passenger Rail Project, 07/2011, Section 106 Project Review

*** Attachments:** ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☑ Building, Structure, and Object Record
☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record
☐ Photograph Record ☐ Other: (List) _____

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # _____
HR # _____

BUILDING, STRUCTURE, AND OBJECT RECORD

Page 2 **of** 2

*** NRHP Status Code** 6Y, 5B

*** Resource Name or #:** _____

B1. Historic Name: Valley Linen Supply

B2. Common Name _____

B3. Original Use: Commercial B4. Present Use: Commercial

*** B5. Architectural Style:** Moderne

*** B6. Construction History:** (Construction date, alterations, and date of alterations.)

This building was constructed in 1930.

*** B7. Moved?** ☐ No ☑ Yes ☐ Unknown Date _____ Original Location: _____

*** B8. Related Features:**

B9a. Architect: Unknown b. Builder: Unknown

*** B10. Significance:** Them Commercial architecture Area San Bernardino

Period of Significance 1930 Property Type Commercial Applicable Criteria N/A

(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Original building permits were not available for this property. However, the 1951 Sanborn map reveals that this was the location of the offices of Valley Linen Supply steam laundry. This property represents a very good example of a 1930s era Moderne style commercial building that exhibits a moderate to high level of physical integrity. Sanborn maps reveal that the building's footprint has not markedly changed and visual inspection confirms that the fenestration, fluted inward-curving entrances, and blue glazed tile are original. Given its proximity to the Santa Fe depot there is a high probability that Valley Linen Supply had some relationship with the railroad's operations. However, the property does not appear to reach a level of significance required for listing in the National Register or California Register under any criteria. Nonetheless, the property may satisfy local designation criteria for architectural merit and historic associations. As a result, the property appears individually eligible for local listing and remains a contributor to the previously identified "Santa Fe Railroad Workers Overlay Zone" (a 5B CHRC status code).

B11. Additional Resource Attributes: (List attributes and codes): _____

*** B12. References:**

TRW/Experian

Sanborn Maps. San Bernardino City Directories

Milford Wayne Donaldson Inc. 1991. Historic Resources Survey. San Bernardino, CA.

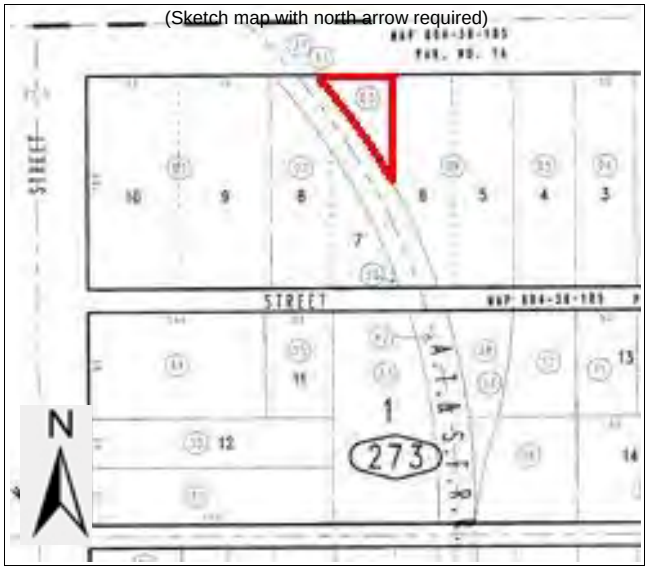
B13. Remarks:

*** B14. Evaluator:** Peter Moruzzi

Date of Evaluation: 4/5/2011

(This space reserved for official comments.)

(Sketch map with north arrow required)



Appendix B
Letter of Interested Parties

ORANGE EMPIRE RAILWAY MUSEUM

2201 South A Street
PO Box 548
Perris, California 92570
(951) 943-3020 Facsimile: (951) 943-2676
Southern California's Railway Museum

Thomas N. Jacobson
President and Chief
Executive Officer
tnjacobson@earthlink.net

Elizabeth Hilton
ICF International
811 West 7th St., Suite 800
Los Angeles, CA 90017

Dear Ms. Hilton:

Orange Empire Railway Museum is in receipt of your letter dated July 29, 2010.

As you probably have also been advised, there are several historical artifacts in the area outlined by the project site, including a crossing on Rialto Avenue with the former Pacific Electric San Bernardino line and another crossing leading into the former San Bernardino Pacific Electric Station. The Pacific Electric also crossed the line at E. Street and adjacent to the line at E Street was the former San Bernardino Valley Traction Company Car House.

If you need any further information, please do not hesitate to contact me at (951) 314-4258.

Very truly yours,

Thomas N. Jacobson
President

Irvin, Elizabeth

From: Glen Icanberry [gsicanberry@verizon.net]
Sent: Tuesday, August 03, 2010 4:52 PM
To: Hilton, Elizabeth
Subject: Santa Fe Ry Redlands District San Bernardino, CA

Dear Ms. Hilton,

The San Bernardino History & Railroad Museum received your letter of July 29, 2010 regarding the Historic and Cultural Resources Documentation for Redlands Rail Metrolink First Mile Extension Project in San Bernardino. I am retired from the Atchison Topeka & Santa Fe Railway and now volunteer with the San Bernardino History & RR Museum, contained within the historic Santa Fe San Bernardino Depot.

As you are no doubt aware there are some historic buildings remaining close to the trackage which is proposed to be double tracked from Third Street through to E Street in San Bernardino, along the BNSF right of way. This is part of the former Atchison Topeka & Santa Fe's Redlands District. However, there are no railroad buildings left along this portion of the right of way. I have studied extensively the Santa Fe Ry in California, and have contributed to several books, and co-authored a book about the Santa Fe in Central and Northern California. If you have questions about the railroad, I can probably furnish some answers or at least point you to where you can obtain some. I have access to some historic Santa Fe records such as employee timetables, a few photos, old track charts, maps etc. I can also help you interpret Santa Fe materials.

Below is some historic information that you might find useful regarding the Atchison Topeka & Santa Fe Railway's Redlands District. This is a portion of one chapter for a book manuscript I have been working hard on. The book is about the history of the Santa Fe's Los Angeles Division. Please do not reprint it or furnish it to others. We have a nice display about the Santa Fe Redlands District "Kite Shaped Track" at our Museum, which was assembled by historian and author Mark Landis.

Glen Icanberry
Director, San Bernardino History & Railroad Museum
www.sbdepotmuseum.com

CHAPTER EIGHT THE REDLANDS LOOP by Glen Icanberry

Copyright 2001

The Redlands District of the Santa Fe was the eastern, tail portion of the famous "Kite Shaped Track," which extended over the Santa Fe's old Second, Third and Redlands Districts. About 1892, excursion tickets for the roundtrip from Los Angeles were first promoted as a means to view the panorama of Southern California, along the "Kite Shaped Route." These Santa Fe excursions, and competitors such as the "Orange Empire Trolley Trip," offered by the Pacific Electric Railway, along with the Southern Pacific's "Inside Track Flyer," and "Orange Belt Special" introduced tourists, investors and new residents to a pre-freeway Southern California. An enthusiastic Santa Fe Passenger Department publicized the "Kite Shaped Route" with the slogan, "No Scene Twice Seen." In a more innocent era, viewing the Santa Fe's San Bernardino Station grounds and yards twice, did not overtly concern parlor car patrons who experienced the "Kite Shaped Route." Instead, passengers contemplated the vast rows of citrus orchards cultivated under the clear Southern California skies, between stations in Los Angeles, Orange, Riverside and San Bernardino Counties.

The Redlands Loop was constructed as two railroads, the San Bernardino Valley Railway and the San Bernardino & Eastern Railway. The San Bernardino Valley Railway was incorporated January 12, 1887 and consolidated into the California Central Railway May 20, 1887. The San Bernardino Valley Railway

was built by California Central Railway forces, led by California Southern Railroad Chief Engineer Fred T. Perris, assisted by Superintendent of Construction J.H. McNeil.

The preliminary and location surveys were begun in May of 1887, by survey parties under the direction of California Southern Railroad Assistant Engineers H.P. Vincent, L.J. Davids, and A.H. Koebig. Mr. Perris made the final location survey.

The firm of Drew & Ball contracted to grade the entire line from San Bernardino to Mentone via Redlands. The grading started in May of 1887. Assistant Engineer H.P. Vincent supervised the grading, which was completed in October of 1887.

The bridges were constructed by A.W. Potter & Company, with materials provided by the California Southern Railroad. The track was laid by a California Central Railway gang under the direction of Foreman Ed Barrett, beginning in July of 1887. According to a report from Mr. Perris, the track was in place as of December 31, 1887. The line from San Bernardino to Mentone, by way of Redlands, was opened for public use on February 1, 1888.

A California Central Railway telegraph construction gang placed the poles and strung the wires, directed by Foreman H. Hagan. The first railroad buildings along the line were completed by California Southern Company B&B forces except for the first depot at Redlands and the depot at Drew. These two depots were completed during 1888 by A.W. Potter & Company and R.H. Falkener respectively. A boxcar body was installed at Redlands until the first depot was ready.

The San Bernardino & Eastern Railway, from Highland Junction to Mentone, via Highland, was begun during 1890 and completed on August 17, 1891. This line segment formed the northern portion of the Redlands Loop, skirting the foothills of the San Bernardino Mountains. The San Bernardino & Eastern Railway was incorporated August 11, 1890 and consolidated into the Southern California Railway June 27, 1892.

Southern California Railway Chief Engineer Fred T. Perris supervised this construction from San Bernardino, in addition to negotiating for the right of way and approving the final location. Assistant Engineer M.B. Terrass led the survey party which conducted the preliminary and location surveys, beginning in September of 1890.

Grading began the same month. The firm of Bright and Crandall from San Bernardino was awarded the grading contract, which was completed in September of 1891. Bridge materials were furnished by the Southern California Railway, yet were delivered to the sites by Bright and Crandall. Southern California Railway Foreman J.F. Parker directed the Southern California Railway B&B forces who erected the bridges and culverts. The Western Union Telegraph Company constructed the telegraph lines, while the Southern California Railway paid for half of the construction costs.

Roadmaster J.E. McNeil and Foreman J.J. Kavangh supervised the Southern California Railway gang which laid the track. Tracklaying began in January of 1891 and was completed on August 17, 1891, as indicated by Santa Fe Railway Engineering Department organization and construction notes for the San Bernardino & Eastern Railway.

A report submitted to the California Board of Railroad Commissioners dated December 31, 1891, substantiated the August 17, 1891 completion date.

Southern California Railway Employee Timetable No. 11, with an effective date of August 16, 1891, indicated two separate branchlines east from San Bernardino, one to Mentone and one to East Highlands. When a timetable supplement No. 11-A, effective January 17, 1892, was issued it indicated the Redlands Loop had been completed by showing it as one branchline instead of two.

The Redlands District had been dark territory operated by timetable and train order authority, in conjunction with yard limits. Since Santa Fe Los Angeles Division Employee Timetable No. 165 became effective, July 27, 1958, the entire branch has been considered yard limits. While the circle of track was intact, the timetable direction of westbound was counterclockwise, or from San Bernardino to Mentone via Redlands, then continuing on through Highland and Del Rosa, back to San Bernardino at Highland Junction. The timetable direction of eastbound was just the opposite, or clockwise.

When the Del Rosa to Highland Junction portion of the Redlands Loop was abandoned, in 1956, the circle of track was broken. Los Angeles Division Timetable No. 161, effective June 2, 1957, indicated that the timetable directions of the Redlands District had been reversed. Westbound was then designated as being from Del Rosa to San Bernardino via Mentone and Redlands. Eastbound trains leaving San Bernardino would be headed towards Redlands, Mentone and Del Rosa.

These timetable directions have been perpetuated to the present, even as the branchline was gradually cut back to Mentone, then Redlands. Santa Fe employees continued to refer to the Redlands District or Redlands Subdivision as "The Loop," often extending the nickname of "The Loop" to the local freights operated on the former Redlands Loop. The San Bernardino yard jobs assigned to traverse the 10 MPH trackage out to Redlands and Mentone, have inherited the label.

Sixty five years after the completion of the Redlands Loop, a changing Southern California and resulting decline in carloadings, caused the circle of track through the citrus groves to be broken. The Redlands District from Highland Junction to Del Rosa had been taken out of service on July 23, 1956. During early 1957, the Highland Junction to Del Rosa line segment trackage was removed. The trackage abandoned was from Highland Juntion to MP 21.65, between Mountain View and Loma Avenues in San Bernardino. Trackage from Del Rosa to Patton followed by May 6, 1967. Another rusting line segment, from Patton to Mentone, was removed from service as of December 13, 1980, after the Santa Ana River's floodwaters "scrapped out" the bridge near Mentone. Freight cars trapped between East Highlands and Patton had to be trucked back to live rails. This left 13.4 miles of trackage on the Redlands District.

During 1979, the Southern Pacific's Redlands Branch was abandoned, between the SP stations of Redlands and Crafton. Also during 1979, a switch was installed just west of Wabash Avenue, MP 11.3, near the old Santa Fe station of Craf. This switch allowed Santa Fe trains to deliver hoppers of plastic pellets to Richmond Technologies, via a short spur at Mentone. This spur, CLIC 412, utilized rails and roadbed, which had been part of the Southern Pacific's Redlands Branch. Thus the Santa Fe inherited a remnant of an SP branch which in decades previous, had extended past Mentone to Crafton and Greenspot. The SP station of Greenspot was originally called Sunshine Heights. Service to Richmond Technologies, at Craf, ended in 1996, when BNSF convinced Richmond Technologies to stop receiving inbound loads of plastic pellets at the plant. Instead of direct rail service,

hoppers were spotted at the QDC Facility in San Bernardino, where the plastic pellets were transloaded to trucks, for final delivery.

Since 1988, the Redlands District had been out of service through Mentone, from MP 11.4, the former station of Craf, to the station designated End of Track at MP 13.4. The Interstate Commerce Commission granted permission to abandon the two mile line segment from MP 11.4, through Mentone, to End of Track, on March 9, 1995. The majority of the Santa Fe's ties had already been stolen between Mentone Boulevard, (MP 12.0), and End of Track, (MP 13.4), by late 1989. The remaining track and materials were removed by early April, 1995, leaving only 11.4 miles of track intact from San Bernardino to the old station of Craf, on the southwestern edge of Mentone. The track was taken out of service from MP 9.4 to Craf in 1996.

During early March 2005, about a mile of track was removed beyond MP 10.1, between Eastberne and Craf. The only clue to an exact date was the prophetic note scrawled into the fading silver paint, of a signal case, at Dearborn Street, MP 10.9, in Redlands. This message, signed by Signal Maintainer R.P. Scott, read “Power turned off 3/10/05.” Meaning Mr. Scott had turned off the commercial power,(Southern California Edison), to the crossing protection on that date. On October 27, 2005 BNSF removed about ten lengths of rail at MP 9.48, between the I-10 Overpass and Sylvan Park in Redlands. In years gone by Sylvan Park, between MP 9.48 and MP 9.8, had been the scene of memorable Santa Fe Railway employee picnics, attended by special trains even as late as 1995. Although removed for use elsewhere, those missing rails, assured that trains may no longer whistle past Sylvan Park, much less attend company picnics.

The San Bernardino Associated Governments acquired the Redlands Subdivision as part of the transaction on October 23, 1992, when the Santa Fe sold five other lines to the Southern California Regional Rail Authority,(SCRRA). It had been anticipated that Metrolink will operate to Redlands, from San Bernardino, possibly as far as the University of Redlands, near the former station of Eastberne. The Santa Fe retained a freight service easement along the Redlands Subdivision, which was relabeled the Redlands Industrial Spur when System Timetable No. 5 was issued on April 16, 1995.

San Bernardino switch jobs continued to work industries along "The Loop" from San Bernardino through Victoria, and beyond to Redlands four to five times per week. Between Redlands and Mentone trains were operated on an as needed basis, handling leased hoppers of plastic pellets, to the sole patron beyond Redlands, Richmond Technologies. In 1996, BNSF was able to convince Richmond Technologies to use the new QDC Facility, at San Bernardino, to transload plastic pellets from covered hoppers to trucks. In recent years, the Santa Fe's business at Redlands had been limited to inbound loads of feed for Perisit's Egg Farm and Sunny-Cal Milling, along with occasional team track business. The Sunny-Cal Milling grain elevator, at Texas Street, was previously known as Upland Feed. It was known as Redlands Feed before it became Upland Feed. The Sunny Cal Milling Company shut down in November, 2005. The last train called at Redlands in November of 2005, thereafter trains only operated to Drew, to deliver inbound, covered hoppers of plastic pellets, to consignee Captive Plastics Inc., at the Redlands Corporate Center.

The last active Redlands packing houses have been shipping primarily by truck. Only the Redlands Foothill Groves packing house retains a rusting railroad spur between Ninth and Church Streets in Redlands, approx MP 9.25.

Refrigerated vans and containers have replaced the orange, Santa Fe "map" reefers. Santa Fe freight trains on the Redlands Loop used to handle strings of dripping SFRD reefers, bearing citrus from the packing houses, back to San Bernardino, destined for points east.

San Bernardino MP 0.0 The old Redlands District connects with the main track, just east of the San Bernardino depot, alongside of Third Street. On Third Street, at MP 0.1, the former San Bernardino Valley Traction Company, later operated as the Pacific Electric's Colton Line, crossed the Santa Fe's Redlands Loop. The red PE streetcars were required to stop before crossing the Santa Fe. This diamond was in service from 1902 until June of 1944, when the streetcar track was removed along Third Street. The PE had previously abandoned passenger service on the Colton Line on February 22, 1942. This included the PE trackage on Third Street past the Santa Fe San Bernardino Depot, at 1170 West Third Street.

Until sometime prior to completion of the Mount Vernon Viaduct, in 1939, there was an old interchange track between the PE and Santa Fe, west of the Santa Fe San Bernardino Depot, off the PE, near Second Street. However, PE freight service was primarily on the PE San Bernardino Line, built in 1914, along Rialto Avenue, and not on the PE Colton Line, along Third Street, past the Santa Fe Depot. The interchange was in use for SBVT from 1902 until 1911. The PE took over SBVT in 1911, then built the line along Rialto Avenue in 1914, likely ending any need for freight service along the PE Colton Line.

I Street Tower MP 0.4 The station at I Street was first shown in employee timetables as **Fertilizer Spur** from 1904 until 1906. Later Santa Fe timecards denoted the location as **Rialto Ave PE Crossing** or simply **PE Crossing**. The E.E. Katz Company was served by a spur, off the Redlands District, at I Street and Rialto Avenue, (old First Street.) Sanborn Map Company fire insurance maps show E.E. Katz as having a corrugated iron warehouse, and adjoining coal shed. The warehouse was labeled as a “lime house” on the 1894 map, which could explain the station name of Fertilizer Spur. Lime has been used as fertilizer in citrus groves. E.E. Katz predated the I Street Tower on the opposite corner of Rialto Avenue and I Street.

At the corner of I Street and Rialto Avenue., within San Bernardino, the Pacific Electric's San Bernardino Line, down Rialto Avenue, was protected by an interlocking tower that was in service from 1915 until July of 1948, near the northwest corner of I Street and Rialto Avenue. Because this was the crossing of the PE main track, with a branch of the Santa Fe, the diamond initially saw more train movements on Henry Huntington's interurban than those of the steam road. I Street Tower had a sixteen lever General Railway Signal electric interlocking, which controlled three position upper quadrant semaphore signals on the Santa Fe, and two position lower quadrant semaphore signals on the PE. The interlocking tower was replaced by an automatic interlocking, which lasted until about 1967, when the segment of the SP San Bernardino Branch, along Rialto Avenue, was removed from service and subsequently abandoned.

E Street Tower MP 0.8 This Southern Pacific Tower protected the Southern Pacific's San Bernardino Branch, the Pacific Electric's Riverside-Redlands Line, and possibly the separate PE Urbita Line to the east, on E Street, from the trains of the Santa Fe.

The initial crossing at grade was between the Southern California Railway, (Santa Fe), and the narrow gauge Southern California Motor Road in

1887. This was the initial three mile, three foot gauge incarnation of the Southern California Motor Road, built between San Bernardino and Colton, by R.W. Button and William B. Isaacs. In October of 1887 a group of investors headed by J.W. Hall incorporated the Southern California Motor Road to become standard gauged, and build to Riverside. Meanwhile, J.W. Hall and his investors organized the narrow gauge San Bernardino & Redlands Railroad, then completed a 10.2 mile line to Redlands in February of 1888, and operated the two steam motor roads as one property. Standard gauging caused the diamond across the Santa Fe to be a dual gauge crossing. The San Bernardino & Redlands Railroad was three foot narrow gauge, complementing the Southern California Motor Road's initial San Bernardino to Colton Line, while the Southern California Motor Road's San Bernardino to Riverside Line was standard gauge.

Former Iowa Governor Samuel Merrill, and a syndicate, gained control of the Southern California Motor Road along with the San Bernardino & Redlands Railroad in 1888, and oversaw completion of the standard gauge Southern California Motor Road to Riverside in November of 1888. Governor Merrill also served as president of the California Trust & Loan Company. The Southern California Motor Road went into receivership in 1890, taking the San Bernardino & Redlands Railroad with it. The Southern California Motor Road was sold under foreclosure to the Southern Pacific's Pacific Improvement Company. Southern Pacific leased the San Bernardino & Redlands Railroad in 1892, then subsequently leased the Southern California Motor Road, in 1896. Both lines were absorbed into the SP during 1898.

During 1903 and 1904, the Southern Pacific rebuilt the former Southern California Motor Road trackage into San Bernardino, added new trackage on private right of ways between San Bernardino and Colton, installed yard trackage and built a new depot and terminal in San Bernardino. As part of these improvements, the SP constructed **SP Tower No. 19** which was 310 feet to the west of E Street, and west of the Southern California Railway's E Street depot. SP Tower No. 19 was constructed in 1904 on the northwest corner of the SP/ATSF diamond. This E Street Tower contained a twenty two lever Union Switch & Signal Company, Saxby & Farmer interlocking machine. The Southern Pacific turned the San Bernardino to Colton line over to the Pacific Electric in 1956, which reverted back to the parent SP, which absorbed all remaining PE lines on August 13, 1965.

From July 3, 1904 until 1918, the San Pedro Los Angeles & Salt Lake Railroad's local passenger trains utilized trackage rights over the SP track, to the new SP San Bernardino depot, which replaced the old Motor Road Depot on Third Street, between E and F Streets. This increase in traffic across the Santa Fe's Redlands District, was the probable impetus for installing E Street Tower. The SP trackage became a part of the PE in 1943, only to revert back to the SP, when the interurban was absorbed into the parent, two decades later. The SP San Bernardino Branch still crossed the Santa Fe Redlands District just west of E Street, until about 1985, although the old E Street Tower had been retired in 1941, and removed during World War II. After the tower was removed PE/SP movements stopped, then flagged across the Santa Fe Redlands District. The SP crossing at grade, at SP MP 541.7, with the Santa Fe's Redlands District, although out of service since 1977, existed until about 1985. The uprooted, dual gauge, crossing frog was observed rusting in the weeds, until about 1989.

Records researched indicated that the second, separate railroad crossing at grade, of the San Bernardino Valley Traction, later Pacific Electric interurban trackage, in the middle of E Street, was not initially, if ever, controlled by E Street Tower. This railroad crossing at grade was

to the east of E Street Tower, at MP 1.1, and not the same crossing controlled by E Street Tower at MP 0.8. In the absence of an interlocking, all SBVT and PE motors and cars, flagged across the Santa Fe, on this separate crossing at grade, in the pavement, on E Street, at MP 1.1. (See E Street MP 1.0.)

The property immediately north, east and west of the old E Street Tower was the West Coast Lumber Company Mill, (1891-1905), then became the San Bernardino Lumber & Box Company, until about 1925, which was served by the Santa Fe, along with Southern California Motor Road, later PE/SP. The San Bernardino Lumber & Box Company was owned by Redlands Orange Grower Arthur Gregory Sr. and Lumberman Henry A. Guernsey. This mill manufactured, and shipped outbound, box shook for citrus packing crates, utilizing lumber produced by mills in the San Bernardino Mountains, specifically from the Valley of the Moon, and Huston Flat timber tracts. Dual gauged trackage served this mill. Two other lumber mills at E Street were, the Gibson Lumber Company and Forest Lumber Company were on opposite sides of the Santa Fe Redlands, District. In addition a switch at MP 0.65 connected a spur to the Miller Construction Company, in 1921, west of G Street.

E Street MP 1.0 The diminutive wooden depot at E Street was a ticket agency on the Redlands Loop, from about 1888 until 1917, the final Santa Fe Agent at E Street was John Culbertson. The E Street depot was constructed on the northwest corner of E Street and the Santa Fe Redlands District. About 1926, the building was transplanted from the original location, to the Santa Fe Shops, where it was utilized as a meeting and school room for shop apprentices. About 1938, Santa Fe General Foreman Bridge & Building Jasper W. Wood, purchased the depot, and moved it to his backyard at 2nd and K Streets. General Foreman Wood, who retired in 1935, with forty two years service, used the tiny depot as a guest house behind his home. Stephen P. Rehwald and N.E. Van Ness acquired the property in 1960, and subsequently donated it to the City of San Bernardino. Mayor Raymond H. Gregory appointed a committee consisting of Councilman George C. Blair, Carl Driscoll, L.E. Moody Fire Chief of the Santa Fe San Bernardino Shops and, a San Bernardino Park Commissioner, Joe Luthey Superintendent of the Santa Fe Shops, A.K. Johnson Los Angeles Division Superintendent, and Earl E. Buie Columnist for the San Bernardino Sun. This committee made arrangements for the E Street depot to be again relocated for display in Viaduct Park, where it kept ATSF 4-8-4 No. 3751 company.

When Santa Fe Steam Locomotive 3751 was removed from Viaduct Park, on April 30, 1986, to Kaiser for restoration, the old E Street depot briefly remained behind. The City of San Bernardino gave the building to County Traffic Engineer Danny Castro. Mr. Castro dismantled the old E. Street depot. The small depot was then transported, in sections, to Muscoy. Mr. Castro had plans to reassemble, then display the E Street depot, on his Kern Street property, in Muscoy. Mr. Castro later sold his property in Muscoy, upon which the dismantled E Street Depot remained. Mr. Castro stated that he failed to interest any organizations, in accepting the E Street Depot as a donation, thus the remnants of the historic depot unceremoniously became scrap lumber, in the hands of the new property owners.

Near the old station of E Street, the Santa Fe switched a Pacific Electric interchange, along with the San Bernardino Milling Company, the Gibson Lumber Company, Forest Lumber Company, the Plaza Glass Company, Dickson’s Planing Mill, the City Feed Mill, Bekins Van & Storage, Sears & Roebuck, the J. J. Hanford Foundry, and the E Street Team track, which was

utilized by several lumber companies.

John J. Hanford arrived in San Bernardino during 1892, having previously worked for the Coronado Foundry and Machine Shop in San Diego, then for the Union Iron Works in Los Angeles, to start the Hanford Iron Works Foundry in the old Henderson Foundry Building, on the west bank of Warm Creek at First Street. Mr. Hanford secured a contract from California Southern Railway Master Mechanic G. W. Prescott to provide iron castings for the railroad. Mr. Hanford entered local politics and served as the second Mayor of San Bernardino, 1907 to 1909.

When John J. “Pop” Hanford, sought a Carnegie Public Library for San Bernardino, he was at first rebuffed, then appealed but did not obtain a large enough endowment from the Carnegie board. Mr. Hanford then prevailed upon Santa Fe’s Fred T. Perris and Santa Fe President Edward P. Ripley to persuade Andrew Carnegie to personally authorize approval, of a more suitable endowment. Mr. Hanford, Mr. Perris and Mr. Ripley urged Mr. Carnegie to fund the library for the City of San Bernardino, because San Bernardino Shops were to be the second largest on the Santa Fe System.

The San Bernardino Valley Traction Company, (PE), diamond on E Street, at MP 1.1, was installed in April of 1902. This San Bernardino Valley Traction Co Urbita Line, down E Street, initially built to serve the Urbita Springs Amusement Park, became the PE Urbita Line, serving Pickering Park, and later the National Orange Show. As with other railroad crossings at grade, such as on San Bernardino's Third Street and at Mill Street crossings, SBVT and PE cars were required to stop, then proceed, across the diamond with the Santa Fe. The PE Urbita Line, was abandoned October 17, 1927, and the interurban street trackage was removed, shortly thereafter.

The old San Bernardino Valley Traction Company’s carbarn and shops were on the southeast corner of E Street and the Santa Fe Redlands District. The SBVT Co. carbarn and shops were constructed by contractor J.F. Byrne of Redlands, and were completed in late 1901, then enlarged during 1903 and 1904. The carbarn and shops included a steam powered substation and the SBVT Co. Dispatchers’ Office. Shortly after the Pacific Electric took over SBVT Co. in 1911, it was decided to build new PE shops south of Rialto Avenue, next to Southern Pacific/PE line. These PE shops were southwest of old E Street Tower, along the Santa Fe Redlands District, where Arrowhead Credit Union Park was constructed in 1996. By 1915, the PE had moved out of the old SBVT Co. E Street carbarn and shops. The former SBVT Co carbarn and shops were subsequently occupied by Bohemian Distributing Company, a wholesale beer and liquor warehouse, switched by the Santa Fe. Greenwood’s Uniform Store now occupies the property at 115 South E Street.

Mill Street MP 2.1 Initially listed as **Kehl's Mill** in 1890, the station name was changed to **Mill Street** in 1896, and remained under that name in timetables for the next thirty years. The Southern California Railway selected the station name of Mill Street due to the street crossing name. This street's name was a reference to the old Mormon gristmill constructed in 1852, near Mill and Allen Streets, by William Davies. The water to power the mill was delivered by flume from Warm Creek. In 1862, floodwaters washed away the mill, which was rebuilt by William A. Conn. Mr. Conn then operated the rolling mill until 1882. In 1888, Charles R. Lloyd, along with Mr. Conn and other investors, organized the San Bernardino Gas & Electric Company to utilize a portion of the mill’s capacity to generate electricity.

The previous station name of Kehl's Mill is in reference to the grain rolling mill and ice factory, which was operated by Mr. Peter Kehl, from 1882, until it burned on the morning of July 3, 1892. The Santa Fe station of Mill Street is within the city limits of San Bernardino.

Next to the flagstop of Mill Street was a non-interlocked crossing of the San Bernardino Valley Traction Company, which became a portion of the Pacific Electric's Redlands Line. The Southern California Railway installed the crossing at the expense of SBVT Co during 1903. The diamond was in place until about 1918, when the PE abandoned this portion of the trackage along Mill Street. The SBVT Co. and PE interurbans were required to stop before fouling the crossing. Southern California Railway or Santa Fe trains were only required to observe the 15 mph * speed limit over the crossing.

During 1925, a spur was installed to serve the old Tagg Dairy near the station of Mill Street. The Suverkrup Lumber Company, the Home Lumber Company, the Sand Door & Plywood Company, and the Mill Street Team Track provided inbound revenue at the station of Mill Street. A 312 foot spur serving the California Cold Storage & Distribution Company was connected in December of 1954. A spur to the Home Ice & Cold Storage Company on Cluster Street was installed in January of 1961.

The John Suverkrup Lumber Company is one of the few pioneer lumber companys remaining in San Bernardino County, and a longtime Santa Fe customer. In 1888, John Suverkrup and John Hook built a sawmill two miles east of Little Bear Meadow, on the slopes of Deep Creek. By 1904, the Suverkrup & Hook Mill was sawing approximately 20,000 board feet at day, and sending much of it to their retail lumber yard in San Bernardino. In 1891, the Arrowhead Reservoir Company was formed and proceeded to purchase much of the timber tracts, and cut over lands, for what would become Lake Arrowhead. These timber tracts included portions of the Suverkrup & Hook holdings. The sawmill closed in 1914, and John Suverkrup subdivided part of his remaining holdings to create the mountain community of Cedar Glen, in 1916. Several mountain sawmills were kept busy utilizing timber removed from what would become Lake Arrowhead, and those sawmills supplied contractors’ needs during construction of the reservoir. The John Suverkrup Lumber Company’s retail building materials and lumber yard, continued, to be a Santa Fe customer at Mill Street, in San Bernardino.

Appendix C
Figures

Figure 1: Large Windows with Awnings at East End of Harvey Restaurant

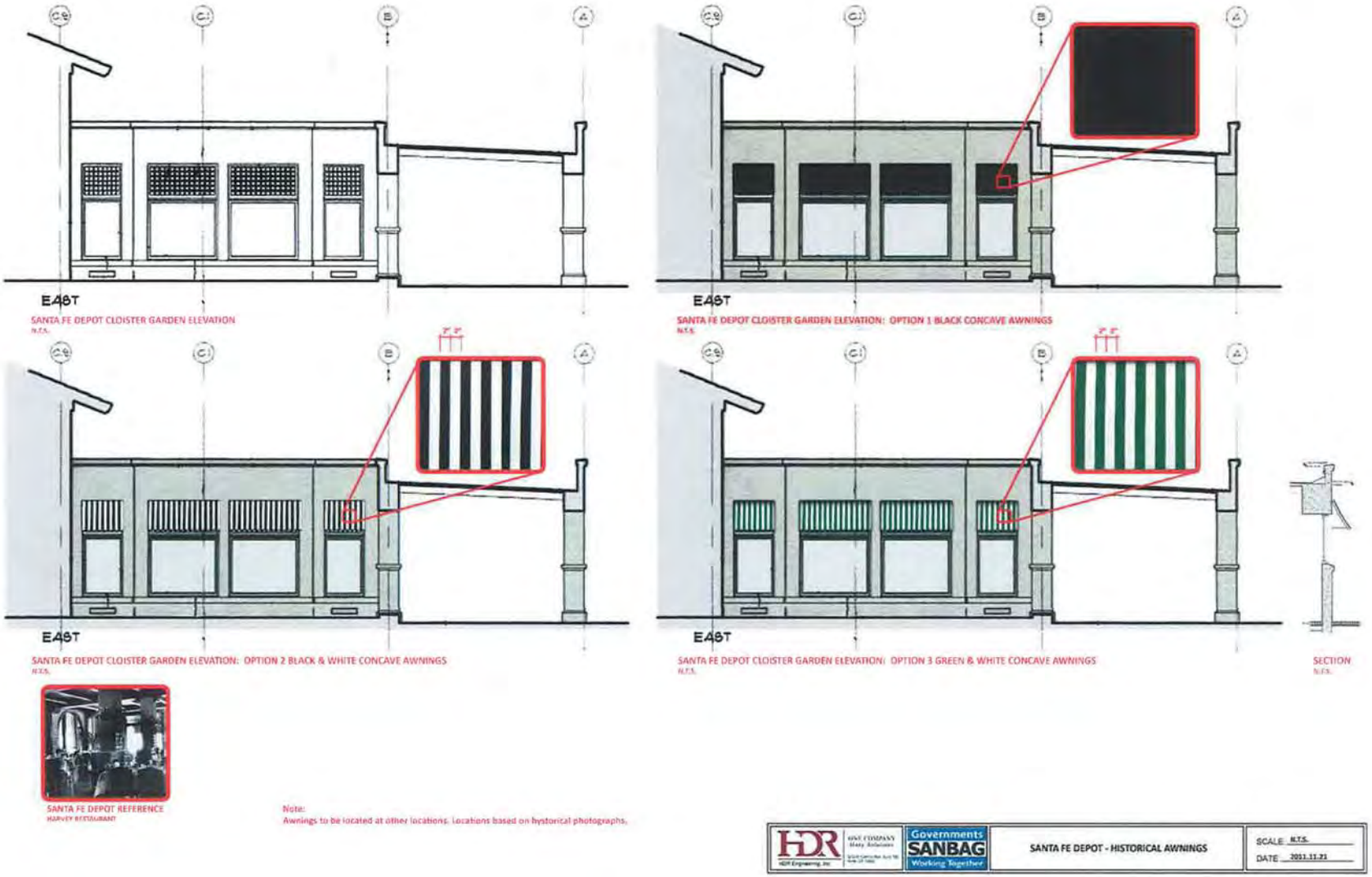

EAST
SANTA FE DEPOT CLOISTER GARDEN ELEVATION
N.T.S.
EAST
SANTA FE DEPOT CLOISTER GARDEN ELEVATION: OPTION 1 BLACK CONCAVE AWNINGS
N.T.S.
EAST
SANTA FE DEPOT CLOISTER GARDEN ELEVATION: OPTION 2 BLACK & WHITE CONCAVE AWNINGS
N.T.S.
EAST
SANTA FE DEPOT CLOISTER GARDEN ELEVATION: OPTION 3 GREEN & WHITE CONCAVE AWNINGS
N.T.S.
SECTION
N.T.S.
SANTA FE DEPOT REFERENCE
HARVEY RESTAURANT
Note:
Awnings to be located at other locations. Locations based on hystorical photographs.
HDR
Governments
SANBAG
Working Together
SANTA FE DEPOT - HISTORICAL AWNINGS
SCALE N.T.S.
DATE 2011.11.21

Figure 2

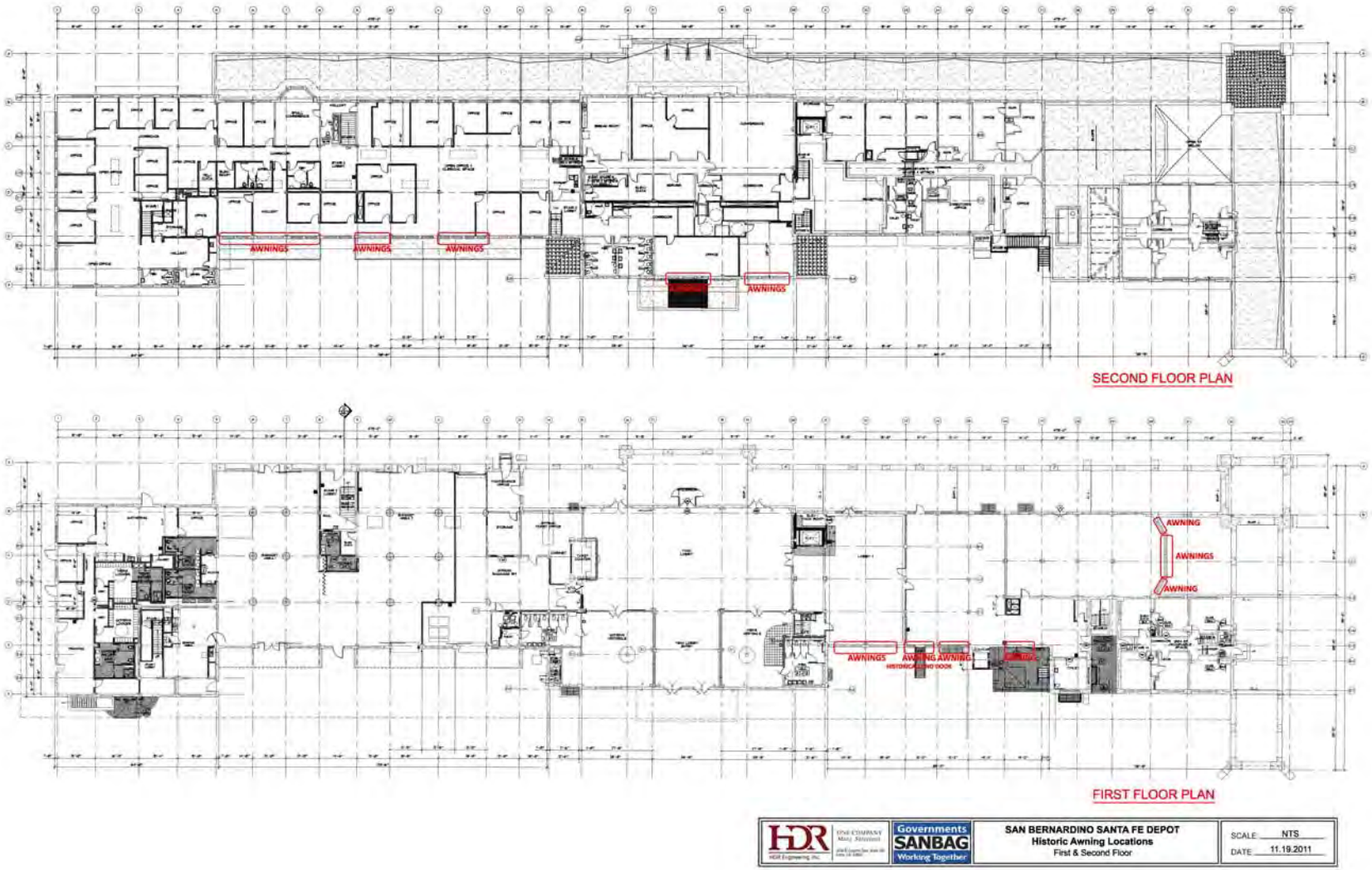

AWNINGS
AWNINGS
AWNINGS
AWNINGS
SECOND FLOOR PLAN
AWNING
AWNINGS
AWNING
AWNINGS
AWNING
AWNING
FIRST FLOOR PLAN
HDR
Governments
SANBAG
Working Together
SAN BERNARDINO SANTA FE DEPOT
Historic Awning Locations
First & Second Floor
SCALE NTS
DATE 11.19.2011

Figure 3

Santa Fe Depot

Wayfinding

Exterior Hanging Wayfinding Signs – View from Colonnade

HDR

Figure 4

Santa Fe Depot

Wayfinding

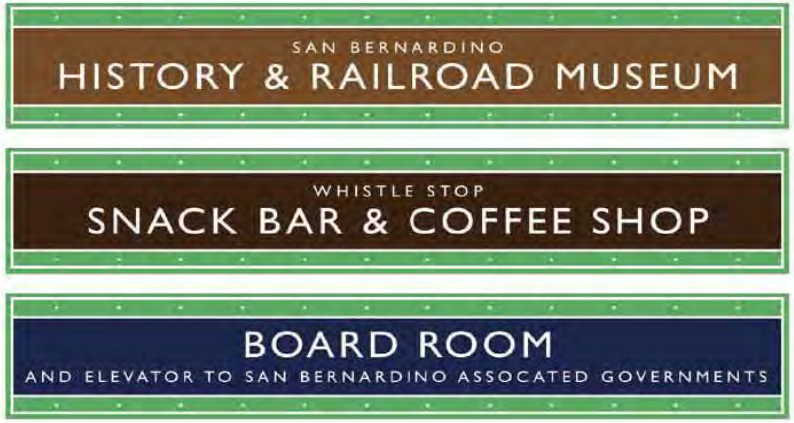
Exterior Hanging Wayfinding Signs – View from Colonnade

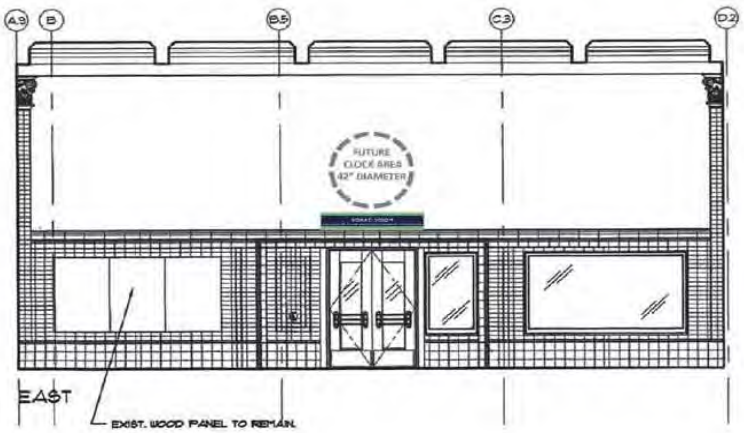
HDR

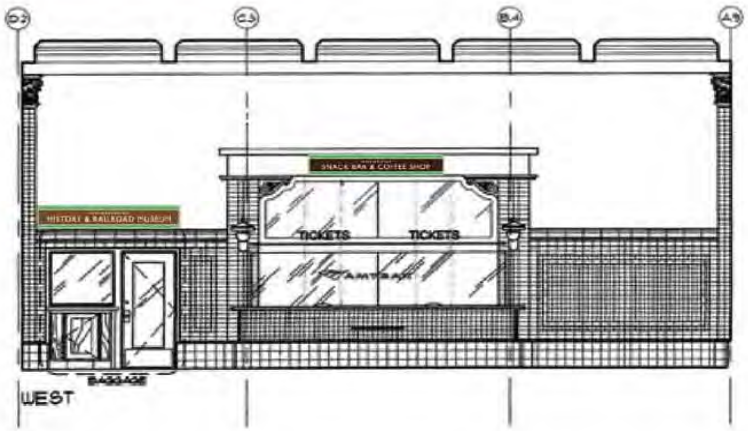
Figure 5

Santa Fe Depot

Wayfinding







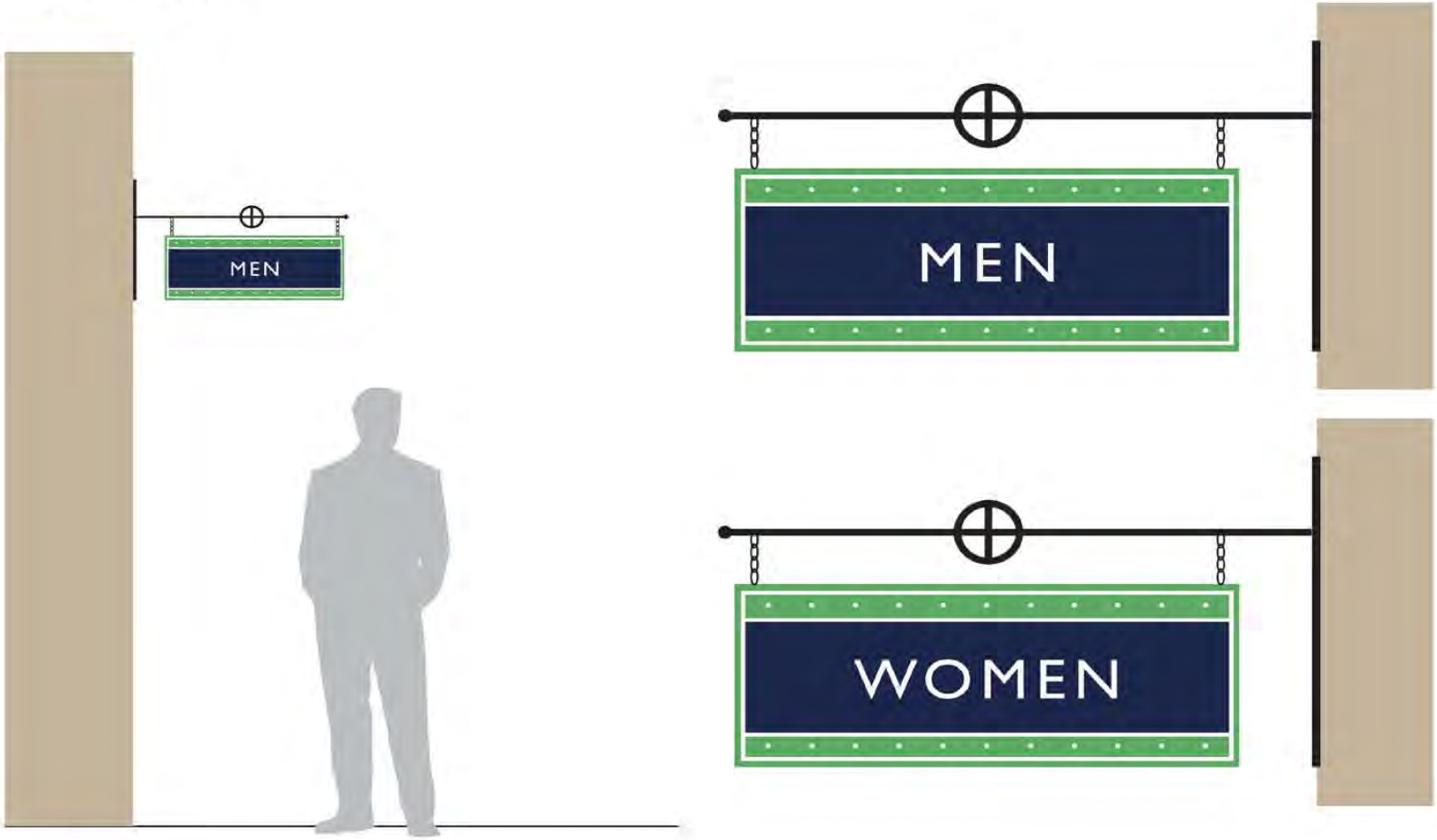
Interior Overhead Identification Signs

HDR

Figure 6

Santa Fe Depot

Wayfinding



Interior Restroom Identification – Overhead Flag Mounted Signs

HDR

Figure 7

Santa Fe Depot

Wayfinding and Clock

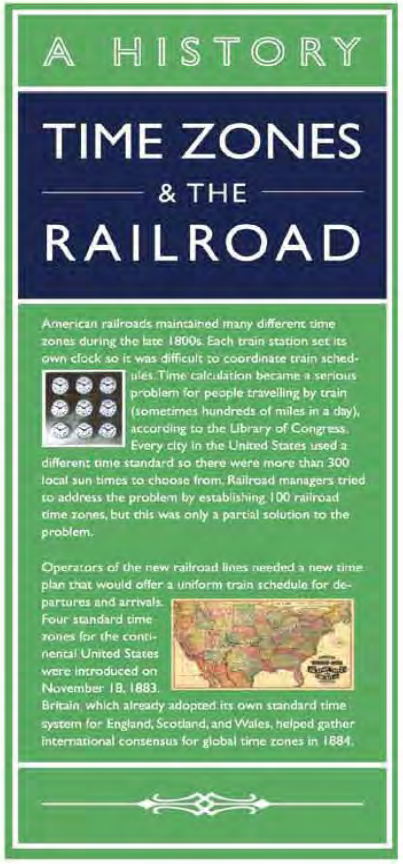
Interior Identification, Wayfinding Signs, and Clock – East and South Walls

HDR

Figure 8

Santa Fe Depot

History of Times Zones Signage



Time Zone History Plaque

HDR

Figure 9

Santa Fe Depot

Wayfinding and Clock

Interior Identification, Wayfinding Signs, and Clock – East and South Walls

HDR

Figure 10

Santa Fe Depot

Monument Sign

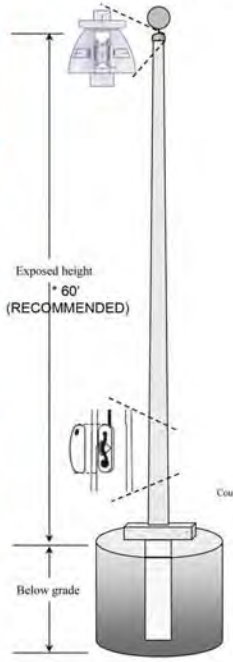
HDR

Figure 11

NOTE: SHOWN IN WHITE, PARK.
DARK BRONZE RECOMMENDED

FLAGPOLES ETC
Residential & Commercial ★ Flags & Flagpoles

Flagpoles & Banner Poles
External & Internal Halyard (IH), In-Ground Sleeve



Counterweights on internal halyard poles: 2.5 lbs.

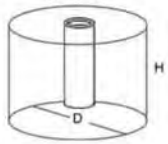
Recommended hole size:

40-ft pole: D = 35" / H = 54"

6" of gravel must be added to the bottom of the hole to facilitate drainage. Actual depth of concrete is equal to Depth minus 6"

D = Hole diameter H = Hole height

Foundation



www.flagpolesetc.com

Email: sales@flagpolesetc.com

HDR Engineering, Inc. — ONE COMPANY *Many Solutions*	Governments SANBAG Working Together	FIBER GLASS FLAG POLE MAX HEIGHT 60 FEET (RECOMMENDED) COLOR -- DARK BRONZE	SCALE: N.T.S. DATE: 2011.11.21

Figure 12