INFORMATION HANDOUT

For Contract No. 04-3G59U4

At 04-Ala,SJ-205, 580-0.0/1.0, 0.0/8.0, 26.1/30.3, 13.5/15.4

Identified by

Project ID 0415000066

PERMITS

California Department of Fish and Wildlife, Incidental Take Permit No. 2081-2015-039-03, Interstate 580 Pavement Rehabilitation Project, February 11, 2016

U.S. Fish and Wildlife Service, Biological Opinion on Effects of the Proposed Interstate 580 and Interstate 205 Pavement Rehabilitation Project, Alameda County, California (Caltrans EA 3G590), August 7, 2014

U.S. Fish and Wildlife Service, Reinitiation of Consultation on the Interstate 580 and Interstate 205 Pavement Rehabilitation Project, Alameda County, California (Caltrans EA 3G590), August 13, 2015

WATER QUALITY

Water Quality Information Handout, Contract No: 04-3G59U4, 04-ALA-580/205 & SJ-580; PM-Var, Roadway Rehabilitation & Ramp Metering, May 2016

MATERIALS INFORMATION

Revised Final Geotechnical Design Report for ERS, August 21, 2015

Preliminary Site Investigation Report, I-580 TOS and MVP Installation Project, Alameda County, California, February 2016

Paleontological Mitigation Plan, Interstate 580 Freeway Performance Initiative Project, Alameda and San Joaquin Counties, California, May 8, 2014

California Department of Fish and Wildlife
Bay Delta Region
7329 Silverado Trail
Napa, Ca 94599

California Endangered Species Act
Incidental Take Permit No. 2081-2015-039-03

Interstate 580 Pavement Rehabilitation Project

Authority: This California Endangered Species Act (CESA) incidental take permit (ITP) is issued by the California Department of Fish and Wildlife (CDFW) pursuant to Fish and Game Code section 2081, subdivisions (b) and (c), and California Code of Regulations, Title 14, section 783.0 et seq. CESA prohibits the take[1] of any species of wildlife designated by the California Fish and Game Commission as an endangered, threatened, or candidate species.[2] CDFW may authorize the take of any such species by permit if the conditions set forth in Fish and Game Code section 2081, subdivisions (b) and (c) are met. (See Cal. Code Regs., tit. 14, § 783.4).

Permittee:	**California Department of Transportation**
Principal Officer:	**JoAnn Cullom, Office Chief**
Contact Person:	**Christopher States, (510) 286-7185**
Mailing Address:	**111 Grand Avenue** **Oakland, CA 94612**

Effective Date and Expiration Date of this ITP:
This ITP shall be executed in duplicate original form and shall become effective once a duplicate original is acknowledged by signature of the Permittee on the last page of this ITP and returned to CDFW's Habitat Conservation Planning Branch at the address listed in the Notices section of this ITP. Unless renewed by CDFW, this ITP's authorization to take the Covered Species shall expire on **December 31, 2019**.

Notwithstanding the expiration date on the take authorization provided by this ITP, Permittee's obligations pursuant to this ITP do not end until CDFW accepts as complete the Permittee's Final Mitigation Report required by Condition of Approval 7.5 of this ITP.

---

[1] Pursuant to Fish and Game Code section 86, "'Take' means hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." See also *Environmental Protection Information Center v. California Department of Forestry and Fire Protection* (2008) 44 Cal.4th 459, 507 (for purposes of incidental take permitting under Fish and Game Code section 2081, subdivision (b), "'take' … means to catch, capture or kill").

[2] "The definition of an endangered, threatened, and candidate species for purposes of CESA are found in Fish and Game Code sections 2062, 2067, and 2068, respectively.

Project Location:
The Project is located along Interstate 580 and Interstate 205 in Alameda and San Joaquin Counties. The project includes an area of Interstate-580 between Patterson Pass Road Overcrossing in San Joaquin County (post mile 13.5) and Greenville Road Overhead in Alameda County (post mile 8.0) and also includes a small section of Interstate 205, post mile 0.0 to 1.0 (combined these segments are referred to as the Altamont Pass segment). A second distinct location occurs on Interstate 580 between Eden Canyon Road Undercrossing (post mile 26.1) and Strobridge Avenue Undercrossing (post mile 30.3) in Alameda County (referred to as the Castro Valley segment).

Project Description:
Caltrans proposes to rehabilitate the pavement of eastbound Interstate 580, from the San Joaquin County Line to one mile east of North Flynn Road and the mainline of Westbound Interstate-580/Interstate-205 from the San Joaquin County Line to Greenville Road Overhead in Alameda County. A second distinct location occurs on Interstate 580 between the Eden Canyon Road Undercrossing (post mile 26.1) and the Strobridge Avenue Undercrossing (post mile 30.3) in Alameda County. Rehabilitation of the pavement will include adding overhead safety signs, replacing dikes, concrete curbs, metal beam guardrails, and concrete barriers, placement of shoulder backing, embankment reconstruction, adjusting existing drainage inlets to grade, replacing bridge approach slabs, and adding polyester concrete overlay on Midway Road Undercrossing and California Aqueduct Bridge. The project will also meter and rehabilitate 12 existing on-ramps, two of which will be widened to provide for a High Occupancy Vehicle preferential lane or Mixed Flow lane, Maintenance Vehicle Pullouts and California Highway Patrol pullouts.

Project-related impacts will generally be confined to within 60 feet of the edge of pavement, with a few exceptions, such as ramp widening at the westbound Grant Line Road on-ramp, which will impact up to a maximum of 105 feet from the edge of pavement.

Covered Species Subject to Take Authorization Provided by this ITP:

This ITP covers the following species:

Name	CESA Status
1. California tiger salamander (*Ambystoma californiense*)	Threatened[3]
2. Alameda whipsnake (*Masticophis lateralis*)	Threatened[3]

These species and only these species are the "Covered Species" for the purposes of this ITP.

Impacts of the Taking on Covered Species:
Project activities and their resulting impacts are expected to result in the incidental take of individuals of the Covered Species. The activities described above expected to result in incidental take of individuals of the Covered Species include mortality from heavy equipment

[3] See Cal. Code Regs. tit. 14 § 670.5, subd. (b)(3)(G), (b)(4)(D)

operation, foot traffic, entombment during excavation and earthwork, introduction of contaminants, loss of habitat, and capture and relocation of encountered individuals of the Covered Species (Covered Activities). Covered Species habitat impacts will result from the earthwork and ground disturbance associated with the above referenced roadway improvements. Accordingly, take is authorized within potential Covered Species habitat areas subject to ground disturbing activities as shown in Figure 1 (collectively, the Project Area).

Temporary impacts will total 32.50 acres, and permanent impacts will total 6.25 acres. Impacts of the authorized taking also include adverse impacts to the Covered Species related to temporal habitat loss, roadside degradation of habitat extending into higher quality habitat (edge effects), and the Project's incremental contribution to cumulative impacts (indirect impacts). These impacts include: stress resulting from construction noise and vibrations, temporary and permanent habitat loss, and capture and relocation.

Incidental Take Authorization of Covered Species:
This ITP authorizes incidental take of the Covered Species and only the Covered Species. With respect to incidental take of the Covered Species, CDFW authorizes the Permittee, its employees, contractors, and agents to take Covered Species incidentally in carrying out the Covered Activities, subject to the limitations described in this section and the Conditions of Approval identified below. This ITP does not authorize take of Covered Species from activities outside the scope of the Covered Activities, take of Covered Species outside of the Project Area, take of Covered Species resulting from violation of this ITP, or intentional take of Covered Species except for capture and relocation of Covered Species as authorized by this ITP.

Conditions of Approval:
Unless specified otherwise, the following measures apply to all Covered Activities within the Project Area, including areas used for vehicular ingress and egress, staging and parking, and noise and vibration generating activities that may cause take. CDFW's issuance of this ITP and Permittee's authorization to take the Covered Species are subject to Permittee's compliance with and implementation of the following Conditions of Approval:

1. **Legal Compliance:** Permittee shall comply with all applicable federal, state, and local laws in existence on the effective date of this ITP or adopted thereafter.

2. **CEQA Compliance:** Permittee shall implement and adhere to the mitigation measures related to the Covered Species in the Biological Resources section of the Negative Declaration and Initial Study (SCH No.: 2014012001) certified by the California Department of Transportation on September 8, 2014 as lead agency for the Project pursuant to the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.).

3. **ESA Compliance:** Permittee shall implement and adhere to the terms and conditions related to the Covered Species in the Biological Opinion on the Proposed Interstate 580 and Interstate 205 Pavement Rehabilitation Project, Alameda County, California No. 2014-F-0311-1 for the Project pursuant to the Federal Endangered Species Act (ESA). For purposes of this ITP, where the terms and conditions for the Covered Species in the federal

authorization are less protective of the Covered Species or otherwise conflict with this ITP, the conditions of approval set forth in this ITP shall control.

4. **ITP Time Frame Compliance:** Permittee shall fully implement and adhere to the conditions of this ITP within the time frames set forth below and as set forth in the Mitigation Monitoring and Reporting Program (MMRP), which is included as Attachment 1 to this ITP.

5. **General Provisions:**

5.1. Designated Representative. Before starting Covered Activities, Permittee shall designate a representative (Designated Representative) responsible for communications with CDFW and overseeing compliance with this ITP. Permittee shall notify CDFW in writing before starting Covered Activities of the Designated Representative's name, business address, and contact information, and shall notify CDFW in writing if a substitute Designated Representative is selected or identified at any time during the term of this ITP.

5.2. Designated Biologist. Permittee shall submit to CDFW in writing the name, qualifications, business address, and contact information of a biological monitor (Designated Biologist) at least 30 days before starting Covered Activities. Permittee shall ensure that the Designated Biologist is knowledgeable and experienced in the biology, natural history, collecting and handling of the Covered Species. The Designated Biologist shall be responsible for monitoring Covered Activities to help minimize and fully mitigate or avoid the incidental take of individual Covered Species and to minimize disturbance of Covered Species' habitat. Permittee shall obtain CDFW approval of the Designated Biologist in writing before starting Covered Activities, and shall also obtain approval in advance in writing if the Designated Biologist must be changed.

5.3. Designated Biologist Authority. To ensure compliance with the Conditions of Approval of this ITP, the Designated Biologist shall have authority to immediately stop any activity, through the Resident Engineer, that does not comply with this ITP, and/or to order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species.

5.4. Education Program. Permittee shall conduct an education program for all persons employed or otherwise working in the Project Area before performing any work. The program shall consist of a presentation from the Designated Biologist that includes a discussion of the biology and general behavior of the Covered Species, information about the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, its status pursuant to CESA including legal protection, recovery efforts, penalties for violations and Project-specific protective measures described in this ITP. Permittee shall provide interpretation for non-English speaking workers, and the same instruction shall be provided to any new workers before they are authorized to perform work in the Project Area. Permittee shall prepare and distribute wallet-sized cards or a fact sheet handout containing this information for

workers to carry in the Project Area. Upon completion of the program, employees shall sign a form stating they attended the program and understand all protection measures.

5.5. Construction Monitoring Notebook. The Designated Biologist shall maintain a construction-monitoring notebook on-site throughout the construction period, which shall include a copy of this ITP with attachments and a list of signatures of all personnel who have successfully completed the education program. Permittee shall ensure a copy of the construction-monitoring notebook is available for review at the Project site upon request by CDFW.

5.6. Trash Abatement. Permittee shall initiate a trash abatement program before starting Covered Activities and shall continue the program for the duration of the Project. Permittee shall ensure that trash and food items are contained in animal-proof containers and removed at least once a week to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.

5.7. Dust Control. Permittee shall implement dust control measures during Covered Activities to facilitate visibility for monitoring of the Covered Species by the Designated Biologist. Permittee shall keep the amount of water used to the minimum amount needed, and shall not allow water to form puddles.

5.8. Erosion Control Materials. Permittee shall prohibit use of erosion control materials potentially harmful to Covered Species and other species, such as monofilament netting (erosion control matting) or similar material, in potential Covered Species' habitat.

5.9. Project Access. Project-related personnel shall access the Project Area using existing routes, or routes identified in the Project Description, and shall not cross Covered Species' habitat outside of or en route to the Project Area. Permittee shall ensure that vehicle speeds do not exceed 5 miles per hour to avoid Covered Species on or traversing the roads. If Permittee determines construction of routes for travel are necessary outside of the Project Area, the Designated Representative shall contact CDFW for written approval before carrying out such an activity. CDFW may require an amendment to this ITP, among other reasons, if additional take of Covered Species will occur as a result of the Project modification.

5.10. Staging Areas. Permittee shall confine all Project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to the Project Area using, to the extent possible, previously disturbed areas. Additionally, Permittee shall not use or cross Covered Species' habitat outside of the marked Project Area.

5.11. Hazardous Waste. Permittee shall immediately stop and, pursuant to pertinent state and federal statutes and regulations, arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safe to do so. Permittee shall exclude the storage and handling of hazardous

materials from the Project Area and shall properly contain and dispose of any unused or leftover hazardous products off-site.

5.12. CDFW Access. Permittee shall provide CDFW staff with reasonable access to the Project, and shall otherwise fully cooperate with CDFW efforts to verify compliance with or effectiveness of mitigation measures set forth in this ITP.

5.13. Refuse Removal. Upon completion of Covered Activities, Permittee shall remove from the Project Area and properly dispose of all temporary fill and construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.

6. Monitoring, Notification and Reporting Provisions:

6.1. Notification Before Commencement. The Designated Representative shall notify CDFW 14 calendar days before starting Covered Activities and shall document compliance with all pre-Project Conditions of Approval before starting Covered Activities.

6.2. Notification of Non-compliance. The Designated Representative shall immediately notify CDFW in writing if it determines that the Permittee is not in compliance with any Condition of Approval of this ITP, including but not limited to any actual or anticipated failure to implement measures within the time periods indicated in this ITP and/or the MMRP. The Designated Representative shall report any non-compliance with this ITP to CDFW within 48 hours.

6.3. Compliance Monitoring. The Designated Biologist shall be on-site daily when Covered Activities occur. The Designated Biologist shall conduct compliance inspections to (1) minimize incidental take of the Covered Species; (2) prevent unlawful take of species; (3) check for compliance with all measures of this ITP; (4) check all exclusion zones; and (5) ensure that Covered Activities are only occurring in the Project Area. The Designated Representative or Designated Biologist shall prepare daily written observation and inspection records summarizing: oversight activities and compliance inspections, observations of Covered Species and their sign, survey results, and monitoring activities required by this ITP.

6.4. CNDDB Observations. The Designated Biologist shall submit all observations of Covered Species to CDFW's California Natural Diversity Database (CNDDB) within 60 calendar days of the observation.

6.5. Final Mitigation Report. No later than 45 days after completion of all mitigation measures, Permittee shall provide CDFW with a Final Mitigation Report. The Designated Biologist shall prepare the Final Mitigation Report which shall include, at a minimum: (1) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; (3) all available information about Project-related incidental take of the Covered Species; (4) information about other Project impacts on

the Covered Species; (5) beginning and ending dates of Covered Activities; (6) an assessment of the effectiveness of this ITP's Conditions of Approval in minimizing and fully mitigating Project impacts of the taking on Covered Species; (7) recommendations on how mitigation measures might be changed to more effectively minimize take and mitigate the impacts of future projects on the Covered Species; and (8) any other pertinent information.

6.6. Notification of Take or Injury. Permittee shall immediately notify the Designated Biologist if a Covered Species is taken or injured by a Project-related activity, or if a Covered Species is otherwise found dead or injured within the vicinity of the Project. The Designated Biologist or Designated Representative shall provide initial notification to CDFW by calling the Regional Office at (707) 944-5500. The initial notification to CDFW shall include information regarding the location, species, and number of animals taken or injured and the ITP Number. Following initial notification, Permittee shall send CDFW a written report within two calendar days. The report shall include the date and time of the finding or incident, GPS location of the animal or carcass, and if possible provide a photograph, explanation as to cause of take or injury, and any other pertinent information.

6.6.1. If the Covered Species is found recently deceased, the carcass shall be immediately bagged, labeled, and preserved in a freezer. The label shall include time and date, GPS location, circumstances surrounding death (if known), and ITP tracking number. Specimens shall be delivered to the CDFW Wildlife Investigations Lab, Attention: Deana Clifford, 1701 Nimbus Road Suite D, Rancho Cordova, CA 95670 within two calendar days of the discovery.

7. Take Minimization Measures:

The following requirements are intended to ensure the minimization of incidental take of Covered Species in the Project Area during Covered Activities. Permittee shall implement and adhere to the following conditions to minimize take of Covered Species:

7.1. Except for limited vegetation clearing necessary to minimize effects to nesting birds, Permittee shall confine all earthwork and vegetation clearing within the Project Area to the period of April 15 to October 31.

7.2. The Designated Biologist shall complete walking surveys of the Project Area to be impacted prior to Covered Activities and shall follow earthmoving equipment to look for Covered Species' during all work that could cause take. If a Covered Species are discovered by the Designated Biologist or anyone else, the Designated Biologist shall move the animal to a safe nearby location (e.g. mouth of ground-squirrel burrow outside of the construction area) and monitor it until it is determined that it is not imperiled by predators or other dangers.

7.3. The Designated Biologist shall relocate any Covered Species found within the Project Area to be impacted to an active rodent burrow system located no more than 300 feet outside of the BSA unless otherwise approved by CDFW. The Covered Species shall be

monitored until it is determined that it is not imperiled by predators or other dangers. Relocation areas shall be identified by the Designated Biologist based upon best suitable habitat available and approved by CDFW prior to the start of Covered Activities. The Covered Species shall be photographed and measured for identification purposes prior to relocation. All documentation shall be provided to the CDFW within 24 hours of Covered Species Relocation.

7.4. Permittee shall at the end of each work day, create an escape ramp at each end of any open trench to allow any animals that may have become entrapped in the trench to climb out overnight. The ramp may be constructed of either dirt fill or wood planking or other suitable material that is placed at an angle no greater than 30 degrees.

7.5. If an injured Covered Species is found during the project term, the individual shall be evaluated by the Lead Designated Biologist who shall then immediately contact the CDFW Regional Representative, via email and telephone, to discuss the next steps. If the CDFW Regional Representative cannot be contacted immediately, the injured Covered Species shall be placed in a shaded container (and amphibians shall be kept moist). If the CDFW Regional Representative is not available or has not responded within 2 hours of initial attempts then the following steps shall be taken:

a) If the injury is minor or healing and the Covered Species is likely to survive, the Covered Species shall be released immediately in accordance with the Condition of Approval 7.5.

b) If it is determined that the Covered Species has major or serious injuries as result of Project-related activities, the Designated Biologist shall immediately take it to the Lindsay Wildlife Museum or another CDFW-approved facility. If taken into captivity, the individual shall remain in captivity and not be released into the wild unless it has been kept in quarantine and the release is authorized by CDFW and USFWS. Permittee shall bear any costs associated with the care or treatment of such injured Covered Species. The circumstances of the injury, the procedure followed and the final disposition of the injured animal shall be documented in a written incident report as described in Condition 6.6.

7.6. Additional Impacts to Habitat. Additional impacts to habitat beyond those identified the Impacts of the Taking on Covered Species section of this ITP are not authorized.

8. Habitat Management Land Acquisition and Restoration:

CDFW has determined that permanent protection and perpetual management of compensatory habitat is necessary and required pursuant to CESA to fully mitigate Project-related impacts of the taking on the Covered Species that will result with implementation of the Covered Activities. This determination is based on factors including an assessment of the importance of the habitat in the Project Area, the extent to which the Covered Activities will impact the habitat, and CDFW's estimate of the acreage required to provide for adequate compensation.

To meet this requirement, the Permittee shall provide for both the permanent protection and management of 54.50 acres of Covered Species habitat (Habitat Management (HM) lands), pursuant to Condition of Approval 8.2 below and the calculation and deposit of the management funds pursuant to Condition of Approval 8.3.10 below. Permanent protection and funding for perpetual management of compensatory habitat must be complete before starting Covered Activities, or within 18 months of the effective date of this ITP if Security is provided pursuant to Condition of Approval 9 below for all uncompleted obligations. The Permittee shall also restore on-site 32.50 acres of temporarily impacted Covered Species habitat pursuant to Condition of Approval 8.5 below.

8.1. Cost Estimates. CDFW has estimated the cost of acquisition, protection, and perpetual management of the HM lands and restoration of temporarily disturbed habitat as follows:

8.1.1. Land acquisition costs for HM lands identified in Condition of Approval 8.2 below, estimated at $35,000/acre for 54.50 acres: **$1,907,500.00**. Land acquisitions costs are estimated using local fair market current value for lands with habitat values meeting mitigation requirements;

8.1.2. Start-up costs for HM lands, including initial site protection and enhancement costs as described in Condition of Approval 8.2.5 below, estimated at **$15,000.00**;

8.1.3. Interim management period funding as described in Condition of Approval 8.2.6 below, estimated at **$17,000.00**;

8.1.4. Long-term management funding as described in Condition of Approval 8.3.7 below, estimated at $6000/acre for 54.50 acres: **$327,000.00**. Long-term management funding is estimated initially for the purpose of providing Security to ensure implementation of HM lands management;

8.1.5. Related transaction fees including but not limited to account set-up fees, administrative fees, title and documentation review and related title transactions, expenses incurred from other state agency reviews, and overhead related to transfer of HM lands to CDFW as described in Condition of Approval 8.2.1, estimated at **$3,000.00**;

8.1.6. Restoration of on-site temporary effects to Covered Species habitat as described in Condition of Approval 8.4, calculated at $20,000/acre for 32.50 acres: **$650,000**.

8.2. Covered Species Credits. Permittee shall purchase 54.50 acres of Covered Species credits from a CDFW-approved mitigation or conservation bank prior to initiating Covered Activities, or no later than 18 months from the issuance of this ITP if Security is provided pursuant to Condition of Approval 9 below.

OR:

8.3. Habitat Acquisition and Protection. To provide for the acquisition and perpetual protection and management of the HM lands, the Permittee shall:

8.3.1. Fee Title/Conservation Easement. Transfer fee title to the HM lands to CDFW pursuant to terms approved in writing by CDFW. Alternatively, CDFW, in its sole discretion, may authorize a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Government Code sections 65965-65968, as amended. If CDFW does not hold fee title to the HM lands, CDFW shall act as grantee for a conservation easement over the HM lands or shall, in its sole discretion, approve a non-profit entity, public agency, or Native American tribe to act as grantee for a conservation easement over the HM lands provided that the entity, agency, or tribe meets the requirements of Civil Code section 815.3. If CDFW does not hold the conservation easement, CDFW shall be expressly named in the conservation easement as a third-party beneficiary. The Permittee shall obtain CDFW written approval of any conservation easement before its execution or recordation. No conservation easement shall be approved by CDFW unless it complies with Government Code sections 65965-65968, as amended and includes provisions expressly addressing Government Code sections 65966(j) and 65967(e);

8.3.2. HM Lands Approval. Obtain CDFW written approval of the HM lands before acquisition and/or transfer of the land by submitting, at least three months before acquisition and/or transfer of the HM lands, a formal Proposed Lands for Acquisition Form (see Attachment 2B) identifying the land to be purchased or property interest conveyed to an approved entity as mitigation for the Project's impacts on Covered Species;

8.3.3. HM Lands Documentation. Provide a recent preliminary title report, initial hazardous materials survey report, and other necessary documents (see Attachment 2A). All documents conveying the HM lands and all conditions of title are subject to the approval of CDFW, and if applicable, the Wildlife Conservation Board and the Department of General Services;

8.3.4. Land Manager. Designate both an interim and long-term land manager approved by CDFW. The interim and long-term land managers may, but need not, be the same. The interim and/or long-term land managers may be the landowner or another party. Documents related to land management shall identify both the interim and long-term land managers. Permittee shall notify CDFW of any subsequent changes in the land manager within 30 days of the change. If CDFW will hold fee title to the mitigation land, CDFW will also act as both the interim and long-term land manager unless otherwise specified.

8.3.5. Start-up Activities. Provide for the implementation of start-up activities, including the initial site protection and enhancement of HM lands, once the HM lands have

been approved by CDFW. Start-up activities include, at a minimum: (1) preparing a final management plan for CDFW approval (see https://www.wildlife.ca.gov/Conservation/Planning/Banking/Templates) as described in Condition of Approval 8.2.6; (2) conducting a baseline biological assessment and land survey report within four months of recording or transfer; (3) developing and transferring Geographic Information Systems (GIS) data if applicable; (4) conducting litter removal; (5) conducting initial habitat restoration or enhancement, if applicable; and (6) installing signage;

8.3.6. Interim Management (Initial and Capital). Provide for the interim management of the HM lands. The Permittee shall ensure that the interim land manager implements the interim management of the HM lands as described in the final management plan and conservation easement approved by CDFW. The interim management period shall be a minimum of three years from the date of HM land acquisition and protection and full funding of the Endowment and includes expected management following start-up activities. Interim management period activities described in the final management plan shall include fence repair, continuing trash removal, site monitoring, and vegetation and invasive species management. Permittee shall either (1) provide a security to CDFW for the minimum of three years of interim management that the land owner, Permittee, or land manager agrees to manage and pay for at their own expense, (2) establish an escrow account with written instructions approved in advance in writing by CDFW to pay the land manager annually in advance, or (3) establish a short-term enhancement account with CDFW or a CDFW-approved entity for payment to the land manager.

8.3.7. Endowment Fund. The Permittee shall ensure that the HM lands are perpetually managed, maintained, and monitored by the long-term land manager as described in this ITP, the conservation easement, and the final management plan approved by CDFW. After obtaining CDFW approval of the HM lands, Permittee shall provide long-term management funding for the perpetual management of the HM lands by establishing a long-term management fund (Endowment). The Endowment is a sum of money, held in a CDFW-approved fund that provides funds for the perpetual management, maintenance, monitoring, and other activities on the HM lands consistent with the management plan(s) required by Condition of Approval 8.2.5. Endowment as used in this ITP shall refer to the endowment deposit and all interest, dividends, other earnings, additions and appreciation thereon. The Endowment shall be governed by this ITP, Government Code sections 65965-65968, as amended, and Probate Code sections 18501-18510, as amended.

After the interim management period, Permittee shall ensure that the designated long-term land manager implements the management and monitoring of the HM lands according to the final management plan. The long-term land manager shall be obligated to manage and monitor the HM lands in perpetuity to preserve their

conservation values in accordance with this ITP, the conservation easement, and the final management plan. Such activities shall be funded through the Endowment.

8.3.8. Identify an Endowment Manager. The Endowment shall be held by the Endowment Manager, which shall be either CDFW or another entity qualified pursuant to Government Code sections 65965-65968, as amended. Permittee shall submit to CDFW a written proposal that includes: (i) the name of the proposed Endowment Manager; (ii) whether the proposed Endowment Manager is a governmental entity, special district, nonprofit organization, community foundation, or congressionally chartered foundation; (iii) whether the proposed Endowment Manager holds the property or an interest in the property for conservation purposes as required by Government Code section 65968(b)(1) or, in the alternative, the basis for finding that the Project qualifies for an exception pursuant to Government Code section 65968(b)(2); and (iv) a copy of the proposed Endowment Manager's certification pursuant to Government Code section 65968(e). Within thirty days of CDFW's receipt of Permittee's written proposal, CDFW shall inform Permittee in writing if it determines the proposal does not satisfy the requirements of Fish and Game Code section 2081(b)(4) and, if so, shall provide Permittee with a written explanation of the reasons for its determination. If CDFW does not provide Permittee with a written determination within the thirty-day period, the proposal shall be deemed consistent with Section 2081(b)(4);

8.3.9. Calculate the Endowment Funds Deposit. After obtaining CDFW written approval of the HM lands, long-term management plan, and Endowment Manager, Permittee shall prepare a Property Analysis Record (PAR), or PAR-equivalent analysis (hereinafter "PAR"), to calculate the amount of funding necessary to ensure the long-term management of the HM lands (Endowment Deposit Amount). The Permittee shall submit to CDFW for review and approval the results of the PAR before transferring funds to the Endowment Manager.

8.3.9.1. Capitalization Rate and Fees. Permittee shall obtain the capitalization rate from the selected Endowment Manager for use in calculating the PAR and adjust for any additional administrative, periodic, or annual fees.

8.3.9.2. Endowment Buffers/Assumptions. Permittee shall include in PAR assumptions the following buffers for endowment establishment and use that will substantially ensure long-term viability and security of the Endowment:

8.3.9.3. 10 Percent Contingency. A 10 percent contingency shall be added to each endowment calculation to hedge against underestimation of the fund, unanticipated expenditures, inflation, or catastrophic events.

8.3.9.4. Three Years Delayed Spending. The endowment shall be established assuming spending will not occur for the first three years after full funding.

8.3.9.5. Non-annualized Expenses. For all large capital expenses to occur periodically but not annually such as fence replacement or well replacement, payments shall be withheld from the annual disbursement until the year of anticipated need or upon request to Endowment Manager and CDFW.

8.3.10. Transfer Long-term Endowment Funds. Permittee shall transfer the long-term endowment funds to the Endowment Manager upon CDFW approval of the Endowment Deposit Amount identified above. The approved Endowment Manager may pool the Endowment with other endowments for the operation, management, and protection of HM lands for local populations of the Covered Species but shall maintain separate accounting for each Endowment. The Endowment Manager shall, at all times, hold and manage the Endowment in compliance with this ITP, Government Code sections 65965-65968, as amended, and Probate Code sections 18501-18510, as amended.

8.4. Reimburse CDFW. Permittee shall reimburse CDFW for all reasonable expenses incurred by CDFW such as transaction fees, account set-up fees, administrative fees, title and documentation review and related title transactions, expenses incurred from other state agency reviews, and overhead related to transfer of HM lands to CDFW.

8.5. Habitat Restoration. Permittee shall restore on-site the 32.50 acre of Covered Species habitat that will be temporarily disturbed during construction to pre-project or better conditions. Within 6 months of issuance of this ITP, the Permittee shall prepare a Vegetation Restoration Plan to facilitate revegetation of the 32.50 acre of temporary construction disturbance on-site, and shall ensure that the Plan is successfully implemented by the contractor. The Plan shall include detailed specifications for restoring all temporarily disturbed areas, such as seed mixes and application methods.

9. Performance Security

The Permittee may proceed with Covered Activities only after the Permittee has ensured funding (Security) to complete any activity required by Condition of Approval 8 that has not been completed before Covered Activities begin. Permittee shall provide Security as follows:

9.1. Security Amount. The Security shall be in the amount of $2,919,500.00. This amount is based on the cost estimates identified in Condition of Approval 8.1 above.

9.2. Security Form. The Security shall be in the form of a funding assurance letter signed by the Deputy District Directors of Environmental Planning and Engineering and Project Management, or another form of Security approved in advance in writing by CDFW's Office of the General Counsel or another mechanism approved in advance in writing by

CDFW's Office of the General Counsel. The funding assurance letter shall reference the estimated security and provide a commitment to fund the full cost of all ITP measures.

9.3. Security Timeline. The Security shall be provided to CDFW before Covered Activities begin or within 30 days after the effective date of this ITP, whichever occurs first.

Even if Security is provided, the Permittee must complete the required acquisition, protection and transfer of all HM lands and record any required conservation easements no later than 18 months from the effective date of this ITP. CDFW may require the Permittee to provide additional HM lands and/or additional funding to ensure the impacts of the taking are minimized and fully mitigated, as required by law, if the Permittee does not complete these requirements within the specified timeframe.

Amendment:
This ITP may be amended as provided by California Code of Regulations, Title 14, section 783.6, subdivision (c), and other applicable law. This ITP may be amended without the concurrence of the Permittee as required by law, including if CDFW determines that continued implementation of the Project as authorized under this ITP would jeopardize the continued existence of the Covered Species or where Project changes or changed biological conditions necessitate an ITP amendment to ensure that all Project-related impacts of the taking to the Covered Species are minimized and fully mitigated.

Stop-Work Order:
CDFW may issue Permittee a written stop-work order requiring Permittee to suspend any Covered Activity for an initial period of up to 25 days to prevent or remedy a violation of this ITP, including but not limited to the failure to comply with reporting or monitoring obligations, or to prevent the unauthorized take of any CESA endangered, threatened, or candidate species. Permittee shall stop work immediately as directed by CDFW upon receipt of any such stop-work order. Upon written notice to Permittee, CDFW may extend any stop-work order issued to Permittee for a period not to exceed 25 additional days. Suspension and revocation of this ITP shall be governed by California Code of Regulations, Title 14, section 783.7, and any other applicable law. Neither the Designated Biologist nor CDFW shall be liable for any costs incurred in complying with stop-work orders.

Compliance with Other Laws:
This ITP sets forth CDFW's requirements for the Permittee to implement the Project pursuant to CESA. This ITP does not necessarily create an entitlement to proceed with the Project. Permittee is responsible for complying with all other applicable federal, state, and local law.

Notices:
The Permittee shall deliver a fully executed duplicate original ITP by registered first class mail or overnight delivery to the following address:

Habitat Conservation Planning Branch
California Department of Fish and Wildlife
Attention: CESA Permitting Program
1416 Ninth Street, Suite 1260
Sacramento, CA 95814

Written notices, reports and other communications relating to this ITP shall be delivered to CDFW by registered first class mail at the following address, or at addresses CDFW may subsequently provide the Permittee. Notices, reports, and other communications shall reference the Project name, Permittee, and ITP Number 2081-2015-020-03 in a cover letter and on any other associated documents.

Original cover with attachment(s) to:
Scott Wilson, Regional Manager
California Department of Fish and Wildlife
7329 Silverado Trail
Napa, CA 94558
Telephone (707) 944-5500

Unless Permittee is notified otherwise, CDFW's Regional Representative for purposes of addressing issues that arise during implementation of this ITP is:

Melissa Escaron
California Department of Fish and Wildlife
7329 Silverado Trail
Napa, CA 94558
Telephone (925) 786-3045

Compliance with CEQA:
CDFW's issuance of this ITP is subject to CEQA. CDFW is a responsible agency pursuant to CEQA with respect to this ITP because of prior environmental review of the Project by the lead agency, California Department of Transportation (See generally Pub. Resources Code, §§ 21067, 21069). The lead agency's prior environmental review of the Project is set forth in the Negative Declaration and Initial Study for the Interstate 580 Pavement Rehabilitation Project, (State Clearinghouse No. 2014012001) dated August 2004 that the California Department of Transportation adopted for the Interstate 580 Pavement Rehabilitation Project. At the time the lead agency adopted the Negative Declaration and approved the Project it also adopted various mitigation measures for the Covered Species as conditions of Project approval.

This ITP, along with CDFW's related CEQA findings, which are available as a separate document, provide evidence of CDFW's consideration of the lead agency's Mitigated Negative Declaration for the Project and the environmental effects related to issuance of this ITP [CEQA Guidelines, § 15096, subd. (f)]. CDFW finds that issuance of this ITP will not result in any previously undisclosed potentially significant effects on the environment or a substantial increase in the severity of any potentially significant environmental effects previously disclosed by the lead

agency. Furthermore, to the extent the potential for such effects exists, CDFW finds adherence to and implementation of the Conditions of Project Approval adopted by the lead agency, and that adherence to and implementation of the Conditions of Approval imposed by CDFW through the issuance of this ITP, will avoid or reduce to below a level of significance any such potential effects. CDFW consequently finds that issuance of this ITP will not result in any significant, adverse impacts on the environment.

Findings Pursuant to CESA:
These findings are intended to document CDFW's compliance with the specific findings requirements set forth in CESA and related regulations. [Fish and Game Code § 2081, subs. (b)-(c); Cal. Code Regs., tit. 14, §§ 783.4, subds, (a)-(b), 783.5, subd. (c)(2)].

CDFW finds based on substantial evidence in the ITP application, the Mitigated Negative Declaration Interstate 580 Pavement Rehabilitation Project, consultations and the administrative record of proceedings, that issuance of this ITP complies and is consistent with the criteria governing the issuance of ITPs pursuant to CESA:

(1) Take of Covered Species as defined in this ITP will be incidental to the otherwise lawful activities covered under this ITP;

(2) Impacts of the taking on Covered Species will be minimized and fully mitigated through the implementation of measures required by this ITP and as described in the MMRP. Measures include: (1) permanent habitat protection; (2) worker education; (3) onsite biological monitoring during Covered Activities; (4) onsite restoration; and (5) Monthly Compliance Reports. CDFW evaluated factors including an assessment of the importance of the habitat in the Project Area, the extent to which the Covered Activities will impact the habitat, and CDFW's estimate of the acreage required to provide for adequate compensation. Based on this evaluation, CDFW determined that the protection and management in perpetuity of 54.50 acres of compensatory habitat that is contiguous with other protected Covered Species habitat and/or is of higher quality than the habitat being destroyed by the Project, along with the minimization, monitoring, reporting, and funding requirements of this ITP minimizes and fully mitigates the impacts of the taking caused by the Project;

(3) The take avoidance and mitigation measures required pursuant to the conditions of this ITP and its attachments are roughly proportional in extent to the impacts of the taking authorized by this ITP;

(4) The measures required by this ITP maintain Permittee's objectives to the greatest extent possible;

(5) All required measures are capable of successful implementation;

(6) This ITP is consistent with any regulations adopted pursuant to Fish and Game Code sections 2112 and 2114;

(7) Permittee has ensured adequate funding to implement the measures required by this ITP as well as for monitoring compliance with, and the effectiveness of, those measures for the Project; and

(8) Issuance of this ITP will not jeopardize the continued existence of the Covered Species based on the best scientific and other information reasonably available, and this finding includes consideration of the species' capability to survive and reproduce, and any adverse impacts of the taking on those abilities in light of (1) known population trends; (2) known threats to the species; and (3) reasonably foreseeable impacts on the species from other related projects and activities. Moreover, CDFW's finding is based, in part, on CDFW's express authority to amend the terms and conditions of this ITP without concurrence of the Permittee as necessary to avoid jeopardy and as required by law.

Attachments:

FIGURE 1	Project Impact Map
ATTACHMENT 1	Mitigation Monitoring and Reporting Program
ATTACHMENT 2A, 2B	Habitat Management Lands Checklist; Proposed Lands for Acquisition Form
ATTACHMENT 3	Mitigation Payment Transmittal Form

ISSUED BY THE CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

on 2/10/2016.

Scott Wilson

Scott Wilson, Regional Manager
BAY DELTA REGION

ACKNOWLEDGMENT

The undersigned: (1) warrants that he or she is acting as a duly authorized representative of the Permittee, (2) acknowledges receipt of this ITP, and (3) agrees on behalf of the Permittee to comply with all terms and conditions

By: Gregory Pera for Jo Ann Cullen Date: 2/11/16

Printed Name: Gregory Pera Title: Branch Chief

Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

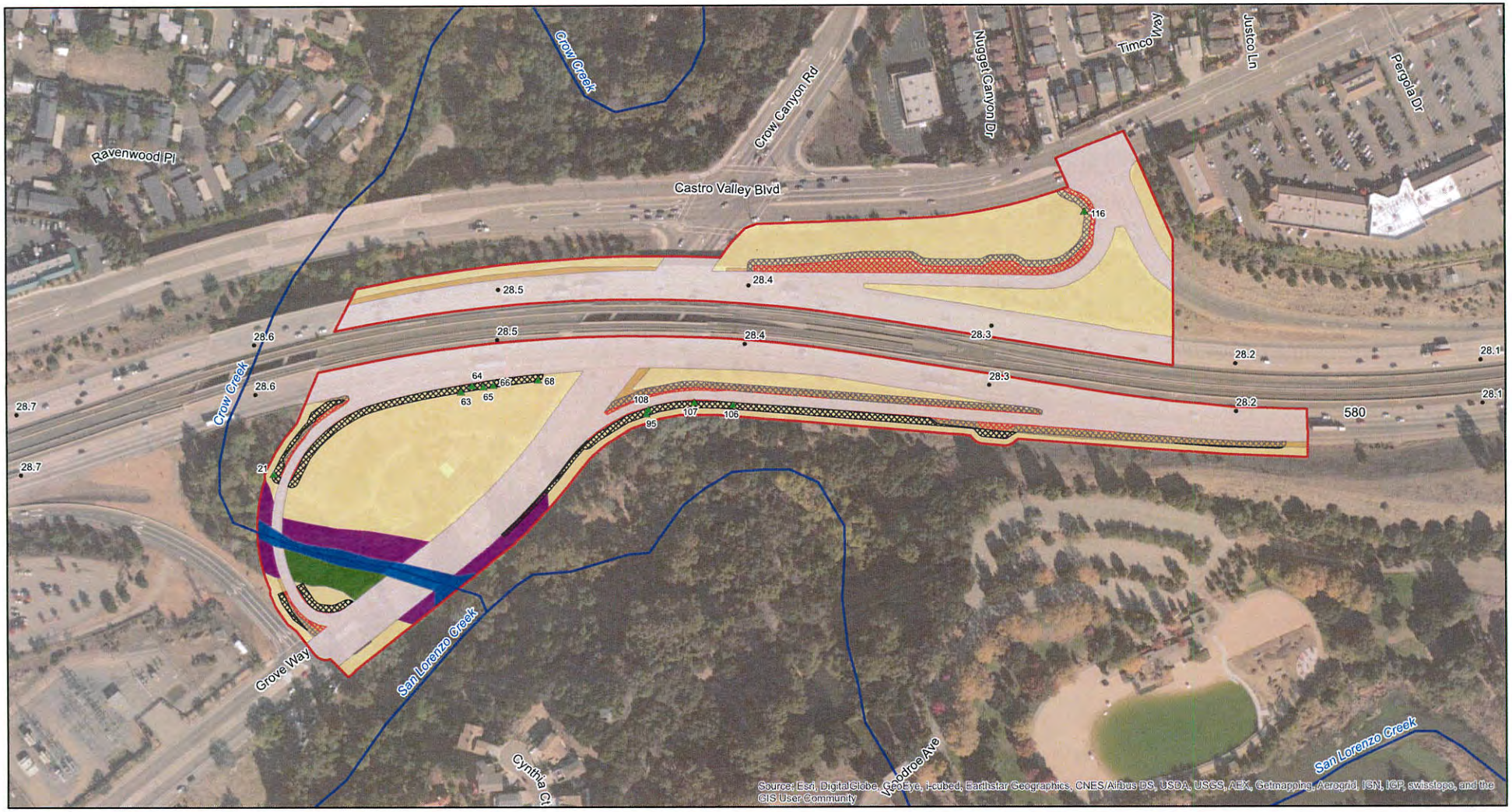
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 1 of 22



Land Cover and Vegetation Types

- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat

- Permanent Impact
- Temporary Impact

Unsuitable Habitat

- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

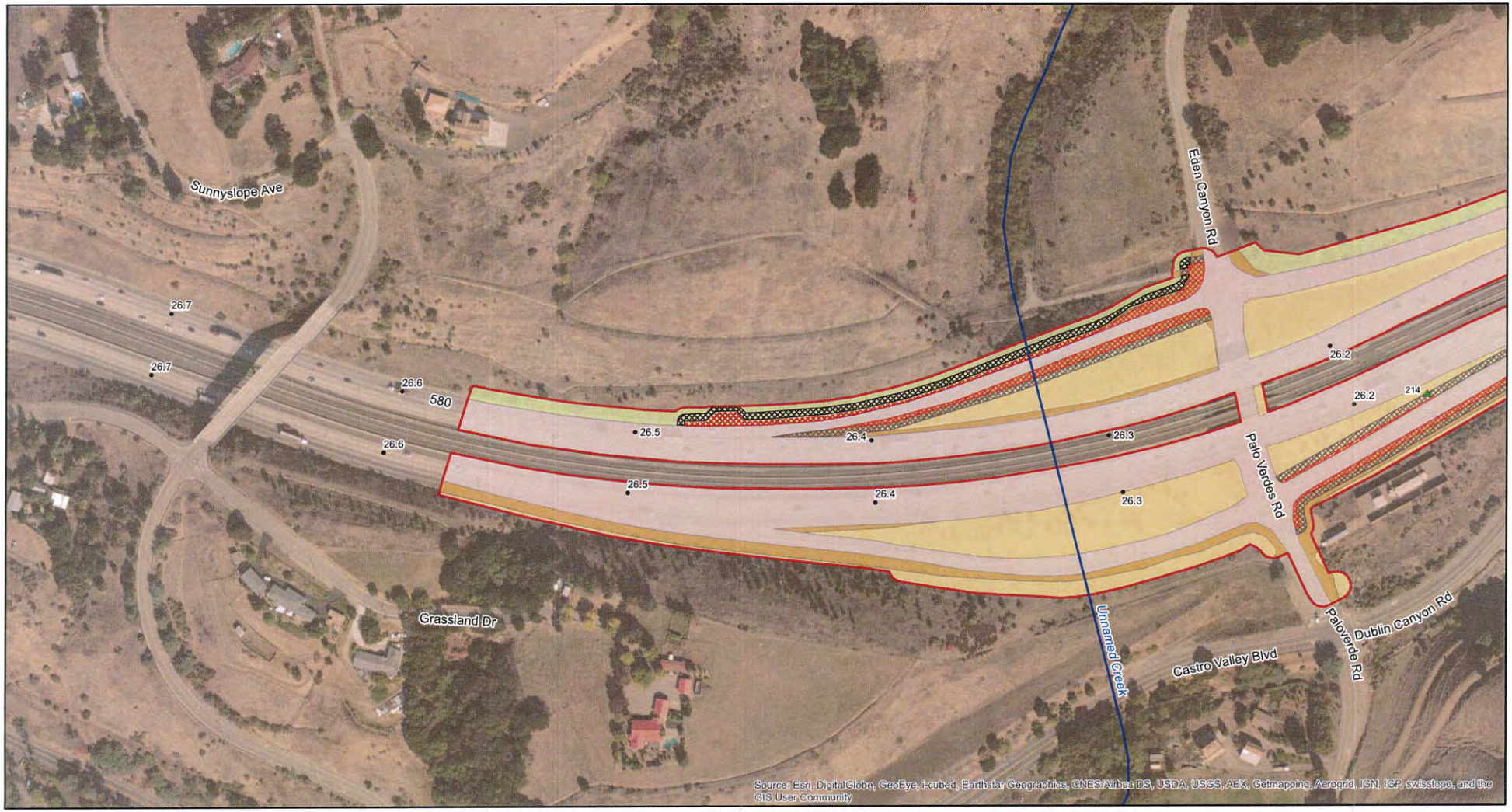
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 2 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road

- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

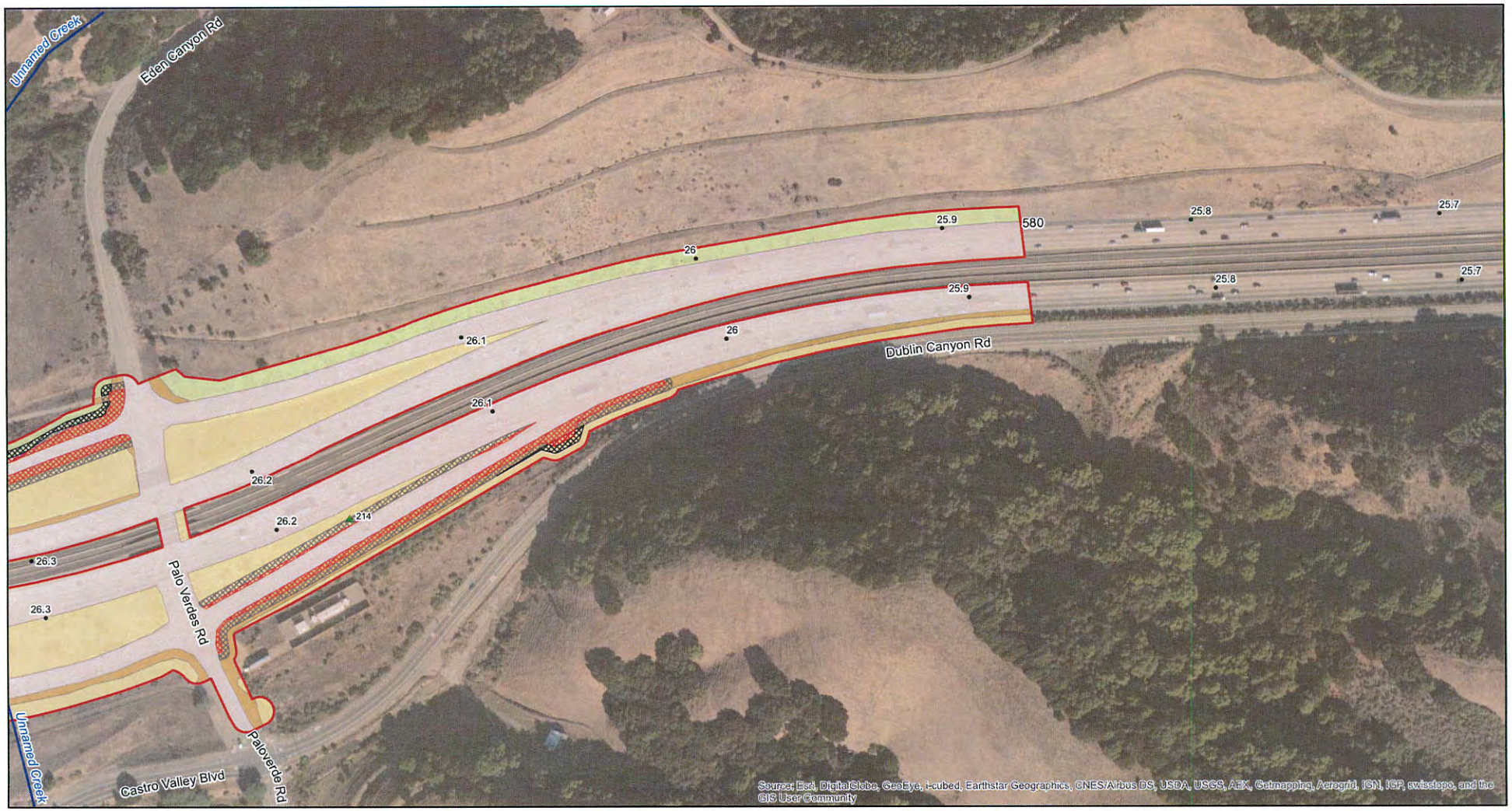
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 3 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 4 of 22

Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 5 of 22

Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road

- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

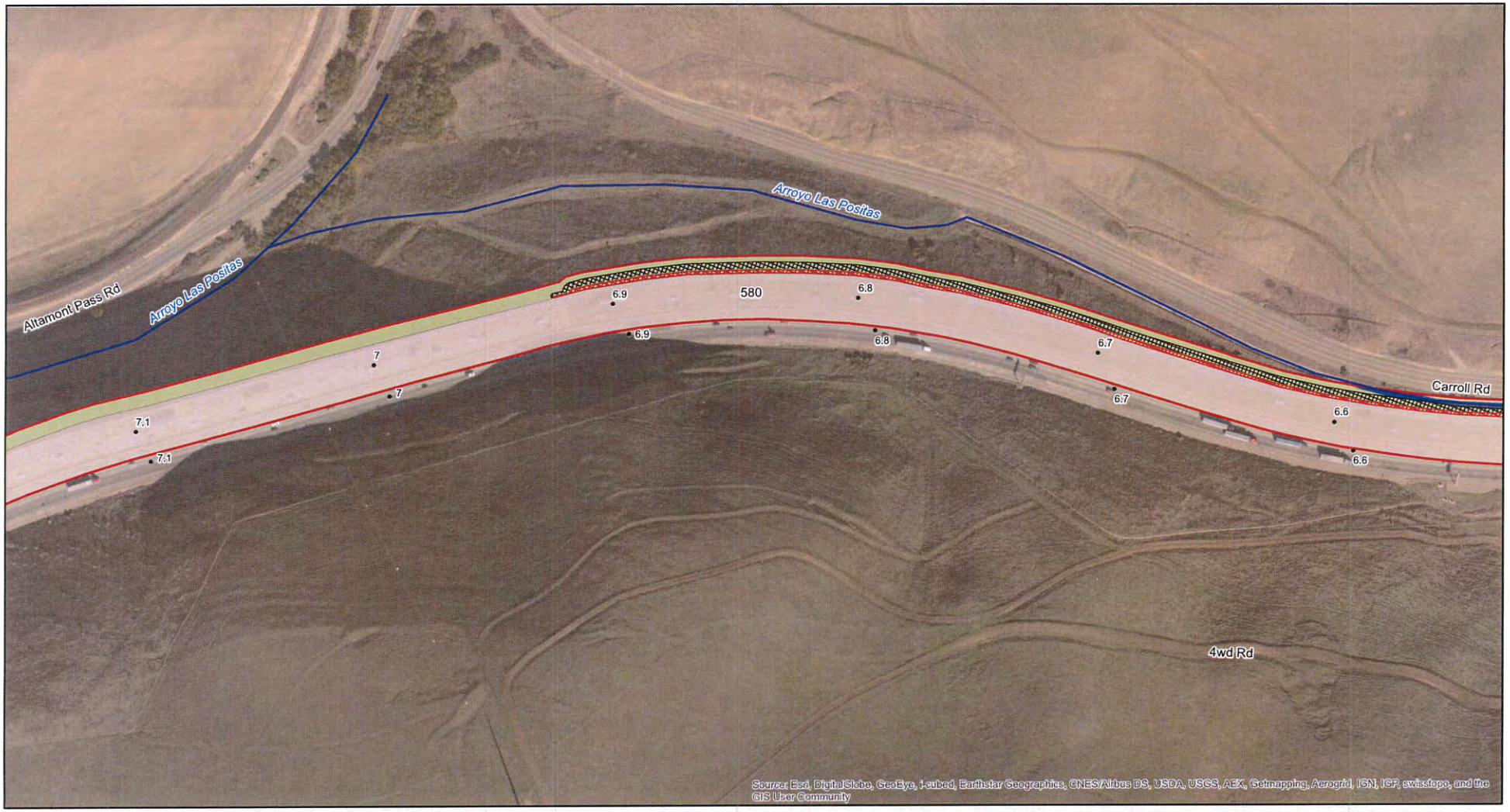
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 6 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

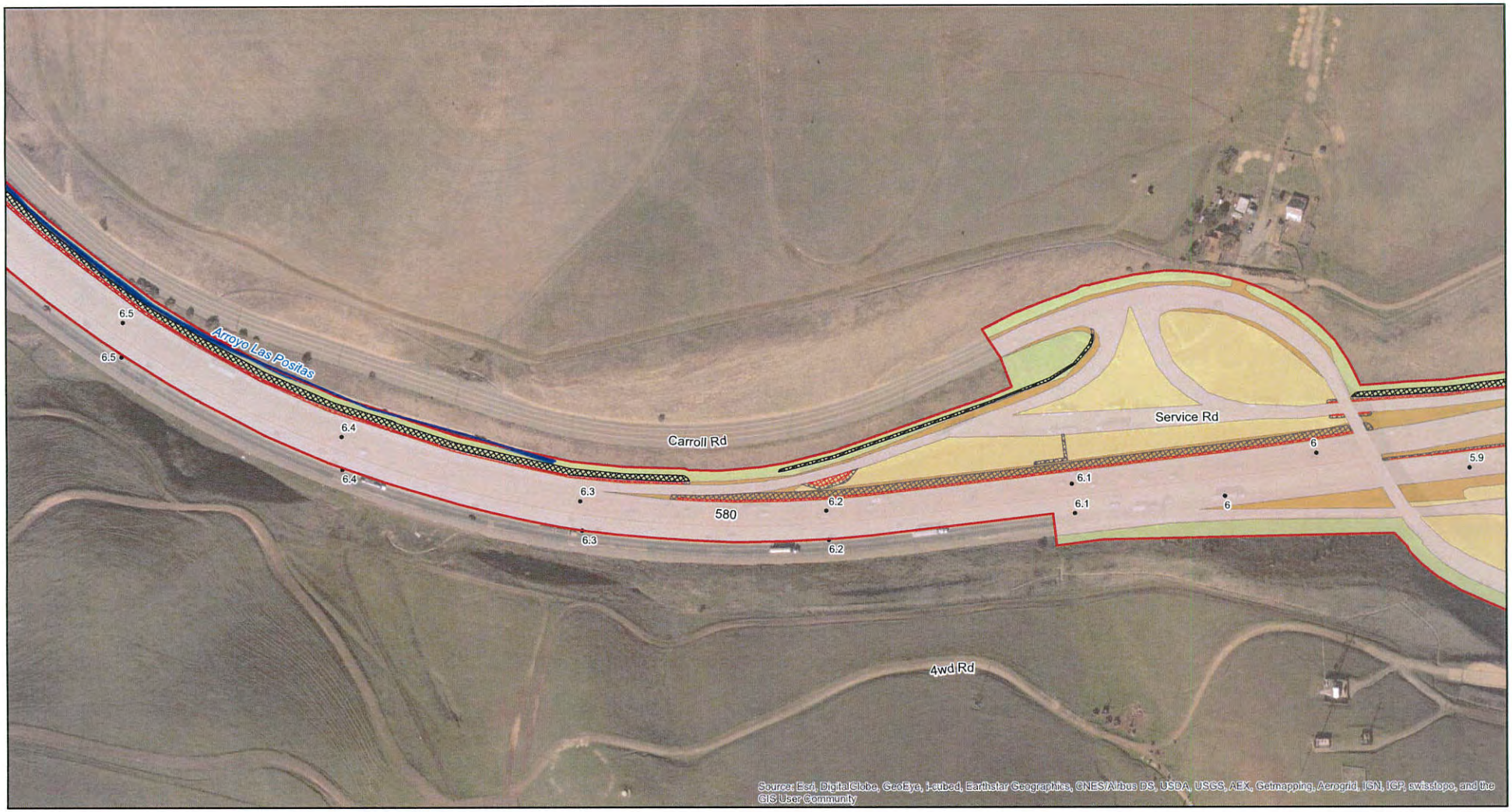
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 7 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road

- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

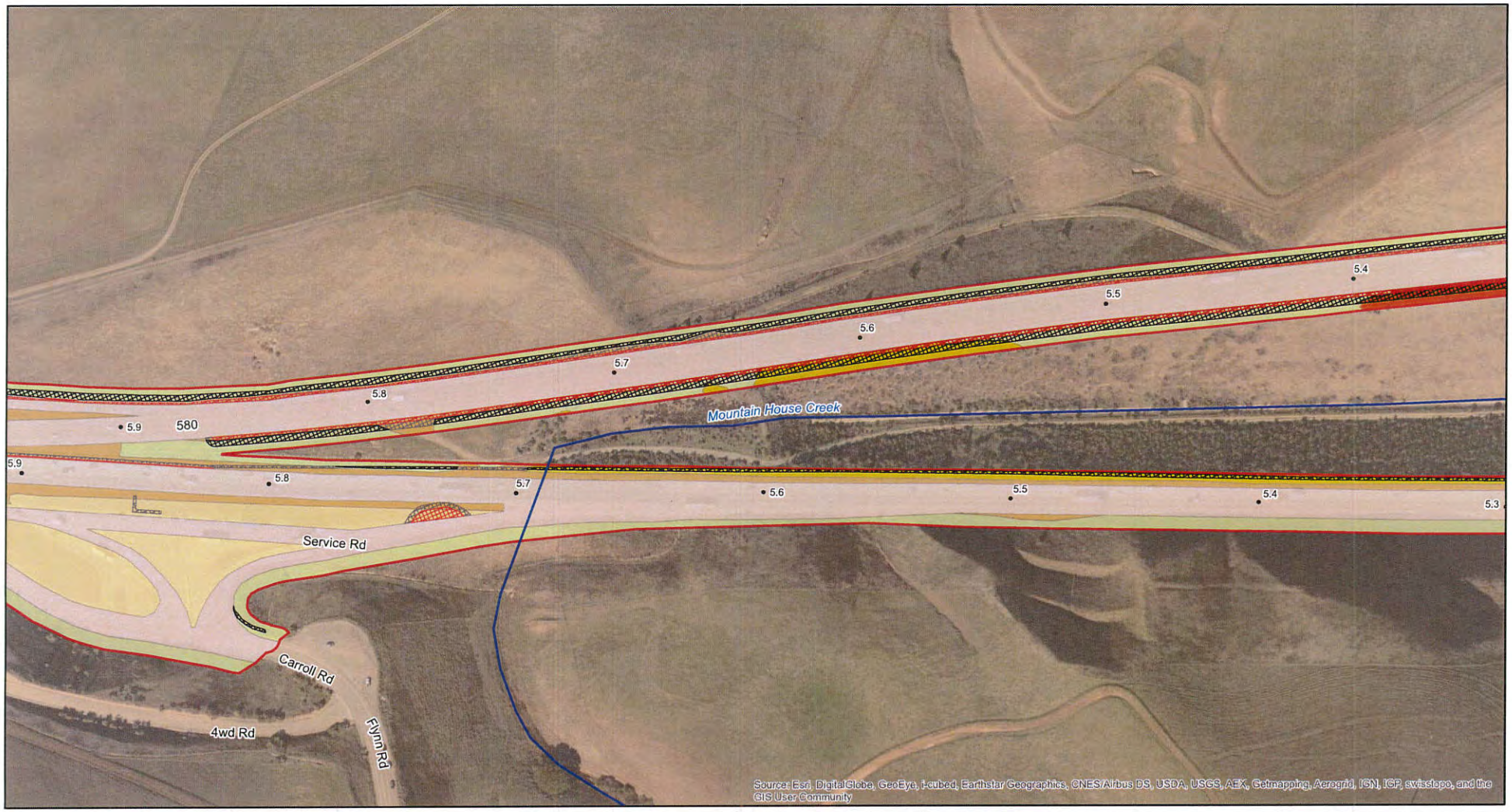
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 8 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

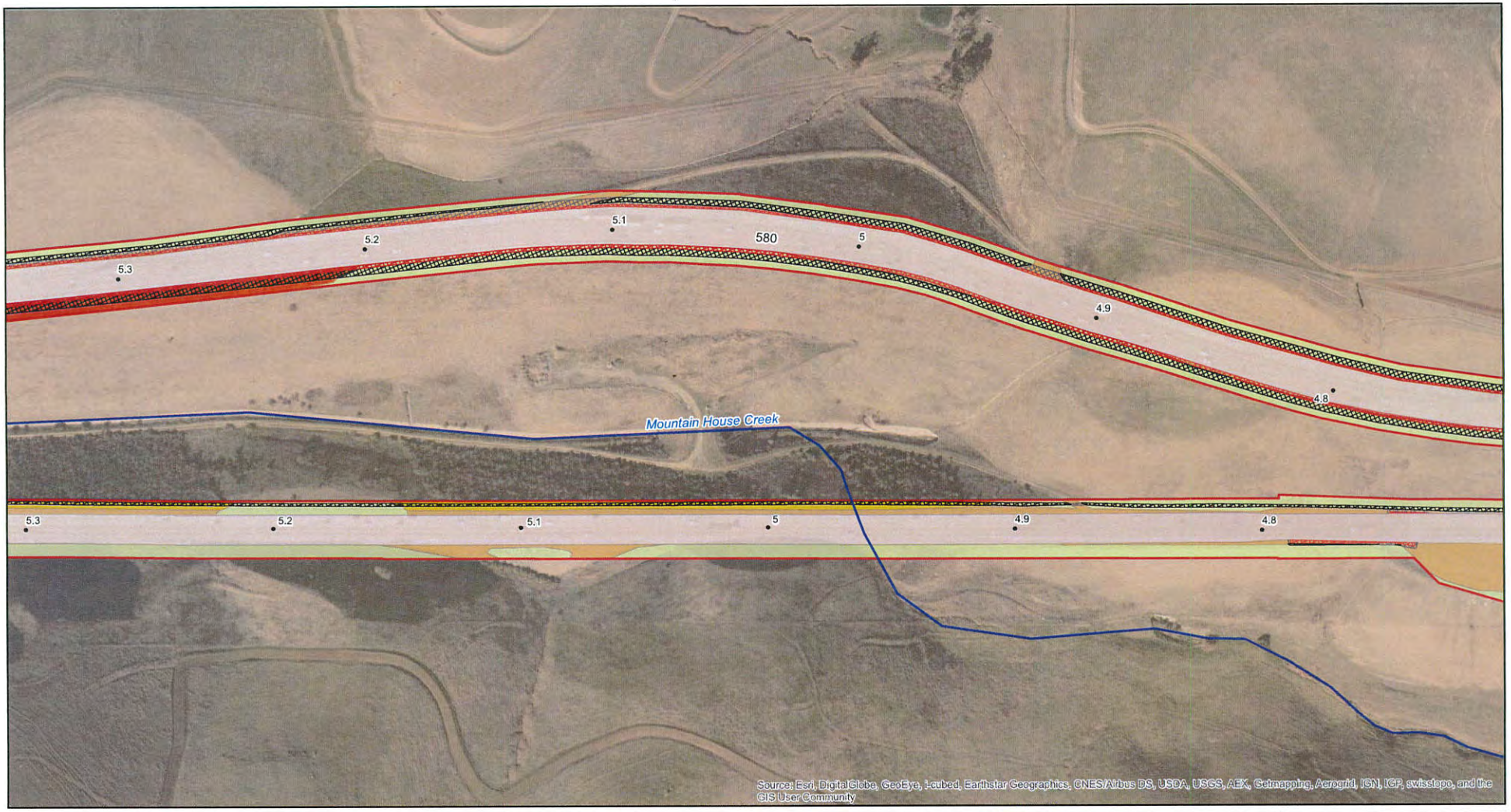
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 9 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 10 of 22

Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

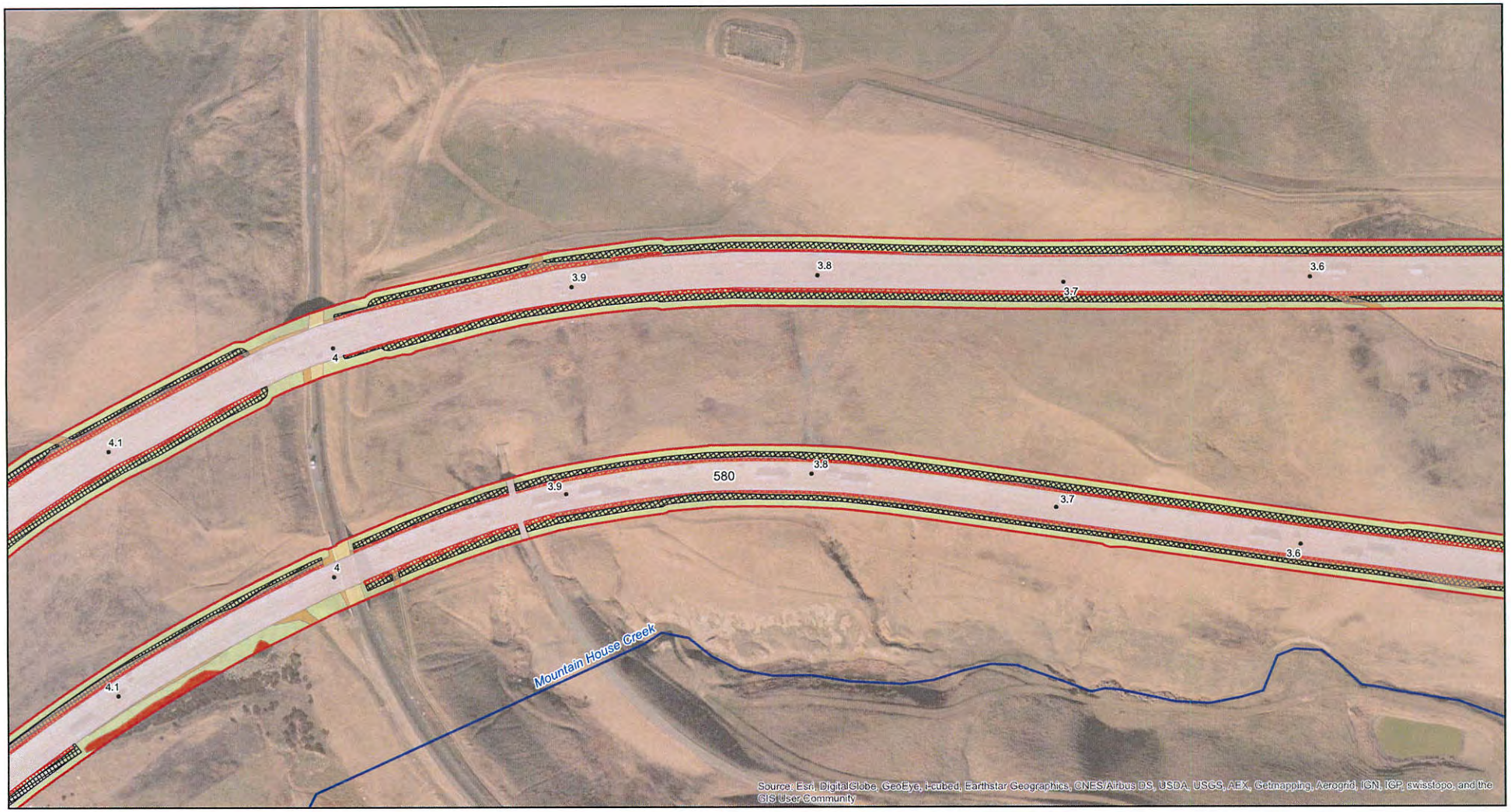
- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 11 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

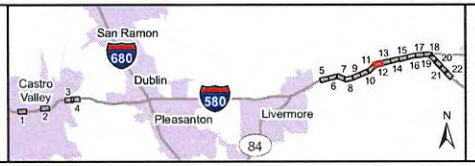
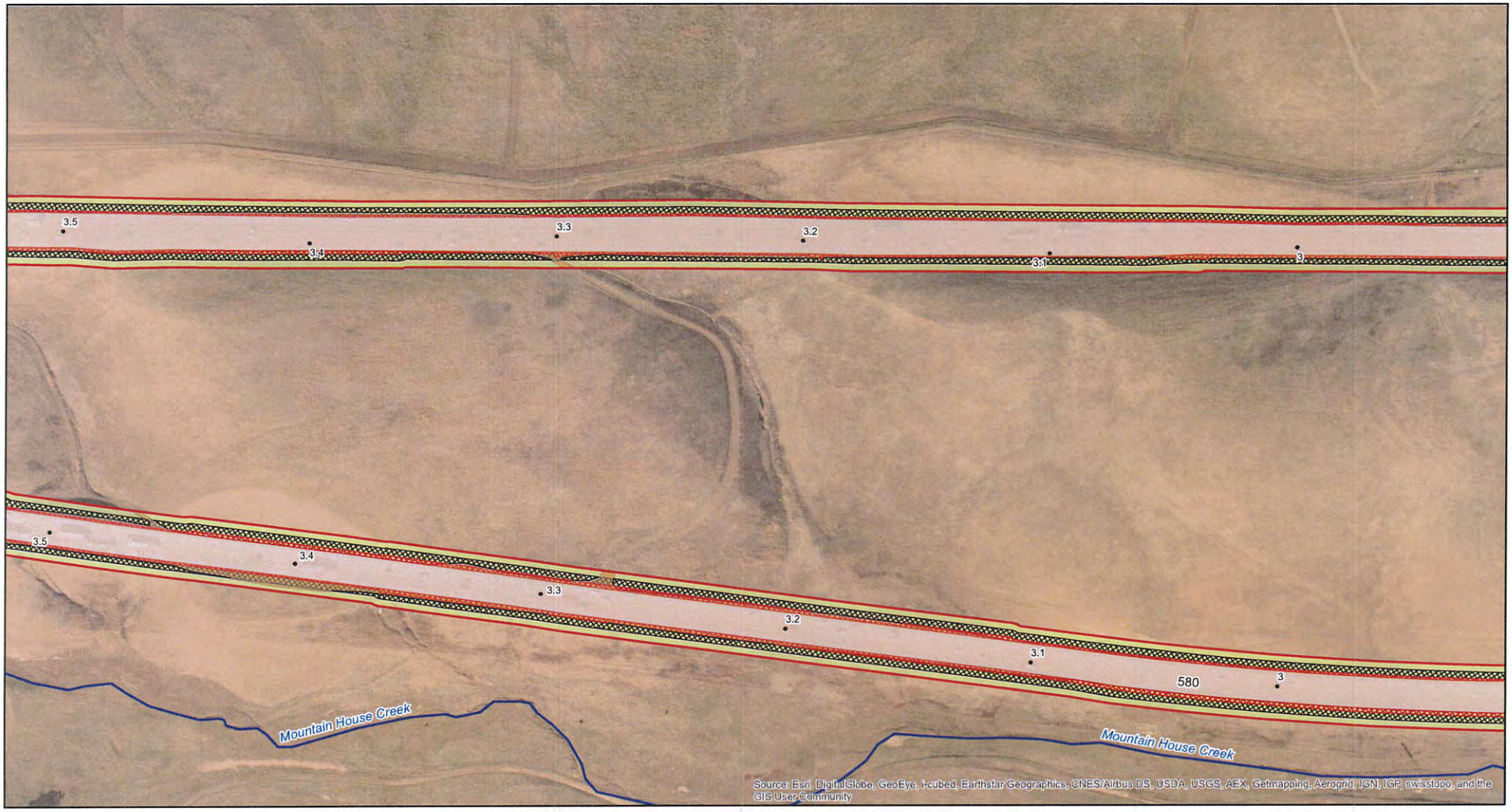


Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 12 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

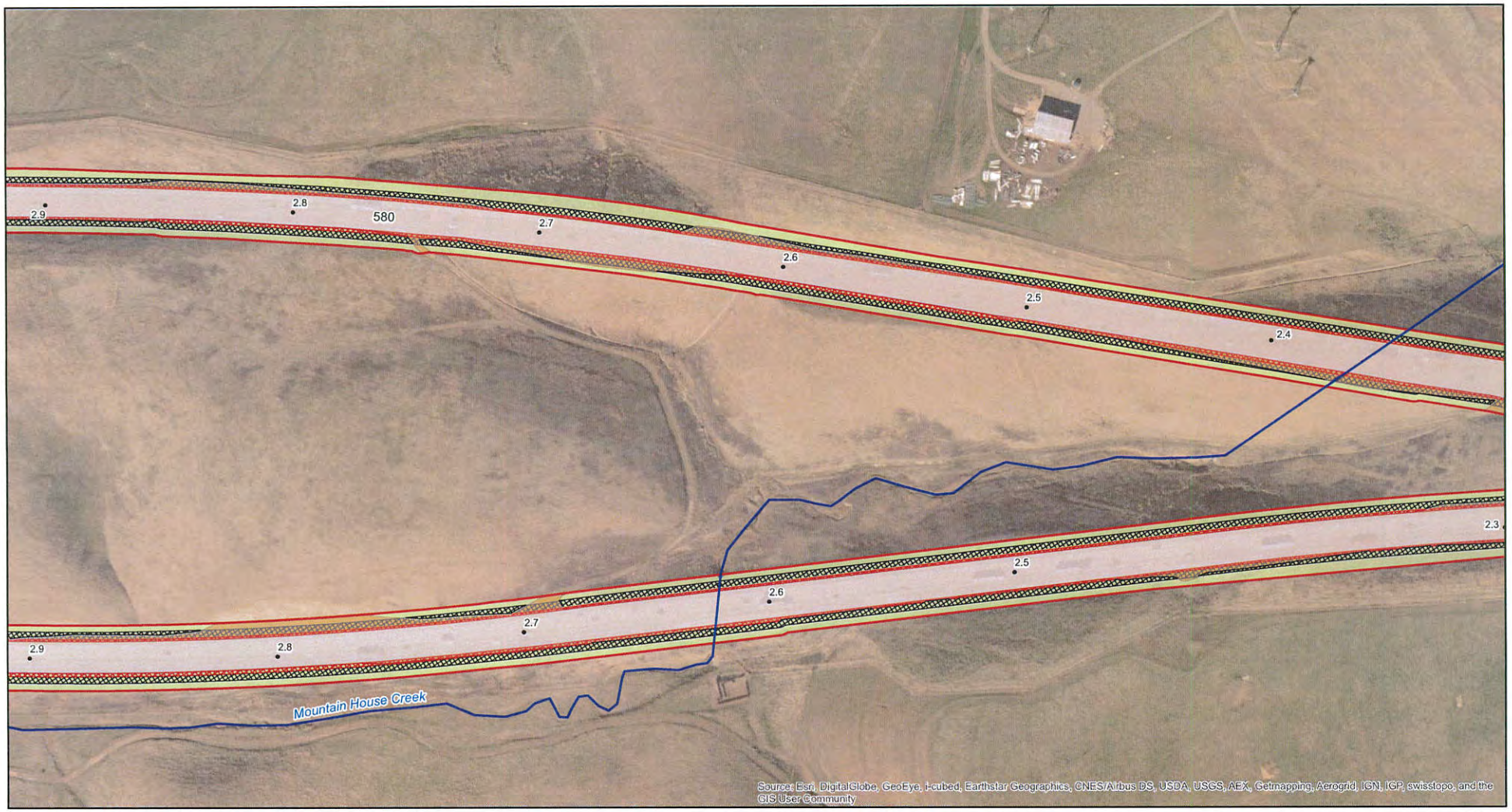
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 13 of 22



Land Cover and Vegetation Types

- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat

- Permanent Impact
- Temporary Impact

Unsuitable Habitat

- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

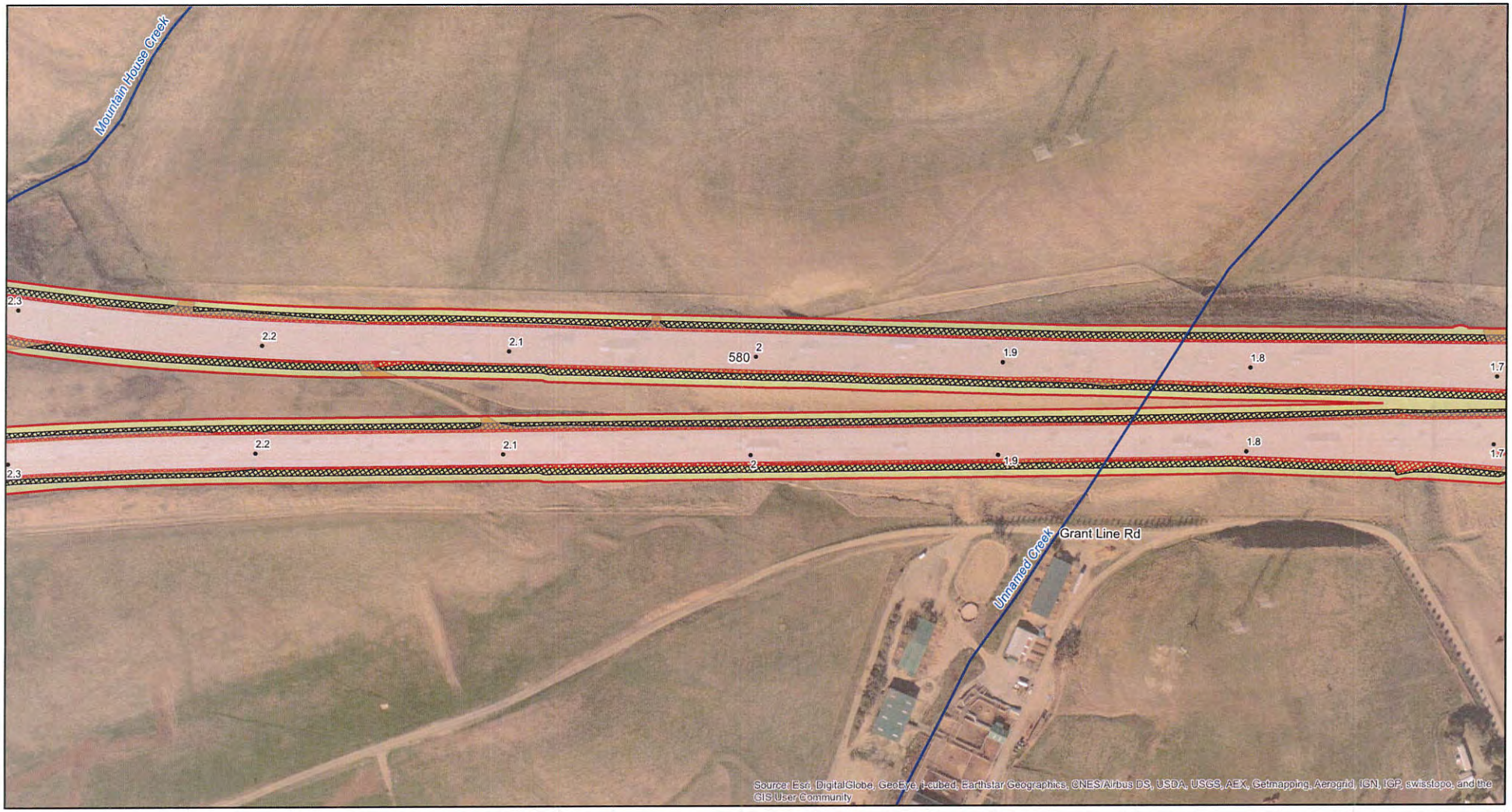
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 14 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

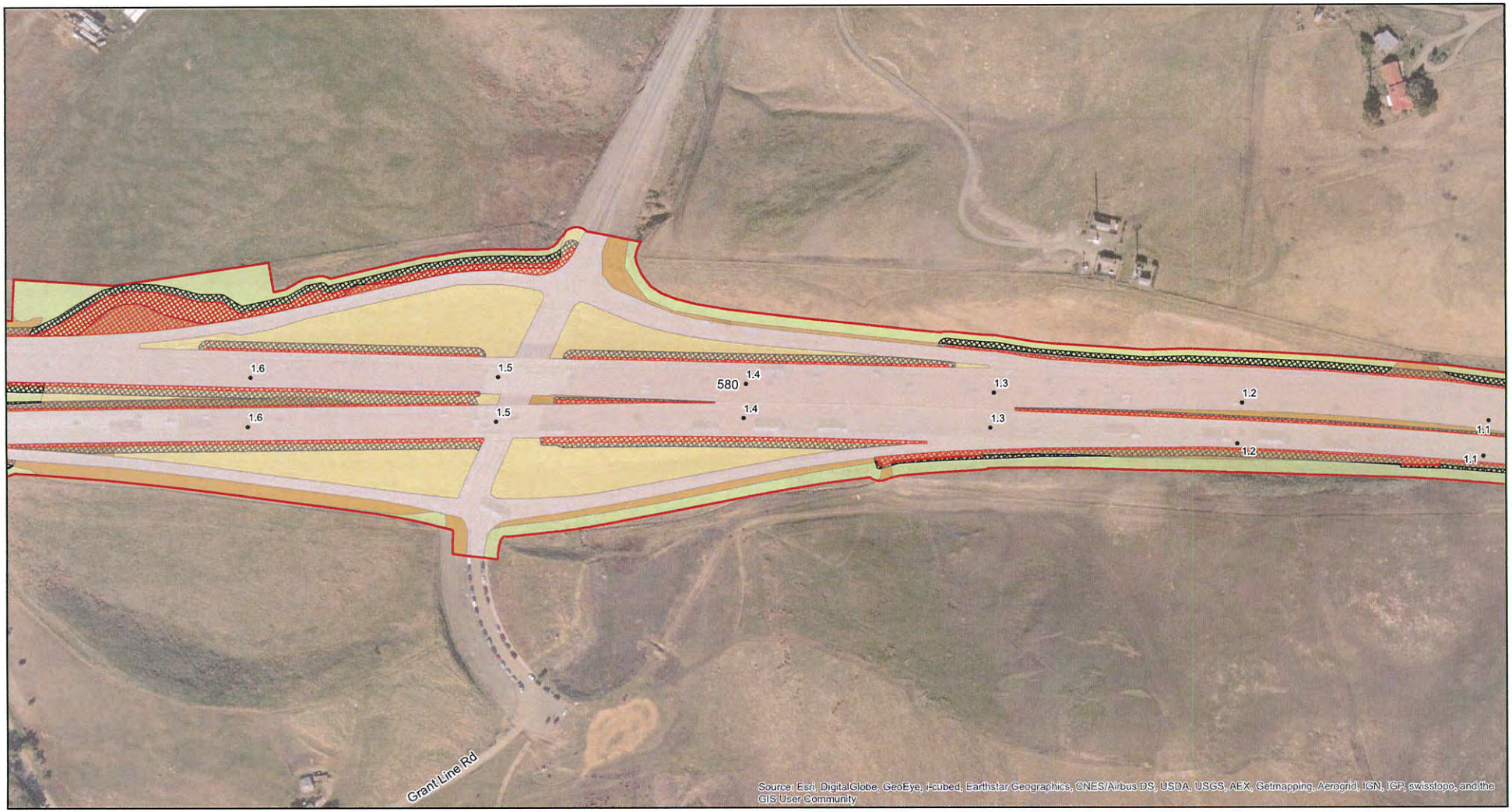
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 15 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

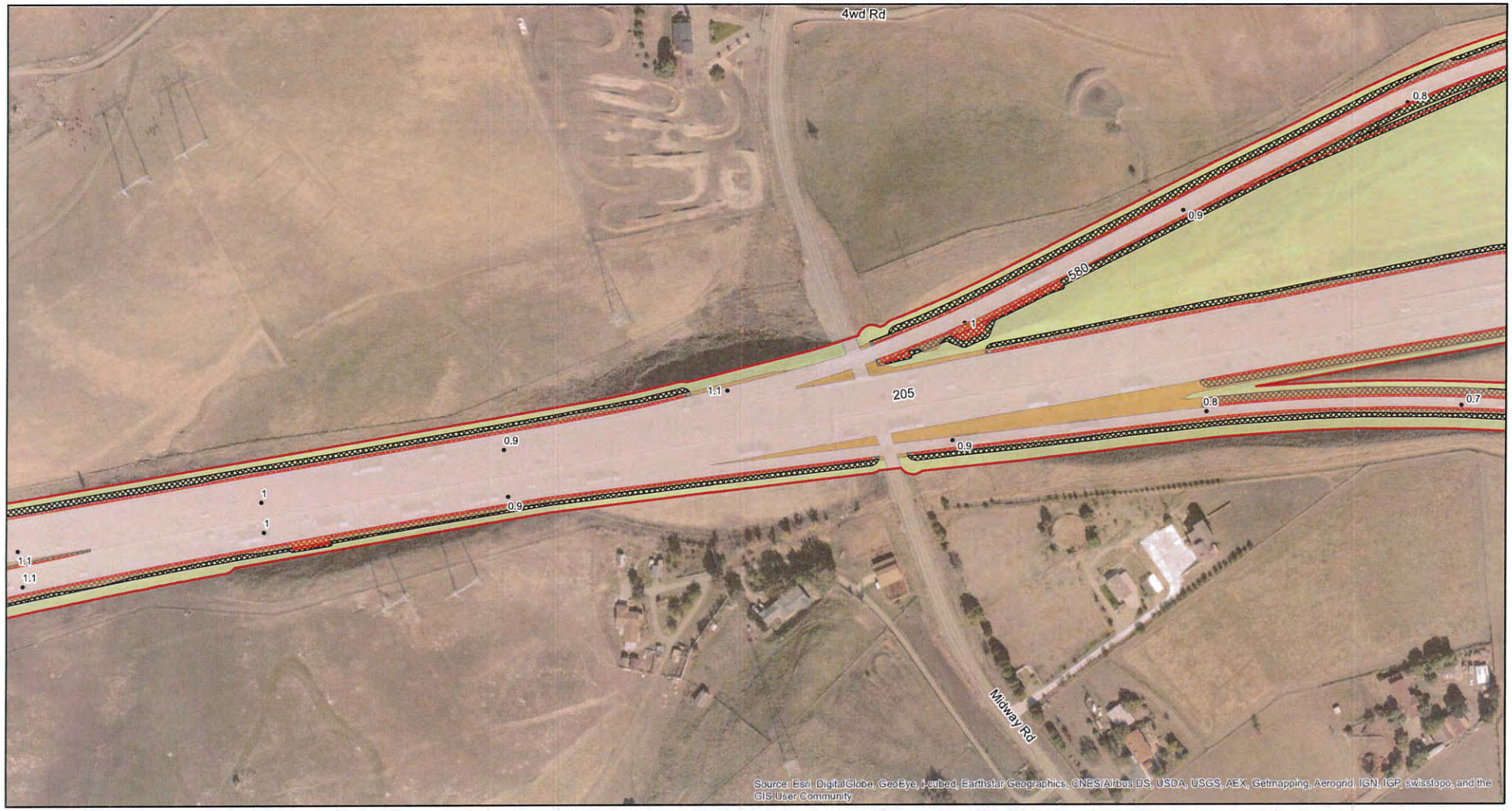
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 16 of 22



Land Cover and Vegetation Types

- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat

- Permanent Impact
- Temporary Impact

Unsuitable Habitat

- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

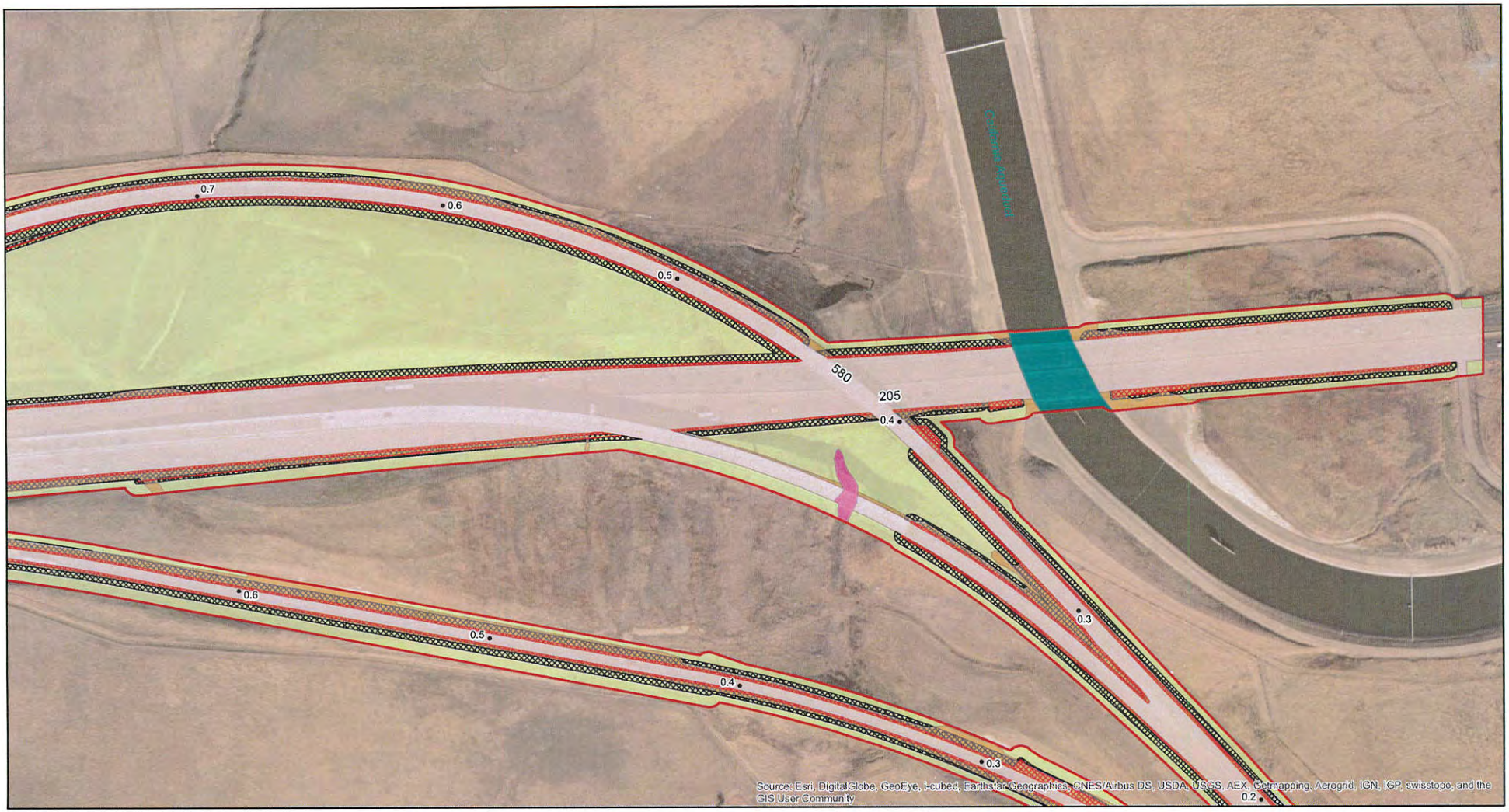
N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 17 of 22



Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road

- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

N

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 18 of 22

Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 19 of 22

Land Cover and Vegetation Types
- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat
- Permanent Impact
- Temporary Impact

Unsuitable Habitat
- Permanent Impact
- Temporary Impact

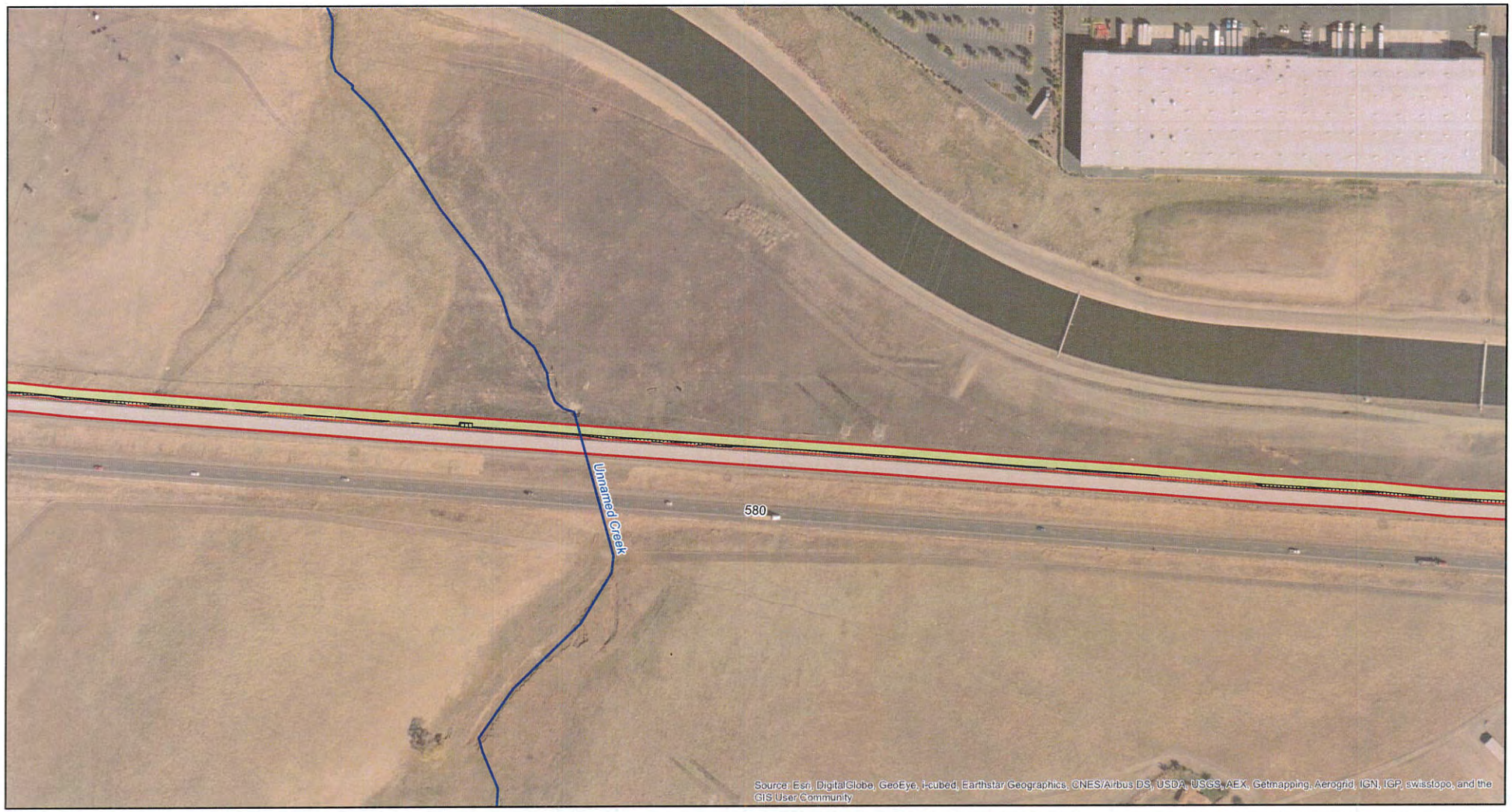
- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 20 of 22



Land Cover and Vegetation Types

- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat

- Permanent Impact
- Temporary Impact

Unsuitable Habitat

- Permanent Impact
- Temporary Impact

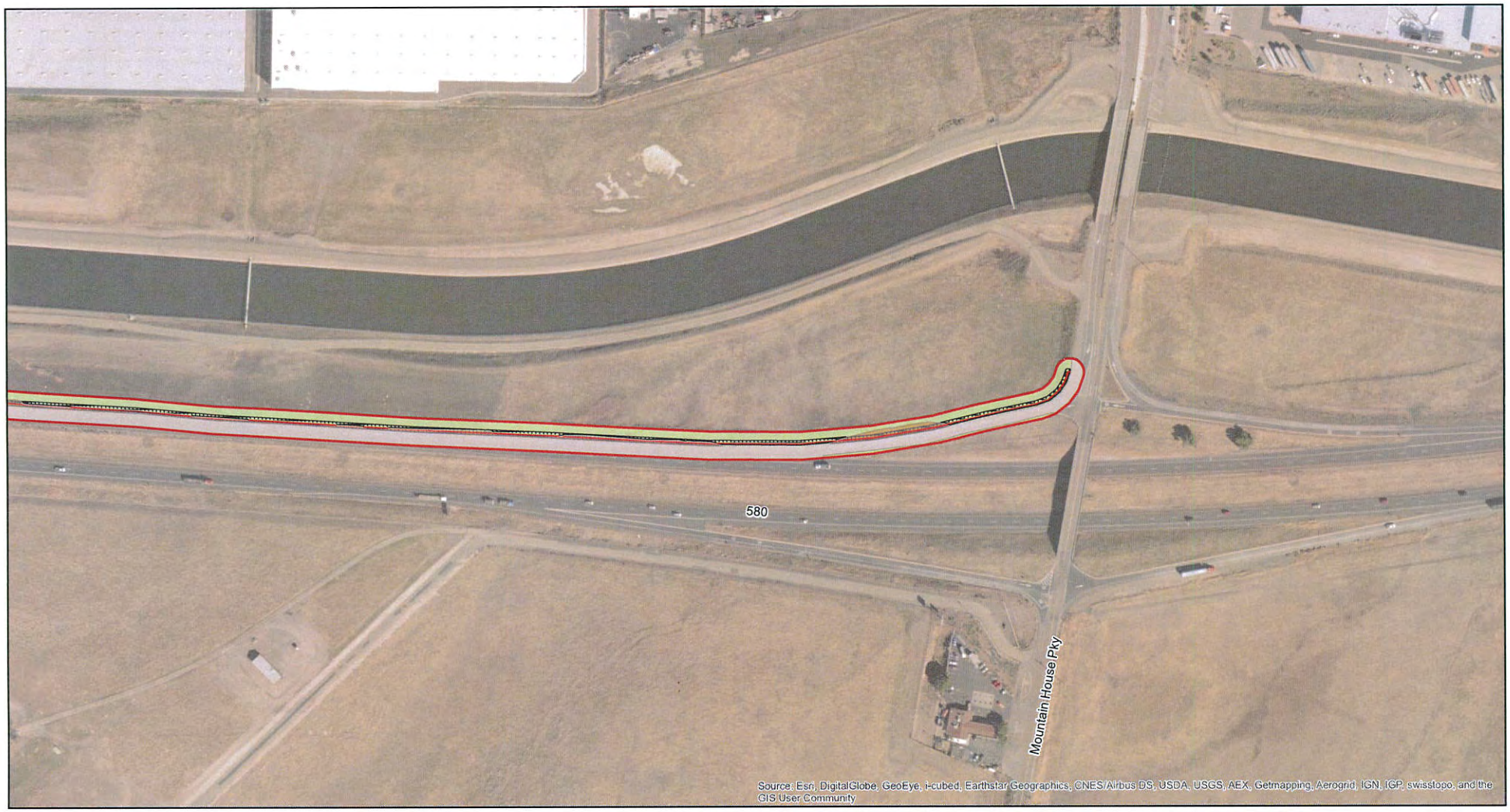
- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 21 of 22



Land Cover and Vegetation Types

- Mediterranean California naturalized annual and perennial grassland
- Coyote Brush Scrub
- California Buckwheat Scrub
- Fremont Cottonwood Forest
- Arroyo Willow Thickets
- American Bulrush Marsh
- Creek
- Canal
- Urban/Landscaped
- Barren Ground
- Road
- Biological Study Area

Suitable CTS/AWS Habitat

- Permanent Impact
- Temporary Impact

Unsuitable Habitat

- Permanent Impact
- Temporary Impact

- Post Mile Markers
- Creek
- Tree Within Temporary Impact Area

0 100 200 Feet

Vegetation Typed as:
(Sawyer, Keeler-Wolf, and Evens 2009)

Scale 1:2,400

Figure 1:
Land Cover Types and Project Construction Area in the Biological Study Area
I-580 Rehabilitation Project
Map 22 of 22

Attachment 1

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
MITIGATION MONITORING AND REPORTING PROGRAM (MMRP)
CALIFORNIA ENDANGERED SPECIES ACT

INCIDENTAL TAKE PERMIT NO. 2081-2015-039-03

PERMITTEE: **California Department of Transportation**

PROJECT: **Interstate 580 Pavement Rehabilitation Project**

PURPOSE OF THE MMRP

The purpose of the MMRP is to ensure that the impact minimization and mitigation measures required by the California Department of Fish and Wildlife (CDFW) for the above-referenced Project are properly implemented, and thereby to ensure compliance with section 2081(b) of the Fish and Game Code and section 21081.6 of the Public Resources Code. A table summarizing the mitigation measures required by CDFW is attached. This table is a tool for use in monitoring and reporting on implementation of mitigation measures, but the descriptions in the table do not supersede the mitigation measures set forth in the California Incidental Take Permit (ITP) and in attachments to the ITP, and the omission of a permit requirement from the attached table does not relieve the Permittee of the obligation to ensure the requirement is performed.

OBLIGATIONS OF PERMITTEE

Mitigation measures must be implemented within the time periods indicated in the table that appears below. Permittee has the primary responsibility for monitoring compliance with all mitigation measures and for reporting to CDFW on the progress in implementing those measures. These monitoring and reporting requirements are set forth in the ITP itself and are summarized at the front of the attached table.

VERIFICATION OF COMPLIANCE, EFFECTIVENESS

CDFW may, at its sole discretion, verify compliance with any mitigation measure or independently assess the effectiveness of any mitigation measure.

TABLE OF MITIGATION MEASURES

The following items are identified for each mitigation measure: Mitigation Measure, Source, Implementation Schedule, Responsible Party, and Status/Date/Initials. The Mitigation Measure column summarizes the mitigation requirements of the ITP. The Source column identifies the ITP condition that sets forth the mitigation measure. The Implementation Schedule column shows the date or phase when each mitigation measure will be implemented. The Responsible Party column identifies the person or agency that is primarily responsible for implementing the mitigation measure. The Status/Date/Initials column shall be completed by the Permittee during preparation of each Status Report and the Final Mitigation Report, and must identify the implementation status of each mitigation measure, the date that status was determined, and the initials of the person determining the status.

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
BEFORE DISTURBING SOIL OR VEGETATION					
1	Designated Representative. Before starting Covered Activities, Permittee shall designate a representative (Designated Representative) responsible for communications with CDFW and overseeing compliance with this ITP. Permittee shall notify CDFW in writing before starting Covered Activities of the Designated Representative's name, business address, and contact information, and shall notify CDFW in writing if a substitute Designated Representative is selected or identified at any time during the term of this ITP.	ITP Condition # 5.1	Before commencing ground- or vegetation-disturbing activities/ Entire Project	Permittee	
2	Designated Biologist. Permittee shall submit to CDFW in writing the name, qualifications, business address, and contact information of a biological monitor (Designated Biologist) at least 30 days before starting Covered Activities. Permittee shall ensure that the Designated Biologist is knowledgeable and experienced in the biology, natural history, collecting and handling of the Covered Species. The Designated Biologist shall be responsible for monitoring Covered Activities to help minimize and fully mitigate or avoid the incidental take of individual Covered Species and to minimize disturbance of Covered Species' habitat. Permittee shall obtain CDFW approval of the Designated Biologist in writing before starting Covered Activities, and shall also obtain approval in advance in writing if the Designated Biologist must be changed.	ITP Condition # 5.2	Before commencing ground- or vegetation-disturbing activities	Permittee	
3	Designated Biologist Authority. To ensure compliance with the Conditions of Approval of this ITP, the Designated Biologist shall have authority to immediately stop any activity, through the Resident Engineer that does not comply with this ITP, and/or to order any reasonable measure to avoid the unauthorized take of an individual of the Covered Species.	ITP Condition # 5.3	Before commencing ground- or vegetation-disturbing activities / Entire Project	Permittee	
4	Education Program. Permittee shall conduct an education program for all persons employed or otherwise working in the Project Area before performing any work. The program shall consist of a presentation from the Designated Biologist that includes a discussion of the biology and general behavior of the Covered Species, information about the distribution and habitat needs of the Covered Species, sensitivity of the Covered Species to human activities, its status pursuant to CESA including legal protection, recovery efforts, penalties for violations and Project-specific protective measures described in this ITP. Permittee shall provide interpretation for non-English speaking workers, and the same instruction shall be provided to any new workers before they are authorized to perform work in the Project Area. Permittee shall prepare and distribute wallet-sized cards or a fact sheet handout containing this information for workers to carry in the Project Area. Upon completion of the program, employees shall sign a form stating they attended the program and understand all protection measures.	ITP Condition # 5.4	Before commencing ground- or vegetation-disturbing activities / Entire Project	Permittee	
5	Notification Before Commencement. The Designated Representative shall notify CDFW 14 calendar days before starting Covered Activities and shall document compliance with all pre-Project Conditions of Approval before starting Covered Activities.	ITP Condition # 6.1	Before commencing ground- or vegetation-disturbing activities/ Entire Project		

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
6	Permittee shall provide for both the permanent protection and management of 54.50 acres of Covered Species habitat (Habitat Management (HM) lands), pursuant to Condition of Approval 8.2 below and the calculation and deposit of the management funds pursuant to Condition of Approval 8.3.10 below. Permanent protection and funding for perpetual management of compensatory habitat must be complete before starting Covered Activities, or within 18 months of the effective date of this ITP if Security is provided pursuant to Condition of Approval 9 below for all uncompleted obligations. The Permittee shall also restore on-site 32.50 acres of temporarily impacted Covered Species habitat pursuant to Condition of Approval 8.5 below.	ITP Condition # 8	Before commencing ground- or vegetation-disturbing activities / Or within 18 months of effective date of ITP if CDFW-approved security is provided	Permittee	
7	Cost Estimates. CDFW has estimated the cost of acquisition, protection, and perpetual management of the HM lands and restoration of temporarily disturbed habitat as follows: Land acquisition costs for HM lands identified in Condition of Approval 8.2 below, estimated at $35,000/acre for 54.50 acres: $1,907,500.00. Land acquisitions costs are estimated using local fair market current value for lands with habitat values meeting mitigation requirements; Start-up costs for HM lands, including initial site protection and enhancement costs as described in Condition of Approval 8.2.5 below, estimated at $15,000.00; Interim management period funding as described in Condition of Approval 8.2.6 below, estimated at $17,000.00; Long-term management funding as described in Condition of Approval 8.3.7 below, estimated at $6000/acre for 54.50 acres: $327,000.00. Long-term management funding is estimated initially for the purpose of providing Security to ensure implementation of HM lands management; Related transaction fees including but not limited to account set-up fees, administrative fees, title and documentation review and related title transactions, expenses incurred from other state agency reviews, and overhead related to transfer of HM lands to CDFW as described in Condition of Approval 8.2.1, estimated at $3,000.00; Restoration of on-site temporary effects to Covered Species habitat as described in Condition of Approval 8.4, calculated at $20,000/acre for 32.50 acres: $650,000.	ITP Condition # 8.1	Before commencing ground- or vegetation-disturbing activities/ Or within 18 months of effective date of ITP if CDFW-approved security is provided	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
8	Covered Species Credits. Permittee shall purchase 54.50 acres of Covered Species credits from a CDFW-approved mitigation or conservation bank prior to initiating Covered Activities, or no later than 18 months from the issuance of this ITP if Security is provided pursuant to Condition of Approval 9 below. OR: Habitat Acquisition and Protection. To provide for the acquisition and perpetual protection and management of the HM lands, the Permittee shall: Fee Title/Conservation Easement. Transfer fee title to the HM lands to CDFW pursuant to terms approved in writing by CDFW. Alternatively, CDFW, in its sole discretion, may authorize a governmental entity, special district, non-profit organization, for-profit entity, person, or another entity to hold title to and manage the property provided that the district, organization, entity, or person meets the requirements of Government Code sections 65965-65968, as amended. If CDFW does not hold fee title to the HM lands, CDFW shall act as grantee for a conservation easement over the HM lands or shall, in its sole discretion, approve a non-profit entity, public agency, or Native American tribe to act as grantee for a conservation easement over the HM lands provided that the entity, agency, or tribe meets the requirements of Civil Code section 815.3. If CDFW does not hold the conservation easement, CDFW shall be expressly named in the conservation easement as a third-party beneficiary. The Permittee shall obtain CDFW written approval of any conservation easement before its execution or recordation. No conservation easement shall be approved by CDFW unless it complies with Government Code sections 65965-65968, as amended and includes provisions expressly addressing Government Code sections 65966(j) and 65967(e); HM Lands Approval. Obtain CDFW written approval of the HM lands before acquisition and/or transfer of the land by submitting, at least three months before acquisition and/or transfer of the HM lands, a formal Proposed Lands for Acquisition Form (see Attachment 2B) identifying the land to be purchased or property interest conveyed to an approved entity as mitigation for the Project's impacts on Covered Species; HM Lands Documentation. Provide a recent preliminary title report, initial hazardous materials survey report, and other necessary documents (see Attachment 2A). All documents conveying the HM lands and all conditions of title are subject to the approval of CDFW, and if applicable, the Wildlife Conservation Board and the Department of General Services; Land Manager. Designate both an interim and long-term land manager approved by CDFW. The interim and long-term land managers may, but need not, be the same. The interim and/or long-term land managers may be the landowner or another party. Documents related to land management shall identify both the interim and long-term land managers. Permittee shall notify CDFW of any subsequent changes in the land manager within 30 days of the change. If CDFW will hold fee title to the mitigation land, CDFW will also act as both the interim and long-term land manager unless otherwise specified. Start-up Activities. Provide for the implementation of start-up activities, including the initial site protection and enhancement of HM lands, once the HM lands have been approved by CDFW. Start-up activities include, at a minimum: (1) preparing a final management plan for CDFW approval (see https://www.wildlife.ca.gov/Conservation/Planning/Banking/Templates) as described in Condition of Approval 8.2.6; (2) conducting a baseline biological assessment and land survey report within four months of recording or transfer; (3) developing and transferring Geographic Information Systems (GIS) data if applicable; (4) conducting litter removal; (5) conducting initial habitat restoration or enhancement, if applicable; and (6) installing signage;	ITP Condition # 8.2 and 8.3	Before commencing ground- or vegetation-disturbing activities / Or within 18 months of effective date of ITP if CDFW-approved security is provided	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
	…Condition 8.3 Interim Management (Initial and Capital). Provide for the interim management of the HM lands. The Permittee shall ensure that the interim land manager implements the interim management of the HM lands as described in the final management plan and conservation easement approved by CDFW. The interim management period shall be a minimum of three years from the date of HM land acquisition and protection and full funding of the Endowment and includes expected management following start-up activities. Interim management period activities described in the final management plan shall include fence repair, continuing trash removal, site monitoring, and vegetation and invasive species management. Permittee shall either (1) provide a security to CDFW for the minimum of three years of interim management that the land owner, Permittee, or land manager agrees to manage and pay for at their own expense, (2) establish an escrow account with written instructions approved in advance in writing by CDFW to pay the land manager annually in advance, or (3) establish a short-term enhancement account with CDFW or a CDFW-approved entity for payment to the land manager. Endowment Fund. The Permittee shall ensure that the HM lands are perpetually managed, maintained, and monitored by the long-term land manager as described in this ITP, the conservation easement, and the final management plan approved by CDFW. After obtaining CDFW approval of the HM lands, Permittee shall provide long-term management funding for the perpetual management of the HM lands by establishing a long-term management fund (Endowment). The Endowment is a sum of money, held in a CDFW-approved fund that provides funds for the perpetual management, maintenance, monitoring, and other activities on the HM lands consistent with the management plan(s) required by Condition of Approval 8.2.5. Endowment as used in this ITP shall refer to the endowment deposit and all interest, dividends, other earnings, additions and appreciation thereon. The Endowment shall be governed by this ITP, Government Code sections 65965-65968, as amended, and Probate Code sections 18501-18510, as amended. After the interim management period, Permittee shall ensure that the designated long-term land manager implements the management and monitoring of the HM lands according to the final management plan. The long-term land manager shall be obligated to manage and monitor the HM lands in perpetuity to preserve their conservation values in accordance with this ITP, the conservation easement, and the final management plan. Such activities shall be funded through the Endowment. Identify an Endowment Manager. The Endowment shall be held by the Endowment Manager, which shall be either CDFW or another entity qualified pursuant to Government Code sections 65965-65968, as amended. Permittee shall submit to CDFW a written proposal that includes: (i) the name of the proposed Endowment Manager; (ii) whether the proposed Endowment Manager is a governmental entity, special district, nonprofit organization, community foundation, or congressionally chartered foundation; (iii) whether the proposed Endowment Manager holds the property or an interest in the property for conservation purposes as required by Government Code section 65968(b)(1) or, in the alternative, the basis for finding that the Project qualifies for an exception pursuant to Government Code section 65968(b)(2); and (iv) a copy of the proposed Endowment Manager's certification pursuant to Government Code section 65968(e). Within thirty days of CDFW's receipt of Permittee's written proposal, CDFW shall inform Permittee in writing if it determines the proposal does not satisfy the requirements of Fish and Game Code section 2081(b)(4) and, if so, shall provide Permittee with a written explanation of the reasons for its determination. If CDFW does not provide Permittee with a written determination within the thirty-day period, the proposal shall be deemed consistent with Section 2081(b)(4).;	ITP Condition # 8.3	Before commencing ground- or vegetation-disturbing activities / Or within 18 months of effective date of ITP if CDFW-approved security is provided	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
	….Continued Condition 8.3 Calculate the Endowment Funds Deposit. After obtaining CDFW written approval of the HM lands, long-term management plan, and Endowment Manager, Permittee shall prepare a Property Analysis Record (PAR), or PAR-equivalent analysis (hereinafter "PAR"), to calculate the amount of funding necessary to ensure the long-term management of the HM lands (Endowment Deposit Amount). The Permittee shall submit to CDFW for review and approval the results of the PAR before transferring funds to the Endowment Manager. Capitalization Rate and Fees. Permittee shall obtain the capitalization rate from the selected Endowment Manager for use in calculating the PAR and adjust for any additional administrative, periodic, or annual fees. Endowment Buffers/Assumptions. Permittee shall include in PAR assumptions the following buffers for endowment establishment and use that will substantially ensure long-term viability and security of the Endowment: 10 Percent Contingency. A 10 percent contingency shall be added to each endowment calculation to hedge against underestimation of the fund, unanticipated expenditures, inflation, or catastrophic events. Three Years Delayed Spending. The endowment shall be established assuming spending will not occur for the first three years after full funding. Non-annualized Expenses. For all large capital expenses to occur periodically but not annually such as fence replacement or well replacement, payments shall be withheld from the annual disbursement until the year of anticipated need or upon request to Endowment Manager and CDFW. Transfer Long-term Endowment Funds. Permittee shall transfer the long-term endowment funds to the Endowment Manager upon CDFW approval of the Endowment Deposit Amount identified above. The approved Endowment Manager may pool the Endowment with other endowments for the operation, management, and protection of HM lands for local populations of the Covered Species but shall maintain separate accounting for each Endowment. The Endowment Manager shall, at all times, hold and manage the Endowment in compliance with this ITP, Government Code sections 65965-65968, as amended, and Probate Code sections 18501-18510, as amended.	ITP Condition # 8.3	Before commencing ground- or vegetation-disturbing activities / Or within 18 months of effective date of ITP if CDFW-approved security is provided	Permittee	
9	Permittee shall reimburse CDFW for all reasonable expenses incurred by CDFW such as transaction fees, account set-up fees, administrative fees, title and documentation review and related title transactions, expenses incurred from other state agency reviews, and overhead related to transfer of HM lands to CDFW.	ITP Condition # 8.4	Before commencing ground- or vegetation-disturbing activities / Or within 18 months of effective date of ITP if CDFW-approved security is provided	Permittee	
10	Security Amount. The Security shall be in the amount of $2,919,500.00. This amount is based on the cost estimates identified in Condition of Approval 9.1 above.	ITP Condition # 9.1	Prior to Covered Activities or Within 30 days of the effective date of ITP	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
11	The Security shall be in the form of a funding assurance letter signed by the Deputy District Directors of Environmental Planning and Engineering and Project Management, or another form of Security approved in advance in writing by CDFW's Office of the General Counsel or another mechanism approved in advance in writing by CDFW's Office of the General Counsel. The funding assurance letter shall reference the estimated security and provide a commitment to fund the full cost of all ITP measures.	ITP Condition # 9.2	Prior to Covered Activities or Within 30 days of the effective date of ITP	Permittee	
12	The Security shall be provided to CDFW before Covered Activities begin or within 30 days after the effective date of this ITP, whichever occurs first.	ITP Condition # 9.3	Prior to Covered Activities or Within 30 days of the effective date of ITP	Permittee	
DURING CONSTRUCTION					
13	The Designated Biologist shall maintain a construction-monitoring notebook on-site throughout the construction period, which shall include a copy of this ITP with attachments and a list of signatures of all personnel who have successfully completed the education program. Permittee shall ensure a copy of the construction-monitoring notebook is available for review at the Project site upon request by CDFW.	ITP Condition # 5.5	Entire Project	Permittee	
14	Permittee shall initiate a trash abatement program before starting Covered Activities and shall continue the program for the duration of the Project. Permittee shall ensure that trash and food items are contained in animal-proof containers and removed at least once a week to avoid attracting opportunistic predators such as ravens, coyotes, and feral dogs.	ITP Condition # 5.6	Entire Project	Permittee	
15	Permittee shall implement dust control measures during Covered Activities to facilitate visibility for monitoring of the Covered Species by the Designated Biologist. Permittee shall keep the amount of water used to the minimum amount needed, and shall not allow water to form puddles.	ITP Condition # 5.7	Entire Project	Permittee	
16	Permittee shall prohibit use of erosion control materials potentially harmful to Covered Species and other species, such as monofilament netting (erosion control matting) or similar material, in potential Covered Species' habitat.	ITP Condition # 5.8	Entire Project	Permittee	
17	Project-related personnel shall access the Project Area using existing routes, or routes identified in the Project Description, and shall not cross Covered Species' habitat outside of or en route to the Project Area. Permittee shall ensure that vehicle speeds do not exceed 5 miles per hour to avoid Covered Species on or traversing the roads. If Permittee determines construction of routes for travel are necessary outside of the Project Area, the Designated Representative shall contact CDFW for written approval before carrying out such an activity. CDFW may require an amendment to this ITP, among other reasons, if additional take of Covered Species will occur as a result of the Project modification.	ITP Condition # 5.9			
18	Permittee shall confine all Project-related parking, storage areas, laydown sites, equipment storage, and any other surface-disturbing activities to the Project Area using, to the extent possible, previously disturbed areas. Additionally, Permittee shall not use or cross Covered Species' habitat outside of the marked Project Area.	ITP Condition # 5.10	Entire Project	Permittee	
19	Permittee shall immediately stop and, pursuant to pertinent state and federal statutes and regulations, arrange for repair and clean up by qualified individuals of any fuel or hazardous waste leaks or spills at the time of occurrence, or as soon as it is safe to do so. Permittee shall exclude the storage and handling of hazardous materials from the Project Area and shall properly contain and dispose of any unused or leftover hazardous products off-site.	ITP Condition # 5.11	Entire Project	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
20	Permittee shall provide CDFW staff with reasonable access to the Project, through the Resident Engineer when possible, and shall otherwise fully cooperate with CDFW efforts to verify compliance with or effectiveness of mitigation measures set forth in this ITP.	ITP Condition # 5.12	Entire Project	Permittee	
21	The Designated Representative shall immediately notify CDFW in writing if it determines that the Permittee is not in compliance with any Condition of Approval of this ITP, including but not limited to any actual or anticipated failure to implement measures within the time periods indicated in this ITP and/or the MMRP. The Designated Representative shall report any non-compliance with this ITP to CDFW within 48 hours.	ITP Condition # 6.2	Entire Project	Permittee	
22	The Designated Biologist shall be on-site daily when Covered Activities occur. The Designated Biologist shall conduct compliance inspections to (1) minimize incidental take of the Covered Species; (2) prevent unlawful take of species; (3) check for compliance with all measures of this ITP; (4) check all exclusion zones; and (5) ensure that signs, stakes, and fencing are intact, and that Covered Activities are only occurring in the Project Area. The Designated Representative or Designated Biologist shall prepare daily written observation and inspection records summarizing: oversight activities and compliance inspections, observations of Covered Species and their sign, survey results, and monitoring activities required by this ITP.	ITP Condition # 6.3	Entire Project	Permittee	
23	The Designated Biologist shall submit all observations of Covered Species to CDFW's California Natural Diversity Database (CNDDB) within 60 calendar days of the observation.	ITP Condition # 6.4	Entire Project	Permittee	
24	Permittee shall immediately notify the Designated Biologist if a Covered Species is taken or injured by a Project-related activity, or if a Covered Species is otherwise found dead or injured within the vicinity of the Project. The Designated Biologist or Designated Representative shall provide initial notification to CDFW by calling the Regional Office at (707) 944-5500. The initial notification to CDFW shall include information regarding the location, species, and number of animals taken or injured and the ITP Number. Following initial notification, Permittee shall send CDFW a written report within two calendar days. The report shall include the date and time of the finding or incident, location of the animal or carcass, and if possible provide a photograph, explanation as to cause of take or injury, and any other pertinent information.	ITP Condition # 6.6	Entire Project	Permittee	
25	If the Covered Species is found recently deceased, the carcass shall be immediately bagged, labeled, and preserved in a freezer. The label shall include time and date, GPS location, circumstances surrounding death (if known), and ITP tracking number. Specimens shall be delivered to the CDFW Wildlife Investigations Lab, Attention: Deana Clifford, 1701 Nimbus Road Suite D, Rancho Cordova, CA 95670 within two calendar days of the discovery.	ITP Condition # 6.6.1	Entire Project	Permittee	
26	Permittee shall confine all earthwork and vegetation clearing within the Project Area to the period of April 15 to October 31.	ITP Condition # 7.1	Entire Project	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
27	The Designated Biologist shall complete walking surveys of the Project Area to be impacted prior to Covered Activities and shall follow earthmoving equipment to look for Covered Species' during all work that could cause take. If a Covered Species are discovered by the Designated Biologist or anyone else, the Designated Biologist shall move the animal to a safe nearby location (e.g. mouth of ground-squirrel burrow outside of the construction area) and monitor it until it is determined that it is not imperiled by predators or other dangers.	ITP Condition # 7.2	Entire Project	Permittee	
28	The Designated Biologist shall relocate any Covered Species found within the Project Area to be impacted to an active rodent burrow system located no more than 300 feet outside of the BSA unless otherwise approved by CDFW. The Covered Species shall be monitored until it is determined that it is not imperiled by predators or other dangers. Relocation areas shall be identified by the Designated Biologist based upon best suitable habitat available and approved by CDFW prior to the start of Covered Activities. The Covered Species shall be photographed and measured for identification purposes prior to relocation. All documentation shall be provided to the CDFW within 24 hours of Covered Species Relocation.	ITP Condition # 7.3	Entire Project	Permittee	
29	Permittee shall at the end of each work day, create an escape ramp at each end of any open trench to allow any animals that may have become entrapped in the trench to climb out overnight. The ramp may be constructed of either dirt fill or wood planking or other suitable material that is placed at an angle no greater than 30 degrees.	ITP Condition # 7.4	Entire Project	Permittee	
30	If an injured Covered Species is found during the project term, the individual shall be evaluated by the Lead Designated Biologist who shall then immediately contact the CDFW Regional Representative, via email and telephone, to discuss the next steps. If the CDFW Regional Representative cannot be contacted immediately, the injured Covered Species shall be placed in a shaded container (and amphibians shall be kept moist). If the CDFW Regional Representative is not available or has not responded within 2 hours of initial attempts then the following steps shall be taken: a) If the injury is minor or healing and the Covered Species is likely to survive, the Covered Species shall be released immediately in accordance with the Condition of Approval 7.5. b) If it is determined that the Covered Species has major or serious injuries as result of Project-related activities, the Designated Biologist shall immediately take it to the Lindsay Wildlife Museum or another CDFW-approved facility. If taken into captivity, the individual shall remain in captivity and not be released into the wild unless it has been kept in quarantine and the release is authorized by CDFW and USFWS. Permittee shall bear any costs associated with the care or treatment of such injured Covered Species. The circumstances of the injury, the procedure followed and the final disposition of the injured animal shall be documented in a written incident report as described in Condition 6.6.	ITP Condition # 7.5	Entire Project	Permittee	
31	Additional impacts to habitat beyond those identified the Impacts of the Taking on Covered Species section of this ITP are not authorized.	ITP Condition # 7.6			
POST-CONSTRUCTION					
32	Upon completion of Covered Activities, Permittee shall remove from the Project Area and properly dispose of all temporary fill and construction refuse, including, but not limited to, broken equipment parts, wrapping material, cords, cables, wire, rope, strapping, twine, buckets, metal or plastic containers, and boxes.	ITP Condition #5.13	Post-construction	Permittee	

	Mitigation Measure	Source	Implementation Schedule	Responsible Party	Status / Date / Initials
33	Permittee shall restore on-site the 32.50 acre of Covered Species habitat that will be temporarily disturbed during construction to pre-project or better conditions. Within 6 months of issuance of this ITP, the Permittee shall prepare a Vegetation Restoration Plan to facilitate revegetation of the 32.50 acre of temporary construction disturbance on-site, and shall ensure that the Plan is successfully implemented by the contractor. The Plan shall include detailed specifications for restoring all temporarily disturbed areas, such as seed mixes and application methods.	ITP Condition # 8.5	Post-construction	Permittee	
34	No later than 45 days after completion of all mitigation measures, Permittee shall provide CDFW with a Final Mitigation Report. The Designated Biologist shall prepare the Final Mitigation Report which shall include, at a minimum: (1) a summary of all Quarterly Compliance Reports and all ASRs; (2) a copy of the table in the MMRP with notes showing when each of the mitigation measures was implemented; (3) all available information about Project-related incidental take of the Covered Species; (4) information about other Project impacts on the Covered Species; (5) beginning and ending dates of Covered Activities; (6) an assessment of the effectiveness of this ITP's Conditions of Approval in minimizing and fully mitigating Project impacts of the taking on Covered Species; (7) recommendations on how mitigation measures might be changed to more effectively minimize take and mitigate the impacts of future projects on the Covered Species; and (8) any other pertinent information.	ITP Condition # 6.5	Post-construction and after completion of mitigation	Permittee	

ATTACHMENT 2A
DEPARTMENT OF FISH AND WILDLIFE
HABITAT MANAGEMENT LAND ACQUISITION PACKAGE CHECKLIST FOR PROJECT APPLICANTS

The following checklist is provided to inform you of what documents are necessary to expedite the Department of Fish and Wildlife (CDFW) processing of your Habitat Management Land acquisition proposal. Any land acquisition processing requests which are incomplete when received, will be returned. The Region contact will review and approve the document package and forward it to the Habitat Conservation Planning Branch Senior Land Agent with a request to process the land acquisition for formal acceptance.

To: _____
Regional Manager, Region Name

From: _____
Project Applicant

Phone: _____

Tracking #: _____
CDFW assigned permit or agreement #

Project Name: _____

Enclosed is the complete package for the ☐ Conservation Easement OR ☐ Grant Deed

Documents in this package include:

- ☐ Fully executed, approved as to form Conservation Easement Deed or Grant Deed with legal description stamped by a licensed surveyor. Date executed: _____
- ☐ Proposed Lands for Acquisition Form (PLFAF)
- ☐ Phase I Environmental Site Assessment Report Date on report: _____
  (An existing report may be used, but it must be less than two years old.)
- ☐ Preliminary Title Report(s) for subject property is enclosed and has been reviewed for Encumbrances, including severed mineral estates, and other easements. The title report must be less than six months old when final processing is conducted.
  Included are additional documents:
  - ☐ document(s) to support title exceptions
  - ☐ document(s) to explain title encumbrances
  - ☐ a plot or map of easements/encumbrances on the property
- ☐ Policy of Title Insurance (an existing title policy is not acceptable)
- ☐ County Assessor Parcel Map(s) for subject property
- ☐ Site Location Map (Site location with property boundaries outline on a USGS 1:24,000 scale topo)
- ☐ Final Permit or Agreement (or other appropriate instrument)
  Type of agreement: ☐ Bank Agreement ☐ Mitigation Agreement
  ☐ Permit _____ Other: _____
  (write in type of permit)
- ☐ Final Management Plan (if required prior to finalizing permit or agreement or if this package is for a Grant Deed)
- ☐ Biological Resources Report
- ☐ Draft Summary of Transactions ☐ hard copy ☐ electronic copy (both are required)

ATTACHMENT 2B

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE
PROPOSED LANDS FOR ACQUISITION FORM ("PLFAF")

Date: _____

TO: Regional Representative

_____

_____

_____

Facsimile:

FROM: _____

_____

_____

_____

Applicant proposes that the following parcel(s) of land be considered for approval by the California Department of Fish and Wildlife as suitable for purposes of habitat management lands to compensate the adverse environmental impacts of the Project:

Section(s)	Township	Range	County	Acres
_____	_____	_____	_____	_____

Current Legal Owner(s), of the surface and mineral estates, include Assessor's Parcel Number(s):

_____

_____

_____

General Description of Location of Parcel(s):

_____

_____

_____

_____

Land Value: $

For Region Use Only

APPROVED ___ By: _____ DATE: _____

Regional Manager's Signature

REJECTED ___

Region: _____

Explanation: _____

_____

_____

Rev. December 8, 2014

California Department of Fish and Wildlife

Mitigation Payment Transmittal Form

Project Applicant Instructions: Please fill out and attach this form to payment. For conservation banks, also attach the Bill(s) of Sale for credits sold. One form may be used for multiple transactions, **BUT YOU MUST USE A SEPARATE FORM FOR EACH CHECK YOU TRANSMIT**. Make sure to include Project Name, Project Tracking Number, and FASB Mitigation Tracking Number (if available) on the attached payment type.

(1) **DATE:** _____

TO: _____
[CDFW Regional Manager]

_____
[CDFW Regional Office Address]

(2) **FROM:** _____
Name

_____
Mailing Address

_____
City, State, Zip

_____
Telephone Number/FAX Number

(3) **RE:** _____
[Project Name as appears on permit/agreement]

(4) **AGREEMENT/ACCOUNT INFORMATION:**
(Check the applicable type)

☐ 2081 Permit ☐ Conservation Bank ☐ 1802 Agreement

☐ 2835 NCCP ☐ Other _____

_____
[Project Tracking Number]

_____
[FASB Mitigation Tracking Number (if available)]

Index _____ PCA _____

(5) PAYMENT TYPE (One check per form only): The following funds are being remitted in connection with the above referenced project:

Check information:

Total $_____ Check No. _____

Account No._____ Bank Routing No. _____

a. Endowment: for Long-Term Management Subtotal $_____

b. Habitat Enhancement Subtotal $_____

c. Security:

1. Cash Refundable Security Deposit Subtotal $_____

2. Letter of Credit Subtotal $_____

1. Financial Institution: _____

2. Letter of Credit Number: _____

3. Date of Expiration: _____

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2014-F-0311-1

AUG 07 2014

Ms. Melanie Brent, Office Chief
Caltrans District 4 Environmental Analysis
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Biological Opinion on the Effects of the Proposed Interstate 580 and Interstate 205 Pavement Rehabilitation Project, Alameda County, California (Caltrans EA 3G590)

Dear Ms. Brent:

This letter responds to a letter from the California Department of Transportation (Caltrans), dated October 2, 2013, which requested formal consultation for the proposed Interstate 580 (I-580) and Interstate 205 (I-205) Pavement Rehabilitation Project in Alameda County, California. Your letter was received by the U.S. Fish and Wildlife Service (Service) on October 18, 2013 (Caltrans EA 3G590). This document represents the Service's response to your request for consultation on the effects of the project on the threatened California red-legged frog (*Rana draytonii*), threatened California tiger salamander (Central Valley Distinct Population Segment) (*Ambystoma californiense*), endangered San Joaquin kit fox (*Vulpes macrotis mutica*), endangered longhorn fairy shrimp (*Branchinecta longiantenna*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*), endangered vernal pool tadpole shrimp (*Lepidurus packardi*), and designated critical habitat for the California red-legged frog. This letter issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation (23 U.S.C. 327) allows the Secretary of the U.S. Department of Transportation acting through the Federal Highway Administration (FHWA) to establish a Surface Transportation Project Delivery Pilot Program, whereby a State may assume the FHWA responsibilities under the National Environmental Policy Act (NEPA) for environmental review, agency consultation and other action pertaining to the review or approval of a specific project. Caltrans assumed these responsibilities for the FHWA on July 1, 2007 through a Memorandum of Understanding (MOU) within the State of California (http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation/sec6005mou.pdf).

The Service has reviewed the submitted project as described in the September 2013 biological assessment, the April 24, 2014 site visit, correspondence from Caltrans on October 2, 2013, supporting documentation, and evaluation of project effects, and concurs with the determination that the project as described is not likely to adversely affect the San Joaquin kit fox, longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp as the effects will be discountable. The Service concurs that the proposed action is not likely to adversely affect the these species based on the following: (1) construction activities, including staging, laydown and vehicle parking, will predominately occur within paved areas and disturbed or ruderal areas immediately adjacent to I-580; (2) construction access, staging, storage and parking areas will be located within the right-of-

way and outside any designated environmentally sensitive areas; (3) Caltrans will implement construction and erosion control Best Management Practices (BMPs); (4) areas adjacent to sensitive habitat will be clearly demarked with temporary high-visibility fencing; (5) all on-site personnel will attend environmental awareness training prior to beginning project activities; and (6) Service-approved biological monitors will conduct preconstruction surveys prior to ground disturbing activities and remain on-site to monitor construction activities adjacent to San Joaquin kit fox, longhorn fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp habitat.

The remainder of this biological opinion is on the effects of the project on California red-legged frog, California tiger salamander, and designated critical habitat for the California red-legged frog. This biological opinion is based on: (1) the Interstate 580 Roadway Rehabilitation Project, Biological Assessment dated September 2013; (2) letter from Caltrans to the Service dated October 2, 2013; (3) email correspondence from Caltrans on October 2, 2013, and accompanying exhibits; (4) miscellaneous correspondence and electronic mail concerning the proposed action between Caltrans and the Service; and (5) other information available to the Service.

Consultation History

October 2, 2013	The Service received a letter requesting the initiation of formal consultation dated October 2, 2013, and a Biological Assessment for the I-580 and I-205 Pavement Rehabilitation Project.
April 24, 2014	The Service conducted a site visit to evaluate on-site habitat suitability for listed species and California red-legged frog critical habitat.
June 26, 2014	The Service issued a draft biological opinion to Caltrans for their reivew.
July 9, 2014	The Service received comments from Caltrans regarding the draft biological opinion.
April 26, 2013 - July 17, 2014	Electronic and phone correspondence between Caltrans and the Service.

BIOLOGICAL OPINION

Description of the Proposed Action

The following project description, inclusive of the proposed compensation and proposed conservation measures, was provided by Caltrans and is an excerpt from the September 2013 Biological Assessment with minor modifications for reasons of clarity and accuracy provided by the Service.

Project History

The purpose of the proposed project is to rehabilitate and reconstruct the existing pavement on the mainline and ramps and to improve traffic safety by upgrading and/or replacing the metal beam guardrails (MBGR) with concrete barriers. The I-580 corridor between the San Joaquin County line and the Greenville Road overhead was originally built in 1966 and has had several improvements over the years, including the 2005 widening project to add another lane to the westbound direction between the Midway Road undercrossing (Post Mile [PM] 1.04) and West Grant Line Road (PM 2.5). According to the 2008 Pavement Condition Survey Inventory, there are numerous incidents of cracking and faulting in this stretch of the I-580 corridor. Some of the on-ramps, off-ramps, and asphalt concrete (AC) shoulder widths (both inside and outside) do not meet the current design

standards in both directions. Some of the existing MBGR in both directions are in poor condition where they were damaged by traffic accidents. There is a critical need to improve the existing condition of I-580 and to enhance traffic safety.

Project Description

This project proposes to remove surface AC, where present, and to replace underlying slabs along westbound and eastbound portions of I-580 and I-205. A new surface layer of up to 9 inches will be installed through crack, seat, and overlay (CSOL) using a layer of hot mix asphalt-type A (HMA-A), geosynthetic pavement interlayer (GPI), and an open-graded friction course (OGFC). Existing AC shoulders in the action area will be replaced with shoulder backing, which involves the laying of a thin course of granular material to protect the outside edge of the pavement. This action prevents edge cracking and pavement edge loss. Shoulder backing requires an additional footprint of 4 to 8 feet from the edge of pavement.

Eastbound I-580 (PM 0.0 to PM 4.7)

Proposed Slab Replacement: Proposed CSOL (up to 9 inches) of 0.1-foot HMA-A, GPI, 0.3-foot HMA-A, 0.25-foot HMA-A, and 0.1-foot OGFC. Existing AC shoulders will be replaced with HMA-A plus shoulder backing.

Westbound I-580 (PM 0.0 to PM 6.9) and I-205 (PM 0.0 to PM 1.0)

Proposed Removal of Existing AC and Slab Replacement: Proposed CSOL (up to 9 inches) of 0.1-foot HMA-A, GPI, 0.3-foot HMA-A, 0.25-foot HMA-A, and 0.1-foot OGFC. Existing AC shoulders will be replaced with HMA-A plus shoulder backing.

Westbound I-580 (PM 6.9 to PM 7.8)

Proposed Slab Replacement: Proposed CSOL (up to 9 inches) of 0.1-foot HMA-A, GPI, 0.3-foot HMA-A, 0.25-foot HMA-A, and 0.1-foot OGFC. Existing AC shoulders will be replaced with HMA-A plus shoulder backing.

On- and Off-Ramp Rehabilitation

This project proposes to remove and replace surface layers from seven ramps within the action area and to replace them with either, or a combination of, HMA-A or rubberized hot mix asphalt (gap graded) (RHMA-G). The proposed design features and specific locations for all of the activities are listed below:

Eastbound Grant Line Road On- and Off-Ramps

Remove current surface layer and replacement with 0.2-foot HMA-A and 0.2-foot RHMA-G.

Westbound Grant Line Road On- and Off-Ramps

Removal of current surface layer and replacement with 0.2-foot RHMA-G.

Eastbound North Flynn Road Off-Ramp

Removal of current surface layer and replacement with 0.2-foot RHMA-G.

Westbound North Flynn Road On- and Off-Ramps

Remove current surface layer and replacement with 0.2-foot HMA-A and 0.2-foot RHMA-G.

Other Rehabilitation Activities

The installation of additional highway safety features are proposed for this project. These activities include the installation of rumble strips, installation of MBGRs and concrete barriers (Type 60/60C), and replacement of hot mix asphalt (HMA) dikes and concrete curbs. Installation of overhead signage, lighting, flashing beacons, barrier markers, roadside delineators, and guardrail delineators also will occur.

Proposed Conservation Measures

Proposed Compensation

To offset permanent effects to California red-legged frog and Central California tiger salamander, suitable habitat for each species, or suitable multi-species habitat in coordination with the Service, will be created, restored, or set aside in perpetuity at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects (Table 1). Alternatively, credits will be purchased at a Service-approved conservation bank. Compensation plans will be subject to review and approval by the Service. On-site restoration of temporarily affected areas may qualify as compensation at a 1:1 ratio once conditions are verified by the Service.

Table 1: Proposed Compensation for Temporary and Permanent Effects

Species	Effects						Total Compensation
	Temporary (acres)			Permanent (acres)			
	Impact	Compensation		Impact	Compensation		
		Ratio	Need		Ratio	Need	
California red-legged frog	29.53	1.1:1	32.48	5.37	3:1	16.11	48.59
California tiger salamander	29.53	1.1:1	32.48	5.37	3:1	16.11	48.59

General Conservation Measures

To reduce potential effects to sensitive biological resources, Caltrans proposes to incorporate construction Best Management Practices (BMPs) and avoidance and minimization measures into the proposed roadway construction project. These measures will be communicated to the contractor through the use of special provisions included in the contract bid solicitation package. These measures include the following:

1. **Seasonal Avoidance**. Construction actions will be scheduled to minimize effects on listed species and habitats. Except for limited vegetation clearing necessary to minimize effects to nesting birds, work will be conducted between April 15 and October 15.

2. **Minimize Nighttime Work**. To the extent practicable, nighttime construction will be minimized to avoid effects to nocturnally active listed species. When utilized in areas adjacent to California red-legged frog and Central California tiger salamander habitat, work lights will be directed away from adjacent habitat areas.

3. **Environmentally Sensitive Areas (ESA)**. Prior to the start of construction, ESAs – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high visibility orange fencing. Construction work areas include the active construction site and all areas providing support for the proposed action including areas used for vehicle parking,

equipment and material storage and staging, access roads, etc. The ESA fencing will remain in place throughout the duration of the proposed action, while construction activities are ongoing, and will be regularly inspected and fully maintained at all times. The final project plans will depict all locations where ESA fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material and equipment storage, access roads and other surface-disturbing activities within ESAs.

4. **Wildlife Exclusion Fencing (WEF)**. Prior to the start of construction, WEF will be installed at the edge of the project footprint in all areas where California red-legged frogs or Central California tiger salamanders could enter the construction area. The location of the fencing shall be determined by the Resident Engineer and Service-approved biologist in cooperation with the Service prior to the start of staging or surface disturbing activities. The location, fencing materials, installation specifications, and monitoring and repair criteria shall be approved by the Service prior to start of construction. Caltrans shall include the WEF specifications on the final project plans. Caltrans shall include the WEF specifications including installation and maintenance criteria in the bid solicitation package special provisions. The WEF shall remain in place throughout the duration of the project and shall be regularly inspected and fully maintained. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion the WEF shall be completely removed, the area cleaned of debris and trash, and returned to natural conditions.

5. **Environmental Awareness Training**. Prior to the start of construction, a qualified biologist will conduct an educational training program for all construction personnel including contractors and subcontractors. The training will include, at a minimum, a description of the California red-legged frog and Central California tiger salamander, and their habitat within the action area; an explanation of the status of these species and protection under state and federal laws; the avoidance and minimization measures to be implemented to reduce take of these species; communication and work stoppage procedures in case a listed species is observed within the action area; and an explanation of the ESAs and WEF and the importance of maintaining these structures. A fact sheet conveying this information will be prepared and distributed to all construction personnel. Upon completion of the program, personnel will sign a form stating that they attended the program and understand all the avoidance and minimization measures and implications of the Act.

6. **Avoidance of Entrapment**. To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 1-foot deep will be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. The Service-approved biologist shall inspect all holes and trenches at the beginning of each workday and before such holes or trenches are filled. All replacement pipes, culverts, or similar structures stored in the action area overnight will be inspected before they are subsequently moved, capped, and/or buried. If at any time a listed species is discovered, the Resident Engineer and Service-approved biologist will be notified immediately and the Service-approved biologist shall implement the species observation and handling protocol outlined below.

7. **Best Management Practices**. Storm Water Pollution Prevention Plans (SWPPP) and erosion control BMPs will be developed and implemented to minimize any wind or water-

related erosion and will be in compliance with the requirements of the Regional Water Quality Control Board. The SWPPP will reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges and can be found online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm. Protective measures will include, at a minimum:

a. No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or watercourses.

b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from watercourses, except at established commercial gas stations or established vehicle maintenance facility.

c. Concrete wastes are collected in washouts and water from curing operations is collected and disposed. Neither will be allowed into watercourses.

d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.

e. Dust control measures will include use of water trucks and dust palliatives to control dust in excavation-and-fill areas, covering temporary access road entrances and exits with rock (rocking), and covering of temporary stockpiles when weather conditions require.

f. Coir rolls or straw wattles that do not contain plastic or synthetic monofilament netting will be installed along or at the base of slopes during construction to capture sediment.

g. Protection of graded areas from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas. Erosion control materials that use plastic or synthetic monofilament netting will not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers.

h. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from the highway, or other impervious surfaces will be incorporated to the maximum extent practicable.

i. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.

8. **Construction Site Management Practices**. The following site restrictions will be implemented to avoid or minimize effects on listed species and their habitats:

a. A speed limit of 15 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.

b. Construction access, staging, storage, and parking areas, will be located within the project Caltrans ROW outside of any designated ESA or outside of the Caltrans

ROW in areas environmentally cleared by the contractor. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.

c. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free.

d. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of off-site.

e. No pets from project personnel will be allowed anywhere in the action area during construction.

f. No firearms will be allowed on the project site except for those carried by authorized security personnel, or local, State or Federal law enforcement officials.

g. A Spill Response Plan will be prepared. Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 50 feet from hydrologic features.

h. All equipment will be properly maintained and free of leaks. Servicing of vehicles and construction equipment including fueling, cleaning, and maintenance will occur at least 50 feet from any hydrologic features unless it is an existing gas station.

9. **Vegetation Removal**. Any vegetation that is within the cut and fill line or growing in locations where permanent structures will be placed (e.g., road alignment, shoulder widening, soil nail walls, etc.) will be cleared. Vegetation will be cleared only where necessary and will be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants that reproduce vegetatively to resprout after construction. All clearing and grubbing of woody vegetation will occur by hand or using light construction equipment such as backhoes. If clearing and grubbing occurs between February 1 and August 31, a qualified biologist(s) will survey for nesting birds within the area(s) to be disturbed including a perimeter buffer of 100 feet for passerines and 500 feet for raptors before clearing activities begin. All nest avoidance requirements of the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503 and 3503.5 will be observed. All cleared vegetation will be removed from the project footprint to prevent attracting animals to the project site. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of such materials. A Service-approved biologist will be present during all vegetation clearing and grubbing activities. Prior to vegetation removal, the Service-approved biologist shall thoroughly survey the area for California red-legged frogs and Central California tiger salamanders. Once the Service-approved biologist has thoroughly surveyed the area, clearing and grubbing may continue without further restrictions on equipment; however, the Service-approved biologist shall remain onsite to monitor for California red-legged frogs and Central California tiger salamanders until all clearing and grubbing activities are complete. After project completion, all temporarily affected areas shall be returned to original grade and contours to the maximum extent practicable, protected with proper erosion control materials, and revegetated with native species appropriate for the region and habitat communities on site.

10. **Reduce Spread of Invasive Species**. To reduce the spread of invasive non-native plant species and minimize the potential decrease of palatable vegetation for wildlife species,

Caltrans will comply with Executive Order 13112. This order is provided to prevent the introduction of invasive species and provide for their control in order to minimize the economic, ecological, and human health impacts. In the event that high- or medium-priority noxious weeds, as defined by the California Department of Food and Agriculture or the California Invasive Plant Council, are disturbed or removed during construction-related activities, the contractor will contain the plant material associated with these noxious weeds and dispose of it in a manner that will not promote the spread of the species. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of materials. Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion control seed mixture. If seeding is not possible, the area should be covered to the extent practicable with heavy black plastic solarization material until the end of the project.

11. **Replant, Reseed, and Restore Disturbed Areas**. All slopes or unpaved areas that are temporarily affected by the proposed action will be revegetated with an assemblage of native grasses and shrubs characteristic of the floristic region and native local habitats to stabilize soils and prevent erosion. Where disturbance includes the removal of trees or plants, native species will be replanted and maintained until they become established. A revegetation plan with success criteria will be submitted to the Service for review and approval. Temporary effects comprise areas denuded, manipulated, or otherwise modified from their existing, pre-project conditions, thereby removing one or more essential components of a listed species' habitat as a result of project activities that include, but are not limited to, construction, staging, storage, lay down, vehicle access, parking, etc. Temporary effects must be restored to baseline habitat values or better within one year following initial disturbance. Areas subject to ongoing operations and maintenance are not considered temporary even if they are restored within one year following initial disturbance. Affected areas not fulfilling these criteria are considered permanent.

Action Area

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the purposes of the effects assessment, the action area encompasses 269.20 acres extending 8.9 miles along the eastbound side of I-580 from the San Joaquin County line (PM 0.0) to PM 4.9, the westbound side of I-580 from the San Joaquin County Line to 0.1-mile east of Greenville Road (PM 7.9) in Livermore, including the eastbound and westbound on- and off-ramps at Grant Line Road, the eastbound off-ramp at North Flynn Road, and the westbound on- and off-ramps at North Flynn Road. The action area also includes I-205 from the San Joaquin County line to the intersection with I-580 (PM 1.0). Habitat within the action area comprises 133.37 acres of paved roadways, 94.8 acres of grassland, 1.4 acres of shrubland, 0.1-acre of freshwater marsh, 0.3-acre of creek channel, 0.5-acre of aqueduct, 11.4 acres of urbanized landscaped area, and 27.3 acres of bare ground.

Analytical Framework for the Jeopardy Determinations

Jeopardy Determination

In accordance with policy and regulation, the jeopardy analyses in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the California red-legged frog and Central California tiger salamander range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of

the California red-legged frog and Central California tiger salamander in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the California red-legged frog and Central California tiger salamander; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the California red-legged frog and Central California tiger salamander; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the California red-legged frog and Central California tiger salamander.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the California red-legged frog and Central California tiger salamander current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these species in the wild.

The jeopardy analyses in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the California red-legged frog and Central California tiger salamander and the role of the action area in the survival and recovery of the California red-legged frog and Central California tiger salamander as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this biological opinion relies on four components: (1) the *Status of Critical Habitat*, which evaluates the range-wide condition of critical habitat for the SPECIES in terms of primary constituent elements (PCE)s, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units and; (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the California red-legged frog critical habitat are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the California red-legged frog.

The analysis in this biological opinion places an emphasis on using the intended range-wide recovery function of California red-legged frog critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed

Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

Status of the Species and Environmental Baseline

California Red-legged Frog

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813) (Service 1996). Critical habitat was designated for this species on April 13, 2006 (71 FR 19244) (Service 2006) and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816) (Service 2010). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). A recovery plan was published for the California red-legged frog on September 12, 2002 (Service 2002).

Description: The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution: The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002). California red-legged frogs are still locally abundant within portions of the San Francisco Bay area and the central California coast. Isolated populations have been documented in the Sierra Nevada, northern coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular Ranges, but is still present in Baja California, Mexico (CDFW 2014).

Status and Natural History: California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, they also inhabit ephemeral creeks, drainages, and ponds with minimal riparian and emergent vegetation. California red-legged frogs breed from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules, or overhanging willows (Storer 1925, Hayes and Jennings 1988). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984).

Habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer including vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees (Fellers 2005). Sheltering habitat for California red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provides cover, such as animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or haystacks may also be

used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5 mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al.* (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger *et al.* (2003) reported that non-migrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, *i.e.*, California blackberry, poison oak, and coyote brush. Dispersing frogs in northern Santa Cruz County traveled distances from 0.25 mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment in eastern Contra Costa County, Tatarian (2008) noted that 57 percent of frogs fitted with radio transmitters in the Round Valley study area stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. Her study reported a peak seasonal terrestrial movement occurring in the fall months associated with the first 0.2 inch of precipitation and tapering off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the base of trees or rocks, logs, and under man-made structures; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from 1 to 4 days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Upland refugia closer to aquatic sites were used more often and were more commonly associated with areas exhibiting higher object cover, *e.g.*, woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000 - 5,000 eggs are attached to vegetation below the surface and hatch after 6 - 14 days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand resulted in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3.5 - 7 months following hatching and reach sexual maturity at 2 - 3 years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations can fluctuate from year to year; favorable conditions allow the

species to have extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, the animal may temporarily disappear from an area when conditions are stressful (*e.g.*, during periods of drought, disease, etc.).

The diet of California red-legged frogs is highly variable and changes with the life history stage. The diet of the larvae is not well studied, but is likely similar to that of other ranid frogs, feeding on algae, diatoms, and detritus by grazing on the surface of rocks and vegetation (Fellers 2005; Kupferberg 1996a, 1996b, 1997). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific chorus frogs, threespine stickleback, and, to a limited extent, California mice, which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult frogs varied in their feeding activity periods; juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination, feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Threats: Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990, Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs, and suggested that bullfrogs could prey on subadult California red-legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with California red-legged frog reproduction by eating adult male California red-legged frogs. Both California and northern red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990, Jennings 1993, Twedt 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

The urbanization of land within and adjacent to California red-legged frog habitat has also affected the threatened amphibian. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks dispersal, and the introduction of predatory fishes and bullfrogs. Diseases may also pose a significant threat, although the specific effects of disease on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Chytridiomycosis and ranaviruses are a potential threat because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson *et al.* 2003; Lips *et al.* 2006). Mao *et al.* (1999 cited in Fellers

2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric threespine sticklebacks in northwestern California. Non-native species, such as bullfrogs and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al.* 2006). Human activities can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (*i.e.*, contaminated boots, waders, or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease.

Recovery Plan: The recovery plan for the California red-legged frog identifies eight recovery units (Service 2002). The establishment of these recovery units is based on the determination that various regional areas of the species' range are essential to its survival and recovery. The status of the California red-legged frog was considered within the small-scale recovery units as opposed to their overall range. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of its range. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations. Thus when combined with suitable dispersal habitat, will allow for the long-term viability within existing populations. The management strategy identified within the Recovery Plan will allow for the recolonization of habitats within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

California Red-legged Frog Critical Habitat

The Service designated critical habitat for the California red-legged frog on April 13, 2006 (71 FR 19244) (Service 2006) and a revised designation to the critical habitat was published on March 17, 2010 (75 FR 12816) (Service 2010). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). Critical habitat is defined in Section 3 of the Act as: (1) The specific areas within the geographical area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (a) essential to the conservation of the species and (b) that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. In determining which areas to designate as critical habitat, the Service considers those physical and biological features that are essential to a species' conservation and that may require special management considerations or protection (50 CFR 424.12(b)). The Service is required to list the known PCEs together with the critical habitat description. Such physical and biological features include, but are not limited to, the following:

1. Space for individual and population growth, and for normal behavior;
2. Food, water, air, light, minerals, or other nutritional or physiological requirements;
3. Cover or shelter;
4. Sites for breeding, reproduction, rearing of offspring, or dispersal; and
5. Generally, habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The PCEs defined for the California red-legged frog were derived from its biological needs. The area designated as revised critical habitat provides aquatic habitat for breeding and non-breeding

activities and upland habitat for shelter, foraging, predator avoidance, and dispersal across its range. The PCEs and, therefore, the resulting physical and biological features essential for the conservation of the species were determined from studies of California red-legged frog ecology. Based on the above needs and our current knowledge of the life history, biology, and ecology of the species, and the habitat requirements for sustaining the essential life-history functions of the species, the Service determined that the PCEs essential to the conservation of the California red-legged frog are:

1. *Aquatic Breeding Habitat.* Standing bodies of fresh water (with salinities less than 7.0 parts per thousand), including: natural and manmade (*e.g.*, stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.

2. *Non-Breeding Aquatic Habitat.* Freshwater and wetted riparian habitats, as described above, that may not hold water long enough for the species to hatch and complete its aquatic life cycle but that do provide for shelter, foraging, predator avoidance, and aquatic dispersal for juvenile and adult California red-legged frogs. Other wetland habitats that would be considered to meet these elements include, but are not limited to: plunge pools within intermittent creeks; seeps; quiet water refugia during high water flows; and springs of sufficient flow to withstand the summer dry period.

3. *Upland Habitat.* Upland areas adjacent to or surrounding breeding and non-breeding aquatic and riparian habitat up to a distance of 1 mile in most cases and comprised of various vegetational series such as grasslands, woodlands, wetland, or riparian plant species that provide the frog shelter, forage, and predator avoidance. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support and surround the wetland or riparian habitat. These upland features contribute to the filling and drying of the wetland or riparian habitat and are responsible for maintaining suitable periods of pool inundation for larval frogs and their food sources, and provide breeding, non-breeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks and organic debris (*e.g.*, downed trees, logs), as well as small mammal burrows and moist leaf litter.

4. *Dispersal Habitat.* Accessible upland or riparian dispersal habitat within designated units and between occupied locations within a minimum of 1 mile of each other that allow for movement between such sites. Dispersal habitat includes various natural habitats and altered habitats such as agricultural fields, which do not contain barriers (*e.g.*, heavily traveled road without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large reservoirs over 50 acres in size, or other areas that do not contain those features identified in PCEs 1, 2, or 3 as essential to the conservation of the species.

With the revised designation of critical habitat, the Service intends to conserve the geographic areas containing the physical and biological features that are essential to the conservation of the species, through the identification of the appropriate quantity and spatial arrangement of the PCEs sufficient to support the life-history functions of the species. Because not all life-history functions require all the PCEs, not all areas designated as critical habitat will contain all the PCEs. Please refer to the

final designation of critical habitat for California red-legged frog for additional information (75 FR 12816).

Central California Tiger Salamander

Listing Status: On May 23, 2003, we proposed to list the Central California DPS of the tiger salamander as threatened. At that time, we also proposed reclassification of the Santa Barbara County DPS and Sonoma County DPS from endangered to threatened (Service 2003). In the same notice, we also proposed a special rule under section 4(d) of the Act to exempt take for routine ranching operations for the Central California DPS and, if reclassified to threatened, for the Santa Barbara and Sonoma County DPSs (Service 2003). On August 4, 2004, after determining that the listed Central California population of the California DPS of the Central California tiger salamander was threatened (Service 2004), we determined that the Santa Barbara and Sonoma County populations were threatened as well, and reclassified the Central California tiger salamander as threatened throughout its range (Service 2004), removing the Santa Barbara and Sonoma County populations as separately listed DPSs (Service 2004). In this notice, we also finalized the special rule to exempt take for routine ranching operations for the Central California tiger salamander throughout its range (Service 2004).

On August 18, 2005, as a result of litigation of the August 4, 2004, final rule on the reclassification of the California tiger salamander DPSs (*Center for Biological Diversity et al. v. United States Fish and Wildlife Service et al.*, C 04-04324 WHA (N.D. Cal. 2005), the District Court of Northern California sustained the portion of the 2004 rule pertaining to listing the Central California tiger salamander as threatened with a special rule, but vacated the portion of the 2004 rule that re-classified the Santa Barbara and Sonoma DPSs to threatened status thereby reinstating their status as endangered. On August 31, 2011, the List of Endangered and Threatened Wildlife in part 17, subchapter B of Chapter I, title 50 of the Code of Federal Regulations (CFR) was amended to reflect the vacatures contained in the 2005 court order, classifying the Santa Barbara DPS and the Sonoma DPS of the California tiger salamander as endangered, and the Central DPS of the California tiger salamander as threatened with a special rule to exempt routine ranching operations from take (Service 2011).

Species Description: The California tiger salamander is a large, stocky, terrestrial salamander with a broad, rounded snout. Recorded adult measurements have been as much as 8.2 inches long (Petranka 1998; Stebbins 2003). California tiger salamanders exhibit sexual dimorphism (differences in body appearance based on gender) with males tending to be larger than females. The coloration of the adults generally consists of random white or yellowish markings against a black body. The markings tend to be more concentrated on the lateral sides of the body; whereas other salamander species tend to have brighter yellow spotting that is heaviest on the dorsal surface.

Distribution: The California tiger salamander is endemic to California and historically inhabited the low-elevation grassland and oak savanna plant communities of the Central Valley, adjacent foothills, and Inner Coast Ranges (Jennings and Hayes 1994; Storer 1925; Shaffer *et al.* 1993). The species has been recorded from near sea level to approximately 3,900 feet in the Coast Ranges and to approximately 1,600 feet in the Sierra Nevada foothills (Shaffer and Trenham 2004). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County.

The Central California tiger salamander occupies the Bay Area (central and southern Alameda, Santa Clara, western Stanislaus, western Merced, and the majority of San Benito counties), Central Valley (Yolo, Sacramento, Solano, eastern Contra Costa, northeastern Alameda, Calaveras, San Joaquin, Stanislaus, Merced, and northwestern Madera counties), southern San Joaquin Valley (portions of Madera, central Fresno, and northern Tulare and Kings Counties), and the Central Coast Range (southern Santa Cruz, Monterey, northern San Luis Obispo, and portions of western San Benito, Fresno, and Kern counties).

Life History: The California tiger salamander has an obligate biphasic life cycle (Shaffer *et al.* 2004). Although the larvae develop in the vernal pools and ponds in which they were born, the species is otherwise terrestrial and spend most of their post-metamorphic lives in widely dispersed underground retreats (Shaffer *et al.* 2004; Trenham *et al.* 2001). Because they spend most of their lives underground, the animals rarely are encountered even in areas where California tiger salamanders are abundant. Subadult and adult California tiger salamanders typically spend the dry summer and fall months in the burrows of small mammals, such as California ground squirrels and Botta's pocket gopher (Storer 1925; Loredo and Van Vuren 1996; Petranka 1998; Trenham 1998a). Although ground squirrels have been known to eat these amphibians, the relationship with their burrowing hosts is primarily commensal (an association that benefits one member while the other is not affected) (Loredo *et al.* 1996; Semonsen 1998).

California tiger salamanders may also use landscape features such as leaf litter or desiccation cracks in the soil for upland refugia. Burrows often harbor camel crickets and other invertebrates that provide likely prey for the amphibians. Underground refugia also provide protection from the sun and wind associated with the dry California climate that can cause excessive drying of amphibian skin. Although California tiger salamanders are members of a family of "burrowing" salamanders, they are not known to create their own burrows. This may be due to the hardness of soils in the California ecosystems in which they are found. California tiger salamanders depend on persistent small mammal activity to create, maintain, and sustain sufficient underground refugia for the species. Burrows are short lived without continued small mammal activity and typically collapse within approximately 18 months (Loredo *et al.* 1996).

Upland burrows inhabited by California tiger salamanders have often been referred to as aestivation-sites. However, "aestivation" implies a state of inactivity, while most evidence suggests that the animals remain active in their underground dwellings. One study has found that salamanders move, feed, and remain active in their burrows (Van Hattem 2004). Because the adults arrive at breeding ponds in good condition and are heavier when entering the pond than when leaving, researchers have long inferred that they are feeding while underground. A number of direct observations have confirmed this (Trenham 2001; Van Hattem 2004). Thus, "upland habitat" is a more accurate description of the terrestrial areas used by California tiger salamanders.

California tiger salamanders typically emerge from their underground refugia at night during the fall or winter rainy season (November-May) to migrate to their breeding ponds (Stebbins 2003; Shaffer *et al.* 1993; Trenham *et al.* 2000). The breeding period is closely associated with the rainfall patterns in any given year with less adults migrating and breeding in drought years (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Male California tiger salamander are typically first to arrive and generally remain in the ponds longer than females. Results from a 7-year study in Monterey County suggested that males remained in the breeding ponds for an average of 44.7 days while females remained for an average of only 11.8 days (Trenham *et al.* 2000). Historically, breeding ponds were likely limited to vernal pools, but now include livestock stock ponds. Ideal breeding ponds are typically fishless,

free of non-native predators, and seasonal or semi-permanent (Barry and Shaffer 1994; Petranka 1998).

While in the ponds, adult California tiger salamanders mate and then the females lay their eggs in the water (Twitty 1941; Shaffer *et al.* 1993; Petranka 1998). Egg laying typically reaches a peak in January (Loredo and Van Vuren 1996; Trenham *et al.* 2000). Females attach their eggs singly, or in rare circumstances, in groups of two to four, to twigs, grass stems, vegetation, or debris (Storer 1925; Twitty 1941). Eggs are often attached to objects, such as rocks and boards in ponds with no or limited vegetation (Jennings and Hayes 1994). Clutch sizes from a Monterey County study had an average of 814 eggs (Trenham *et al.* 2000). Seasonal pools may not exhibit sufficient depth, persistence, or other necessary parameters for adult breeding during times of drought (Barry and Shaffer 1994). After breeding and egg laying is complete, adults leave the pool and return to their upland refugia (Loredo *et al.* 1996; Trenham 1998a). Adult California tiger salamanders often continue to emerge nightly for approximately the next two weeks to feed amongst their upland habitat (Shaffer *et al.* 1993).

California tiger salamander larvae typically hatch within 10 to 24 days after eggs are laid (Storer 1925). The larvae are totally aquatic and range in length from approximately 0.45 to 0.56 inches (Petranka 1998). They have yellowish gray bodies, broad fat heads, large, feathery external gills, and broad dorsal fins that extend well up their back. The larvae feed on zooplankton, small crustaceans, and aquatic insects for about six weeks after hatching, after which they switch to larger prey (J. Anderson 1968). Larger larvae have been known to consume the tadpoles of Pacific tree frogs, western spadefoot toads, and California red-legged frogs (J. Anderson 1968; P. Anderson 1968). California tiger salamander larvae are among the top aquatic predators in seasonal pool ecosystems. When not feeding, they often rest on the bottom in shallow water but are also found throughout the water column in deeper water. Young California tiger salamanders are wary and typically escape into vegetation at the bottom of the pool when approached by potential predators (Storer 1925).

The California tiger salamander larval stage is typically completed in 3 to 6 months with most metamorphs entering upland habitat during the summer (Petranka 1998). In order to be successful, the aquatic phase of this species' life history must correspond with the persistence of its seasonal aquatic habitat. Most seasonal ponds and pools dry up completely during the summer. Amphibian larvae must grow to a critical minimum body size before they can metamorphose (change into a different physical form) to the terrestrial stage (Wilbur and Collins 1973). Larval development and metamorphosis can vary and is often site-dependent. Larvae collected near Stockton in the Central Valley during April varied between 1.88 to 2.32 inches in length (Storer 1925). Feaver (1971) found that larvae metamorphosed and left breeding pools 60 to 94 days after eggs had been laid, with larvae developing faster in smaller, more rapidly drying pools. Longer ponding duration typically results in larger larvae and metamorphosed juveniles that are more likely to survive and reproduce (Pechmann *et al.* 1989; Semlitsch *et al.* 1988; Morey 1998; Trenham 1998b). Larvae will perish if a breeding pond dries before metamorphosis is complete (P. Anderson 1968; Feaver 1971). Pechmann *et al.* (1989) found a strong positive correlation between ponding duration and total number of metamorphosing juveniles in five salamander species. In Madera County, Feaver (1971) found that only 11 of 30 sampled pools supported larval salamanders, and five of these dried before metamorphosis could occur. Therefore, out of the original 30 pools, only 6 (20 percent) provided suitable conditions for successful reproduction that year. Size at metamorphosis is positively correlated with stored body fat and survival of juvenile amphibians, and negatively correlated with age at first reproduction (Semlitsch *et al.* 1988; Scott 1994; Morey 1998).

Following metamorphosis, juvenile California tiger salamanders leave their pools and move to upland habitat. This emigration can occur in both wet and dry conditions (Loredo and Van Vuren 1996; Loredo *et al.* 1996). Wet conditions are more favorable for upland travel but summer rain events seldom occur as metamorphosis is completed and ponds begin to dry. As a result, juveniles may be forced to leave their ponds on rainless nights. Under dry conditions, juveniles may be limited to seeking upland refugia in close proximity to their aquatic larval pool. These individuals often wait until the next winter's rains to move further into more suitable upland refugia. The peak emergence of these metamorphs in ponds is typically between mid-June and mid-July (Loredo and Van Vuren 1996; Trenham et al. 2000). Juveniles remain active in their upland habitat, emerging from underground refugia during rainfall events to disperse or forage (Trenham and Shaffer 2005). Depending on location and other development factors, metamorphs will not return as adults to aquatic breeding habitat for 2 to 5 years (Loredo and Van Vuren 1996; Trenham *et al.* 2000).

Reproductive success for the California tiger salamander is low. Results from one study suggest that the average female bred 1.4 times over their lifespan and produced 8.5 young per reproductive effort that survived to metamorphosis (Trenham *et al.* 2000). This resulted in the output of roughly 11 metamorphic offspring over a breeding female's lifetime. The primary reason for low reproductive success may be that this relatively short-lived species requires two or more years to become sexually mature (Shaffer *et al.* 1993). Some individuals may not breed until they are 4 to 6 years old. While California tiger salamanders may survive for more than 10 years, many breed only once, and in one study, less than 5 percent of marked juveniles survived to become breeding adults (Trenham 1998b). With such low recruitment, isolated populations are susceptible to unusual, randomly occurring natural events as well human-caused factors that reduce breeding success and individual survival. Factors that repeatedly lower breeding success in isolated pools can quickly extirpate a population.

Dispersal and migration movements made by California tiger salamanders can be grouped into two main categories: (1) breeding migration; and (2) interpond dispersal. Breeding migration is the movement of salamanders to and from a pond from the surrounding upland habitat. After metamorphosis, juveniles move away from breeding ponds into the surrounding uplands, where they live continuously for several years. At a study in Monterey County, it was found that upon reaching sexual maturity, most individuals returned to their natal/birth pond to breed, while 20 percent dispersed to other ponds (Trenham *et al.* 2001). After breeding, adult California tiger salamanders return to upland habitats, where they may live for one or more years before attempting to breed again (Trenham *et al.* 2000).

California tiger salamanders are known to travel long distances between breeding ponds and their upland refugia. Generally it is difficult to establish the maximum distances traveled by any species, but salamanders in Santa Barbara County have been recorded dispersing up to 1.3 miles from their breeding ponds (Sweet 1998). As a result of a 5-year capture and relocation study in Contra Costa County, Orloff (2007) estimated that captured California tiger salamanders were traveling a minimum of 0.5 miles to the nearest breeding pond and that some individuals were likely traveling more than 1.3 miles to and from breeding ponds. California tiger salamanders are also known to travel between breeding ponds. One study found that 20 to 25 percent of the individuals captured at one pond were recaptured later at other ponds approximately 1,900 and 2,200 feet away (Trenham *et al.* 2001). In addition to traveling long distances during juvenile dispersal and adult migration, salamanders may reside in burrows far from their associated breeding ponds.

Although previously cited information indicates that California tiger salamanders can travel long distances, they typically remain close to their associated breeding ponds. A trapping study conducted in Solano County during the winter of 2002/2003 suggested that juveniles dispersed and

used upland habitats further from breeding ponds than adults (Trenham and Shaffer 2005). More juvenile California tiger salamanders were captured at traps placed at 328, 656, and 1,312 feet from a breeding pond than at 164 feet. Approximately 20 percent of the captured juveniles were found at least 1,312 feet from the nearest breeding pond. The associated distribution curve suggested that 95 percent of juvenile California tiger salamanders were within 2,099 feet of the pond, with the remaining 5 percent being found at even greater distances. Preliminary results from the 2003-04 trapping efforts at the same study site detected juvenile California tiger salamanders at even further distances, with a large proportion of the captures at 2,297 feet from the breeding pond (Trenham 1998a). Surprisingly, most juveniles captured, even those at 2,100 feet, were still moving away from ponds. In Santa Barbara County, juvenile Santa Barbara County DPS California tiger salamanders have been trapped approximately 1,200 feet away while dispersing from their natal pond (Science Applications International Corporation, unpublished data). These data show that many California tiger salamanders travel far while still in the juvenile stage. Post-breeding movements away from breeding ponds by adults appear to be much smaller. During post-breeding emigration from aquatic habitat, radio-equipped adult California tiger salamanders were tracked to burrows between 62 to 813 feet from their breeding ponds (Trenham 2001). These reduced movements may be due to adult California tiger salamanders exiting the ponds with depleted physical reserves, or drier weather conditions typically associated with the post-breeding upland migration period.

California tiger salamanders are also known to use several successive burrows at increasing distances from an associated breeding pond. Although previously cited studies provide information regarding linear movement from breeding ponds, upland habitat features appear to have some influence on movement. Trenham (2001) found that radio-tracked adults were more abundant in grasslands with scattered large oaks, than in more densely wooded areas. Based on radio-tracked adults, there is no indication that certain habitat types are favored as terrestrial movement corridors (Trenham 2001). In addition, captures of arriving adults and dispersing new metamorphs were evenly distributed around two ponds completely encircled by drift fences and pitfall traps. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Threats: The Central California tiger salamander is imperiled throughout its range due to a variety of human activities (Service 2004). Current factors associated with declining Central California tiger salamander populations include continued habitat loss and degradation due to agriculture and urbanization; hybridization with the non-native eastern salamander (Fitzpatrick and Shaffer 2004; Riley *et al.* 2003); and predation by introduced species. Central California tiger salamander populations are likely threatened by multiple factors but continued habitat fragmentation and colonization of non-native salamanders may represent the most significant current threats. Habitat isolation and fragmentation within many watersheds have precluded dispersal between sub-populations. Other threats include predation and competition from introduced exotic species; possible commercial over-utilization; diseases; various chemical contaminants; road kill; and certain mosquito and rodent control operations. Currently, these various primary and secondary threats are largely not being offset by existing Federal, State, or local regulatory mechanisms. The Central California tiger salamander is also prone to chance environmental or demographic events to which small populations are particularly vulnerable.

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many Central California tiger salamander breeding sites consist of artificial water bodies. Overall, 89 percent (124) of the identified water bodies are stock, farm, or berm ponds used by cattle grazing and/or as a temporary water source for small farm irrigation (CDFW 2014). This places the Central California tiger salamander at great risk of hybridization with non-native tiger salamanders, especially in Santa Clara and San Benito counties. Without long-term maintenance, the longevity of

artificial breeding habitats is uncertain relative to naturally occurring vernal pools that are dependent on the continuation of seasonal weather patterns (Shaffer in litt. 2003).

Status of the Species: Thirty-one percent (221 of 711 records and occurrences) of all California tiger salamander records and occurrences are located in Alameda, Santa Clara, San Benito (excluding the extreme western end of the County), southwestern San Joaquin, western Stanislaus, western Merced, and southeastern San Mateo counties. Of these counties, most of the records are from eastern Alameda and Santa Clara counties (Buckingham in litt. 2003; Service 2004; CDFW 2014). The California Department of Fish and Wildlife (2014) now considers 13 of these records from the Bay Area region as extirpated or likely to be extirpated.

Of the 140 reported California tiger salamander localities where wetland habitat was identified, only 7 percent were located in vernal pools (CDFW 2014). The Bay Area is located within the Central Coast and Livermore vernal pool regions (Keeler-Wolf et al. 1998). Vernal pools within the Coast Range are more sporadically distributed than vernal pools in the Central Valley (Holland 2003). This rate of loss suggests that vernal pools in these counties are disappearing faster than previously reported (Holland 2003). Most of the vernal pools in the Livermore Region in Alameda County have been destroyed or degraded by urban development, agriculture, water diversions, poor water quality, and long-term overgrazing (Keeler-Wolf et al. 1998). During the 1980s and 1990s, vernal pools were lost at a 1.1 percent annual rate in Alameda County (Holland 1998).

Due to the extensive losses of vernal pool complexes and their limited distribution in the Bay Area region, many California tiger salamander breeding sites consist of artificial water bodies. Overall, 89 percent (124) of the identified water bodies are stock, farm, or berm ponds used by cattle grazing and/or as a temporary water source for small farm irrigation (CDFW 2-14). This places the California tiger salamander at great risk of hybridization with non-native tiger salamanders, especially in Santa Clara and San Benito counties. Without long-term maintenance, the longevity of artificial breeding habitats is uncertain relative to naturally occurring vernal pools that are dependent on the continuation of seasonal weather patterns (Shaffer in litt. 2003).

Environmental Baseline

California Red-legged Frog

The action area is located within the East San Francisco Bay Core Area (Alameda Creek Hydrologic Sub-Area) and the Diablo Range and Salinas Valley Recovery Unit (Service 2002, 2006). The recovery action guidelines provide recommendations for minimizing the effects of various land and water uses, non-native species/predators, and air and water contamination in addition to outlining recommendations for habitat preservation. These recommendations assist in the conservation and recovery of the species, protect high quality habitat within core areas and priority watersheds, increase opportunities for dispersal, population expansion, and recolonization, and provide connectivity between core areas and occupied watersheds. The conservation needs for the East San Francisco Bay Core Area are: (1) protect existing populations; (2) control non-native predators; (3) study the effects of grazing in riparian corridors, ponds and uplands; (4) reduce impacts associated with livestock grazing; (5) protect habitat connectivity; (6) minimize effects of recreation and off-road vehicle use, e.g. Corral Hollow watershed; (7) avoid and reduce impacts of urbanization; and (8) protect habitat buffers from nearby urbanization.

The project is located within the known range of the California red-legged frog. The grazed Mediterranean California naturalized annual and perennial grasslands, coyotebrush scrub, and California buckwheat scrub vegetation communities within the action area are part of a larger mosaic

of essential habitat features sustaining a viable core population (i.e., sheltering, foraging, and dispersal) within the Livermore and Altamont foothills. Based on the biological assessment provided by Caltrans, the site visit conducted by the Service, and the evaluation performed by the Service no known or potential breeding habitat is present within the project footprint; however, a total of 19 ponds, stock ponds, reservoirs, and other water bodies are present within a one-mile radius of the BSA. Caltrans identified 19 reported breeding occurrences within ponds, stock ponds, and other water bodies present within a one-mile radius of the BSA and a total of 38 occurrences within two miles of the action area. The entire action area is within dispersal distance of known and potential breeding sites and all vegetation communities with the exception on paved roadways and road shoulders within the action area are considered suitable upland habitat. No focused frog or roadkill surveys were conducted in preparation of the biological assessment.

Interstate 580 poses a significant barrier to the safe north-south movement and dispersal of California red-legged frogs in the portion of core habitat within the action area. A vegetated median between the eastbound and westbound lanes extends up to 100 feet in some areas and provides similar, but highly disturbed, ruderal upland and dispersal habitat. However, there are natural and artificial wildlife crossings within the BSA that provide connectivity between habitat north and south of I-580 and I-205 for California red-legged frogs, including underpasses for lightly-used railroads or roads such the one at Midway Road and drainage culverts and stream crossings (e.g. Mountain House Creek, Arroyo Las Positas) under the freeway.

The proposed action occurs within Conservation Zone 5 (CZ-5) and Conservation Zone 6 (CZ-6) of the East Alameda County Conservation Strategy (EACCS) (ICF International 2010). The action area contains three of the Conservation Strategy land cover types: alkali wetland, seasonal wetland and California annual grassland (ICF International 2010). EACCS modeling analysis determined that CZ-5 contains 15 percent (127 acres) of the area's unprotected alkali wetland, 2 percent (8 acres) of the area's unprotected seasonal wetlands, and 7 percent (7,528 acres) of unprotected California annual grasslands. EACCS modeling analysis determined that CZ-6 contains 61 percent (380 acres) of the area's unprotected alkali wetland and 12 percent (12,245 acres) of unprotected California annual grasslands. Conservation priorities for CZ-5 applicable to the proposed action include: 1) enhance linkages across I-580 for San Joaquin kit fox and protect lands on the north side of the roadway; 2) protect seasonal wetlands along Arroyo Las Positas; and 3) protect annual grasslands in areas where it provides non-breeding habitat for California red-legged frogs and Central California tiger salamanders (ICF International 2010). Conservation priorities for CZ-6 applicable to the proposed action include: 1) protect of alkali wetlands; 2) protect and restore seasonal wetlands and ponds to provide protected dispersal corridors between ponds and to increase habitat for California red-legged frog and Central California tiger salamander; and 3) protect annual grasslands in areas where it provides non-breeding habitat for California red-legged frogs and Central California tiger salamanders (ICF International 2010). The proposed action is located within potential upland and movement habitat as modeled in Figure D-9 of EACCS (ICF International 2010).

The Service believes that the California red-legged frog is reasonably certain to occur within the action area because: (1) the project is located within the species' range and current distribution, and within the East San Francisco Bay Core Area; (2) the project area is modeled for the species' presence in the EACCS; (3) there is suitable upland, movement and dispersal habitat within the action area and potential breeding habitat nearby; (4) the habitat within the action area is similar to that which is found in nearby areas with confirmed California red-legged frog occupancy; (5) there is a known breeding pond immediately adjacent to the action area; (6) there are no significant barriers to California red-legged frog movement between confirmed occupied areas and the action area; (7)

the lack of significant disturbance or history of significant threats to the species in the general vicinity; and (8) the biology and ecology of the animal.

Critical Habitat

Interstate 580 separates two designated critical habitat units: CCS-2B (Mount Diablo) north of I-580 and ALA-2 south of I-580. A total of 4.75 acres of ALA-2 (Arroyo Valle) falls within the action area at two locations: 1) at the Grant Line Road exit (PM 1.5) on the westbound side of I-580, and 2) between PM 2.65 and PM 3.6 on the eastbound side of I-580. This unit is approximately 153,624 acres; the portion within the action area and subject to ground disturbance totals approximately 1.77 acres, which represents less than one-tenth of one percent of the total unit acreage. This unit stretches from southwestern Alameda County from I-580 at the Altamont Pass southeast into San Joaquin County and southwest into Santa Clara County near Arroyo Hondo and Calaveras Reservoir (75 FR 12816). Unit STC–2 contains the features that are essential for the conservation of the species. The unit contains aquatic habitat for breeding and non-breeding activities (PCE 1 and PCE 2) and upland habitat for foraging and dispersal activities (PCE 3 and PCE 4). The unit contains high-quality permanent and ephemeral aquatic habitats suitable for breeding and upland areas for dispersal, shelter, and food. This unit provides for connectivity between populations farther north and south in the interior Coast Range. The designation of this unit is expected to prevent further habitat fragmentation, provide connectivity to populations farther north and south in the interior Coast Range, and protect the species against urbanization, alternation of aquatic and riparian habitats, and erosion and siltation of ponded habitat.

The portion of the action area within this unit contains two of the four PCE's: upland habitat (PCE 3) and dispersal habitat (PCE-4). The upland and dispersal habitat consists entirely of Mediterranean California naturalized annual and perennial grasslands. Critical habitat within the action area occurs along the southern edge of eastbound I-580 and represents a narrow, linear portion of critical habitat with weedy vegetation, human refuse from I-580 traffic and scattered ground squirrel burrows that provide a network of subterranean burrows for shelter. A total of 177 acres of designated critical habitat will be affected by the proposed action comprising 0.48-acre of permanent effects and 1.29 acres of temporary effects.

Central California Tiger Salamander

The project is located within the known range of the Central California tiger salamander population. Suitable upland and dispersal habitat are present in the action area within the grazed Mediterranean California naturalized annual and perennial grasslands, coyotebrush scrub, and California buckwheat scrub vegetation communities. Based on the biological assessment, no known or potential breeding habitat is present within the action area; however, one small perennial wetland area characterized as a cattail series, freshwater marsh is present 0.05-mile from the action area. No focused salamander or roadkill surveys were conducted in preparation of the biological assessment; however, CNDDB records reported 20 occurrences within a two miles of the action area. Fourteen occurrences have been reported within 1.24 maximum-recorded dispersal distance of the action area. The entire action area is within dispersal distance of known and potential breeding sites and all annual grassland vegetation communities within the action area provide suitable upland and dispersal habitat.

Grassland habitat south of I-580 exhibits the characteristics of upland and dispersal habitat, and is largely undeveloped except for lands near Greenville Road and North Flynn Road. The majority of this land is actively grazed and is leased to wind turbine power generating companies. Fossorial mammal activity is scattered throughout this portion of the action area and provides subterranean habitat that may support salamander aestivation, refugia, and foraging. Movement among land

south of I-580 is relatively unrestricted. The Service anticipates undeveloped habitats south of I-580 to be inhabited with greater occupancy and abundance than habitat within the vegetated median due to the quality and accessibility of habitat within the action area.
Interstate 580 poses a significant barrier to the safe north-south movement and dispersal of Central California tiger salamanders within the action area. The proposed action will upgrade MBGA with concrete barriers, which will increase the barrier-effect I-580 and I-280 poses to the safe passage of Central California tiger salamanders across the road surface. A vegetated median between the eastbound and westbound lanes extends up to 100 feet in some areas and provides similar, but highly disturbed, ruderal upland and dispersal habitat. However, there are natural and artificial wildlife crossings within the BSA that provide connectivity between habitat north and south of I-580 and I-205 for Central California tiger salamanders, including underpasses for lightly-used railroads or roads such the one at Midway Road and drainage culverts and stream crossings (e.g. Mountain House Creek, Arroyo Las Positas) under the freeway.

The proposed action occurs within Conservation Zone 5 (CZ-5) and Conservation Zone 6 (CZ-6) of the East Alameda County Conservation Strategy (EACCS) (ICF International 2010). The action area contains three of the Conservation Strategy land cover types: alkali wetland, seasonal wetland and California annual grassland (ICF International 2010). EACCS modeling analysis determined that CZ-5 contains 15 percent (127 acres) of the area's unprotected alkali wetland, 2 percent (8 acres) of the area's unprotected seasonal wetlands, and 7 percent (7,528 acres) of unprotected California annual grasslands. EACCS modeling analysis determined that CZ-6 contains 61 percent (380 acres) of the area's unprotected alkali wetland and 12 percent (12,245 acres) of unprotected California annual grasslands. Conservation priorities for CZ-5 applicable to the proposed action include: 1) enhance linkages across I-580 for San Joaquin kit fox and protect lands on the north side of the roadway; 2) protect seasonal wetlands along Arroyo Las Positas; and 3) protect annual grasslands in areas where it provides non-breeding habitat for California red-legged frogs and Central California tiger salamanders (ICF International 2010). Conservation priorities for CZ-6 applicable to the proposed action include: 1) protect of alkali wetlands; 2) protect and restore seasonal wetlands and ponds to provide protected dispersal corridors between ponds and to increase habitat for California red-legged frog and Central California tiger salamander; and 3) protect annual grasslands in areas where it provides non-breeding habitat for California red-legged frogs and Central California tiger salamanders (ICF International 2010). The proposed action is located within potential upland and movement habitat as modeled in Figure D-9 of EACCS (ICF International 2010).

The Service believes that the Central California tiger salamander is reasonably certain to occur within the action area because: (1) the project is located within the species' range and current distribution; (2) the project area is modeled for the species' presence in the EACCS; (3) there is suitable upland, movement and dispersal habitat within the action area and potential breeding habitat nearby; (4) the habitat within the action area is similar to that which is found in nearby areas with confirmed Central California tiger salamander occupancy; (5) there are larval and adult Central California tiger salamander observations immediately adjacent to the action area; (6) nearby observations are well within the known travel distance of a Central California tiger salamander; (7) there are no significant barriers to salamander movement between confirmed occupied areas and the action area; (8) the lack of significant disturbance or history of significant threats to the species in the general vicinity; and (9) the biology and ecology of the animal.

Effects of the Action

California Red-legged Frog and Central California Tiger Salamander

The proposed project will likely adversely affect the threatened California red-legged frog and Central California tiger salamander by killing, injuring, harming, and/or harassing juveniles and adults inhabiting suitable upland and dispersal habitat within the action area. The aspects of the proposed action most likely to affect the California red-legged frog or Central California tiger salamander are largely confined to the construction phase of the project associated with the off-ramp rehabilitation and work along the road shoulders at the following locations: 1) eastbound I-580 from PM 0.0 to PM 4.7; 2) westbound I-580 from PM 0.0 to PM 7.8; and 3) I-205 from PM 0.0 to PM 1.0. Additional effects may occur due to the replacement of MBGR with concrete barriers, which will act as a barrier to movement across I-580 and I-205. This may increase the amount of time a California red-legged frog or Central California tiger salamander is exposed on the road surface subjecting them to vehicle strikes or predation. The total length of concrete barriers within the action area will be approximately 2.34 miles.

Construction noise, vibration, and increased human activity may interfere with normal behaviors – feeding, sheltering, movement between refugia and foraging grounds, and other essential behaviors of the California red-legged frog and California tiger salamander – resulting in avoidance of areas that have suitable habitat but intolerable levels of disturbance. Short-term temporal effects will occur when vegetative cover and subterranean upland habitat is removed during project construction. Caltrans proposes to minimize these effects, in part, by locating construction staging, storage and parking areas outside of sensitive habitat; clearly marking construction work boundaries to prevent crews from affecting more habitat than is absolutely necessary, and revegetating all unpaved areas disturbed by project activities.

The proposed construction activities could result in the introduction of chemical contaminants to the site. Frogs and salamanders using these areas could be exposed to any contaminants that are present at the site. Exposure pathways could include inhalation, dermal contact, direct ingestion, or secondary ingestion of contaminated soil, plants, or prey species. Exposure to contaminants could cause short- or long-term morbidity, possibly resulting in reduced productivity or mortality. Caltrans proposes to minimize these risks by implementing a Storm Water Pollution Prevention Plan (SWPPP), erosion control BMPs and a Spill Response Plan, which will consist of refueling, oiling or cleaning of vehicles and equipment a minimum of 100 feet from aquatic resources; installing coir rolls, straw wattles and/or silt fencing to capture sediment and prevent runoff or other harmful chemicals from entering the wetland; and locating staging, storage and parking areas away from aquatic habitats.

Preconstruction surveys and the relocation of individual California red-legged frogs and California tiger salamanders by a Service-approved biologist will minimize the likelihood of serious injury or mortality; however, capturing and handling frogs may result in stress and/or minor injury during handling, containment, and transport. Death and injury of individuals could occur at the time of relocation or later in time subsequent to their release. Although survivorship for translocated amphibians has not been estimated, survivorship of translocated wildlife, in general, is low because of intraspecific competition, lack of familiarity with the relocation site with regards to breeding, feeding, and sheltering habitats, risk of contracting disease in foreign environment, and increased risk of predation. Caltrans proposes to minimize these effects by using qualified Service-approved biologists, limiting the duration of handling, and relocating amphibians to suitable nearby habitat.

Biologists and construction workers traveling to the action area from other project sites may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States. It is possible that chytridiomycosis, caused by chytrid fungus (Batrachochytrium dendrobatidis), may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch et al. 2001, Weldon et al. 2004). Implementing proper decontamination procedures prior to and following aquatic surveys and handling of frogs and salamanders will minimize the risk of transferring diseases through contaminated equipment or clothing.

Temporary effects comprise areas denuded, manipulated, or otherwise modified from their existing, pre-project conditions, thereby removing one or more essential components of a listed species' habitat as a result of project activities that include, but are not limited to, construction, staging, storage, lay down, vehicle access, parking, etc. Temporary effects must be restored to baseline habitat values or better within one year following initial disturbance. Areas subject to ongoing operations and maintenance are not considered temporary even if they are restored within one year following initial disturbance. Affected areas not fulfilling these criteria are considered permanent. Construction within upland habitat, e.g. pavement removal and resurfacing, shoulder backing, installation of rumble strips, MBGRs, concrete barriers, overhead signage, lighting, flashing beacons, barrier markers, roadside delineators, and guardrail delineators would result in the permanent loss and/or degradation of 5.37 acres of California red-legged frog and Central California tiger salamander upland and dispersal habitat; and the temporary loss and/or degradation of 29.53 acres of California red-legged frog and Central California tiger salamander upland and dispersal habitat. Caltrans has proposed a compensatory habitat conservation measure at a ratio of 3:1 (acres of compensation to acres of habitat loss) for permanent effects and 1.1:1 for temporary effects.

These effects will be further minimized by installing environmentally sensitive area fencing to keep workers from straying into otherwise undisturbed habitat; erecting wildlife exclusion fencing to deter frogs and salamanders from wandering onto the construction site; implementing storm water and erosion BMP's; educating workers about the presence of California red-legged frogs and California tiger salamanders, their habitat, identification, regulatory laws, and avoidance and minimization measures; and requiring a Service-approved biologist(s) to be present to monitor project activities within or adjacent to suitable habitat.

<u>California Red-legged Frog Critical Habitat</u>

The proposed action will result in the permanent loss and/or degradation of 0.48-acre of upland (PCE 3) and dispersal (PCE 3) habitat and the temporary loss and/or degradation of 1.29 acres of upland (PCE 3) and dispersal (PCE 3) habitat comprising mixed grazed Mediterranean California naturalized annual and perennial grasslands, coyotebrush scrub, and California buckwheat scrub vegetation communities. The proposed action will not affect California red-legged frog breeding or non-breeding aquatic habitat since neither habitat type is located within the action area. The portion of critical habitat falling within the project footprint comprises a narrow, linear portion along the northernmost extend of ALA-2 that abuts I-580 in southeastern Alameda County. Caltrans has minimized effects to critical habitat by incorporating design modifications that avoid or minimize disturbance or loss of designated critical habitat containing PCEs. The permanent loss and/or degradation of 0.48-acre and temporary loss and/or degradation of 1.29 acres of California red-legged frog critical habitat supporting PCEs 3 and 4 will not compromise the recovery of the species. Furthermore, the effects to habitat will not preclude the stated objectives of preventing

further habitat fragmentation, diminish connectivity to populations farther north and south in the interior Coast Range, or interfere with protecting the species against urbanization, alternation of aquatic and riparian habitats, and erosion and siltation of ponded habitat.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. No other State, Tribal, local or private actions are anticipated in the action area within the foreseeable future.

The global average temperature has risen by approximately 0.6 degrees centigrade during the 20th Century (International Panel on Climate Change 2001, 2007; Adger et al 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (International Panel on Climate Change 2001, 2007; Adger et al. 2007), and that it is "very likely" that it is largely due to increasing concentrations of greenhouse gases (carbon dioxide, methane, nitrous oxide, and others) in the global atmosphere from burning fossil fuels and other human activities (Cayan 2005, EPA Global Warming webpage http://yosemite. epa.gov; Adger et al. 2007). Eleven of the twelve years between 1995 and 2006 rank among the twelve warmest years since global temperatures began in 1850 (Adger et al. 2007). The warming trend over the last fifty years is nearly twice that for the last 100 years (Adger et al. 2007). Looking forward, under a high emissions scenario, the International Panel on Climate Change estimates that global temperatures will rise another four degrees centigrade by the end of this Century; even under a low emissions growth scenario, the International Panel on Climate Change estimates that the global temperature will go up another 1.8 degrees centigrade (International Panel on Climate Change 2001). The increase in global average temperatures affects certain areas more than others. The western United States, in general, is experiencing more warming than the rest of the Nation, with the 11 western states averaging 1.7 degrees Fahrenheit warmer temperatures than this region's average over the 20th Century (Saunders et al. 2008). California, in particular, will suffer significant consequences as a result of global warming (California Climate Action Team 2006). In California, reduced snowpack will cause more winter flooding and summer drought, as well as higher temperatures in lakes and coastal areas. The incidence of wildfires in the Golden State also will increase and the amount of increase is highly dependent upon the extent of global warming. No less certain than the fact of global warming itself is the fact that global warming, unchecked, will harm biodiversity generally and cause the extinction of large numbers of species. If the global mean temperatures exceed a warming of two to three degrees centigrade above pre-industrial levels, twenty to thirty percent of plant and animal species will face an increasingly high risk of extinction (International Panel on Climate Change 2001, 2007). The mechanisms by which global warming may push already imperiled species closer or over the edge of extinction are multiple. Global warming increases the frequency of extreme weather events, such as heat waves, droughts, and storms (International Panel on Climate Change 2001, 2007; California Climate Action Team 2006; Lenihan et al. 2003). Extreme events, in turn may cause mass mortality of individuals and significantly contribute to determining which species will remain or occur in natural habitats. Ongoing global climate change (Anonymous 2007; Inkley et al. 2004; Adger et al. 2007; Kanter 2007) likely imperils the California red-legged frog, California tiger salamander and the resources necessary for their survival. Since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, and diseases. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the California red-legged frog and Central California tiger salamander; the environmental baseline for the action area; the effects of the proposed I-580 and I-205 Pavement Rehabilitation Project and the cumulative effects; it is the Service's biological opinion that the project, as proposed, is likely to adversely affect both species, but is not likely to jeopardize their continued existence. This determination is based on our opinion that the magnitude of the effects of this action does not appreciably reduce the likelihood of both the survival and recovery of these species in the wild.

After reviewing the current status of designated critical habitat for the California red-legged frog, the environmental baseline for each critical habitat, effects of the proposed action, and cumulative effects, the Service finds that the project, as proposed, is not likely to destroy or adversely modify critical habitat for either species based upon the statutory provisions of the Act. The local effects resulting from the proposed action will not result in the inability of range-wide critical habitat to remain functional or serve its intended recovery role for these species based on the location of effected critical habitat along an existing roadway and minimal permanent loss of habitat.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by Caltrans so that they become binding conditions of any grant or permit issued to Caltrans, as appropriate, in order for the exemption in section 7(o)(2) to apply. Caltrans has a continuing duty to regulate the activity covered by this incidental take statement. If Caltrans (1) fails to require Caltrans to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

<u>California Red-Legged Frog</u>

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect due to their cryptic nature and wariness of humans. Losses of this species may also be difficult to quantify due to a lack of baseline survey data and seasonal/annual fluctuations in their numbers due to environmental or human-caused disturbances. Due to the difficulty in quantifying the number of California red-legged frogs that will be taken as a result of the proposed action, the Service is

quantifying take incidental to the proposed action as the mortality/injury of no more than one and the harassment of all California red-legged frogs inhabiting or utilizing the 133.37-acre action area. The Service anticipates that take of juvenile and adult life history stages may be killed, harmed or harassed as a result of habitat loss/degradation, construction-related disturbance, or capture and relocation efforts. Upon implementation of the following Reasonable and Prudent Measures, all juvenile and adult California red-legged frogs within the action area in accordance with the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are authorized under this opinion.

Central California Tiger Salamander

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect due of their cryptic nature, subterranean lifestyle, and predominately nocturnal behavior. Losses of this species may also be difficult to quantify due to seasonal/annual fluctuations in their numbers due to environmental or human-caused disturbances. Due to the difficulty in quantifying the number of California tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the proposed action as the mortality/injury of one and harassment of all California tiger salamanders inhabiting or utilizing the 133.37-acre action area. The Service anticipates that take of juvenile or adult California tiger salamanders may result from habitat loss/degradation, construction-related disturbance, or capture and relocation efforts. Upon implementation of the following Reasonable and Prudent Measures, all juvenile and adult California tiger salamanders within the action area in accordance with the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are authorized under this opinion.

Effect of the Take

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the California red-legged frog or Central California tiger salamander.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take of California red-legged frog or Central California tiger salamander:

1. Minimize the effects to the California red-legged frog and Central California tiger salamander by implementing the project description as described and adhering to the following terms and conditions.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Caltrans must comply with the following terms and conditions, which implement the reasonable and prudent measure, described above and outline required reporting/monitoring requirements. These Terms and Conditions are nondiscretionary.

The following Terms and Conditions implement the Reasonable and Prudent Measure number 1:

1. **Compliance with Biological Opinion**. Caltrans shall include Special Provisions that include the Conservation Measures and the Terms and Conditions of this biological opinion

in the solicitation for bid information for all contracts for the project that are issued by them to all contractors. Caltrans shall require all contractors and subcontractors to comply with the Act in the performance of the proposed action and shall perform the action as outlined in the Project Description of this biological opinion as provided by Caltrans in the Biological Assessment dated September 2013, and all other supporting documentation submitted to the Service in support of the action. Changes to the Project Description or performance of work outside the scope of this biological opinion are subject to the requirements of reinitiation of formal consultation.

2. **Implementation of Biological Opinion**. Caltrans shall ensure the Resident Engineer or their designee shall have full authority to implement and enforce all Conservation Measures and Terms and Conditions of this biological opinion. The Resident Engineer or their designee shall maintain a copy of this biological opinion onsite whenever construction is in progress. Their name(s) and telephone number(s) shall be provided to the Service at least 30 calendar days prior to groundbreaking at the project.

3. **Proposed Compensation**. The compensation measures proposed by Caltrans and outlined in Table 1 will minimize the effects of harm on the California red-legged frog and Central California tiger salamander. Habitat considered for compensation shall comprise high quality breeding, foraging, sheltering, migration, and/or dispersal habitat. Caltrans shall comply with all applicable CDFW regulations pertaining to mitigation for species designated as fully protected and/or listed by the State. Compensation shall be implemented in accordance with the Selected Review Criteria for section 7 Off-Site Compensation provided in Appendix A. If conservation banking credits are to be purchased, Caltrans shall submit a conceptual compensation plan to the Service for review and approval prior to the purchase of credits. If the proposed compensation scheme is not fully implemented, Caltrans shall provide an alternative compensation scheme to be reviewed and approved by the Service. On-site restoration of temporarily affected areas may qualify as compensation at a 1:1 ratio if it is restored within one calendar year following project completion and the conditions are verified by the Service. All compensation will be acquired prior to the beginning of earthmoving for the project.

4. **Biological Monitor Approval and Stop Work Authority**. The qualifications of all proposed Service-approved biological monitors shall be presented to the Service for review and written approval at least 30 calendar days prior to project initiation. The Service-approved biological monitors shall keep a copy of this biological opinion in his/her possession when onsite. The Service-approved biological monitors shall communicate through the Resident Engineer or their designee, verbally, by telephone, email, or hardcopy with Caltrans personnel, construction personnel or any other person(s) at the project site or otherwise associated with the project to ensure that the terms and conditions of this biological opinion are met. The Service-approved biologist(s) through communication with the Resident Engineer shall have oversight over implementation of the Terms and Conditions in this Biological Opinion, and shall have the authority to stop project activities if they determine any of the requirements associated with these Terms and Conditions are not being fulfilled. If the Service-approved biologist(s) exercises this authority, the Service shall be notified by telephone and email within 24 hours. The Service contact is Coast-Bay/Forest Foothills Division Chief of the Endangered Species Program, Sacramento Fish and Wildlife Office at telephone (916) 414-6600.

5. **Biological Monitoring Records**. The Service-approved biologist(s) shall maintain monitoring records that include: (1) the beginning and ending time of each day's monitoring effort; (2) a statement identifying the listed species encountered, including the time and location of the observation; (3) the time the specimen was identified and by whom and its condition; and (4) a description of any actions taken. The Service-approved biologist(s) shall maintain complete records in their possession while conducting monitoring activities and shall immediately surrender records to the Service, CDFW, and/or their designated agents upon request. If requested, all monitoring records shall be provided to the Service within 30 of the completion of monitoring work.

6. **Agency Access**. If verbally requested through the Resident Engineer or Construction Inspector, before, during, or upon completion of ground breaking and construction activities, Caltrans shall ensure the Service or their designated agents can immediately and without delay, access and inspect the project site for compliance with the proposed project description, conservation measures, and terms and conditions of this Biological Opinion, and to evaluate project effects to the California red-legged frog and Central California tiger salamander and their habitat.

7. **Inclement Weather Restrictions**. No work shall occur during or within 24 hours following a rain event exceeding 0.2-inch as measured by the NOAA National Weather Service for the Livermore, CA (KLVK) base station available at: http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=mtr&sid=KLVK&num=72&raw=0. Service-approval to continue work during or within 24 hours of a rain event shall be considered on a case-by-case basis.

8. **Proper Use of Erosion Control Devices**. To prevent California red-legged frogs and Central California tiger salamanders from becoming entangled, trapped, or injured, erosion control materials that use plastic or synthetic monofilament netting will not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers.

9. **Biological Monitoring**. A Service-approved biologist(s) shall be onsite during all activities that may result in take of California red-legged frogs or Central California tiger salamanders as determined by the Service. A minimum of one Service-approved biologist shall be on-site throughout the project duration. However, an adequate number of Service-approved biologists to monitor the effects of the project on the California red-legged frog and Central California tiger salamander. The Service will consider the implementation of specific project activities without the oversight of an on-site Service-approved biologist on a case-by-case basis.

10. **Preconstruction and Daily Surveys**. Preconstruction surveys shall be conducted by a Service-approved biologist immediately prior to the initiation of any ground disturbing activities and vegetation clearing that may result in take of California red-legged frogs and Central California tiger salamanders as determined by the Service. All suitable aquatic and upland habitat including refugia habitat such as dense vegetation, small woody debris, refuse, burrows, etc., shall be thoroughly inspected. The Service-approved biologist(s) shall conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of California red-legged frogs and Central California tiger salamanders as determined by the Service. If a California red-legged

frog and Central California tiger salamander is observed, the Service-approved biologist shall implement the species observation and handling protocol outlined below.

11. **Protocol for Species Observation and Handling**. If a California red-legged frog or Central California tiger salamander is encountered in the action area, work activities within 50 feet of the individual shall cease immediately and the Resident Engineer and Service-approved biologist shall be notified. Based on the professional judgment of the Service-approved biologist, if project activities can be conducted without harming or injuring the California red-legged frog or Central California tiger salamander, it may be left at the location of discovery and monitored by the Service-approved biologist. All project personnel will be notified of the finding and at no time shall work occur within 50 feet of the California red-legged frog or Central California tiger salamander without a Service-approved biologist present. If it is determined by the Service-approved biologist that relocating the California red-legged frog or Central California tiger salamander is necessary, the following steps shall be followed:

    a. Prior to handling and relocation, the Service-approved biologist will take precautions to prevent introduction of amphibian diseases in accordance with the *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (Service 2005) and *Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander* (Service 2003). Disinfecting equipment and clothing is especially important when biologists are coming to the action area to handle amphibians after working in other aquatic habitats.

    b. California red-legged frogs and Central California tiger salamanders shall be captured by hand, dipnet or other Service-approved methodology, transported by hand, dipnet or temporary holding container, and released as soon as practicable the same day of capture. Handling of California red-legged frogs and Central California tiger salamanders shall be captured by hand, dipnet, or other Service-approved methodology, transported will be minimized to the maximum extent practicable. Holding/transporting containers and dipnets shall be thoroughly cleaned, disinfected, and rinsed with freshwater prior to use within the action area.

    c. California red-legged frogs and Central California tiger salamanders shall be captured by hand, dipnet, or other Service-approved methodology, transported and relocated to nearby suitable habitat outside of the work area and released in a safe area on the same side of I-580 or I-205 where it was discovered. The individual(s) shall be released within the Caltrans right-of-way only if suitable habitat exists and would not pose a risk to the animal's survival or well-being. Otherwise, they shall be released at a location subject to the approval of the property owner. If suitable habitat cannot be identified, the Service shall be contacted to determine an acceptable alternative. The Service shall be notified within 24 hours of all capture, handling, and relocation efforts.

Reporting Requirements

In order to monitor whether the amount or extent of incidental take anticipated from implementation of the project is approached or exceeded, Caltrans shall adhere to the following reporting requirements. Should this anticipated amount or extent of incidental take be exceeded, Caltrans must reinitiate formal consultation as per 50 CFR 402.16.

1. The Service must be notified within one (1) working day of the finding of any injured or dead listed species or any unanticipated damage to its habitat associated with the proposed project. Notification will be made to the Coast-Bay/Forest Foothills Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at (916) 414-6600, and must include the date, time, and precise location of the individual/incident clearly indicated on a U.S. Geological Survey 7.5 minute quadrangle or other maps at a finer scale, as requested by the Service, and any other pertinent information. When an injured or dead individual of the listed species is found, Caltrans shall follow the steps outlined in the Disposition of Individuals Taken section below.

2. Other pertinent reporting information such as monitoring reports (if not included as a term and condition), notification of project completion/implementation, etc. including when this information is due to the Service.

Disposition of Individuals Taken

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instruction s are received from the Service regarding the disposition of the dead specimen. The Service contact persons are the Coast-Bay/Forest Foothills Division Chief of the Endangered Species Program at the Sacramento Fish and Wildlife Office at (916) 414-6600; and the Resident Agent-in-Charge of the Service's Office of Law Enforcement, 5622 Price Way, McClellen, California 95562, at (916) 569-8444.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

1. Caltrans District 4 should work with the Service to develop a conservation strategy that would identify the current safe passage potential along Bay Area highways and the areas where safe passage for wildlife could be enhanced or established.

2. Caltrans should assist the Service in implementing recovery actions identified in the *Recovery Plan for the California Red-legged Frog* (Service 2002), the *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay*, California (Service 2003), and the *Recovery Plan for Upland Species of the San Joaquin Valley, California* (Service 1998).

3. Caltrans should consider participating in the planning for a regional habitat conservation plan for the Central California tiger salamander, California red-legged frog, San Joaquin kit fox, other listed species, and sensitive species.

4. Caltrans should consider establishing functioning preservation and creation conservation banking systems to further the conservation of the California red-legged frog, Central California

tiger salamander, and other appropriate species. Such banking systems also could possibly be utilized for other required mitigation (i.e., seasonal wetlands, riparian habitats, etc.) where appropriate. Efforts should be made to preserve habitat along roadways in association with wildlife crossings.

5. Roadways can constitute a major barrier to critical wildlife movement. Therefore, Caltrans should incorporate culverts, tunnels, or bridges on highways and other roadways that allow safe passage by the Central California tiger salamander, California red-legged frog, Alameda whipsnake, San Joaquin kit fox, other listed animals, and wildlife. Photographs, plans, and other information into the BAs if "wildlife friendly" crossings are incorporated into projects. Efforts should be made to establish upland culverts designed specifically for wildlife movement rather than accommodations for hydrology. Transportation agencies should also acknowledge the value of enhancing human safety by providing safe passage for wildlife in their early project design.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION--CLOSING STATEMENT

This concludes formal consultation on the I-580 and I-205 Pavement Rehabilitation Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any additional take will not be exempt from the prohibitions of section 9 of the Act, pending reinitiation.

If you have any questions regarding this biological opinion on the proposed I-580 and I-205 Pavement Rehabilitation Project, Alameda County, California, contact Jerry Roe or Ryan Olah at the letterhead address or at (916) 414-6600.

Sincerely,

Jennifer M. Norris
Field Supervisor

Enclosure

cc:
Melissa Escaron, California Department of Fish and Wildlife, Napa California

LITERATURE CITED

Adger, N., P.Aggarwal, S. Agrawala, J. Alcamo, A. Allali, O. Anisimov, N. Arnell, M. Boko, O. Canziani, T. Cartèr, G. Cassa, U. Confalonieri, R. Cruz, E. de Alba Alcaraz, W. Eastreling, C. Field, A. Fischlin, B. Fitzharris, C.G. Garcia, C. Hanson, H. Harasawa, K. Hennessy, S. Huq, R. Jones, L. K. Bogataj, D. Karoly, R. Klein, Z. Kundzewicz, M. Lal, R. Lasco, G. Love, X. Lu, G. Magrin, L.J. Mata, R. McLean, B. Menne, G. Midgley, N. Mimura, M.Q. Mirza, J. Moreno, L. Mortsch, I. Niang-Diop, R. Nichols, B. Novaky, L. Nurse, A. Nyon, M. Oppenheimer, J. Palutikof, M. Parry, A. Patwardhan, P. R. Lankao, C. Rosenzweig, S. Schneider, S. Semenov, J. Smith, J. Stone, J van Ypersele, D. Vaughan, C. Vogel, T. Wilbanks, P. Wong, S. Wu, and G. Yohe. 2007. Working Group II Contribution to the Intergovernmental Panel on Climate Change Fourth Assessment Report. Climate Change 2007: Climate Change Impacts, Adaptation and Vulnerability. Brussels, Belgium.

Anderson, J. D. 1968. Comparison of the Food Habits of *Ambystoma macrodactylum sigillatum*, *Ambystoma macrodactylum croceum*, and *Ambystoma tigrinum californiense*. Herpetologica 24(4): 273-284.

Anderson, P. R. 1968. The Reproductive and Developmental History of the California Tiger Salamander. Masters thesis, Department of Biology, Fresno State College, Fresno, California. 82 pages.

Anonymous. 2007. Global Warming is Changing the World. Science 316:188-190.

Barry, S. 1992. Letter to Marvin L. Plenert, Regional Director, U.S. Fish and Wildlife Service, Portland, Oregon, regarding proposed listing.

Barry, S. J. and H. B. Shaffer. 1994. The Status of the California Tiger Salamander (*Ambystoma californiense*) at Lagunita: A 50-year update. Journal of Herpetology 28(2): 159-164.

Barry, S. J. and H. B. Shaffer. 1994. The Status of the California Tiger Salamander (*Ambystoma californiense*) at Lagunita: A 50-year update. Journal of Herpetology 28(2): 159-164.

Bosch J, I. Martínez-Solano, M. García-París. 2001. Evidence of a Chytrid Fungus Infection Involved in the Decline of the Common Midwife Toad (*Alytes obstetricans*) in Protected Areas of Central Spain. Biological Conservation 97:331–337.

Buckingham, J. 2003. Biological Resources Studies Conducted for Carnegie State Vehicle Recreation Area in 2003. In litt.

Bulger, J. B., N. J. Scott Jr., and R. B. Seymour. 2003. Terrestrial Activity and Conservation of Adult California Red-Legged Frogs *Rana aurora draytonii* in Coastal Forests and Grasslands. Biological Conservation 110:85-95.

Bury, R.B and J.A. Whelan. 1984. Ecology and Management of the Bullfrog. Fish and Wildlife Service/Resource Publication 155.

California Climate Action Team. 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature. California Environmental Protection Agency, Sacramento, California.

California Department of Fish and Wildlife (CDFW). 2014. RAREFIND. California Natural Diversity Data Base, Natural Heritage Division, Sacramento, California.

California Department of Transportation (Caltrans). 2013. Interstate 580 Roadway Rehabilitation Project, Caltrans District 4, Alameda County, California. September.

Cayan, D. 2005. Northern Hemisphere Spring Warming During the Past Five Decades: Links to Snow Cover Losses. Presented at 16th Conference on Climate Variability and Change.

Scripps Institute of Oceanography, University of California, San Diego. January 13, 2005.

Davidson, E. W., M. Parris, J. P. Collins, J. E. Longcore, A. P. Pessier, J. Brunner. 2003. Pathogenicity and transmission of *Chytridiomycosis* in tiger salamanders (*Ambystoma tigrinum*). Copeia 2003(3):601–607.

Emlen, S. T. 1977. "Double Clutching" and its Possible Significance in the Bullfrog. Copeia 1977(4):749-751.

Feaver, P. E. 1971. Breeding Pool Selection and Larval Mortality of Three California Amphibians: *Ambystoma tigrinum californiense* Gray, *Hyla regilla* Baird and Girard and *Scaphiopus hammondi hammondi* Girard. Master's thesis, Department of Biology, Fresno State College, Fresno California. 58 pages.

Fellers, G. 2005. *Rana draytonii* Baird and Girard, 1852b California Red-Legged Frog. Pages 552-554 *in* M. Lannoo (editor). Amphibian Declines: The Conservation Status of United States Species. University of California Press. Berkeley, California.

Fisher, R. N., and H. B. Schaffer. 1996. The Decline of Amphibians in California's Great Central Valley. Conservation Biology 10(5):1387-1397.

Fitzpatrick, B. M. an H. B. Shaffer. 2004. Environmental-Dependent Admixture Dynamics in a Tiger Salamander Hybrid Zone. Evolution 58(6): 1282-1293.

Garner, T. W. J., M. W. Perkins, P. Govindarajulu, D. Seglie, S. Walker, A. A. Cunningham, and M. C. Fisher. 2006. The Emerging Amphibian Pathogen *Batrachochytrium dendrobatidis* Globally Infects Introduced Populations of the North American Bullfrog, *Rana catesbeiana*. Biology Letters 2:455-459.

Hayes, M. P., and M. R. Jennings. 1988. Habitat Correlates of Distribution of the California Red-Legged Frog (*Rana aurora draytonii*) and the Foothill Yellow-Legged Frog (*Rana boylii*): Implications for Management. Pages 144-158 in R. Sarzo, K. E. Severson, and D. R. Patton (technical coordinators). Proceedings of the Symposium on the Management of Amphibians, Reptiles, and Small Mammals in North America. United States Department of Agriculture, Forest Service, Rocky Mountain Range and Experiment Station, Fort Collins, Colorado. General Technical Report (RM-166): 1-458.

Hayes, M. P. and D. M. Krempels. 1986. Vocal Sac Variation among Frogs of the Genus Rana from Western North America. Copeia 1986(4):927-936.

Hayes, M. P. and M. M. Miyamoto. 1984. Biochemical, Behavioral and Body Size Differences between *Rana aurora aurora* and *R. a. draytonii*. Copeia 1984(4):1018-1022.

Hayes, M. P., and M. R. Tennant. 1985. Diet and Feeding Behavior of the California Red-Legged Frog, *Rana aurora draytonii* (Ranidae). Southwestern Naturalist 30(4): 601-605.

Hunt, L. 1993. Letter to Marvin L. Plenert, Regional Director, U.S. Fish and Wildlife Service, Portland, Oregon, regarding proposed listing.

Inkley, D.B., M.G. Anderson, A.R. Blaustein, V.R. Burkett, B. Felzer, B. Griffith, J. Price and T.L. Root. 2004. Global Climate Change and Wildlife in North America. Technical Review 04-2, The Wildlife Society, Bethesda, Maryland.

International Panel on Climate Change. 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Houghton, J.T., Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, and C.A. Johnson (editors)]. Cambridge University Press, Cambridge, United Kingdom and New York, New York. 881 pp. Available at http://www.ipcc.ch/

_____ 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Alley,

R., T. Berntsen, N.L. Bindoff, Z. Chen, A. Chidthaisong, P. Friedlingstein, J. Gregory, G. Hegerl, M. Heimann, B. Hewitson, B. Hoskins, F. Joos, J. Jouzel, V. Kattsov, U. Lohmann, M. Manning, T. Matsuno, M. Molina, N. Nicholls, J. Overpeck, D. Qin, G. Raga, V. Ramaswamy, J. Ren, M. Rusticucci, S. Solomon, R. Somerville, T.F. Stocker, P. Stott, R.F. Stouffer, P. Whetton, R.A. Wood, D. Wratt. 21 pp. Available at http://www.ipcc.ch/.

Jennings, M. R. 1993. Letter to Peter C. Sorensen, U.S. Fish and Wildlife Service, Sacramento, California.

Jennings, M. R., and M. P. Hayes. 1985. Pre-1900 Overharvest of California Red-Legged Frogs (*Rana aurora draytonii*): The Inducement for Bullfrog (*Rana catesbeiana*) Introduction. Herpetological Review 31(1):94-103.

_____ 1990. Final Report of the Status of the California Red-Legged Frog (*Rana aurora draytonii*) in the Pescadero Marsh Natural Preserve. Final report prepared for the California Department of Parks and Recreation, Sacramento, California, through Agreement (4-823-9018). Department of Herpetology, California Academy of Sciences, Golden Gate Park, San Francisco, California. 30 pages.

_____ 1994. Amphibian and Reptile Species of Special Concern in California. Report prepared for the California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California. 255 pages.

Jennings, M. R., M. P. Hayes, and D. C. Holland. 1992. A Petition to the U.S. Fish and Wildlife Service to Place the California Red-Legged Frog (*Rana aurora draytonii*) and the Western Pond Turtle (*Clemmys marmorata*) on the List of Endangered and Threatened Wildlife and Plants. 21 pages.

Kanter, J. 2007. Scientists Detail Climate Changes, Poles to Tropics. New York Times. April 10, 2007.

Keeler-Wolf T, Evens JM, Solomeshch AI, Holland VL, Barbour MG. 2007. Community classification and nomenclature. In: Stromberg MR, Corbin JD, D'Antonio CM, editors. California grasslands: ecology and management. Berkeley, Los Angeles, London: University of California Press. p 21-34.

Kruse, K. C. and M. G. Francis. 1977. A Predation Deterrent in Larvae of the Bullfrog, *Rana catesbeiana*. Transactions of the American Fisheries Society 106(3):248-252.

Kupferberg, S. J. 1996a. Hydrologic and Geomorphic Factors Affecting Conservation of a River-Breeding Frog (*Rana boylii*). Ecological applications 6: 1322-1344.

_____ 1996b. The Ecology of Native Tadpoles (*Rana boylii* and *Hyla regilla*) and the Impacts of Invading Bullfrogs (*Rana catesbeiana*) in a Northern California River. PhD dissertation. University of California, Berkeley, California.

_____ 1997. Bullfrog (*Rana catesbeiana*) invasion of a California river: the role of larval competition. Ecology 78(6):1736-1751.

Lenihan, J., R. Drapek, D. Bachelet, and R. Neilson. 2003. Climate Change Effects on Vegetation Distribution, Carbon, and Fire in California. Ecological Applications 13(6) 1667-1681.

Lips, K. R., F. Brem, R. Brenes, J. D. Reeve, R. A. Alford, J. Voyles, C. Carey, L. Livo, A. P. Pessier, and J. P. Collins. 2006. Emerging infectious disease and the loss of biodiversity in a neotropical amphibian community. Proceedings of the National Academy of Sciences 103(9):3165-3170.

Loredo, I., and D. Van Vuren. 1996. Reproductive Ecology of a Population of the California Tiger Salamander. Copeia 4:895-901.

Loredo, I., D. Van Vuren and M. L. Morrison. 1996. Habitat Use and Migration Behavior of the California Tiger Salamander. Journal of Herpetology 30(2): 282-285.

Mao, J., D. E. Green, G. M. Fellers, and V. G. Chincar. 1999. Molecular Characterization of Iridoviruses Isolated from Sympatric Amphibians and Fish. Virus Research 6: 45-52. California Department of Fish and Game, Sacramento, California.

Morey, S. R. 1998. Pool Duration Influences Age and Body Mass at Metamorphosis in the Western Spadefoot Toad: Implications for Vernal Pool Conservation. Pages 86-91 *in* Witham, C.W., E.T. Bauder, D. Belk, W.R. Ferren Jr., and R. Ornduff (editor). Ecology, Conservation, and Management of Vernal Pool Ecosystems - Proceedings from a 1996 Conference. California Native Plant Society. Sacramento, California. 1998.

Moyle, P. B. 1976. Fish Introductions in California: History and Impact on Native Fishes. Biological Conservation 9(1):101-118.

Pechmann, J. H. K., D. E. Scott, J. W. Gibbons, and R. D. Semlitsch. 1989. Influence of Wetland Hydroperiod on Diversity and Abundance of Metamorphosing Juvenile Amphibians. Wetlands Ecology and Management 1(1):3-11.

Petranka, J. W. 1998. Salamanders of the United States and Canada. Smithsonian Institution Press, Washington, D.C.

Riley, S. P. D., H. B. Shaffer, S. R. Voss, and B. M. Fitzpatrick. 2003. Hybridization Between a Rare, Native Tiger Salamander (*Ambystoma californiense*) and its Introduced Congener. Biological Applications 13(5): 1263-1275.

Saunders, S., C. Montgomery, and T. Easley. 2008. Hotter and Drier The West's Changing Climate. Rocky Mountain Climate Organization, Denver, Colorado.

Scott, D. E. 1994. The Effect of Larval Density on Adult Demographic Traits in *Ambystoma opacum*. Ecology 75:1383-1396.

Semlitsch, R. D., D. E. Scott, and J. H. K. Pechmann. 1988. Time and Size at Metamorphosis Related to Adult Fitness in *Ambystoma talpoideum*. Ecology 69: 184-192.

Semonsen, V. J. 1998. *Ambystoma californiense* (California tiger salamander) Survey Technique. Herpetological Review 29:96.

Shaffer, H. B. and P. C. Trenham. 2004. *Ambystoma californiense* Gray, 1853. California tiger salamander. Pages 605 in Lannoo, M.(editor). Amphibian declines: The Conservation Status of United States Species. University of California Press, Berkeley, California. 2005.

Shaffer, H.B., G.B. Pauly, J.C. Oliver, and P.C. Trenham. 2004. The Molecular Phylogenitics of Endangerment: Cryptic Variation and Historic Phylogeography of the California Tiger Salamander, *Ambystoma californiense*. Molecular Ecology 13: 3033-3049.

Shaffer, H.B., G.M. Fellers, S.R. Voss, C. Oliver, and G.B. Pauley. 2010. Species boundaries, phylogeography, and conservation genetics of the red-legged frog (*Rana aurora/draytonii*) complex. Molecular ecology 13: 2667-2677.

Shaffer, H.B., R.N. Fisher, and S.E. Stanley. 1993. Status Report: the California Tiger Salamander (*Ambystoma californiense*). Final report for the California Department of Fish and Game. 36 pages plus figures and tables.

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

Storer, T. I. 1925. A Synopsis of the Amphibia of California. University of California Publications in Zoology 27:1-1-342.

_____ 1933. Frogs and their Commercial Use. California Department of Fish and Game 19(3)203-213.

Sweet, S. 1998. Letter to Dwight Harvey, U.S. Fish and Wildlife Service with a report titled "Vineyard Development Posing an Imminent Threat to *Ambystoma californiense* in Santa Barbara County, California." University of California, Santa Barbara, California.

Tatarian, P. J. 2008. Movement Patterns of California Red-Legged Frogs (*Rana draytonii*) in an Inland California Environment. Herpetological Conservation and Biology 3(2):155-169. November.

Trenham, P. 1998a. Radio Tracking Information. University of California, Davis, California.

_____ 1998b. Demography, Migration, and Metapopulation Structure of Pond Breeding Salamanders. Ph.D. dissertation. University of California, Davis, California.

_____ 2001. Terrestrial Habitat Use by Adult California Tiger Salamanders. Journal of Herpetology 35(2):343-346.

Trenham, P. C., and H. B. Shaffer. 2005. Amphibian Upland Habitat Use and its Consequences for Population Viability. Ecological Applications 15:1158–1168.

Trenham, P. C., H. B. Shaffer, W. D. Koening and M. R. Stromberg. 2000. Life History and Demographic Variation in the California Tiger Salamander (*Ambystoma californiense*). Copeia 2000(2): 365-377.

Trenham, P. C., W. D. Koenig, and H. B. Shaffer. 2001. Spatially Autocorrelated Demography and Interpond Dispersal in the Salamander *Ambystoma californiense*. Ecology 82: 3519-3530.

Twedt, B. 1993. A Comparative Ecology of *Rana aurora* Baird and Girard and *Rana catesbeiana* Shaw at Freshwater Lagoon, Humboldt County, California. Unpublished. Master of Science thesis. Humboldt State University, Arcata, California. 53 pages plus appendix.

Twitty, V. C. 1941. Data on the Life History of *Ambystoma tigrinum californiense* Gray. Copeia 1941 (1):1-4.

U. S. Fish and Wildlife Service (Service). 1996. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Red-Legged Frog. Federal Register 61:25813-25833.

_____ 2002. Recovery Plan for the Red-Legged Frog (*Rana aurora draytonii*). Portland, Oregon. 173 pages.

_____ 2003. Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander. Sacramento Field Office, Sacramento, California.

_____ 2004. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the California Tiger Salamander; and Special Rule Exemption for Existing Routine Ranching Activities; Final Rule. **Federal Register** 69: 47212-47248.

_____ 2005. Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog. Sacramento Field Office, Sacramento, California.

_____ 2006. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the California Red-legged Frog (*Rana aurora draytonii*), and Special Rule Exemption Associated with Final Listing for Existing Routine Ranching Activities; Final Rule. **Federal Register** 71(71):19244-19346. April 13.

_____ 2010. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the California Red-Legged Frog. Federal Register 75:12816-12959.

Van Hattem, M. G. 2004. Underground Ecology and Natural History of the California Tiger Salamander. Master of Science thesis. San Jose State University, San Jose, California.

Weldon, C., L.H. du Preez, R. Muller, A.D. Hyatt, and R. Speare. 2004. Origin of the Amphibian Chytrid Fungus. Emerging Infectious Diseases 10:2100–2105.

Wilbur, H. M. and J. P. Collins. 1973. Ecological Aspects of Amphibian Metamorphosis. Science (n.s.) 182(4119): 1305-1314.

Wright, A. H. and A. A. Wright. 1949. Handbook of Frogs and Toads of the United States and Canada. Comstock Publishing Company, Inc., Ithaca, New York. 640 pages.

APPENDIX A
Sacramento Fish and Wildlife Office
Review Criteria for Section 7 Compensation
Revised January 30, 2014

Property Assurances and Conservation Easement

- ☐ Title Report [*preliminary at proposal, and Final Title Insurance at recordation*]; no older than six months;
- ☐ Property Assessment and Warranty;
- ☐ Subordination Agreement [*include if any outstanding debts or liens on the property; may be needed for existing easements*];
- ☐ Legal Description and Parcel Map;
- ☐ Conservation Easement [*use the current SFWO standardized CE template*]; or
- ☐ Non-Template Conservation Easement [*this requires additional review*]

Site Assessment and Development

- ☐ Phase I Environmental Site Assessment;
- ☐ Habitat Development Plan [*include if habitat will be constructed, restored, or enhanced*];
- ☐ Construction Security Analysis *[applicable if habitat is being constructed/ enhanced/ restored]*;
- ☐ Performance Security Analysis [*applicable if there are performance standards*];

Site Management

- ☐ Interim Management Plan;
- ☐ Interim Management Security Analysis and Schedule;
- ☐ Long-Term Management Plan;
- ☐ Endowment Fund Analysis and Schedule;
- ☐ Endowment Funding Agreement or Trust Agreement or Declaration of Trust [*DFW calls this a "mitigation agreement"*]

Guidelines

Real Estate Assurances and Conservation Easement (CE)

Title Report

1. Who holds fee title to property?
2. Exceptions to title. Are there any liens or encumbrances (existing debts, leases, or easements) on the property? Note that any existing exceptions to title will have priority over a conservation easement for the mitigation project.
    a. Review Preliminary Title Report to evaluate liens and encumbrances (see Property Assessment and Warranty, below).
    b. Could any of these exceptions to title potentially interfere with either biological habitat values or ownership? If existing easements can potentially interfere with the conservation values/habitat of the property, those portions of the land should be deducted from the total compensation acreage available on the site.
    c. Split estates. Have the water or mineral rights been severed from title? If so, property owner should be encouraged to re-acquire those rights, or at least to acquire the surface-entry rights to remove or limit access for mineral exploration/development.

Property Assessment and Warranty

1. Property owner should submit a Property Assessment and Warranty, which discusses every exception to title listed on the Preliminary Title Report and Final Title Insurance Policy, evaluating any potential impacts to the conservation values that could result from the exceptions to title (see below).
2. The Property Assessment and Warranty should include a summary and full explanation of all exceptions remaining on the title, with a statement that the owner/Grantor accepts responsibility for all lands being placed under the CE as available for the primary purposes of the easement, as stated in the easement, and assures that these lands have a free and clear title and are available to be placed under the CE.

Subordination Agreement

1. A Subordination Agreement is necessary if there is any outstanding debt on the property; it could also be used to subordinate liens or easements. Review Subordination Agreement language for adequacy—the lending bank or other lien or rights holder must agree to fully subordinate each lien, encumbrance, or easement under the CE.

Legal Description and Parcel Map

1. Ensure accuracy of map, and location and acreage protected under the CE.
2. Both the map and the legal description should explain the boundaries of the individual project compensation site. The site should *not* have 'leftover' areas for later use.
3. Ask for an easement map to be prepared (if applicable), showing all easements on the property.

Conservation Easement from Template

1. Who will hold the easement?

a. Conservation easements require third-party oversight by a qualified non-profit or government agency (=easement holder or Grantee). Minimum qualifications for an easement holder include:
    i. Maintaining accreditation by the Land Trust Accreditation Commission http://www.landtrustaccreditation.org/home.
    ii. Organized under IRS 501(c)(3);
    iii. Qualified under CA Civil Code § 815;
    iv. Bylaws, Articles of Incorporation, and biographies of Boards of Directors on file at;
        1. Must meet requirements of SFWO, including 51% disinterested parties on the Board of Directors;
    v. Approved by SFWO

2. Project Applicant should submit a redline version showing all of their proposed revisions in track changes or other editable electronic format, along with an explanation of all deviations from the template.

Non-Template Conservation Easement

1. If not using the CE template, the Project Applicant should specify objections they have to the template. This may substantially delay processing as the non-template CE will require review by the Solicitor's Office. Alternate CEs are subject to SFWO approval prior to being granted and recorded.
2. The Project Applicant must either 1) add SFWO as a third-party beneficiary, or 2) add language throughout the document, in all appropriate places, that will assure SFWO the right to enforce, inspect, and approve any and all uses and/or changes under the CE prior to occurrence (including land use, biological management or ownership).
3. Include, at a minimum, language to:
    a. Reserve all mineral, air, and water rights under the CE as necessary to maintain and operate the site in perpetuity;
    b. Ensure all future development rights are forfeited;
    c. Ensure all prohibited uses contained in the CE template are addressed; and
    d. Link the CE, Management Plan, and the Endowment Fund within the document (e.g., note that each exists to support the others, and where each of the documents can be located if a copy is required).
4. Insert necessary language, particularly, but not exclusively, per: (can compare to CE template):
    a. Rights of Grantee
    b. Grantee's Duties
    c. Reserved Rights
    d. Enforcement
    e. Remedies
    f. Access
    g. Costs and Liabilities
    h. Assignment and Transfer
    i. Merger
    j. Notices
5. Include a signature block for USFWS to sign "approved as to form".

Site Assessment and Development

Phase I Environmental Site Assessment

1. The Phase I ESA must show that the compensation site is not subject to any recognized environmental conditions as defined by the American Society for Testing and Materials (ASTM) Standard E1527-05 "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, available at http://www.astm.org/Standards/E1527.htm, (i.e., the presence or likely presence of any Hazardous Substances or petroleum products).
2. If the Phase I ESA identifies any recognized environmental conditions, the Project Applicant must represent and warrant to the SFWO that all appropriate assessment, clean-up, remediation, or removal action has been completed.
3. If the Phase I ESA identifies any recognized environmental conditions, a Phase II ESA may be needed for sampling and laboratory analysis.

Restoration or Habitat Development Plan [*not required if the site is preservation only*]

1. The overall plan governing construction and habitat establishment activities required to be conducted on the Property, including, without limitation, creation, restoration, and enhancement of habitat.
   a. This plan should include the baseline conditions of the Property including biological resources, geographic location and features, topography, hydrology, vegetation, past, present, and adjacent land uses, species and habitats occurring on the property, a description of the activities and methodologies for creating, restoring, or enhancing habitat types, a map of the approved modifications, overall habitat establishment goals, objectives and Performance Standards, monitoring methodologies required to evaluate and meet the Performance Standards, an approved schedule for reporting monitoring results, a discussion of possible remedial actions, and any other information deemed necessary by the SFWO.
2. Any permits and other authorizations needed to construct and maintain the site shall be included and in place prior to the start of construction of the habitat.
3. Full construction plans for any habitat construction are subject to SFWO approval and must be *SFWO-approved prior* to the start of construction of the habitat.

Construction Security

1. Construction Security in the amount of 100% of a reasonable third party estimate or contract to create, restore, or enhance habitats on the property in accordance with the Restoration or Habitat Development Plan.
2. Construction Security can be drawn on should the project proponent default.
3. The Construction Security should be in the form of an irrevocable standby letter of credit or a cashier's check.
   a. LOC: issued for a period of at least one year, and provide that the expiration date will be automatically extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
   b. Beneficiary: a third party subject to approval by the SFWO.
   c. Language in a draft letter of credit subject to approval by the SFWO.

Performance Security *[only necessary if habitat if performance standards have been identified]*

1. Performance Security in the amount of 20% of the Construction Security.
2. Performance Security can be drawn on should the Performance Standards not be met, if remedial action becomes necessary.
3. The Performance Security in the form of an irrevocable standby letter of credit or a cashier's check.
   a. LOC: issued for a period of at least one year, and provide that the expiration date will be automatically extended for at least one year on each successive expiration date unless, until extension is no longer necessary.
   b. Beneficiary: a third party who is subject to approval by the SFWO.
   c. Language in a draft letter of credit is subject to SFWO approval.

Site Management

Interim Management Plan

1. The Interim Management Plan should identify the short-term management, monitoring, and reporting activities to be conducted from the time construction ends until the Endowment Fund has been fully funded for three years and all the Performance Standards in the Development Plan have been met. This may be the same as the Long-term Management Plan.

Interim Management Security Analysis and Schedule

The purpose of the Interim Management Security is to allow the endowment to grow for at least three years without any disbursements, and is a safeguard to ensure that there will be enough funds in the endowment to pay for future management costs. The period can be longer than three years; a 5 year period is recommended by many land trusts.

1. Interim Management Security (in the form of a standby letter of credit) in the amount equal to the estimated cost to implement the Interim Management Plan during the first three years of the Interim Management Period, as set for in the Interim Management Security Analysis and Schedule.
2. The Interim Management Security Analysis and Schedule should be in the form of a table and/or spreadsheet that shows all of the tasks (management, monitoring, reporting), task descriptions, labor (hours), cost per unit, cost frequency, timing or scheduling of the tasks, the total annual funding necessary for each task, and any associated assumptions for each task required by the Interim Management Plan. The total annual expenses should include administration and contingency costs.
3. The Interim Management Security:
   a. Held by a qualified, non-profit organization or government agency, subject to SFWO approval [see requirements under CE above], and
   b. Held according to minimum standards for assuring maximum success in earning potential, and will include assurances to safeguard against loss of principle.
   c. Instructions for disbursements or releases from the fund must be outlined in the Endowment Management Agreement/Trust Agreement/Declaration of Trust.

Long-Term Management Plan (LTMP)

1. The LTMP template identifies the long-term management, monitoring and reporting activities to be conducted.
2. The LTMP should include at minimum:
   a. Purpose of the Project and purpose of the LTMP;
   b. A baseline description of the setting, location, history, and types of land use activities, geology, soils, climate, hydrology, habitats present (once project meets Performance Standards), and species descriptions;
   c. Overall management, maintenance and monitoring goals; specific tasks and timing of implementation; and discussion of any constraints, which may affect goals;
   d. The Endowment Fund Analysis and Schedule (see below);
   e. Discussion of Adaptive Management actions for reasonably foreseeable events and possible thresholds for evaluating and implementing Adaptive Management;
   f. Rights of access to the Property and prohibited uses of the Property as provided in the CE; and
   g. Procedures for Property transfer, land manager replacement, amendments, and notices.
3. The LTMP must be incorporated by reference in the CE.
4. The LTMP is considered a living document and may be revised as necessary upon agreement of the land manager, easement holder, and SFWO.

Endowment Fund Analysis and Schedule

1. Can use a PAR or PAR-like analysis and must be based upon the final LTMP, subject to SFWO approval.
   - The analysis should be developed with input by the land manager and conservation easement holder.
2. The analysis and schedule should be in the form of a table and/or spreadsheet that shows, at a minimum:
   - all of the tasks (management, monitoring, reporting)
   - task descriptions, with tasks numbers cross-referenced in management plan(s)
   - labor (hours)
   - materials
   - cost per unit (hr., linear feet, each, etc.).
   - cost frequency
   - timing or scheduling of the tasks,
   - the total annual funding necessary for each task, and
   - the assumptions required for each task by the Management Plan.
3. The total annual expenses should include administration and contingency costs (contingency can be included on each line item – identify the percentage). Unless there is a separate endowment for the purpose of monitoring and reporting on the CE conditions, then, the analysis should also include costs of
   - Monitoring and reporting CE conditions;
   - Defending the CE; and
   - Liability insurance.

4. The Endowment Fund::
   - Held by a qualified, SFWO-approved, non-profit organization or government agency [see requirements under CE above],
   - Held according to minimum standards for assuring maximum success in earning potential, and should include assurances for no loss of principle.
   - Disbursements or releases from the fund must be for documented expenditures, as they occur.

<u>Endowment Funding Agreement</u>

1. This is the agreement between the endowment holder and the Project Applicant, as to how the endowment is to be funded, held and disbursed;
2. USFWS is not signatory to this agreement, but there should be a signature block on the agreement for SFWO to sign "approved as to form";
3. USFWS has approval authority over the language in the document, and it must state that modifications or transfer of the endowment to another holder are subject to USFWS approval;
4. This agreement can also be called: "Trust Agreement", "Declaration of Trust"
5. When the CA Dept. of Fish and Wildlife is involved, this is called "Mitigation Agreement

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2014-F-0311-R001

AUG 13 2015

Melanie Brent, Division Chief
Caltrans District 4, Environmental Planning and Engineering
California Department of Transportation
P.O. Box 23660
Oakland, California 94623-0660

Subject: Reinitiation of Consultation on the Interstate 580 and Interstate 205 Pavement Rehabilitation Project, Alameda County, California (Caltrans EA 3G590)

Dear Ms. Brent:

This is in response to your letter dated June 9, 2015, requesting reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the Interstate 580 (I-580) and Interstate 205 (I-205) Pavement Rehabilitation Project in Alameda County, California. The original biological opinion was issued on August 7, 2014, (Service File No. 08ESMF00-2014-F-0311-1). Your request was received on June 12, 2015. Reinitiation of consultation was requested to combine ramp widening and ramp metering elements from the Interstate 580 (I-580) Freeway Performance Initiative Project (Service File No.: 08ESMF00-2014-F-0246-2) with the I-580 and I-205 Pavement Rehabilitation Project to reduce the construction time and lesson the effects to listed species. This response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation (23 U.S.C. 327) allows the Secretary of the U.S. Department of Transportation acting through the Federal Highway Administration (FHWA) to establish a Surface Transportation Project Delivery Pilot Program, whereby a State may assume the FHWA responsibilities under the National Environmental Policy Act (NEPA) for environmental review, agency consultation and other action pertaining to the review or approval of a specific project. Caltrans assumed these responsibilities for the FHWA on July 1, 2007 through a Memorandum of Understanding (MOU) within the State of California (http://www.dot.ca.gov/ser/downloads/MOUs/nepa_delegation/sec6005mou.pdf).

The following changes are made to the August 7, 2014 Biological Opinion:

1. Add the following to the Consultation History:

June 12, 2015	The Service received a request dated June 9, 2015, to reinitiate formal consultation to amend the August 7, 2014, Biological Opinion and Conference Opinion to combine the I-580 Freeway Performance Initiative Project and I-580 and I-205 Pavement Rehabilitation Project.

June 12, 2015 - July 28, 2015	Electronic and phone correspondence between Caltrans and the Service.

2. Make the following changes to the Description of the Proposed Action on page 2:

Project History

The purpose of the proposed project is to rehabilitate and reconstruct the existing pavement on the mainline and ramps ~~and~~**,** to improve traffic safety by upgrading and/or replacing the metal beam guardrails (MBGR) with concrete barriers**, and installing ramp metering and high occupancy vehicle (HOV) lanes at various locations along I-580**. The I-580 corridor between the San Joaquin County line and the Greenville Road overhead was originally built in 1966 and has had several improvements over the years, including the 2005 widening project to add another lane to the westbound direction between the Midway Road undercrossing (Post Mile [PM] 1.04) and West Grant Line Road (PM 2.5). According to the 2008 Pavement Condition Survey Inventory, there are numerous incidents of cracking and faulting in this stretch of the I-580 corridor. Some of the on-ramps, off-ramps, and asphalt concrete (AC) shoulder widths (both inside and outside) do not meet the current design standards in both directions. Some of the existing MBGR in both directions are in poor condition where they were damaged by traffic accidents. There is a critical need to improve the existing condition of I-580 and to enhance traffic safety. **The project will also reduce congestions and delay on I-580 by metering vehicles entering the mainline traffic and encourage HOV lane usage by adding HOV lanes to three onramps. The project construction activities are spread throughout two distinct segments of I-580 and I-205, totaling approximately 15.1 miles. Caltrans refers to the eastern segment as the Altamont Pass Segment and the western portion as the Castro Valley Segment. The Altamont Pass Segment extends approximately 10.1 miles from the Patterson Pass Road intersection just west of Tracy to the Greenville Road intersection in Livermore. The Castro Valley Segment is comprised of three distinct locations at Eden Canyon Road, Crow Canyon Road/East Castro Valley Boulevard and Strobridge Avenue. Approximately 1.9 miles of the Altamont Pass Segment is within San Joaquin County with the remainder of the project in Alameda County.**

Project Description

This project proposes to remove surface AC, where present, and to replace underlying slabs along westbound and eastbound portions of I-580 and I-205. A new surface layer of up to 9 inches will be installed through crack, seat, and overlay (CSOL) using a layer of hot mix asphalt-type A (HMA-A), geosynthetic pavement interlayer (GPI), and an open-graded friction course (OGFC). Existing AC shoulders in the action area will be replaced with shoulder backing, which involves the laying of a thin course of granular material to protect the outside edge of the pavement. This action prevents edge cracking and pavement edge loss. Shoulder backing **or embankment reconstruction** requires an additional footprint of 4 to 8 feet from the edge of pavement.

Eastbound I-580 (PM 0.0 to PM 4.47) ***and I-205 (PM 0.0 to PM 1.0)***

Proposed Slab Replacement: Proposed CSOL (up to 9 inches) of 0.1-foot HMA-A, GPI, 0.3-foot HMA-A, 0.25-foot HMA-A, and 0.1-foot OGFC. Existing AC shoulders will be replaced with HMA-A plus shoulder backing **or embankment reconstruction**.

Westbound I-580 (PM 0.0 to PM 6.9) and I-205 (PM 0.0 to PM 1.0)

Proposed Removal of Existing AC and Slab Replacement: Proposed CSOL (up to 9 inches) of 0.1-foot HMA-A, GPI, 0.3-foot HMA-A, 0.25-foot HMA-A, and 0.1-foot OGFC. Existing AC shoulders will be replaced with HMA-A plus shoulder backing **or embankment reconstruction**.

*Westbound I-580 (PM 6.9 to PM ~~7.8~~ **8.0**)*

Proposed Slab Replacement: Proposed CSOL (up to 9 inches) of 0.1-foot HMA-A, GPI, 0.3-foot HMA-A, 0.25-foot HMA-A, and 0.1-foot OGFC. Existing AC shoulders will be replaced with HMA-A plus shoulder backing **or embankment reconstruction.**

*On- and Off-Ramp Rehabilitation, **Metering, and Widening***

This project proposes to remove and replace surface layers from **15** ramps/**connectors** within the action area and to replace them with either, or a combination of, HMA-A or rubberized hot mix asphalt (gap graded) (RHMA-G). **The project also proposes the installation of ramp metering systems for twelve on-ramps/connector ramps and the addition of three HOV on-ramp lanes.** The proposed design features and specific locations for all of the activities are listed below:

~~*Eastbound Grant Line Road On- and Off-Ramps*~~

~~Remove current surface layer and replacement with 0.2-foot HMA-A and 0.2-foot RHMA-G.~~

~~*Westbound Grant Line Road On- and Off-Ramps*~~

~~Removal of current surface layer and replacement with 0.2-foot RHMA-G.~~

~~*Eastbound North Flynn Road Off-Ramp*~~

~~Removal of current surface layer and replacement with 0.2-foot RHMA-G.~~

~~*Westbound North Flynn Road On- and Off-Ramps*~~

~~Remove current surface layer and replacement with 0.2-foot HMA-A and 0.2-foot RHMA-G.~~

I-580/I-205 Connector Ramp (New) (PM 0.6)

Resurface and restore connector by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install ramp metering equipment (including four Extinguishable Message Signs (EMS) –prepare to stop advanced warning signs) on the existing two lane on-ramp.

I-580/I-205 Connector Ramp (Old) (PM 1.0)

Resurface and restore connector by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install ramp metering equipment. The two existing mixed-flow lanes will be converted to one HOV preferential lane and one mixed-flow lane.

Grant Line Road Eastbound On-and Off-Ramps (PM 1.4)

Resurface and restore ramps by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install metering equipment, a maintenance vehicle pullout (MVP), and a California Highway Patrol (CHP) pullout on the existing one lane on-ramp.

Grant Line Road Westbound On-and Off-Ramps (PM 1.4)

Resurface and restore ramps by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts on the on-ramp. In addition, the on-ramp will be widened by utilizing slope regrading to provide one HOV preferential lane and one mixed-flow lane. Widening will require slope regrading on the right side of the ramp that will be 430 feet in length and a maximum of 105 feet in width.

North Flynn Road Eastbound On-Ramp (PM 5.8)

Resurface and restore ramp by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts.

North Flynn Road Westbound On-and Off-Ramp (PM 6.1)

Resurface and restore ramps by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts on the on-ramp.

Eden Canyon Road Eastbound On-Ramp (PM 26.27)

Resurface and restore ramp by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts.

Eden Canyon Road Westbound On-Ramp (26.27)

Resurface and restore ramp by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts.

Crow Canyon Road/Grove Way Northbound On-Ramp (PM 28.27)

Resurface and restore ramp by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts.

Crow Canyon Road/Grove Way Southbound On-Ramp (PM 28.55)

Resurface and restore ramp by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts.

East Castro Valley Boulevard Westbound On-Ramp (PM 28.27)

Resurface and restore the ramp by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and MVP/CHP pullouts. The on-ramp will be widened using a sliver widening to provide one HOV preferential lane and one mixed-flow lane. Sliver widening will be constructed on the right side of the ramp and will be approximately eight feet in width and 300 feet in length.

Strobridge Avenue Eastbound On-Ramp (PM 30.16)

Resurface and restore the ramp by removing the existing surface and replacing with HMA, RHMA-G, and OGFC. Install new ramp metering equipment and

MVP/CHP pullouts. A soldier pile retaining wall is also required to accommodate the MVP/CHP pullouts.

Other Rehabilitation Activities

The installation of additional highway safety features are proposed for this project. These activities include the installation of rumble strips, installation of MBGRs and concrete barriers (Type 60/60C), and replacement of hot mix asphalt (HM.A) dikes and concrete curbs. Installation of overhead signage, **median** lighting **along eastbound I-580 from Grant Line Road (PM 1.7) to North Flynn Road Overcrossing (PM 5.7),** flashing beacons, barrier markers, roadside delineators, and guardrail delineators also will occur.

3. Change the Proposed Conservation Measures on page 4 from:

To offset permanent effects to California red-legged frog and Central California tiger salamander, suitable habitat for each species, or suitable multi-species habitat in coordination with the Service, will be created, restored, or set aside in perpetuity at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects (Table 1). Alternatively, credits will be purchased at a Service-approved conservation bank. Compensation plans will be subject to review and approval by the Service. On-site restoration of temporarily affected areas may qualify as compensation at a 1:1 ratio once conditions are verified by the Service.

Table 1: Proposed Compensation for Temporary and Permanent Effects

Species	Effects						Total Compensation
	Temporary (acres)			Permanent (acres)			
	Impact	Compensation		Impact	Compensation		
		Ratio	Need		Ratio	Need	
California red-legged frog	29.53	1.1:1	32.48	5.37	3:1	16.11	48.59
California tiger salamander	29.53	1.1:1	32.48	5.37	3:1	16.11	48.59

To:

To offset permanent effects to **Alameda whipsnake,** California red-legged frog**,** and Central California tiger salamander, suitable habitat for each species, or suitable multi-species habitat in coordination with the Service, will be created, restored, or set aside in perpetuity at a ratio of 3:1 for permanent effects and 1.1:1 for temporary effects (Table 1). Alternatively, credits will be purchased at a Service-approved conservation bank. Compensation plans will be subject to review and approval by the Service. Onsite restoration of temporarily affected areas may qualify as compensation at a 1:1 ratio once conditions are verified by the Service.

Table 1: Proposed Compensation for Temporary and Permanent Effects

Species	Effects						Total Compensation
	Temporary (acres)			Permanent (acres)			
	Impact	Compensation		Impact	Compensation		
		Ratio	Need		Ratio	Need	
California red-legged frog	**32.50**	1.1:1	**35.75**	**6.25**	3:1	**18.75**	**54.50**
California tiger salamander	**30.99**	1.1:1	**34.09**	**5.97**	3:1	**17.91**	**48.90**
Alameda whipsnake	**1.51**	1.1:1	**1.66**	**0.27**	3:1	**0.81**	**2.47**

4. Make the following changes to the General Conservation Measures on page 4:

1. Seasonal Avoidance. Construction actions will be scheduled to minimize effects on listed species and habitats. Except for limited vegetation clearing necessary to minimize effects to nesting birds, work will be conducted between April 15 and October 15.

2. Minimize Nighttime Work. To the extent practicable, nighttime construction will be minimized to avoid effects to nocturnally active listed species. When utilized in areas adjacent to California red-legged frog, ~~and~~ Central California tiger salamander, **and San Joaquin kit fox** habitat, work lights will be directed away from adjacent habitat areas.

3. Environmentally Sensitive Areas (ESA). Prior to the start of construction, ESAs – defined as areas containing sensitive habitats adjacent to or within construction work areas for which physical disturbance is not allowed – will be clearly delineated using high visibility orange fencing. **The location of the fencing shall be determined by the Resident Engineer and Service-approved biologist in cooperation with the Service prior to the start of staging or surface disturbing activities.** Construction work areas include the active construction site and all areas providing support for the proposed action including areas used for vehicle parking, equipment and material storage and staging, access roads, etc. The ESA fencing will remain in place throughout the duration of the proposed action, while construction activities are ongoing, and will be regularly inspected and fully maintained at all times. The final project plans will depict all locations where ESA fencing will be installed and will provide installation specifications. The bid solicitation package special provisions will clearly describe acceptable fencing material and prohibited construction-related activities including vehicle operation, material and equipment storage, access roads and other surface-disturbing activities within ESAs.

4. Wildlife Exclusion Fencing (WEF). Prior to the start of construction, WEF will be installed at the edge of **ramp widening and concrete barrier construction** ~~the project footprint~~ in all areas where **Alameda whipsnake,** California red-legged frogs, or Central California tiger salamanders could enter the construction area. The location of the fencing shall be determined by the Resident Engineer and Service-approved biologist in cooperation with the Service prior to the start of staging or surface disturbing activities. The location, fencing materials, installation specifications, and monitoring and repair criteria shall be approved by the Service prior to start of construction. Caltrans shall include the WEF specifications on the final project plans. Caltrans shall include the WEF specifications including installation and maintenance criteria in the bid solicitation package special provisions. The WEF shall remain in place throughout the duration of the project and shall be regularly inspected and fully maintained. Repairs to the WEF shall be made within 24 hours of discovery. Upon project completion the WEF shall be completely removed, the area cleaned of debris and trash, and returned to natural conditions.

5. Environmental Awareness Training. Prior to the start of construction, a qualified biologist will conduct an educational training program for all construction personnel including contractors and subcontractors. The training will include, at a minimum, a description of the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox**, and their habitat within the action area; an explanation of the status of these species and protection under state and federal laws; the avoidance and minimization measures to be implemented to reduce take of these species; communication and work stoppage procedures in case a listed species is

observed within the action area; and an explanation of the ESAs and WEF and the importance of maintaining these structures. A fact sheet conveying this information will be prepared and distributed to all construction personnel. Upon completion of the program, personnel will sign a form stating that they attended the program and understand all the avoidance and minimization measures and implications of the Act.

6. Avoidance of Entrapment. To prevent inadvertent entrapment of animals during construction, all excavated, steep-walled holes or trenches more than 1-foot deep will be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. The Service-approved biologist shall inspect all holes and trenches at the beginning of each workday and before such holes or trenches are filled. All replacement pipes, culverts, or similar structures stored in the action area overnight will be inspected before they are subsequently moved, capped, and/or buried. If at any time a listed species is discovered, the Resident Engineer and Service-approved biologist will be notified immediately and the Service-approved biologist shall implement the species observation and handling protocol outlined below.

7. Best Management Practices. Storm Water Pollution Prevention Plans (SWPPP) and erosion control BMPs will be developed and implemented to minimize any wind or water-related erosion and will be in compliance with the requirements of the Regional Water Quality Control Board. The SWPPP will reference the Caltrans Construction Site BMPs Manual. This manual is comprehensive and includes many other protective measures and guidance to prevent and minimize pollutant discharges and can be found online at: http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm. Protective measures will include, at a minimum:

    a. No discharge of pollutants from vehicle and equipment cleaning is allowed into any storm drains or watercourses.

    b. Vehicle and equipment fueling and maintenance operations must be at least 50 feet away from watercourses, except at established commercial gas stations or established vehicle maintenance facility.

    c. Concrete wastes are collected in washouts and water from curing operations is collected and disposed. Neither will be allowed into watercourses.

    d. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.

    e. Dust control measures will include use of water trucks and dust palliatives to control dust in excavation-and-fill areas, covering temporary access road entrances and exits with rock (rocking), and covering of temporary stockpiles when weather conditions require.

    f. Coir rolls or straw wattles that do not contain plastic or synthetic monofilament netting will be installed along or at the base of slopes during construction to capture sediment.

    g. Protection of graded areas from erosion using a combination of silt fences, fiber rolls, etc. along toes of slopes or along edges of designated staging areas, and erosion control netting (such as jute or coir) as appropriate on sloped areas. Erosion control materials that use plastic or synthetic monofilament netting will not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several

months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers.

h. Permanent erosion control measures such as bio-filtration strips and swales to receive storm water discharges from the highway, or other impervious surfaces will be incorporated to the maximum extent practicable.

i. All grindings and asphaltic-concrete waste will be stored within previously disturbed areas absent of habitat and at a minimum of 50 feet from any aquatic habitat, culvert, or drainage feature.

8. Construction Site Management Practices. The following site restrictions will be implemented to avoid or minimize effects on listed species and their habitats:

   a. A speed limit of 15 miles per hour (mph) in the project footprint in unpaved areas will be enforced to reduce dust and excessive soil disturbance.

   b. Construction access, staging, storage, and parking areas, will be located within the project Caltrans ROW outside of any designated ESA or outside of the Caltrans ROW in areas environmentally cleared by the contractor. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed project. Routes and boundaries of roadwork will be clearly marked prior to initiating construction or grading.

   c. To the maximum extent practicable, any borrow material will be certified to be non-toxic and weed free.

   d. All food and food-related trash items will be enclosed in sealed trash containers and properly disposed of off-site.

   e. No pets from project personnel will be allowed anywhere in the action area during construction.

   f. No firearms will be allowed on the project site except for those carried by authorized security personnel, or local, State or Federal law enforcement officials.

   g. A Spill Response Plan will be prepared. Hazardous materials such as fuels, oils, solvents, etc. will be stored in sealable containers in a designated location that is at least 50 feet from hydrologic features.

   h. All equipment will be properly maintained and free of leaks. Servicing of vehicles and construction equipment including fueling, cleaning, and maintenance will occur at least 50 feet from any hydrologic features unless it is an existing gas station.

9. Vegetation Removal. Any vegetation that is within the cut and fill line or growing in locations where permanent structures will be placed (e.g., road alignment, shoulder widening, soil nail walls, etc.) will be cleared. Vegetation will be cleared only where necessary and will be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants that reproduce vegetatively to resprout after construction. All clearing and grubbing of woody vegetation will occur by hand or using light construction equipment such as backhoes. If clearing and grubbing occurs between February 1 and August 31, a qualified biologist(s) will survey for nesting birds within the area(s) to be disturbed including a perimeter buffer of 100 feet for passerines and 500 feet for raptors before clearing activities begin. All nest avoidance requirements of the Migratory Bird Treaty Act and California Fish and Game Code Sections 3503 and 3503.5 will be observed. All cleared vegetation will be removed from the project

footprint to prevent attracting animals to the project site. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of such materials. A Service-approved biologist will be present during all vegetation clearing and grubbing activities. Prior to vegetation removal, the Service-approved biologist shall thoroughly survey the area for **Alameda whipsnake,** California red-legged frog**,** Central California tiger salamander**, and San Joaquin kit fox**. Once the Service approved biologist has thoroughly surveyed the area, clearing and grubbing may continue without further restrictions on equipment; however, the Service-approved biologist shall remain onsite to monitor for **Alameda whipsnake,** California red-legged frog**,** Central California tiger salamander**, and San Joaquin kit fox** until all clearing and grubbing activities are complete. After project completion, all temporarily affected areas shall be returned to original grade and contours to the maximum extent practicable, protected with proper erosion control materials, and revegetated with native species appropriate for the region and habitat communities on site.

10. Reduce Spread of Invasive Species. To reduce the spread of invasive non-native plant species and minimize the potential decrease of palatable vegetation for wildlife species, Caltrans will comply with Executive Order 13112. This order is provided to prevent the introduction of invasive species and provide for their control in order to minimize the economic, ecological, and human health impacts. In the event that high- or medium-priority noxious weeds, as defined by the California Department of Food and Agriculture or the California Invasive Plant Council, are disturbed or removed during construction-related activities, the contractor will contain the plant material associated with these noxious weeds and dispose of it in a manner that will not promote the spread of the species. The contractor will be responsible for obtaining all permits, licenses, and environmental clearances for properly disposing of materials. Areas subject to noxious weed removal or disturbance will be replanted with fast-growing native grasses or a native erosion control seed mixture. If seeding is not possible, the area should be covered to the extent practicable with heavy black plastic solarization material until the end of the project.

11. Replant, Reseed, and Restore Disturbed Areas. All slopes or unpaved areas that are temporarily affected by the proposed action will be revegetated with an assemblage of native grasses and shrubs characteristic of the floristic region and native local habitats to stabilize soils and prevent erosion. Where disturbance includes the removal of trees or plants, native species will be replanted and maintained until they become established. A revegetation plan with success criteria will be submitted to the Service for review and approval. Temporary effects comprise areas denuded, manipulated, or otherwise modified from their existing, pre-project conditions, thereby removing one or more essential components of a listed species' habitat as a result of project activities that include, but are not limited to, construction, staging, storage, lay down, vehicle access, parking, etc. Temporary effects must be restored to baseline habitat values or better within one year following initial disturbance. Areas subject to ongoing operations and maintenance are not considered temporary even if they are restored within one year following initial disturbance. Affected areas not fulfilling these criteria are considered permanent.

5. Make the following changes to the Action Area on page 8:

The action area is defined in 50 CFR § 402.02, as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the purposes of the effects assessment, the action area encompasses ~~269.20~~ **367.21** acres extending 8.9 miles along the eastbound side of I-580 from the San Joaquin County line (PM 0.0) to PM 4.9, the westbound side of I-580 from the San Joaquin County Line to 0.1-mile east of Greenville Road (PM 7. 9) in Livermore, including the eastbound and westbound on- and off-ramps at Grant Line Road, the eastbound off-ramp at North Flynn Road, and the westbound on- and off-ramps at North Flynn Road . The action area also includes I-205 from the San Joaquin County line to the intersection with I-580 (PM 1.0) **and three distinct locations on I-580 in Castro Valley including the eastbound and westbound on-ramps at Eden Canyon Road (PM 26.67), northbound and southbound on-ramps at Crow Canyon Road (PM 28.27), westbound on-ramp at East Castro Valley Boulevard (PM 28.27), and eastbound on-ramp at Strobridge Avenue (PM 30.1)** . Habitat within the action area comprises ~~133.37~~ **185.30** acres of paved roadways, ~~94.8~~ **108.97** acres of grassland, **0.96-acre of riparian woodland,** ~~1.4~~ **2.98** acres of shrubland, ~~0.1~~**0.15**-acre of freshwater marsh, ~~0.3~~**0.63**-acre of creek channel, 0.5-acre of aqueduct, ~~11.4~~ **31.23** acres of urbanized landscaped area, and ~~27.3~~ **36.54** acres of bare ground.

6. Make the following changes to the Jeopardy Determination on page 8:

In accordance with policy and regulation, the jeopardy analyses in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox** range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox** in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox**; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox**; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox**.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox** current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these species in the wild.

The jeopardy analyses in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander, **and San Joaquin kit fox** and the role of the action area in the survival and recovery of the **Alameda whipsnake,** California red-

legged frog, Central California tiger salamander, **and San Joaquin kit fox** as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

7. Add Alameda whipsnake to Status of Species on page 10:

Refer to the Alameda Whipsnake 5-Year Review: Summary and Evaluation (Service 2011) for the snake's status and life history information . This document can be downloaded from the World Wide Web at: http://ecos.fws.gov/docs/five_year_review/doc3886.pdf.

8. Add San Joaquin kit fox to Status of Species on page 10:

Refer to the San Joaquin Kit Fox 5-Year Review for the mammal's status and life history information (Service 2010b). This document can be downloaded from the World Wide Web at: http://www.fws.gov/ecos/ajax/docs/five_year_review/doc3222.pdf. Critical habitat has not been designated for the San Joaquin kit fox.

9. Add Alameda whipsnake to Environmental Baseline on page 20:

The three distinct project areas of the Castro Valley Segment are within the range of the Alameda whipsnake and are immediately adjacent to the species critical habitat and a recovery unit. Caltrans I-580 ROW defines the northern boundary of the snake's Hayward-Pleasanton Ridge critical habitat unit (Unit 3) (Service 2006) and the southern boundary of the Oakland-Las Trampas Recovery Unit (Unit 2) (Service 2003). The Alameda whipsnake is typically associated with areas of scrub vegetation and rocky outcrops within its range. However, it will also travel into adjacent grassland and riparian communities . The action area north and south of the Castro Valley Segments includes scrub and grassland habitat. The construction footprint is limited to grassland vegetation where the snake could be encountered. There are 2 Alameda whipsnake CNDDB occurrences within 2 miles of the action area (Occurrences 41 and 136) (CDFW 2014a & 2014b). These observations are located in a large area of contiguous habitat south of the Castro Valley Segment and range between 0.86 to 1.6 miles from the construction footprint. The Service believes that the Alameda whipsnake is reasonably certain to occur within the action area because: (1) the project is located within the species' range and current distribution; (2) there is suitable habitat within the action area; (3) the habitat within the action area is similar to that which is found in nearby areas with confirmed Alameda whip snake occupancy; (4) there are nearby observations of the species; (5) there are no significant barriers to snake movement between confirmed occupied areas and the action area; (6) the lack of significant disturbance or history of significant threats to the species in the general vicinity; and (7) the biology and ecology of the animal.

10. Add San Joaquin kit fox to Environmental Baseline on page 20:

The Altamont Pass Segment is within the northern range of the San Joaquin kit fox and is within one of the species' satellite areas (Service 201 Ob). Although not often seen in this, the northern part of their range, the San Joaquin kit fox is well documented in the Altamont Hills. The CNDDB includes at least 9 observations of the listed fox within 2 miles of the proposed project footprint for the Altamont Pass Segment . These include an adult with pups found denning in the bank of an aqueduct, less than 200 feet from the proposed project footprint (Occurrence 35) (CDFW 2014a & 2014b). Occurrence 35 is located in a narrow strip of disturbed grassland sandwiched between the California

Aqueduct and I-580. Other occurrences, north and south of the proposed project footprint are located in more open rolling and contiguous grassland habitat which is more conducive to the fox's life history. The Service believes that the San Joaquin kit fox is reasonably certain to occur within the action area because: (1) the project is located within the species' range and current distribution; (2) there is suitable grassland habitat with abundant small mammal prey within the action area; (3) there are nearby occurrences of kit fox; (4) all the elements needed to support the species' life history are located in the action area; (5) the ability of the kit fox to move a considerable distance; and (6) the biology and ecology of the animal.

11. Make the following changes to the Effects of the Action on page 24:

Alameda whipsnake, California Red-legged Frog, and Central California Tiger Salamander

The proposed project will likely adversely affect the threatened **Alameda whipsnake,** California red-legged frog, and Central California tiger salamander by killing, injuring, harming, and/or harassing juveniles and adults inhabiting suitable upland and dispersal habitat within the action area . The aspects of the proposed action most likely to affect the California red-legged frog, or Central California tiger salamander are largely confined to the construction phase of the project associated with **the Altamont Pass Segment** of the off-ramp rehabilitation and work along the road shoulders at the following locations: 1) eastbound I-580 from PM 0.0 to PM 4.7; 2) westbound I-580 from PM 0.0 to PM 7.8; 3) I-205 from PM 0.0 to PM 1.0). **The proposed action in the Castro Valley Segment will most likely effect Alameda whipsnake and California red-legged frog at the following locations: 1) eastbound and westbound on-ramps at Eden Canyon Road (PM 26.67); 2) northbound and southbound on-ramps at Crow Canyon Road (PM 28.27), and 3) westbound on-ramp at East Castro Valley Boulevard (PM 28.27).** Additional effects may occur due to the replacement of MBGR with concrete barriers, which will act as a barrier to movement across I-580 and I-205 **in the Altamont Pass Segment** . This may increase the amount of time a California red-legged frog and Central California tiger salamander is exposed on the road surface subjecting them to vehicle strikes or predation . The total length of concrete barriers within the **Altamont Pass Segment** of the action area will be approximately 2.34 miles.

Construction noise, vibration, and increased human activity may interfere with normal behaviors -feeding, sheltering, movement between refugia and foraging grounds, and other essential behaviors of the **Alameda whipsnake**, California red-legged frog, and California tiger salamander - resulting in avoidance of areas that have suitable habitat but intolerable levels of disturbance. Short-term temporal effects will occur when vegetative cover and subterranean upland habitat is removed during project construction Caltrans proposes to minimize these effects, in part, by locating construction staging, storage and parking areas outside of sensitive habitat; clearly marking construction work boundaries to prevent crews from affecting more habitat than is absolutely necessary, and revegetating all unpaved areas disturbed by project activities.

The proposed construction activities could result in the introduction of chemical contaminants to the site. **Listed species** using these areas could be exposed to any contaminants that are present at the site . Exposure pathways could include inhalation, dermal contact, direct ingestion, or secondary ingestion of contaminated soil, plants, or prey species. Exposure to contaminants could cause short- or long-term morbidity,

possibly resulting in reduced productivity or mortality. Caltrans proposes to minimize these risks by implementing a Storm Water Pollution Prevention Plan (SWPPP), erosion control BMPs and a Spill Response Plan, which will consist of refueling, oiling or cleaning of vehicles and equipment: a minimum of 100 feet from aquatic resources; installing coir rolls, straw wattles and/or silt fencing to capture sediment and prevent runoff or other harmful chemicals from entering the wetland; and locating staging, storage and parking areas away from aquatic habitats.

Preconstruction surveys and the relocation of individual **Alameda whipsnake,** California red-legged frogs, and California tiger salamanders by a Service-approved biologist will minimize the likelihood of serious injury or mortality; however, capturing and handling may result in stress and/or minor injury during handling, containment, and transport. Death and injury of individuals could occur at the time of relocation or later in time subsequent to their release. Although survivorship for translocated amphibians has not been estimated, survivorship of translocated wildlife, in general, is low because of intraspecific competition, lack of familiarity with the relocation site with regards to breeding, feeding, and sheltering habitats, risk of contracting disease in foreign environment, and increased risk of predation. Caltrans proposes to minimize these effects by using qualified Service-approved biologists, limiting the duration of handling, and relocating amphibians to suitable nearby habitat.

Biologists and construction workers traveling to the action area from other project sites may transmit diseases by introducing contaminated equipment. The chance of a disease being introduced into a new area is greater today than in the past due to the increasing occurrences of disease throughout amphibian populations in California and the United States . It is possible that chytridiomycosis, caused by chytrid fungus (*Batrachochytrium dendrobatidis*), may exacerbate the effects of other diseases on amphibians or increase the sensitivity of the amphibian to environmental changes (e.g., water pH) that reduce normal immune response capabilities (Bosch et al. 2001, Weldon et al. 2004). Implementing proper decontamination procedures prior to and following aquatic surveys and handling of frogs and salamanders will minimize the risk of transferring diseases through contaminated equipment or clothing.

Temporary effects comprise areas denuded, manipulated, or otherwise modified from their existing, pre-project conditions, thereby removing one or more essential components of a listed species habitat as a result of project activities that include, but are not limited to, construction, staging, storage, lay down, vehicle access, parking, etc. Temporary effects must be restored to baseline habitat values or better within one year following initial disturbance. Areas subject to ongoing operations and maintenance are not considered temporary even if they are restored within one year following initial disturbance. Affected areas not fulfilling these criteria are considered permanent. Construction within upland habitat, e.g. pavement removal and resurfacing, shoulder backing, installation of rumble strips, MBGRs, concrete barriers, overhead signage, lighting, flashing beacons, barriers markers, roadside delineators, and guardrail delineators would result in the permanent loss and/or degradation of **0.27-acre of Alameda whipsnake,** ~~5.37~~ **6.25** acres of California red-legged frog, **and** ~~5.37~~ **5.97 acres of** Central California tiger salamander upland and dispersal habitat; and the temporary loss and/or degradation of **1.51 acres of Alameda whipsnake,** ~~29.53~~ **32.50** acres of California red-legged frog, **and** ~~29.53~~ **30.99 acres** of Central California tiger salamander upland and dispersal habitat. Caltrans has proposed a

compensatory habitat conservation measure at a ratio of 3:1 (acres of compensation to acres of habitat loss) for permanent effects and 1.1:1 for temporary effects.

These effects will be further minimized by installing environmentally sensitive area fencing to keep workers from straying into otherwise undisturbed habitat; erecting wildlife exclusion fencing to deter frogs and salamanders from wandering onto the construction site; implementing storm water and erosion BMP's; educating workers about the presence of **Alameda whipsnakes,** California red-legged frogs, and California tiger salamanders, their habitat, identification, regulatory laws, and avoidance and minimization measures; and requiring a Service-approved biologist(s) to be present to monitor project activities within or adjacent to suitable habitat.

12. Add following to the Effects of the Action on page 24:

San Joaquin Kit Fox

Effects to the San Joaquin kit fox are expected to be limited to the construction of the Altamont Pass Segment. Within this segment the proposed project will result in temporary and permanent loss of 6.73 acres of habitat associated with the listed fox. Given the area of work will be distributed over numerous small construction sites adjacent to the road shoulder, it is likely that effects to the San Joaquin kit fox will be limited to non-lethal disturbance. Construction activities, human presence, noise, and lack of dens for shelter could disrupt movement of San Joaquin kit fox through the project area and are likely to add to the baseline road effects that may cause the fox to avoid the I-580 corridor. Trash from construction could attract other predators (red fox, coyote) to the work site, which could, in turn, prey on San Joaquin kit fox.

Excavation and recontouring could destroy any dens within the project area, if present. However, implementation of the conservation measures, including preconstruction surveys and monitoring, observance of no work buffers from dens, construction monitoring, construction personnel training, and use of Service-approved biologists during surveys and monitoring, will minimize the potential for disturbance of San Joaquin kit fox. Acquisition of habitat within the range of San Joaquin kit fox is likely to partially offset the temporary effects associated with disturbance and the permanent and temporal loss of kit fox habitat.

13. Make the following changes to the first paragraph under the Conclusion on page 27:

After reviewing the current status of the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander**, and San Joaquin** kit fox the environmental baseline for the action area; the effects of the proposed I-580 Freeway Performance Initiative Project and the I-580 and I-205 Pavement Rehabilitation Project and the cumulative effects; it is the Service's biological opinion that the project, as proposed, is likely to adversely affect these species, but is not likely to jeopardize their continued existence. This determination is based on our opinion that the magnitude of the effects of this action does not appreciably reduce the likelihood of both the survival and recovery of these species in the wild.

14. Make the following changes to the Amount or Extent of Take on page 27:

California Red-Legged Frog

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect due to their cryptic nature and wariness of humans. Losses of this species may also be difficult to quantify due to a lack of baseline survey data and seasonal/ annual fluctuations in their numbers due to environmental or human-caused disturbances. Due to the difficulty in quantifying the number of California red-legged frogs that will be taken as a result of the proposed action, the Service is quantifying take incidental to the proposed action as the mortality/ injury of no more than one and the harassment of all California red-legged frogs inhabiting or utilizing the ~~133.37~~**367.21-**acre action area **of the Altamont Pass and Castro Valley Segments of the proposed project**. The Service anticipates that take of juvenile and adult life history stages may be killed, harmed or harassed as a result of habitat loss/degradation, construction-related disturbance, or capture and relocation efforts. Upon implementation of the following Reasonable and Prudent Measures, all juvenile and adult California red-legged frogs within the action area in accordance with the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are authorized under this opinion.

Central California Tiger Salamander

The Service anticipates that incidental take of the California tiger salamander will be difficult to detect due to their cryptic nature, subterranean lifestyle, and predominately nocturnal behavior. Losses of this species may also be difficult to quantify due to seasonal/ annual fluctuations in their numbers due to environmental or human-caused disturbances. Due to the difficulty in quantifying the number of California tiger salamanders that will be taken as a result of the proposed action, the Service is quantifying take incidental to the proposed action as the mortality /injury of one and harassment of all California tiger salamanders inhabiting or utilizing the ~~133.37~~**311.21**-acre action area **of the Altamont Pass Segment of the proposed project**. The Service anticipates that take of juvenile or adult California tiger salamanders may result from habitat loss/ degradation, construction-related disturbance, or capture and relocation efforts. Upon implementation of the following Reasonable and Prudent Measures, all juvenile and adult California tiger salamanders within the action area in accordance with the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are authorized under this opinion.

Add the following to the Amount or Extent of Take on page 27:
Alameda Whipsnake

The Service expects that incidental take of the Alameda whipsnake will be difficult to detect or quantify because this animal may range over a large territory and the finding an injured or dead individual is unlikely because of their relatively small body size and behavioral tendency flee or seek refugia when injured or startled. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. Due to the difficulty in quantifying the number of Alameda whipsnakes that will be taken as a result of the proposed action, the Service is quantifying take incidental to the proposed action as the mortality/injury of one and harassment of all Alameda whipsnakes inhabiting or utilizing the 56.16-acre action area of the Castro Valley Segment of the proposed project. The Service anticipates that take of

juvenile or adult Alameda whipsnake may result from habitat loss and/or degradation, construction-related disturbance, or capture and relocation efforts. Upon implementation of the following Reasonable and Prudent Measures, all juvenile and adult Alameda whipsnakes within the action area in accordance with the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are authorized under this opinion.

San Joaquin Kit Fox

The Service anticipates that incidental take of the San Joaquin kit fox will be difficult to detect or quantify because this mammal inhabits dens or burrows when it is not foraging, mating, or conducting other surface activity; the animal may range over a large territory; it is primarily active at night, and it is a highly intelligent animal that often is extremely shy around humans. Losses of this species also may be difficult to quantify due to seasonal fluctuations in their numbers. There is a risk of harm, harassment, injury and mortality as a result of the proposed construction activities, the permanent and temporary loss and/or degradation of suitable habitat; however, proper implementation of avoidance measures should be effective in preventing incidental take due to harm, injury, or mortality. Therefore, the Service is authorizing take incidental to the proposed action as the harassment of all San Joaquin kit fox inhabiting or utilizing the 311.05-acre action area of the Altamont Pass project segment. Upon implementation of the following Reasonable and Prudent Measures, all San Joaquin kit fox within the action area in accordance with the amount and type of take outlined above will become exempt from the prohibitions described under section 9 of the Act. No other forms of take are authorized under this opinion.

15. Make the following changes to the Effect of the Take on page 28:

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the **Alameda whipsnake**, California red-legged frog, Central California tiger salamander, **or San Joaquin kit fox.**

16. Make the following changes to the Reasonable and Prudent Measures on page 28:

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize impacts of incidental take of **Alameda whipsnake**, California red-legged frog, Central California tiger salamander**, or San Joaquin kit fox**:

1. Minimize the effects to the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander**, and San Joaquin kit** fox by implementing the project description as described and adhering to the following terms and conditions.

17. Make the following changes to Term and Condition 3 on page 29:

The compensation measures proposed by Caltrans and outlined in Table 1 will minimize the effects of harm on the **Alameda whipsnake,** California red-legged frog**,** and Central California tiger salamander. Habitat considered for compensation shall comprise high quality breeding, foraging, sheltering, migration, and/or dispersal habitat. Caltrans shall comply with all applicable CDFW regulations pertaining to mitigation for species designated as fully protected and/or listed by the State. Compensation shall be implemented in accordance with the Selected Review Criteria for Section 7 Off-Site

Compensation provided in Appendix A. If conservation banking credits are to be purchased, Caltrans shall submit a conceptual compensation plan to the Service for review and approval prior to the purchase of credits. If the proposed compensation scheme is not fully implemented, Caltrans shall provide an alternative compensation scheme to be reviewed and approved by the Service. On-site restoration of temporarily affected areas may qualify as compensation at a 1:1 ratio if it is restored within one calendar year following project completion and the conditions are verified by the Service. All compensation will be acquired prior to the beginning of earthmoving for the project.

18. Make the following changes to Term and Condition 6 on page 30:

If verbally requested through the Resident Engineer or Construction Inspector, before, during, or upon completion of ground breaking and construction activities, Caltrans shall ensure the Service or their designated agents can immediately and without delay, access and inspect the project site for compliance with the proposed project description, conservation measures, and terms and conditions of this Biological Opinion, and to evaluate project effects to the **Alameda whipsnake,** California red-legged frog, Central California tiger salamander**, and San Joaquin Kit fox** and their habitat.

19. Make the following changes to Term and Condition 8 on page 30:

To prevent **Alameda whipsnakes,** California red-legged frogs, and Central California tiger salamanders from becoming entangled, trapped, or injured, erosion control materials that use plastic or synthetic monofilament netting will not be used within the action area. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine or other similar fibers.

20. Make the following changes to Term and Condition 9 on page 30:

A Service-approved biologist(s) shall be onsite during all activities that may result in take of **Alameda whipsnakes,** California red-legged frogs**,** Central California tiger salamanders, **and San Joaquin kit fox** as determined by the Service. A minimum of one Service-approved biologist shall be on-site throughout the project duration. However, an adequate number of Service-approved biologists to monitor the effects of the project on the **Alameda whipsnakes,** California red-legged frogs**,** Central California tiger salamanders, **and San Joaquin kit fox will be onsite**. The Service will consider the implementation of specific project activities without the oversight of an on-site Service-approved biologist on a case-by-case basis.

21. Make the following changes to Term and Condition 10 on page 30:

Preconstruction surveys shall be conducted by a Service-approved biologist immediately prior to the initiation of any ground disturbing activities and vegetation clearing that may result in take of **Alameda whipsnakes,** California red-legged frogs**,** Central California tiger salamanders, **and San Joaquin kit fox** as determined by the Service. All suitable aquatic and upland habitat including refugia habitat such as dense vegetation, small woody debris, refuse, burrows, etc., shall be thoroughly inspected. The Service-approved biologist(s) shall conduct clearance surveys at the beginning of each day and regularly throughout the workday when construction activities are occurring that may result in take of **Alameda whipsnakes,** California red-legged frogs**,** Central California tiger

salamanders, **and San Joaquin kit fox** as determined by the Service. If an **Alameda whipsnake,** California red-legged frog**,** Central California tiger salamander**, or San Joaquin kit fox** is observed, the Service-approved biologist shall implement the species observation and handling protocol outlined below.

This concludes the reinitiation of formal consultation on the I-580 and I-205 Pavement Rehabilitation Project located in Alameda County, California. The remainder of the August 7, 2014, biological opinion, as amended, is unchanged. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the Federal agency or by the Service where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and:

(a) If the amount or extent of taking specified in the incidental take statement is exceeded;

(b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or

(d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have questions concerning this reinitiation, please contact Jerry Roe or Ryan Olah, Coast Bay Division Chief, at (916) 414-6600.

Sincerely,

Jennifer M. Norris
Field Supervisor

cc:
Melissa Escaron, California Department of Fish and Wildlife, Napa, California

WATER QUALITY INFORMATION HANDOUT
CONTRACT NO: 04-3G59U4
04-ALA-580/205 & SJ-580; PM-VAR
ROADWAY REHABILITATION & RAMP METERING

California Department of Transportation
District 04
Office of Water Quality
111 Grand Avenue, Oakland, CA 94612

May, 2016

Disclaimer

A "Disclaimer" is required specifying that the information provided in the Water Quality Information Handout is just a guideline and is to be used for information purposes only and should not be considered a sole source document to adhere to the requirements of the conditions of the Construction General Permit (NPDES No. CAS000002) and new Caltrans Statewide NPDES Permit (Order No. 2012-0011-DWQ), and address the temporary water quality impacts resulting from the construction activities in this project. The contractor is required to provide water quality monitoring, sampling and implement best management practices (BMPs) based on standard industry operations, field conditions and conditions encountered based on the contractor's means and methods. The information in this handout is not to be construed in any way as a waiver of the provisions in the CGP. Bidders and contractors are cautioned to make independent investigations and examinations as they deem necessary to satisfy the conditions encountered in performance of work, with respect to the following: sampling and monitoring locations, distribution of watershed areas for sizing of BMPs, and selection of BMPs in order to conform to the requirement of the contract documents and the CGP.

TABLE OF CONTENTS
CONTRACT NO: 04-3G59U4

1 PROJECT INFORMATION
- 1A Project Description
- 1B Receiving Water Bodies
- 1C Climate and Rainfall Data

2 CONSTRUCTION GENERAL PERMIT
- 2A Risk Level

3 TEMPORARY CONSTRUCTION SITE BMPs
- 3A Water Quality Monitoring
- 3B Run-on Discharges
- 3C Temporary Creek Diversion System
- 3D Temporary Dewatering and Temporary Active Treatment System
- 3E Temporary ESA Fencing

4 PERMITS
- 4A General

5 ATTACHMENTS
- A LOCATION MAP
- B RISK LEVEL DETERMINATION
- C RAINFALL DATA
- D WATER POLLUTION CONTROL PLAN

1 Project Information

1A Project Description & Scope

2R Pavement focused rehab and construct ramp metering from Patterson Pass Road Overcrossing in San Joaquin County to Greenville Road Overhead in Alameda County and from San Ramon Road Overcrossing to Strobridge Avenue Undercrossing in Alameda County, and on I-205 from San Joaquin County line to Midway Road Undercrossing.

Scope of project: 40 year pavement rehabilitation (Crack, Seat, Overlay w/ HMA-A, RHMA-G, RHMA-OG, PJCP) for mainline I-580, the ramps and I-205. Install rumble strips, MBGR replacement, upgrade MBGR w/ Concrete Barrier Type 60/60C, adjust inlets & pipes, HMA dike & concrete curb replacement, Overhead sign, lighting & flashing beacon. Install barrier markers, roadside delineators, guard railing delineators. Place High Friction Surface Treatment (HFST) on RHMA-G on EB 580 PM 3.75 to 4.6. Construct 12 ramp metering w/ 2 ramp widening and construction of MVPs, and CHP enforcement areas.

Construction Start Date	0 9/15/2016
Construction End Date	07/01/2019
Project Area	35.2 ac
Disturbed Soil Area	1.2 ac

1B Receiving Water Bodies

Alameda Creek, Arroyo De La, Laguna, Arroyo Del Valle, Arroyo Las Positas, Calaveras Reservoir, Del Valle Reservoir and Shallow Cliff Reservoir are the 303 listed water bodies Clean Water Act (CWA) Section 303(d). The pollutant concerns on these water bodies are COLD, MIGR, SPWN and sediment etc. according to the most recent applicable Regional Board Basin Plan. The project has a US Environmental Protection Agency-approved, sediment-related Total Maximum Daily Load (TMDL). The project area within Alameda County is partially located in High Risk Receiving Watershed area. But the project area within San Joaquin County is not located on High Risk Receiving Watershed. The project site area is located within hydrologic sub-area # 204.30; with average annual rainfall of 20.25 inches. The hydrologic unit is South Bay; the hydrologic area is Alameda creek watershed area is 404,764 acres.

1C Climate and Rainfall Data

A National Oceanic and Atmospheric Administration (NOAA) weather station located in San Mateo, CA was used to obtain an estimated number of rainy days per year and qualifying rain events. The Compliance Storm Event was also downloaded from the NOAA website.

Rainy days per year (precipitation 0.10 inches or greater)	100.4 days
Qualifying rain events per year	101.0 days
Average Annual Precipitation	20.25 inches

2 Construction General Permit

A Storm Water Pollution Prevention Plan is required since the disturbed soil area is 1.2 acres and R value is 116.94 in this project.

2A Risk Level

The project was divided into two segments: Castro Valley segment (PM 26.1 to PM 30.3 on route ALA-580) and Livermore segment (PM 0.0 to PM 8.0 on Route ALA-580; PM 0.0 to PM 1.0 on Route SJ-205; and PM 13.5 to PM 15.4 on Route SJ-580) considering estimated construction schedule received from design team. The details of the RL determination is as follows and is in Attachment B.

Castro Valley Segment

R factor	81.48
K factor	0.24
LS factor	1.45
Sediment Risk	26.23 (medium)
Receiving Water Body Risk (COLD/MIGR/SPW)	Yes/High
Risk Level	**2**

Livermore Segment

R factor	45.42
K factor	0.24
LS factor	5.89
Sediment Risk	64.21 (medium)
Receiving Water Body Risk (COLD/MIGR/SPW)	Yes/High
Risk Level	**2**

A project-specific Spill Containment, Cleanup Plan, which should be prepared and included as part of Section 500 (500.1.1) in the Storm Water Pollution Prevention Plan (SWPPP). Please see Materials Management Plan under Section 500 (500.1.1) of the SWPPP template. This Plan also needs to address Drilling Slurries and Fluids per Standard Specifications section 13-4.03D (5) Liquid Waste.

3 Temporary Construction Site BMPs

The estimated quantities of temporary construction site BMPs are in the PSE package. These BMPs are applied during construction activities to reduce the pollutants in the storm water discharges throughout construction. This project will require Construction Site BMPs including, but not limited to:

- **Soil Stabilization**: scheduling, preservation of existing vegetation, slope protection, slope interrupter devices, and channelized flow;
- **Sediment Control**: run-on or run-off control, storm drain inlet protection, sediment or desilting basins, and sediment traps.
- **Tracking Control**: stabilized construction entrances, tire or wheel washes, stabilized construction roadways, and street sweeping and vacuuming;
- **Wind Erosion Control**; hydraulic mulch, hydroseeding, and temporary cover;
- **Non-Storm Water Management**: temporary stream crossing, clear water diversion, water conservation practices, dewatering operations, paving and grinding operations, potable water/irrigation, vehicle and equipment operations (fueling, cleaning and maintenance), pile driving operations, concrete curing and finishing, and material and equipment use, structure demolition or removal over water; and

- **Waste Management and Materials Pollution Control**: material delivery and storage, material use, stockpile management, spill prevention and control, solid and concrete waste management, hazardous waste and contaminated soil management, and sanitary or septic and liquid waste management.

3A Water Quality Monitoring

Since there is no in-water work including the installation and removal of the temporary creek diversion system, Water Quality Monitoring is not applicable for this project.

3B Run-on Discharges

Run-on discharges are off-site storm water that can potentially run to the site. Run-on discharges should be calculated based on a rainfall intensity for a 2-year 24-hour event per the PPDG. The Rational Method is typically used to calculate run-on discharges.

Equation: Q=Ciao
Where Q = Run-on discharge (cubic feet per second)
C = Runoff coefficient (see HDM Figure 819.2A)
i = 2-year, 24-hour rainfall intensity (inches/hour)

The project cross-sections in the PSE package do not show areas of run-on adjacent to the roadway that would flow into the project work area; however, the Contractor needs to verify all run-on for the proposed project.

3C Temporary Creek Diversion System

Since there is no in-water work including the installation and removal of the temporary creek diversion system, the Temporary Creek Diversion System is not applicable for this project.

3D Temporary Dewatering and Temporary Active Treatment System

According to geotechnical report prepared by Geotechnical Services, groundwater was not encountered to the depth of expected retaining wall locations. In regards to ground water contamination, as information received from Environmental Engineering (Hazardous Waste Branch) that there is no evidence of ground water contamination in the area of construction, therefore there no ground water investigation were conducted at the project locations. Hence the "Temporary Dewatering and Temporary Active Treatment System" is not expected in this project.

3E Temporary ESA Fencing

Temporary ESA fencing is depicted on the layouts and on the USACE and CDFG impact maps. Adhere to the ESA fencing on the layout plans. The ESA fencing will depict areas where no construction activity can occur, except water quality monitoring and sampling. In many locations where temporary silt fence was also required, ESA fencing may be combined with temporary silt fence as temporary reinforced silt fence type 1. These locations will be depicted on the layout maps.

4 Permits

No 401 Certification from the Regional Water Quality Board, Biological Opinion from the U.S. Fish and Wildlife and 1600 Permit from the CA Department of Fish and Game are applicable to this project.

5 ATTACHMENTS

ATTACHMENT A

LOCATION MAP

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0	1	
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

STATE OF CALIFORNIA

DEPARTMENT OF TRANSPORTATION

ACIM-000C(075)E

PROJECT PLANS FOR CONSTRUCTION ON

STATE HIGHWAY

IN ALAMEDA AND SAN JOAQUIN COUNTIES ON ROUTE 580 FROM PATTERSON PASS ROAD OVERCROSSING TO GREENVILLE ROAD OVERHEAD AND FROM EDN CANYON ROAD UNDERCROSSING TO STROBRIDGE AVENUE UNDERCROSSING ON ROUTE 205 FROM SAN JOAQUIN COUNTY LINE TO MIDWAY ROAD UNDERCROSSING

TO BE SUPPLEMENTED BY STANDARD PLANS DATED 2010

INDEX OF PLANS

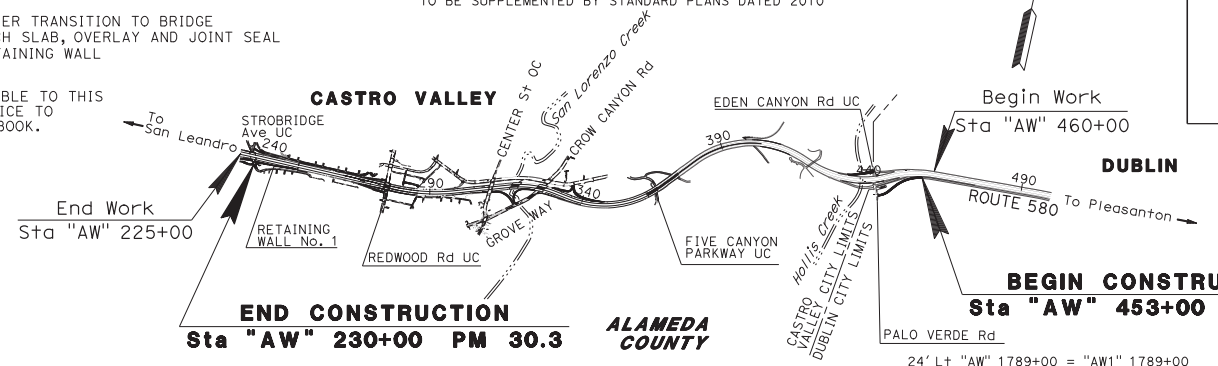
SHEET No.	DESCRIPTION
1	TITLE SHEET AND LOCATION MAP
2 - 4	KEY MAP
5 - 28	TYPICAL CROSS SECTIONS
29 - 78	LAYOUT
79 - 161	CONSTRUCTION DETAILS
161 - 203	TEMPORARY WATER POLLUTION CONTROL PLAN AND QUANTITIES
204 - 286	DRAINAGE PLAN, PROFILES, DETAILS AND QUANTITIES
287 - 307	UTILITY PLAN
308 - 319	CONSTRUCTION AREA SIGNS
320 - 408	STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN
409 - 457	PAVEMENT DELINEATION PLAN, DETAILS AND QUANTITIES
458 - 466	SIGN PLAN, DETAILS AND QUANTITIES
467 - 473	SUMMARY OF QUANTITIES
474 - 477	EROSION CONTROL PLAN AND DETAILS
478 - 519	ELECTRICAL PLANS
520	LOG OF TEST BORING
521 - 566	REVISED STANDARD PLANS

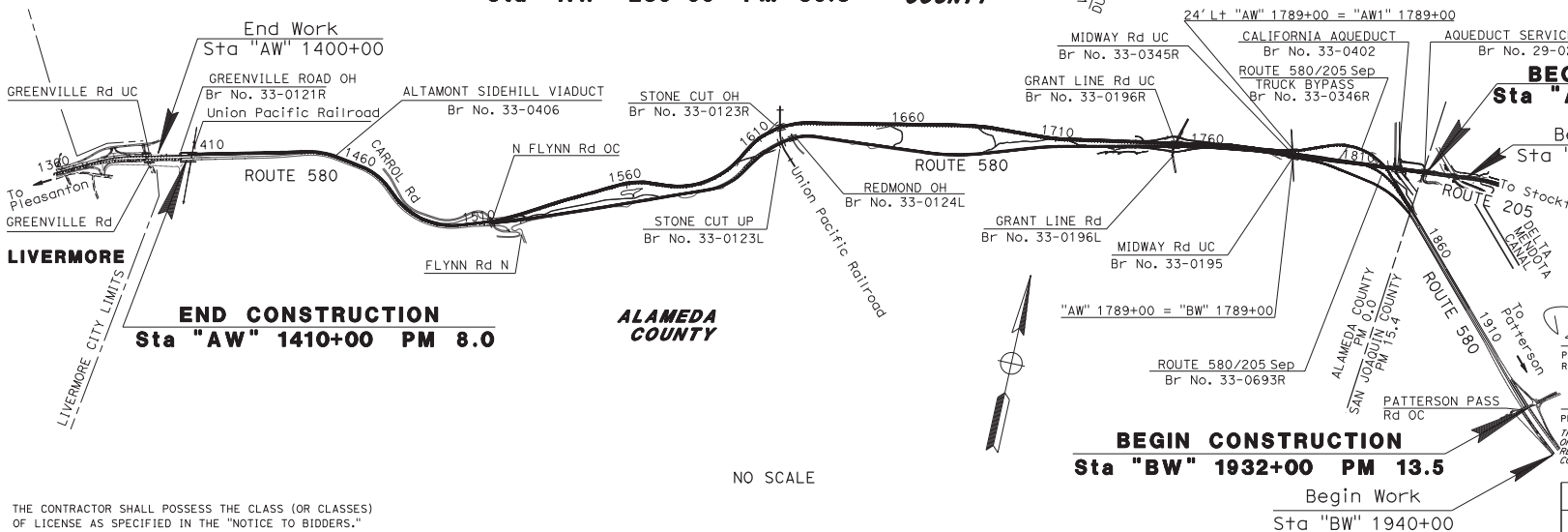
STRUCTURE PLANS

567 - 571	CONCRETE BARRIER TRANSITION TO BRIDGE
572 - 583	BRIDGE APPROACH SLAB, OVERLAY AND JOINT SEAL
584 - 593	STROBRIDGE RETAINING WALL

THE STANDARD PLANS LIST APPLICABLE TO THIS CONTRACT IS INCLUDED IN THE NOTICE TO BIDDERS AND SPECIAL PROVISIONS BOOK.

LOCATION MAP





THE CONTRACTOR SHALL POSSESS THE CLASS (OR CLASSES) OF LICENSE AS SPECIFIED IN THE "NOTICE TO BIDDERS."

PROJECT MANAGER ISSA BOURI

DESIGN MANAGER EDMUND CHOY

2-26-16
PROJECT ENGINEER REGISTERED CIVIL ENGINEER — DATE

REGISTERED PROFESSIONAL ENGINEER Danny Kao No. 61646 Exp. 6-30-17 CIVIL STATE OF CALIFORNIA

PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

CONTRACT No.	04-3G59U4
PROJECT ID	0415000066

LAST REVISION 03-22-16 | DATE PLOTTED => 05-MAY-2016 TIME PLOTTED => 06:35

ATTACHMENT B

RISK LEVEL DETERMINATION

Risk Assessment for Castro Valley Portion

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		81.48
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.24
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		1.454
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		28.4332608
16	**Site Sediment Risk Factor**		**Medium**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry	Score
A. Watershed Characteristics	**yes/no**	
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml **OR** A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan) http://www.waterboards.ca.gov/waterboards_map.shtml	**yes**	**High**
Region 1 Basin Plan Region 2 Basin Plan Region 3 Basin Plan Region 4 Basin Plan Region 5 Basin Plan Region 6 Basin Plan Region 7 Basin Plan Region 8 Basin Plan Region 9 Basin Plan		

Combined Risk Level Matrix

Receiving Water Risk	Sediment Risk: Low	Sediment Risk: Medium	Sediment Risk: High
Low	Level 1	Level 2	
High	Level 2		Level 3

Project Sediment Risk: **Medium**

Project RW Risk: **High**

Project Combined Risk: **Level 2**

Risk Assessment for Livermore Portion

	A	B	C
1	**Sediment Risk Factor Worksheet**		**Entry**
2	**A) R Factor**		
3	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.		
4	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm		
5	**R Factor Value**		45.42
6	**B) K Factor (weighted average, by area, for all site soils)**		
7	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.		
8	Site-specific K factor guidance		
9	**K Factor Value**		0.24
10	**C) LS Factor (weighted average, by area, for all slopes)**		
11	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.		
12	LS Table		
13	**LS Factor Value**		5.89
14			
15	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**		64.205712
16	**Site Sediment Risk Factor**		**Medium**
17	Low Sediment Risk: < 15 tons/acre		
18	Medium Sediment Risk: >=15 and <75 tons/acre		
19	High Sediment Risk: >= 75 tons/acre		
20			

Receiving Water (RW) Risk Factor Worksheet	Entry
A. Watershed Characteristics	**yes/no**
A.1. Does the disturbed area discharge (either directly or indirectly) to a **303(d)-listed waterbody impaired by sediment** (For help with impaired waterbodies please visit the link below) or has a **USEPA approved TMDL implementation plan for sediment**?:	**yes**
http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml	
OR	
A.2. Does the disturbed area discharge to a waterbody with designated beneficial uses of SPAWN & COLD & MIGRATORY? (For help please review the appropriate Regional Board Basin Plan)	
http://www.waterboards.ca.gov/waterboards_map.shtml	
Region 1 Basin Plan	
Region 2 Basin Plan	
Region 3 Basin Plan	
Region 4 Basin Plan	
Region 5 Basin Plan	
Region 6 Basin Plan	
Region 7 Basin Plan	
Region 8 Basin Plan	
Region 9 Basin Plan	

Combined Risk Level Matrix

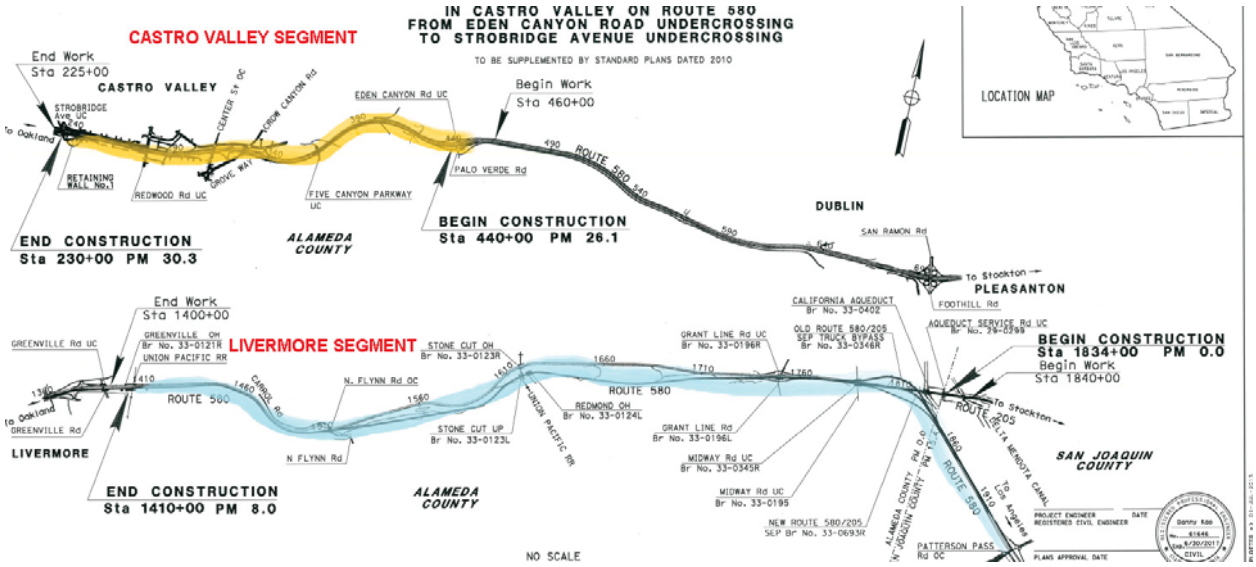
Receiving Water Risk	Sediment Risk: Low	Sediment Risk: Medium	Sediment Risk: High
Low	Level 1	Level 2	
High	Level 2		Level 3

Project Sediment Risk: **Medium**

Project RW Risk: **Low**

Project Combined Risk: **Level 2**

The project was divided into two segments: Castro Valley and Livermore



Castro Valley Segment

<u>Figure 1-Erosivity Index Zone Map</u>

The EI distribution zone is 24

Table 1-Erosivity Index Table

EI percentage (May 2, 2016 to May 2, 2018)

200

EI percentage (May 2, 2018 to October 1, 2018)

61.4-57.7 = 3.7

EI percentage (May 2, 2016 to October 1, 2018)

200+3.7= 203.7

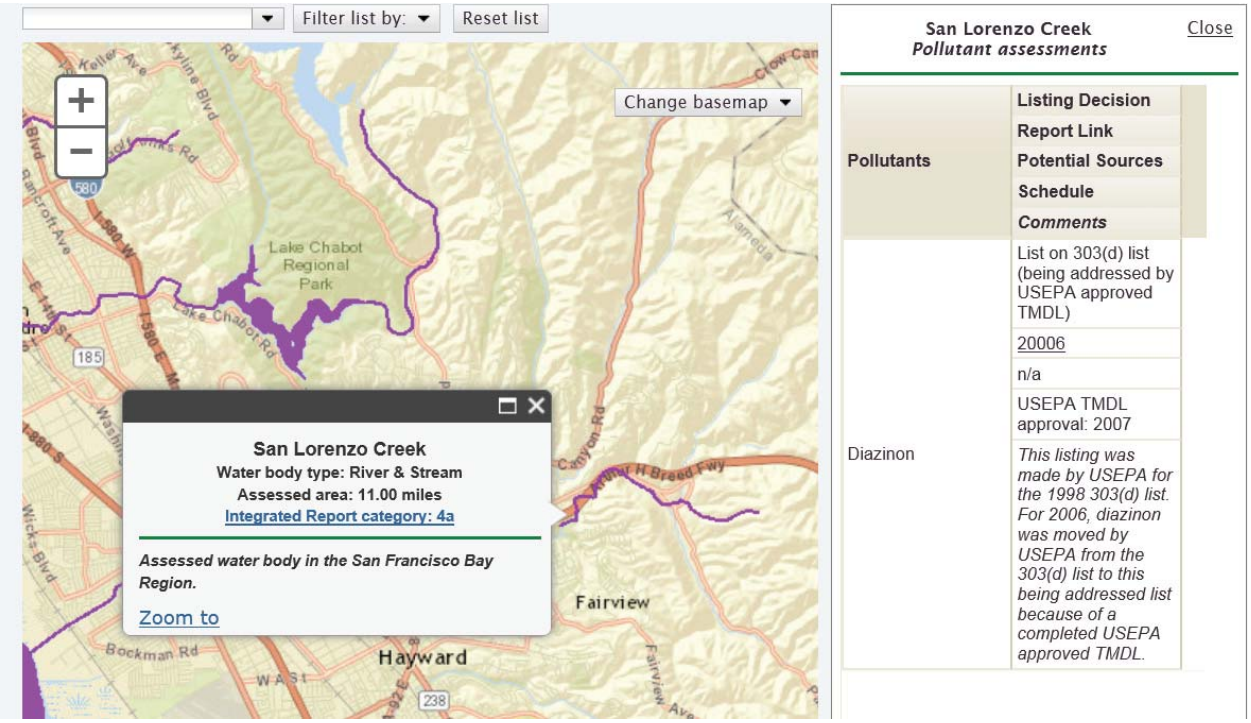
Figure 4_ Isoerodent map of California =40

R factor is 203.7 X 40% = 81.48

Use the populated K =0.24, LS = 1.45 provided by the SMARTs, the sediment factor is 26.43

Receiving water for the Castro Valley portion is San Lorenzo Creek, which is beneficial use for COLD/MIGR/SPWN

COUNTY Waterbody	AGR	MUN	FRSH	GWR	IND	PROC	COMM	SHELL	COLD	EST	MAR	MIGR	RARE	SPWN	WARM	WILD	REC-1	REC-2	NAV
ALAMEDA COUNTY, continued																			
Upper San Leandro Reservoir		E							E					E	E	E	E*	P	
Kaiser Creek			E						E					E	E	E	E	E	
Buckhorn Creek			E						E					E	E	E	E	E	
Redwood Creek (Alameda)			E						E					E	E	E	E	E	
Moraga Creek (in Contra Costa Co.)			E						E					E	E	E	E	E	
Estudillo Canal															E	E	E	E	
San Lorenzo Creek		E	E	E					E			E		E	E	E	E	E	



Livermore Segment

Figure 1-Erosivity Index Zone Map

The EI distribution zone is 23

Table 1-Erosivity Index Table

EI percentage (May 2, 2016 to May 2, 2018)

200

EI percentage (May 2, 2018 to October 1, 2018)

62.8-35.7 = 27.1

EI percentage (May 2, 2016 to October 1, 2018)

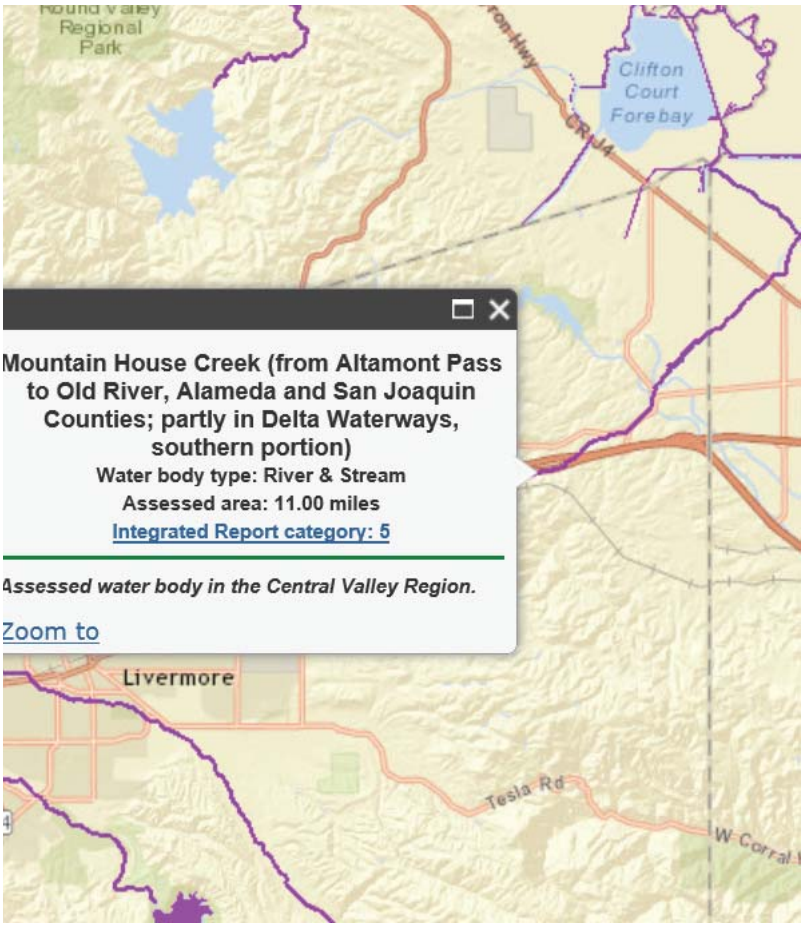
200+27.1= 227.1

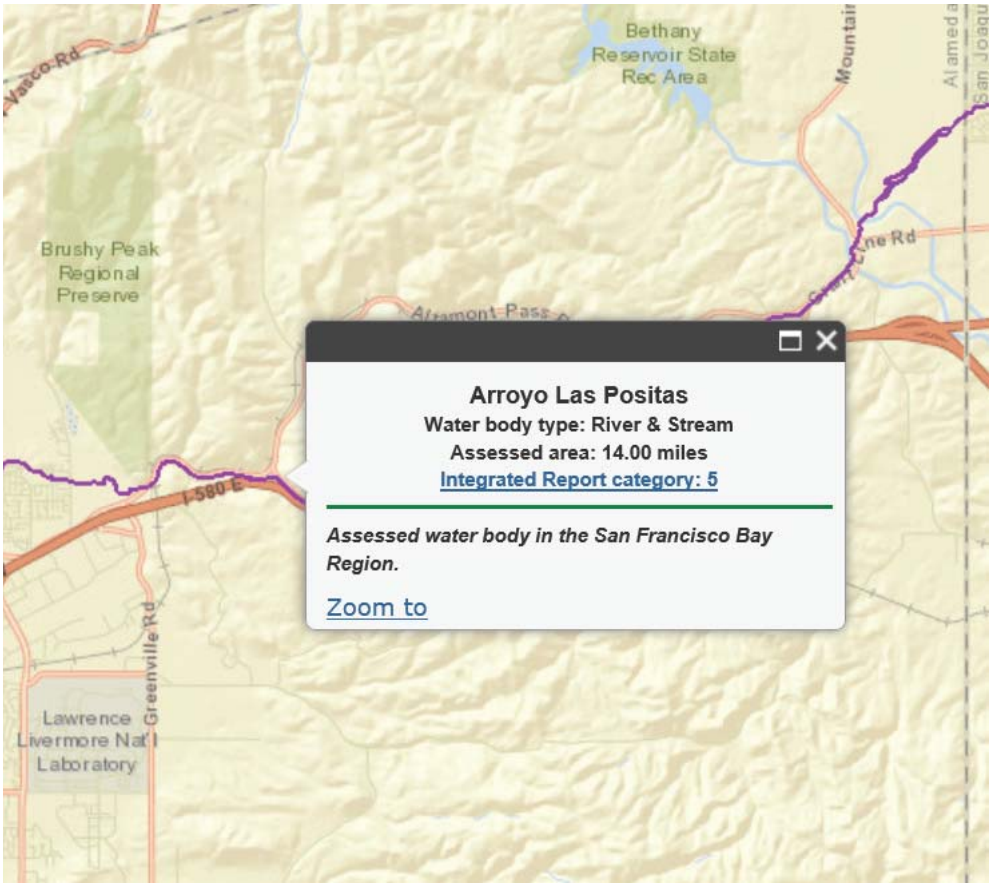
Figure 4_ Isoerodent map of California =20

R factor is 227.1 X 20% = 45.42

Use the populated K =0.24, LS = 5.89 provided by the SMARTs, the sediment factor is 64.21

Receiving water for the Livermore portion is Mountain House Creek and Arroyo Las Positas Creek, which are not a 303(d)-listed water body impaired by sediment, but the Arroyo Las Positas Creek is a water body with designated beneficial used of COLD/AND MIGR/SPWN.





COUNTY Waterbody	AGR	MUN	FRSH	GWR	IND	PROC	COMM	SHELL	COLD	EST	MAR	MIGR	RARE	SPWN	WARM	WILD	REC-1	REC-2	NAV
ALAMEDA COUNTY, continued																			
Indian Creek (central Alameda)			E						E				E	E	E	E	E*	E	
La Costa Creek			E						E				E	E	E	E	E	E	
Arroyo de la Laguna				E					E			E		E	E	E	E	E	
Vallecitos Creek															E	E	E	E	
Happy Valley Creek															E	E	E	E	
Sycamore Creek															E	E	E	E	
Arroyo del Valle		E		E					E			P	E	E	E	E	E	E	
Shadow Cliffs Reservoir				E			E		E					E	E	E	E	E	
Del Valle Reservoir		E					E		E					E	E	E	E	E	
Arroyo Mocho				E					E			E		E	E	E	E	E	
Tassajara Creek				E					P			E	E	E	E	E	E	E	
Arroyo las Positas				E					E			E	E	E	E	E	E	E	

ATTACHMENT C

RAINFALL DATA

Rainfall Intensity can be obtained by the following link:
http://www.wrcc.dri.edu/pcpnfreq/nca5y24.gif

Refer to chapters 800, Highway Drainage Design of Highway Design Manual for information on runoff coefficient and shed map. The weighted runoff coefficient of 0.55 is recommended for the project area.

Rainfall/precipitation detail of the San Mateo station which is close to job site is given as below

LIVERMORE
Elevation: 480 feet
Start Year: 1930
End Year: 2005
Number of Years: 76

Average number of days per month with precipitation:

Month	>=0.1 in	>=0.5 in
January	6	2
February	5.9	1.7
March	5.2	1.2
April	3.2	0.5
May	1.4	0.1
June	0.4	0
July	0.1	0
August	0.2	0
September	0.4	0.1
October	1.6	0.5
November	3.7	1
December	5.6	1.8
Yearly Total	33.5	8.8

ATTACHMENT D

WATER POLLUTION CONTROL PLAN

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

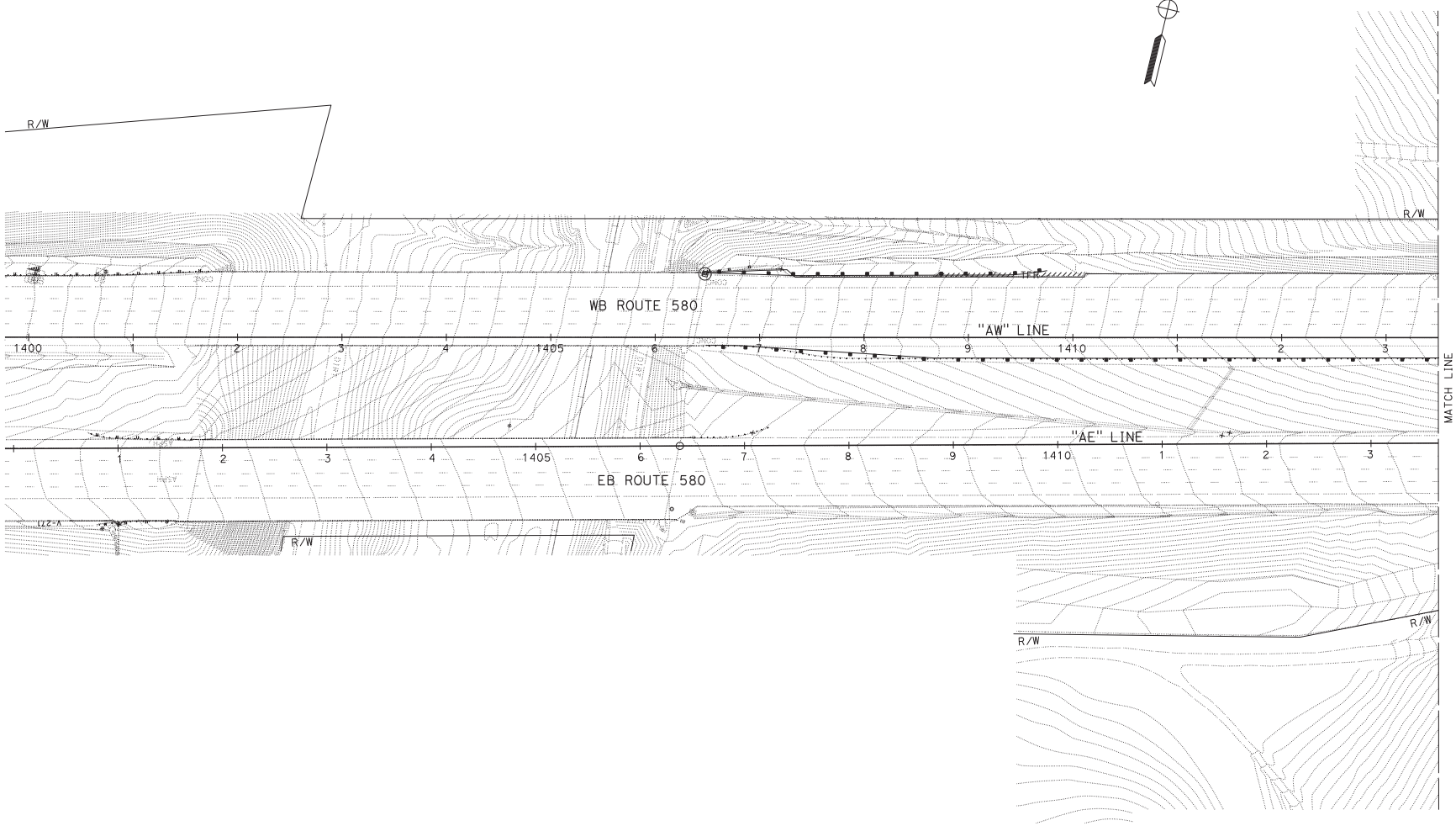
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND:

TEMPORARY HYDRAULIC MULCH (BONDED FIBER METRIX)



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-1

REVISED BY	DATE REVISED
GT	10-28-15

CALCULATED-DESIGNED BY	CHECKED BY
GANGA TRIPATHI	KAMRAN NAKHJIRI

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans — WATER QUALITY

LAST REVISION 03-28-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

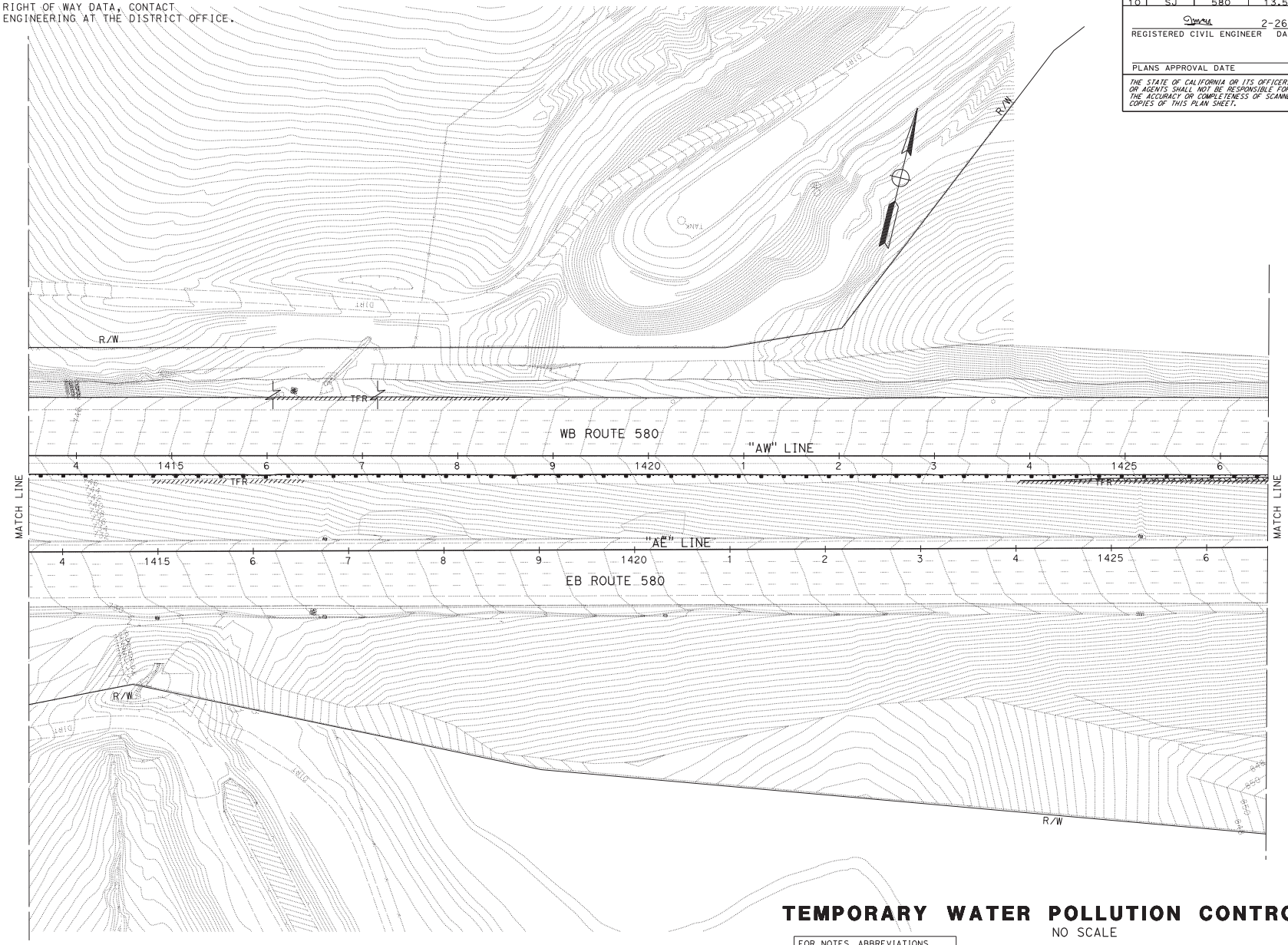
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

WPC-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 02-28-16

DATE PLOTTED => 05-MAY-2016

TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010

USERNAME => s128787

DGN FILE => 0415000066gb002.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0721

PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

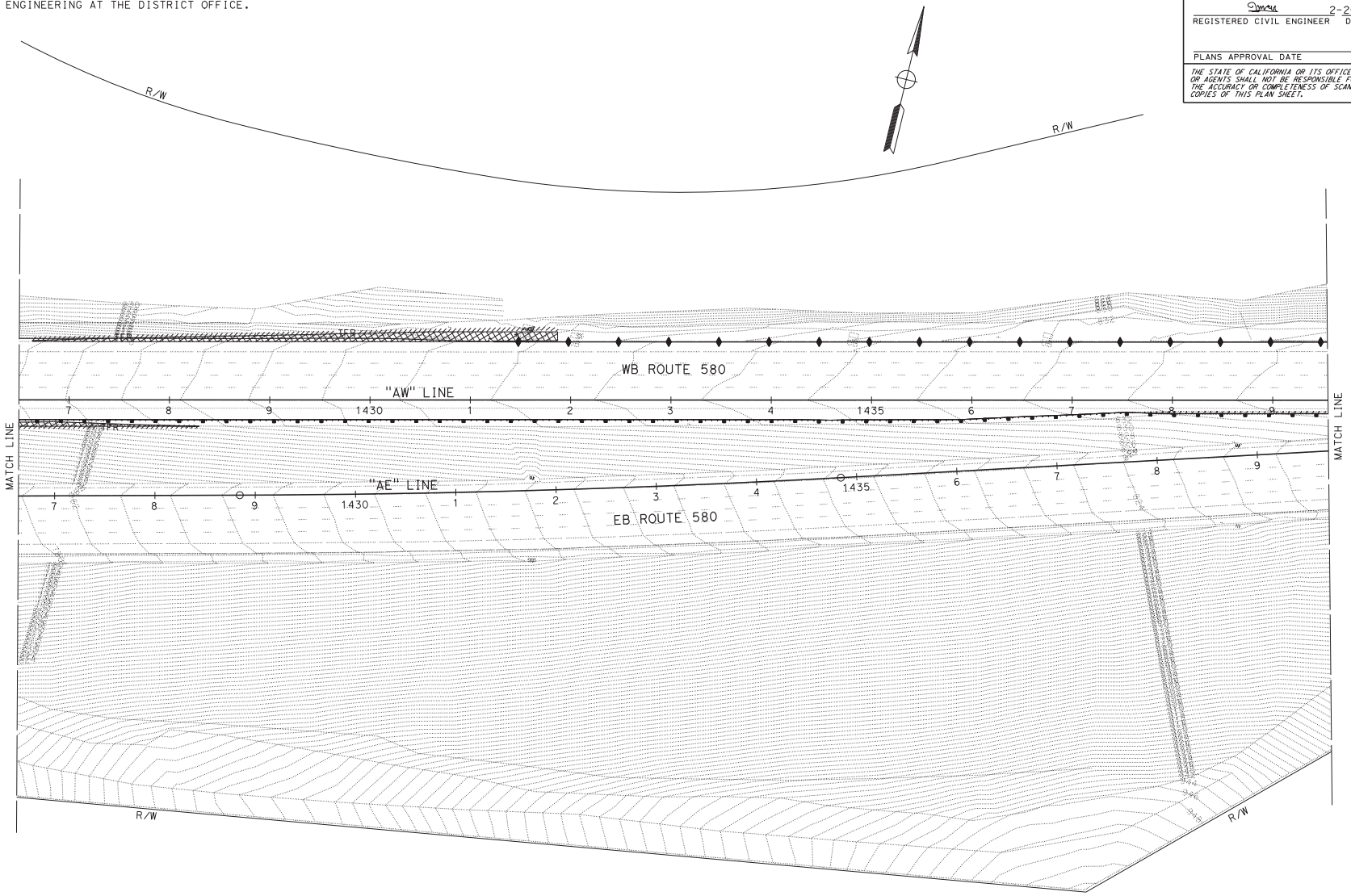
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 03-07-16

DATE PLOTTED => 05-MAY-2016

TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010

USERNAME => s128787

DGN FILE => 0415000066gb003.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0721

PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

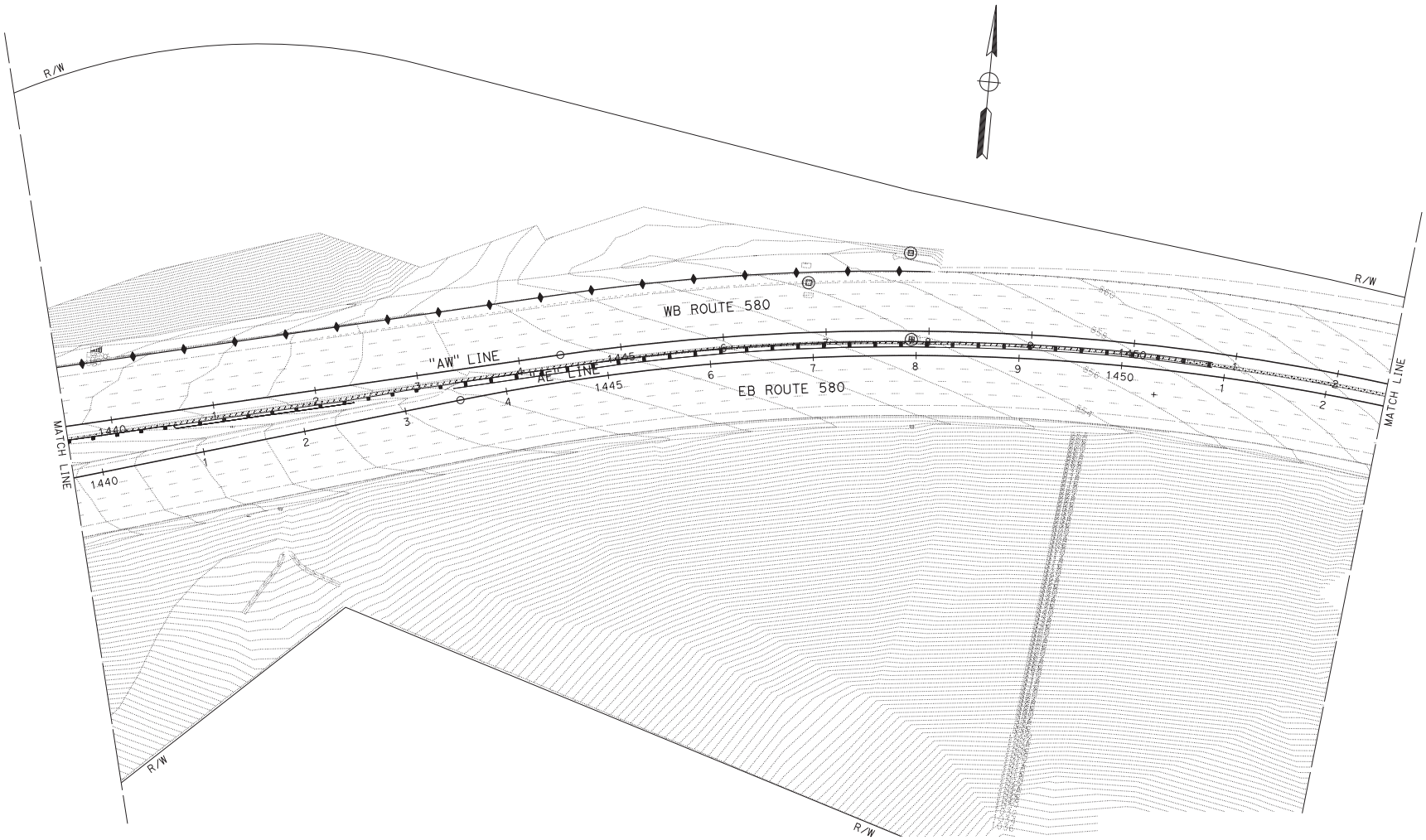
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

WPC-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION: DATE PLOTTED => 05-MAY-2016 TIME PLOTTED => 06:45 03-07-16

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 DGN FILE => 0415000066gb004.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

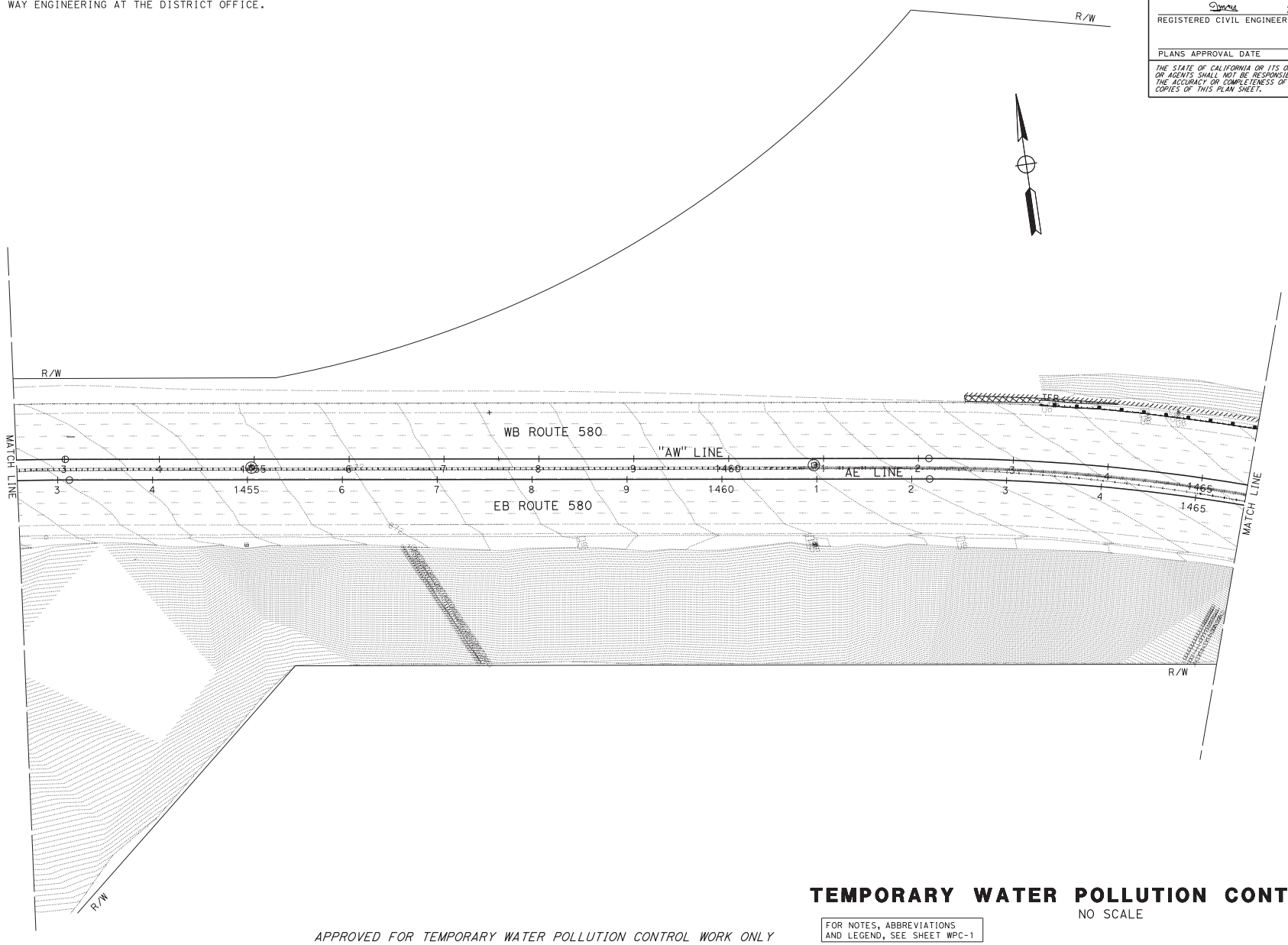
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-5

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb005.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

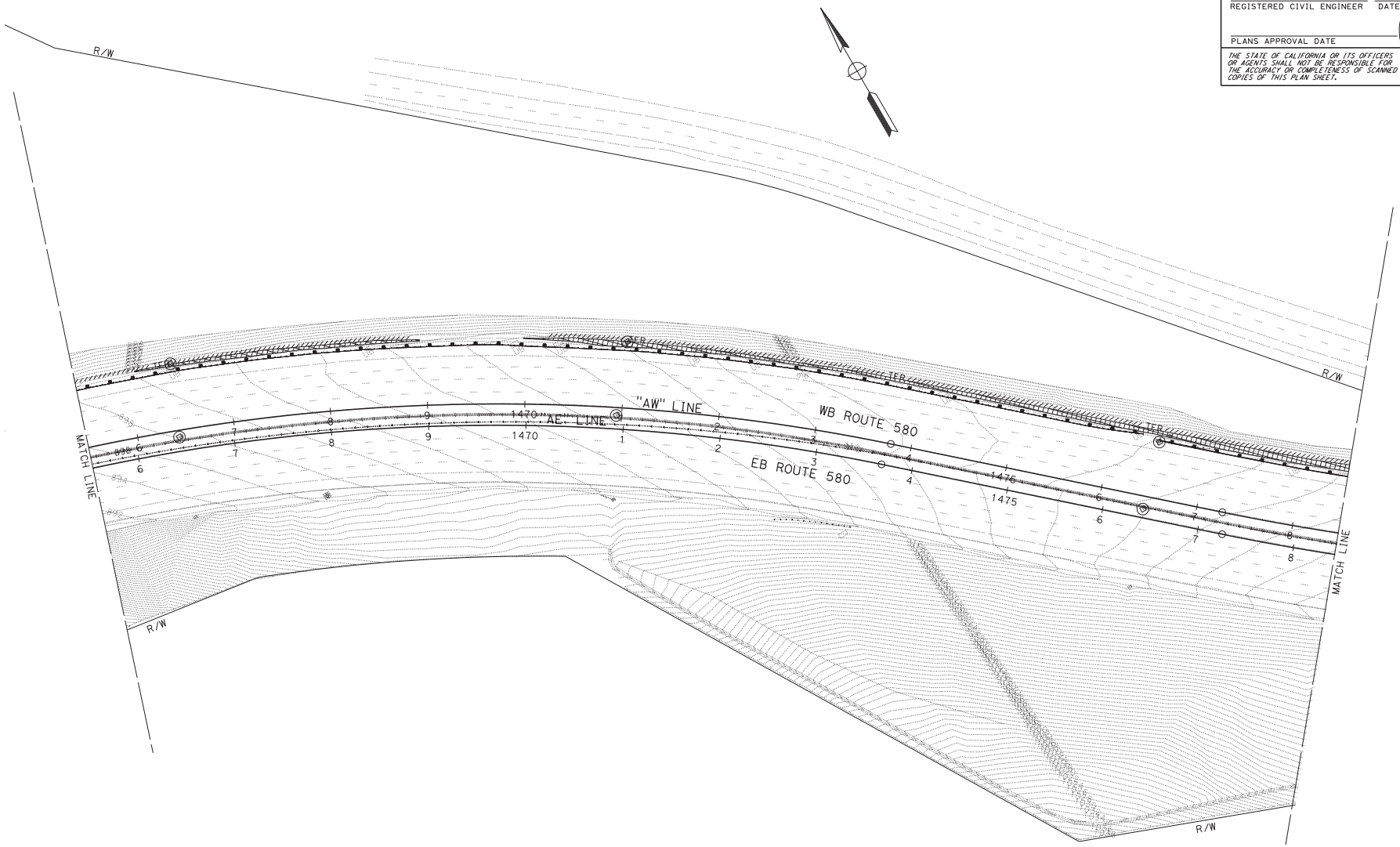
PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 03-07-16

DATE PLOTTED => 05-MAY-2016
TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010

USERNAME => s128787
DGN FILE => 0415000066gb006.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0721

PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

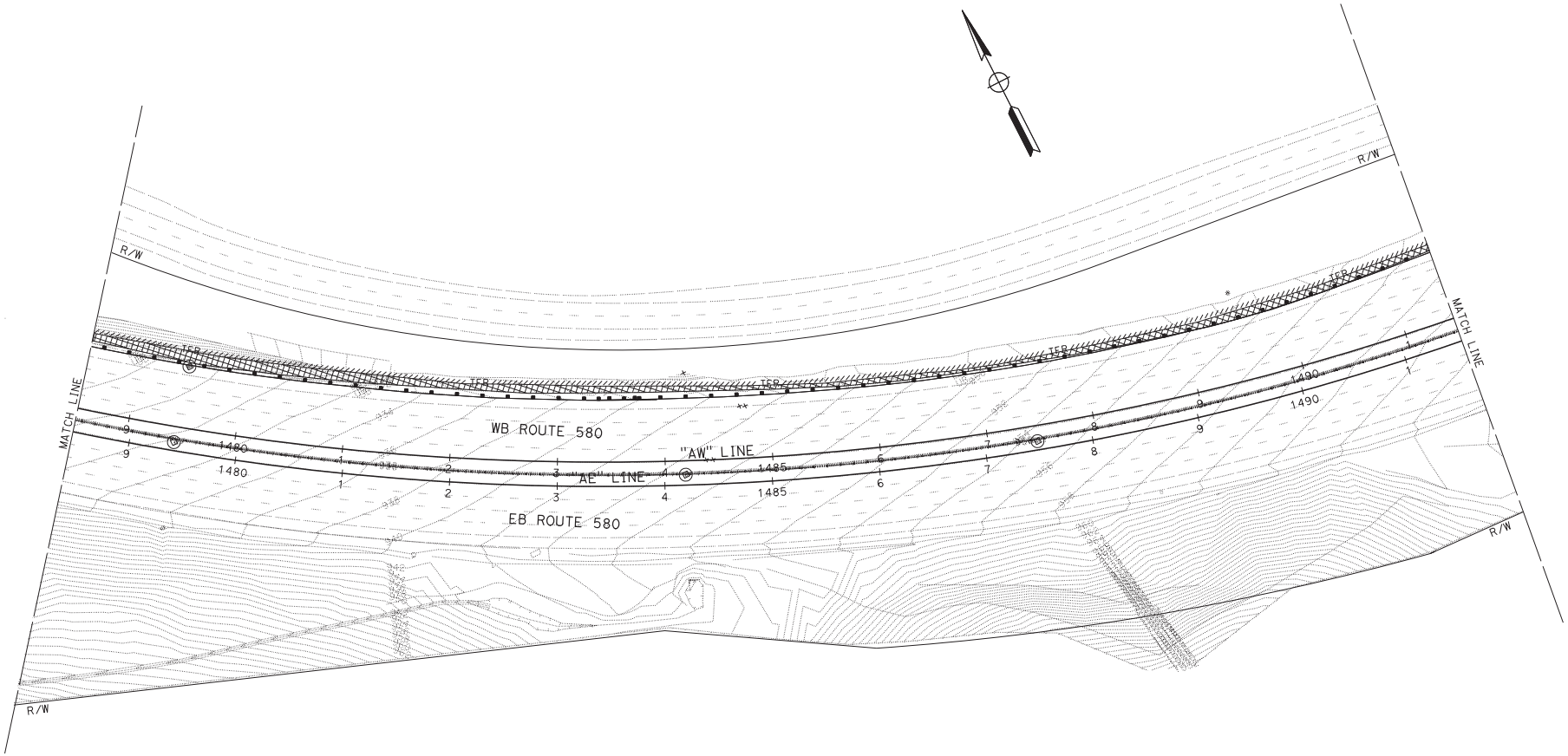
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-7

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI
CALCULATED-DESIGNED BY: GANGA TRIPATHI
CHECKED BY: KAMRAN NAKHJIRI
REVISED BY: GT
DATE REVISED: 10-28-15

LAST REVISION 03-07-16
DATE PLOTTED => 05-MAY-2016
TIME PLOTTED => 06:45

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

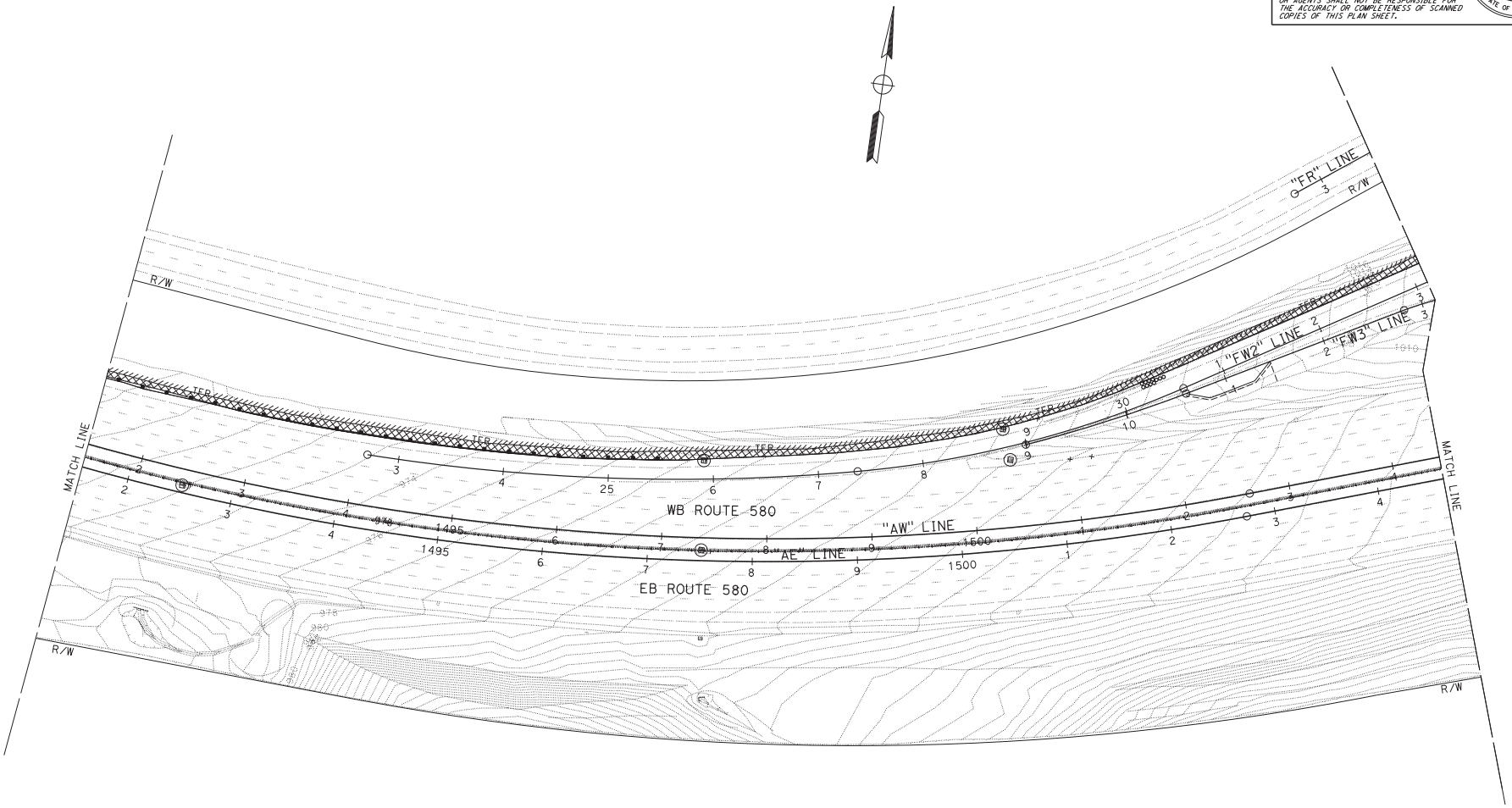
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-8

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 03-12-16

DATE PLOTTED => 05-MAY-2016

TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010

USERNAME => s128787

DGN FILE => 0415000066gb008.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0721

PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

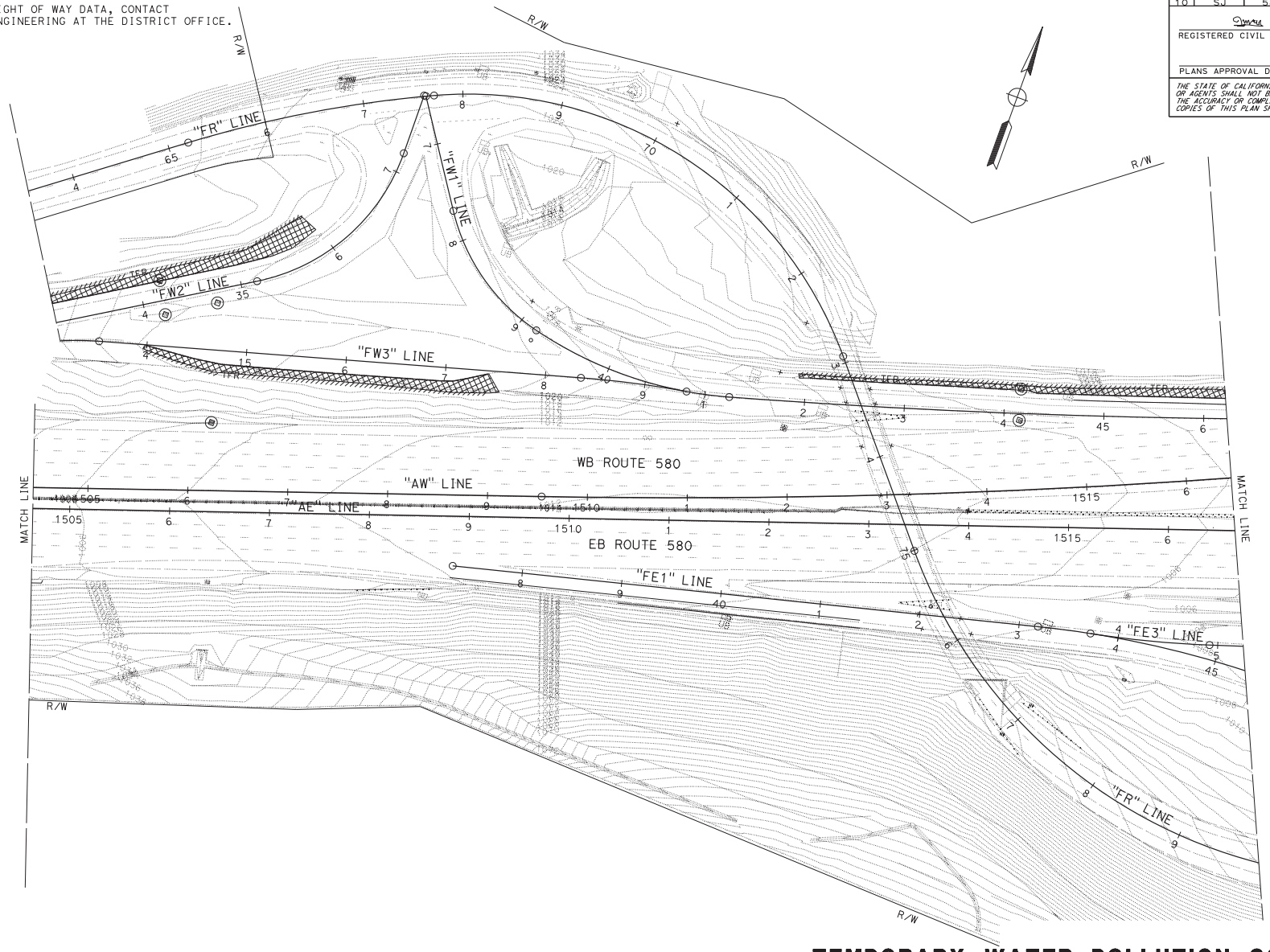
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-9

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-07-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb009.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

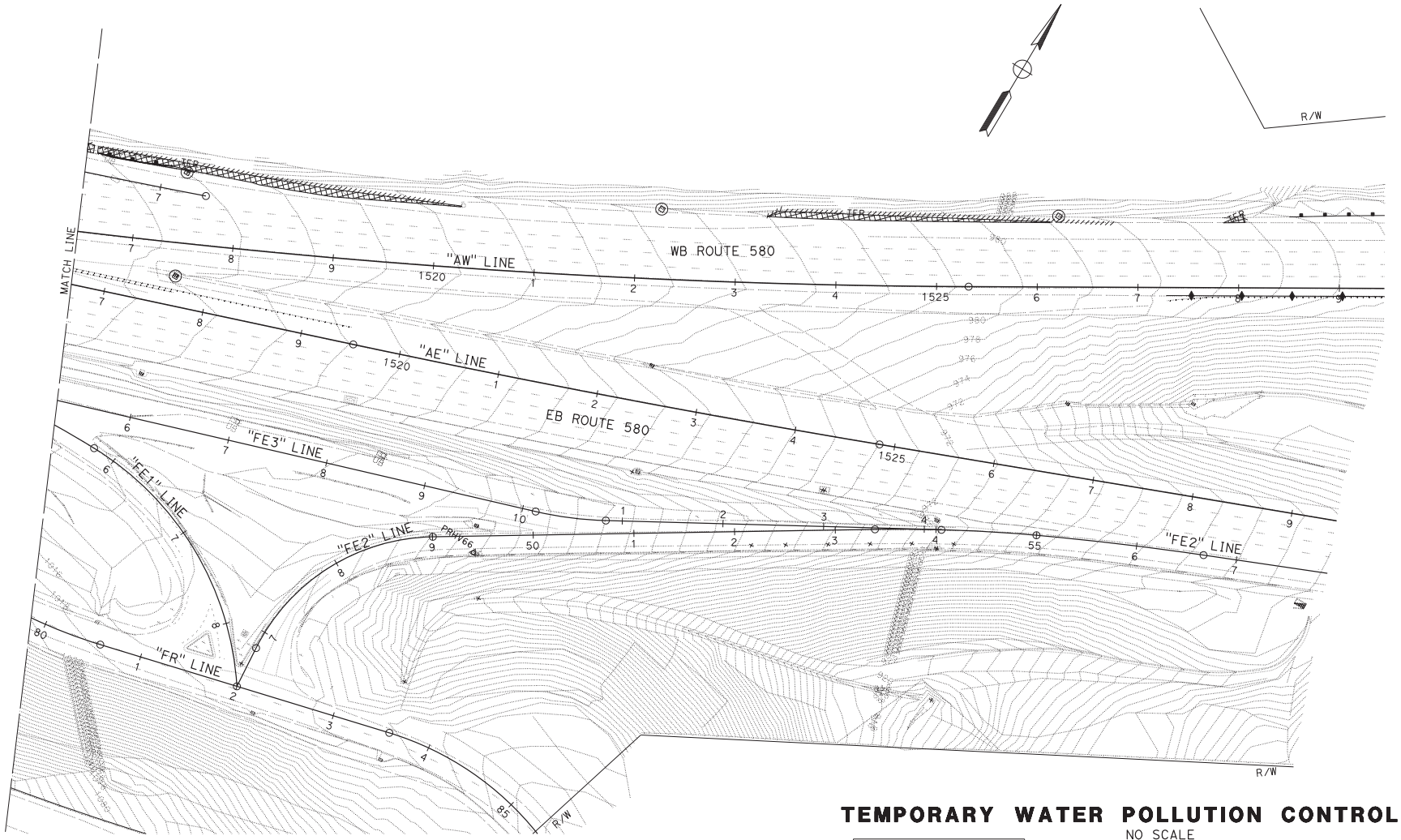
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

WPC-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb010.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

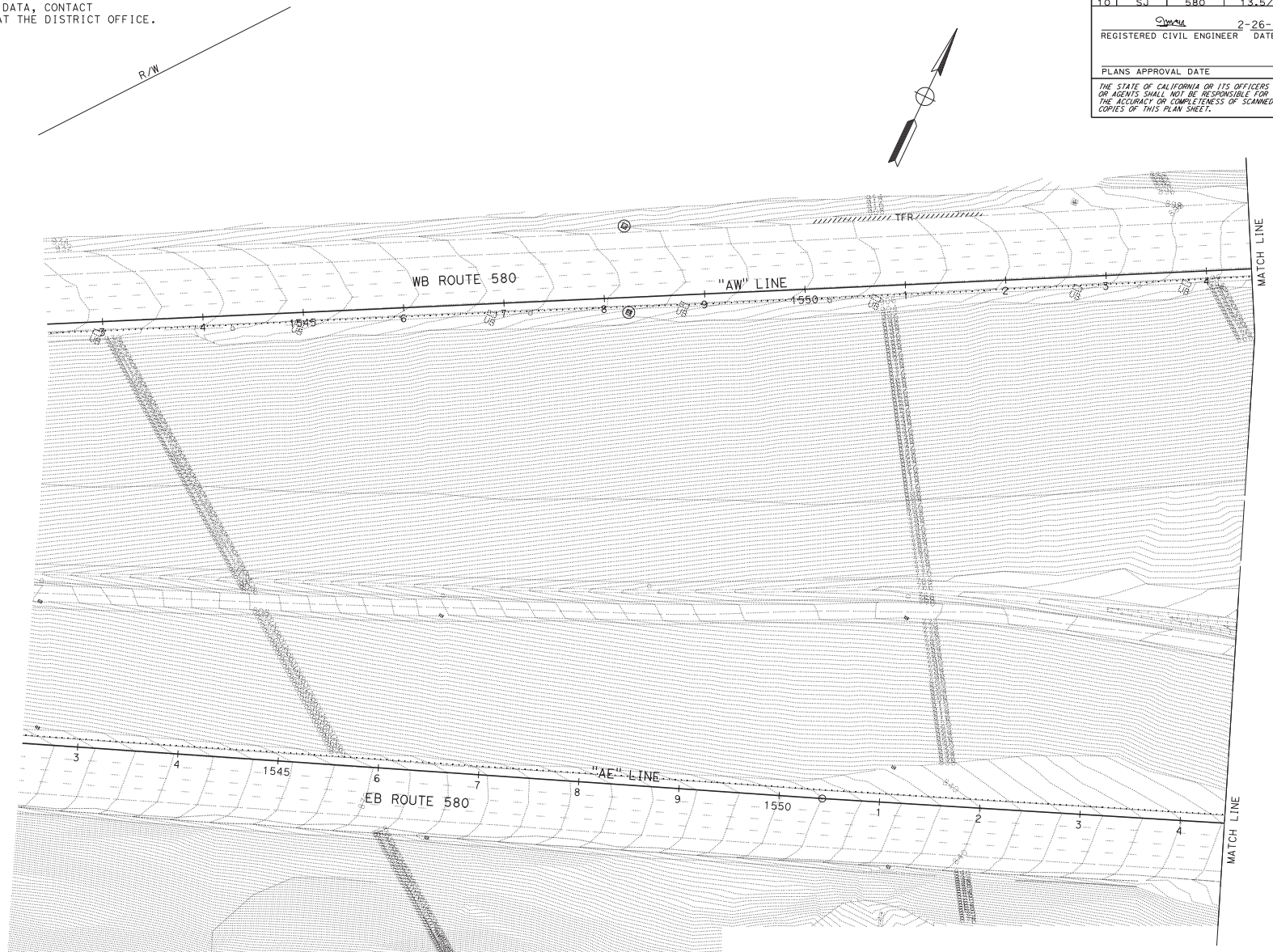
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-11

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION DATE PLOTTED => 05-MAY-2016
TIME PLOTTED => 06:45

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

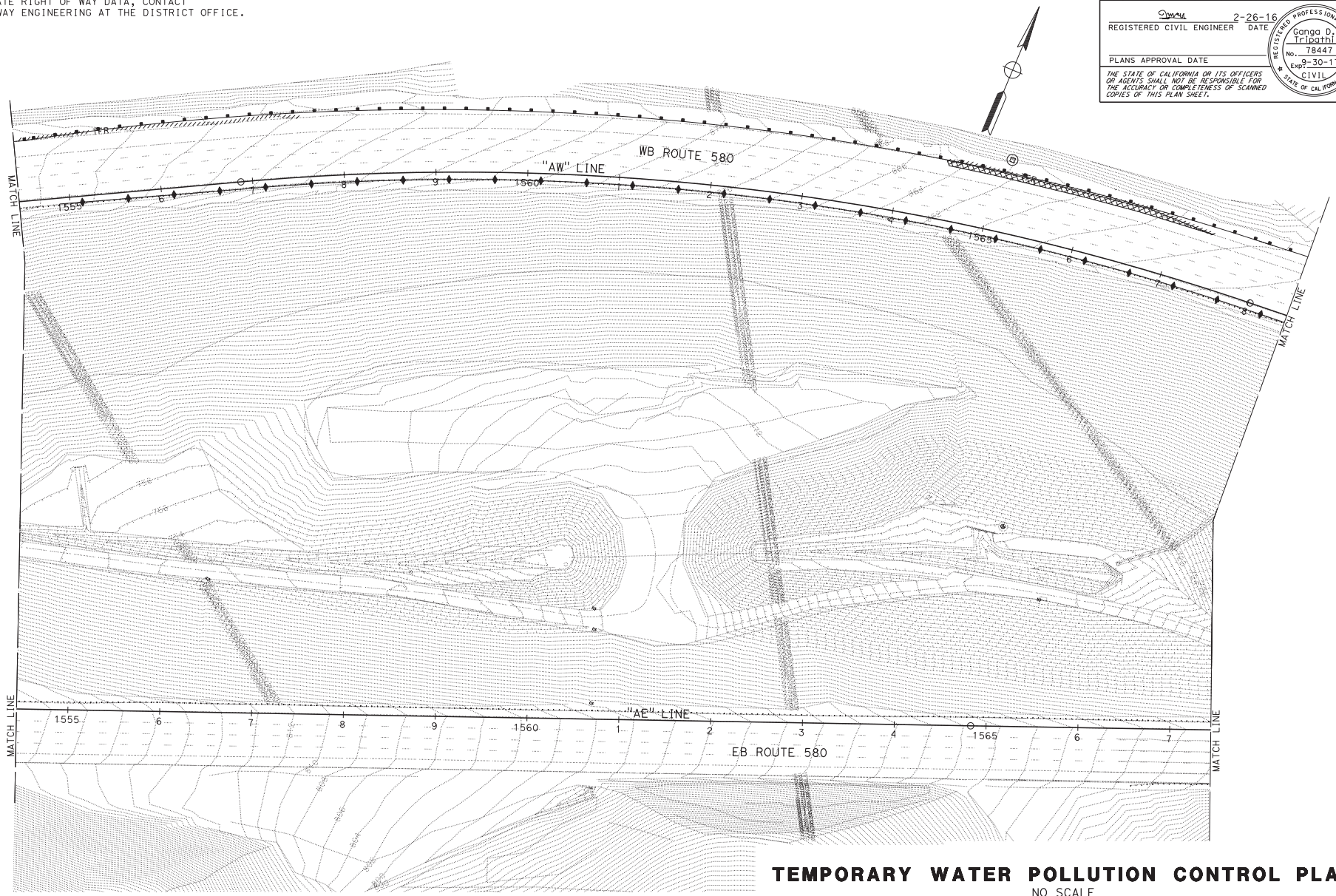
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

WPC-12

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-07-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb012.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

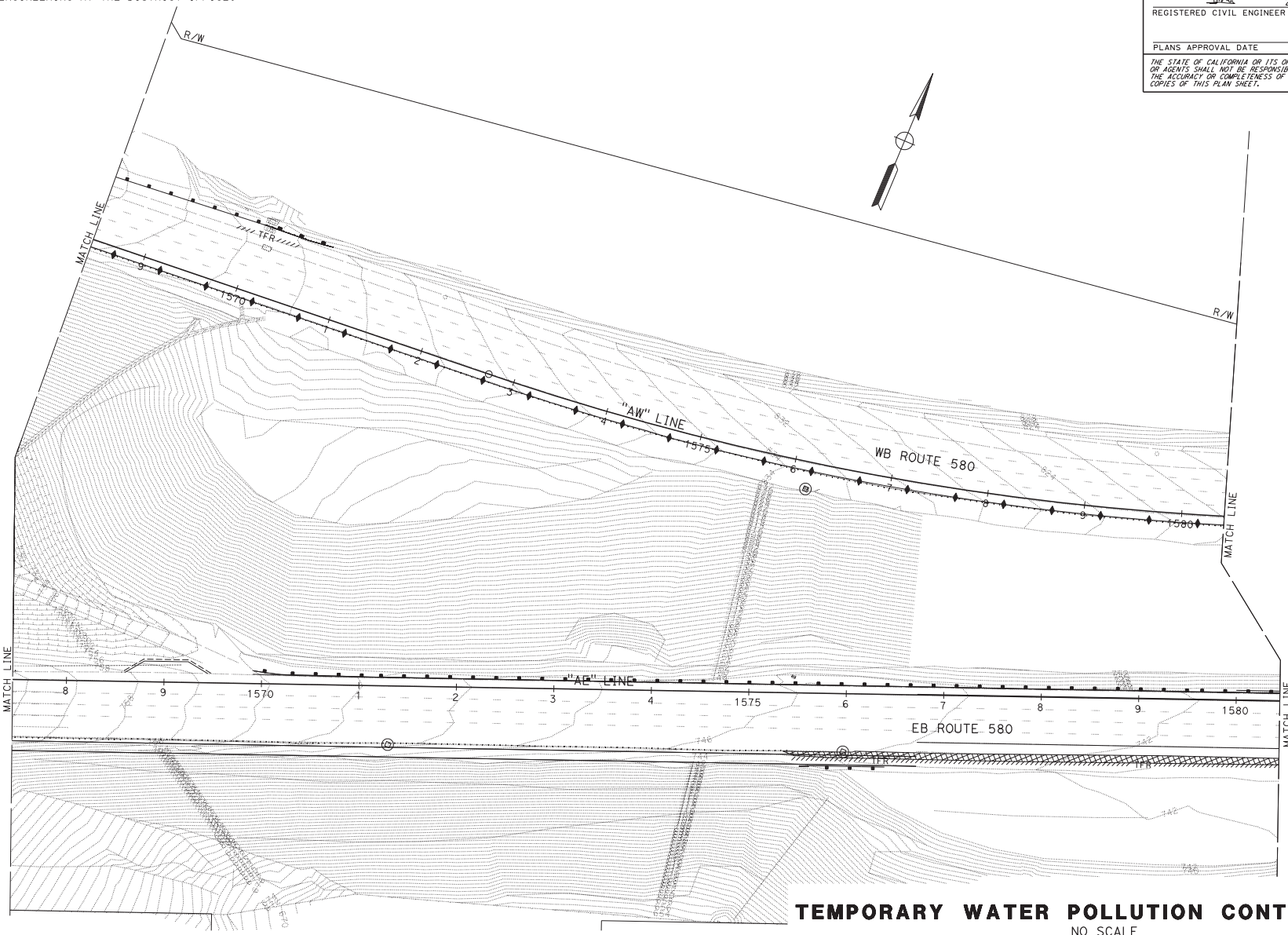
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-07-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb013.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

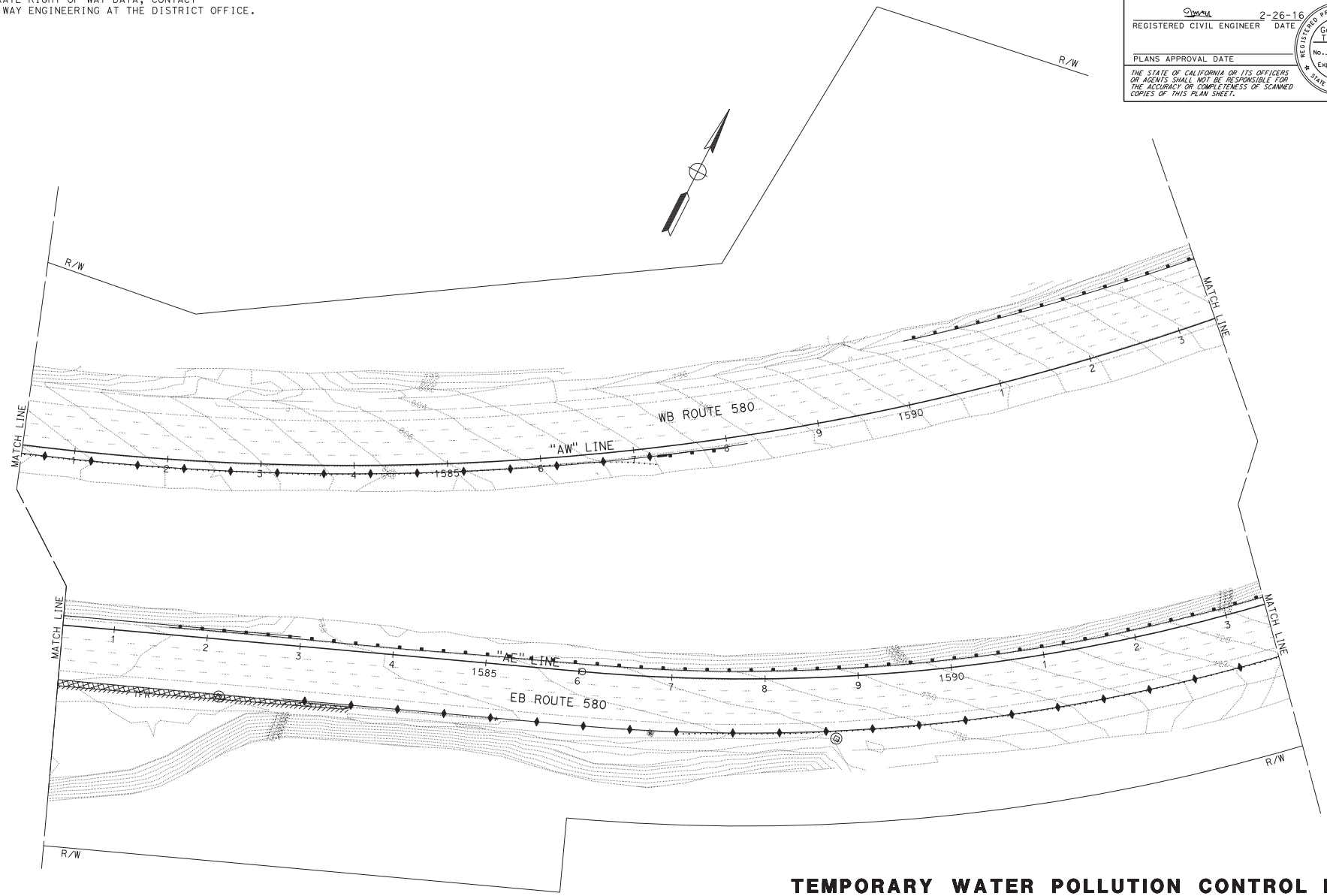
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-14

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-07-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb014.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

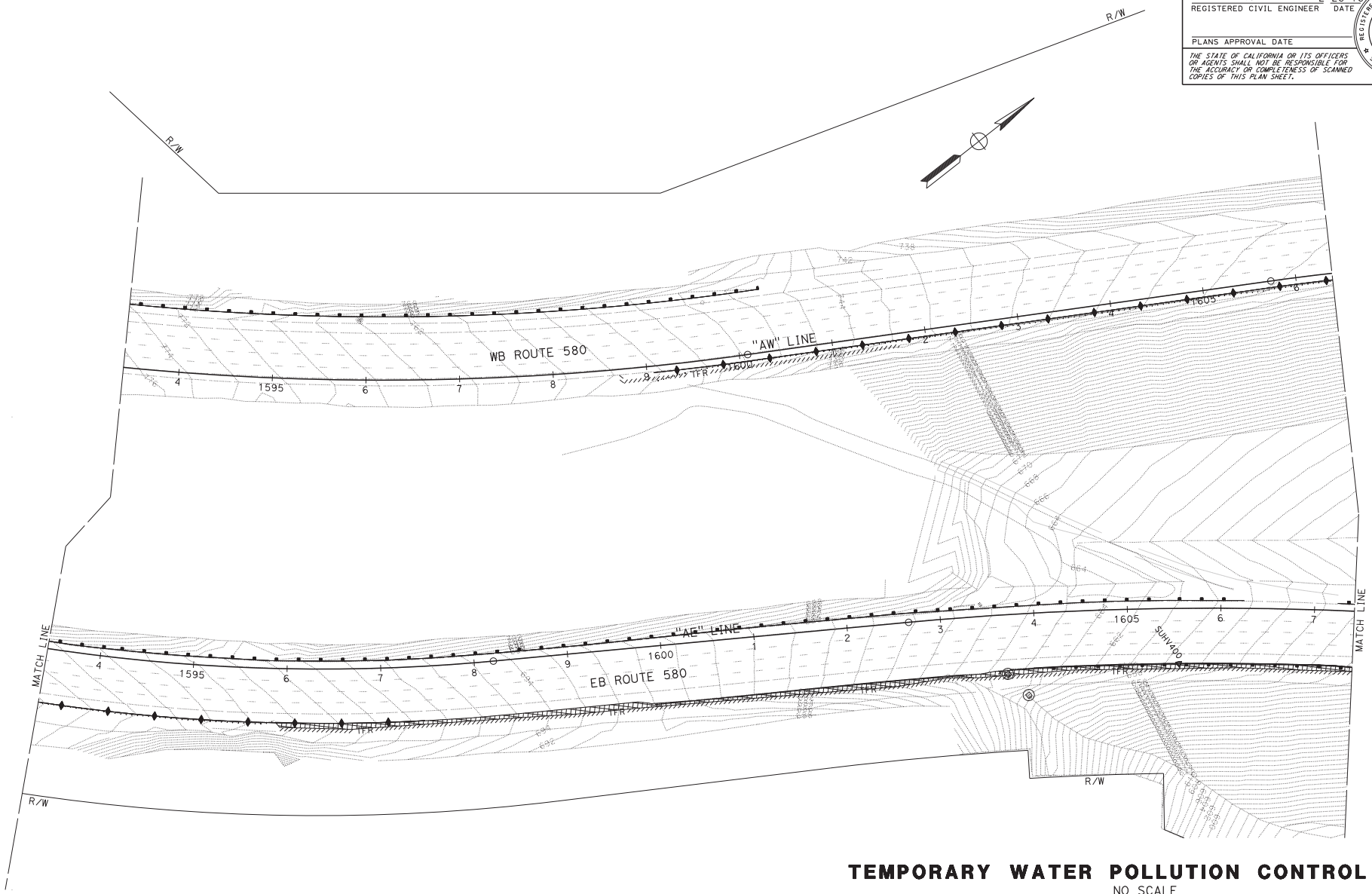
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-15

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-07-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb015.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

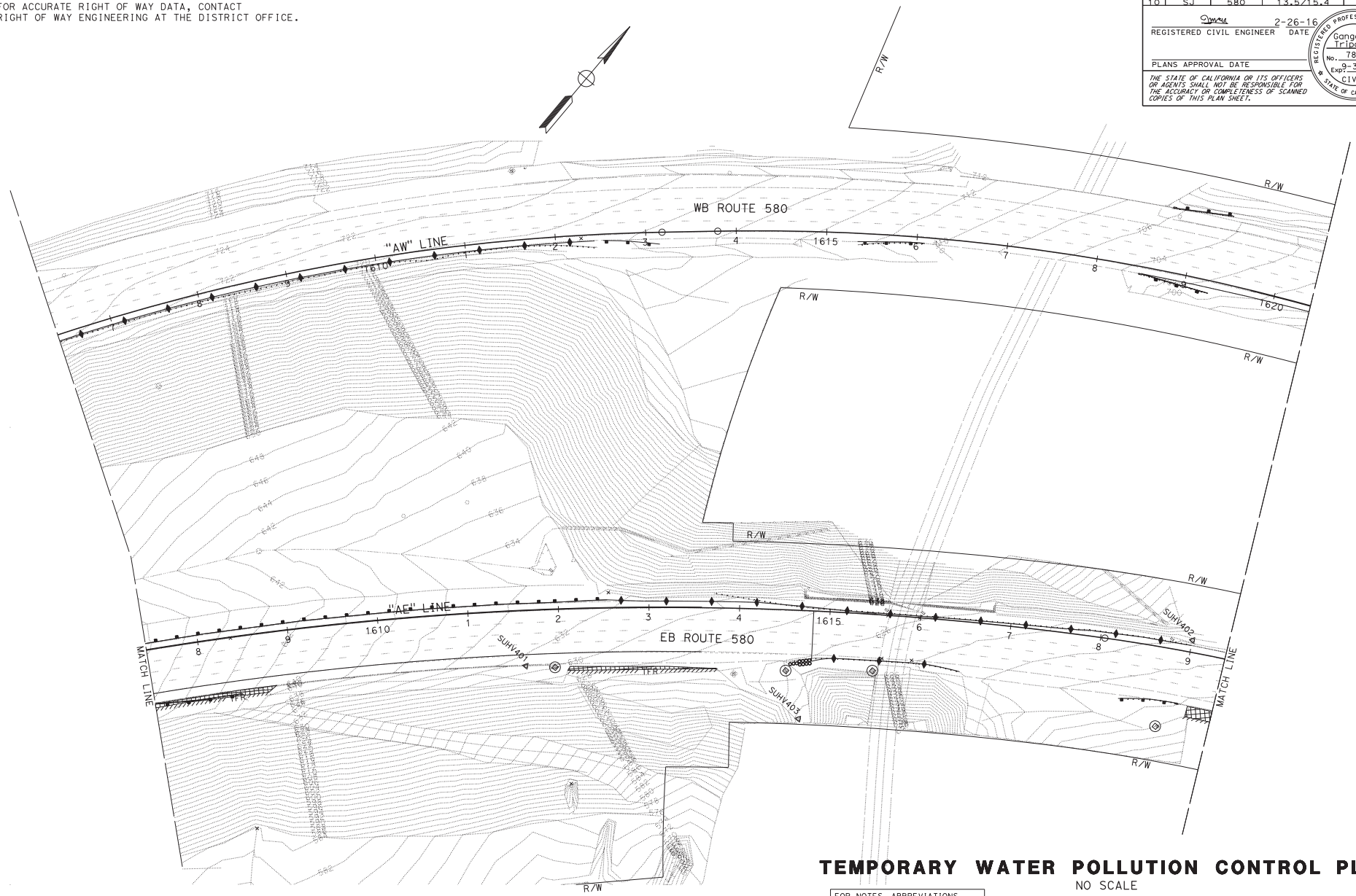
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

WPC-16

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans — WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — REVISED BY: GT

CHECKED BY: KAMRAN NAKHJIRI — DATE REVISED: 10-28-15

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb016.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

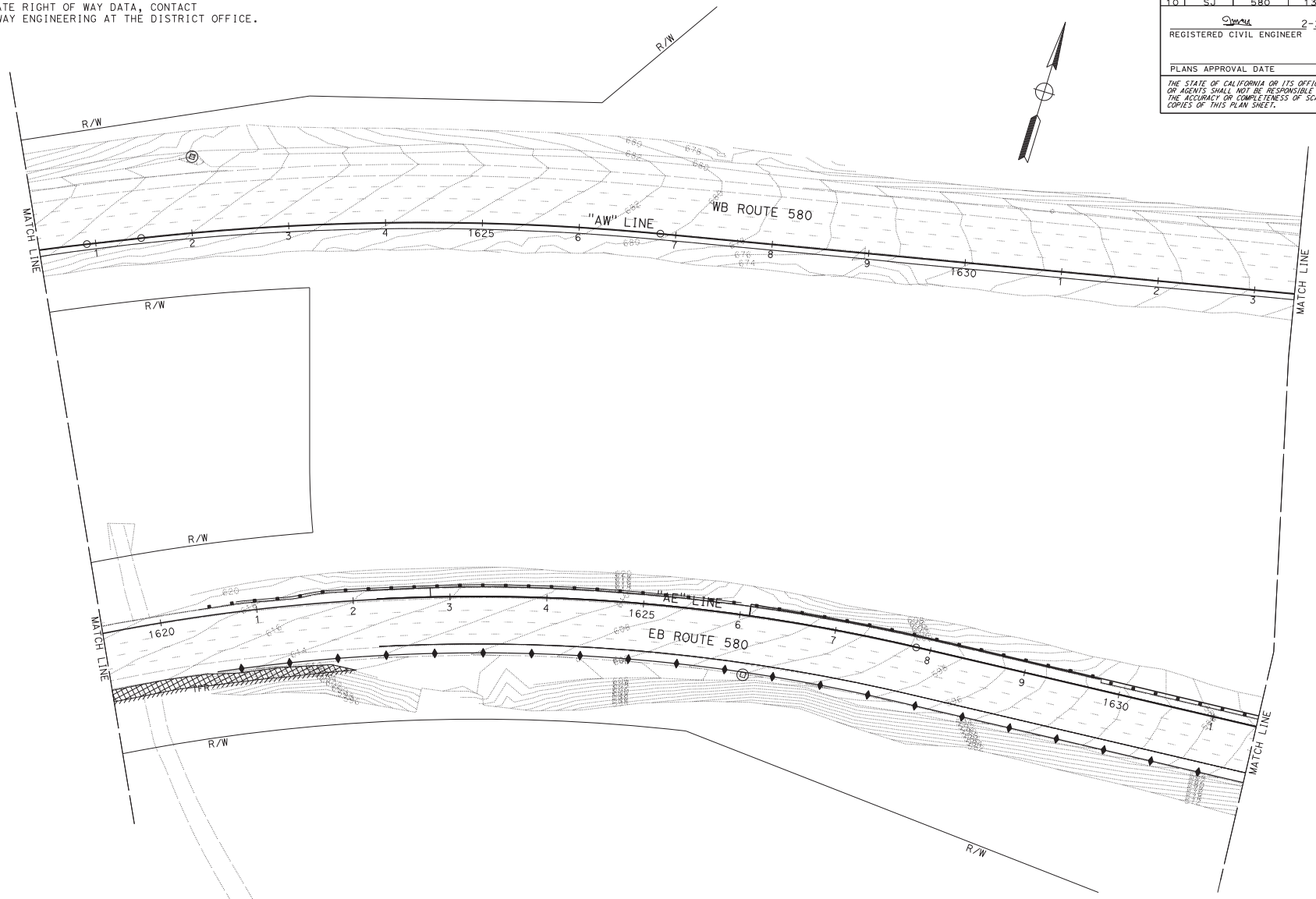
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-17

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

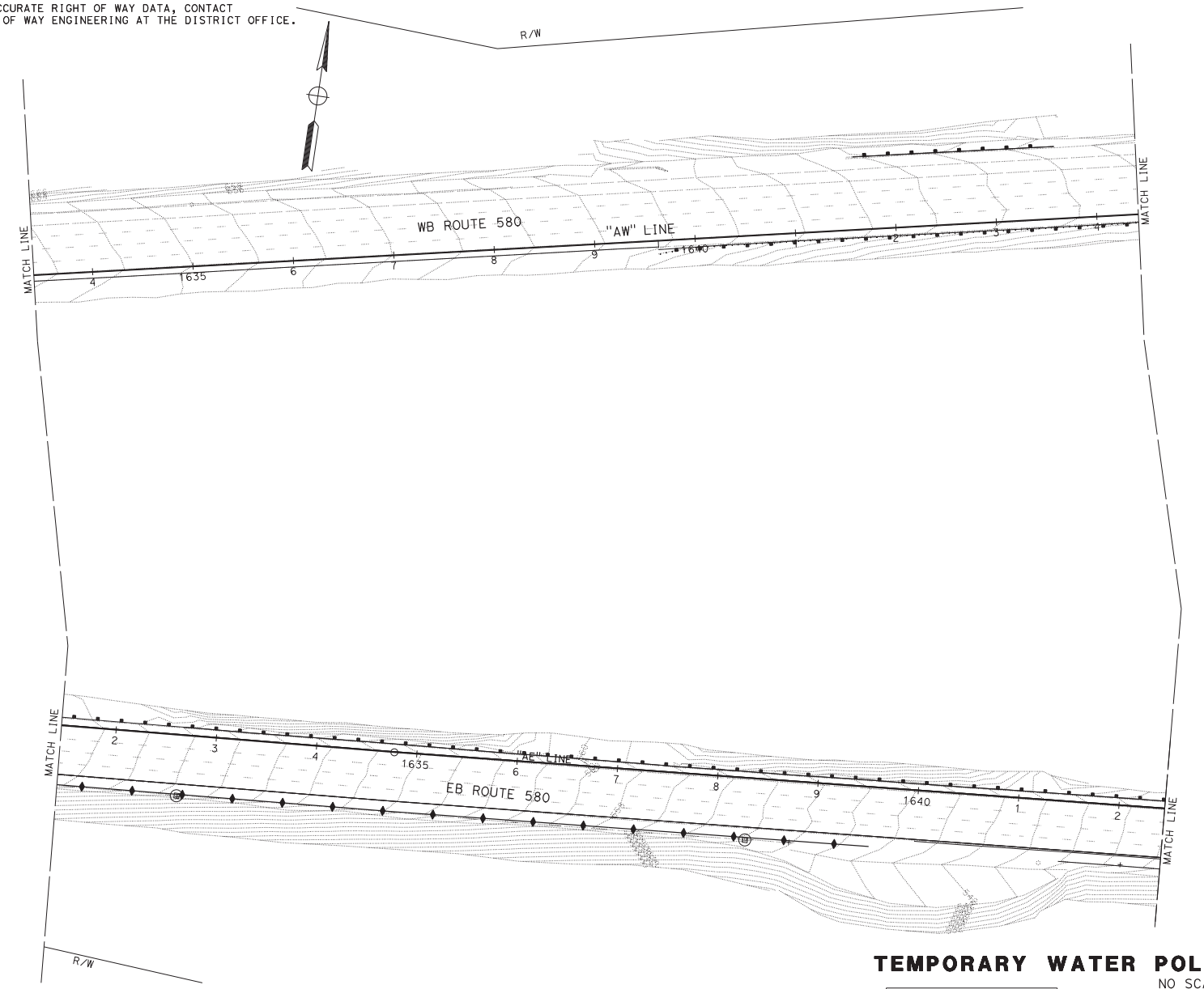
CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-18

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — REVISED BY: GT

CHECKED BY: KAMRAN NAKHJIRI — DATE REVISED: 10-28-15

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb018.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

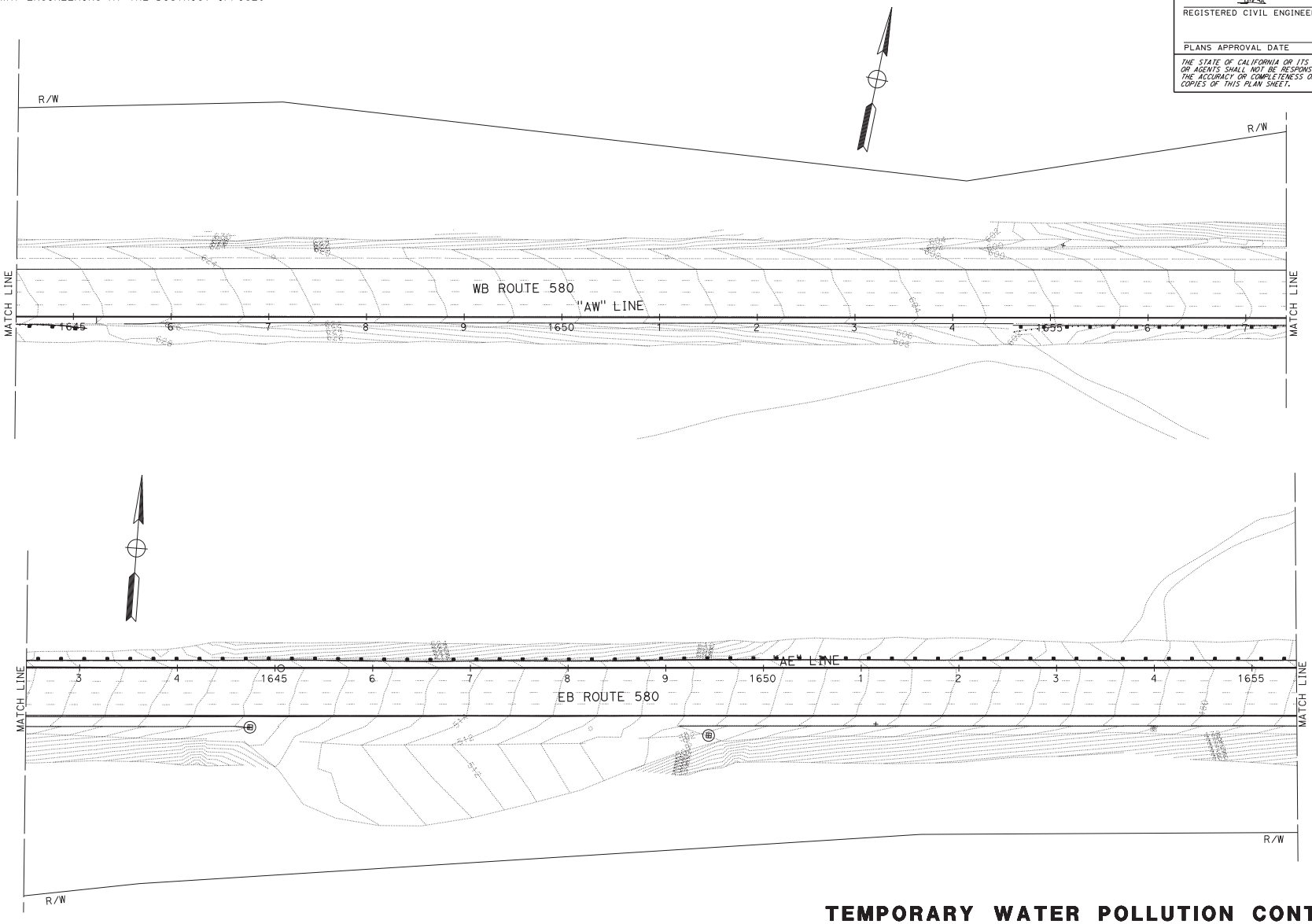
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-19

GT	REVISED BY
10-28-15	DATE REVISED
GANGA TRIPATHI	CALCULATED-DESIGNED BY
KAMRAN NAKHJIRI	CHECKED BY
FUNCTIONAL SUPERVISOR	
KAMRAN NAKHJIRI	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

LAST REVISION 03-12-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:45

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

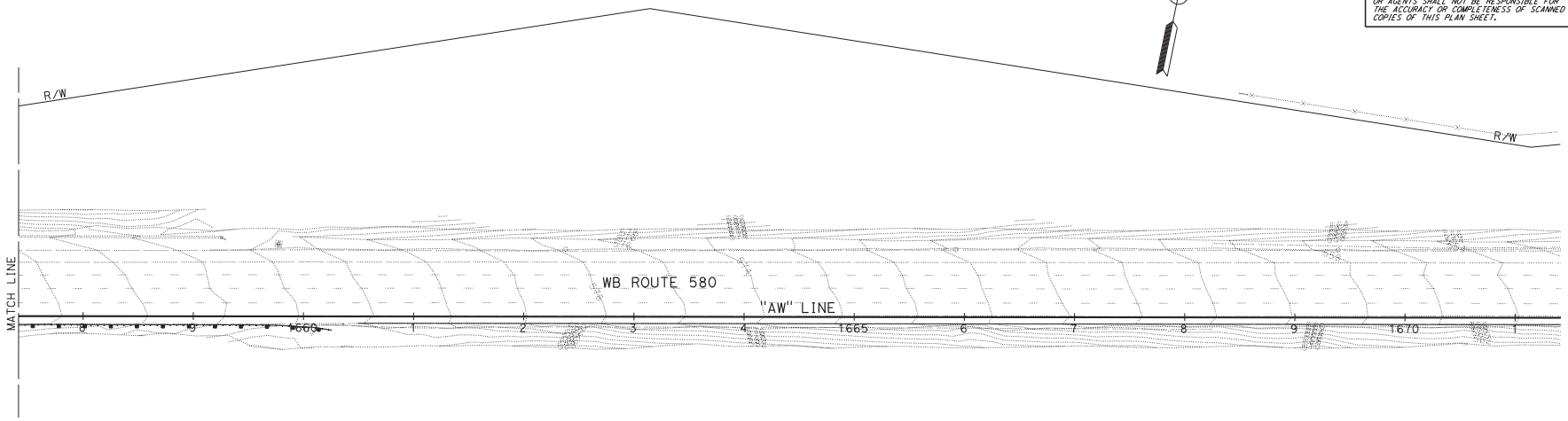
PLANS APPROVAL DATE

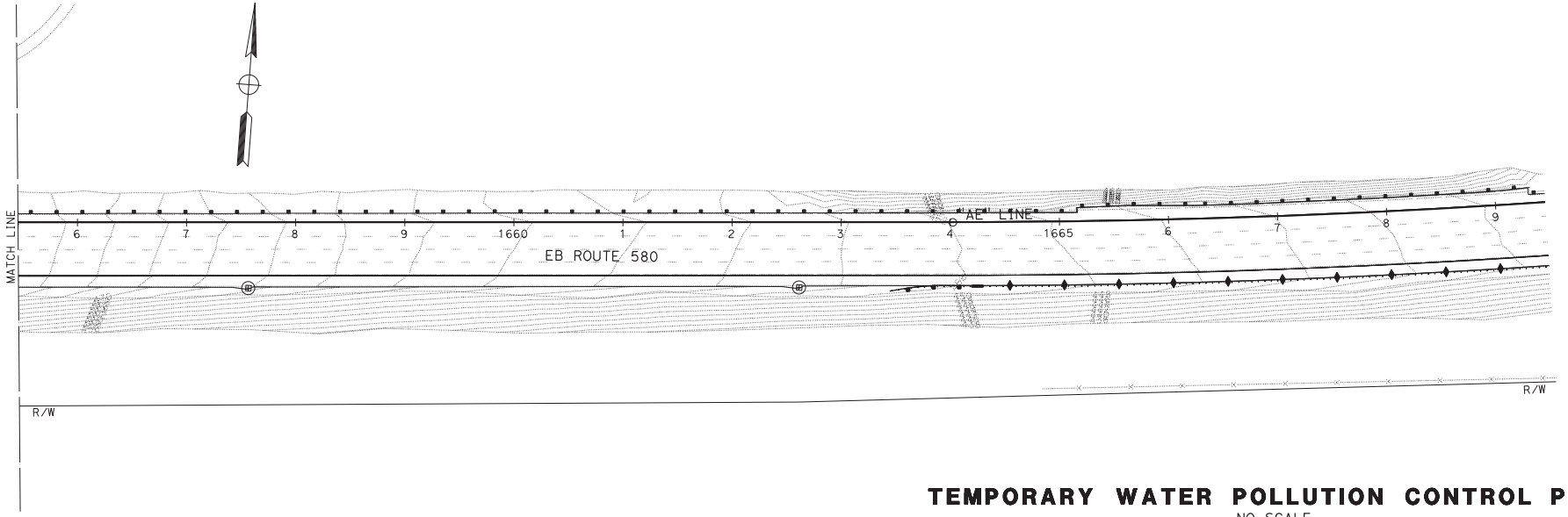
REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.





TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-20

REVISED BY	GT
DATE REVISED	10-28-15
CALCULATED-DESIGNED BY	GANGA TRIPATHI
CHECKED BY	KAMRAN NAKHJIRI
FUNCTIONAL SUPERVISOR	KAMRAN NAKHJIRI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

LAST REVISION 03-12-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:45

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

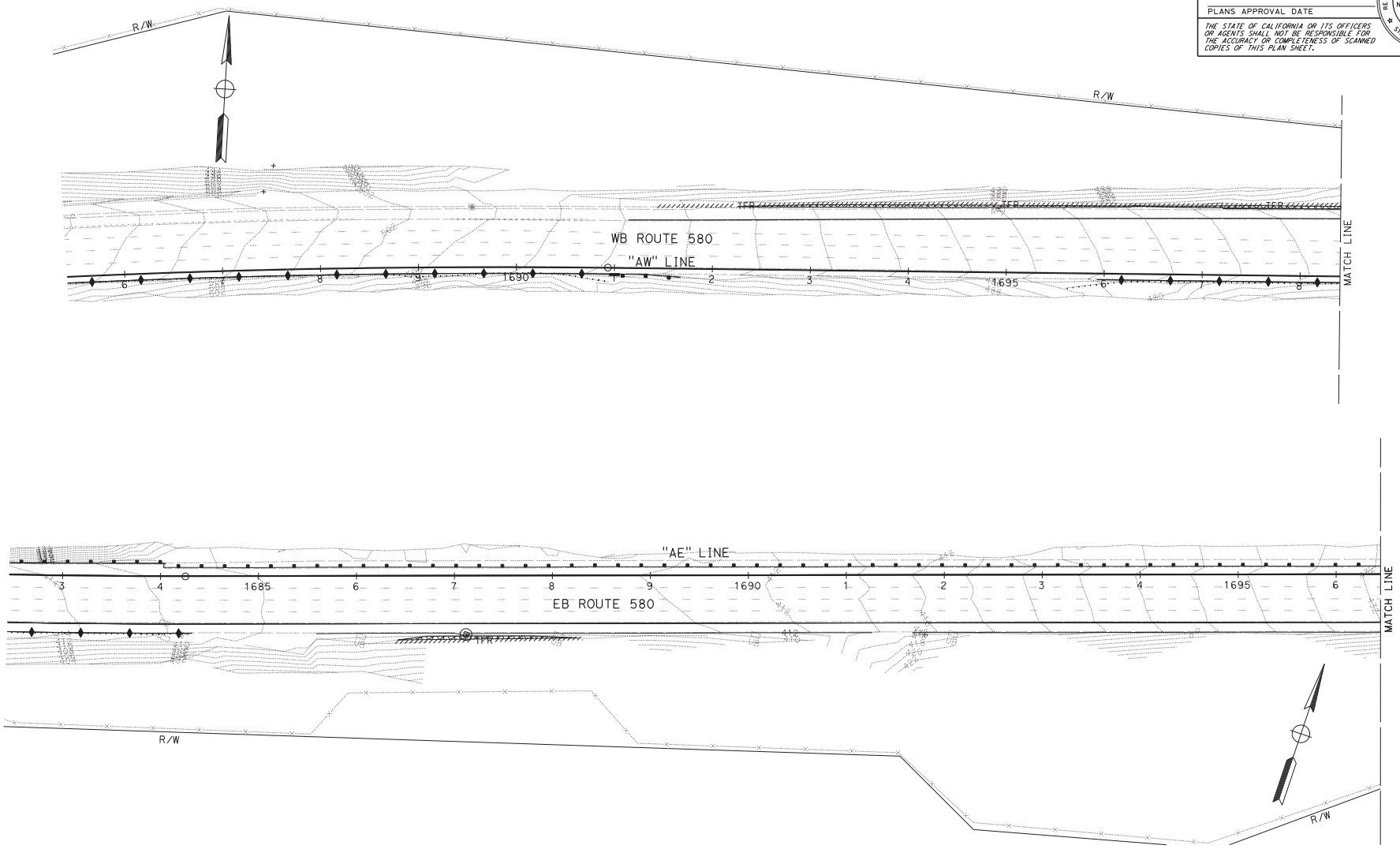
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-21

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-28-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:45

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

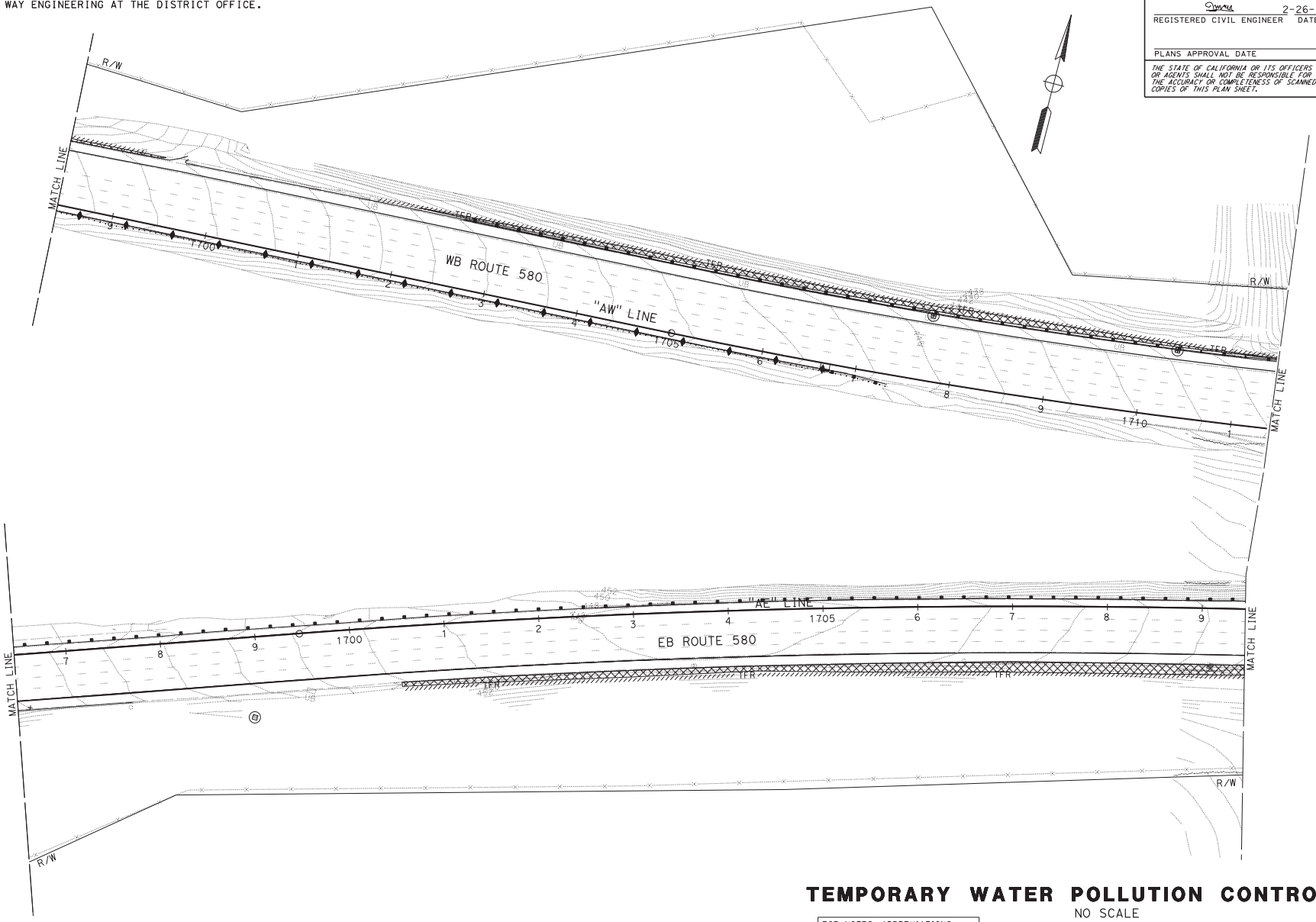
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-22

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 03-07-16

DATE PLOTTED => 05-MAY-2016
TIME PLOTTED => 06:45

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

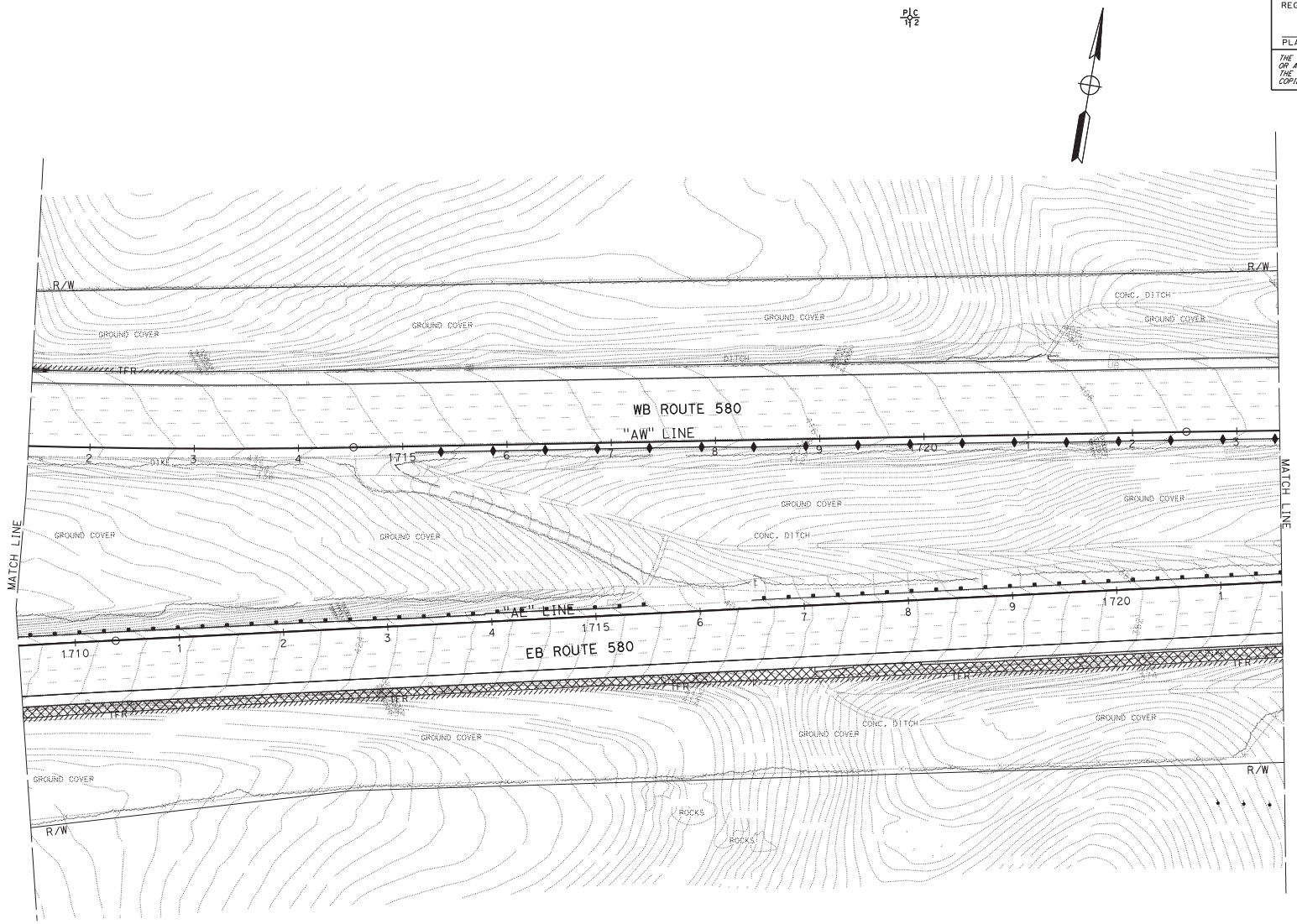
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-23

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	GANGA TRIPATHI
Caltrans WATER QUALITY	KAMRAN NAKHJIRI	CHECKED BY	KAMRAN NAKHJIRI
		REVISED BY	GT
		DATE REVISED	10-28-15

LAST REVISION 03-12-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:45

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb023.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

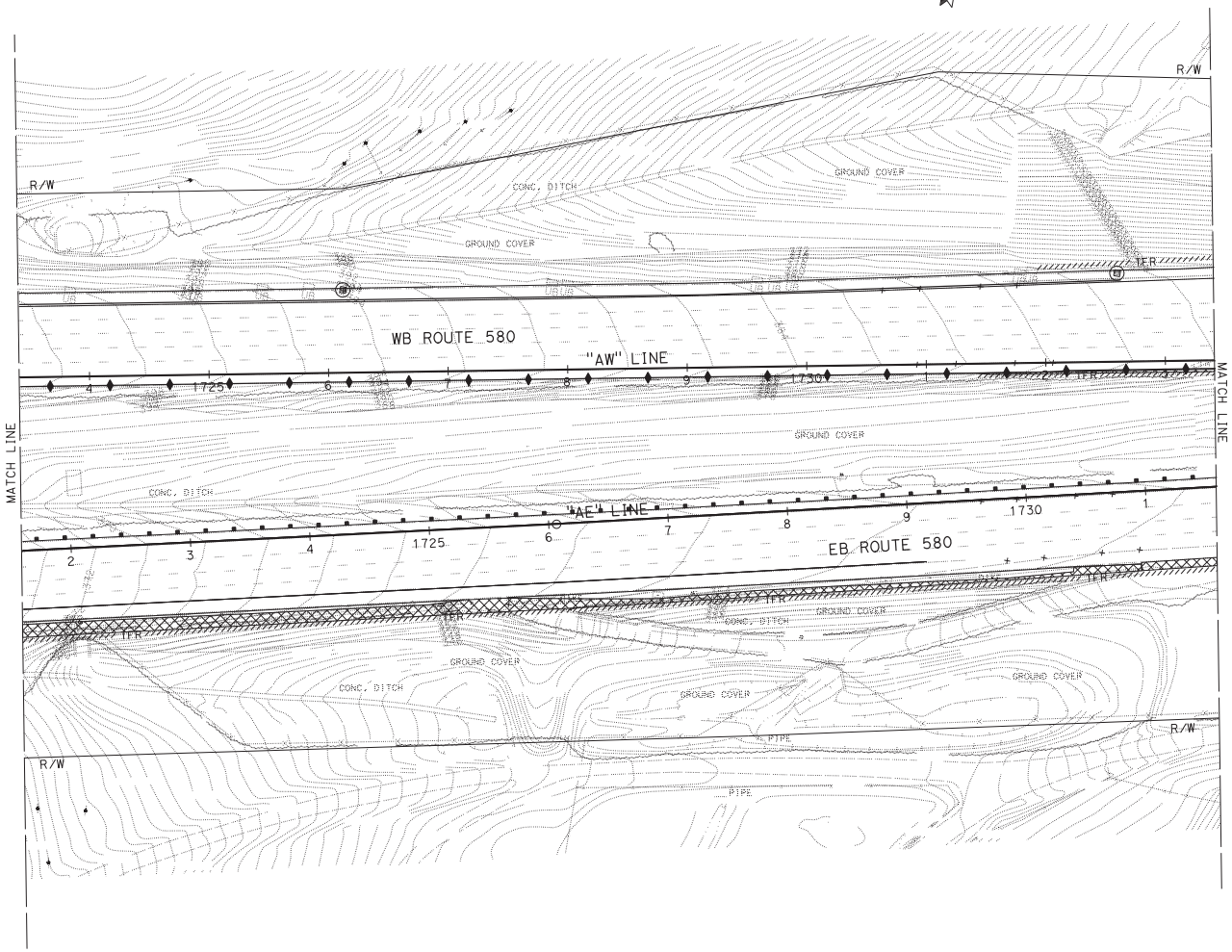
REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PLC 1/3



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-24

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

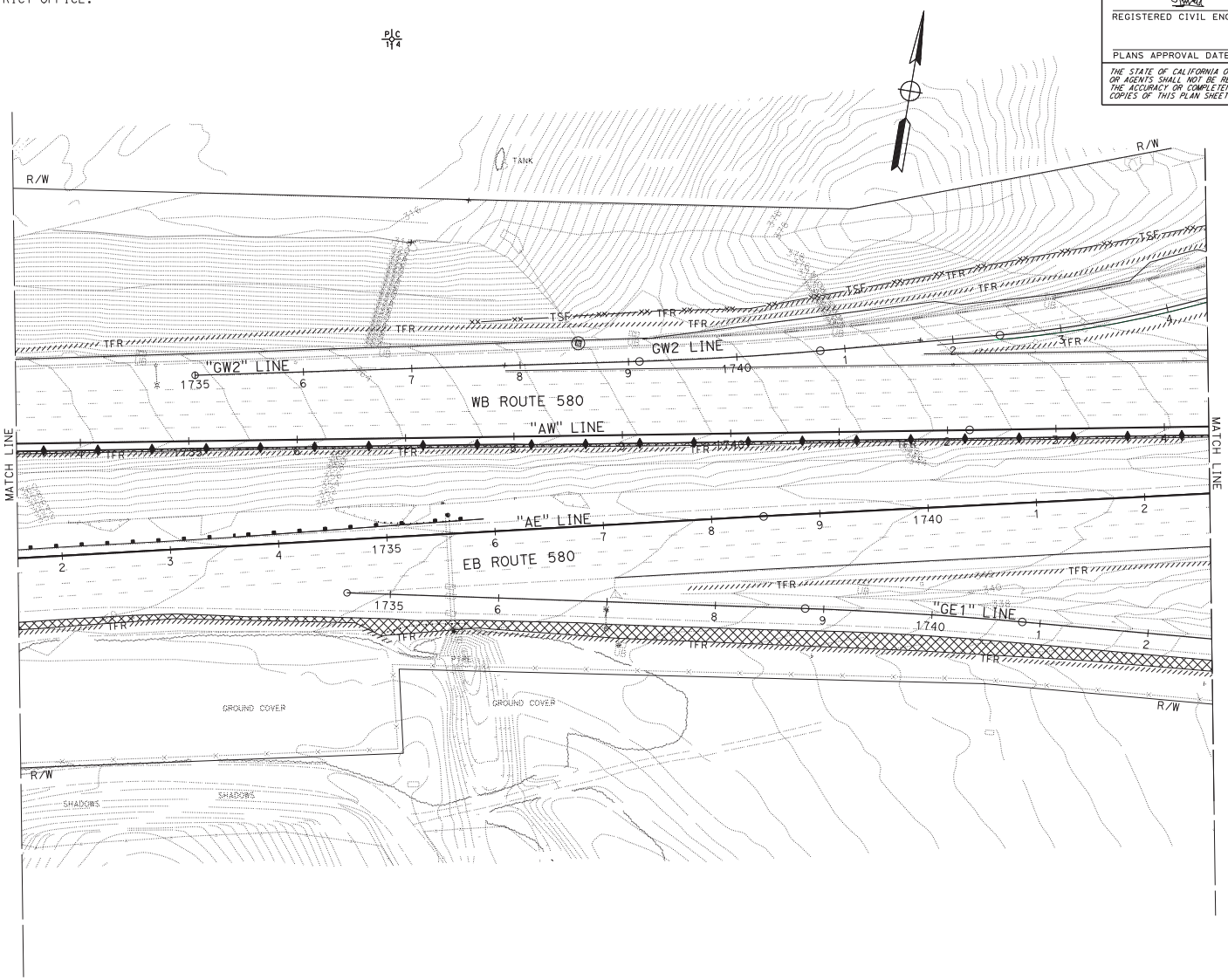
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-25

GT	10-28-15	GANGA TRIPATHI	KAMRAN NAKHJIRI
REVISED BY	DATE REVISED	CALCULATED-DESIGNED BY	CHECKED BY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

LAST REVISION 03-28-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

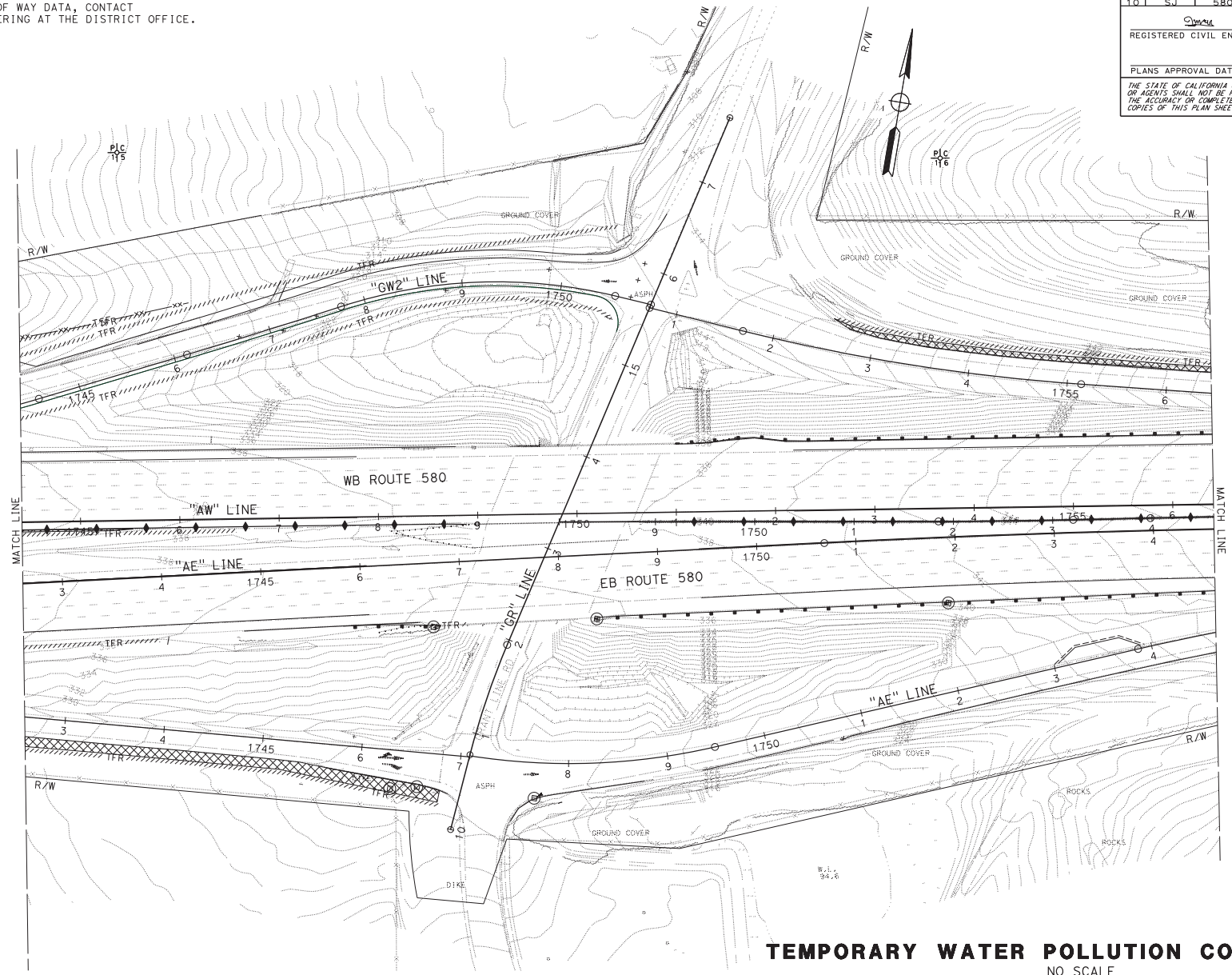
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-26

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — WATER QUALITY

FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	GANGA TRIPATHI	REVISED BY	GT
KAMRAN NAKHJIRI	CHECKED BY	KAMRAN NAKHJIRI	DATE REVISED	10-28-15

LAST REVISION 03-28-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:46

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb026.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

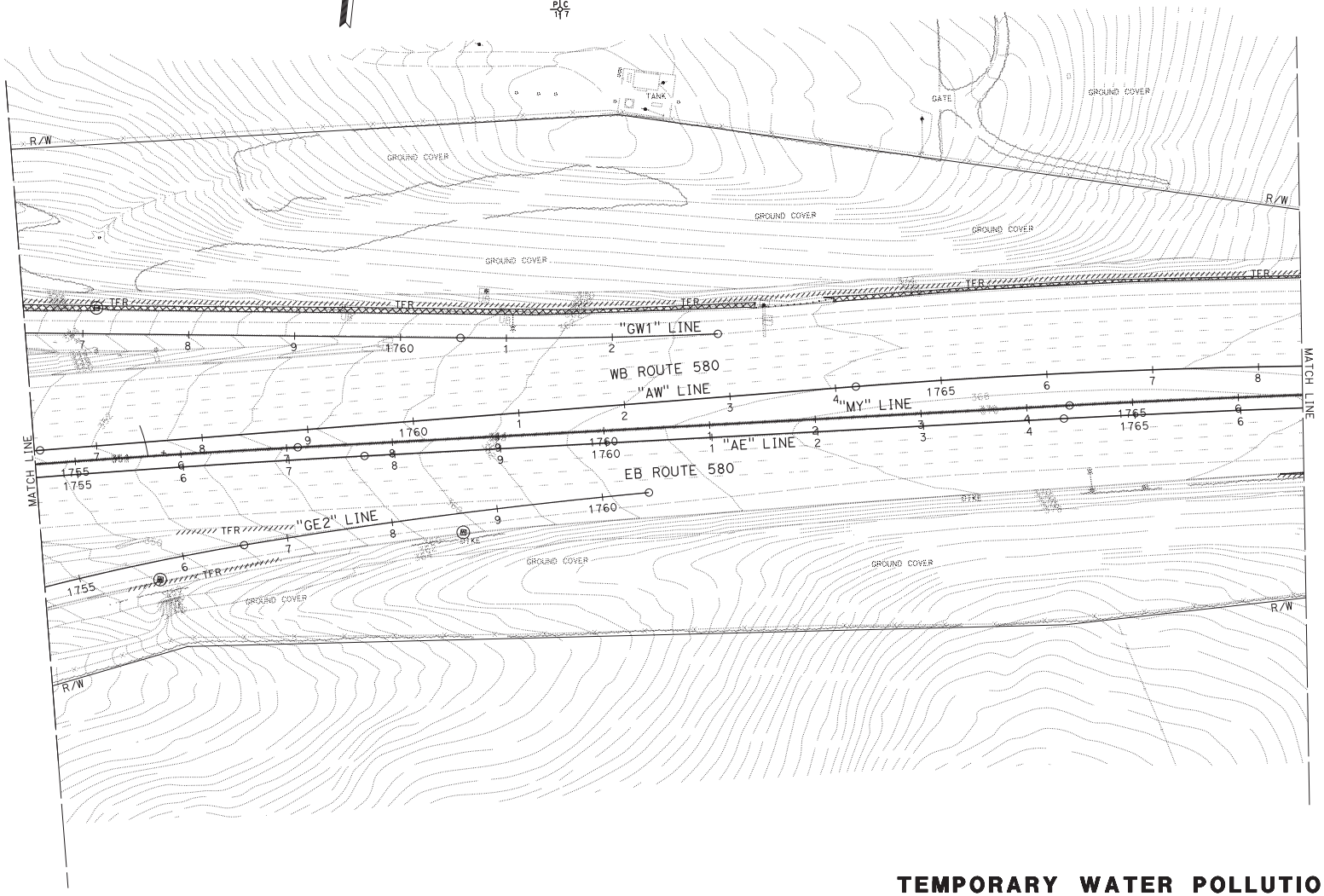
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-27

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:46

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb027.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

PLANS APPROVAL DATE

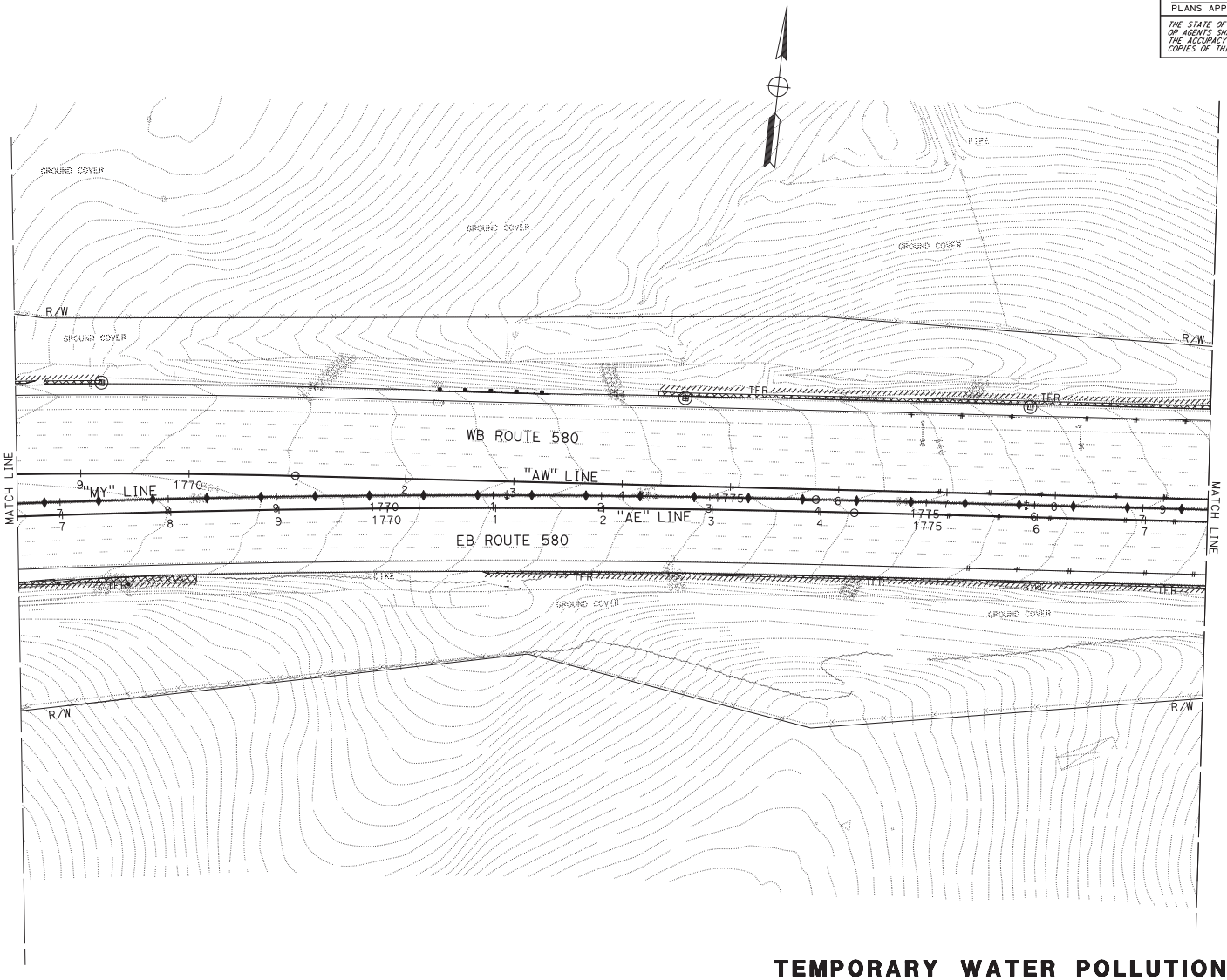
REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

PLC 1/8



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-28

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 03-07-16

DATE PLOTTED => 05-MAY-2016

TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

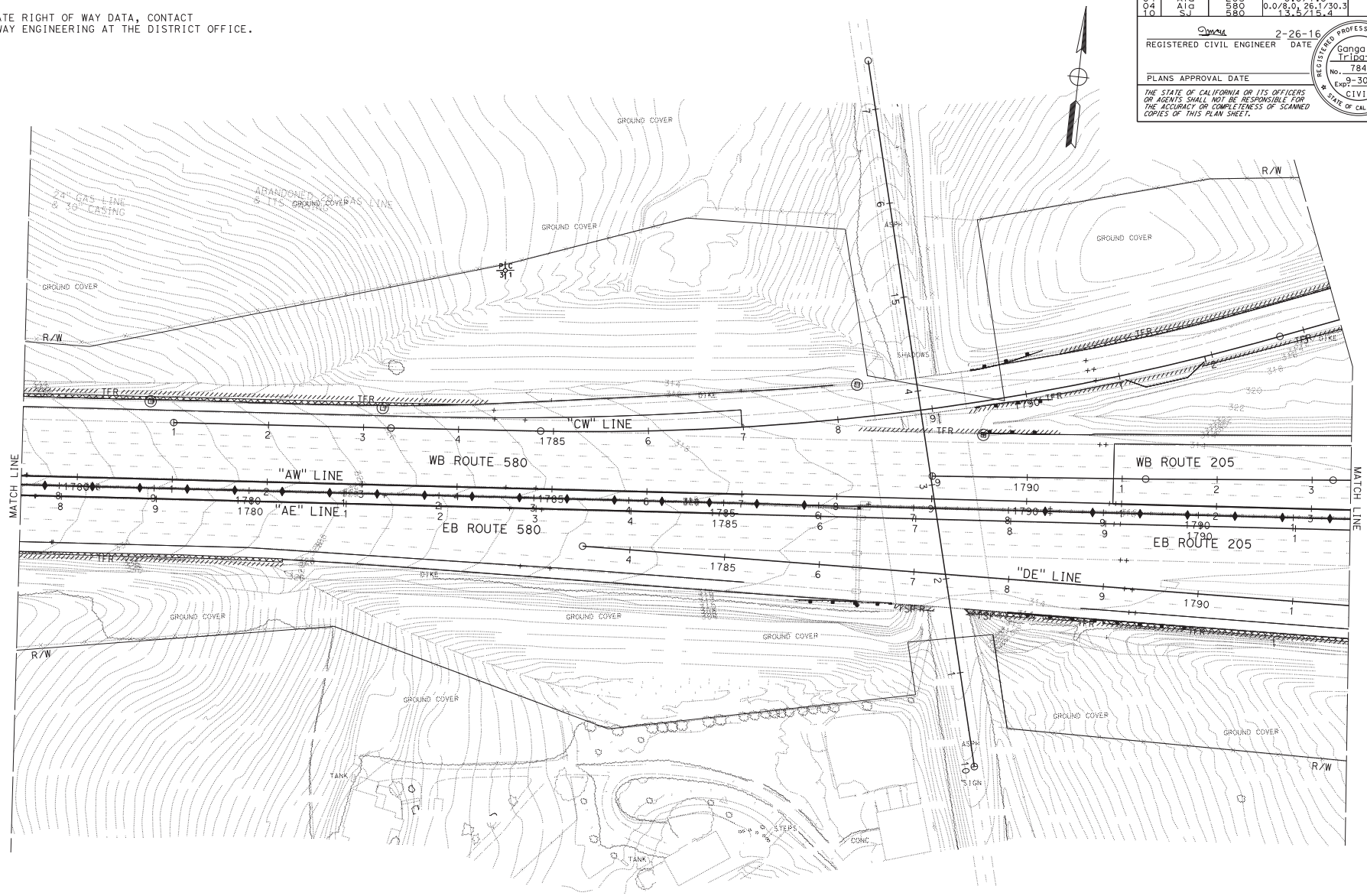
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-29

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

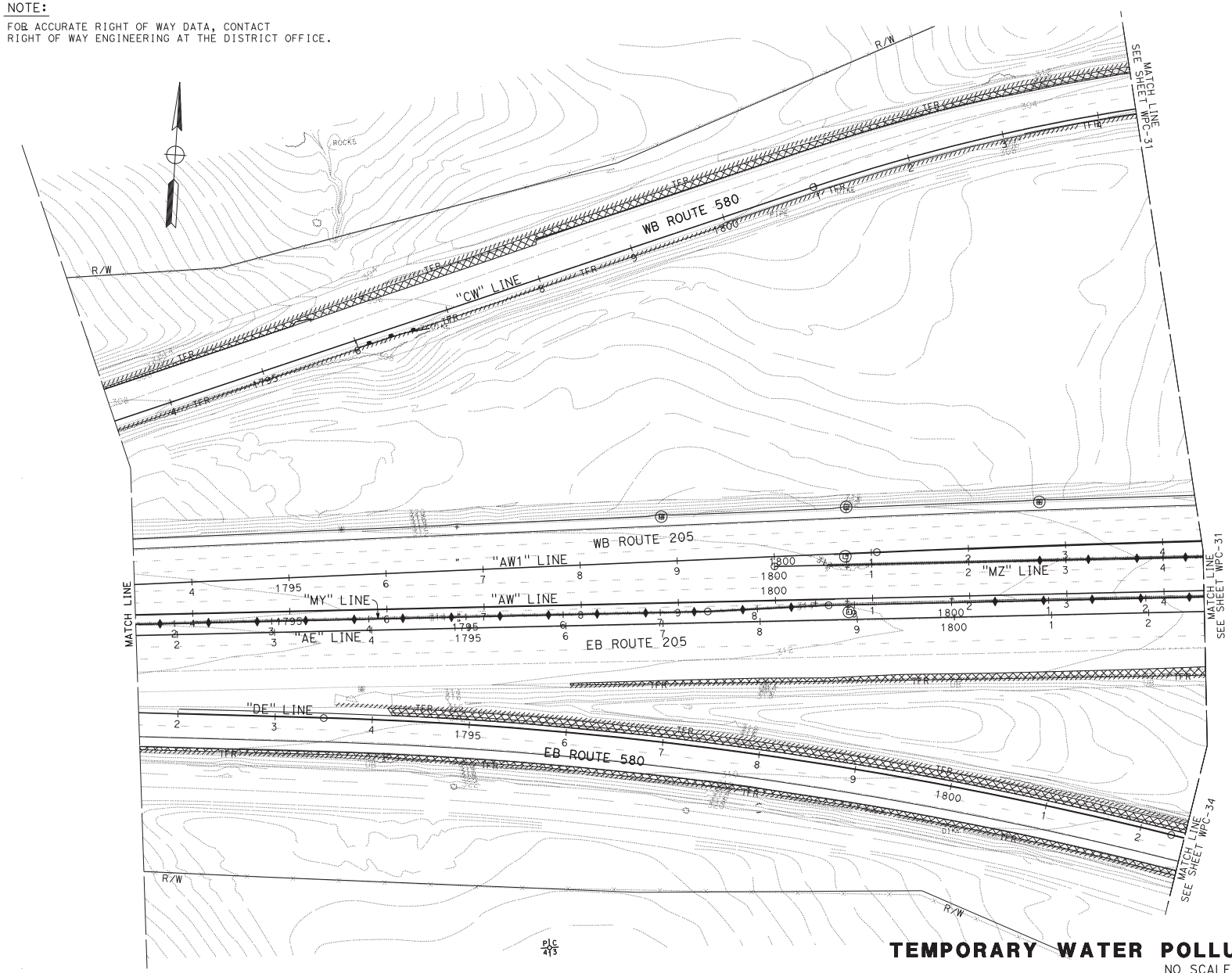
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-30

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	GANGA TRIPATHI
Caltrans® WATER QUALITY	KAMRAN NAKHJIRI	CHECKED BY	KAMRAN NAKHJIRI
		REVISED BY	GT
		DATE REVISED	10-28-15

LAST REVISION 03-12-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

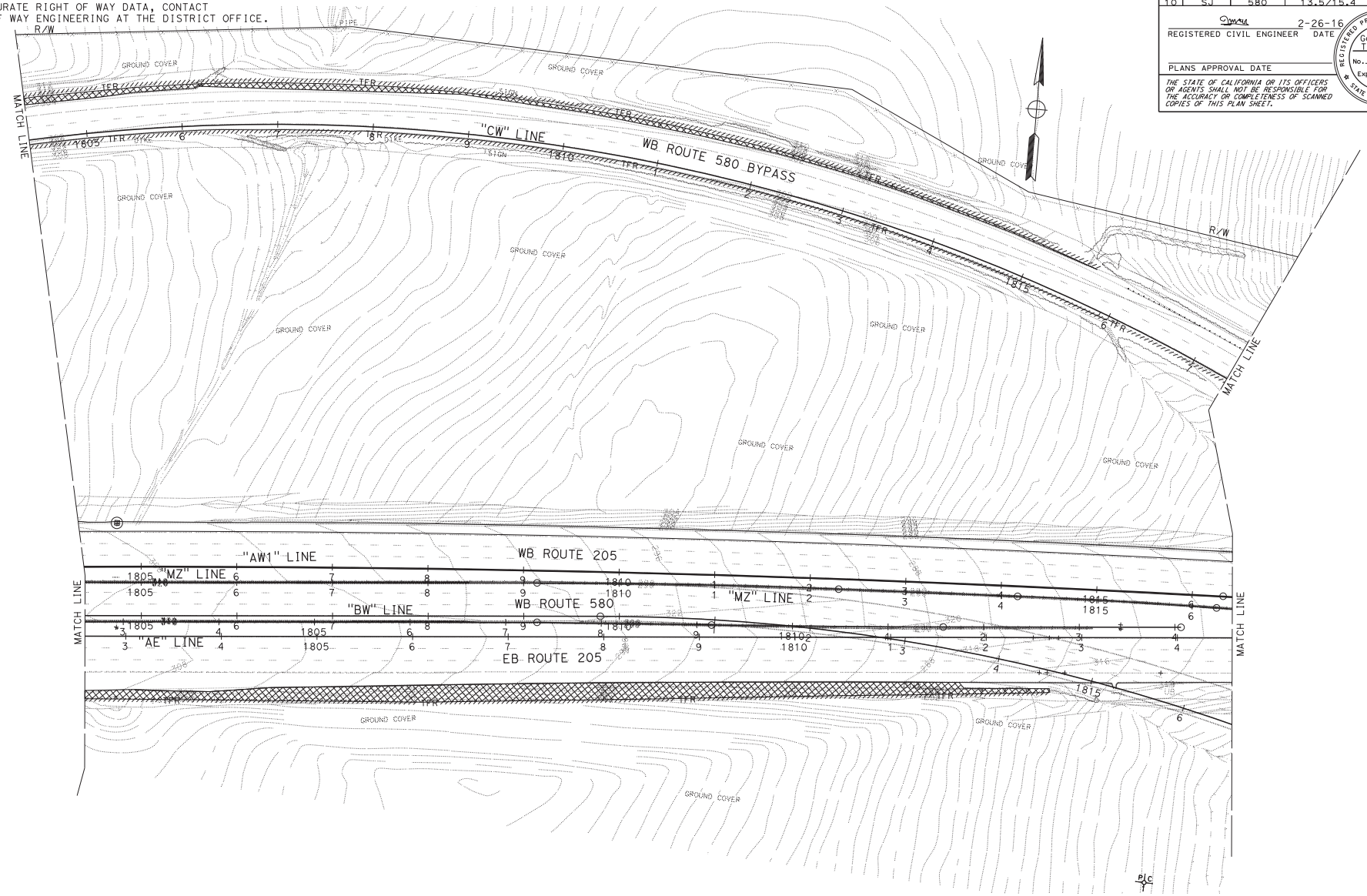
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-31

GT	10-28-15	GANGA TRIPATHI	KAMRAN NAKHJIRI
REVISED BY	DATE REVISED	CALCULATED-DESIGNED BY	CHECKED BY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans — WATER QUALITY

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

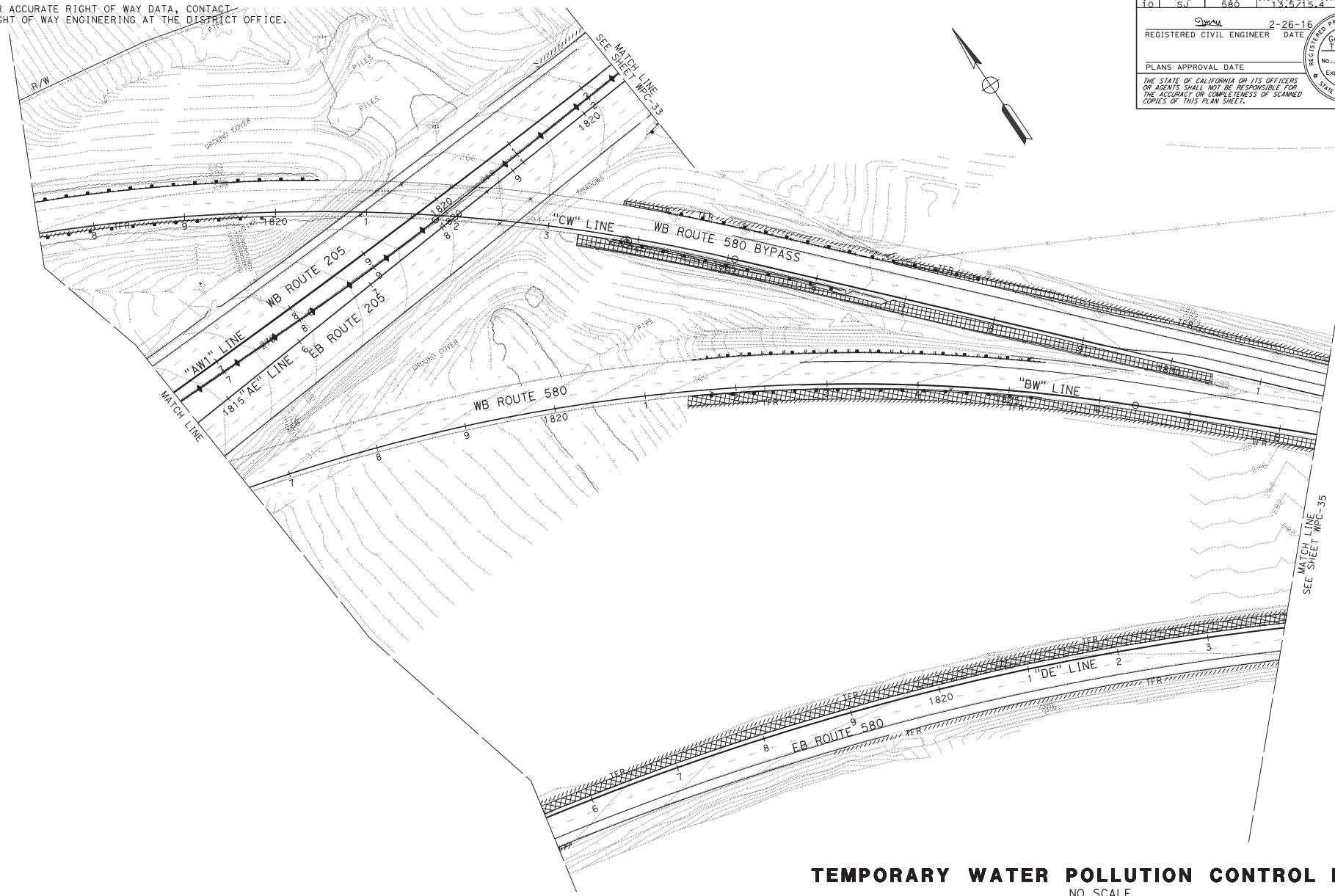
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-32

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — REVISED BY: GT

CHECKED BY: KAMRAN NAKHJIRI — DATE REVISED: 10-28-15

LAST REVISION 03-28-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:46

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb032.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

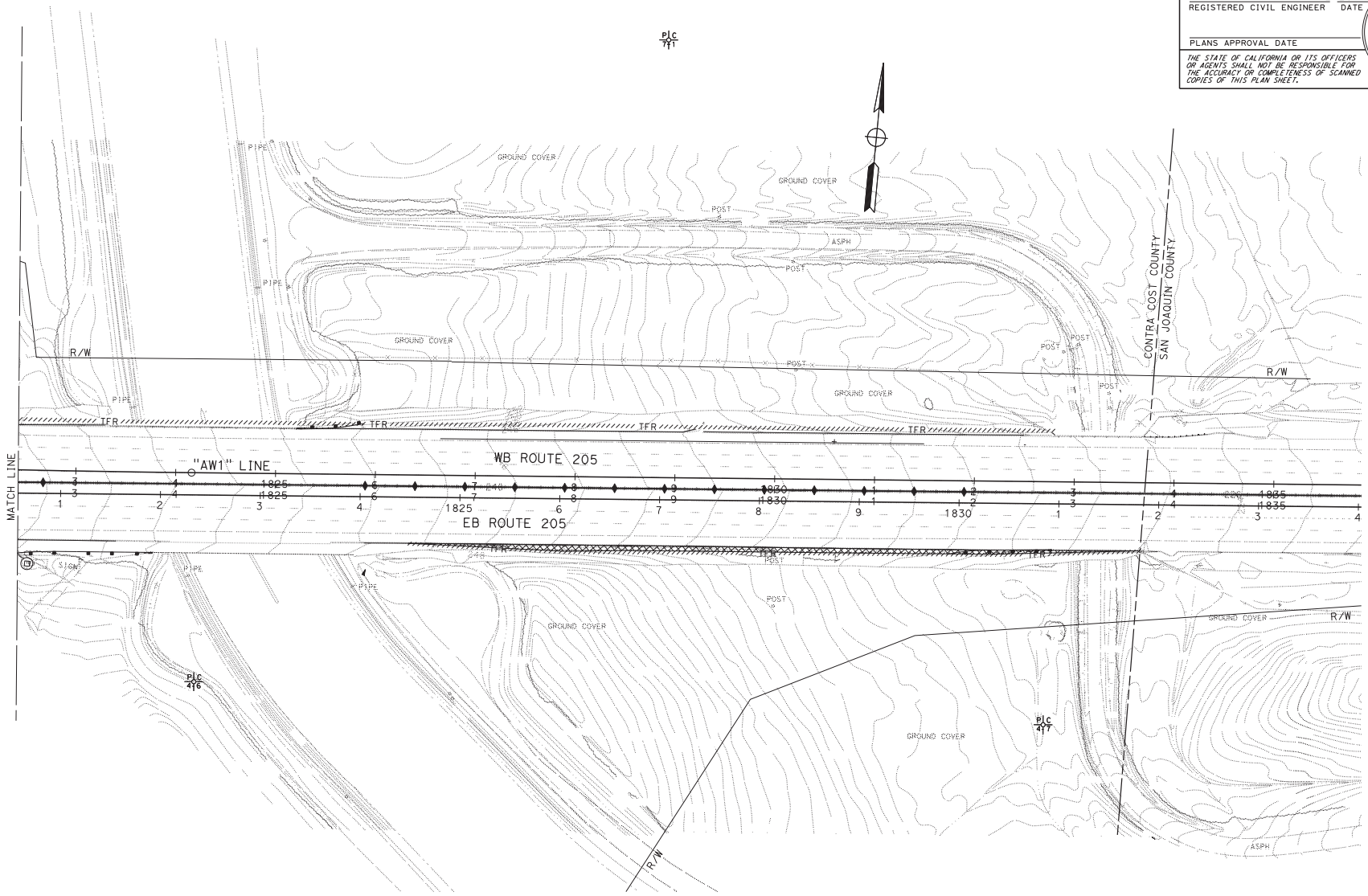
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-33

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION — Caltrans — WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-12-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:46

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb033.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

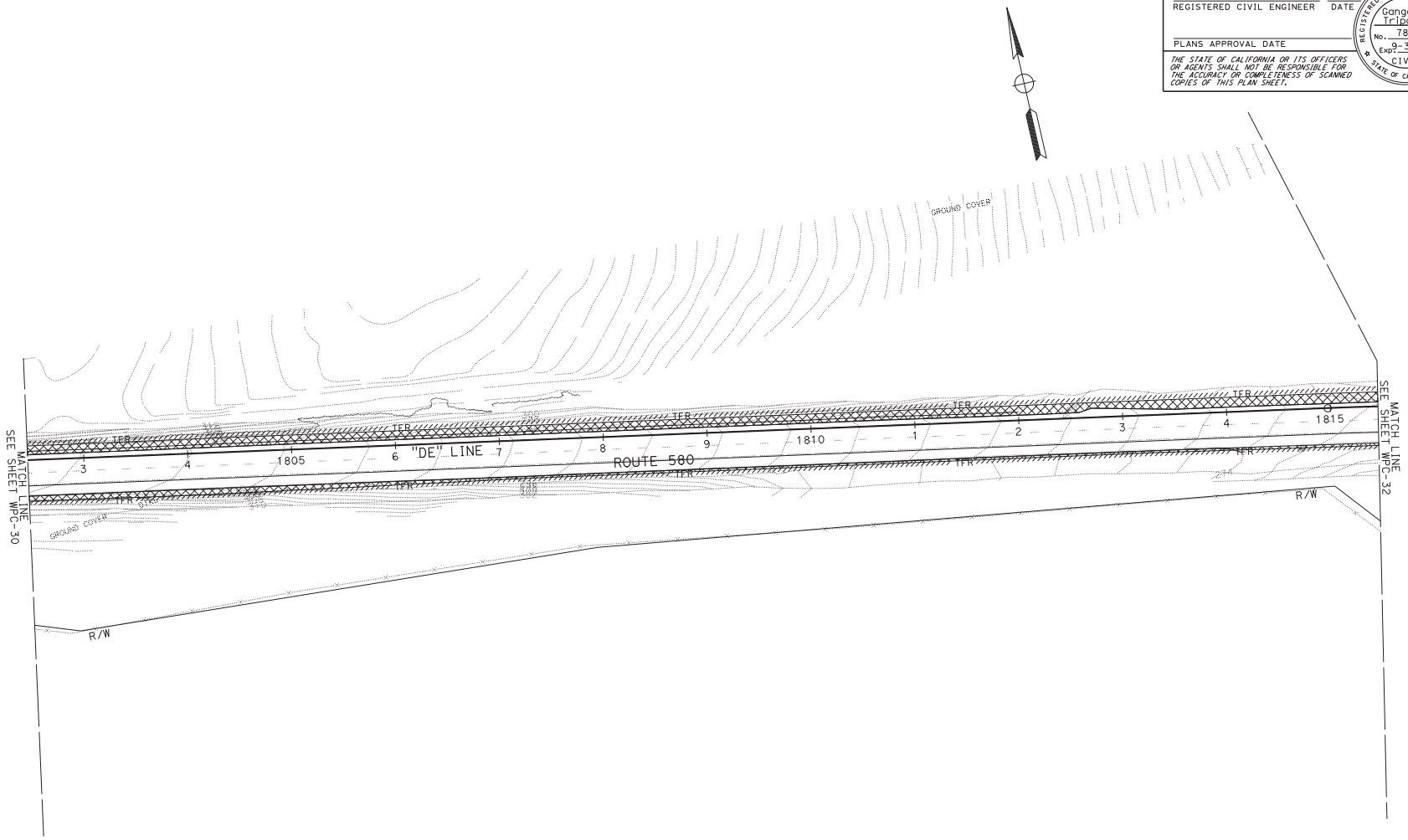
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-34

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION 03-28-16 — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 06:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

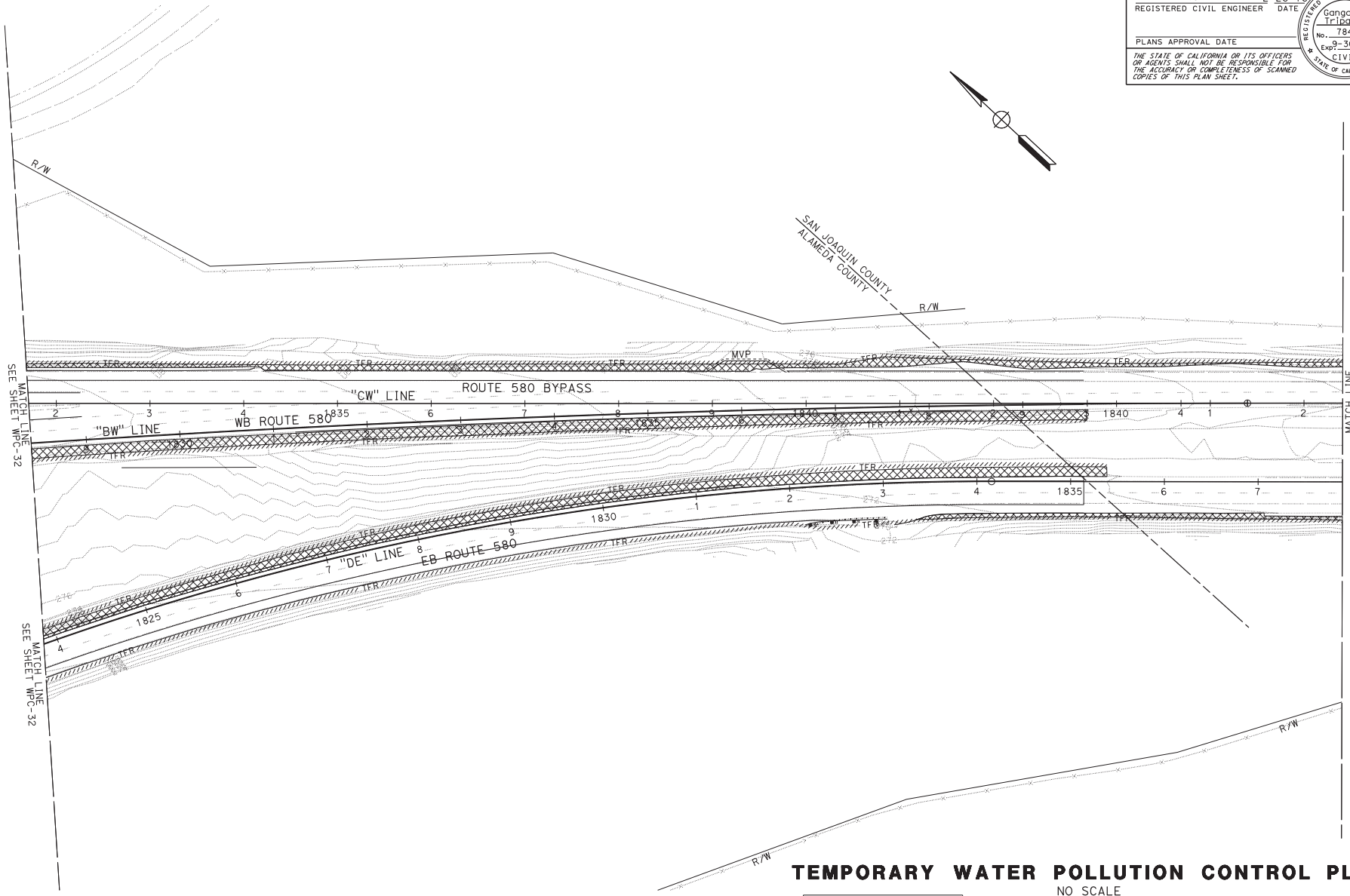
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-35

REVISED BY	GT
DATE REVISED	10-28-15
CALCULATED-DESIGNED BY	GANGA TRIPATHI
CHECKED BY	KAMRAN NAKHJIRI
FUNCTIONAL SUPERVISOR	KAMRAN NAKHJIRI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

LAST REVISION 03-28-16 DATE PLOTTED => 05-MAY-2016 TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

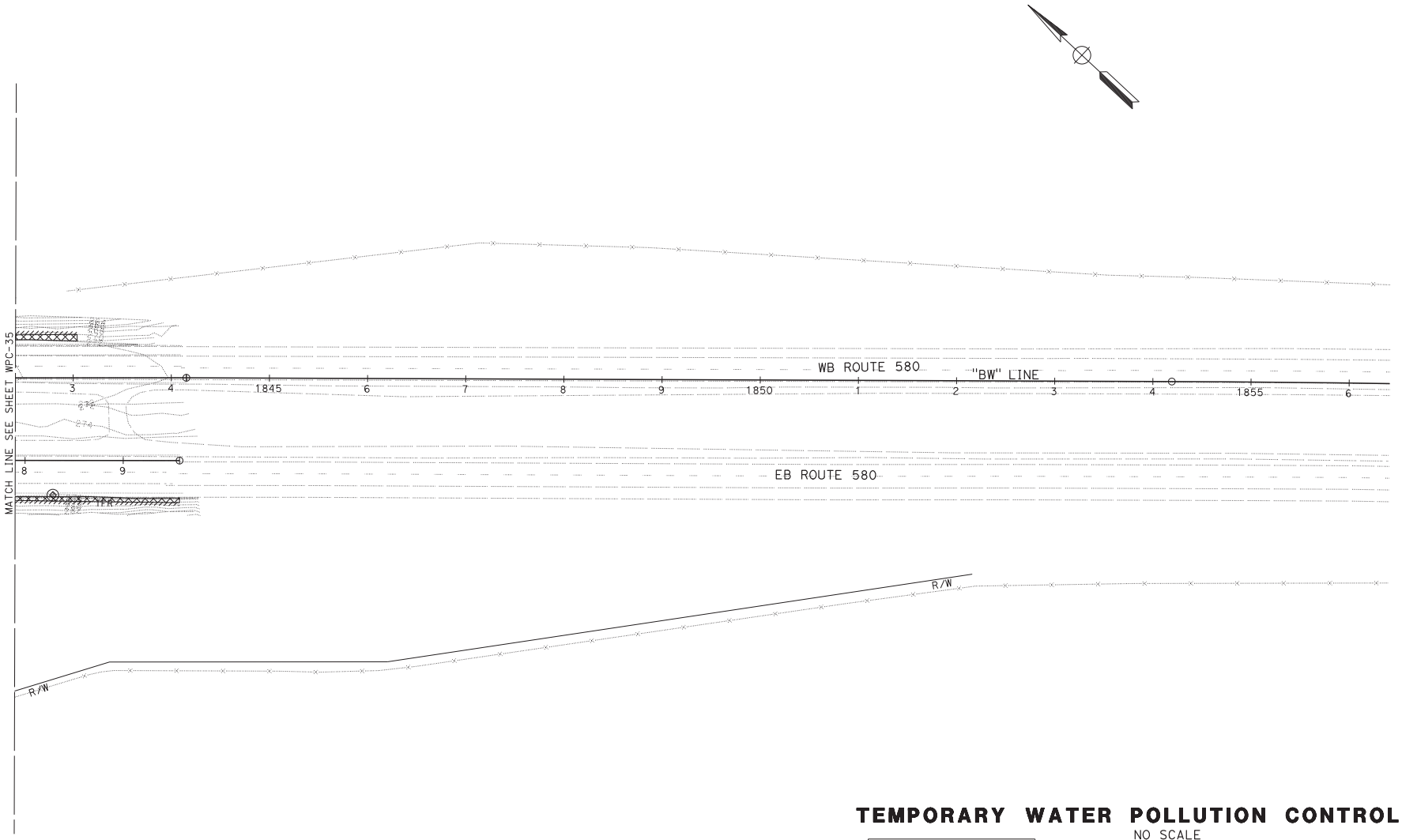
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-36

CALCULATED-DESIGNED BY	GANGA TRIPATHI
CHECKED BY	KAMRAN NAKHJIRI
REVISED BY	GT
DATE REVISED	10-28-15
FUNCTIONAL SUPERVISOR	KAMRAN NAKHJIRI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans WATER QUALITY

LAST REVISION 03-12-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT
RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

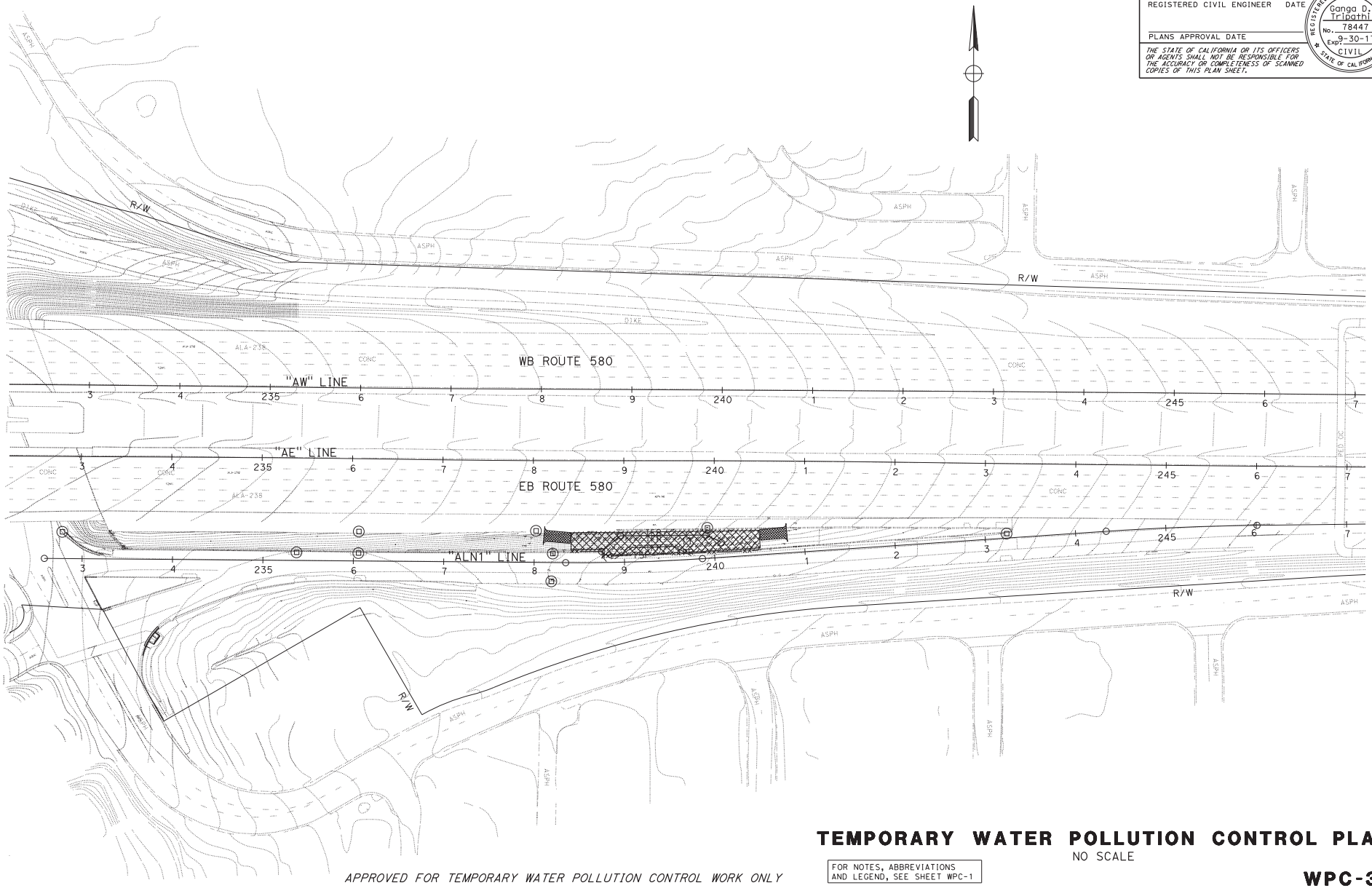
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

WPC-37

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 03-28-16

DATE PLOTTED => 05-MAY-2016
TIME PLOTTED => 06:46

BORDER LAST REVISED 7/2/2010

USERNAME => s128787
DGN FILE => 0415000066gb037.dgn

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0721

PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

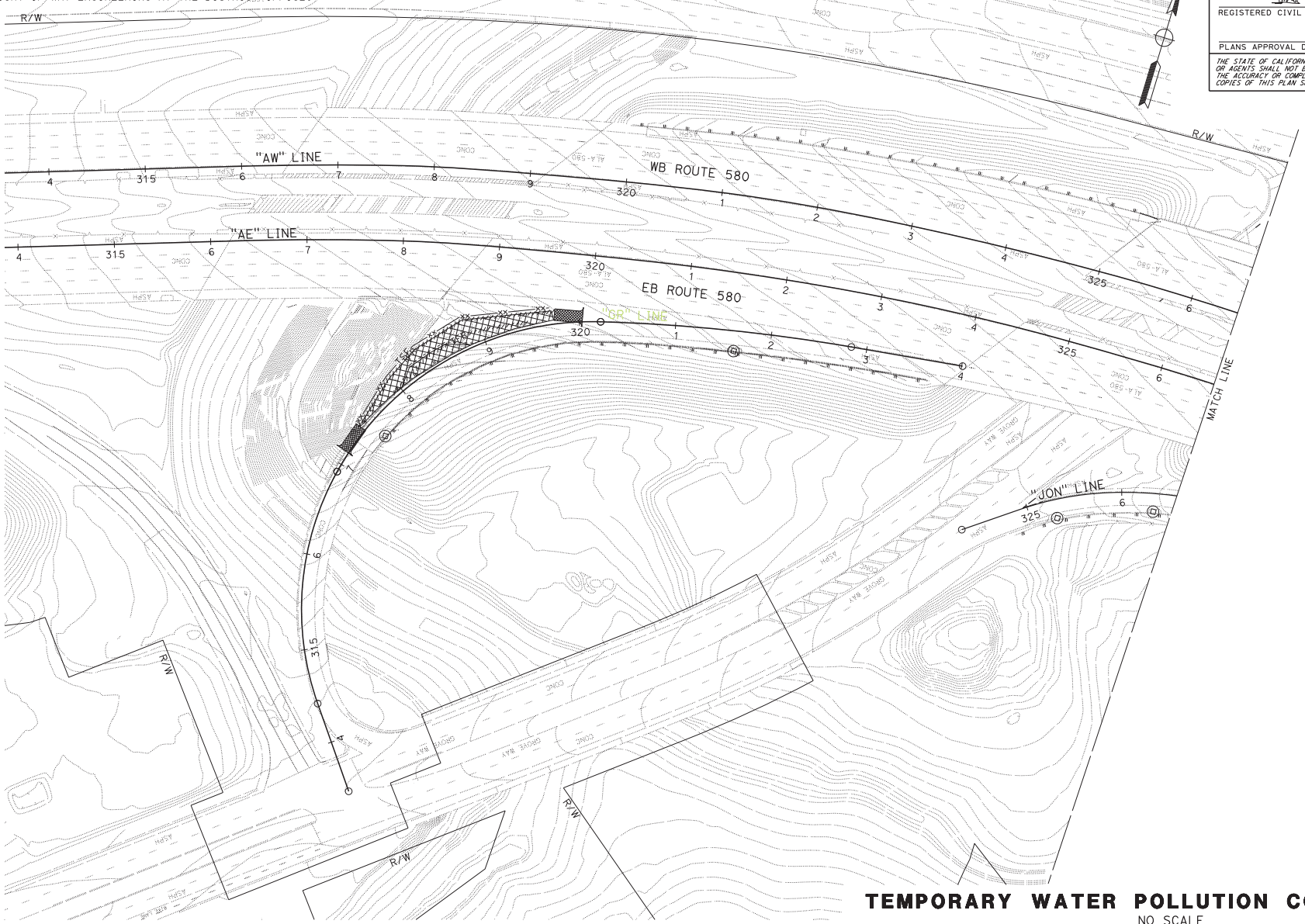
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-38

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

LAST REVISION 03-28-16

DATE PLOTTED => 05-MAY-2016

TIME PLOTTED => 06:46

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

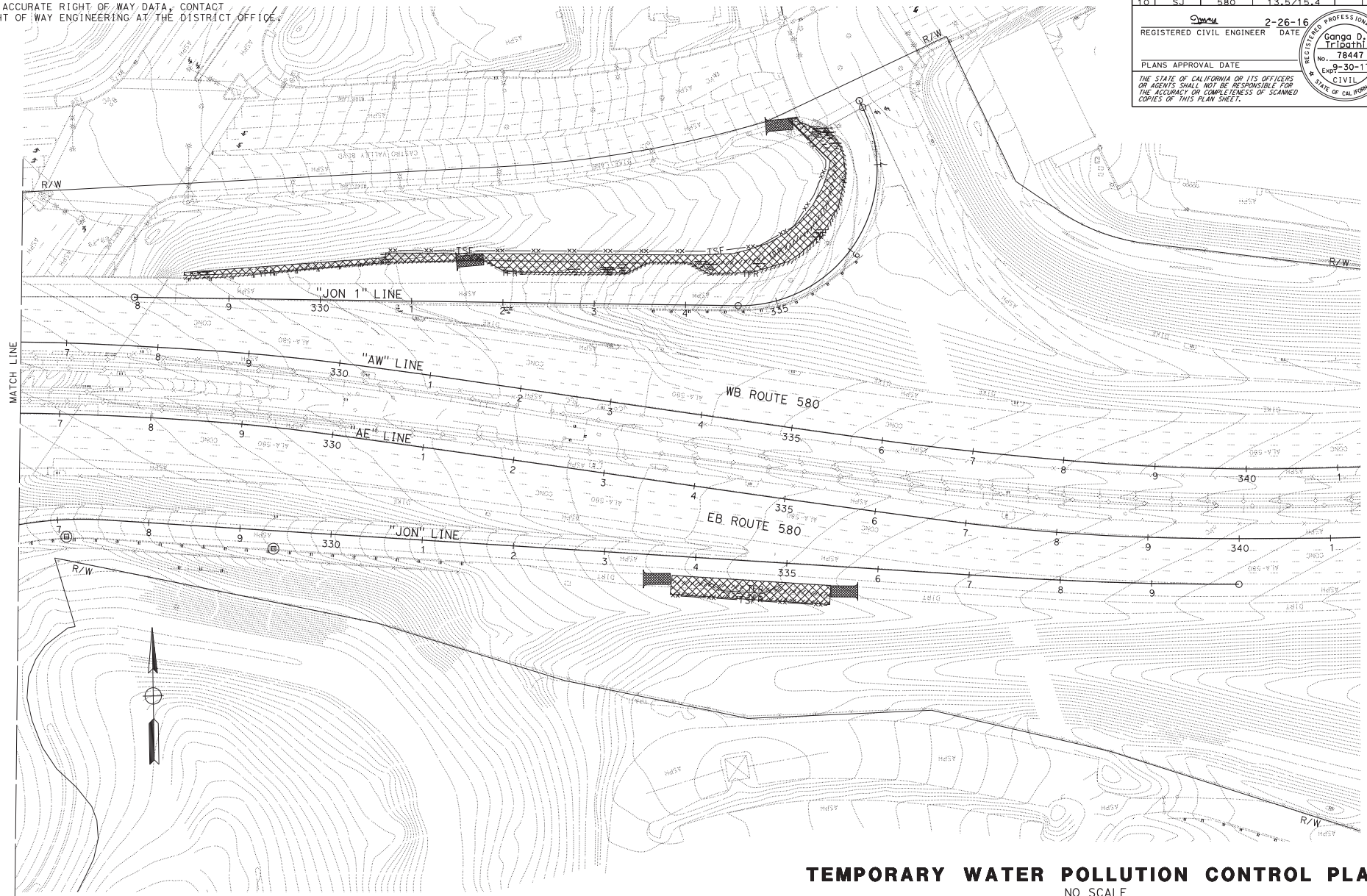
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

WPC-39

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	GANGA TRIPATHI
Caltrans	KAMRAN NAKHJIRI	CHECKED BY	KAMRAN NAKHJIRI
WATER QUALITY		REVISED BY	GT
		DATE REVISED	10-28-15

LAST REVISION 03-12-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:46

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb039.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

NOTE:

FOR ACCURATE RIGHT OF WAY ~~DATA,~~ CONTACT
RIGHT OF WAY ~~ENGINEERING~~ AT THE DISTRICT OFFICE.

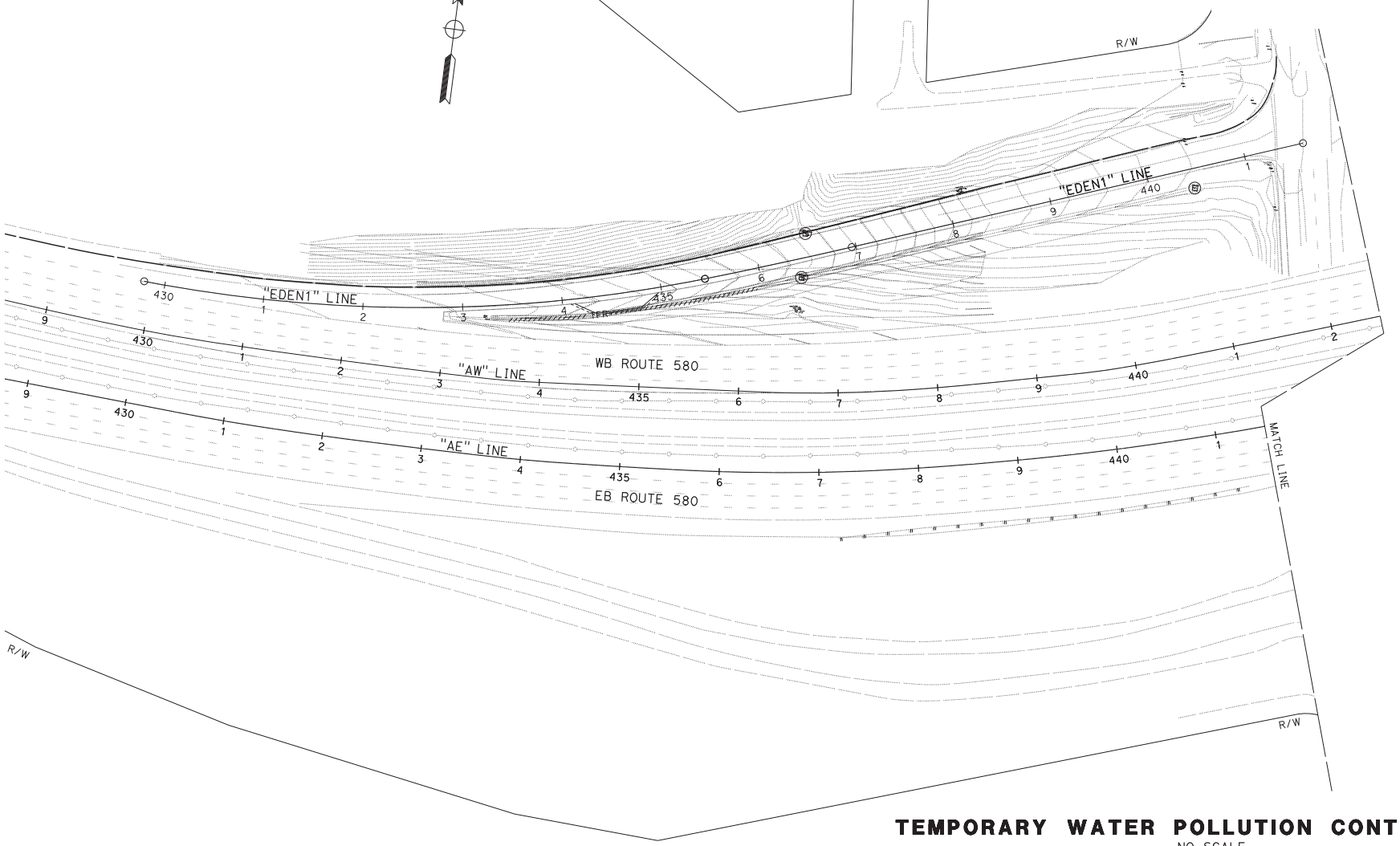
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

WPC-40

REVISED BY	GT
DATE REVISED	10-28-15
CALCULATED-DESIGNED BY	GANGA TRIPATHI
CHECKED BY	KAMRAN NAKHJIRI
FUNCTIONAL SUPERVISOR	KAMRAN NAKHJIRI

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans WATER QUALITY

LAST REVISION 03-12-16 | DATE PLOTTED => 05-MAY-2016 | TIME PLOTTED => 06:46

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER — DATE 2-26-16

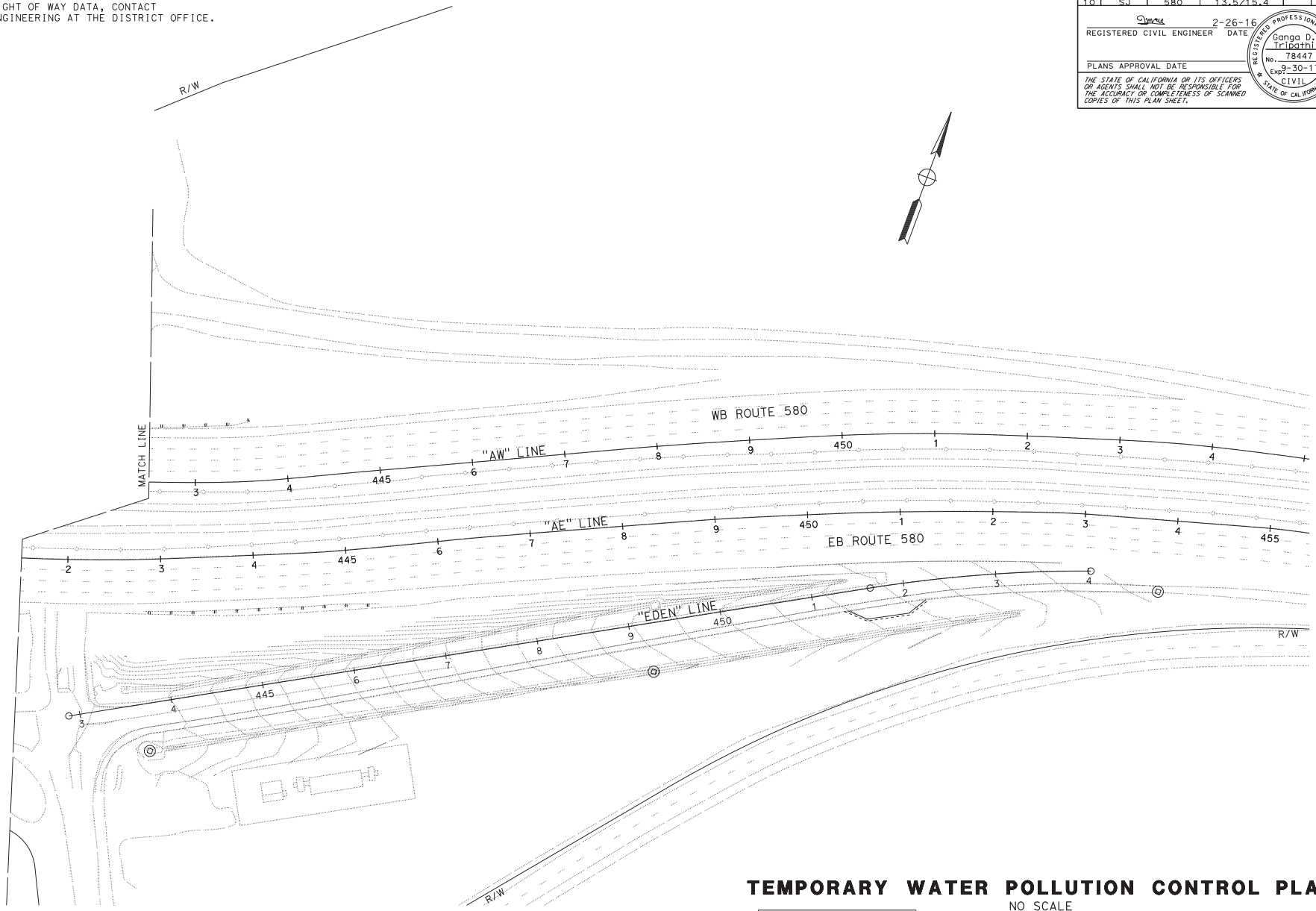
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — Ganga D. Tripathi — No. 78447 — Exp. 9-30-17 — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

NOTE:

FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.



APPROVED FOR TEMPORARY WATER POLLUTION CONTROL WORK ONLY

TEMPORARY WATER POLLUTION CONTROL PLAN

NO SCALE

FOR NOTES, ABBREVIATIONS AND LEGEND, SEE SHEET WPC-1

WPC-41

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans® **WATER QUALITY**

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI — CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT — DATE REVISED: 10-28-15

LAST REVISION — DATE PLOTTED => 05-MAY-2016 — TIME PLOTTED => 07:05 — 03-12-16

BORDER LAST REVISED 7/2/2010 | USERNAME => s128787 | DGN FILE => 0415000066gb041.dgn | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0721 | PROJECT NUMBER & PHASE 04150000661

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Ala	205	0.0/1.0		
04	Ala	580	0.0/8.0, 26.1/30.3		
10	SJ	580	13.5/15.4		

REGISTERED CIVIL ENGINEER 2-26-16 DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER Ganga D. Tripathi No. 78447 Exp. 9-30-17 CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

TEMPORARY WATER POLLUTION CONTROL QUANTITIES

ITEM	UNIT	SHEET	QUANTITY
TEMPORARY DRAINAGE INLET PROTECTION	EA	WPC-1 TO WPC-41	106
TEMPORARY FIBER ROLL	LF		53000
TEMPORARY SILT FENCE	LF		4000
TEMPORARY HYDRAULIC MULCH (BONDED FIBER MATRIX)	SQYD		28000
TEMPORARY CONSTRUCTION ENTRANCE	EA		8

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans WATER QUALITY

FUNCTIONAL SUPERVISOR: KAMRAN NAKHJIRI

CALCULATED-DESIGNED BY: GANGA TRIPATHI

CHECKED BY: KAMRAN NAKHJIRI

REVISED BY: GT

DATE REVISED: 10-28-15

TEMPORARY WATER POLLUTION CONTROL QUANTITIES

WPCQ-1

LAST REVISION 02-28-16

DATE PLOTTED => 05-MAY-2016
TIME PLOTTED => 07:05

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Serious drought
Help Save Water!

To: MS. KELLY HOLDEN
Supervising Bridge Engineer
Office of Bridge Design-West

Date: August 21, 2015

Attention: M. Kaddoura
M. Omran

File: 04-ALA-580 PM 30.3±
EA 04-3G59U4
EFIS 0415000066
Retaining Wall for MVP

From: TUNG NGUYEN/RON KARPOWICZ
Transportation Engineer/Eng. Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

MAHMOOD MOMENZADEH/CHRIS RISDEN
Chiefs, Branches C/B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: REVISED FINAL GEOTECHNICAL DESIGN REPORT FOR ERS

1. INTRODUCTION

This Geotechnical Design Report (GDR) provides our foundation recommendations and updates for the proposed retaining wall of the ramp metering project located on Interstate 580 in Alameda and San Joaquin counties per requests from your Office on April 30, 2014 and August 14, 2015.

1.1 Project Description

The project extends from Patterson Pass Interchange in San Joaquin County (PM 13.5) to Greenville Road in Alameda County (PM 8.1) and from San Ramon Road (PM 22.0) to Strobridge Avenue (PM 30.3) in Alameda County. A retaining wall (RW) is proposed for the project at EB 580 Strobridge Avenue On-Ramp in Castro Valley to accommodate maintenance vehicle pullout (MVP) as shown in Appendix A, Figures 1 and 2.

1.2 Proposed Earth Retaining System

A soldier pile wall is proposed to retain the cut at this site for MVP. The limits and height of this RW are presented in Table 1.

Table 1: Description of the Proposed Retaining Walls

RW ID	RW Type	Begin			End			Length, ft	Design Height, ft		Notes
		~Sta.	Lat.	Long.	~Sta.	Lat.	Long.		Min.	Max.	
1	Soldier Pile Wall	"ALN1" 238+75	NA	NA	"ALN1" Line 240+09	NA	NA	141	≤6	15	-

1.3 Project Constraints and Requirements

The right of way, site accessibility, and noise are not an issue for the project. However, project site is located on freeway and it's ramp, therefore, construction operation should consider heavy traffic and traffic control.

2. SCOPE OF WORK

The scope of work performed for this GDR included:

- Review of the project scope requirements,
- Review existing geology and relevant geotechnical information and reports,
- Geotechnical data review and interpretation,
- Engineering analysis and development of the geotechnical design recommendations and construction considerations,
- Communication with the other functional units, and
- Preparation of the GDR

3. REFERENCE REPORT REVIEW

We reviewed the final foundation investigation report for Strobridge Avenue Undercrossing widening (Bridge No. 33-0189L) of SR-238 Widening Project (EA 04-249041) prepared by Parsons Brinkerhoff (PB) in association with Fugro on January 07, 2005. The boring FRW-9 drilled for the project at about 285 ft west of the proposed RW and other information are used for site subsurface description and the RW foundation design herein. Boring FRW-9 was drilled on 12/20/2002 from the surface (elevation +55.0 m or +180.4 ft) to a depth of 22.3 ft (elevation +48.2 m or +158.1 ft). The as-built LOTB of this boring is included in Appendix B.

4. SITE CONDITIONS

4.1 Climate

The climate in the project area is characterized as Mediterranean, with warm, dry summers and cool, moist winters. The warmest month of the year is September with an average maximum temperature of 76.30 degrees Fahrenheit, while the coldest month of the year is December with an average minimum temperature of 41.20 degrees Fahrenheit. Temperature variations between night and day tend to be moderate during summer with a difference that can reach 21 degrees Fahrenheit, and fairly limited during winter with an average difference of 17 degrees Fahrenheit.

The annual average precipitation at Castro Valley is 26.30 Inches. Winter months tend to be wetter than summer months. On the average, freezing temperatures do not occur in Castro Valley and freeze-thaw conditions have a low potential to impact the proposed project.

4.2 Topography and Drainage

The site is located on the east site of Strobridge Undercrossing and parallel to the freeway I-580 east bound. The site is located within the fill embankment between the on-ramp and eastbound I-580 with the approximate slope ratio 2.5 to 1 (Horizontal to Vertical). Drainage at the site is generally characterized as sheet flow from the east side of the on ramp controlled by an ac dike and multiple drainage inlets.

5. GEOLOGIC SETTING

5.1 Regional Geologic Overview

The project is located in the Coast Range Geomorphic Province of Central California, a series of northwest-trending mountain ranges (2,000 to 4,000, occasionally 6,000 feet elevation above sea level), and intermountain valleys, bounded in the east by the Great Valley and to the west by the Pacific Ocean. The Coast Ranges are composed of thick Cenozoic sedimentary and volcanic strata overlying Mesozoic metamorphic basement rock. The northern and southern ranges are separated by a depression containing the San Francisco Bay. The Coast Range is sub parallel to the active San Andreas Fault, which is more than 600 miles long, extending from Pt. Arena to the Gulf of California.

5.2 Site Geology

According to the Quaternary Geology of Alameda County Map (Helley and Graymer, 1997), the site is underlain by artificial fill over alluvial and fluvial fan deposits. The artificial fill (af) is described as engineered or non engineered man-made deposit of various materials and ages. Some are compacted and quite firm, but fills made before 1965 are nearly everywhere not compacted and consist simply of dumped materials. Alluvial fan deposits (Qpaf), are described as brown, dense gravely and clayey sand or clayey gravel that fines upward to sandy clay. All Qpaf deposits can be related to modern stream courses. They are distinguished from younger alluvial fans and fluvial deposits by higher topographic position, greater degree of dissection, and stronger soil profile development. They are overlain by Holocene deposits on lower parts of the alluvial plain, and incised by channels that are partly filled with Holocene alluvium on higher parts of the alluvial plain. Maximum thickness is unknown but at least 50 m. A relevant portion of this map is included as Figure 3 of Appendix C, Vicinity Geologic Map.

5.3 Geologic Hazards

The site may be affected by activity along any of the active faults discussed below. Earthquake induced hazards can be categorized as primary and secondary seismic effects.

Primary seismic effects such as ground rupture or surface deformation resulting from differential movement along a fault trace are not expected to occur on the site since there are no active faults mapped within the project limits.

Secondary seismic effects result from various soil responses to ground acceleration. These effects result from activity of any nearby active faults.

- Liquefaction of Natural Ground – Liquefaction is a process by which soil deposits below the water table temporarily lose strength and behave as a viscous liquid rather than a solid, typically during a moderate to large earthquake. In general, very loose to medium dense, clean fine- to medium-grained sand, and very soft to firm, low plasticity silts that are relatively free of clay are most susceptible to liquefaction. Earthquake-induced ground shaking can cause these loose or soft materials to densify, resulting in increased pore water pressures and an upward movement of groundwater that may result in a liquefied condition. Depending on the weight of the structure, the depth to the liquefied stratum and the nature of the overlying soils, structures situated above such temporarily liquefied soils may sink or tilt, causing significant structural damage.

  According to the State Seismic Hazard Zones Map, the project is located in an area where historic occurrence of liquefaction, or local, geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required (See Figure 4 of Appendix C, Earthquake Fault Hazard and State Seismic Hazard Map). However, since the site is located on an elevated fill embankment well above the ground water table, the liquefaction potential at the site is considered low.

- Cracking – Lurch cracks may develop in the silty soil overlying the site. The potential for lurch cracking will be higher in the rainy periods when the soil is saturated. The hazard from cracking is considered minimal.

- Differential Settlement – During moderate to large earthquakes, soft or loose soil can densify and consolidate, often unevenly across a site. The hazard from differential settlement is considered minimal.

- Ground Shaking - Moderate to large earthquakes are probable along several active faults in the greater Bay Area. Therefore, strong ground shaking should be expected at some time during the design life of the proposed development. The improvements should be designed in accordance with current earthquake resistant standards.

- Shrink Swell - The expansion and/or contraction of clayey soil can cause foundations to shift and roadways to crack. Due to the lack of clayey soil at the site, the potential for shrink swell to impact the project is considered low.

5.4 Subsurface Conditions

Based on as-built boring FRW-9 the site subsurface condition consists of fill underlain by very stiff clay and weathered/fractured rock. The fill consists of medium dense to dense silty gravel and clayey sand, and stiff to very stiff sandy clay. Below the fill is very stiff clay and dense gravels underlain by weathered/fractured shale, siltstone, and claystone.

5.5 Groundwater

Groundwater was not encountered in the boring FRW-9. However, minimum perched groundwater or seepage water from the fractured bedrock could be encountered during drilling hole for pile construction. For purpose of groundwater seepage volume calculation, use a groundwater depth of 10 ft below the bottom of the wall.

6. REGIONAL SEISMICITY AND FAULTS

6.1 Faulting and Seismicity

The San Francisco Bay Area is one of the most active seismic regions in the United States. Three major faults trend northwest through the Bay Area and have generated about 12 earthquakes per century large enough to cause significant structural damage. These earthquakes occur on any of the numerous faults that are part of the San Andreas Fault system that extends for at least 700 miles along the California Coast.

The U. S. Geological Survey concluded that there is a 62 percent probability for at least one "large" earthquake of magnitude 6.7 or greater in the Bay Area before 2032. There could also be more than one earthquake of this magnitude and that numerous "moderate" earthquakes of about magnitude 6 are probable before 2032. The San Andreas Fault is estimated to have a 21 percent probability of producing a magnitude 6.7 or larger earthquake by the Year 2032 (WGCEP, 2003). The probability of the Hayward, Calaveras, and Greenville Faults producing a similar size

earthquake during the same time period is 27 percent, 11 percent and 3 percent, respectively (See Figure 5 of Appendix C, San Francisco Bay Region Earthquake Probability Map).

6.2 Site Seismicity

According to the latest California Seismic Hazard Map Version 2.0.4 (USGS, 2008), which is based on the United States Geological Survey (USGS) and California Geological Survey (CGS) maps, the nearest active faults are the Hayward South Section, Hayward North Section, and the Calaveras faults. The site is not located in an Alquist-Priolo Earthquake Fault Zone (See Figure 4. The Hayward South Section fault is a strike slip fault, has a Maximum Magnitude (Mmax) of 7.3, and is located approximately 0.72 miles to the southwest of the project. Hayward North Section Fault is a strike slip fault, has a Mmax of 7.3 and is located approximately 4.6 miles northwest of the site. The Calaveras Fault is a strike-slip fault, has a Mmax of 6.9 and is located approximately 7.9 miles east of the site. The fault distances were measured on Google Earth and represent the horizontal distances from the fault traces or surface projections of the top of rupture planes to the project site.

6.3 Site Ground Motions

Since geophysical testing, including shear wave velocity, was not performed at the site, we determined the Vs30 based on the geologic map and logs of test borings. Vs30 refers to the average shear wave velocity in the upper 30 meters (100 ft) of the soil/rock profile and is a measure of the near surface soil stiffness. As noted in section 5.2, Site Geology, the geologic map for the area indicates that the site is underlain by artificial fill and alluvial fan deposits. The logs of test borings indicate confirm that the site is underlain by fill and alluvium, underlain by soft to hard bedrock. Based on the boring log and geologic map, we assigned a NEHRP class D to the site, which correlates to a shear wave velocity (Vs30) of 270 m/s (886 ft/s), stiff soil.

We generated Acceleration Response Spectrum (ARS) curves with the Caltrans Deterministic Seismic Hazard Analysis (DSHA) and Probabilistic Seismic Hazard Analysis (PSHA) version 2.0.4 using a 975-year return period (5% probability of exceedance in 50 years). The probabilistic and deterministic data generated from the curves are listed in table 2 below.

Table 2: Fault Data[1]

Fault Name	Distance (Miles)	Fault ID	Fault Type	Maximum Magnitude (MMax)	Peak Ground Acceleration (g)	Hazard Analysis Type
Hayward-South Section	0.72	137	Strike-Slip	7.3	0.49	DSHA
Hayward-North Section	4.6	123	Strike-Slip	7.3	0.35	DSHA
Calaveras	7.9	130	Strike-Slip	6.9	0.24	DSHA
Probabilistic Model USGS Seismic Hazard Map (2008) 975 Year Return Period					0.89	PSHA

6.4 Corrosion

Based on the results of corrosion tests performed for foundation designs of soundwall and retaining wall of 04-249041 Project, the site is non-corrosive.

7. ANALYSIS AND RECOMMENDATION FOR RETAINING WALLS

7.1 Geometry and External Loads

Proposed RW ID 1 will retain the adjacent highway embankment. Therefore, traffic load is considered in the design for this RW.

7.2 Foundation Soil Materials

Based on the results of drilled boreholes, the following idealized soil profiles represents the foundation soils for this RW:

Table 3: Soil Profile and Engineering Properties

Depth, ft		Soil Type	Unit Weight, pcf	Friction Angle, Degree	Cohesion, psf	p-y Subgrade Modulus k, pci	Strain ε_{50}	k_a	k_p
From	To								
0.0	15	Silty Sand/Gravel	120	33	0	90	-	0.30	-
Below 15’		Sand/Gravel	130	35	0	225	-	0.27	3.0

[1] http://dap3.dot.ca.gov/ARS_Online/index.php

7.3 Backfill Material

No significant backfill is required for the RW. Drilled hole with soldier pile will be filled with the concrete.

7.4 Effects of Water

Groundwater is unlikely encountered during the excavation of the existing embankment and drilling holes.

7.5 Landslide Hazard

According to the State Seismic Hazard Zones Map, the project is not located in an area previous occurrence of landslide movement and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) (See Figure 4, Earthquake Fault and State Seismic Hazard Map). Landslide hazard is considered low.

7.6 Effects on Existing Facilities

Based on information provided in PSR-PR, effects on existing facilities are minimum.

7.7 Static Design Analyses

7.7.1 Lateral Earth Pressures and Passive Resistances

We recommend to use lateral active earth pressure coefficient $k_a = 0.30$ of retaining soil for this RW. The lateral active and passive earth pressures of foundation soil(s) are 0.27 and 3.0 respectively. The arching factor 2.4 shall be used for the design. Furthermore, RW shall also be designed with uniform 72 psf lateral loading from traffic impact, but for drained condition, i.e. without excess pore water pressure.

7.7.2 Service Limit States

This RW to retain the cut, therefore settlement is not an issue. Slope stability analyses were performed by Slope W, Version 2007, indicated that stability meets the requirement with safety factor greater than 1.5 for static condition.

7.7.3 Strength Limit States

Axial pile capacity demand is minimum.

7.8 Seismic Design Analyses

7.8.1 Seismic Hazard Analyses

Seismic hazards such as fault rupture, liquefaction, and lateral spread have low potential at this site.

7.8.2 Seismic Lateral Earth Pressures and Passive Soil Resistances

We recommend to use seismic lateral earth pressure coefficients k_{ae} = 0.53 for this RW computed by Mononobe-Okabe and other method, respectively. This value represents total static and seismic increments of active lateral earth pressures. We used k_h = 0.3 for this RW to determine the above pressure coefficients. Since the lateral loading controls the design, we recommend to use W24x146 pile or equivalent pile on 6 ft center to center spacing installed on 30-inch or 36-inch drilled hole. The pile lengths are shown in the following Table to support the cut.

Table 4: HP 24x146 Piles

Retaining Height, ft	Pile Embedment Length, ft	Minimum Pile Length*, ft
≤6 ft	10	16
8	14	22
10	16	26
12	18	30
14	20	34

**Total pile length shall be defined from design height*

7.8.3 Analysis for Seismic Design

Seismic slope stability analysis was performed using seismic horizontal coefficients of 0.3 by Slope W, Version 2007. The calculated factor of safety is greater than 1.1 which meets the seismic slope stability condition.

7.9 Scour and Erosion

According to the FEMA Flood Hazard Areas Map, the proposed retaining walls are outside of the flood hazard area. The proposed retaining walls are not susceptible to scour.

7.10 Drainage and Filters

Caltrans July 2014 standard drawing xs12-050 for cantilever soldier pile wall should be used in incorporation with drainage system for this RW.

8. CONSTRUCTION CONSIDERATIONS

8.1 Notes for Specification Development

The Contractor(s) shall furnish the piles in accordance with the contract plans. Alternative piles are not allowed.

Difficult hole drilling and caving for pile installation is anticipated. Minor groundwater may be encountered above the pile tip. Groundwater will need to be removed from the drilled hole prior to placement of concrete.

8.2 Notes for Construction

The following construction considerations and requirements should be included in the design and construction specifications for the proposed retaining wall.

- Traffic considerations: Heavy traffic corridor is present at the site. Construction sequencing and traffic flow maintenance will influence construction procedures.

- It appears that temporary back cuts for the construction of this RW are not applicable. However, any excavation should follow the Cal/OSHA excavation requirements. Our Office shall be contacted for specific recommendations to mitigate the abnormal slope and foundation soil conditions.

- During the drilling operation for the proposed soldier piles, we believe that difficult drilling due to hard drilling in stiff to very stiff and dense materials and some caving of the drilled holes are anticipated. Thus, use of temporary casing is required. The Contractor(s) shall expect minimum to moderate dewatering for heavy rainfall and perched groundwater conditions.

- Contractor(s) are responsible for the issues mentioned above. Contractor(s) should refer to the as-built LOTB and soil types and properties.

The recommendations contained in this GDR are based on specific project information regarding structure type and location. If any conceptual changes are made during final project design, the Office of Geotechnical Design-West, Design Branch C should review those changes to determine if these foundation recommendations are still applicable. Any questions regarding the above recommendations should be directed to the attention of Tung Nguyen/Ron Karpowicz at 510-622-1775/510-286-5640 or Mahmood Momenzadeh/Chris Risden at 510-286-5732/510-622-8757 of the Office of Geotechnical Design-West.

9. REFERENCES

1. Caltrans, (1983) Foundation Investigation for Strobridge Avenue Undercrossing, 3 pp.

2. Parsons Brinckerhoff, (2005) I-238 Widening Project Final Foundation Investigation Report, Strobridge Avenue Undercrossing Widening Bridge No. 33-0189L, 37 pp.

10. APPENDICES

Appendix A, Location Maps
Appendix B, As-Built Log of Test Boring
Appendix C, Geologic and Seismic Maps

c: AYazdaniMotlagh, WCraig, EChoy, KNhieu, RSchaerli, SGalvez, RE_Pending_File@dot.ca.gov RFernandes, RWoo, TMishra, http://svgcgeodog.dot.ca.gov/, TPokrywka, MMomenzadeh, CRisden, RKarpowicz, TNguyen, Daily File

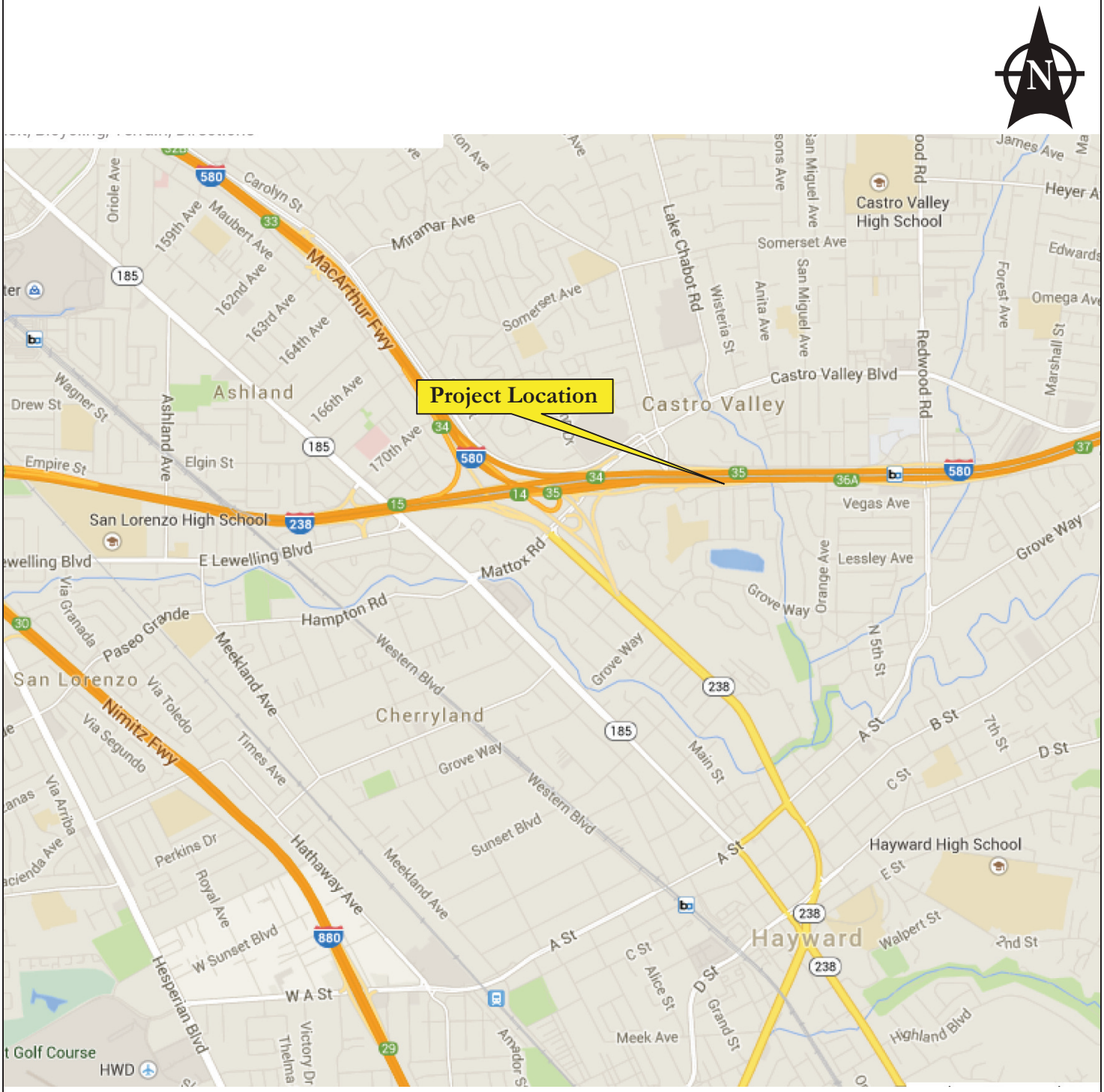
TNguyen/mm

PROFESSIONAL GEOLOGIST
CHRIS RISDEN
CERTIFIED ENGINEERING GEOLOGIST
No. 2542
Exp. 11/30/17
STATE OF CALIFORNIA

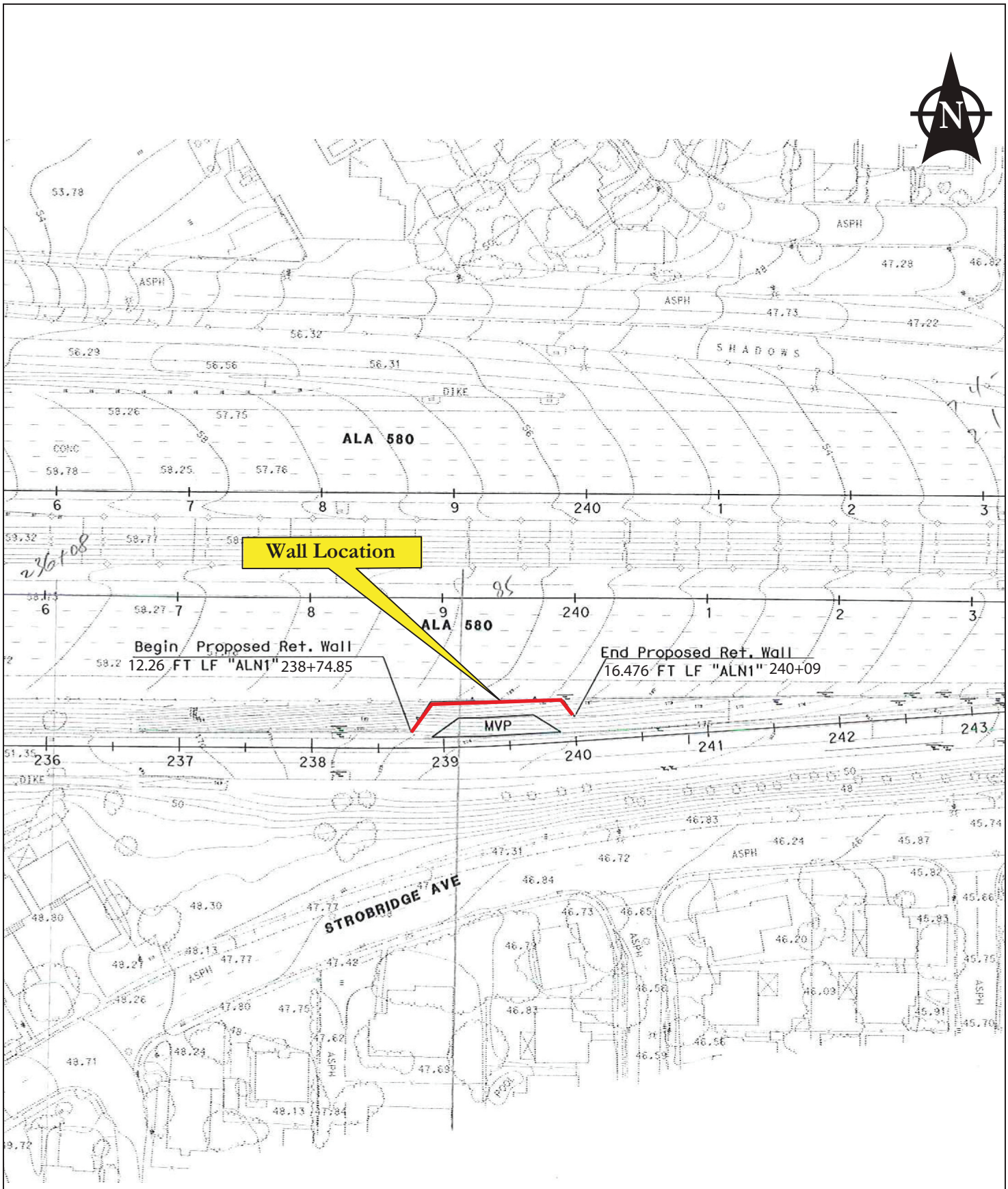
REGISTERED PROFESSIONAL ENGINEER
TUNG NGUYEN
No. 72143
Exp. 06/30/2016
CIVIL
STATE OF CALIFORNIA

Appendix A

Location Maps



Caltrans	MVP RETAINING WALL HIGHWAY 580 PM 30.3 ALAMEDA COUNTY, CALIFORNIA	VICINITY MAP
	EFIS#: 0415000066 — DECEMBER 2014	FIGURE 1



Caltrans	MVP RETAINING WALL HIGHWAY 580 PM 30.3 ALAMEDA COUNTY, CALIFORNIA	LAYOUT MAP
	EFIS#: 0415000066 / AUGUST 2015	FIGURE 2

Appendix B

As-Built Log of Test Boring

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET No	TOTAL SHEETS
04	Ala	238,580, 880	R23.2/26.8,48.5/R49.6, 29.8/32.8	555	1157

REGISTERED PROFESSIONAL 04/01/05

12-19-05
PLANS APPROVAL DATE

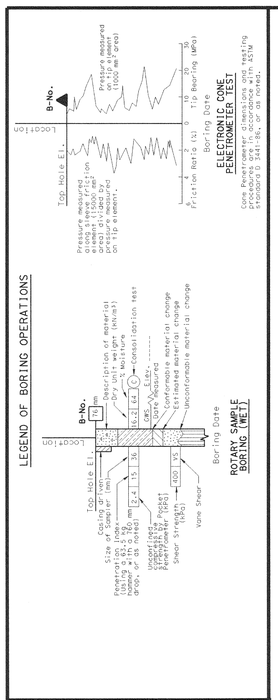
REGISTERED PROFESSIONAL ENGINEER S VAHDANI No. PE 45349 Exp. 09/30/06 STATE OF CALIFORNIA

The State of California or its officers or agents shall not be responsible for the accuracy or completeness of electronic copies of this plan sheet.

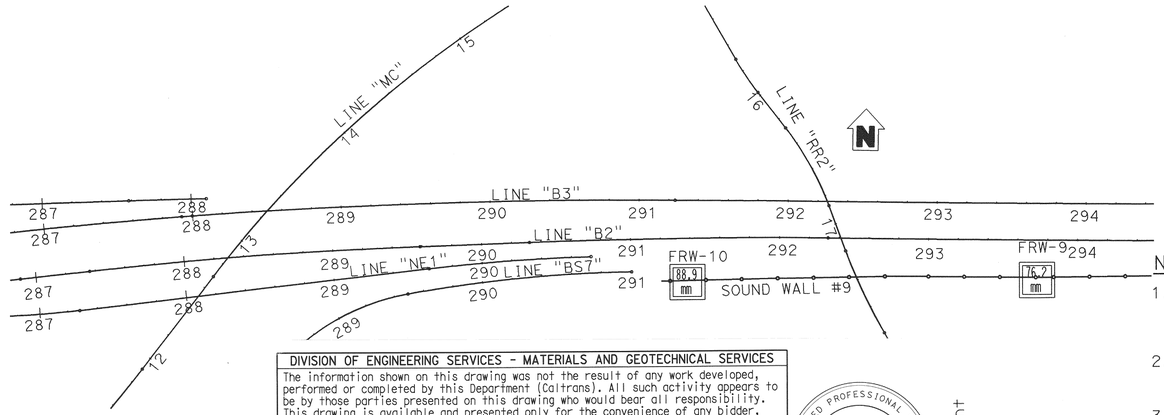
Alameda County Transportation Improvement Authority
426 17th Street, Suite 100
Oakland, CA 94612

Fugro West, Inc.
1000 Broadway, Suite 200
Oakland, CA 94607

To get to the Caltrans web site, go to: http://www.dot.ca.gov



NOTE: Classification of earth material as shown on this sheet is based upon field inspection and is not to be construed to imply mechanical analysis.



DIVISION OF ENGINEERING SERVICES - MATERIALS AND GEOTECHNICAL SERVICES

The information shown on this drawing was not the result of any work developed, performed or completed by this Department (Caltrans). All such activity appears to be by those parties presented on this drawing who would bear all responsibility. This drawing is available and presented only for the convenience of any bidder, contractor or other interested party. It should be understood that Caltrans assumes no responsibility with respect to the sufficiency, accuracy, completeness, or interpretation set forth therein or any other aspect of the information shown on this drawing.

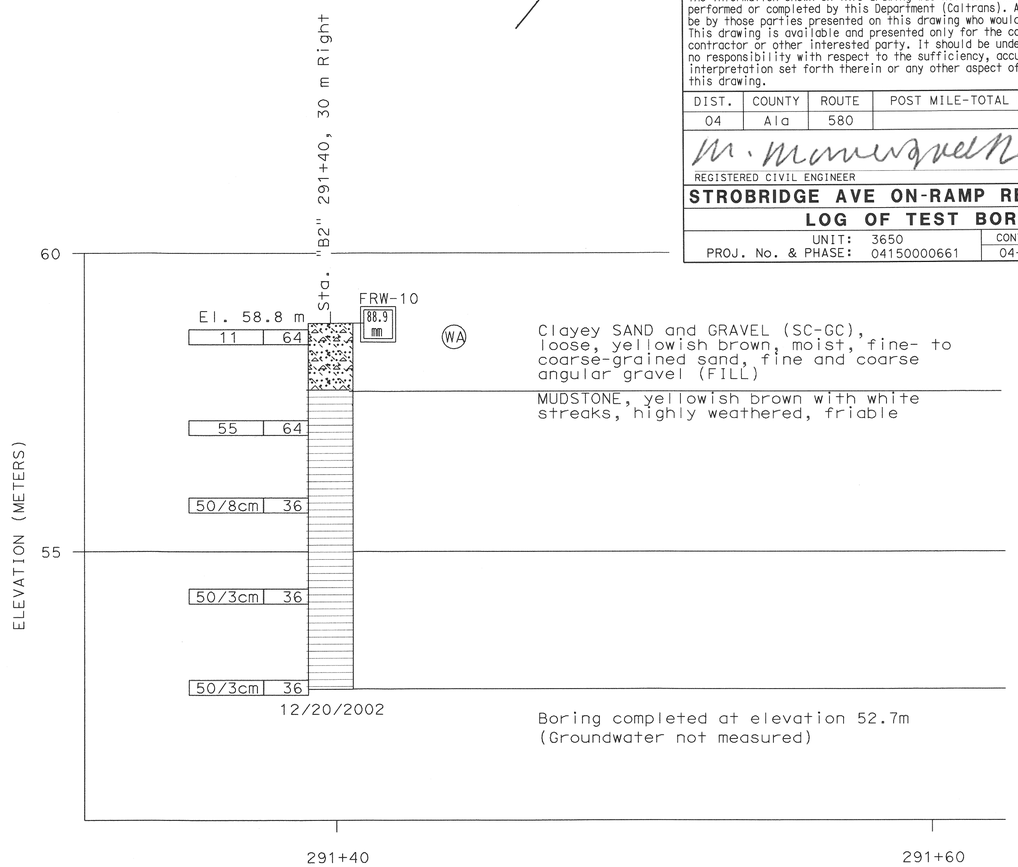
DIST.	COUNTY	ROUTE	POST MILE-TOTAL PROJECT	Sheet No.	Total Sheets
04	Ala	580			

M. Momenzadeh 11/17/2015
REGISTERED CIVIL ENGINEER DATE

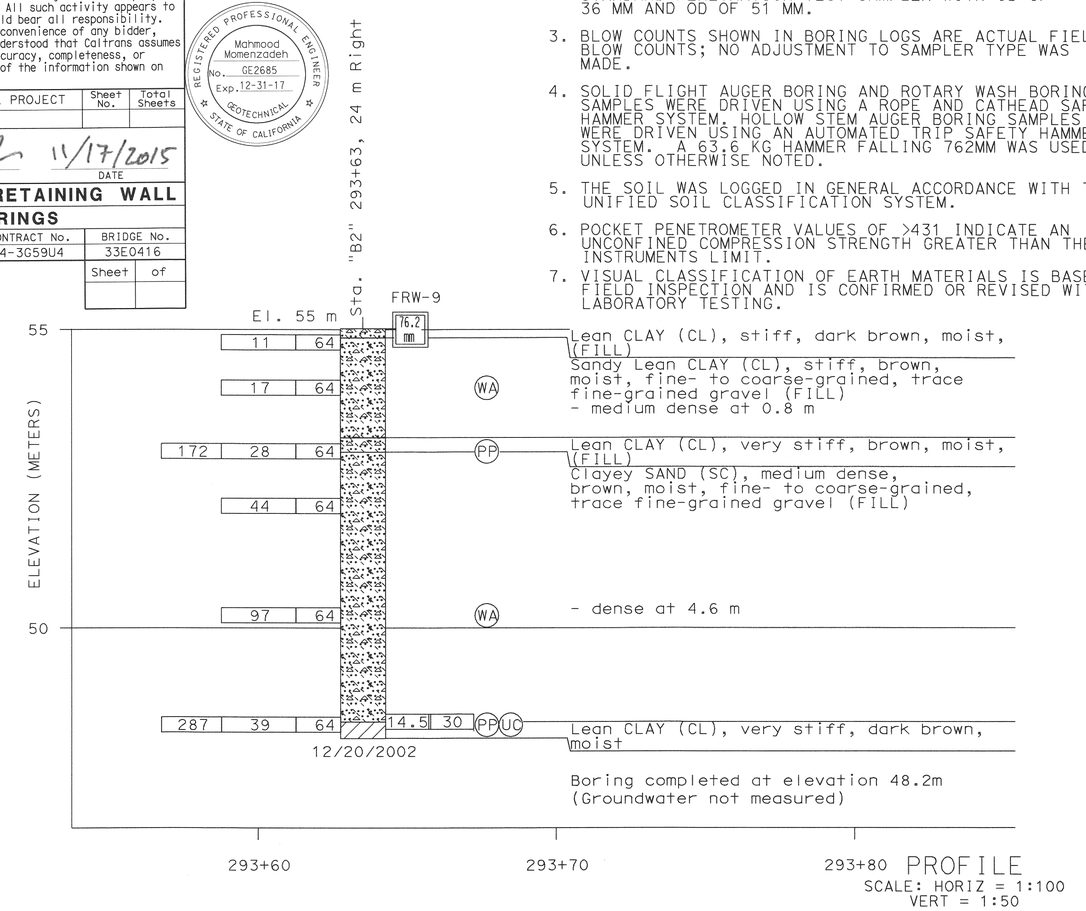
REGISTERED PROFESSIONAL ENGINEER Mahmood Momenzadeh No. GE2685 Exp. 12-31-17 GEOTECHNICAL STATE OF CALIFORNIA

STROBRIDGE AVE ON-RAMP RETAINING WALL
LOG OF TEST BORINGS

UNIT: 3650	CONTRACT No.	BRIDGE No.
PROJ. No. & PHASE: 04150000661	04-3G59U4	33E0416
	Sheet	of



PROFILE
SCALE: HORIZ = 1:100
VERT = 1:50



PROFILE
SCALE: HORIZ = 1:100
VERT = 1:50

NOTES:

1. 64 MM DIAMETER SAMPLES WERE RETRIEVED USING A MODIFIED CALIFORNIA SAMPLER WITH AN INSIDE DIAMETER (ID) OF 64 MM AND AN OUTSIDE DIAMETER (OD) OF 76 MM.
2. 36 MM DIAMETER SAMPLES WERE RETRIEVED USING A STANDARD PENETRATION TEST SAMPLER WITH ID OF 36 MM AND OD OF 51 MM.
3. BLOW COUNTS SHOWN IN BORING LOGS ARE ACTUAL FIELD BLOW COUNTS; NO ADJUSTMENT TO SAMPLER TYPE WAS MADE.
4. SOLID FLIGHT AUGER BORING AND ROTARY WASH BORING SAMPLES WERE DRIVEN USING A ROPE AND CATHEAD SAFETY HAMMER SYSTEM. HOLLOW STEM AUGER BORING SAMPLES WERE DRIVEN USING AN AUTOMATED TRIP SAFETY HAMMER SYSTEM. A 63.6 KG HAMMER FALLING 762MM WAS USED UNLESS OTHERWISE NOTED.
5. THE SOIL WAS LOGGED IN GENERAL ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM.
6. POCKET PENETROMETER VALUES OF >431 INDICATE AN UNCONFINED COMPRESSION STRENGTH GREATER THAN THE INSTRUMENTS LIMIT.
7. VISUAL CLASSIFICATION OF EARTH MATERIALS IS BASED ON FIELD INSPECTION AND IS CONFIRMED OR REVISED WITH LABORATORY TESTING.

** FOR KILOMETER POST AND BRIDGE NUMBER, SEE "GENERAL PLAN NO. 1" SHEET.

SW-42

EMIL VERGARA DESIGN OVERSIGHT	DRAWN BY	M FILLINGIM	R STORESUND FIELD INVESTIGATION BY:
SIGN OFF DATE	CHECKED BY	M BAJUNIEMI	DATE: 12/20/02

PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION

R STORESUND
PROJECT ENGINEER

BRIDGE NO. **
KILOMETER POST **

SOUND WALL NO. 9
LOG OF TEST BORINGS

CU 04257
EA 249041

DISREGARD PRINTS BEARING EARLIER REVISION DATES

REVISION DATES (PRELIMINARY STAGE ONLY) 3/13/03 5/28/04 6/18/04 04/01/05

SHEET OF

GEOTECHNICAL LOG OF TEST BORINGS SHEET (METRIC) (REV 2/1/00)

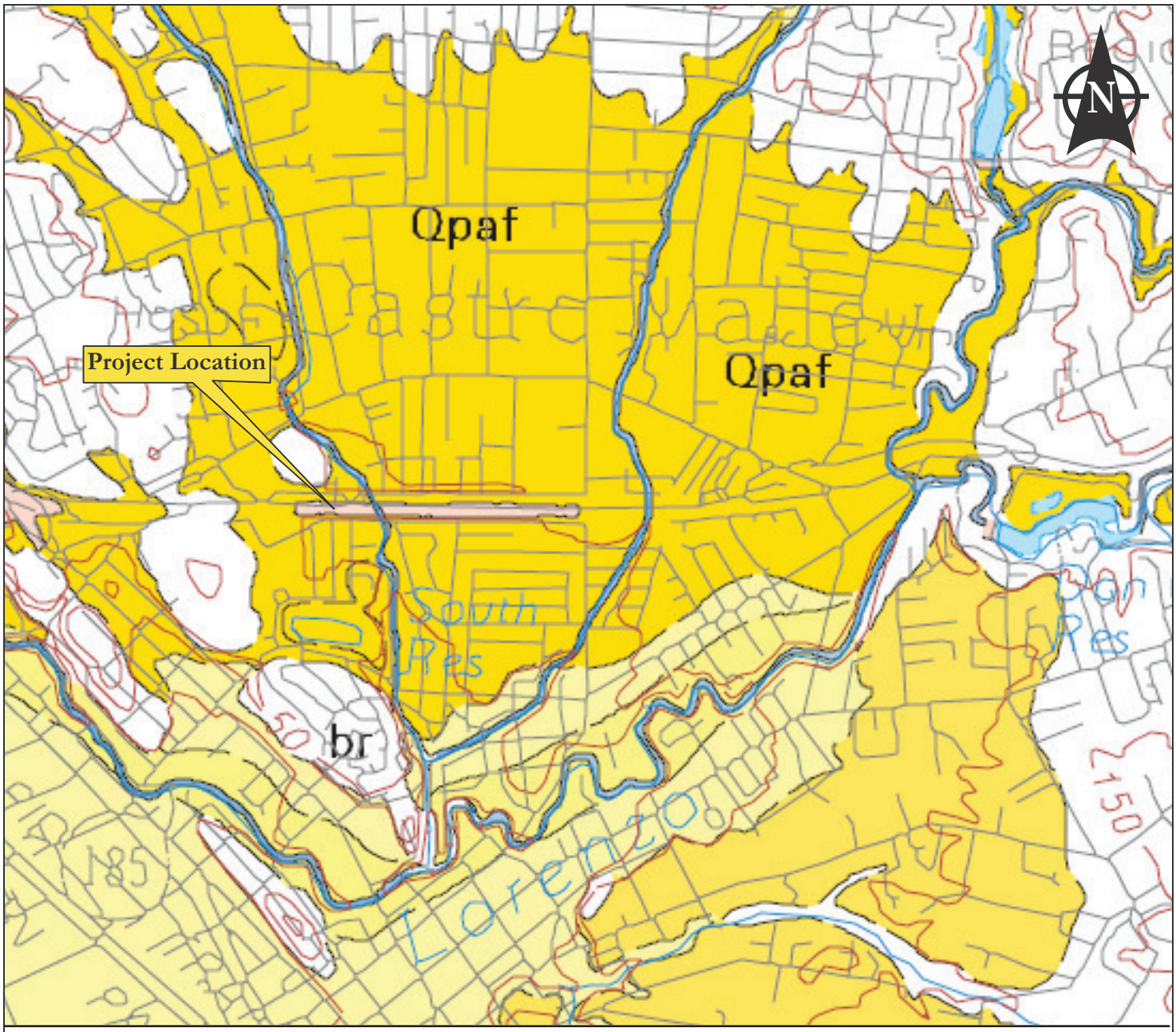
ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS 0 10 20 30 40 50 60 70 80 90 100

FILE => 424904rj006.dgn

USERNAME => trrichf DATE PLOTTED => 20-DEC-2005 TIME PLOTTED => 10:19

Appendix C

Geologic and Seismic Maps



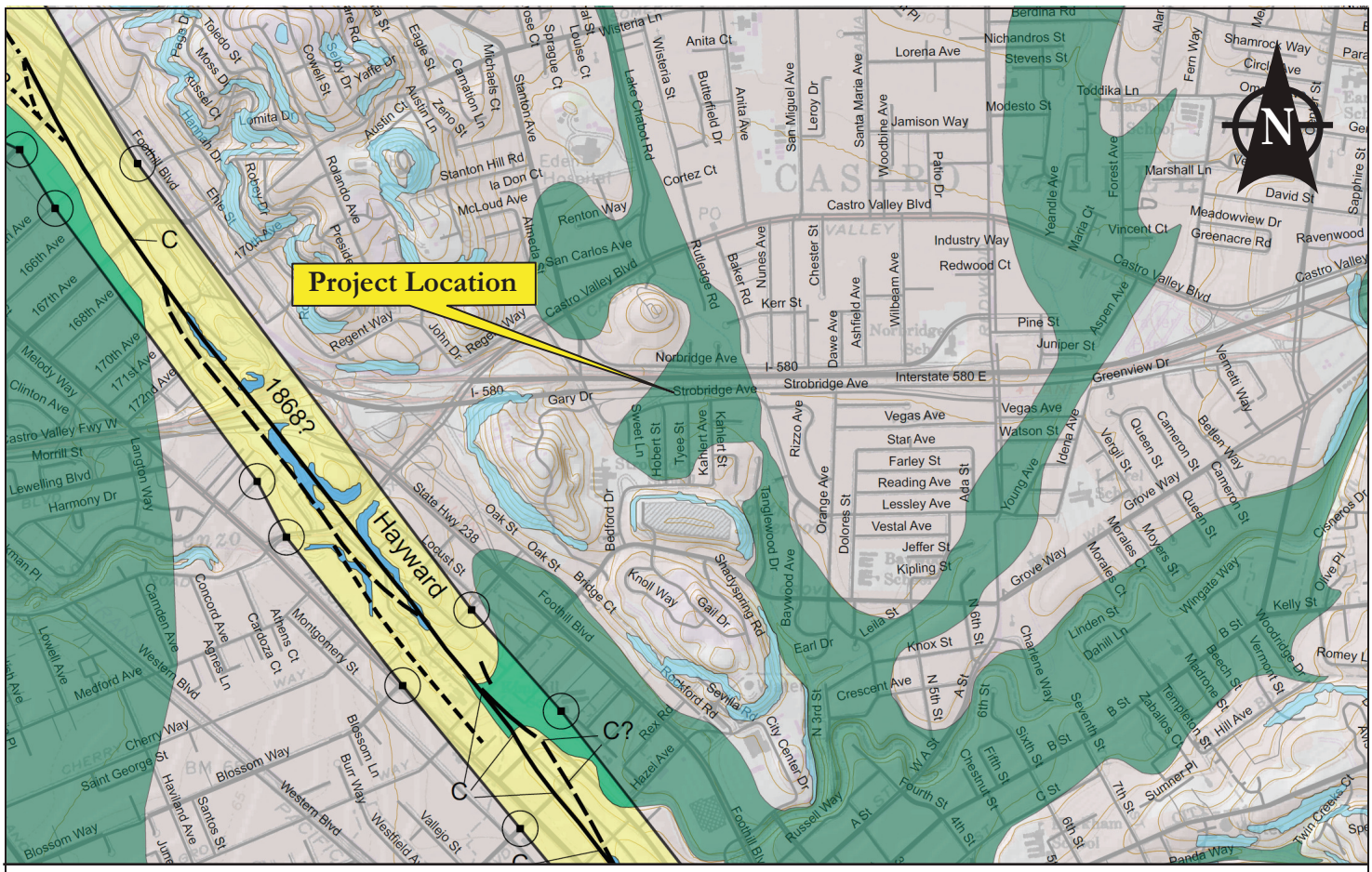
LEGEND

	artificial fill
Qpaf	Alluvial Fans and Fluvial Deposits
br	Bedrock

Base: Quaternary Geology of Alameda County and Surrounding Areas, California: Derived from the Digital Database Open-File 97-97 (Helley and Graymer, 1997)

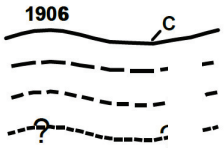
Not to scale

Caltrans	**MVP RETAINING WALL HIGHWAY 580 PM 30.3 ALAMEDA COUNTY, CALIFORNIA**	**VICINITY GEOLOGIC MAP**
	EFIS#: 0415000066 / **DECEMBER 2014**	**FIGURE 3**

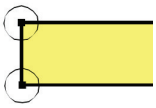


LEGEND

Liquefaction
Areas where historical occurrence of liquefaction, or local geological, geotechnical and ground water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693(c) would be required.



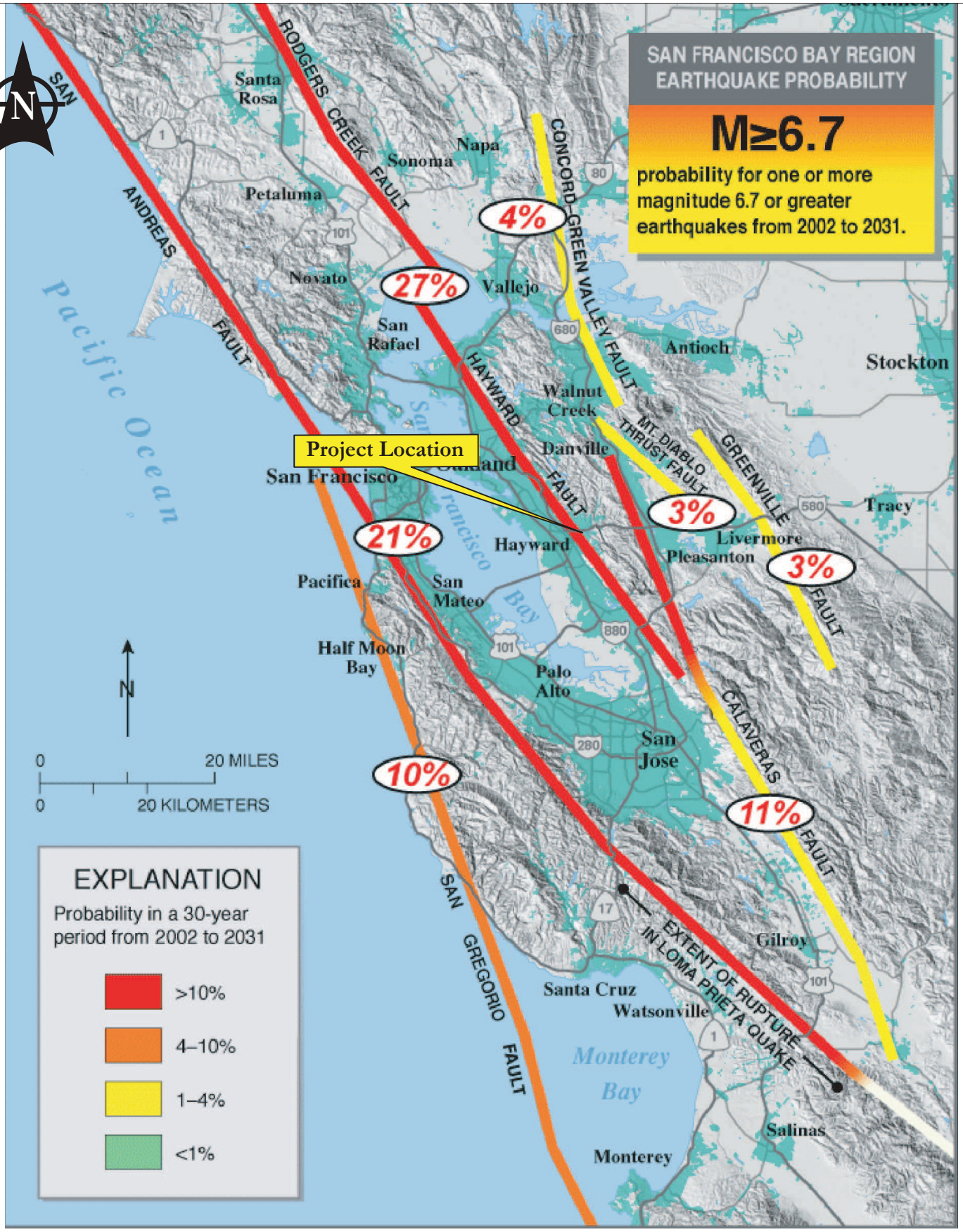
Active Fault Traces
Faults considered to have been active during Holocene time and to have potential for surface rupture; solid line where accurately located,
long dash where approximately located, short dash where inferred, dotted where concealed; query (?) indicates additional uncertainty. Evidence of historic offset indicated by year of earthquake-associated event or



Earthquake Fault Zones
Zones are areas delineated as straight-line segments that connect encircled turning points encompassing active faults that constitute a potential hazard to structures from surface faulting or fault creep such that avoidance as defined in Public Resources Code Section 2621.5(a) would be required.

Base: State of California Seismic Hazard Zone Map for the Hayward 7.5 Minute Quadrangle, CGS 2012.
Scale: 1 inch = 2,000 feet

Caltrans	MVP RETAINING WALL HIGHWAY 580 PM 30.3 ALAMEDA COUNTY, CALIFORNIA	EARTHQUAKE FAULT HAZARD AND STATE SEISMIC HAZARD MAP
	EFIS#: 0415000066 — DECEMBER 2014	FIGURE 4



Caltrans	MVP RETAINING WALL HIGHWAY 580 PM 30.3 ALAMEDA COUNTY, CALIFORNIA	SF BAY REGION EARTHQUAKE PROBABILITYY MAP
	EFIS#: 0415000066 — DECEMBER 2014	FIGURE 5

PREPARED FOR:
CALIFORNIA DEPARTMENT OF TRANSPORTATION
DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING
111 GRAND AVENUE, MS8C
OAKLAND, CA 94612

PREPARED BY:
GEOCON CONSULTANTS, INC.
6671 BRISA STREET
LIVERMORE, CA 94550

GEOCON PROJECT NO. E8721-02-38
CALTRANS EA 04-3G59U1
PROJECT # 04-1500-0066-1

FEBRUARY 2016

TABLE OF CONTENTS

PRELIMINARY SITE INVESTIGATION REPORT Page

REPORT LIMITATIONS i

1.0 INTRODUCTION 1
- 1.1 Project Description and Proposed Improvements 1
- 1.2 General Objectives 1

2.0 BACKGROUND 1
- 2.1 Hazardous Waste Determination Criteria 1
- 2.2 DTSC Variance 2
- 2.3 California Human Health Screening Levels 3
- 2.4 Environmental Screening Levels 4

3.0 SCOPE OF SERVICES 5
- 3.1 Pre-field Activities 5
- 3.2 Field Activities 5

4.0 INVESTIGATIVE METHODS 6
- 4.1 Sampling Procedures 6
- 4.2 Laboratory Analyses 6
- 4.3 Laboratory QA/QC 7

5.0 INVESTIGATIVE RESULTS 7
- 5.1 Subsurface Conditions 7
- 5.2 Laboratory Analytical Results 8
- 5.3 Laboratory Quality Assurance/Quality Control 8
- 5.4 Statistical Evaluation for Lead Detected in Soil Samples 9
  - 5.4.1 Calculating the UCLs for the Arithmetic Mean 9
  - 5.4.2 Correlation of Total and WET Lead 10

6.0 CONCLUSIONS 12
- 6.1 Lead in Soil 12
  - 6.1.1 Strobridge Avenue Onramp to Eastbound (EB) I-580 (borings S1A to S3C) 12
  - 6.1.2 Castro Valley Boulevard Onramp to Westbound (WB) I-580 (borings C1A to C5B) 12
  - 6.1.3 Grant Line Road Onramp to WB I-580 (borings G1A to G10B) 12
  - 6.1.4 I-205 Onramp to WB I-580 at Midway Road (borings M1 to M4) 12
  - 6.1.5 Site (All borings) 13
- 6.2 Remaining CAM 17 Metals in Soil 13
- 6.3 Organic Compounds in Soil 14
- 6.4 Worker Protection 15

TABLE OF CONTENTS
(Continued)

FIGURES
1. Key Map
2 to 5 Site Plans

TABLES
1. Boring Coordinates
2. Summary of Lead and pH Results
3. Summary of CAM 17 Metals Results
4. Summary of Petroleum Hydrocarbons Results
5a to
5b. Summary of Lead Statistical Analysis

APPENDICES
A. DTSC Variance
B. Laboratory Reports and Chain-of-Custody Documentation
C. Metal and Hydrocarbon Statistical Analysis

REPORT LIMITATIONS

This report has been prepared exclusively for the State of California Department of Transportation (Caltrans) District 4. The information contained herein is only valid as of the date of the report and will require an update to reflect additional information obtained.

This report is not a comprehensive site characterization and should not be construed as such. The findings as presented in this report are predicated on the results of the limited sampling and laboratory testing performed. In addition, the information obtained is not intended to address potential impacts related to sources other than those specified herein. Therefore, the report should be deemed conclusive with respect to only the information obtained. We make no warranty, express or implied, with respect to the content of this report or any subsequent reports, correspondence or consultation. Geocon Consultants, Inc. strived to perform the services summarized herein in accordance with the local standard of care in the geographic region at the time the services were rendered.

The contents of this report reflect the views of the author who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the State of California or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

GEOCON CONSULTANTS, INC.

Luann Beadle
Project Scientist

Richard Day, CEG, CHG
Senior Geologist

PROFESSIONAL GEOLOGIST
RICHARD W. DAY
No. 5479
Exp. 09-30-17
STATE OF CALIFORNIA

CALIFORNIA DEPARTMENT OF TRANSPORTATION – DISTRICT 4
OFFICE OF ENVIRONMENTAL ENGINEERING

Reviewed By:	Recommended By:	Approved By:
Nandini Vishwanath Task Order Manager	Chris Wilson, PE District Branch Chief	Allen Baradar, PE District Office Chief

PROJECT TEAM

Contact	Affiliation	Responsibility
Romy Fuentes, PE 510.622.8803 510.622.0198 fax romy_f_fuentes@dot.ca.gov	Caltrans – District 4 Consultant Services 111 Grand Avenue, MS7B Oakland, CA 94612	Contract Manager
Nandini Vishwanath, PE 510.286.5654 510.286.5639 fax nandini.vishwanath@dot.ca.gov	Caltrans – District 4 Environmental Engineering 111 Grand Avenue, MS8C Oakland, CA 94612	Task Order Managers
Richard Day, CEG, CHG Luann Beadle 925.371.5900 925.371.5915 fax geoconliv@geoconinc.com	Geocon Consultants, Inc. 6671 Brisa Street Livermore, CA 94550 *(Caltrans Consultant)*	Project Management Sample Collection Field QA/QC Investigation Report
Doug Krause, CIH 530.758.6397 530.758.6506 fax dskrause@pacbell.net	Krause & Associates 216 F. Street, Suite 162 Davis, CA 95616 (*Geocon Subconsultant*)	Health and Safety
Diane Galvan 562.989.4045 562.989.4040 fax diane@atlglobal.com	Advanced Technology Laboratories 1510 E. 33rd Street Signal Hill, CA 90807 *(Geocon Subcontractor)*	Soil Sample Analysis
Glen Gesmundo 702.307.2659 702.307.2691 fax glen@assetlaboratories.com	Asset Laboratories 3151 W. Post Road Las Vegas, NV 89118 *(Geocon Subcontractor)*	Soil Sample Analysis
Chris Pruner 925.313.5800 925.313.0302 cpruner@greggdrilling.com	Gregg Drilling 950 Howe Road Martinez, CA 94553 *(Geocon Subcontractor)*	Drilling

PRELIMINARY SITE INVESTIGATION REPORT

1.0 INTRODUCTION

This Preliminary Site Investigation Report for the traffic operations system (TOS) and maintenance vehicle pullout (MVP) installation project along Interstate 580 (I-580) in Alameda County, California was prepared by Geocon Consultants, Inc. (Geocon) under California Department of Transportation (Caltrans) Contract No. 04A4336 and Task Order No. 38 (TO-38), EA 04-3G59U1.

1.1 Project Description and Proposed Improvements

The project proposes to install one MVP and ramp metering systems at various locations along I-580 in the city of Castro Valley and in Alameda County east of Livermore, California. Work will take place within Caltrans right-of-way. The project area is depicted on the attached Key Map, Figure 1.

The site investigation was performed in the following areas:

- Strobridge Avenue Onramp to Eastbound (EB) I-580 (borings S1A to S3C) – Figure 2
- Castro Valley Boulevard Onramp to Westbound (WB) I-580 (borings C1A to C5B) - Figure 3
- Grant Line Road Onramp to WB I-580 (borings G1A to G10B) – Figure 4
- I-205 Onramp to WB I-580 at Midway Road (borings M1 to M4) – Figure 5

1.2 General Objectives

The purpose of the site investigation was to evaluate concentrations of California Assessment Manual 17 (CAM 17) metals, particularly aerially-deposited lead (ADL), total petroleum hydrocarbons as diesel (TPHd), as motor oil (TPHmo), and as gasoline (TPHg), and benzene, toluene, ethylbenzene, and total xylenes (BTEX) in soil within the project limits.

The information obtained from this investigation will be used by Caltrans to evaluate soil handling practices, worker health and safety, and soil reuse and disposal options.

2.0 BACKGROUND

2.1 Hazardous Waste Determination Criteria

Regulatory criteria to classify a waste as California hazardous for handling and disposal purposes are contained in the CCR, Title 22, Division 4.5, Chapter 11, Article 3, §66261.24. Criteria to classify a waste as Resource, Conservation, and Recovery Act (RCRA) hazardous are contained in Chapter 40 of the Code of Federal Regulations (40 CFR), Section 261.

For waste containing metals, the waste is classified as California hazardous when: 1) the representative total metal content equals or exceeds the respective Total Threshold Limit Concentration (TTLC); or 2) the representative soluble metal content equals or exceeds the respective Soluble Threshold Limit Concentration (STLC) based on the standard Waste Extraction Test (WET). A waste has the potential of exceeding the STLC when the waste's total metal content is greater than or equal to 10 times the respective STLC value since the WET uses a 1:10 dilution ratio. Hence, when a total metal is detected at a concentration greater than or equal to 10 times the respective STLC, and assuming that 100 percent of the total metals are soluble, soluble metal analysis is required. A material is classified as RCRA hazardous, or Federal hazardous, when the representative soluble metal content equals or exceeds the Federal regulatory level based on the Toxicity Characteristic Leaching Procedure (TCLP).

The above regulatory criteria are based on chemical concentrations. Wastes may also be classified as hazardous based on other criteria such as ignitability and corrosivity; however, for the purposes of this investigation, toxicity (i.e., representative lead concentrations) is the primary factor considered for waste classification since waste generated during the construction activities would not likely warrant testing for ignitability or other criteria. Waste that is classified as either California hazardous or RCRA hazardous requires management as a hazardous waste.

2.2 DTSC Variance

The DTSC issued a statewide Variance effective July 1, 2009, regarding the management of ADL-impacted soils within Caltrans right-of-way. Under the Variance, soil that is classified as a non-RCRA hazardous waste, based primarily on ADL content, may be suitable for reuse within Caltrans right-of-way. ADL soil that is classified as a RCRA hazardous waste is not eligible for reuse under the Variance and must be disposed of as a RCRA hazardous waste (Caltrans Type Z-3).

ADL soil reused under the Variance must always be at least five feet above the highest groundwater elevation and, depending on lead concentrations, must be covered with at least one foot of non-hazardous soil or a pavement structure. The ADL soil may not be placed in areas where it might contact groundwater or surface water (such as streams and rivers), and must be buried in locations that are protected from erosion that may result from storm water run-on and run-off.

Review of the statewide Variance indicates the following conditions regarding the reuse and management of ADL-impacted soil as fill material for construction and maintenance operations. If ADL soil meets the Variance criteria but is not intended to be reused within Caltrans right-of-way, then the excavated soil must be disposed of as a California hazardous waste (Caltrans Type Z-2). A copy of the Variance is presented as Appendix A.

Caltrans Type Y-1: ADL soil exhibiting a total lead concentration less than or equal to 1,411 milligrams per kilogram (mg/kg), a DI-WET (WET using deionized water as extractant) lead concentration less than or equal to 1.5 milligrams per liter (mg/l), and a pH value greater than or equal to 5.5 may be reused within the same Caltrans corridor and must be covered with at least one foot of non-hazardous soil.

Caltrans Type Y-2: ADL soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a DI-WET lead concentration less than or equal to 1.5 mg/l, and a pH value greater than 5 and less than 5.5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

ADL soil exhibiting a total lead concentration less than or equal to 1,411 mg/kg, a DI-WET lead concentration greater than 1.5 mg/l and less than or equal to 150 mg/l, and a pH value greater than 5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

ADL soil exhibiting a total lead concentration greater than 1,411 mg/kg and less than or equal to 3,397 mg/kg, a DI-WET lead concentration less than or equal to 150 mg/l, and a pH value greater than 5 may be reused within the same Caltrans corridor and must be covered and protected from infiltration by a pavement structure.

Caltrans Type Z-2: ADL soil exhibiting a total lead concentration greater than 3,397 mg/kg, a DI-WET lead concentration greater than 150 mg/l, or a pH value less than or equal to 5 is not eligible for reuse under the Variance and must be disposed of as a California hazardous waste.

Caltrans Type Z-3: ADL soil exhibiting a TCLP lead concentration greater than or equal to 5 mg/l is not eligible for reuse under the Variance and must be disposed of as a RCRA hazardous waste.

2.3 California Human Health Screening Levels

The California Environmental Protection Agency (Cal/EPA) has prepared technical reports entitled *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties* (Cal/EPA, January 2005) and *Revised California Human Health Screening Levels for Beryllium* (Cal/EPA, March 2009) and *Lead* (Cal/EPA, September 2009), which present CHHSLs for soil, shallow soil gas, and indoor air to assist in evaluating sites impacted by releases of hazardous chemicals.

The CHHSLs are concentrations of 54 hazardous chemicals including Title 22 metals that Cal/EPA considers to be below thresholds of concern for risks to human health. The CHHSLs were developed

by the Office of Environmental Health Hazard Assessment (OEHHA) on behalf of Cal/EPA. The thresholds of concern used to develop the CHHSLs are an excess lifetime cancer risk of one in a million and a hazard quotient or 1.0 for non-cancer effects. Under most circumstances, the presence of a chemical at concentrations below its respective CHHSL can be assumed to not pose a significant risk. The presence of a chemical at concentrations above a CHHSL does not indicate that adverse impacts to human health are occurring or will occur but suggests that further evaluation is warranted (Cal/EPA, January 2005).

The CHHSLs for residential and industrial/commercial land use were used for comparison on Table 3.

2.4 Environmental Screening Levels

The San Francisco Bay Regional Water Quality Control Board (SFRWQCB) has prepared a technical report entitled *User's Guide: Derivation and Application of Environmental Screening Levels, Interim Final 2013* (updated December 2013), which presents Environmental Screening Levels (ESLs) for over 100 commonly found contaminants in soil, groundwater, soil gas, and surface water, to assist in evaluating sites impacted by releases of hazardous chemicals. "The ESLs are considered to be protective for typical bay area sites. Under most circumstances, …the presence of a chemical in soil, soil gas, or groundwater at concentrations below the corresponding ESL can be assumed to not pose a significant threat to human health, water resources, or the environment." (SFRWQCB, December 2013). ESLs are risk assessment tools and are "not intended to serve as a rule to determine if a waste is hazardous under the state or federal regulations."

Residential and commercial/industrial land use ESLs are commonly used by contractors, soil trucking companies, and private and commercial land owners as default acceptance criteria to evaluate suitability of import soil material. The following ESL tables were used for this characterization:

- Table A. Shallow Soil (≤3m bgs), Groundwater is a Current or Potential Source of Drinking Water
- Table K-3. Direct Exposure Soil Screening Levels, Construction/Trench Worker Exposure Scenario

The respective ESLs are listed at the end of Tables 3 and 4 for comparative purposes.

3.0 SCOPE OF SERVICES

The scope of services performed under TO-38, EA 04-3G59U1 included the following:

3.1 Pre-field Activities

- Prepared a Preliminary Site Investigation Workplan and Health and Safety Plan, dated October 2015.
- Retained the services of Gregg Drilling.
- Notified Underground Service Alert (USA) at least 48 hours prior to field activities.
- Retained the services of Asset Laboratories (Asset) in Las Vegas, Nevada, and Advanced Technology Laboratories (ATL) in Signal Hill, California, Caltrans-approved and California-certified analytical laboratories, to perform the chemical analyses of soil samples.
- Retained the services of, a Caltrans-approved and California-certified analytical laboratory, to perform the chemical analyses of soil samples.

3.2 Field Activities

Our field investigation was performed on October 21 and 30, 2015, by Geocon staff. The following field activities were performed during the sampling efforts:

- Advanced 24 soil borings at the project location using hand-auger drilling techniques. The borings were advanced to a maximum depth of 5.5 feet.
- Advanced 20 borings at the project location using direct-push drilling techniques. The borings were advanced to a maximum depth of 2.5 feet.

The following samples were collected:

- 24 for CAM 17 metals analysis
- 61 for total lead analysis
- 17 for TPHd and TPHmo analyses
- 17 samples for TPHg analysis
- 8 samples for BTEX analysis
- 10 samples for pH analysis
- 1 equipment rinse blank sample for total lead analysis

All samples were transported to Asset and ATL for analysis under standard chain-of-custody (COC) documentation.

4.0 INVESTIGATIVE METHODS

4.1 Sampling Procedures

Soil samples were collected from the 44 boring locations identified by the Caltrans TO Manager using hand-auger drilling and direct-push drilling techniques. Boring coordinates are presented on Table 1. A Vicinity Map, Figure 1, shows the project location, and borings locations are shown on the Site Plan, Figures 2 through 5.

Soil samples collected using a hand auger were transferred from the hand-auger bucket to stainless steel tubes or resealable plastic bags.

Soil samples were collected using a direct-push sample rig by hydraulically advancing a two-inch-diameter, four-foot-long stainless steel core-barrel sampler lined with an acetate sample tube into undisturbed soil. The target sample depth was collected for laboratory analysis by cutting an approximately six-inch-long section of the acetate tube and capping the ends with Teflon tape and plastic end caps.

Sample containers were labeled, placed in a chest cooled with ice as necessary, and transported to a Caltrans-approved, certified environmental laboratory using standard COC documentation. Soil borings were back-filled to surface with soil cuttings.

Geocon provided QA/QC procedures during the field activities. These procedures included washing the sampling equipment with a Liqui-Nox® solution followed by a double rinse with deionized water. Decontamination water was disposed of to the ground surface within Caltrans right-of-way in a manner not to create runoff, away from drain inlets or potential water bodies.

4.2 Laboratory Analyses

Laboratory analyses were performed by Asset and ATL under standard turnaround-times. The laboratory reports and COC documentation are included in Appendix B.

The samples were analyzed as follows:

- 61 samples for total lead using EPA Test Method 6010 ICAP.
- 24 samples for CAM 17 metals using EPA Test Methods 6010 ICAP and 7471.
- 5 samples with a total chromium concentration equal to or exceeding 50 mg/kg (i.e. equal to or exceeding 10 times the STLC of 5.0 mg/l) were further analyzed for WET chromium.
- 8 samples with total lead concentrations equal to or exceeding 50 mg/kg (i.e. equal to or exceeding 10 times the STLC of 5.0 mg/l) were further analyzed for WET lead.

- 2 samples with WET lead concentrations equal to or exceeding 5 mg/l (i.e. equal to or exceeding the STLC of 5.0 mg/l) and total lead equal to or exceeding 100 mg/kg were further analyzed for DI-WET and TCLP lead.
- 2 samples with a total nickel concentration equal to or exceeding 200 mg/kg (i.e. equal to or exceeding 10 times the STLC of 20 mg/l) were further analyzed for WET nickel.
- 17 samples for TPHd using EPA Test Method 8015B.
- 17 samples for TPHmo using EPA Test Method 8015B.
- 15 samples for TPHg using EPA Test Method 8015B.
- 8 samples for BTEX using EPA Test Method 8021.
- 10 samples for pH using EPA Test Method 9045C.

The equipment rinse blank sample was analyzed for total lead using EPA Test Method 6010 ICAP.

4.3 Laboratory QA/QC

QA/QC procedures were performed for each method of analysis with specificity for each analyte listed in the test method's QA/QC. The laboratory QA/QC procedures included the following:

- One method blank for every 10 samples, batch of samples or type of matrix, whichever was more frequent.
- One sample analyzed in duplicate for every 10 samples, batch of samples or type of matrix, whichever was more frequent.
- One spiked sample for every 10 samples, batch of samples or type of matrix; whichever was more frequent, with spike made at 10 times the detection limit or at the analyte level.

Prior to submitting the samples to the laboratories, the COC documentation was reviewed for accuracy and completeness.

5.0 INVESTIGATIVE RESULTS

5.1 Subsurface Conditions

Borings were completed using hand-auger and direct-push drilling techniques. Soil in the Castro Valley area consisted of predominately of hard, dry, silty sand with gravels to a depth of 2 feet, and hard, moist, brown sandy clay with gravel to 5.5 feet. Soil in the Grant Line Road and Midway Road areas consisted of tan, dry, rocky clay and shale outcropping to a depth of 2.5 feet. Refusal was encountered in several of the borings. Groundwater was not encountered.

5.2 Laboratory Analytical Results

The analytical results are summarized in Tables 2 through 4 and are summarized below:

- The following metals were not detected above their respective laboratory reporting limits: antimony, beryllium, cadmium, silver, and thallium.
- Chromium, lead, and nickel were reported at concentrations equal to or exceeding 10 times their respective STLCs.
- Total chromium was reported at concentrations ranging from 14 mg/kg to 280 mg/kg.
- WET chromium was not detected at or above the reporting limit of 1.0 mg/l.
- Total lead was reported at concentrations ranging from 1.8 mg/kg to 210 mg/kg.
- WET lead was reported at concentrations ranging from 0.48 mg/l to 12 mg/l.
- TCLP lead was reported at concentrations of 0.019 mg/l and 0.035 mg/l.
- Total nickel was reported at concentrations ranging from 10 mg/kg to 350 mg/kg.
- WET nickel was reported at concentrations of 2.0 mg/l and 3.4 mg/l.
- Remaining CAM 17 metals were reported in the samples at total concentrations below 10 times their respective STLCs.
- TPHd was reported at concentrations ranging from not detected (laboratory reporting limit of 1.0 mg/kg) to 230 mg/kg.
- TPHmo was reported at concentrations ranging from not detected (laboratory reporting limit of 1.0 mg/kg) to 660 mg/kg.
- TPHg was not detected at or above the laboratory reporting limit of 1.0 mg/kg.
- BTEX were not detected at or above the laboratory reporting limits.
- pH ranged from 7.6 to 8.8.

5.3 Laboratory Quality Assurance/Quality Control

We reviewed the QA/QC results provided with the laboratory analytical reports. The data indicate non-detect results for the method blanks at or above reporting limits. The surrogate was diluted out for five samples. The surrogate recovery was below acceptance limits for one sample. Reanalysis confirms low recovery caused by matrix effect. The RPD was outside of acceptance criteria for several samples; therefore, the calculations were based on raw values. The Matrix Spike (MS) recovery was outside of acceptance limits for several QA samples. The analytical batches were validated by the laboratory control samples.

5.4 Statistical Evaluation for Lead Detected in Soil Samples

Statistical methods were applied to the total lead data to evaluate: 1) the upper confidence limits (UCLs) of the arithmetic means of the total lead concentrations for each sampling depth; and 2) if an acceptable correlation between total and WET lead concentrations exists that would allow the prediction of WET lead concentrations based on calculated UCLs.

5.4.1 Calculating the UCLs for the Arithmetic Mean

The upper one-sided 90% and 95% UCLs of the arithmetic mean are defined as the values that, when calculated repeatedly for randomly drawn subsets of site data, equal or exceed the true mean 90% and 95% of the time, respectively. Statistical confidence limits are the classical tool for addressing uncertainties of a distribution mean. The UCLs of the arithmetic mean concentration are used as the mean concentrations because it is not possible to know the true mean due to the essentially infinite number of soil samples that could be collected from a site. The UCLs therefore account for uncertainties due to limited sampling data. As data become less limited at a site, uncertainties decrease, and the UCLs move closer to the true mean.

Non-parametric bootstrap techniques were used to calculate the UCLs. The bootstrap test results are included in Appendix B. The following table presents the calculated UCLs and statistics for the site:

Strobridge Avenue Onramp to Eastbound (EB) I-580 (borings S1A to S3C)

Sample Interval (feet)	Total Lead 90% UCL (mg/kg)	Total Lead 95% UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	10.5	10.7	9.51	4.6	12
1.5 to 2	9.58	9.93	8.42	3.0	14
2 to 3	NC	NC	7.6	6.3	8.9
5 to 5.5	NC	NC	6.5	3.8	9.1

NC - Not calculated due to insufficient data population

Castro Valley Boulevard Onramp to Westbound (WB) I-580 (borings C1A to C5B)

Sample Interval (feet)	Total Lead 90% UCL (mg/kg)	Total Lead 95% UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	13.7	14.2	12.1	4.9	17
1.5 to 2	11.1	11.4	9.96	7.2	15

Grant Line Road Onramp to WB I-580 (borings G1A to G10B)

Sample Interval (feet)	Total Lead 90% UCL (mg/kg)	Total Lead 95% UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	69.4	74	53.3	6.8	210
2 to 2.5	8.09	8.47	6.67	1.8	12.5

I-205 Onramp to WB I-580 at Midway Road (borings M1 to M4)

Sample Interval (feet)	Total Lead 90% UCL (mg/kg)	Total Lead 95% UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	NC	NC	32.5	12	77
1 to 1.5	NC	NC	17.6	9.3	26

Site (All Borings)

Sample Interval (feet)	Total Lead 90% UCL (mg/kg)	Total Lead 95% UCL (mg/kg)	Total Lead Mean (mg/kg)	Total Lead Minimum (mg/kg)	Total Lead Maximum (mg/kg)
0 to 0.5	39.7	42.1	31.7	4.6	210
1 to 1.5	18.2	19.1	14.1	7.2	26
1.5 to 2	9.79	10.0	8.9	3.0	15
2 to 2.5	8.16	8.49	6.79	1.8	12.5

5.4.2 Correlation of Total and WET Lead

Total and corresponding WET lead concentrations are bivariate data with a linear structure. This linear structure should allow for the prediction of WET lead concentrations based on the 95% UCL total lead concentrations presented in the table above.

To estimate the degree of interrelation between total and corresponding WET lead values (x and y, respectively), the *correlation coefficient [r]* is used. The correlation coefficient is a ratio that ranges from +1 to –1. A *correlation coefficient* of +1 indicates a perfect direct relationship between two variables; a *correlation coefficient* of –1 indicates that one variable changes inversely with relation to the other. Between the two extremes is a spectrum of less-than-perfect relationships, including zero, which indicates the lack of any sort of linear relationship at all. The *correlation coefficient* was calculated for 7 (x, y) data points (i.e., soil samples analyzed for both total lead [x] and WET lead [y]) from the site. To achieve an acceptable correlation, the data point with the highest squared residual WET lead result (G-7A-0) was not used in the regression analysis. The resulting *coefficient of determination* (r^2) equaled 0.6396, which yields a corresponding *correlation coefficient* (r) of 0.800.

For the *correlation coefficient* that indicates a linear relationship between total and WET lead concentrations, it is possible to compute the line of dependence or a best-fit line between the two variables. A least squares method was used to find the equation of a best-fit line (regression line) by forcing the y-intercept equal to zero since that is a known point. The equation of the regression line was determined to be $y = 0.0402(x)$, where x represents total lead concentrations and y represents predicted WET lead concentrations.

This equation was used to estimate the expected WET lead concentrations for the total lead UCLs for the data set (see Section 5.4.1). Regression analysis results and a scatter plot depicting the (x, y) data points along with the regression line are included in Appendix B. The predicted WET lead concentrations are summarized in Tables 5a and 5b.

6.0 CONCLUSIONS

6.1 Lead in Soil

6.1.1 Strobridge Avenue Onramp to Eastbound (EB) I-580 (borings S1A to S3C)

Total lead was reported in the samples at concentrations below 50 mg/kg (i.e., below the TTLC of 1,000 mg/kg and below ten times the STLC of 5 mg/l). Therefore, soil excavated to a depth of up to 5.5 feet would be classified as non-hazardous based on lead content.

6.1.2 Castro Valley Boulevard Onramp to Westbound (WB) I-580 (borings C1A to C5B)

Total lead was reported in the samples at concentrations below 50 mg/kg (i.e., below the TTLC of 1,000 mg/kg and below ten times the STLC of 5 mg/l). Therefore, soil excavated to a depth of 2 feet would be classified as non-hazardous based on lead content.

6.1.3 Grant Line Road Onramp to WB I-580 (borings G1A to G10B)

The following table summarizes the predicted waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and predicted WET lead concentrations for data collected from the site. Weighted averages are calculated by using the total lead concentration for each sample depth interval as the value for the underlying interval (unless a sample was collected from the underlying depth interval). The total and WET lead calculations are summarized below and in Table 5a.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 2 ft	69	2.8	74	Non-hazardous
Underlying soil (2 to 2.5 ft)	*8.1*	*0.3*	*8.5*	*Non-hazardous*
0 to 2.5 ft	57	2.3	8.2	Non-hazardous

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data presented in the above table, soil excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content.

6.1.4 I-205 Onramp to WB I-580 at Midway Road (borings M1 to M4)

Soil samples from this location reported a maximum total lead concentration of less than the TTLC of 1,000 mg/kg and a maximum WET lead concentration less than the STLC of 5 mg/l. Accordingly, soil excavated to a depth of 1.5 feet would be classified as non-hazardous based on lead content.

6.1.5 Site (All borings)

The following table summarizes the predicted waste classification for excavated soil based on the calculated weighted averages of the total lead UCLs and predicted WET lead concentrations for data collected from the site. Weighted averages are calculated by using the total lead concentration for each sample depth interval as the value for the underlying interval (unless a sample was collected from the underlying depth interval). The total and WET lead calculations are summarized below and in Table 5b.

Excavation Depth	90% UCL Total Lead (mg/kg)	90% UCL Predicted WET Lead (mg/l)	95% UCL Total Lead (mg/kg)	Waste Classification
0 to 1 ft	39.7	1.6	42.1	Non-hazardous
Underlying soil (1 to 2.5 ft)	*12.1*	*0.5*	*12.5*	*Non-hazardous*
0 to 1.5 ft	32.5	1.3	34.4	Non-hazardous
Underlying soil (1.5 to 2.5 ft)	*9.9*	*0.4*	*9.2*	*Non-hazardous*
0 to 2 ft	26.8	1.1	28.3	Non-hazardous
Underlying soil (2 to 2.5 ft)	*8.2*	*0.3*	*8.5*	*Non-hazardous*
0 to 2.5 ft	23.1	0.9	24.4	Non-hazardous

90% UCL applicable for waste classification and onsite reuse; 95% UCL applicable for risk assessment and offsite disposal

Based on the data presented in the above table, soil excavated to a depth of 2.5 feet would be classified as non-hazardous based on lead content.

6.2 Remaining CAM 17 Metals in Soil

With the exceptions of chromium, nickel, and lead, remaining CAM 17 metals were reported in the samples at total concentrations below 10 times their respective STLCs.

WET chromium was not detected at or above the reporting limit of 1.0 mg/l. Therefore, soil would not be classified as hazardous based on soluble chromium content. WET nickel was reported at a maximum concentration of 3.4 mg/l, below the STLC of 20 mg/l. Therefore, soil would not be classified as hazardous based on nickel content.

The CAM 17 metal concentrations in site soil were compared to ESLs. Arsenic, cobalt, lead, and nickel were reported at concentrations greater than one or more ESL values. Because concentrations of arsenic, cobalt, lead, and nickel exceeded one or more ESL, non-parametric bootstrap techniques were used to calculate the UCLs. The bootstrap test result is included in Appendix C. ESLs, UCLs, and

published background concentrations for arsenic, cobalt, lead, and nickel are summarized in the table below.

Metal	Maximum	95% UCL	Shallow Soil Residential CHHSL/ESL	Shallow Soil Commercial/ Industrial CHHSL/ESL	Worker Direct Exposure ESL	Published Background Mean[1]	Published Background Range[1]
Arsenic	12	4.77	0.07/0.39	0.24/1.6	10	3.5	0.6 to 11.0
Cobalt	47	17.8	660/23	3,200/80	49	14.9	2.7 to 46.9
Lead	210	29.7	150/80	3,500/320	320	23.9	12.4 to 97.1
Nickel	350	82.4	1,600/150	16,000/150	6,100	57	9 to 509

Concentrations reported in mg/kg
[1] Kearney Foundation of Soil Science, March 1996
*Value listed is for Chromium III, as there is no construction exposure standard for total chromium.

The 95% UCL arsenic concentration is greater than the residential and commercial land use CHHSLs and ESLs; however, it is less than the construction exposure ESL and within the published background range. The SFRWQCB *November 2007 Update to Environmental Screening Levels (ESLs) Technical Document* states that ambient background concentrations of arsenic typically exceed risk-based screening levels. In such instances, it may be more appropriate to compare site data to regionally specific established background levels.

The 95% UCL cobalt concentration is less than the residential and commercial land use CHHSLs and ESLs, the construction exposure ESL, and within the background range.

The 95% UCL lead concentration is less than the residential and commercial land use CHHSLs and ESLs, the construction exposure ESL, and within the background range.

The 95% UCL nickel concentration is less than the residential and commercial land use CHHSLs and ESLs, the construction exposure ESL, and within the background range.

Based on the reported results for arsenic, cobalt, lead, and nickel, reuse or disposal of excavated soil may be restricted, depending on proposed use.

Metals results for soil samples are summarized in Table 3.

6.3 Organic Compounds in Soil

TPHg or BTEX were not detected in the samples at or above the reporting limits.

TPHd was reported at concentrations ranging from not detected (reporting limit of 1.0 mg/kg) to 230 mg/kg. Three sample results equaled or exceeded the residential land use ESL of 100 mg/kg. Two results exceeded the commercial/industrial land use ESL of 110 mg/kg. All results were below the construction/trench worker direct exposure ESL of 900 mg/kg. TPHd has a 95% UCL concentration of 79.8 mg/kg.

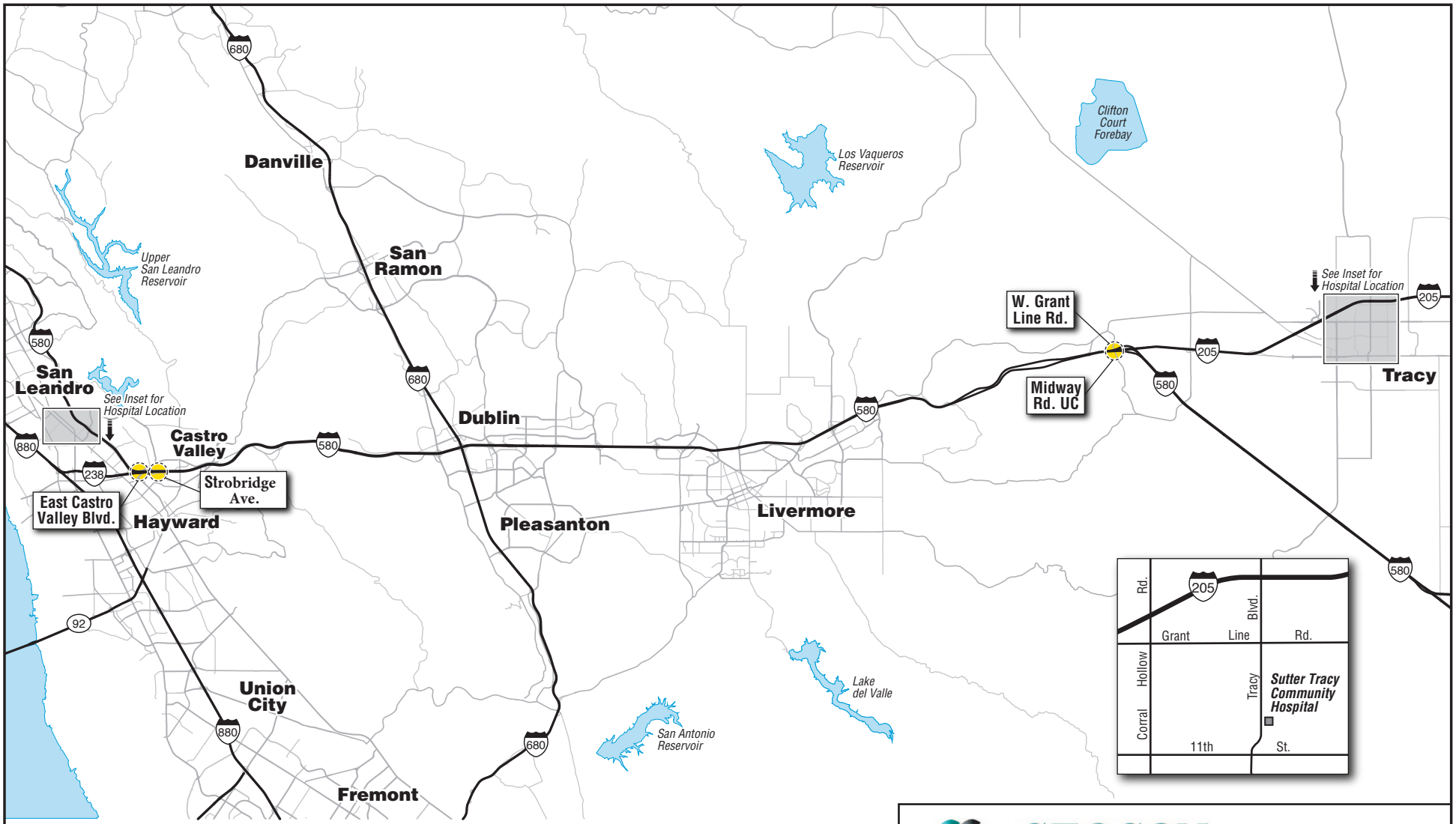
TPHmo was reported at concentrations ranging from not detected (reporting limit of 1.0 mg/kg) to 660 mg/kg. Eleven sample results exceeded the residential land use ESL of 100 mg/kg and one sample result exceeded the commercial/industrial land use ESL of 500 mg/kg. All results were below the construction/trench worker direct exposure ESL of 28,000 mg/kg. TPHmo has a 95% UCL concentration of 274 mg/kg.

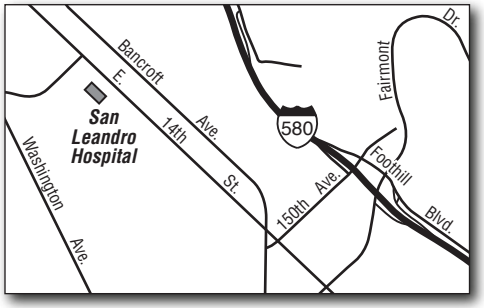
Based on the reported TPHd and TPHmo concentrations exceeding the residential and commercial/industrial land use ESLs, reuse or disposal of excavated soil may be restricted based on TPHd and TPHmo content, depending on proposed use.

A summary of petroleum hydrocarbon concentrations in site soil is presented in Table 4.

6.4 Worker Protection

The contractor(s) should prepare a project-specific health and safety plan to prevent or minimize worker exposure to metals and hydrocarbons in soil. The plan should include protocols for environmental and personnel monitoring, requirements for personal protective equipment, and other health and safety protocols and procedures for the handling of soil.





N

0 5

Scale in Miles

GEOCON CONSULTANTS, INC.

6671 BRISA STREET, LIVERMORE, CA 94550
PHONE 925-371-5900 - FAX 925-371-5915

I-580 TOS and MVP

Alameda County, California	**KEY MAP**
GEOCON Proj. No. E8721-02-38	
Task Order No. 38	FEBRUARY 2016 — Figure 1

GEOCON CONSULTANTS, INC.

6671 BRISA STREET, LIVERMORE, CA 94550; PHONE 925 371-5900 - FAX 925 371-5915

I-580 TOS and MVP

Alameda County, California

SITE PLAN

GEOCON Proj. No. E8721-02-38

EA No. 04-3G59U1

February 2016

Figure 2

SITE1115.DWG

GEOCON CONSULTANTS, INC.

6671 BRISA STREET, LIVERMORE, CA 94550; PHONE 925 371-5900 - FAX 925 371-5915

I-580 TOS and MVP

Alameda County, California

SITE PLAN

GEOCON Proj. No. E8721-02-38

EA No. 04-3G59U1

February 2016

Figure 3

SITE1115.DWG

GEOCON
CONSULTANTS, INC.
6671 BRISA STREET, LIVERMORE, CA 94550; PHONE 925 371-5900 - FAX 925 371-5915

I-580 TOS and MVP

Alameda County, California

GEOCON Proj. No. E8721-02-38

EA No. 04-3G59U1

SITE PLAN

February 2016

Figure 4

SITE1115.DWG

GEOCON
CONSULTANTS, INC.
6671 BRISA STREET, LIVERMORE, CA 94550; PHONE 925 371-5900 - FAX 925 371-5915

I-580 TOS and MVP

Alameda County, California

GEOCON Proj. No. E8721-02-38

EA No. 04-3G59U1

SITE PLAN

February 2016

Figure 5

SITE1115.DWG

TABLE 1
Boring Coordinates
I-580 TOS and MVP
Alameda County, CA

Boring	Latitude	Longitude
Strobridge Avenue		
S-1A	37.690281	-122.086515
S-1B	37.690309	-122.086524
S-1C	37.690328	-122.086520
S-2A	37.690287	-122.086363
S-2B	37.690303	-122.086361
S-2C	37.690320	-122.086360
S-3A	37.690297	-122.086221
S-3B	37.690309	-122.086226
S-3C	37.690325	-122.086231
Castro Valley Boulevard		
C-1A	37.694450	-122.053770
C-1B	37.694446	-122.053779
C-2A	37.694336	-122.053757
C-2B	37.694339	-122.053771
C-3A	37.694178	-122.053866
C-3B	37.694190	-122.053875
C-4A	37.694104	-122.054042
C-4B	37.694113	-122.054045
C-5A	37.694096	-122.054218
C-5B	37.694104	-122.054219
Grant Line Road		
G-1A	37.740324	-121.588237
G-1B	37.740315	-121.588229
G-2A	37.740559	-121.587595
G-2B	37.740549	-121.587593
G-3A	37.740804	-121.586952
G-3B	37.740797	-121.586947
G-4A	37.740936	-121.586602
G-4B	37.740930	-121.586593
G-5A	37.741040	-121.586244
G-5B	37.741028	-121.586243
G-6A	37.741142	-121.586163
G-6B	37.741150	-121.586171
G-7A	37.741010	-121.586662
G-7B	37.741017	-121.586664
G-8A	37.740815	-121.587179
G-8B	37.740824	-121.587188

TABLE 1
Boring Coordinates
I-580 TOS and MVP
Alameda County, CA

Boring	Latitude	Longitude
G-9A	37.740558	-121.587864
G-9B	37.740561	-121.587873
G-10A	37.740409	-121.588328
G-10B	37.740415	-121.588332
Midway Road Undercrossing		
M-1	37.742370	-121.571815
M-1	37.742370	-121.571769
M-2	37.742369	-121.571768
M-3	37.742378	-121.571734
M-4	37.742399	-121.571708

TABLE 2
Summary of Lead and pH Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	DI-WET Lead (mg/l)	TCLP Lead (mg/l)	pH
Strobridge Avenue						
S-1A-0	0 to 0.5	8.6	---	---	---	---
S-1A-1.5	1.5 to 2	7.1	---	---	---	---
S-1B-0	0 to 0.5	4.6	---	---	---	---
S-1B-1.5	1.5 to 2	9.7	---	---	---	---
S-1B-2.5	2.5 to 3	6.3	---	---	---	---
S-1C-0	0 to 0.5	7.5	---	---	---	---
S-1C-1.5	1.5 to 2	8.7	---	---	---	---
S-2A-0	0 to 0.5	11	---	---	---	8.0
S-2A-1.5	1.5 to 2	9.4	---	---	---	---
S-2B-0	0 to 0.5	11	---	---	---	---
S-2B-1.5	1.5 to 2	8.4	---	---	---	---
S-2B-2.0	2 to 2.5	8.9	---	---	---	---
S-2C-0	0 to 0.5	11	---	---	---	---
S-2C-1.5	1.5 to 2	7.9	---	---	---	---
S-2C-5	5 to 5.5	3.8	---	---	---	---
S-3A-0	0 to 0.5	11	---	---	---	---
S-3A-1.5	1.5 to 2	3.0	---	---	---	---
S-3B-0	0 to 0.5	8.9	---	---	---	---
S-3B-1.5	1.5 to 2	7.6	---	---	---	---
S-3C-0	0 to 0.5	12	---	---	---	7.7
S-3C-1.5	1.5 to 2	14	---	---	---	---
S-3C-5	5 to 5.5	9.1	---	---	---	---
Castro Valley Boulevard						
C-1A-0	0 to 0.5	8.9	---	---	---	---
C-1A-1.5	1.5 to 2	7.9	---	---	---	---

TABLE 2
Summary of Lead and pH Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	DI-WET Lead (mg/l)	TCLP Lead (mg/l)	pH
C-1B-0	0 to 0.5	9.2	---	---	---	---
C-1B-1.5	1.5 to 2	11	---	---	---	---
C-2A-0	0 to 0.5	13	---	---	---	7.6
C-2A-1.5	1.5 to 2	15	---	---	---	---
C-2B-0	0 to 0.5	15	---	---	---	---
C-2B-1.5	1.5 to 2	11	---	---	---	---
C-3A-0	0 to 0.5	14	---	---	---	---
C-3A-1.5	1.5 to 2	11	---	---	---	---
C-3B-0	0 to 0.5	16	---	---	---	---
C-3B-1.5	1.5 to 2	9.3	---	---	---	---
C-4A-0	0 to 0.5	17	---	---	---	---
C-4B-0	0 to 0.5	11	---	---	---	---
C-5A-0	0 to 0.5	4.9	---	---	---	---
C-5A-1	1 to 1.5	7.3	---	---	---	7.8
C-5B-0	0 to 0.5	9.4	---	---	---	---
C-5B-1	1 to 1.5	7.2	---	---	---	---
Grant Line Road						
G-1A-0	0 to 0.5	30	---	---	---	---
G-1A-2	2 to 2.5	9.1	---	---	---	---
G-1B-0	0 to 0.5	27	---	---	---	---
G-1B-2	2 to 2.5	12	---	---	---	---
G-2A-0	0 to 0.5	14	---	---	---	---
G-2A-2	2 to 2.5	<5.0	---	---	---	8.3
G-2B-0	0 to 0.5	53	3.8	---	---	---
G-2B-2	2 to 2.5	<5.0	---	---	---	---

TABLE 2
Summary of Lead and pH Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	DI-WET Lead (mg/l)	TCLP Lead (mg/l)	pH
G-3A-0	0 to 0.5	11	---	---	---	---
G-3A-2	2 to 2.5	1.8	---	---	---	---
G-3B-0	0 to 0.5	12	---	---	---	---
G-3B-2	2 to 2.5	<5.0	---	---	---	---
G-4A-0	0 to 0.5	210	12	0.035	<0.25	8.0
G-4A-2	2 to 2.5	<25	---	---	---	---
G-4B-0	0 to 0.5	190	5.0	0.019	<0.25	8.2
G-4B-2	2 to 2.5	<25	---	---	---	---
G-5A-0	0 to 0.5	40	---	---	---	---
G-5A-2	2 to 2.5	<25	---	---	---	8.3
G-5B-0	0 to 0.5	120	2.9	---	---	---
G-5B-2	2 to 2.5	6.8	---	---	---	---
G-6A-0	0 to 0.5	52	0.48	---	---	---
G-6A-2	2 to 2.5	3.2	---	---	---	---
G-6B-0	0 to 0.5	35	---	---	---	---
G-6B-2	2 to 2.5	<25	---	---	---	---
G-7A-0	0 to 0.5	89	4.0	---	---	---
G-7A-2	2 to 2.5	<25	---	---	---	---
G-7B-0	0 to 0.5	52	2.8	---	---	---
G-7B-2	2 to 2.5	<5.0	---	---	---	---
G-8A-0	0 to 0.5	32	---	---	---	---
G-8A-2	2 to 2.5	<5.0	---	---	---	8.6
G-8B-0	0 to 0.5	24	---	---	---	---
G-8B-2	2 to 2.5	<5.0	---	---	---	---

TABLE 2
Summary of Lead and pH Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	DI-WET Lead (mg/l)	TCLP Lead (mg/l)	pH
G-9A-0	0 to 0.5	6.8	---	---	---	---
G-9A-2	2 to 2.5	2.9	---	---	---	---
G-9B-0	0 to 0.5	27	---	---	---	---
G-10A-0	0 to 0.5	20	---	---	---	---
G-10B-0	0 to 0.5	22	---	---	---	---
Midway Road Undercrossing						
M-1-0	0 to 0.5	12	---	---	---	---
M-1-1	1 to 1.5	12	---	---	---	8.8
M-2-0	0 to 0.5	25	---	---	---	---
M-2-1	1 to 1.5	26	---	---	---	---
M-3-0	0 to 0.5	16	---	---	---	---
M-3-1	1 to 1.5	9.3	---	---	---	---
M-4-0	0 to 0.5	77	2.4	---	---	---
M-4-1	1 to 1.5	23	---	---	---	---
Rinse Blank		<0.0050 mg/l				
Hazardous Waste Criteria						
TTLC (mg/kg)		1,000	---	---	---	---
STLC (mg/l)		---	5.0	5.0	---	---
TCLP (mg/l)		---	---	---	5.0	---

Notes:

mg/kg = Milligrams per kilogram
mg/l = Milligrams per liter
WET = Waste Extraction Test using citric acid as the extraction fluid
TCLP = Toxicity Characteristic Leaching Procedure
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration

Table 3
Summary of CAM 17 Metals Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
Strobridge Avenue																		
S-1A-1.5	1.5 to 2	<2.0	4.1	97	<1.0	<1.0	49	14	51	7.1	0.19	<1.0	46	<1.0	<1.0	<1.0	29	45
S-1B-2.5	2.5 to 3	<2.0	2.6	66	<1.0	<1.0	89 *<1.0*	21	39	6.3	<0.10	<1.0	90	1.8	<1.0	<1.0	24	32
S-2A-1.5	1.5 to 2	<2.0	4.0	110	<1.0	<1.0	170 *<1.0*	22	37	9.4	0.18	<1.0	220 *2.0*	1.5	<1.0	<1.0	33	42
S-2B-2	2 to 2.5	<2.0	4.9	100	<1.0	<1.0	280 *<1.0*	31	39	8.9	<0.10	<1.0	350 *3.4*	1.2	<1.0	<1.0	37	42
S-2C-5	5 to 5.5	<2.0	3.3	99	<1.0	<1.0	23	9.9	45	3.8	0.16	<1.0	24	1.2	<1.0	<1.0	30	26
S-3A-1.5	1.5 to 2	<2.0	4.0	95	<1.0	<1.0	86 *<1.0*	19	63	3.0	0.19	<1.0	78	<1.0	<1.0	<1.0	39	26
S-3C-5	5 to 5.5	<2.0	5.1	140	<1.0	<1.0	87 *<1.0*	19	52	9.1	0.21	<1.0	97	1.6	<1.0	<1.0	35	34
Castro Valley Boulevard																		
C-1A-1.5	1.5 to 2	<2.0	4.4	77	<1.0	<1.0	26	8.1	30	7.9	<0.10	<1.0	24	1.3	<1.0	<1.0	41	51
C-2A-0	0 to 0.5	<2.0	5.8	94	<1.0	<1.0	25	9.1	63	13	<0.10	1.2	28	<1.0	<1.0	<1.0	47	140
C-3A-1.5	1.5 to 2	<2.0	12	190	<1.0	<1.0	29	47	30	11	<0.10	<1.0	53	<1.0	<1.0	<1.0	40	78
C-4A-0	0 to 0.5	<2.0	5.0	86	<1.0	<1.0	23	7.7	26	17	<0.10	1.2	26	1.5	<1.0	<1.0	46	88
C-5A-0	0 to 0.5	<2.0	4.2	91	<1.0	<1.0	18	5.7	11	4.9	<0.10	<1.0	15	<1.0	<1.0	<1.0	24	52
Grant Line Road																		
G-1A-0	0 to 0.5	<2.0	3.1	140	<1.0	<1.0	24	13	25	30	<0.10	<1.0	25	<1.0	<1.0	<1.0	77	61
G-2A-0	0 to 0.5	<2.0	3.3	270	<1.0	<1.0	23	18	48	14	<0.10	<1.0	25	<1.0	<1.0	<1.0	68	48
G-3A-2	2 to 2.5	<2.0	<1.0	45	<1.0	<1.0	14	10	13	1.8	<0.10	<1.0	10	<1.0	<1.0	<1.0	76	35
G-4A-0	0 to 0.5	<2.0	5.3	190	<1.0	<1.0	35	13	34	210	<0.10	<1.0	37	<1.0	<1.0	<1.0	43	99

Table 3
Summary of CAM 17 Metals Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (ft)	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
G-5A-0	0 to 0.5	<2.0	6.2	160	<1.0	<1.0	35	18	40	40	<0.099	<1.0	47	<1.0	<1.0	<1.0	50	86
G-6A-2	2 to 2.5	<2.0	2.3	91	<1.0	<1.0	15	9.7	15	3.2	<0.10	<1.0	12	<1.0	<1.0	<1.0	72	36
G-7A-0	0 to 0.5	<2.0	3.6	130	<1.0	<1.0	35	8.7	26	89	<0.099	<1.0	33	<1.0	<1.0	<1.0	41	100
G-8A-0	0 to 0.5	<2.0	2.5	87	<1.0	<1.0	19	9.8	15	32	<0.10	<1.0	18	<1.0	<1.0	<1.0	59	41
G-9A-2	2 to 2.5	<2.0	<1.0	61	<1.0	<1.0	19	14	18	2.9	<0.099	<1.0	19	<1.0	<1.0	<1.0	88	43
G-10A-0	0 to 0.5	<2.0	1.8	91	<1.0	<1.0	17	11	23	20	<0.099	<1.0	17	<1.0	<1.0	<1.0	67	98
Midway Road Undercrossing																		
M-1-0	0 to 0.5	<2.0	3.9	130	<1.0	<1.0	25	7.4	32	12	<0.10	<1.0	33	1.4	<1.0	<1.0	27	100
M-3-1	1 to 1.5	<2.0	4.7	35	<1.0	<1.0	35	8.7	24	9.3	<0.10	<1.0	47	1.2	<1.0	<1.0	17	48
Hazardous Waste Criteria																		
TTLC (mg/kg)		500	500	10,000	75	100	2,500	8,000	2,500	1,000	20	3,500	2,000	100	500	700	2,400	5,000
STLC (mg/l)		15	5.0	100	0.75	1.0	5.0	80	25	5.0	0.2	350	20	1.0	5.0	7.0	24	250
TCLP (mg/l)		---	5.0	100	---	1.0	6.0	---	---	5.0	0.2	---	---	1.0	5.0	---	---	---
CHHSLs																		
Residential Land Use		30	0.07	5,200	150	1.7	100,000	660	3,000	150	18	380	1,600	380	380	5.0	530	23,000
Commercial/Industrial Land Use		380	0.24	63,000	1,700	7.5	100,000	3,200	38,000	3,500	180	4,800	16,000	4,800	4,800	63	6,700	100,000
ESLs																		
Residential Land Use		20	0.39	750	4.0	12	1,000	23	230	80	6.7	40	150	10	20	0.78	200	600
Commercial/Industrial Land Use		40	1.6	1,500	8.0	12	2,500	80	230	320	10	40	150	10	40	10	200	600
Construction Worker Exposure		120	10	61,000	180	110	460,000[1]	49	12,000	320	27	1,500	6,100	1,500	1,500	3.1	1,500	93,000
Background Concentrations [(2)]																		
Minimum		0.15	0.6	133	0.25	0.05	23	2.7	9.1	12.4	0.10	0.1	9.0	0.015	0.10	0.17	39	88
Mean		0.60	3.5	509	1.28	0.36	122	14.9	28.7	23.9	0.26	1.3	57	0.058	0.80	0.56	112	149
Maximum		1.95	11	1,400	2.70	1.70	1,579	46.9	96.4	97.1	0.90	9.6	509	0.430	8.30	1.10	288	236

Notes:

Results are shown in milligrams per kilogram (mg/kg)
[1]Value listed is for Chromium III, as there is no construction exposure standard for total chromium
Values listed in italics are results of WET analysis
< = Analyte was not detected above the laboratory reporting limit
CHHSLs = California Human Health Screening Levels, Table 1, California EPA, January 2005

ESLs = Environmental Screening Levels, Tables A and K-3, SFRWQCB, December 2013
TTLC = total threshold limit concentration
STLC = soluble threshold limit concentration
TCLP = toxicity characteristic leaching procedure

TABLE 4
Summary of Petroleum Hydrocarbons Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (ft)	TPHd (mg/kg)	TPHmo (mg/kg)	TPHg (mg/kg)	BTEX (µg/kg)
Strobridge Avenue					
S-1A-0	0 to 0.5	100	430	---	---
S-2A-1.5	1.5 to 2	46	180	---	---
S-1B-1.5	1.5 to 2	---	---	<1.0	ND
S-2B-1.5	1.5 to 2	---	---	<1.0	ND
S-3A-0	0 to 0.5	89	380	---	---
S-3C-5	5 to 5.5	26	110	---	---
Castro Valley Boulevard					
C-1A-0	0 to 0.5	94	370	---	---
C-2A-1.5	1.5 to 2	130	440	---	---
C-3A-0	0 to 0.5	33	130	---	---
C-1B-1.5	1.5 to 2	---	---	<1.0	ND
C-2B-1.5	1.5 to 2	---	---	<1.0	ND
C-3B-1.5	1.5 to 2	---	---	<1.0	ND
C-5A-1	1 to 1.5	4.5	4.7	<1.0	ND
Grant Line Road					
G-1A-0	0 to 0.5	62	230	---	---
G-1B-2	2 to 2.5	---	---	<1.0	---
G-3A-2	2 to 2.5	---	---	<1.0	---
G-3B-2	2 to 2.5	<1.0	<1.0	---	---
G-4A-0	0 to 0.5	37	110	---	---
G-4B-2	2 to 2.5	---	---	<1.0	---

TABLE 4
Summary of Petroleum Hydrocarbons Results
I-580 TOS and MVP
Alameda County, CA

Sample ID	Sample Depth (ft)	TPHd (mg/kg)	TPHmo (mg/kg)	TPHg (mg/kg)	BTEX (µg/kg)
G-6A-2	2 to 2.5	---	---	<1.0	---
G-6B-2	2 to 2.5	2.7	2.9	---	---
G-7A-0	0 to 0.5	230	660	---	---
G-7B-2	2 to 2.5	---	---	<1.0	---
G-9A-2	2 to 2.5	1.2	1.2	<1.0	---
G-10A-0	0 to 0.5	45	98	---	---
G-10B-0	0 to 0.5	---	---	<1.0	---
Midway Road Undercrossing					
M-1-1	1 to 1.5	26	80	---	---
M-2-1	1 to 1.5	---	---	<1.0	ND
M-4-0	0 to 0.5	44	140	---	---
M-4-1	1 to 1.5	---	---	<1.0	ND
	ESLs				
	Residential	100	100	100	100
	Commercial/Industrial	110	500	500	500
	Construction Exposure	900	28,000	2,700	2,700

Notes:
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
TPHd = Total petroleum hydrocarbons as diesel
TPHmo = Total petroleum hydrocarbons as motor oil
TPHg = Total petroleum hydrocarbons as gasoline
BTEX = Benzene, toluene, ethylbenzene, and total xylenes
ESLs = Environmental Screening Levels, Tables A and K-3, SFRWQCB, December 2013.

TABLE 5a
Summary of Lead Statistical Analysis
I-580 TOS and MVP
Alameda County, CA

Grant Line Road (borings G1A to G10B)

TOTAL LEAD

	90% UCL	95% UCL
0 ft	69.4	74
2 ft	8.1	8.47

EXCAVATION SCENARIOS

	Weighted Averages		
Excavation Depth	**90% UCL Total Lead (mg/kg)**	**WET Lead* (mg/l)**	**95% UCL Total Lead (mg/kg)**
0 to 2 ft	69	2.8	74
Underlying Soil (2 to 2.5 ft)	*8.1*	*0.3*	*8.5*
0 to 2.5 ft	57	2.3	8.2

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)
mg/kg = milligrams per kilogram
mg/l = milligrams per liter
* = WET lead concentrations are predicted using slope of regression line,
where y = predicted WET lead and x = total lead.

Regression Line Slope: y = 0.0402 x

TABLE 5b
Summary of Lead Statistical Analysis
I-580 TOS and MVP
Alameda County, CA

All Borings

TOTAL LEAD

	90% UCL	95% UCL
0 to 0.5 ft	39.7	42.1
1 to 1.5 ft	18.2	19.1
1.5 to 2 ft	9.8	10.0
2 to 2.5 ft	8.16	8.49

EXCAVATION SCENARIOS

	Weighted Averages		
	90% UCL		95% UCL
Excavation Depth	**Total Lead (mg/kg)**	**WET Lead* (mg/l)**	**Total Lead (mg/kg)**
0 to 1 ft	39.7	1.6	42.1
Underlying Soil (1 to 2.5 ft)	*12.1*	*0.5*	*12.5*
0 to 1.5 ft	32.5	1.3	34.4
Underlying Soil (1.5 to 2.5 ft)	*9.9*	*0.4*	*9.2*
0 to 2 ft	26.8	1.1	28.3
Underlying Soil (2 to 2.5 ft)	*8.2*	*0.3*	*8.5*
0 to 2.5 ft	23.1	0.9	24.4

Notes:

UCL = Upper Confidence Limit (90% UCL is applicable for waste classification; 95% UCL applicable for risk assessment)

mg/kg = milligrams per kilogram

mg/l = milligrams per liter

* = WET lead concentrations are predicted using slope of regression line, where y = predicted WET lead and x = total lead.

Regression Line Slope: y = 0.040 x

APPENDIX A

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Barbara A. Lee, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Edmund G. Brown Jr.
Governor

October 30, 2015

Ms. Katrina C. Pierce, Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 94284, MS-27
Sacramento, California 94723-0001

EXTENSION OF STATEWIDE VARIANCE NO. V09HQSCD006 FOR CALTRANS HANDLING OF AERIALLY DEPOSITED LEAD SOILS

Dear Ms. Pierce:

This letter is in response to the October 20, 2015 request from the California Department of Transportation (Caltrans) for an extension of Variance No. V09HQSCD006 (Variance).

The Variance is hereby extended to April 30, 2016 and is subject to the same additional conditions as set forth in correspondence from Mr. Raymond Leclerc of the Department of Toxic Substances Control (DTSC) to Ms. Katrina C. Pierce of Caltrans dated June 30, 2015 (Extension) and clarified in correspondence dated July 6, 2015, which are repeated below for your convenience.

Additional requirements included in the June 30, 2015 correspondence:

(1) Caltrans shall provide at least 30 day advance written notification to DTSC prior to implementation of any project for which Caltrans will invoke this Variance, and shall send copies of the notification to the Regional Water Quality Control Board (RWQCB) Air Quality Management District (AQMD [or Air Pollution Control District, as applicable]) and local Certified Uniform Program Agency (CUPA). For projects that overlie multiple local agency jurisdictions, all appropriate agencies shall receive a copy of the notification. The advance written notification shall include the following information:
   a. A statement that the project will entail excavation, stockpiling and burial of aerially deposited lead (ADL)-contaminated soil pursuant to DTSC Variance No. V09HQSCD006;
   b. Project number;
   c. Project description;
   d. Project Limits;
   e. Electronic versions of the following documents:
      i. The environmental document prepared for the project;
      ii. This Variance; and
      iii. DTSC-prepared fact sheet about this Variance.
   f. Identify any ADL-contaminated soil that will be moved from the project area to another project area with a complete description of additional project areas.

g. The following documents will be made available as described above within 10 days of completion:
   i. The Caltrans-approved Excavation and Transportation Plan,
   ii. Contact information for the Resident Engineer and Project Manager

(2) For every property where ADL-contaminated soil is buried pursuant to this Variance, Caltrans shall, in compliance with California Code of Regulations, title 22, section 67391.1, execute a legal instrument restricting use of that property, which instrument shall be binding in perpetuity upon Caltrans or any future legatee of the property. Said instrument shall be a land use covenant, except as provided by (a), and shall be recorded with the county (or counties) wherein ADL-contaminated soil has been buried.
   a. For any property for which DTSC determines as set forth in California Code of Regulations, title 22, section 67391.1(f) a land use covenant is not feasible, then another institutional control mechanism may be used as approved by DTSC.

Clarification for the additional requirements, provided in the July 6, 2015 correspondence:

- The additional requirements of the extension only apply to projects awarded after June 30, 2015, where excavation of ADL-contaminated soil will be handled and placed beneath roadways as defined in the Variance No. V09HQSCD006.
- For purposes of reporting, Caltrans may submit electronic copies, URL locations or hard copies of required documents;
- Item 1(f) applies to ADL-contaminated soil moved from one project to another project within the same corridor. Caltrans will provide all information required by Variance No. V09HQSCD006 under Section 9(u).
- Until an appropriate institutional control mechanism can be agreed upon, CalTrans shall provide to DTSC land survey measurement data collected where ADL-contaminated soil is buried.
- "Project implementation" in item 1 of the June 30, 2015, Extension refers to excavation of ADL-contaminated soil.
- Items 1(f) and 1(g) in the Extension are not subject to the 30-day submittal deadline specified in (1), but are subject to a 10-day deadline following document approval or staff identification.

This extension is granted without waiver of any rights that DTSC has to enforce any violations of the Variance that may have occurred prior to October 30, 2015.

If you have any questions regarding this extension of the Variance, please contact me at (916) 255-3582.

Sincerely

Raymond Leclerc, P.E.
Division Chief

cc: See next page

Mr. Scott McGowen, Assistant Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 942874, MS-27
Sacramento, California 94271-0001

Mr. Reed Sato
Chief Counsel
Office of Legal Affairs
Department of Toxic Substances Control
1001 I Street 23rd Floor
Sacramento, California 95814

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Barbara A. Lee, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

June 30, 2015

Ms. Katrina C. Pierce, Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 942873, MS-27
Sacramento, California 94273-0001

EXTENSION OF STATEWIDE VARIANCE NO. V09HQSCD006 FOR CALTRANS HANDLING OF AERIALLY DEPOSITED LEAD SOIL

Dear Ms. Pierce:

This letter is in response to the June 16, 2015 request from the California Department of Transportation (CalTrans) for an extension of Variance No. V09HQSCD006 (Variance).

The Variance is hereby extended to October 31, 2015 and is subject to the following additional conditions:

(1) Caltrans shall provide at least 30 day advance written notification to DTSC prior to implementation of any project for which CalTrans will invoke this Variance, and shall send copies of the notification to the RWQCB, AQMD (or APCD, as applicable) and local Certified Uniform Program Agency (CUPA). For projects that overlie multiple local agency jurisdictions, all appropriate agencies shall receive a copy of the notification. The advance written notification shall include the following information:

A. A statement that the project will entail excavation, stockpiling and burial of ADL-contaminated soil pursuant to DTSC Variance No. V15HWMP001;
B. Project number;
C. Project description;
D. Project Limits;
E. Electronic versions of the following documents:
   i. the environmental document prepared for the project;
   ii. this Variance; and
   iii. DTSC-prepared fact sheet about this Variance.

F. Identify any ADL soil that will be moved from the project area to another project area with a complete description of additional project areas.
G. The following documents will be made available as described above within 10 days of completion:
   a. The Caltrans-approved Excavation and Transportation Plan,
   b. Contact information for Resident Engineer and Project Manager,

(2) For every property where ADL-contaminated soil is buried pursuant to this variance, CalTrans shall, in compliance with California Code of Regulations, title 22, section 67391.1, execute a legal instrument restricting use of that property, which instrument shall be binding in perpetuity upon CalTrans or any future legatee of the property. Said instrument shall be a land use covenant, except as provided by (a), and shall be recorded with the county (or counties) wherein ADL-contaminated soil has been buried.

(a) For any property for which the Department determines as set forth in California Code of Regulations, title 22, section 67391.1(f) a land use covenant is not feasible, then another institutional control mechanism may be used as approved by the Department.

This extension is granted without waiver of any rights that DTSC has to enforce any violations of the Variance that may have occurred prior to July 1, 2015.

If you have any questions regarding this extension of the Variance, please contact me at (916) 255-3582.

Sincerely,

Raymond Leclerc, P.E.
Division Chief

cc: See next page.

Mr. Scott McGowen, Chief
Division of Environmental Analysis
P.O. Box 942874, MS-27
Sacramento, California 94271-0001

Mr. Reed Sato
Chief Counsel
Office of Legal Affairs
Department of Toxic Substances Control
1001 I Street, 23rd Floor
Sacramento, California 95814

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Barbara A. Lee, Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

December 16, 2014

Ms. Katrina C. Pierce, Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 942873, MS-27
Sacramento, CA 94273-0001

SUBJECT: SECOND EXTENSION OF STATEWIDE VARIANCE NO. V09HQSCD006 FOR CALTRANS' HANDLING OF AERIALLY DEPOSITED LEAD SOIL

Dear Ms. Pierce:

This letter is in response to the December 2, 2014, request from the California Department of Transportation (Caltrans), for an extension for Variance No. V09HQSCD006 (Variance).

The original Variance was issued on June 30, 2009, with an effective period of five years, such that it was set to expire on June 30, 2014. Caltrans requested an extension in May 2014 and received a six-month extension of the Variance to December 31, 2014. The Department of Toxic Substances Control (DTSC) will be unable to issue Caltrans a new five-year Variance before the current Variance extension expires on December 31, 2014. This letter hereby extends the effective date of Variance from December 31, 2014 to June 30, 2015. This extension enables Caltrans to proceed with already-scheduled highway improvement projects without interruption.

The Variance applies to Caltrans' management of soil contaminated by aerial deposition of lead from motor vehicle exhaust. Such soil, historically referred to as "aerially deposited lead (ADL) soil," occurs along many roadsides statewide, and must be appropriately handled by Caltrans in the course of highway improvement projects. For such soil that contains lead in concentrations exceeding state, but not federal, regulatory thresholds for hazardous waste, the

Variance waives specific hazardous waste management standards. In lieu of the standards waived, the Variance imposes alternate management standards (conditions) on Caltrans' soil handling activities, to ensure that the handling and relocation of the soil is conducted in a manner protective of human health and safety and the environment. The Variance applies to Caltrans' highway improvement projects in all Caltrans Districts.

If you have further questions regarding this Variance extension, please contact Mr. Bob Gipson, DTSC Project Manager, at (916) 327-4061.

Sincerely,

Pauline Batarseh

Pauline Batarseh, Chief
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program

Cc:
Shaila Chowdhury
Chief, Office of Hazardous Waste, Air, Noise and Paleontology
Division of Environmental Analysis
California Department of Transportation
Sacramento, CA 94273-0001

Richard Bailey
Senior Engineering Geologist
Division of Environmental Analysis
California Department of Transportation
Sacramento, CA 94273-0001

Kim Christmann
Senior Engineering Geologist
Division of Environmental Analysis
California Department of Transportation
Sacramento, CA 94273-0001

Donn Diebert, P.E.
Chief, Policy Implementation Unit
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program
Department of Toxic Substances Control
1001 I Street, Sacramento, CA 95812-0806

Bob Gipson
Environmental Scientist
Policy Implementation Unit
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program
Department of Toxic Substances Control
1001 I Street, Sacramento, CA 95812-0806

Matthew Rodriquez
Secretary for
Environmental Protection

Department of Toxic Substances Control

Miriam Barcellona Ingenito
Acting Director
1001 "I" Street
P.O. Box 806
Sacramento, California 95812-0806

Edmund G. Brown Jr.
Governor

June 26, 2014

Ms. Katrina C. Pierce, Chief
Division of Environmental Analysis
California Department of Transportation
P.O. Box 942873, MS-27
Sacramento, California 94273-0001

EXTENSION OF STATEWIDE VARIANCE NO. V09HQSCD006 FOR CALTRANS' HANDLING OF AERIALLY DEPOSITED LEAD

Dear Ms. Pierce:

The Department of Toxic Substances Control (DTSC) received a letter dated May 30, 2014, from the California Department of Transportation (Caltrans), regarding Variance No. V09HQSCD006 (Variance), issued June 30, 2009. Caltrans is requesting DTSC to grant a six-month extension on the Variance with the new expiration date of December 31, 2014, instead of June 30, 2014. The Variance waives specified hazardous waste management requirements for purposes of Caltrans' handling of roadside soil contaminated with aerially deposited lead, and applies to Caltrans' highway improvement projects in all Caltrans Districts statewide.

Based on recent discussions between Caltrans and DTSC both agreed a six-month extension is necessary to provide adequate time for DTSC to finalize the new (renewal) variance, and for Caltrans to review and provide comments on the renewal variance. Key next steps in DTSC's review process include finalizing the ecological and health risk assessments, working on the California Environmental Quality Act documents, drafting of the renewal variance, and allowing adequate time for a public notice period for the renewal variance.

This letter hereby extends the effective date of Variance No. V09HQSCD006 to December 31, 2014. If you have any questions regarding this extension, please contact Mr. Bob Gipson of my staff at (916) 327-4061 or via email at Bob.Gipson@dtsc.ca.gov.

Sincerely,

Pauline Batarseh

Pauline Batarseh, Chief
Policy Implementation and Support Branch
Policy and Program Support Division
Hazardous Waste Management Program

cc: See next page.

California Environmental Protection Agency
Department of Toxic Substances Control

VARIANCE

Applicant Names:

State of California
Department of Transportation
(Caltrans)
1120 N Street
Sacramento, California 95814

Variance No. V09HQSCD006

Effective Date: July 1, 2009

Expiration Date: July 1, 2014

Modification History:

Pursuant to California Health and Safety Code, Section 25143, the Department of Toxic Substances Control hereby issues the attached Variance consisting of 9 pages to the Department of Transportation.

Beverly Rikala
Team Leader, Operating Facilities Team
Department of Toxic Substances Control

Date: 6/30/09

1. INTRODUCTION.

a) Pursuant to Health and Safety Code, section 25143, the California Department of Toxic Substances Control (DTSC) grants this variance to the applicant below for waste considered to be hazardous solely because of its lead concentrations and as further specified herein.

b) DTSC hereby grants this variance only from the requirements specified herein and only in accordance with all terms and conditions specified herein.

2. IDENTIFYING INFORMATION.

APPLICANT/OWNER/OPERATOR

State of California
Department of Transportation, (Caltrans)
All Districts

3. TYPE OF VARIANCE.

Generation, Manifest, Transportation, Storage and Disposal.

4. ISSUANCE AND EXPIRATION DATES.

DATE ISSUED: July 1, 2009 EXPIRATION DATE: July 1, 2014

5. APPLICABLE STATUTES AND REGULATIONS. The hazardous waste that is the subject of this variance is fully regulated under Health and Safety Code, section 25100, et seq. and California Code of Regulations, title 22, division 4.5 except as specifically identified in Section 8 of this variance.

6. DEFINITION. For purposes of this variance, "lead-contaminated soil(s)" shall mean soil that meets the criteria for hazardous waste but contains less than 3397 mg/kg total lead and is hazardous primarily because of aerially-deposited lead contamination associated with exhaust emissions from the operation of motor vehicles.

7. FINDINGS/DETERMINATIONS. DTSC has determined that the variance applicant meets the requirements set forth in Health and Safety Code, section 25143 for a variance from specific regulatory requirements as outlined in Section 8 of this variance. The specific determinations and findings made by DTSC are as follows:

a) Caltrans intends to excavate, stockpile, transport, bury and cover large volumes of soil associated with highway construction projects. In the more urbanized highway corridors around the State this soil is contaminated with lead, primarily due to historic emissions from automobile exhausts. In situ sampling and laboratory testing has shown that some of the soil contains concentrations of lead in excess of State regulatory thresholds, and thus any generated waste from disturbance of the soil

would be regulated as hazardous waste. Such soil contains a Total Threshold Limit Concentration (TTLC) of 1000 milligrams per kilogram (mg/kg) or more lead and/or it meets or exceeds the Soluble Threshold Limit Concentration (STLC) for lead of 5 milligrams per liter (mg/l). A Human Health Risk Assessment prepared for this variance concludes that soil contaminated with elevated concentrations of lead can be managed in a way that presents no significant risk to human health.

b) The lead-contaminated soil will be placed only in Caltrans' right-of-way. Depending on concentration levels, the wastes will be covered with a minimum thickness of one (1) foot of non-hazardous soil or asphalt/concrete cover and will always be at least five (5) feet above the highest groundwater elevation. Caltrans will assure that proper health and safety procedures will be followed for workers, including any persons engaged in maintenance work in areas where the waste has been buried and covered.

c) DTSC finds and requires that the lead-contaminated soil excavated, stockpiled, transported, buried and covered pursuant to this variance is a non-RCRA hazardous waste, and that the waste management activity is insignificant as a potential hazard to human health and safety and the environment, when managed in accordance with the conditions, limitations and other requirements specified in this variance.

8. PROVISIONS WAIVED.

Provided Caltrans meets the terms and conditions of this variance, DTSC waives the hazardous waste management requirements of Health and Safety Code, Chapter 6.5 and California Code of Regulations, title 22 for the lead-contaminated soil that Caltrans reuses in projects that would require Caltrans to obtain a permit for a disposal facility and any other generator requirements that concern the transportation, manifesting, storage and land disposal of hazardous waste.

9. SPECIFIC CONDITIONS, LIMITATIONS AND OTHER REQUIREMENTS.

In order for the provisions discussed in section 8 to be waived, lead-contaminated soil must not exceed the contaminant concentrations discussed below and Caltrans management practices must meet all the following conditions:

a) Caltrans implementation of this variance shall comply with all applicable state laws and regulations for water quality control, water quality control plans, waste discharge requirements (including storm water permits), and others issued by the State Water Resources Control Board (SWRCB) and/or a California Regional Water Quality Control Board (RWQCB). Caltrans shall provide written notification to the appropriate RWQCB at least 30 days prior to advertisement for bids of projects that involve invocation of this variance, or as otherwise negotiated with the SWRCB or appropriate RWQCB.

b) The waivers in this variance shall only be applied to lead-contaminated soil that is not a RCRA hazardous waste and is hazardous primarily because of aerially-

deposited lead contamination associated with exhaust emissions from the operation of motor vehicles. The variance is not applicable to any other hazardous waste.

c) Soil containing 1.5 mg/l extractable lead or less (based on a modified waste extraction test using deionized water as the extractant) and 1411 mg/kg or less total lead may be used as fill provided that the lead-contaminated soil is placed a minimum of five (5) feet above the maximum historic water table elevation and covered with at least one (1) foot of nonhazardous soil that will be maintained by Caltrans to prevent future erosion.

d) Soil containing 150 mg/L extractable lead or less (based on a modified waste extraction test using deionized water as the extractant) and 3397 mg/kg or less total lead may be used as fill provided that the lead-contaminated soils are placed a minimum of five (5) feet above the maximum historic water table elevation and protected from infiltration by a pavement structure which will be maintained by Caltrans.

e) Lead-contaminated soil with a pH less than 5.5 but greater than 5.0 shall only be used as fill material under the paved portion of the roadway. Lead-contaminated soil with a pH at or less than 5.0 shall be managed as a hazardous waste.

f) For each project that has the potential to generate waste by disturbing lead-contaminated soil (as defined in 6), Caltrans shall conduct sampling and analysis to adequately characterize the soils containing aerially deposited lead in the areas of planned excavation along the project route. Such sampling and analysis shall include the Toxicity Characteristic Leaching Procedure (TCLP) as prescribed by the United States Environmental Protection Agency to determine whether concentrations of contaminants in soil exceed federal criteria for classification as a hazardous waste.

g) Lead-contaminated soil managed pursuant to this variance shall not be moved outside the designated corridor boundaries (see paragraph t) below. All lead-contaminated soil not buried and covered within the same Caltrans corridor where it originated is not eligible for management under this variance and shall be managed as a hazardous waste.

h) Lead-contaminated soil managed pursuant to this variance shall not be placed in areas where it would become in contact with groundwater or surface water (such as streams and rivers).

i) Lead-contaminated soil managed pursuant to this variance shall be buried and covered only in locations that are protected from erosion that may result from storm water run-on and run-off.

j) The lead-contaminated soil shall be buried and covered in a manner that will prevent accidental or deliberate breach of the asphalt, concrete, and/or cover soil.

k) The presence of lead-contaminated soil shall be incorporated into the projects' as-built drawings. The as-built drawings shall be annotated with the location, representative analytical data, and volume of lead-contaminated soil. The as-built drawings shall also state the depth of the cover. These as-built drawings shall be retained by Caltrans.

l) Caltrans shall ensure that no other hazardous wastes, other than the lead-contaminated hazardous waste soil, are placed in the burial areas.

m) Lead-contaminated soil shall not be buried within ten (10) feet of culverts or locations subject to frequent worker exposure.

n) Excavated lead-contaminated soil not placed into the designated area (fill area, roadbed area) by the end of the working day shall be stockpiled and covered with sheets of polyethylene or at least one foot of non-hazardous soil. The lead-contaminated soil, while stockpiled or under transport, shall be protected from contacting surface water and from being dislodged or transported by wind or storm water. The stockpile covers shall be inspected at least once a week and within 24 hours after rainstorms. If the lead-contaminated soil is stockpiled for more than 4 days from the time of excavation, Caltrans shall restrict public access to the stockpile by using barriers that meet the safety requirements of the construction zone. The lead-contaminated soil shall be stockpiled for no more than 90 days from the time the soil is first excavated. If the contaminated soil is stockpiled beyond the 90 day limit Caltrans shall:

1. notify DTSC in writing of the 90 day exceedance and expected date of removal;
2. perform weekly inspections of the stockpiled material to ensure that there is adequate protection from run-on, runoff, public access, and wind dispersion; and
3. notify DTSC on weekly basis of the stockpile status until the stockpile is removed.

The lead-contaminated soil shall be stockpiled for no more than 180 days from the time the soil is first excavated.

o) Caltrans shall ensure that all stockpiling of lead-contaminated soil remains within the project area of the specified corridor. Stockpiling of lead-contaminated soil within the specified corridor, but outside the project area, is prohibited.

p) Caltrans shall conduct confirmatory sampling of any stockpile area in areas not known or expected to contain lead-contaminated soil after removal of the lead-contaminated soil to ensure that contamination has not been left behind or has not migrated from the stockpiled material to the surrounding soils.

q) Caltrans shall stockpile lead-contaminated soil only on high ground (i.e. no sump areas or low points) so that stockpiled soil will not come in contact with surface

water run-on or run-off.

r) Caltrans shall not stockpile lead-contaminated soil in environmentally and ecologically sensitive areas.

s) Caltrans shall ensure that storm/rain run-off that has come into contact with stockpiled lead-contaminated soil will not flow to storm drains, inlets, or waters of the State.

t) Caltrans may dispose of the lead-contaminated soil only within the operating right-of-way of an existing highway, as defined in Streets and Highways Code, section 23. Caltrans may move lead-contaminated soil from one Caltrans project to another Caltrans project only if the lead-contaminated soil remains within the same designated corridor.

Caltrans shall record any movement of lead-contaminated soil by using a bill of lading. The bill of lading must contain: 1) the US DOT description including shipping name, hazard class and ID number; 2) handling codes; 3) quantity of material; 4) volume of material; 5) date of shipment; 6) origin and destination of shipment; and 7) any specific handling instructions. The bill of lading shall be referenced in and kept on file with the project's as-built drawings. The lead-contaminated soil must be kept covered during transportation.

u) For each specific corridor where this variance is to be implemented, all of the following information shall be submitted in writing to DTSC at least five (5) days before construction of any project begins:

1. plan drawing designating the boundaries of the corridor where lead-contaminated soils will be excavated, stockpiled, buried and covered;

2. a list of the Caltrans projects that the corridor encompasses;

3. a list of Caltrans contractors that will be conducting any phase of work on any project affected by this variance;

4. duration of corridor construction;

5. location where sampling and analytical data used to make lead concentration level determinations are kept (e.g. a particular Caltrans project file);

6. name and phone number (including area code) of project resident engineer and project manager;

7. location where Caltrans and contractor health and safety plan and records are kept;

8. location of project special provisions (including page or section number) for soil excavation, transportation, stockpile, burial and placement of cover material;

9. location of project drawings (including drawing page number) for soil excavation, burial and placement of cover in plan and cross section (for example, "The project plans are located at the resident engineer's office located at 5th and Main Streets, City of Fresno, See pages xxxxx of contract xxxx");

10. updated information if a Caltrans project within the corridor is added, changed or deleted; and

11. type of environmental document prepared for each project, date of adoption, document title, Clearing House number and where the document is available for review. A copy of the Caltrans Categorical Exemption, Categorical Exclusion Form, or if filed, the Notice of Exemption for any project shall be submitted to the DTSC Headquarters Project Manager.

v) Changes in location of lead-contaminated soil placement, quantities or protection measures (field changes) shall be noted in the resident engineer's project log within five (5) days of the field change.

w) Caltrans shall ensure that field changes are in compliance with the requirements of this variance.

x) Operational procedures described in the California Environmental Quality Act (CEQA) Special Initial Study shall be followed by Caltrans for activities conducted under this variance.

y) Caltrans shall implement appropriate health and safety procedures to protect its employees and the public, and to prevent or minimize exposure to potentially hazardous wastes. A project-specific health and safety plan must be prepared and implemented. The monitoring and exposure standards shall be based on construction standards for exposure to lead in California Code of Regulations, title 8, section 1532.1.

z) Caltrans shall provide a district Coordinator for this variance. This Coordinator will be the primary point of contact for information flowing to, or received from, DTSC regarding any matter or submission under this variance. Caltrans shall promptly notify DTSC of the name of Coordinator and any change in the Coordinator.

aa) Caltrans shall conduct regular inspections, consistent with Caltrans' Maintenance Division's current Pavement Inspection and Slope Inspection programs, of the locations where lead-contaminated soil has been buried and/or covered pursuant to this variance. If site inspection reveals deterioration of cover so that conditions in the variance are not met, Caltrans shall repair or replace the cover.

bb) Caltrans shall develop and implement a record keeping mechanisms to record and retain permanent records of all locations where lead-contaminated soil has been buried per this variance. The records shall be made available to DTSC.

cc) If areas subject to the terms of this variance are sold, relinquished or abandoned (including roadways), all future property owners shall be notified in writing in advance by Caltrans of the requirements of this variance, and Caltrans shall provide the owner with a copy of the variance. A copy of such a notice shall be sent to DTSC and contain the corridor location and project. Caltrans shall also disclose to DTSC and the new owner the location of areas where lead-contaminated soil has been buried. Future property owners shall be subject to the same requirements as Caltrans.

dd) For the purposes of informing the public about instances where the variance is implemented, Caltrans shall:

1. maintain current fact sheets at all Caltrans resident engineer offices and the Caltrans District office. Caltrans shall make the fact sheets available to anyone expressing an interest in variance-related work.

2. maintain a binder(s) containing copies of all reports submitted to DTSC at the District office. Caltrans shall ensure that the binders are readily accessible to the public.

3. carry out the following actions when it identifies additional projects:

(A) notify the public via a display advertisement in a newspaper of general circulation in that area.

(B) update and distribute the fact sheet to the mailing list and repository locations.

ee) Lead-contaminated soil may be buried only in areas where access is limited or where lead-contaminated soil is covered and contained by a pavement structure.

ff) Dust containing lead-contaminated soil must be controlled. Water or dust palliative may be applied to control dust. If visible dust migration occurs, all excavation, stockpiling and truck loading and burying must be stopped. The granting of this variance confers no relief on Caltrans from compliance with the laws, regulations and requirements enforced by any local air district or the California Air Resources Board.

gg) Sampling and analysis is required to show the lead-contaminated soil meets the variance criteria. All sampling and analysis must be conducted in accordance with the appropriate methods specified in U.S. EPA SW-846.

hh) DTSC retains the right to require Caltrans or any future owner to remove, and properly dispose of, lead-contaminated soil in the event DTSC determines it is necessary for protection of public health, safety or the environment.

ii) DTSC finds that some projects involving lead-contaminated soil are joint projects between Caltrans and other government entities. In these joint projects, Caltrans may not be the lead agency implementing the project although Caltrans is still involved if the project occurs on its right-of-way.

Caltrans may invoke this variance for joint projects where Caltrans and local government entity are involved provided that 1) the project is within the Caltrans Right-of-Way; 2) Caltrans reviews/ oversees all phases of the project including design, contracting, environmental assessment, construction, operation, and maintenance; and 3) Caltrans oversees the project to verify all variance conditions are complied with. Caltrans will be fully responsible for the variance notification and implementation in these joint projects.

jj) All correspondence shall be directed to the following office:

Hazardous Waste Permitting
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826

Attn: Caltrans Lead Variance Notification Unit

10. DISCLAIMER.

a) The issuance of this variance does not relieve Caltrans of the responsibility for compliance with Health and Safety Code, chapter 6.5, or the regulations adopted thereunder, and any other laws and regulations other than those specifically identified in Section 8 of this variance. Caltrans is subject to all terms and conditions herein. The granting of this variance confers no relief from compliance with any federal, State or local requirements other than those specifically provided herein.

b) The issuance of this variance does not release Caltrans from any liability associated with the handling of hazardous waste, except as specifically provided herein and subject to all terms and conditions of this variance.

11. VARIANCE MODIFICATION OR REVOCATION. This variance is subject to review at the discretion of DTSC and may be modified or revoked by DTSC upon change of ownership and at any other time pursuant to Health and Safety Code, section 25143.

12. CEQA DETERMINATION. DTSC adopted a Negative Declaration on June 30, 2009.

Approved:

6/30/09
Date

Beverly Rikala
Operating Facilities Team
Department of Toxic Substances Control

APPENDIX B

October 29, 2015

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 371-5900
Fax:(925) 371-5915

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1503631
Client Reference : ALA 580, E8721-02-38

Enclosed are the results for sample(s) received on October 22, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
C-1A-0	1503631-01	Soil	10/21/15 9:27	10/22/15 8:05
C-1A-1.5	1503631-02	Soil	10/21/15 9:31	10/22/15 8:05
C-1B-0	1503631-03	Soil	10/21/15 9:34	10/22/15 8:05
C-1B-1.5	1503631-04	Soil	10/21/15 9:37	10/22/15 8:05
C-2A-0	1503631-05	Soil	10/21/15 9:44	10/22/15 8:05
C-2A-1.5	1503631-06	Soil	10/21/15 9:47	10/22/15 8:05
C-2B-0	1503631-07	Soil	10/21/15 9:47	10/22/15 8:05
C-2B-1.5	1503631-08	Soil	10/21/15 9:51	10/22/15 8:05
C-3A-0	1503631-09	Soil	10/21/15 9:25	10/22/15 8:05
C-3A-1.5	1503631-10	Soil	10/21/15 9:40	10/22/15 8:05
C-3B-0	1503631-11	Soil	10/21/15 9:50	10/22/15 8:05
C-3B-1.5	1503631-12	Soil	10/21/15 9:55	10/22/15 8:05
C-4A-0	1503631-13	Soil	10/21/15 10:00	10/22/15 8:05
C-4B-0	1503631-14	Soil	10/21/15 10:05	10/22/15 8:05
C-5A-0	1503631-15	Soil	10/21/15 9:55	10/22/15 8:05
C-5A-1	1503631-16	Soil	10/21/15 10:07	10/22/15 8:05
C-5B-0	1503631-17	Soil	10/21/15 10:08	10/22/15 8:05
C-5B-1	1503631-18	Soil	10/21/15 10:11	10/22/15 8:05
S-1A-0	1503631-19	Soil	10/21/15 10:29	10/22/15 8:05
S-1A-1.5	1503631-20	Soil	10/21/15 10:31	10/22/15 8:05
S-1B-0	1503631-21	Soil	10/21/15 10:35	10/22/15 8:05
S-1B-1.5	1503631-22	Soil	10/21/15 10:40	10/22/15 8:05
S-1B-2.5	1503631-23	Soil	10/21/15 10:47	10/22/15 8:05
S-2C-0	1503631-24	Soil	10/21/15 10:37	10/22/15 8:05
S-2C-1.5	1503631-25	Soil	10/21/15 10:41	10/22/15 8:05
S-2C-5	1503631-26	Soil	10/21/15 11:01	10/22/15 8:05
S-1C-0	1503631-27	Soil	10/21/15 10:52	10/22/15 8:05
S-1C-1.5	1503631-28	Soil	10/21/15 10:55	10/22/15 8:05
S-2B-0	1503631-29	Soil	10/21/15 11:16	10/22/15 8:05
S-2B-1.5	1503631-30	Soil	10/21/15 11:19	10/22/15 8:05
S-2B-2.0	1503631-31	Soil	10/21/15 11:24	10/22/15 8:05
S-2A-0	1503631-32	Soil	10/21/15 11:11	10/22/15 8:05
S-2A-1.5	1503631-33	Soil	10/21/15 11:14	10/22/15 8:05
S-3A-0	1503631-34	Soil	10/21/15 11:12	10/22/15 8:05
S-3A-1.5	1503631-35	Soil	10/21/15 11:27	10/22/15 8:05
S-3C-0	1503631-36	Soil	10/21/15 11:34	10/22/15 8:05
S-3C-1.5	1503631-37	Soil	10/21/15 11:37	10/22/15 8:05

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

S-3C-5	1503631-38	Soil	10/21/15 11:41	10/22/15 8:05
S-3B-0	1503631-39	Soil	10/21/15 11:34	10/22/15 8:05
S-3B-1.5	1503631-40	Soil	10/21/15 11:37	10/22/15 8:05
M-1-0	1503631-41	Soil	10/21/15 13:01	10/22/15 8:05
M-1-1	1503631-42	Soil	10/21/15 13:02	10/22/15 8:05
M-2-0	1503631-43	Soil	10/21/15 13:02	10/22/15 8:05
M-2-1	1503631-44	Soil	10/21/15 13:04	10/22/15 8:05
M-3-0	1503631-45	Soil	10/21/15 13:05	10/22/15 8:05
M-3-1	1503631-46	Soil	10/21/15 13:06	10/22/15 8:05
M-4-0	1503631-47	Soil	10/21/15 13:07	10/22/15 8:05
M-4-1	1503631-48	Soil	10/21/15 13:08	10/22/15 8:05

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-1A-0
Lab ID: 1503631-01

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.9**	1.0	1	B5J0788	10/28/2015	10/28/15 15:09	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**94**	10	10	B5J0674	10/23/2015	10/23/15 22:40	
ORO	**370**	10	10	B5J0674	10/23/2015	10/23/15 22:40	
Surrogate: p-Terphenyl	*0%*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 22:40*	S4

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-1A-1.5
Lab ID: 1503631-02

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Arsenic	**4.4**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Barium	**77**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Beryllium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Cadmium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Chromium	**26**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Cobalt	**8.1**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Copper	**30**	2.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Lead	**7.9**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Molybdenum	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Nickel	**24**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Selenium	**1.3**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Silver	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Thallium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Vanadium	**41**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	
Zinc	**51**	1.0	1	B5J0729	10/27/2015	10/28/15 11:14	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0791	10/28/2015	10/28/15 14:45	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-1B-0

Lab ID: 1503631-03

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**9.2**	1.0	1	B5J0788	10/28/2015	10/28/15 15:10	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-1B-1.5
Lab ID: 1503631-04

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B5J0788	10/28/2015	10/28/15 15:12	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B5J0686	10/21/2015	10/26/15 12:21	
Surrogate: 4-Bromofluorobenzene	*68.3 %*		*37 - 153*		B5J0686	10/21/2015	*10/26/15 12:21*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:34	
Toluene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:34	
Ethylbenzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:34	
m,p-Xylene		ND	10	1	B5J0779	10/21/2015	10/28/15 15:34	
o-Xylene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:34	
Surrogate: 4-Bromofluorobenzene	*67.3 %*		*62 - 128*		B5J0779	10/21/2015	*10/28/15 15:34*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-2A-0
Lab ID: 1503631-05

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Arsenic	**5.8**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Barium	**94**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Beryllium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Cadmium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Chromium	**25**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Cobalt	**9.1**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Copper	**63**	2.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Lead	**13**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Molybdenum	**1.2**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Nickel	**28**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Selenium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Silver	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Thallium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Vanadium	**47**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	
Zinc	**140**	1.0	1	B5J0729	10/27/2015	10/28/15 11:16	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0791	10/28/2015	10/28/15 14:55	

pH by EPA 9045C

Analyst: LA

Analyte	Result (pH Units)	PQL (pH Units)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
pH	**7.6**	0.10	1	B5J0752	10/27/2015	10/27/15 14:53	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-2A-1.5

Lab ID: 1503631-06

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**15**	1.0	1	B5J0788	10/28/2015	10/28/15 15:13	

Diesel Range Organics by EPA 8015B **Analyst: CR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**130**	20	20	B5J0674	10/23/2015	10/23/15 22:05	
ORO	**440**	20	20	B5J0674	10/23/2015	10/23/15 22:05	
Surrogate: p-Terphenyl	*0%*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 22:05*	S4

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-2B-0

Lab ID: 1503631-07

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**15**	1.0	1	B5J0788	10/28/2015	10/28/15 15:14	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-2B-1.5
Lab ID: 1503631-08

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B5J0788	10/28/2015	10/28/15 15:15	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B5J0686	10/21/2015	10/26/15 12:37	
Surrogate: 4-Bromofluorobenzene	*61.6 %*		*37 - 153*		B5J0686	10/21/2015	*10/26/15 12:37*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:50	
Toluene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:50	
Ethylbenzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:50	
m,p-Xylene	ND	10	1	B5J0779	10/21/2015	10/28/15 15:50	
o-Xylene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:50	
Surrogate: 4-Bromofluorobenzene	*70.3 %*	*62 - 128*		B5J0779	10/21/2015	*10/28/15 15:50*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-3A-0
Lab ID: 1503631-09

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**14**	1.0	1	B5J0788	10/28/2015	10/28/15 15:17	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**33**	5.0	5	B5J0674	10/23/2015	10/23/15 23:31	
ORO	**130**	5.0	5	B5J0674	10/23/2015	10/23/15 23:31	
Surrogate: p-Terphenyl	*63.8 %*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 23:31*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-3A-1.5

Lab ID: 1503631-10

Title 22 Metals by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Arsenic	**12**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Barium	**190**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Beryllium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Cadmium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Chromium	**29**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Cobalt	**47**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Copper	**30**	2.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Lead	**11**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Molybdenum	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Nickel	**53**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Selenium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Silver	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Thallium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Vanadium	**40**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	
Zinc	**78**	1.0	1	B5J0729	10/27/2015	10/28/15 11:18	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: SB**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0791	10/28/2015	10/28/15 14:57	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-3B-0

Lab ID: 1503631-11

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**16**	1.0	1	B5J0788	10/28/2015	10/28/15 15:20	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-3B-1.5
Lab ID: 1503631-12

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**9.3**	1.0	1	B5J0788	10/28/2015	10/28/15 15:22	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B5J0686	10/21/2015	10/26/15 12:05	
Surrogate: 4-Bromofluorobenzene	*92.9 %*		*37 - 153*		B5J0686	10/21/2015	*10/26/15 12:05*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:19	
Toluene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:19	
Ethylbenzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:19	
m,p-Xylene	ND	10	1	B5J0779	10/21/2015	10/28/15 15:19	
o-Xylene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 15:19	
Surrogate: 4-Bromofluorobenzene	*81.5 %*	*62 - 128*		B5J0779	10/21/2015	*10/28/15 15:19*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Client Sample ID C-4A-0
Lab ID: 1503631-13

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Arsenic	**5.0**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Barium	**86**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Beryllium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Cadmium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Chromium	**23**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Cobalt	**7.7**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Copper	**26**	2.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Lead	**17**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Molybdenum	**1.2**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Nickel	**26**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Selenium	**1.5**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Silver	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Thallium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Vanadium	**46**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	
Zinc	**88**	1.0	1	B5J0729	10/27/2015	10/28/15 11:19	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0791	10/28/2015	10/28/15 14:59	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-4B-0

Lab ID: 1503631-14

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B5J0788	10/28/2015	10/28/15 15:23	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-5A-0
Lab ID: 1503631-15

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Arsenic	**4.2**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Barium	**91**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Beryllium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Cadmium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Chromium	**18**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Cobalt	**5.7**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Copper	**11**	2.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Lead	**4.9**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Molybdenum	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Nickel	**15**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Selenium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Silver	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Thallium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Vanadium	**24**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	
Zinc	**52**	1.0	1	B5J0729	10/27/2015	10/28/15 11:21	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0791	10/28/2015	10/28/15 15:47	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-5A-1
Lab ID: 1503631-16

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.3**	1.0	1	B5J0788	10/28/2015	10/28/15 15:26	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B5J0686	10/21/2015	10/26/15 12:53	
Surrogate: 4-Bromofluorobenzene	*93.7 %*	*37 - 153*		B5J0686	10/21/2015	*10/26/15 12:53*	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**4.5**	1.0	1	B5J0674	10/23/2015	10/23/15 20:06	
ORO	**4.7**	1.0	1	B5J0674	10/23/2015	10/23/15 20:06	
Surrogate: p-Terphenyl	*46.9 %*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 20:06*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:06	
Toluene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:06	
Ethylbenzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:06	
m,p-Xylene	ND	10	1	B5J0779	10/21/2015	10/28/15 16:06	
o-Xylene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:06	
Surrogate: 4-Bromofluorobenzene	*78.8 %*	*62 - 128*		B5J0779	10/21/2015	*10/28/15 16:06*	

pH by EPA 9045C

Analyst: LA

Analyte	Result (pH Units)	PQL (pH Units)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
pH	**7.8**	0.10	1	B5J0752	10/27/2015	10/27/15 14:53	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-5B-0

Lab ID: 1503631-17

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**9.4**	1.0	1	B5J0788	10/28/2015	10/28/15 15:27	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID C-5B-1

Lab ID: 1503631-18

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.2**	1.0	1	B5J0788	10/28/2015	10/28/15 15:29	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-1A-0
Lab ID: 1503631-19

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.6**	1.0	1	B5J0788	10/28/2015	10/28/15 15:30	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**100**	20	20	B5J0674	10/23/2015	10/23/15 23:48	
ORO	**430**	20	20	B5J0674	10/23/2015	10/23/15 23:48	
Surrogate: p-Terphenyl	*0%*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 23:48*	S4

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-1A-1.5

Lab ID: 1503631-20

Title 22 Metals by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Arsenic	**4.1**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Barium	**97**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Beryllium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Cadmium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Chromium	**49**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Cobalt	**14**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Copper	**51**	2.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Lead	**7.1**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Molybdenum	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Nickel	**46**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Selenium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Silver	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Thallium	ND	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Vanadium	**29**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	
Zinc	**45**	1.0	1	B5J0729	10/27/2015	10/28/15 11:23	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: SB**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.19**	0.10	1	B5J0791	10/28/2015	10/28/15 15:49	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-1B-0

Lab ID: 1503631-21

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**4.6**	1.0	1	B5J0788	10/28/2015	10/28/15 15:31	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-1B-1.5
Lab ID: 1503631-22

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**9.7**	1.0	1	B5J0788	10/28/2015	10/28/15 15:35	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B5J0686	10/21/2015	10/26/15 13:09	
Surrogate: 4-Bromofluorobenzene	*76.7 %*		*37 - 153*		B5J0686	10/21/2015	*10/26/15 13:09*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:22	
Toluene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:22	
Ethylbenzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:22	
m,p-Xylene		ND	10	1	B5J0779	10/21/2015	10/28/15 16:22	
o-Xylene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:22	
Surrogate: 4-Bromofluorobenzene	*68.2 %*		*62 - 128*		B5J0779	10/21/2015	*10/28/15 16:22*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-1B-2.5
Lab ID: 1503631-23

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Arsenic	**2.6**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Barium	**66**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Chromium	**89**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Cobalt	**21**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Copper	**39**	2.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Lead	**6.3**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Nickel	**90**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Selenium	**1.8**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Vanadium	**24**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	
Zinc	**32**	1.0	1	B5J0734	10/27/2015	10/28/15 12:37	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0791	10/28/2015	10/28/15 15:51	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-2C-0

Lab ID: 1503631-24

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B5J0788	10/28/2015	10/28/15 15:36	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-2C-1.5

Lab ID: 1503631-25

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.9**	1.0	1	B5J0788	10/28/2015	10/28/15 15:37	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Client Sample ID S-2C-5
Lab ID: 1503631-26

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Arsenic	**3.3**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Barium	**99**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Chromium	**23**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Cobalt	**9.9**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Copper	**45**	2.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Lead	**3.8**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Nickel	**24**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Selenium	**1.2**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Vanadium	**30**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	
Zinc	**26**	1.0	1	B5J0734	10/27/2015	10/28/15 12:45	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.16**	0.10	1	B5J0791	10/28/2015	10/28/15 15:53	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-1C-0

Lab ID: 1503631-27

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.5**	1.0	1	B5J0788	10/28/2015	10/28/15 15:39	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-1C-1.5

Lab ID: 1503631-28

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.7**	1.0	1	B5J0788	10/28/2015	10/28/15 15:39	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-2B-0

Lab ID: 1503631-29

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B5J0789	10/28/2015	10/28/15 15:50	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-2B-1.5
Lab ID: 1503631-30

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.4**	1.0	1	B5J0789	10/28/2015	10/28/15 15:51	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B5J0686	10/21/2015	10/26/15 13:25	
Surrogate: 4-Bromofluorobenzene	*76.1 %*		*37 - 153*		B5J0686	10/21/2015	*10/26/15 13:25*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:38	
Toluene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:38	
Ethylbenzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:38	
m,p-Xylene		ND	10	1	B5J0779	10/21/2015	10/28/15 16:38	
o-Xylene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:38	
Surrogate: 4-Bromofluorobenzene	*66.6 %*		*62 - 128*		B5J0779	10/21/2015	*10/28/15 16:38*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-2B-2.0
Lab ID: 1503631-31

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Arsenic	**4.9**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Barium	**100**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Chromium	**280**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Cobalt	**31**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Copper	**39**	2.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Lead	**8.9**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Nickel	**350**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Selenium	**1.2**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Vanadium	**37**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	
Zinc	**42**	1.0	1	B5J0734	10/27/2015	10/28/15 12:47	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0791	10/28/2015	10/28/15 15:55	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-2A-0
Lab ID: 1503631-32

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B5J0789	10/28/2015	10/28/15 15:52	

pH by EPA 9045C

Analyst: LA

Analyte	Result (pH Units)	PQL (pH Units)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
pH	**8.0**	0.10	1	B5J0752	10/27/2015	10/27/15 14:53	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-2A-1.5
Lab ID: 1503631-33

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Arsenic	**4.0**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Barium	**110**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Chromium	**170**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Cobalt	**22**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Copper	**37**	2.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Lead	**9.4**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Nickel	**220**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Selenium	**1.5**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Vanadium	**33**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	
Zinc	**42**	1.0	1	B5J0734	10/27/2015	10/28/15 12:49	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.18**	0.10	1	B5J0791	10/28/2015	10/28/15 15:57	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**46**	10	10	B5J0674	10/23/2015	10/23/15 22:22	
ORO	**180**	10	10	B5J0674	10/23/2015	10/23/15 22:22	
Surrogate: p-Terphenyl	*0%*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 22:22*	S4

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-3A-0
Lab ID: 1503631-34

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**11**	1.0	1	B5J0789	10/28/2015	10/28/15 15:54	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**89**	20	20	B5J0674	10/23/2015	10/23/15 21:14	
ORO	**380**	20	20	B5J0674	10/23/2015	10/23/15 21:14	
Surrogate: p-Terphenyl	*0%*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 21:14*	S4

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-3A-1.5
Lab ID: 1503631-35

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Arsenic	**4.0**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Barium	**95**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Chromium	**86**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Cobalt	**19**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Copper	**63**	2.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Lead	**3.0**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Nickel	**78**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Selenium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Vanadium	**39**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	
Zinc	**26**	1.0	1	B5J0734	10/27/2015	10/28/15 12:50	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.19**	0.10	1	B5J0792	10/28/2015	10/28/15 16:03	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-3C-0
Lab ID: 1503631-36

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**12**	1.0	1	B5J0789	10/28/2015	10/28/15 15:55	

pH by EPA 9045C

Analyst: LA

Analyte	Result (pH Units)	PQL (pH Units)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
pH	**7.7**	0.10	1	B5J0752	10/27/2015	10/27/15 14:53	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-3C-1.5

Lab ID: 1503631-37

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**14**	1.0	1	B5J0789	10/28/2015	10/28/15 15:56	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-3C-5
Lab ID: 1503631-38

Title 22 Metals by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Arsenic	**5.1**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Barium	**140**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Chromium	**87**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Cobalt	**19**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Copper	**52**	2.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Lead	**9.1**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Nickel	**97**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Selenium	**1.6**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Vanadium	**35**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	
Zinc	**34**	1.0	1	B5J0734	10/27/2015	10/28/15 12:56	

Mercury by AA (Cold Vapor) EPA 7471A

Analyst: SB

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	**0.21**	0.10	1	B5J0792	10/28/2015	10/28/15 16:17	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**26**	5.0	5	B5J0674	10/23/2015	10/23/15 22:57	
ORO	**110**	5.0	5	B5J0674	10/23/2015	10/23/15 22:57	
Surrogate: p-Terphenyl	*70.3 %*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 22:57*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-3B-0

Lab ID: 1503631-39

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**8.9**	1.0	1	B5J0789	10/28/2015	10/28/15 15:57	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID S-3B-1.5

Lab ID: 1503631-40

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**7.6**	1.0	1	B5J0789	10/28/2015	10/28/15 15:59	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-1-0

Lab ID: 1503631-41

Title 22 Metals by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Arsenic	**3.9**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Barium	**130**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Chromium	**25**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Cobalt	**7.4**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Copper	**32**	2.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Lead	**12**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Nickel	**33**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Selenium	**1.4**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Vanadium	**27**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	
Zinc	**100**	1.0	1	B5J0734	10/27/2015	10/28/15 12:58	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: SB**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0792	10/28/2015	10/28/15 16:19	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-1-1
Lab ID: 1503631-42

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**12**	1.0	1	B5J0789	10/28/2015	10/28/15 16:00	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**26**	5.0	5	B5J0674	10/23/2015	10/23/15 20:57	
ORO	**80**	5.0	5	B5J0674	10/23/2015	10/23/15 20:57	
Surrogate: p-Terphenyl	*72.3 %*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 20:57*	

pH by EPA 9045C

Analyst: LA

Analyte	Result (pH Units)	PQL (pH Units)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
pH	**8.8**	0.10	1	B5J0752	10/27/2015	10/27/15 14:53	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-2-0

Lab ID: 1503631-43

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**25**	1.0	1	B5J0789	10/28/2015	10/28/15 16:04	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-2-1
Lab ID: 1503631-44

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**26**	1.0	1	B5J0789	10/28/2015	10/28/15 16:07	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics	ND	1.0	1	B5J0686	10/21/2015	10/26/15 13:41	
Surrogate: 4-Bromofluorobenzene	*74.2 %*	*37 - 153*		B5J0686	10/21/2015	*10/26/15 13:41*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte	Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:54	
Toluene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:54	
Ethylbenzene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:54	
m,p-Xylene	ND	10	1	B5J0779	10/21/2015	10/28/15 16:54	
o-Xylene	ND	5.0	1	B5J0779	10/21/2015	10/28/15 16:54	
Surrogate: 4-Bromofluorobenzene	*65.0 %*	*62 - 128*		B5J0779	10/21/2015	*10/28/15 16:54*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-3-0

Lab ID: 1503631-45

Lead by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**16**	1.0	1	B5J0789	10/28/2015	10/28/15 16:08	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-3-1

Lab ID: 1503631-46

Title 22 Metals by ICP-AES EPA 6010B **Analyst: RR**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Antimony	ND	2.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Arsenic	**4.7**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Barium	**35**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Beryllium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Cadmium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Chromium	**35**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Cobalt	**8.7**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Copper	**24**	2.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Lead	**9.3**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Molybdenum	ND	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Nickel	**47**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Selenium	**1.2**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Silver	ND	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Thallium	ND	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Vanadium	**17**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	
Zinc	**48**	1.0	1	B5J0734	10/27/2015	10/28/15 13:00	

Mercury by AA (Cold Vapor) EPA 7471A **Analyst: SB**

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Mercury	ND	0.10	1	B5J0792	10/28/2015	10/28/15 16:21	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-4-0
Lab ID: 1503631-47

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**77**	1.0	1	B5J0789	10/28/2015	10/28/15 16:09	

Diesel Range Organics by EPA 8015B

Analyst: CR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
DRO	**44**	5.0	5	B5J0674	10/23/2015	10/23/15 23:14	
ORO	**140**	5.0	5	B5J0674	10/23/2015	10/23/15 23:14	
Surrogate: p-Terphenyl	*100 %*	*26 - 123*		B5J0674	10/23/2015	*10/23/15 23:14*	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Client Sample ID M-4-1
Lab ID: 1503631-48

Lead by ICP-AES EPA 6010B

Analyst: RR

Analyte	Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Lead	**23**	1.0	1	B5J0789	10/28/2015	10/28/15 16:11	

Gasoline Range Organics by EPA 8015B (Modified)

Analyst: BT

Analyte		Result (mg/kg)	PQL (mg/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Gasoline Range Organics		ND	1.0	1	B5J0686	10/21/2015	10/26/15 13:57	
Surrogate: 4-Bromofluorobenzene	*71.6 %*		*37 - 153*		B5J0686	10/21/2015	*10/26/15 13:57*	

BTEX/MTBE by EPA 8021

Analyst: BT

Analyte		Result (ug/kg)	PQL (ug/kg)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Benzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 17:10	
Toluene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 17:10	
Ethylbenzene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 17:10	
m,p-Xylene		ND	10	1	B5J0779	10/21/2015	10/28/15 17:10	
o-Xylene		ND	5.0	1	B5J0779	10/21/2015	10/28/15 17:10	
Surrogate: 4-Bromofluorobenzene	*76.1 %*		*62 - 128*		B5J0779	10/21/2015	*10/28/15 17:10*	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

QUALITY CONTROL SECTION

Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0729 - EPA 3050B_S									
Blank (B5J0729-BLK1)				Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	ND	2.0			NR				
Arsenic	ND	1.0			NR				
Barium	ND	1.0			NR				
Beryllium	ND	1.0			NR				
Cadmium	ND	1.0			NR				
Chromium	ND	1.0			NR				
Cobalt	ND	1.0			NR				
Copper	ND	2.0			NR				
Lead	ND	1.0			NR				
Molybdenum	ND	1.0			NR				
Nickel	ND	1.0			NR				
Selenium	ND	1.0			NR				
Silver	ND	1.0			NR				
Thallium	ND	1.0			NR				
Vanadium	ND	1.0			NR				
Zinc	ND	1.0			NR				
LCS (B5J0729-BS1)				Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	48.5846	2.0	50.0000		97.2	80 - 120			
Arsenic	46.6351	1.0	50.0000		93.3	80 - 120			
Barium	50.6464	1.0	50.0000		101	80 - 120			
Beryllium	48.3912	1.0	50.0000		96.8	80 - 120			
Cadmium	48.2216	1.0	50.0000		96.4	80 - 120			
Chromium	51.0994	1.0	50.0000		102	80 - 120			
Cobalt	48.6545	1.0	50.0000		97.3	80 - 120			
Copper	49.1177	2.0	50.0000		98.2	80 - 120			
Lead	47.8537	1.0	50.0000		95.7	80 - 120			
Molybdenum	49.5254	1.0	50.0000		99.1	80 - 120			
Nickel	47.9280	1.0	50.0000		95.9	80 - 120			
Selenium	43.7654	1.0	50.0000		87.5	80 - 120			
Silver	46.7396	1.0	50.0000		93.5	80 - 120			
Thallium	49.6134	1.0	50.0000		99.2	80 - 120			
Vanadium	49.6986	1.0	50.0000		99.4	80 - 120			
Zinc	46.3757	1.0	50.0000		92.8	80 - 120			
Duplicate (B5J0729-DUP1)		**Source: 1503617-01**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	0.775332	2.0		0.892219	NR		14.0	20	
Arsenic	3.16414	1.0		2.78947	NR		12.6	20	
Barium	310.281	1.0		254.244	NR		19.9	20	
Beryllium	0.135152	1.0		0.139433	NR		3.12	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0729 - EPA 3050B_S (continued)									
Duplicate (B5J0729-DUP1) - Continued		**Source: 1503617-01**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Cadmium	0.345202	1.0		0.269600	NR		24.6	20	R
Chromium	12.5844	1.0		10.9258	NR		14.1	20	
Cobalt	3.09922	1.0		2.98683	NR		3.69	20	
Copper	38.5264	2.0		24.9444	NR		42.8	20	R
Lead	34.5299	1.0		23.6408	NR		37.4	20	R
Molybdenum	1.66013	1.0		1.29005	NR		25.1	20	R
Nickel	14.6063	1.0		13.2747	NR		9.55	20	
Selenium	1.02014	1.0		0.768639	NR		28.1	20	R
Silver	ND	1.0		ND	NR			20	
Thallium	ND	1.0		ND	NR			20	
Vanadium	14.8259	1.0		13.3741	NR		10.3	20	
Zinc	80.9849	1.0		63.0625	NR		24.9	20	R
Matrix Spike (B5J0729-MS1)		**Source: 1503617-01**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	94.0790	2.0	125.000	0.892219	74.5	28 - 106			
Arsenic	113.157	1.0	125.000	2.78947	88.3	57 - 109			
Barium	458.727	1.0	125.000	254.244	164	18 - 159			M1
Beryllium	110.592	1.0	125.000	0.139433	88.4	61 - 107			
Cadmium	102.219	1.0	125.000	0.269600	81.6	53 - 104			
Chromium	121.889	1.0	125.000	10.9258	88.8	53 - 121			
Cobalt	106.680	1.0	125.000	2.98683	83.0	55 - 109			
Copper	149.408	2.0	125.000	24.9444	99.6	58 - 124			
Lead	134.325	1.0	125.000	23.6408	88.5	35 - 129			
Molybdenum	111.286	1.0	125.000	1.29005	88.0	57 - 108			
Nickel	116.898	1.0	125.000	13.2747	82.9	44 - 122			
Selenium	106.691	1.0	125.000	0.768639	84.7	54 - 104			
Silver	108.715	1.0	125.000	ND	87.0	60 - 112			
Thallium	102.202	1.0	125.000	ND	81.8	50 - 103			
Vanadium	123.702	1.0	125.000	13.3741	88.3	54 - 123			
Zinc	173.423	1.0	125.000	63.0625	88.3	29 - 132			
Matrix Spike Dup (B5J0729-MSD1)		**Source: 1503617-01**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	94.0150	2.0	125.000	0.892219	74.5	28 - 106	0.0681	20	
Arsenic	114.478	1.0	125.000	2.78947	89.4	57 - 109	1.16	20	
Barium	448.194	1.0	125.000	254.244	155	18 - 159	2.32	20	
Beryllium	112.635	1.0	125.000	0.139433	90.0	61 - 107	1.83	20	
Cadmium	102.270	1.0	125.000	0.269600	81.6	53 - 104	0.0502	20	
Chromium	122.295	1.0	125.000	10.9258	89.1	53 - 121	0.333	20	
Cobalt	105.768	1.0	125.000	2.98683	82.2	55 - 109	0.859	20	
Copper	144.026	2.0	125.000	24.9444	95.3	58 - 124	3.67	20	
Lead	131.047	1.0	125.000	23.6408	85.9	35 - 129	2.47	20	
Molybdenum	111.557	1.0	125.000	1.29005	88.2	57 - 108	0.244	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0729 - EPA 3050B_S (continued)									
Matrix Spike Dup (B5J0729-MSD1) - Continued		**Source: 1503617-01**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Nickel	118.566	1.0	125.000	13.2747	84.2	44 - 122	1.42	20	
Selenium	107.002	1.0	125.000	0.768639	85.0	54 - 104	0.291	20	
Silver	109.106	1.0	125.000	ND	87.3	60 - 112	0.360	20	
Thallium	102.828	1.0	125.000	ND	82.3	50 - 103	0.610	20	
Vanadium	123.429	1.0	125.000	13.3741	88.0	54 - 123	0.221	20	
Zinc	168.367	1.0	125.000	63.0625	84.2	29 - 132	2.96	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Title 22 Metals by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0734 - EPA 3050B_S									
Blank (B5J0734-BLK1)				Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	ND	2.0			NR				
Arsenic	ND	1.0			NR				
Barium	ND	1.0			NR				
Beryllium	ND	1.0			NR				
Cadmium	ND	1.0			NR				
Chromium	ND	1.0			NR				
Cobalt	ND	1.0			NR				
Copper	ND	2.0			NR				
Lead	ND	1.0			NR				
Molybdenum	ND	1.0			NR				
Nickel	ND	1.0			NR				
Selenium	ND	1.0			NR				
Silver	ND	1.0			NR				
Thallium	ND	1.0			NR				
Vanadium	ND	1.0			NR				
Zinc	ND	1.0			NR				
LCS (B5J0734-BS1)				Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	46.6928	2.0	50.0000		93.4	80 - 120			
Arsenic	45.4172	1.0	50.0000		90.8	80 - 120			
Barium	48.4285	1.0	50.0000		96.9	80 - 120			
Beryllium	47.0083	1.0	50.0000		94.0	80 - 120			
Cadmium	46.4150	1.0	50.0000		92.8	80 - 120			
Chromium	49.5711	1.0	50.0000		99.1	80 - 120			
Cobalt	45.8467	1.0	50.0000		91.7	80 - 120			
Copper	48.2876	2.0	50.0000		96.6	80 - 120			
Lead	45.7091	1.0	50.0000		91.4	80 - 120			
Molybdenum	47.6214	1.0	50.0000		95.2	80 - 120			
Nickel	46.0523	1.0	50.0000		92.1	80 - 120			
Selenium	42.7210	1.0	50.0000		85.4	80 - 120			
Silver	44.7218	1.0	50.0000		89.4	80 - 120			
Thallium	47.7482	1.0	50.0000		95.5	80 - 120			
Vanadium	47.2422	1.0	50.0000		94.5	80 - 120			
Zinc	43.9428	1.0	50.0000		87.9	80 - 120			
Duplicate (B5J0734-DUP1)		**Source: 1503631-23**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	0.732604	2.0		0.939152	NR		24.7	20	R
Arsenic	2.45708	1.0		2.59703	NR		5.54	20	
Barium	61.2590	1.0		65.9670	NR		7.40	20	
Beryllium	0.246707	1.0		0.166826	NR		38.6	20	R
Cadmium	0.171822	1.0		0.104854	NR		48.4	20	R
Chromium	104.364	1.0		88.6840	NR		16.2	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0734 - EPA 3050B_S (continued)									
Duplicate (B5J0734-DUP1) - Continued		**Source: 1503631-23**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Cobalt	18.7885	1.0		21.1060	NR		11.6	20	
Copper	37.3134	2.0		39.2657	NR		5.10	20	
Lead	6.36130	1.0		6.26164	NR		1.58	20	
Molybdenum	0.263269	1.0		0.265004	NR		0.657	20	
Nickel	74.2622	1.0		89.5250	NR		18.6	20	
Selenium	1.38290	1.0		1.81188	NR		26.9	20	R
Silver	ND	1.0		ND	NR			20	
Thallium	ND	1.0		ND	NR			20	
Vanadium	24.9297	1.0		23.9254	NR		4.11	20	
Zinc	29.4352	1.0		32.0207	NR		8.41	20	
Matrix Spike (B5J0734-MS1)		**Source: 1503631-23**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	79.9036	2.0	125.000	0.939152	63.2	28 - 106			
Arsenic	101.086	1.0	125.000	2.59703	78.8	57 - 109			
Barium	185.849	1.0	125.000	65.9670	95.9	18 - 159			
Beryllium	97.8182	1.0	125.000	0.166826	78.1	61 - 107			
Cadmium	87.0006	1.0	125.000	0.104854	69.5	53 - 104			
Chromium	191.941	1.0	125.000	88.6840	82.6	53 - 121			
Cobalt	103.762	1.0	125.000	21.1060	66.1	55 - 109			
Copper	149.421	2.0	125.000	39.2657	88.1	58 - 124			
Lead	93.7629	1.0	125.000	6.26164	70.0	35 - 129			
Molybdenum	93.4027	1.0	125.000	0.265004	74.5	57 - 108			
Nickel	149.271	1.0	125.000	89.5250	47.8	44 - 122			
Selenium	95.9326	1.0	125.000	1.81188	75.3	54 - 104			
Silver	106.220	1.0	125.000	ND	85.0	60 - 112			
Thallium	90.1258	1.0	125.000	ND	72.1	50 - 103			
Vanadium	117.797	1.0	125.000	23.9254	75.1	54 - 123			
Zinc	114.642	1.0	125.000	32.0207	66.1	29 - 132			
Matrix Spike Dup (B5J0734-MSD1)		**Source: 1503631-23**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Antimony	71.5173	2.0	125.000	0.939152	56.5	28 - 106	11.1	20	
Arsenic	98.8956	1.0	125.000	2.59703	77.0	57 - 109	2.19	20	
Barium	168.485	1.0	125.000	65.9670	82.0	18 - 159	9.80	20	
Beryllium	95.3118	1.0	125.000	0.166826	76.1	61 - 107	2.60	20	
Cadmium	84.8704	1.0	125.000	0.104854	67.8	53 - 104	2.48	20	
Chromium	180.338	1.0	125.000	88.6840	73.3	53 - 121	6.23	20	
Cobalt	101.531	1.0	125.000	21.1060	64.3	55 - 109	2.17	20	
Copper	150.449	2.0	125.000	39.2657	88.9	58 - 124	0.686	20	
Lead	92.3664	1.0	125.000	6.26164	68.9	35 - 129	1.50	20	
Molybdenum	88.4187	1.0	125.000	0.265004	70.5	57 - 108	5.48	20	
Nickel	145.325	1.0	125.000	89.5250	44.6	44 - 122	2.68	20	
Selenium	92.1076	1.0	125.000	1.81188	72.2	54 - 104	4.07	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Title 22 Metals by ICP-AES EPA 6010B - Quality Control (cont'd)

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0734 - EPA 3050B_S (continued)									
Matrix Spike Dup (B5J0734-MSD1) - Continued		**Source: 1503631-23**		Prepared: 10/27/2015 Analyzed: 10/28/2015					
Silver	101.405	1.0	125.000	ND	81.1	60 - 112	4.64	20	
Thallium	86.8707	1.0	125.000	ND	69.5	50 - 103	3.68	20	
Vanadium	115.370	1.0	125.000	23.9254	73.2	54 - 123	2.08	20	
Zinc	117.014	1.0	125.000	32.0207	68.0	29 - 132	2.05	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0788 - EPA 3050 Modified_S									
Blank (B5J0788-BLK1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	ND	1.0			NR				
Blank (B5J0788-BLK2)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	ND	1.0			NR				
LCS (B5J0788-BS1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	48.9697	1.0	50.0000		97.9	80 - 120			
Duplicate (B5J0788-DUP1)		**Source: 1503631-28**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	6.97593	1.0		8.70452	NR		22.0	20	R
Duplicate (B5J0788-DUP2)		**Source: 1503631-14**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	11.3228	1.0		11.3335	NR		0.0947	20	
Matrix Spike (B5J0788-MS1)		**Source: 1503631-28**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	201.732	1.0	250.000	8.70452	77.2	35 - 129			
Matrix Spike (B5J0788-MS2)		**Source: 1503631-14**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	228.418	1.0	250.000	11.3335	86.8	35 - 129			
Matrix Spike Dup (B5J0788-MSD1)		**Source: 1503631-28**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	210.413	1.0	250.000	8.70452	80.7	35 - 129	4.21	20	

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Lead by ICP-AES EPA 6010B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0789 - EPA 3050 Modified_S									
Blank (B5J0789-BLK1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	ND	1.0			NR				
Blank (B5J0789-BLK2)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	ND	1.0			NR				
LCS (B5J0789-BS1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	47.1183	1.0	50.0000		94.2	80 - 120			
Duplicate (B5J0789-DUP1)		**Source: 1503633-06**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	15.5088	1.0		15.2252	NR		1.85	20	
Duplicate (B5J0789-DUP2)		**Source: 1503631-43**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	19.1478	1.0		24.5072	NR		24.6	20	R
Matrix Spike (B5J0789-MS1)		**Source: 1503633-06**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	228.840	1.0	250.000	15.2252	85.4	35 - 129			
Matrix Spike (B5J0789-MS2)		**Source: 1503631-43**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	229.343	1.0	250.000	24.5072	81.9	35 - 129			
Matrix Spike Dup (B5J0789-MSD1)		**Source: 1503633-06**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Lead	229.017	1.0	250.000	15.2252	85.5	35 - 129	0.0773	20	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0791 - EPA 7471_S									
Blank (B5J0791-BLK1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	ND	0.10			NR				
LCS (B5J0791-BS1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.791505	0.10	0.833333		95.0	80 - 120			
Duplicate (B5J0791-DUP1)		**Source: 1503631-02**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.047435	0.10		0.069650	NR		37.9	20	R
Matrix Spike (B5J0791-MS1)		**Source: 1503631-02**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.949811	0.10	0.833333	0.069650	106	70 - 130			
Matrix Spike Dup (B5J0791-MSD1)		**Source: 1503631-02**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.848873	0.10	0.833333	0.069650	93.5	70 - 130	11.2	20	
Post Spike (B5J0791-PS1)		**Source: 1503631-02**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.006649		5.00000E-3	0.000836	116	85 - 115			M1

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Mercury by AA (Cold Vapor) EPA 7471A - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0792 - EPA 7471_S									
Blank (B5J0792-BLK1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	ND	0.10			NR				
LCS (B5J0792-BS1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.826378	0.10	0.833333		99.2	80 - 120			
Duplicate (B5J0792-DUP1)		**Source: 1503631-35**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.156053	0.10		0.186396	NR		17.7	20	
Matrix Spike (B5J0792-MS1)		**Source: 1503631-35**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	1.05230	0.10	0.833333	0.186396	104	70 - 130			
Matrix Spike Dup (B5J0792-MSD1)		**Source: 1503631-35**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	1.00699	0.10	0.833333	0.186396	98.5	70 - 130	4.40	20	
Post Spike (B5J0792-PS1)		**Source: 1503631-35**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Mercury	0.007754		5.00000E-3	0.002237	110	85 - 115			

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Gasoline Range Organics by EPA 8015B (Modified) - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0686 - GCVOA_S									
Blank (B5J0686-BLK1)				Prepared: 10/26/2015 Analyzed: 10/26/2015					
Gasoline Range Organics	ND	1.0			NR				
Surrogate: 4-Bromofluorobenzene	*0.1827*		*0.200000*		*91.3*	*37 - 153*			
LCS (B5J0686-BS1)				Prepared: 10/26/2015 Analyzed: 10/26/2015					
Gasoline Range Organics	4.57600	1.0	5.00000		91.5	70 - 130			
Surrogate: 4-Bromofluorobenzene	*0.2380*		*0.200000*		*119*	*37 - 153*			
Duplicate (B5J0686-DUP1)		**Source: 1503631-12**		Prepared: 10/26/2015 Analyzed: 10/26/2015					
Gasoline Range Organics	ND	1.0		ND	NR			20	
Surrogate: 4-Bromofluorobenzene	*0.1640*		*0.200000*		*82.0*	*37 - 153*			
Matrix Spike (B5J0686-MS1)		**Source: 1503631-12**		Prepared: 10/26/2015 Analyzed: 10/26/2015					
Gasoline Range Organics	4.54400	1.0	5.00000	ND	90.9	20 - 130			
Surrogate: 4-Bromofluorobenzene	*0.2007*		*0.200000*		*100*	*37 - 153*			
Matrix Spike Dup (B5J0686-MSD1)		**Source: 1503631-12**		Prepared: 10/26/2015 Analyzed: 10/26/2015					
Gasoline Range Organics	4.10900	1.0	5.00000	ND	82.2	20 - 130	10.1	20	
Surrogate: 4-Bromofluorobenzene	*0.2016*		*0.200000*		*101*	*37 - 153*			

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Gasoline Range Organics by EPA 8015B (Modified) - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0779 - GCVOA_S									
Duplicate (B5J0779-DUP1)		**Source: 1503631-12**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Gasoline Range Organics	ND	1.0		ND	NR			20	
Surrogate: 4-Bromofluorobenzene	*0.1802*		*0.200000*		*90.1*	*37 - 153*			

Certificate of Analysis

Geocon Consultants, Inc.	Project Number :	ALA 580, E8721-02-38
6671 Brisa Street	Report To :	Luann Beadle
Livermore , CA 94550	Reported :	10/29/2015

Diesel Range Organics by EPA 8015B - Quality Control

Analyte	Result (mg/kg)	PQL (mg/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0674 - GCSEMI_DRO_LL_S									
Blank (B5J0674-BLK1)				Prepared: 10/23/2015 Analyzed: 10/23/2015					
DRO	ND	1.0			NR				
ORO	ND	1.0			NR				
Surrogate: p-Terphenyl	*1.547*		*2.66667*		*58.0*	*26 - 123*			
LCS (B5J0674-BS1)				Prepared: 10/23/2015 Analyzed: 10/23/2015					
DRO	27.1797	1.0	33.3333		81.5	47 - 127			
Surrogate: p-Terphenyl	*1.579*		*2.66667*		*59.2*	*26 - 123*			
Duplicate (B5J0674-DUP1)		**Source: 1503631-16**		Prepared: 10/23/2015 Analyzed: 10/23/2015					
DRO	4.18333	1.0		4.50633	NR		7.43	20	
Surrogate: p-Terphenyl	*1.069*		*2.66667*		*40.1*	*26 - 123*			
Matrix Spike (B5J0674-MS1)		**Source: 1503631-16**		Prepared: 10/23/2015 Analyzed: 10/23/2015					
DRO	16.3067	1.0	33.3333	4.50633	35.4	16 - 123			
Surrogate: p-Terphenyl	*1.403*		*2.66667*		*52.6*	*26 - 123*			
Matrix Spike Dup (B5J0674-MSD1)		**Source: 1503631-16**		Prepared: 10/23/2015 Analyzed: 10/23/2015					
DRO	23.5003	1.0	33.3333	4.50633	57.0	16 - 123	36.1	20	R
Surrogate: p-Terphenyl	*1.176*		*2.66667*		*44.1*	*26 - 123*			

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

BTEX/MTBE by EPA 8021 - Quality Control

Analyte	Result (ug/kg)	PQL (ug/kg)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0779 - GCVOA_S									
Blank (B5J0779-BLK1)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Benzene	ND	5.0			NR				
Toluene	ND	5.0			NR				
Ethylbenzene	ND	5.0			NR				
m,p-Xylene	ND	10			NR				
o-Xylene	ND	5.0			NR				
Surrogate: 4-Bromofluorobenzene	*168.0*		*200.000*		*84.0*	*62 - 128*			
LCS (B5J0779-BS2)				Prepared: 10/28/2015 Analyzed: 10/28/2015					
Benzene	80.9910	5.0	100.000		81.0	70 - 130			
Toluene	80.6690	5.0	100.000		80.7	70 - 130			
Ethylbenzene	78.9940	5.0	100.000		79.0	70 - 130			
m,p-Xylene	164.433	10	200.000		82.2	70 - 130			
o-Xylene	79.5610	5.0	100.000		79.6	70 - 130			
Surrogate: 4-Bromofluorobenzene	*190.2*		*200.000*		*95.1*	*62 - 128*			
Duplicate (B5J0779-DUP1)		**Source: 1503631-12**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Benzene	ND	5.0		ND	NR			20	
Toluene	ND	5.0		ND	NR			20	
Ethylbenzene	ND	5.0		ND	NR			20	
m,p-Xylene	ND	10		ND	NR			20	
o-Xylene	ND	5.0		ND	NR			20	
Surrogate: 4-Bromofluorobenzene	*178.9*		*200.000*		*89.4*	*62 - 128*			
Matrix Spike (B5J0779-MS1)		**Source: 1503632-01**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Benzene	9.21100	5.0	40.7500	ND	22.6	29 - 143			M1
Toluene	32.8690	5.0	202.250	ND	16.3	24 - 125			M1
Ethylbenzene	11.3800	5.0	76.0000	ND	15.0	13 - 99			
m,p-Xylene	38.9720	10	206.500	ND	18.9	15 - 141			
o-Xylene	15.7190	5.0	73.5000	ND	21.4	16 - 144			
Surrogate: 4-Bromofluorobenzene	*166.7*		*200.000*		*83.4*	*62 - 128*			
Matrix Spike Dup (B5J0779-MSD1)		**Source: 1503632-01**		Prepared: 10/28/2015 Analyzed: 10/28/2015					
Benzene	5.46200	5.0	40.7500	ND	13.4	29 - 143	51.1	20	R
Toluene	27.8920	5.0	202.250	ND	13.8	24 - 125	16.4	20	M1
Ethylbenzene	8.20900	5.0	76.0000	ND	10.8	13 - 99	32.4	20	R
m,p-Xylene	29.6880	10	206.500	ND	14.4	15 - 141	27.0	20	R
o-Xylene	11.3460	5.0	73.5000	ND	15.4	16 - 144	32.3	20	R
Surrogate: 4-Bromofluorobenzene	*126.0*		*200.000*		*63.0*	*62 - 128*			

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

pH by EPA 9045C - Quality Control

Analyte	Result (pH Units)	PQL (pH Units)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5J0752 - Prep_WC1_S									
Duplicate (B5J0752-DUP1)		**Source: 1503426-31**		Prepared: 10/27/2015 Analyzed: 10/27/2015					
pH	8.15000	0.10		7.96000	NR		2.36	20	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	10/29/2015

Notes and Definitions

S4	Surrogate was diluted out.
R	RPD value outside acceptance criteria. Calculation is based on raw values.
M1	Matrix spike recovery outside of acceptance limit. The analytical batch was validated by the laboratory control sample.
ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:
(1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
(2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
(3) Results are wet unless otherwise specified.

CHAIN OF CUSTODY RECORD

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☑ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED 6.0 Y ☑ N ☐
2. HEADSPACE (VOA) N/A Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5900
Fax: " " 5915

Project Name: ALA 580
Project #: E8721-02-38
Sampler: D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
Kimberlina Gomez [signature]	10/21/15	1700	C. Aguilar [signature]	10/22/15	805

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/21/15
Print Name Date
Signature [signature]

Send Report To:
Attn:
Co: "CLIENT"
Addr:
City: State: Zip:

Bill To:
Attn:
Co:
Addr:
City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☑ Legal ☐
SWRCB ☐ Logcode _____
OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal)	8015B (GRO) / 8021 (BTEX)	8015B (DRO) / mo	TITLE 22 / CAM 17 (6010 / 7000)	Total Lead	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	1503631-1	C-1A-0	10/21/15	0927						X			X				X						5-DAY	1	T	M	
	-2	C-1A-1.5		0931							X														T		
	-3	C-1B-0		0934									X												P	B	
	-4	C-1B-1.5		0937					X				X												T		
	-5	C-2A-0		0944							X			X											T		
	-6	C-2A-1.5		0947						X			X												T		
	-7	C-2B-0		0947									X												P		
	-8	C-2B-1.5		0951					X				X												T		
	-9	C-3A-0		0925						X			X												T		
	-10	C-3A-1.5		0940							X														T		

TAT starts 8AM the following day
Samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives:
H=HCl N=HNO_3 S=H_2SO_4 C=4°C
Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

CHAIN OF CUSTODY RECORD

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Address: 6671 BRISA ST
Tel: 925-371-5900
Attention: L. BEADLE
City: LIVERMORE State: CA Zip Code: 94550
Fax: " " 5915
Project Name: ALA 580
Project #: E8721-02-38
Sampler: D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
Kimberlina Gomez Kelogg	10/21/15	1700	C. Bynia	10/22/15	805
Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:

I hereby authorize ATL to perform the work indicated below:
Project Mgr./Submitter: D. WATTS 10/21/15
Print Name Date
Signature [signature]

Send Report To: Attn: Co: "CLIENT" Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested — SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☒ Legal ☐ SWRCB ☐ Logcode _____ OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal)	8015B (GRO) / 8021 (BTEX)	8015B (DRO) / mo	TITLE 22 / CAM 17 (6010 / 7000)	Total Lead	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	1503031-11	C-3B-0	10/21/15	0950									X				X						5-DAY	1	P		
	-11	C-3B-1.5		0955					X				X												T		
	-12	C-4A-0		1000							X														T		
	-14	C-4B-0		1005									X												P		
	-15	C-5A-0		0955							X														T		
	-16	C-5A-1		1007					X	X			X	X											T		
	-17	C-5B-0		1008									X												P		
	-18	C-5B-1		1011									X												P		
	-19	S-1A-0		1029						X			X												T		
	-20	S-1A-1.5		1031								X													T		

TAT starts 8AM the following day
Samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

CHAIN OF CUSTODY RECORD

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5800
Fax: " " 5915

Project Name: ALA 580
Project #: E8721-02-38
Sampler: D. WATTS (Signature)

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
Kimberlina Gomez Kelly	10/21/15	1700	C. Aguilar	10/22/15	805

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/22/15
Print Name Date
Signature

Send Report To: Attn: Co: "CLIENT" Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☒ Legal ☐ SWRCB ☐ Logcode _____ OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal)	8015B (GRO) / 8021 (BTEX)	8015B (DRO) / 8270	TITLE 22 / CAM 17 (6010 / 7000)	Total lead	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	A583631-21	S-1B-0	10/21/15	1035									X				X						5-Day	1	P		
	-22	S-1B-1.5		1040					X				X												T		
	-23	S-1B-2.5		1047							X														T		
	-24	S-2C-0		1037									X												P		
	-25	S-2C-1.5		1041									X												P		
	-26	S-2C-5		1101							X														T		
	-27	S-1C-0		1052									X												P		
	-28	S-1C-1.5		1055									X												P		
	-29	S-2B-0		1114									X												P		
	-30	S-2B-1.5		1119					X				X												T		

TAT starts 8AM the following day if samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

CHAIN OF CUSTODY RECORD

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5900
Fax: " " 5915

Project Name: ALA 580 Project #: E8721-02-38 Sampler: D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
Kimberlina Gomez [signature]	10/21/15	1700	[signature]	10/21/15	1700

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/21/15
Print Name Date
Signature [signature]

Send Report To: Attn: Co: "CLIENT" Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☒ Legal ☐ SWRCB ☐ Logcode_____

OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal)	8015B (GRO) / 8021 (BTEX) / Mo	8015B (DRO)	TITLE 22 / CAM 17 (6010 / 7000)	Total Lead	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	1503031-31	S-2B-2.0	10/21/15	1124								X					X						5-Day		T		
	-32	S-2A-0		1111									X	X											P		
	-33	S-2A-1.5		1114						X		X													T		
	-34	S-3A-0		1112						X			X												T		
	-35	S-3A-1.5		1127								X													T		
	-36	S-3C-0		1134									X	X											P		
	-37	S-3C-1.5		1137									X												P		
	-38	S-3C-5		1141						X		X													T		
	-39	S-3B-0		1134									X												P		
	-40	S-3B-1.5		1137									X												P		

TAT starts 8AM the following day if samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

CHAIN OF CUSTODY RECORD

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5900
Fax: " " 5915

Project Name: ALA 580
Project #: E8721-02-38
Sampler: D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:
Kimberlina Gomez Kellogg	10/21/15	1700	C. [signature]	10/21/15	805

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/21/15
Print Name Date
Signature [signature]

Send Report To: Attn: Co: "CLIENT" Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☒ Legal ☐ SWRCB ☐ Logcode_____ OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal)	8015B (GRO) / 8021 (BTEX)	8015B (DRO)	TITLE 22 / CAM 17 (6010 / 7000)	Total lead	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	M0301-41	M-1-0	10/21/15	1301							X					X							5-Day	1	T		
	-42	M-1-1		1302						X			X	X											T		
	-43	M-2-0		1302									X												P		
	-44	M-2-1		1304					X				X												T		
	-45	M-3-0		1305									X												P		
	-46	M-3-1		1306							X														T		
	-47	M-4-0		1307						X			X												T		
	-48	M-4-1		1308					X				X												T		

TAT starts 8AM the following day if samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

November 09, 2015

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550
Tel: (925) 371-5900
Fax:(925) 371-5915

ELAP No.: 1838
CSDLAC No.: 10196
ORELAP No.: CA300003
TCEQ No. : T104704502

Re: ATL Work Order Number : 1503631
Client Reference : ALA 580, E8721-02-38

Enclosed are the results for sample(s) received on October 22, 2015 by Advanced Technology Laboratories. The sample(s) are tested for the parameters as indicated on the enclosed chain of custody in accordance with applicable laboratory certifications. The laboratory results contained in this report specifically pertains to the sample(s) submitted.

Thank you for the opportunity to serve the needs of your company. If you have any questions, please feel free to contact me or your Project Manager.

Sincerely,

Eddie Rodriguez
Laboratory Director

The cover letter and the case narrative are an integral part of this analytical report and its absence renders the report invalid. Test results contained within this data package meet the requirements of applicable state-specific certification programs. The report cannot be reproduced without written permission from the client and Advanced Technology Laboratories.

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	11/09/2015

SUMMARY OF SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
S-1B-2.5	1503631-23	Soil	10/21/15 10:47	10/22/15 8:05
S-2B-2.0	1503631-31	Soil	10/21/15 11:24	10/22/15 8:05
S-2A-1.5	1503631-33	Soil	10/21/15 11:14	10/22/15 8:05
S-3A-1.5	1503631-35	Soil	10/21/15 11:27	10/22/15 8:05
S-3C-5	1503631-38	Soil	10/21/15 11:41	10/22/15 8:05
M-4-0	1503631-47	Soil	10/21/15 13:07	10/22/15 8:05

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	11/09/2015

STLC Metals by ICP-AES by EPA 6010B

Analyte: Chromium **Analyst: RR**

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1503631-23	S-1B-2.5	**ND**	mg/L	1.0	20	B5K0176	11/06/2015	11/06/15 09:53	
1503631-35	S-3A-1.5	**ND**	mg/L	1.0	20	B5K0176	11/06/2015	11/06/15 10:07	
1503631-38	S-3C-5	**ND**	mg/L	1.0	20	B5K0176	11/06/2015	11/06/15 10:10	

STLC Metals by ICP-AES by EPA 6010B

Analyte: Lead **Analyst: RR**

Laboratory ID	Client Sample ID	Result	Units	PQL	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
1503631-47	M-4-0	**2.4**	mg/L	1.0	20	B5K0176	11/06/2015	11/06/15 10:16	

Client Sample ID S-2B-2.0
Lab ID: 1503631-31

STLC Metals by ICP-AES by EPA 6010B **Analyst: RR**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B5K0176	11/06/2015	11/06/15 10:03	
Nickel	**3.4**	1.0	20	B5K0176	11/06/2015	11/06/15 10:03	

Client Sample ID S-2A-1.5
Lab ID: 1503631-33

STLC Metals by ICP-AES by EPA 6010B **Analyst: RR**

Analyte	Result (mg/L)	PQL (mg/L)	Dilution	Batch	Prepared	Date/Time Analyzed	Notes
Chromium	ND	1.0	20	B5K0176	11/06/2015	11/06/15 10:05	
Nickel	**2.0**	1.0	20	B5K0176	11/06/2015	11/06/15 10:05	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	11/09/2015

QUALITY CONTROL SECTION

STLC Metals by ICP-AES by EPA 6010B - Quality Control

Analyte	Result (mg/L)	PQL (mg/L)	Spike Level	Source Result	% Rec	% Rec Limits	RPD	RPD Limit	Notes
Batch B5K0176 - STLC_S Extraction									
Blank (B5K0176-BLK1)					Prepared: 11/6/2015 Analyzed: 11/6/2015				
Chromium	ND	1.0			NR				
Lead	ND	1.0			NR				
Nickel	ND	1.0			NR				
LCS (B5K0176-BS1)					Prepared: 11/6/2015 Analyzed: 11/6/2015				
Chromium	2.02255		2.00000		101	80 - 120			
Lead	1.98020		2.00000		99.0	80 - 120			
Nickel	2.05162		2.00000		103	80 - 120			
Duplicate (B5K0176-DUP1)		**Source: 1503631-23**			Prepared: 11/6/2015 Analyzed: 11/6/2015				
Chromium	0.128298	1.0		0.152174	NR		17.0	20	
Lead	0.226691	1.0		0.227873	NR		0.520	20	
Nickel	0.897944	1.0		0.851272	NR		5.34	20	
Matrix Spike (B5K0176-MS1)		**Source: 1503631-23**			Prepared: 11/6/2015 Analyzed: 11/6/2015				
Chromium	2.63575		2.50000	0.152174	99.3	74 - 121			
Lead	2.58336		2.50000	0.227873	94.2	44 - 130			
Nickel	3.29775		2.50000	0.851272	97.9	83 - 116			
Matrix Spike Dup (B5K0176-MSD1)		**Source: 1503631-23**			Prepared: 11/6/2015 Analyzed: 11/6/2015				
Chromium	2.54521		2.50000	0.152174	95.7	74 - 121	3.50	20	
Lead	2.56495		2.50000	0.227873	93.5	44 - 130	0.715	20	
Nickel	3.24019		2.50000	0.851272	95.6	83 - 116	1.76	20	

Certificate of Analysis

Geocon Consultants, Inc.		Project Number :	ALA 580, E8721-02-38
6671 Brisa Street		Report To :	Luann Beadle
Livermore , CA 94550		Reported :	11/09/2015

Notes and Definitions

ND	Analyte is not detected at or above the Practical Quantitation Limit (PQL). When client requests quantitation against MDL, analyte is not detected at or above the Method Detection Limit (MDL)
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
NR	Not Reported
RPD	Relative Percent Difference
CA2	CA-ELAP (CDPH)
OR1	OR-NELAP (OSPHL)
TX1	TX-NELAP (TCEQ)

Notes:
(1) The reported MDL and PQL are based on prep ratio variation and analytical dilution.
(2) The suffix [2C] of specific analytes signifies that the reported result is taken from the instrument's second column.
(3) Results are wet unless otherwise specified.

Diane Galvan

From: Luann Beadle [beadle@geoconinc.com]
Sent: Monday, November 02, 2015 11:20 AM
To: Diane Galvan
Subject: Lab Order 1503631 (TO-38 580 TOS)

Hi Diane,

Could you please run WETs for the following sample on a regular TAT?

S-3A-1.5	Chromium	86
S-3C-5	Chromium	87
S-1B-2.5	Chromium	89
S-2A-1.5	Chromium	170
S-2B-2.0	Chromium	280
M-4-0	Lead	77
S-2A-1.5	Nickel	220
S-2B-2.0	Nickel	350

Thanks,
Luann

Luann Beadle | *Senior Staff Scientist*
GEOCON CONSULTANTS, INC.
6671 Brisa Street, Livermore, California 94550
P|925.371.5900 ext. 403 M|925.395.1669
beadle@geoconinc.com / www.geoconinc.com / Facebook / Linkedin

Bay Area ~ Sacramento ~ Fairfield ~ Los Angeles ~ Orange County ~ Riverside County ~ Palm Desert ~ San Diego

Geotechnical Engineering Environmental Services Engineering Geology Construction Inspection
Land Development Transportation Infrastructure Institutional Brownfields/Redevelopment Natural Resources

December 09, 2015

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: 925-371-5900 Ext 403
FAX: (925) 371-5915

CA-ELAP No.: 2676
NV Cert. No.: NV-00922

Workorder No.: N017444

RE: ALA 580, E8721-02-38

Attention: Luann Beadle

Enclosed are the results for sample(s) received on October 31, 2015 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

This is an addendum report. Please incorporate with documentation previously submitted.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Nancy Liberacao for

Glen Gesmundo
QA Manager

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.

ASSET Laboratories **Date:** *09-Dec-15*

CLIENT: Geocon Consultants, Inc.
Project: ALA 580, E8721-02-38
Lab Order: N017444

CASE NARRATIVE

Analytical Comments for EPA 1311/6010B:

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria on QC samples N017444-013A-MS and N017444-013A-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

ASSET LABORATORIES
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES
CALIFORNIA
11060 Artesia Blvd., Ste C, Cerritos, CA 90703
P: 562.219.7435 F: 562.219.7436
NEVADA
3151 W. Post Rd., Las Vegas, NV 89118
P: 702.307.2659 F: 702.307.2691

"Serving Clients with Passion and Professionalism"

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *09-Dec-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:24:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-013		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
EPA 9045C						
RunID: WETCHEM_151202A QC Batch: R104423 PrepDate Analyst: **LR**						
pH	8.0	0.10		pH Units	1	12/2/2015 10:30 AM
Temp. at time of pH Analysis	19	0		°C	1	12/2/2015 10:30 AM
ICP METALS BY WET DI EXTRACTION						
WET DI/ EPA 6010B						
RunID: ICP2_151208A QC Batch: R104504 PrepDate Analyst: **CEI**						
Lead	0.035	0.0050		mg/L	1	12/8/2015 10:44 AM
ICP METALS BY TCLP EXTRACTION						
EPA 3010A **EPA 1311/ 6010B**						
RunID: ICP2_151203B QC Batch: 55220 PrepDate 12/3/2015 Analyst: **CEI**						
Lead	ND	0.25		mg/L	5	12/3/2015 07:52 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *09-Dec-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:29:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-015		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
EPA 9045C						
RunID: WETCHEM_151202A QC Batch: R104423 PrepDate Analyst: **LR**						
pH	8.2	0.10		pH Units	1	12/2/2015 10:30 AM
Temp. at time of pH Analysis	19	0		°C	1	12/2/2015 10:30 AM
ICP METALS BY WET DI EXTRACTION						
WET DI/ EPA 6010B						
RunID: ICP2_151208A QC Batch: R104504 PrepDate Analyst: **CEI**						
Lead	0.019	0.0050		mg/L	1	12/8/2015 10:50 AM
ICP METALS BY TCLP EXTRACTION						
EPA 3010A **EPA 1311/ 6010B**						
RunID: ICP2_151203B QC Batch: 55220 PrepDate 12/3/2015 Analyst: **CEI**						
Lead	ND	0.25		mg/L	5	12/3/2015 08:20 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_STDI

Sample ID **MB-R104504** SampType: **MBLK** TestCode: **6010_STDI** Units: **mg/L** Prep Date: RunNo: **104504**
Client ID: **PBW** Batch ID: **R104504** TestNo: **WET DI/ EPA** Analysis Date: **12/8/2015** SeqNo: **2157438**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.0050									

Sample ID **LCS-R104504** SampType: **LCS** TestCode: **6010_STDI** Units: **mg/L** Prep Date: RunNo: **104504**
Client ID: **LCSW** Batch ID: **R104504** TestNo: **WET DI/ EPA** Analysis Date: **12/8/2015** SeqNo: **2157440**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.520	0.0050	0.5000	0	104	85	115				

Sample ID **N017444-015A-DUP** SampType: **DUP** TestCode: **6010_STDI** Units: **mg/L** Prep Date: RunNo: **104504**
Client ID: **ZZZZZZ** Batch ID: **R104504** TestNo: **WET DI/ EPA** Analysis Date: **12/8/2015** SeqNo: **2157445**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.019	0.0050						0.01938	2.80	20	

Sample ID **N017444-015A-MS** SampType: **MS** TestCode: **6010_STDI** Units: **mg/L** Prep Date: RunNo: **104504**
Client ID: **ZZZZZZ** Batch ID: **R104504** TestNo: **WET DI/ EPA** Analysis Date: **12/8/2015** SeqNo: **2157446**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.428	0.0050	0.5000	0.01938	81.7	75	125				

Sample ID **N017444-015A-MSD** SampType: **MSD** TestCode: **6010_STDI** Units: **mg/L** Prep Date: RunNo: **104504**
Client ID: **ZZZZZZ** Batch ID: **R104504** TestNo: **WET DI/ EPA** Analysis Date: **12/8/2015** SeqNo: **2157447**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.430	0.0050	0.5000	0.01938	82.0	75	125	0.4281	0.343	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_STDI

Sample ID	**MB-55208 STLC**	SampType:	**MBLK**	TestCode:	**6010_STDI**	Units:	**mg/L**	Prep Date:			RunNo:	**104504**	
Client ID:	**PBW**	Batch ID:	**R104504**	TestNo:	**WET DI/ EPA**			Analysis Date:	**12/8/2015**		SeqNo:	**2157477**	

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.0050									

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_TC

Sample ID	MB-55220	SampType:	MBLK	TestCode:	6010_TC	Units:	mg/L	Prep Date:	12/3/2015	RunNo:	104432
Client ID:	PBS	Batch ID:	55220	TestNo:	EPA 1311/ 60 EPA 3010A			Analysis Date:	12/3/2015	SeqNo:	2153038

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.050									

Sample ID	MB-55197 TCLP	SampType:	MBLK	TestCode:	6010_TC	Units:	mg/L	Prep Date:		RunNo:	104432
Client ID:	PBS	Batch ID:	55220	TestNo:	EPA 1311/ 60 EPA 3010A			Analysis Date:	12/3/2015	SeqNo:	2153041

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.004	0.25									

Sample ID	MB-55207 TCLP	SampType:	MBLK	TestCode:	6010_TC	Units:	mg/L	Prep Date:		RunNo:	104432
Client ID:	PBS	Batch ID:	55220	TestNo:	EPA 1311/ 60 EPA 3010A			Analysis Date:	12/3/2015	SeqNo:	2153042

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.25									

Sample ID	LCS-55220	SampType:	LCS	TestCode:	6010_TC	Units:	mg/L	Prep Date:	12/3/2015	RunNo:	104432
Client ID:	LCSS	Batch ID:	55220	TestNo:	EPA 1311/ 60 EPA 3010A			Analysis Date:	12/3/2015	SeqNo:	2153043

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.500	0.050	0.5000	0	100	85	115				

Sample ID	N017444-013A-MS	SampType:	MS	TestCode:	6010_TC	Units:	mg/L	Prep Date:	12/3/2015	RunNo:	104432
Client ID:	ZZZZZZ	Batch ID:	55220	TestNo:	EPA 1311/ 60 EPA 3010A			Analysis Date:	12/3/2015	SeqNo:	2153048

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.354	0.25	0.5000	0	70.8	75	125				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_TC

Sample ID **N017444-013A-MSD** SampType: **MSD** TestCode: **6010_TC** Units: **mg/L** Prep Date: **12/3/2015** RunNo: **104432**
Client ID: **ZZZZZZ** Batch ID: **55220** TestNo: **EPA 1311/ 60 EPA 3010A** Analysis Date: **12/3/2015** SeqNo: **2153049**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.352	0.25	0.5000	0	70.4	75	125	0.3538	0.461	20	S

Sample ID **N017444-015A-DUP** SampType: **DUP** TestCode: **6010_TC** Units: **mg/L** Prep Date: **12/3/2015** RunNo: **104432**
Client ID: **ZZZZZZ** Batch ID: **55220** TestNo: **EPA 1311/ 60 EPA 3010A** Analysis Date: **12/3/2015** SeqNo: **2153053**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.25						0.01948	0	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 9045_S

Sample ID **N017444-013A DUP** SampType: **DUP** TestCode: **9045_S** Units: **pH Units** Prep Date: RunNo: **104423**
Client ID: **ZZZZZZ** Batch ID: **R104423** TestNo: **EPA 9045C** Analysis Date: **12/2/2015** SeqNo: **2152249**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	7.950	0.10						7.950	0	20	
Temp. at time of pH Analysis	18.900	0						19.00	0.528	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

nancy@assetlaboratories.com

From: reports.lv@assetlaboratories.com
Sent: Tuesday, December 01, 2015 11:47 AM
To: 'SampleControlLV'
Subject: FW: ALA 580, E8721-02-38 (Asset Labs No.N0174444)

Please process.

Thanks,
Glen

From: Luann Beadle [mailto:beadle@geoconinc.com]
Sent: Tuesday, December 01, 2015 7:51 AM
To: reports.lv@assetlaboratories.com
Subject: RE: ALA 580, E8721-02-38 (Asset Labs No.N0174444)

Hi Glen/Asset,
Could you please run DI-WET and TCLP lead along with pH on samples G-4A-0 and G-4B-0 on a regular TAT?
Thanks,
Luann

From: reports.lv@assetlaboratories.com [mailto:reports.lv@assetlaboratories.com]
Sent: Thursday, November 19, 2015 4:00 PM
To: Luann Beadle
Cc: Rick Day
Subject: ALA 580, E8721-02-38 (Asset Labs No.N0174444)

Enclosed is the additional final report for the above project.

Thanks,

Glen Gesmundo
California: 11060 Artesia Blvd., Ste. C, Cerritos, CA 90703 | P: 562.219.7435 | F: 562.219.7436
Nevada: 3151 W. Post Road, Las Vegas, NV 89118 | P: 702.307.2659 Ext. 406 | F: 702.307.2691 | M: 702.882.3289
www.assetlaboratories.com

ASSET LABORATORIES
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES

ASSET LABORATORIES - Serving Clients with Passion and Professionalism

This message is intended for the use of the individual or entity to which it is addressed. This may contain information that is privileged, confidential, and exempt from disclosure under applicable law. If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering the message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone and delete the original message. Thank you.

November 10, 2015

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: 925-371-5900 Ext 403
FAX: (925) 371-5915

CA-ELAP No.: 2676
NV Cert. No.: NV-00922

Workorder No.: N017444

RE: ALA 580, E8721-02-38

Attention: Luann Beadle

Enclosed are the results for sample(s) received on October 31, 2015 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Glen Gesmundo
QA Manager

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

Sample was received intact with proper chain of custody documentation.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Sample was analyzed within method holding time.

Analytical Comments for EPA 6010B Soil :

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria for some analytes on QC samples N017444-001A-MS, N017444-001A-MSD, N017444-015A-MS and N017444-028A-MS possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

RPD for Sample Duplicate (DUP) N017444-001A-DUP is outside criteria for some analytes possibly due to non-homogeneity of sample; however, the Laboratory Control Sample (LCS) validated the analytical batch.

Analytical Comments for EPA 8015B DRO/ORO:

Surrogate recovery was below the laboratory acceptable limit for sample N017444-001. Reanalysis confirms low recovery caused by matrix effect.

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) are outside recovery criteria on QC samples N017444-001A-MS and N017444-001A-MSD possibly due to matrix interference. The associated Laboratory Control Sample (LCS) recovery was acceptable.

RPD for Sample Duplicate (DUP) N017444-001A-DUP is outside criteria possibly due to non-homogeneity of sample; however, the Laboratory Control Sample (LCS) validated the analytical batch.

ASSET LABORATORIES
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES
CALIFORNIA
11060 Artesia Blvd., Ste C, Cerritos, CA 90703
P: 562.219.7435 F: 562.219.7436
NEVADA
3151 W. Post Rd., Las Vegas, NV 89118
P: 702.307.2659 F: 702.307.2691

"Serving Clients with Passion and Professionalism"

ASSET Laboratories

Date: *10-Nov-15*

CLIENT: Geocon Consultants, Inc.
Project: ALA 580, E8721-02-38
Lab Order: N017444
Contract No:

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N017444-001A	G-1A-0	Soil	10/30/2015 9:24:00 AM	10/31/2015	11/10/2015
N017444-002A	G-1A-2	Soil	10/30/2015 9:24:00 AM	10/31/2015	11/10/2015
N017444-003A	G-1B-0	Soil	10/30/2015 9:27:00 AM	10/31/2015	11/10/2015
N017444-004A	G-1B-2	Soil	10/30/2015 9:27:00 AM	10/31/2015	11/10/2015
N017444-005A	G-2A-0	Soil	10/30/2015 9:41:00 AM	10/31/2015	11/10/2015
N017444-006A	G-2A-2	Soil	10/30/2015 9:41:00 AM	10/31/2015	11/10/2015
N017444-007A	G-2B-0	Soil	10/30/2015 9:47:00 AM	10/31/2015	11/10/2015
N017444-008A	G-2B-2	Soil	10/30/2015 9:47:00 AM	10/31/2015	11/10/2015
N017444-009A	G-3A-0	Soil	10/30/2015 10:07:00 AM	10/31/2015	11/10/2015
N017444-010A	G-3A-2	Soil	10/30/2015 10:07:00 AM	10/31/2015	11/10/2015
N017444-011A	G-3B-0	Soil	10/30/2015 10:14:00 AM	10/31/2015	11/10/2015
N017444-012A	G-3B-2	Soil	10/30/2015 10:14:00 AM	10/31/2015	11/10/2015
N017444-013A	G-4A-0	Soil	10/30/2015 10:24:00 AM	10/31/2015	11/10/2015
N017444-014A	G-4A-2	Soil	10/30/2015 10:24:00 AM	10/31/2015	11/10/2015
N017444-015A	G-4B-0	Soil	10/30/2015 10:29:00 AM	10/31/2015	11/10/2015
N017444-016A	G-4B-2	Soil	10/30/2015 10:29:00 AM	10/31/2015	11/10/2015
N017444-017A	G-5A-0	Soil	10/30/2015 10:41:00 AM	10/31/2015	11/10/2015
N017444-018A	G-5A-2	Soil	10/30/2015 10:41:00 AM	10/31/2015	11/10/2015
N017444-019A	G-5B-0	Soil	10/30/2015 10:51:00 AM	10/31/2015	11/10/2015
N017444-020A	G-5B-2	Soil	10/30/2015 10:51:00 AM	10/31/2015	11/10/2015
N017444-021A	G-6A-0	Soil	10/30/2015 7:38:00 AM	10/31/2015	11/10/2015
N017444-022A	G-6A-2	Soil	10/30/2015 7:38:00 AM	10/31/2015	11/10/2015
N017444-023A	G-6B-0	Soil	10/30/2015 7:44:00 AM	10/31/2015	11/10/2015
N017444-024A	G-6B-2	Soil	10/30/2015 7:44:00 AM	10/31/2015	11/10/2015
N017444-025A	G-7A-0	Soil	10/30/2015 7:55:00 AM	10/31/2015	11/10/2015
N017444-026A	G-7A-2	Soil	10/30/2015 7:55:00 AM	10/31/2015	11/10/2015
N017444-027A	G-7B-0	Soil	10/30/2015 8:01:00 AM	10/31/2015	11/10/2015
N017444-028A	G-7B-2	Soil	10/30/2015 8:01:00 AM	10/31/2015	11/10/2015
N017444-029A	G-8A-0	Soil	10/30/2015 8:11:00 AM	10/31/2015	11/10/2015

ASSET LABORATORIES
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES
CALIFORNIA
11060 Artesia Blvd., Ste C, Cerritos, CA 90703
P: 562.219.7435 F: 562.219.7436
NEVADA
3151 W. Post Rd., Las Vegas, NV 89118
P: 702.307.2659 F: 702.307.2691

"Serving Clients with Passion and Professionalism"

CLIENT: Geocon Consultants, Inc.
Project: ALA 580, E8721-02-38
Lab Order: N017444
Contract No:

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N017444-030A	G-8A-2	Soil	10/30/2015 8:11:00 AM	10/31/2015	11/10/2015
N017444-031A	G-8B-0	Soil	10/30/2015 8:21:00 AM	10/31/2015	11/10/2015
N017444-032A	G-8B-2	Soil	10/30/2015 8:21:00 AM	10/31/2015	11/10/2015
N017444-033A	G-9A-0	Soil	10/30/2015 8:41:00 AM	10/31/2015	11/10/2015
N017444-034A	G-9A-2	Soil	10/30/2015 8:41:00 AM	10/31/2015	11/10/2015
N017444-035A	G-9B-0	Soil	10/30/2015 8:44:00 AM	10/31/2015	11/10/2015
N017444-036A	G-10A-0	Soil	10/30/2015 8:46:00 AM	10/31/2015	11/10/2015
N017444-037A	G-10B-0	Soil	10/30/2015 8:48:00 AM	10/31/2015	11/10/2015
N017444-038A	Rinse Blk	Water	10/30/2015	10/31/2015	11/10/2015

ASSET LABORATORIES
ANALYTICAL SUPPORT SERVICES FOR ENVIRONMENTAL TECHNOLOGIES
CALIFORNIA
11060 Artesia Blvd., Ste C, Cerritos, CA 90703
P: 562.219.7435 F: 562.219.7436
NEVADA
3151 W. Post Rd., Las Vegas, NV 89118
P: 702.307.2659 F: 702.307.2691
"Serving Clients with Passion and Professionalism"

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-1A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:24:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-001		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B**		
RunID: GC1_151106A QC Batch: 52952				PrepDate:	11/5/2015	Analyst: **MDM**
DRO	62	10		mg/Kg	10	11/6/2015 03:42 PM
ORO	230	10		mg/Kg	10	11/6/2015 03:42 PM
Surr: p-Terphenyl	46.2	48-123	S	%REC	10	11/6/2015 03:42 PM
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA1_151105B QC Batch: 52921				PrepDate:	11/3/2015	Analyst: **CEI**
Mercury	ND	0.10		mg/Kg	1	11/5/2015 04:32 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A QC Batch: 52912				PrepDate:	11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 02:01 PM
Arsenic	3.1	1.0		mg/Kg	1	11/6/2015 02:01 PM
Barium	140	1.0		mg/Kg	1	11/6/2015 02:01 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 02:01 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 02:01 PM
Chromium	24	1.0		mg/Kg	1	11/6/2015 02:01 PM
Cobalt	13	1.0		mg/Kg	1	11/6/2015 02:01 PM
Copper	25	2.0		mg/Kg	1	11/6/2015 02:01 PM
Lead	30	1.0		mg/Kg	1	11/6/2015 02:01 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 02:01 PM
Nickel	25	1.0		mg/Kg	1	11/6/2015 02:01 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 02:01 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 02:01 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 02:01 PM
Vanadium	77	1.0		mg/Kg	1	11/6/2015 02:01 PM
Zinc	61	1.0		mg/Kg	1	11/6/2015 02:01 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-1A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:24:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-002		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	9.1	5.0		mg/Kg	1	11/9/2015 12:41 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-1B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:27:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-003		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	27	5.0		mg/Kg	1	11/9/2015 01:13 PM

Qualifiers:	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-1B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:27:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-004		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B		
RunID: GC4_151103A	QC Batch: E15VS126			PrepDate:		Analyst: **QBM**
GRO	ND	1.0		mg/Kg	1	11/3/2015 02:15 PM
Surr: Chlorobenzene - d5	112	46-154		%REC	1	11/3/2015 02:15 PM
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	12	5.0		mg/Kg	1	11/9/2015 01:17 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-2A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:41:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-005		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
EPA 7471A						
RunID: AA1_151105B QC Batch: 52921 PrepDate: 11/3/2015 Analyst: **CEI**						
Mercury	ND	0.10		mg/Kg	1	11/5/2015 04:34 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A QC Batch: 52912 PrepDate: 11/2/2015 Analyst: **CEI**						
Antimony	ND	2.0		mg/Kg	1	11/6/2015 03:11 PM
Arsenic	3.3	1.0		mg/Kg	1	11/6/2015 03:11 PM
Barium	270	1.0		mg/Kg	1	11/6/2015 03:11 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 03:11 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 03:11 PM
Chromium	23	1.0		mg/Kg	1	11/6/2015 03:11 PM
Cobalt	18	1.0		mg/Kg	1	11/6/2015 03:11 PM
Copper	48	2.0		mg/Kg	1	11/6/2015 03:11 PM
Lead	14	1.0		mg/Kg	1	11/6/2015 03:11 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 03:11 PM
Nickel	25	1.0		mg/Kg	1	11/6/2015 03:11 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 03:11 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 03:11 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 03:11 PM
Vanadium	68	1.0		mg/Kg	1	11/6/2015 03:11 PM
Zinc	48	1.0		mg/Kg	1	11/6/2015 03:11 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-2A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:41:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-006		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
				EPA 9045C		
RunID: WETCHEM_151102E	QC Batch: R103952			PrepDate:		Analyst: **LR**
pH	8.3	0.10		pH Units	1	11/2/2015 02:00 PM
Temp. at time of pH Analysis	28	0		°C	1	11/2/2015 02:00 PM
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	5.0		mg/Kg	1	11/9/2015 01:21 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-2B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:47:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-007		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	53	5.0		mg/Kg	1	11/9/2015 01:25 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-2B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:47:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-008		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	5.0		mg/Kg	1	11/9/2015 01:30 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-3A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:07:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-009		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	11	5.0		mg/Kg	1	11/9/2015 01:33 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-3A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:07:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-010		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B		
RunID: GC4_151103A	QC Batch: E15VS126			PrepDate:		Analyst: **QBM**
GRO	ND	1.0		mg/Kg	1	11/3/2015 02:50 PM
Surr: Chlorobenzene - d5	114	46-154		%REC	1	11/3/2015 02:50 PM
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA1_151105B	QC Batch: 52921			PrepDate:	11/3/2015	Analyst: **CEI**
Mercury	ND	0.10		mg/Kg	1	11/5/2015 04:37 PM
TOTAL METALS BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 03:17 PM
Arsenic	ND	1.0		mg/Kg	1	11/6/2015 03:17 PM
Barium	45	1.0		mg/Kg	1	11/6/2015 03:17 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 03:17 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 03:17 PM
Chromium	14	1.0		mg/Kg	1	11/6/2015 03:17 PM
Cobalt	10	1.0		mg/Kg	1	11/6/2015 03:17 PM
Copper	13	2.0		mg/Kg	1	11/6/2015 03:17 PM
Lead	1.8	1.0		mg/Kg	1	11/6/2015 03:17 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 03:17 PM
Nickel	10	1.0		mg/Kg	1	11/6/2015 03:17 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 03:17 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 03:17 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 03:17 PM
Vanadium	76	1.0		mg/Kg	1	11/6/2015 03:17 PM
Zinc	35	1.0		mg/Kg	1	11/6/2015 03:17 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-3B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:14:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-011		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	12	5.0		mg/Kg	1	11/9/2015 01:37 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-3B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:14:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-012		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B**		
RunID: GC3_151109A	QC Batch: 52989			PrepDate:	11/9/2015	Analyst: **MDM**
DRO	ND	1.0		mg/Kg	1	11/9/2015 01:53 PM
ORO	ND	1.0		mg/Kg	1	11/9/2015 01:53 PM
Surr: p-Terphenyl	86.0	48-123		%REC	1	11/9/2015 01:53 PM
LEAD BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	5.0		mg/Kg	1	11/9/2015 01:41 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:24:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-013		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B**		
RunID: GC1_151106A	QC Batch: 52952				PrepDate: 11/5/2015	Analyst: **MDM**
DRO	37	10		mg/Kg	10	11/6/2015 04:59 PM
ORO	110	10		mg/Kg	10	11/6/2015 04:59 PM
Surr: p-Terphenyl	66.3	48-123		%REC	10	11/6/2015 04:59 PM
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA1_151105B	QC Batch: 52921				PrepDate: 11/3/2015	Analyst: **CEI**
Mercury	ND	0.10		mg/Kg	1	11/5/2015 04:45 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912				PrepDate: 11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 03:24 PM
Arsenic	5.3	1.0		mg/Kg	1	11/6/2015 03:24 PM
Barium	190	1.0		mg/Kg	1	11/6/2015 03:24 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 03:24 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 03:24 PM
Chromium	35	1.0		mg/Kg	1	11/6/2015 03:24 PM
Cobalt	13	1.0		mg/Kg	1	11/6/2015 03:24 PM
Copper	34	2.0		mg/Kg	1	11/6/2015 03:24 PM
Lead	210	1.0		mg/Kg	1	11/6/2015 03:24 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 03:24 PM
Nickel	37	1.0		mg/Kg	1	11/6/2015 03:24 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 03:24 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 03:24 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 03:24 PM
Vanadium	43	1.0		mg/Kg	1	11/6/2015 03:24 PM
Zinc	99	1.0		mg/Kg	1	11/6/2015 03:24 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:24:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-014		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	25		mg/Kg	5	11/9/2015 02:50 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:29:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-015		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911				PrepDate: 11/2/2015	Analyst: **CEI**
Lead	190	5.0		mg/Kg	1	11/9/2015 01:55 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:29:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-016		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B		
RunID: GC4_151103A	QC Batch: E15VS126			PrepDate:		Analyst: **QBM**
GRO	ND	1.0		mg/Kg	1	11/3/2015 03:26 PM
Surr: Chlorobenzene - d5	104	46-154		%REC	1	11/3/2015 03:26 PM
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	25		mg/Kg	5	11/9/2015 02:53 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-5A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:41:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-017		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
EPA 7471A						
RunID: AA1_151105B QC Batch: 52921 PrepDate: 11/3/2015 Analyst: **CEI**						
Mercury	ND	0.099		mg/Kg	1	11/5/2015 04:48 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A QC Batch: 52912 PrepDate: 11/2/2015 Analyst: **CEI**						
Antimony	ND	2.0		mg/Kg	1	11/6/2015 03:36 PM
Arsenic	6.2	1.0		mg/Kg	1	11/6/2015 03:36 PM
Barium	160	1.0		mg/Kg	1	11/6/2015 03:36 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 03:36 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 03:36 PM
Chromium	35	1.0		mg/Kg	1	11/6/2015 03:36 PM
Cobalt	18	1.0		mg/Kg	1	11/6/2015 03:36 PM
Copper	40	2.0		mg/Kg	1	11/6/2015 03:36 PM
Lead	40	1.0		mg/Kg	1	11/6/2015 03:36 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 03:36 PM
Nickel	47	1.0		mg/Kg	1	11/6/2015 03:36 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 03:36 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 03:36 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 03:36 PM
Vanadium	50	1.0		mg/Kg	1	11/6/2015 03:36 PM
Zinc	86	1.0		mg/Kg	1	11/6/2015 03:36 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-5A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:41:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-018		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
				EPA 9045C		
RunID: WETCHEM_151102E	QC Batch: R103952			PrepDate:		Analyst: **LR**
pH	8.3	0.10		pH Units	1	11/2/2015 02:00 PM
Temp. at time of pH Analysis	27	0		°C	1	11/2/2015 02:00 PM
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	25		mg/Kg	5	11/9/2015 02:57 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-5B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:51:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-019		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	120	25		mg/Kg	5	11/9/2015 03:01 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-5B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:51:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-020		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	6.8	5.0		mg/Kg	1	11/9/2015 02:20 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-6A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:38:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-021		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	52	5.0		mg/Kg	1	11/9/2015 02:23 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-6A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:38:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-022		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B		
RunID: GC4_151103A	QC Batch: E15VS126			PrepDate:		Analyst: **QBM**
GRO	ND	1.0		mg/Kg	1	11/3/2015 04:01 PM
Surr: Chlorobenzene - d5	112	46-154		%REC	1	11/3/2015 04:01 PM
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA1_151105B	QC Batch: 52921			PrepDate:	11/3/2015	Analyst: **CEI**
Mercury	ND	0.10		mg/Kg	1	11/5/2015 04:50 PM
TOTAL METALS BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 03:43 PM
Arsenic	2.3	1.0		mg/Kg	1	11/6/2015 03:43 PM
Barium	91	1.0		mg/Kg	1	11/6/2015 03:43 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 03:43 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 03:43 PM
Chromium	15	1.0		mg/Kg	1	11/6/2015 03:43 PM
Cobalt	9.7	1.0		mg/Kg	1	11/6/2015 03:43 PM
Copper	15	2.0		mg/Kg	1	11/6/2015 03:43 PM
Lead	3.2	1.0		mg/Kg	1	11/6/2015 03:43 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 03:43 PM
Nickel	12	1.0		mg/Kg	1	11/6/2015 03:43 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 03:43 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 03:43 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 03:43 PM
Vanadium	72	1.0		mg/Kg	1	11/6/2015 03:43 PM
Zinc	36	1.0		mg/Kg	1	11/6/2015 03:43 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-6B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:44:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-023		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	35	5.0		mg/Kg	1	11/9/2015 02:28 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-6B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:44:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-024		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B**		
RunID: GC3_151109A	QC Batch: 52989			PrepDate:	11/9/2015	Analyst: **MDM**
DRO	2.7	1.0		mg/Kg	1	11/9/2015 02:46 PM
ORO	2.9	1.0		mg/Kg	1	11/9/2015 02:46 PM
Surr: p-Terphenyl	83.1	48-123		%REC	1	11/9/2015 02:46 PM
LEAD BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	25		mg/Kg	5	11/9/2015 03:05 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-7A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:55:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-025		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B**		
RunID: GC1_151106A	QC Batch: 52952				PrepDate: 11/5/2015	Analyst: **MDM**
DRO	230	10		mg/Kg	10	11/6/2015 05:50 PM
ORO	660	10		mg/Kg	10	11/6/2015 05:50 PM
Surr: p-Terphenyl	62.9	48-123		%REC	10	11/6/2015 05:50 PM
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA1_151105B	QC Batch: 52921				PrepDate: 11/3/2015	Analyst: **CEI**
Mercury	ND	0.099		mg/Kg	1	11/5/2015 04:53 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912				PrepDate: 11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 03:49 PM
Arsenic	3.6	1.0		mg/Kg	1	11/6/2015 03:49 PM
Barium	130	1.0		mg/Kg	1	11/6/2015 03:49 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 03:49 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 03:49 PM
Chromium	35	1.0		mg/Kg	1	11/6/2015 03:49 PM
Cobalt	8.7	1.0		mg/Kg	1	11/6/2015 03:49 PM
Copper	26	2.0		mg/Kg	1	11/6/2015 03:49 PM
Lead	89	1.0		mg/Kg	1	11/6/2015 03:49 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 03:49 PM
Nickel	33	1.0		mg/Kg	1	11/6/2015 03:49 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 03:49 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 03:49 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 03:49 PM
Vanadium	41	1.0		mg/Kg	1	11/6/2015 03:49 PM
Zinc	100	1.0		mg/Kg	1	11/6/2015 03:49 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-7A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:55:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-026		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	25		mg/Kg	5	11/9/2015 03:09 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-7B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:01:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-027		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151109C	QC Batch: 52911			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	52	5.0		mg/Kg	1	11/9/2015 02:45 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-7B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:01:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-028		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B		
RunID: GC4_151103A	QC Batch: E15VS126			PrepDate:		Analyst: **QBM**
GRO	ND	1.0		mg/Kg	1	11/3/2015 05:11 PM
Surr: Chlorobenzene - d5	117	46-154		%REC	1	11/3/2015 05:11 PM
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	5.0		mg/Kg	1	11/6/2015 02:43 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT: Geocon Consultants, Inc.
Lab Order: N017444
Project: ALA 580, E8721-02-38
Lab ID: N017444-029

Client Sample ID: G-8A-0
Collection Date: 10/30/2015 8:11:00 AM
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
EPA 7471A						
RunID: AA1_151105B	QC Batch: 52921			PrepDate:	11/3/2015	Analyst: **CEI**
Mercury	ND	0.10		mg/Kg	1	11/5/2015 04:56 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 03:55 PM
Arsenic	2.5	1.0		mg/Kg	1	11/6/2015 03:55 PM
Barium	87	1.0		mg/Kg	1	11/6/2015 03:55 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 03:55 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 03:55 PM
Chromium	19	1.0		mg/Kg	1	11/6/2015 03:55 PM
Cobalt	9.8	1.0		mg/Kg	1	11/6/2015 03:55 PM
Copper	15	2.0		mg/Kg	1	11/6/2015 03:55 PM
Lead	32	1.0		mg/Kg	1	11/6/2015 03:55 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 03:55 PM
Nickel	18	1.0		mg/Kg	1	11/6/2015 03:55 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 03:55 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 03:55 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 03:55 PM
Vanadium	59	1.0		mg/Kg	1	11/6/2015 03:55 PM
Zinc	41	1.0		mg/Kg	1	11/6/2015 03:55 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT: Geocon Consultants, Inc.
Lab Order: N017444
Project: ALA 580, E8721-02-38
Lab ID: N017444-030

Client Sample ID: G-8A-2
Collection Date: 10/30/2015 8:11:00 AM
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
PH						
				EPA 9045C		
RunID: WETCHEM_151102E	QC Batch: R103952			PrepDate:		Analyst: **LR**
pH	8.6	0.10		pH Units	1	11/2/2015 02:00 PM
Temp. at time of pH Analysis	27	0		°C	1	11/2/2015 02:00 PM
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	5.0		mg/Kg	1	11/6/2015 06:08 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-8B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:21:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-031		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912				PrepDate: 11/2/2015	Analyst: **CEI**
Lead	24	5.0		mg/Kg	1	11/6/2015 06:14 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-8B-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:21:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-032		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912				PrepDate: 11/2/2015	Analyst: **CEI**
Lead	ND	5.0		mg/Kg	1	11/6/2015 06:21 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-9A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:41:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-033		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
EPA 3050B			**EPA 6010B**			
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	6.8	5.0		mg/Kg	1	11/6/2015 06:27 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-9A-2
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:41:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-034		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B**		
RunID: GC3_151109A	QC Batch: 52989			PrepDate:	11/9/2015	Analyst: **MDM**
DRO	1.2	1.0		mg/Kg	1	11/9/2015 03:12 PM
ORO	1.2	1.0		mg/Kg	1	11/9/2015 03:12 PM
Surr: p-Terphenyl	90.4	48-123		%REC	1	11/9/2015 03:12 PM
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B		
RunID: GC4_151103A	QC Batch: E15VS126			PrepDate:		Analyst: **QBM**
GRO	ND	1.0		mg/Kg	1	11/3/2015 07:33 PM
Surr: Chlorobenzene - d5	116	46-154		%REC	1	11/3/2015 07:33 PM
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA1_151105B	QC Batch: 52921			PrepDate:	11/3/2015	Analyst: **CEI**
Mercury	ND	0.099		mg/Kg	1	11/5/2015 04:59 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 06:34 PM
Arsenic	ND	1.0		mg/Kg	1	11/6/2015 06:34 PM
Barium	61	1.0		mg/Kg	1	11/6/2015 06:34 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 06:34 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 06:34 PM
Chromium	19	1.0		mg/Kg	1	11/6/2015 06:34 PM
Cobalt	14	1.0		mg/Kg	1	11/6/2015 06:34 PM
Copper	18	2.0		mg/Kg	1	11/6/2015 06:34 PM
Lead	2.9	1.0		mg/Kg	1	11/6/2015 06:34 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 06:34 PM
Nickel	19	1.0		mg/Kg	1	11/6/2015 06:34 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 06:34 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 06:34 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 06:34 PM
Vanadium	88	1.0		mg/Kg	1	11/6/2015 06:34 PM
Zinc	43	1.0		mg/Kg	1	11/6/2015 06:34 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-9B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:44:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-035		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	27	5.0		mg/Kg	1	11/6/2015 06:40 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT: Geocon Consultants, Inc.
Lab Order: N017444
Project: ALA 580, E8721-02-38
Lab ID: N017444-036

Client Sample ID: G-10A-0
Collection Date: 10/30/2015 8:46:00 AM
Matrix: SOIL

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
DIESEL & MOTOR OIL RANGE ORGANICS BY GC/FID						
EPA 3550B				**EPA 8015B**		
RunID: GC1_151106A	QC Batch: 52952				PrepDate: 11/5/2015	Analyst: **MDM**
DRO	45	10		mg/Kg	10	11/6/2015 06:40 PM
ORO	98	10		mg/Kg	10	11/6/2015 06:40 PM
Surr: p-Terphenyl	71.4	48-123		%REC	10	11/6/2015 06:40 PM
TOTAL MERCURY BY COLD VAPOR TECHNIQUE						
				EPA 7471A		
RunID: AA1_151105B	QC Batch: 52921				PrepDate: 11/3/2015	Analyst: **CEI**
Mercury	ND	0.099		mg/Kg	1	11/5/2015 05:01 PM
TOTAL METALS BY ICP						
EPA 3050B				**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912				PrepDate: 11/2/2015	Analyst: **CEI**
Antimony	ND	2.0		mg/Kg	1	11/6/2015 06:47 PM
Arsenic	1.8	1.0		mg/Kg	1	11/6/2015 06:47 PM
Barium	91	1.0		mg/Kg	1	11/6/2015 06:47 PM
Beryllium	ND	1.0		mg/Kg	1	11/6/2015 06:47 PM
Cadmium	ND	1.0		mg/Kg	1	11/6/2015 06:47 PM
Chromium	17	1.0		mg/Kg	1	11/6/2015 06:47 PM
Cobalt	11	1.0		mg/Kg	1	11/6/2015 06:47 PM
Copper	23	2.0		mg/Kg	1	11/6/2015 06:47 PM
Lead	20	1.0		mg/Kg	1	11/6/2015 06:47 PM
Molybdenum	ND	1.0		mg/Kg	1	11/6/2015 06:47 PM
Nickel	17	1.0		mg/Kg	1	11/6/2015 06:47 PM
Selenium	ND	1.0		mg/Kg	1	11/6/2015 06:47 PM
Silver	ND	1.0		mg/Kg	1	11/6/2015 06:47 PM
Thallium	ND	1.0		mg/Kg	1	11/6/2015 06:47 PM
Vanadium	67	1.0		mg/Kg	1	11/6/2015 06:47 PM
Zinc	98	1.0		mg/Kg	1	11/6/2015 06:47 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-10B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:48:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-037		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
GASOLINE RANGE ORGANICS BY GC/FID						
				EPA 8015B		
RunID: GC4_151103A	QC Batch: E15VS126			PrepDate:		Analyst: **QBM**
GRO	ND	1.0		mg/Kg	1	11/3/2015 08:09 PM
Surr: Chlorobenzene - d5	91.5	46-154		%REC	1	11/3/2015 08:09 PM
LEAD BY ICP						
	EPA 3050B			**EPA 6010B**		
RunID: ICP2_151106A	QC Batch: 52912			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	22	5.0		mg/Kg	1	11/6/2015 06:53 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *10-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	Rinse Blk
Lab Order:	N017444	**Collection Date:**	10/30/2015
Project:	ALA 580, E8721-02-38	**Matrix:**	WATER
Lab ID:	N017444-038		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
TOTAL METALS BY ICP						
EPA 3010A			**EPA 6010B**			
RunID: ICP2_151109D	QC Batch: 52908			PrepDate:	11/2/2015	Analyst: **CEI**
Lead	ND	0.0050		mg/L	1	11/9/2015 06:20 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **MB1-52912** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **PBS** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128701**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	0.009	1.0									
Beryllium	ND	1.0									
Cadmium	ND	1.0									
Chromium	ND	1.0									
Cobalt	ND	1.0									
Copper	ND	2.0									
Lead	ND	1.0									
Molybdenum	0.148	1.0									
Nickel	ND	1.0									
Selenium	ND	1.0									
Silver	0.030	1.0									
Thallium	0.342	1.0									
Vanadium	ND	1.0									
Zinc	ND	1.0									

Sample ID: **MB2-52912** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **PBS** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128704**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0									
Arsenic	ND	1.0									
Barium	ND	1.0									
Beryllium	ND	1.0									
Cadmium	ND	1.0									
Chromium	ND	1.0									
Cobalt	ND	1.0									

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **MB2-52912** SampType: **MBLK** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **PBS** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128704**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	ND	2.0									
Lead	ND	1.0									
Molybdenum	0.053	1.0									
Nickel	ND	1.0									
Selenium	ND	1.0									
Silver	0.048	1.0									
Thallium	0.087	1.0									
Vanadium	ND	1.0									
Zinc	ND	1.0									

Sample ID: **LCS-52912** SampType: **LCS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **LCSS** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128705**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	25.458	2.0	25.00	0	102	80	120				
Arsenic	25.433	1.0	25.00	0	102	80	120				
Barium	25.907	1.0	25.00	0	104	80	120				
Beryllium	25.108	1.0	25.00	0	100	80	120				
Cadmium	24.742	1.0	25.00	0	99.0	80	120				
Chromium	25.513	1.0	25.00	0	102	80	120				
Cobalt	24.498	1.0	25.00	0	98.0	80	120				
Copper	25.388	2.0	25.00	0	102	80	120				
Lead	25.617	1.0	25.00	0	102	80	120				
Molybdenum	25.355	1.0	25.00	0	101	80	120				
Nickel	25.450	1.0	25.00	0	102	80	120				
Selenium	25.027	1.0	25.00	0	100	80	120				
Silver	25.031	1.0	25.00	0	100	80	120				
Thallium	24.382	1.0	25.00	0	97.5	80	120				
Vanadium	24.758	1.0	25.00	0	99.0	80	120				
Zinc	24.756	1.0	25.00	0	99.0	80	120				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **N017444-001A-DUP** SampType: **DUP** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128710**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0						0	0	20	
Arsenic	3.714	1.0						3.085	18.5	20	
Barium	106.023	1.0						136.5	25.2	20	R
Beryllium	ND	1.0						0	0	20	
Cadmium	0.629	1.0						0.6881	0	20	
Chromium	18.966	1.0						24.22	24.3	20	R
Cobalt	11.279	1.0						12.68	11.7	20	
Copper	21.784	2.0						25.04	13.9	20	
Lead	35.508	1.0						30.28	15.9	20	
Molybdenum	ND	1.0						0	0	20	
Nickel	19.024	1.0						25.44	28.8	20	R
Selenium	ND	1.0						0	0	20	
Silver	ND	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	72.931	1.0						77.20	5.69	20	
Zinc	61.432	1.0						61.18	0.407	20	

Sample ID: **N017444-001A-MS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128711**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	5.655	2.0	25.05	0	22.6	75	125				S
Arsenic	22.221	1.0	25.05	3.085	76.4	75	125				
Barium	144.402	1.0	25.05	136.5	31.5	75	125				S
Beryllium	18.662	1.0	25.05	0	74.5	75	125				S
Cadmium	19.434	1.0	25.05	0.6881	74.8	75	125				S
Chromium	41.776	1.0	25.05	24.22	70.1	75	125				S
Cobalt	32.057	1.0	25.05	12.68	77.4	75	125				
Copper	47.510	2.0	25.05	25.04	89.7	75	125				
Lead	68.821	1.0	25.05	30.28	154	75	125				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **N017444-001A-MS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128711**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	17.526	1.0	25.05	0	70.0	75	125				S
Nickel	43.008	1.0	25.05	25.44	70.1	75	125				S
Selenium	12.060	1.0	25.05	0	48.1	75	125				S
Silver	19.505	1.0	25.05	0	77.9	75	125				
Thallium	15.288	1.0	25.05	0	61.0	75	125				S
Vanadium	98.773	1.0	25.05	77.20	86.1	75	125				
Zinc	90.189	1.0	25.05	61.18	116	75	125				

Sample ID: **N017444-001A-MSD** SampType: **MSD** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128712**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	6.490	2.0	25.09	0	25.9	75	125	5.655	13.7	20	S
Arsenic	30.657	1.0	25.09	3.085	110	75	125	22.22	31.9	20	R
Barium	140.869	1.0	25.09	136.5	17.3	75	125	144.4	2.48	20	S
Beryllium	19.067	1.0	25.09	0	76.0	75	125	18.66	2.15	20	
Cadmium	19.975	1.0	25.09	0.6881	76.9	75	125	19.43	2.75	20	
Chromium	42.610	1.0	25.09	24.22	73.3	75	125	41.78	1.98	20	S
Cobalt	32.342	1.0	25.09	12.68	78.4	75	125	32.06	0.885	20	
Copper	45.418	2.0	25.09	25.04	81.2	75	125	47.51	4.50	20	
Lead	53.221	1.0	25.09	30.28	91.5	75	125	68.82	25.6	20	R
Molybdenum	18.019	1.0	25.09	0	71.8	75	125	17.53	2.77	20	S
Nickel	41.286	1.0	25.09	25.44	63.2	75	125	43.01	4.09	20	S
Selenium	12.851	1.0	25.09	0	51.2	75	125	12.06	6.34	20	S
Silver	20.177	1.0	25.09	0	80.4	75	125	19.51	3.38	20	
Thallium	15.942	1.0	25.09	0	63.5	75	125	15.29	4.19	20	S
Vanadium	99.198	1.0	25.09	77.20	87.7	75	125	98.77	0.429	20	
Zinc	82.336	1.0	25.09	61.18	84.3	75	125	90.19	9.10	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **N017444-028A-DUP** SampType: **DUP** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128716**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	ND	2.0						0	0	20	
Arsenic	3.097	1.0						3.639	16.1	20	
Barium	85.443	1.0						88.94	4.00	20	
Beryllium	ND	1.0						0	0	20	
Cadmium	0.572	1.0						0.5368	0	20	
Chromium	14.814	1.0						14.36	3.10	20	
Cobalt	11.151	1.0						11.32	1.53	20	
Copper	16.326	2.0						17.95	9.49	20	
Lead	2.805	1.0						2.927	4.28	20	
Molybdenum	ND	1.0						0	0	20	
Nickel	13.970	1.0						14.76	5.48	20	
Selenium	ND	1.0						0	0	20	
Silver	ND	1.0						0	0	20	
Thallium	ND	1.0						0	0	20	
Vanadium	86.381	1.0						97.45	12.0	20	
Zinc	40.951	1.0						40.98	0.0625	20	

Sample ID: **N017444-028A-MS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128717**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Antimony	5.725	2.0	25.13	0	22.8	75	125				S
Arsenic	22.703	1.0	25.13	3.639	75.9	75	125				
Barium	118.953	1.0	25.13	88.94	119	75	125				
Beryllium	16.820	1.0	25.13	0	66.9	75	125				S
Cadmium	18.541	1.0	25.13	0.5368	71.7	75	125				S
Chromium	36.683	1.0	25.13	14.36	88.8	75	125				
Cobalt	30.237	1.0	25.13	11.32	75.3	75	125				
Copper	37.788	2.0	25.13	17.95	78.9	75	125				
Lead	21.316	1.0	25.13	2.927	73.2	75	125				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_S

Sample ID: **N017444-028A-MS** SampType: **MS** TestCode: **6010_S** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2128717**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Molybdenum	16.376	1.0	25.13	0	65.2	75	125				S
Nickel	33.371	1.0	25.13	14.76	74.1	75	125				S
Selenium	11.099	1.0	25.13	0	44.2	75	125				S
Silver	18.747	1.0	25.13	0	74.6	75	125				S
Thallium	15.159	1.0	25.13	0	60.3	75	125				S
Vanadium	116.760	1.0	25.13	97.45	76.9	75	125				
Zinc	61.076	1.0	25.13	40.98	80.0	75	125				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPB

Sample ID: **MB1-52911** SampType: **MBLK** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **PBS** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131210**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									

Sample ID: **MB2-52911** SampType: **MBLK** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **PBS** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131211**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									

Sample ID: **LCS-52911** SampType: **LCS** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **LCSS** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131212**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	23.081	5.0	25.00	0	92.3	80	120				

Sample ID: **N017444-002A-DUP** SampType: **DUP** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **ZZZZZZ** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131216**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	4.351	5.0						9.122	0	20	

Sample ID: **N017444-002A-MS** SampType: **MS** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **ZZZZZZ** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131219**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	28.433	5.0	24.89	9.122	77.6	75	125				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPB

Sample ID: **N017444-002A-MSD** SampType: **MSD** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **ZZZZZZ** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131220**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	28.564	5.0	24.93	9.122	78.0	75	125	28.43	0.459	20	

Sample ID: **N017444-015A-DUP** SampType: **DUP** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **ZZZZZZ** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131233**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	135.470	5.0						186.1	31.5	20	R

Sample ID: **N017444-015A-MS** SampType: **MS** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104044**
Client ID: **ZZZZZZ** Batch ID: **52911** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/9/2015** SeqNo: **2131234**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	116.191	5.0	24.88	186.1	-281	75	125				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPB

Sample ID: **MB1-52912** SampType: **MBLK** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **PBS** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131337**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									

Sample ID: **MB2-52912** SampType: **MBLK** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **PBS** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131340**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	5.0									

Sample ID: **LCS-52912** SampType: **LCS** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **LCSS** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131341**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	25.617	5.0	25.00	0	102	80	120				

Sample ID: **N017444-001A-DUP** SampType: **DUP** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131346**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	35.508	5.0						30.28	15.9	20	

Sample ID: **N017444-001A-MS** SampType: **MS** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131347**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	68.821	5.0	25.05	30.28	154	75	125				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_SPB

Sample ID: **N017444-001A-MSD** SampType: **MSD** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131348**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	53.221	5.0	25.09	30.28	91.5	75	125	68.82	25.6	20	R

Sample ID: **N017444-028A-DUP** SampType: **DUP** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131352**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	2.805	5.0						2.927	0	20	

Sample ID: **N017444-028A-MS** SampType: **MS** TestCode: **6010_SPB** Units: **mg/Kg** Prep Date: **11/2/2015** RunNo: **104011**
Client ID: **ZZZZZZ** Batch ID: **52912** TestNo: **EPA 6010B** **EPA 3050B** Analysis Date: **11/6/2015** SeqNo: **2131353**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	21.316	5.0	25.13	2.927	73.2	75	125				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID: **N017444-038A-DUP** SampType: **DUP** TestCode: **6010_W** Units: **mg/L** Prep Date: **11/2/2015** RunNo: **104048**
Client ID: **ZZZZZZ** Batch ID: **52908** TestNo: **EPA 6010B** **EPA 3010A** Analysis Date: **11/9/2015** SeqNo: **2132161**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.001	0.010						0	0	20	
Chromium	0.000628	0.0030						0.0002295	0	20	
Lead	ND	0.0050						0	0	20	

Sample ID: **N017444-038A-MS** SampType: **MS** TestCode: **6010_W** Units: **mg/L** Prep Date: **11/2/2015** RunNo: **104048**
Client ID: **ZZZZZZ** Batch ID: **52908** TestNo: **EPA 6010B** **EPA 3010A** Analysis Date: **11/9/2015** SeqNo: **2132612**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.508	0.010	0.5000	0	102	75	125				
Chromium	0.508	0.0030	0.5000	0.0002295	102	75	125				
Lead	0.528	0.0050	0.5000	0	106	75	125				

Sample ID: **N017435-010I-DUP** SampType: **DUP** TestCode: **6010_W** Units: **mg/L** Prep Date: **11/2/2015** RunNo: **104048**
Client ID: **ZZZZZZ** Batch ID: **52908** TestNo: **EPA 6010B** **EPA 3010A** Analysis Date: **11/9/2015** SeqNo: **2132619**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.004	0.010						0.003465	0	20	
Chromium	0.009	0.0030						0.008281	7.66	20	
Lead	ND	0.0050						0	0	20	

Sample ID: **N017435-010I-MSD** SampType: **MSD** TestCode: **6010_W** Units: **mg/L** Prep Date: **11/2/2015** RunNo: **104048**
Client ID: **ZZZZZZ** Batch ID: **52908** TestNo: **EPA 6010B** **EPA 3010A** Analysis Date: **11/9/2015** SeqNo: **2132621**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.509	0.010	0.5000	0.003465	101	75	125	1.526	100	20	R
Chromium	0.502	0.0030	0.5000	0.008281	98.8	75	125	0.5559	10.1	20	
Lead	0.476	0.0050	0.5000	0	95.2	75	125	1.481	103	20	R

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_W

Sample ID: **N017435-010I-MS**	SampType: **MS**	TestCode: **6010_W**	Units: **mg/L**	Prep Date: **11/2/2015**	RunNo: **104048**
Client ID: **ZZZZZZ**	Batch ID: **52908**	TestNo: **EPA 6010B**	**EPA 3010A**	Analysis Date: **11/9/2015**	SeqNo: **2132622**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	0.520	0.010	0.5000	0.003465	103	75	125				
Chromium	0.516	0.0030	0.5000	0.008281	101	75	125				
Lead	0.496	0.0050	0.5000	0	99.2	75	125				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **MB1-52921** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **PBS** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128756**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **MB2-52921** SampType: **MBLK** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **PBS** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128757**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	ND	0.10									

Sample ID: **LCS-52921** SampType: **LCS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **LCSS** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128758**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.424	0.10	0.4167	0	102	80	120				

Sample ID: **N017437-005A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **ZZZZZZ** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128759**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.440	0.10	0.4153	0.02051	101	75	125				

Sample ID: **N017437-005A-MSD** SampType: **MSD** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **ZZZZZZ** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128760**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.471	0.10	0.4160	0.02051	108	75	125	0.4399	6.84	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 7471_S

Sample ID: **N017437-005A-DUP** SampType: **DUP** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **ZZZZZZ** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128761**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.024	0.099						0.02051	0	20	

Sample ID: **N017444-036A-DUP** SampType: **DUP** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **ZZZZZZ** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128775**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.009	0.10						0.01043	0	20	

Sample ID: **N017444-036A-MS** SampType: **MS** TestCode: **7471_S** Units: **mg/Kg** Prep Date: **11/3/2015** RunNo: **104012**
Client ID: **ZZZZZZ** Batch ID: **52921** TestNo: **EPA 7471A** Analysis Date: **11/5/2015** SeqNo: **2128776**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Mercury	0.436	0.10	0.4160	0.01043	102	75	125				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **LCS-52952** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/5/2015** RunNo: **104017**
Client ID: **LCSS** Batch ID: **52952** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/6/2015** SeqNo: **2129174**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	74.407	1.0	83.30	0	89.3	51	100				
Surr: p-Terphenyl	6.640		6.670		99.6	48	123				

Sample ID: **MB-52952** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/5/2015** RunNo: **104017**
Client ID: **PBS** Batch ID: **52952** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/6/2015** SeqNo: **2129175**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	1.045	1.0									
Surr: p-Terphenyl	5.386		6.670		80.7	48	123				

Sample ID: **N017444-001A-MS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/5/2015** RunNo: **104017**
Client ID: **ZZZZZZ** Batch ID: **52952** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/6/2015** SeqNo: **2129184**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	172.559	10	83.33	62.25	132	31	108				S
Surr: p-Terphenyl	1.691		6.672		25.3	48	123				S

Sample ID: **N017444-001A-MSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/5/2015** RunNo: **104017**
Client ID: **ZZZZZZ** Batch ID: **52952** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/6/2015** SeqNo: **2129185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	191.671	10	83.38	62.25	155	31	108	174.2	9.56	20	S
Surr: p-Terphenyl	6.590		6.677		98.7	48	123		0		

Sample ID: **N017444-001A-DUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/5/2015** RunNo: **104017**
Client ID: **ZZZZZZ** Batch ID: **52952** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/6/2015** SeqNo: **2129186**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **N017444-001A-DUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/5/2015** RunNo: **104017**
Client ID: **ZZZZZZ** Batch ID: **52952** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/6/2015** SeqNo: **2129186**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	111.849	10						62.25	57.0	20	R
ORO	356.525	10						225.6	45.0	20	R
Surr: p-Terphenyl	2.922		6.677		43.8	48	123		0		S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **LCS-52989** SampType: **LCS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/9/2015** RunNo: **104045**
Client ID: **LCSS** Batch ID: **52989** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/9/2015** SeqNo: **2131588**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	74.893	1.0	83.30	0	89.9	51	100				
Surr: p-Terphenyl	6.540		6.670		98.0	48	123				

Sample ID: **MB-52989** SampType: **MBLK** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/9/2015** RunNo: **104045**
Client ID: **PBS** Batch ID: **52989** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/9/2015** SeqNo: **2131589**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0									
ORO	ND	1.0									
Surr: p-Terphenyl	5.938		6.670		89.0	48	123				

Sample ID: **N017444-012A-DUP** SampType: **DUP** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/9/2015** RunNo: **104045**
Client ID: **ZZZZZZ** Batch ID: **52989** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/9/2015** SeqNo: **2131591**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	ND	1.0	0	0	0	0	0				
ORO	ND	1.0	0	0	0	0	0				
Surr: p-Terphenyl	5.838		6.674		87.5	48	123				

Sample ID: **N017444-012A-MS** SampType: **MS** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/9/2015** RunNo: **104045**
Client ID: **ZZZZZZ** Batch ID: **52989** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/9/2015** SeqNo: **2131594**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	74.274	1.0	83.27	1.674	87.2	31	108				
Surr: p-Terphenyl	6.592		6.668		98.9	48	123				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015_S_DM LL

Sample ID: **N017444-012A-MSD** SampType: **MSD** TestCode: **8015_S_DM L** Units: **mg/Kg** Prep Date: **11/9/2015** RunNo: **104045**
Client ID: **ZZZZZZ** Batch ID: **52989** TestNo: **EPA 8015B EPA 3550B** Analysis Date: **11/9/2015** SeqNo: **2131595**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
DRO	73.317	1.0	83.30	1.674	86.0	31	108	74.27	1.30	20	
Surr: p-Terphenyl	6.615		6.670		99.2	48	123		0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015GAS_S

Sample ID: **E151103LCS** SampType: **LCS** TestCode: **8015GAS_S** Units: **mg/Kg** Prep Date: RunNo: **103946**
Client ID: **LCSS** Batch ID: **E15VS126** TestNo: **EPA 8015B** Analysis Date: **11/3/2015** SeqNo: **2124848**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	5.034	1.0	5.000	0	101	70	137				
Surr: Chlorobenzene - d5	102.235		100.0		102	46	154				

Sample ID: **E151103MB1** SampType: **MBLK** TestCode: **8015GAS_S** Units: **mg/Kg** Prep Date: RunNo: **103946**
Client ID: **PBS** Batch ID: **E15VS126** TestNo: **EPA 8015B** Analysis Date: **11/3/2015** SeqNo: **2124849**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	0.051	1.0									
Surr: Chlorobenzene - d5	108.299		100.0		108	46	154				

Sample ID: **N017444-004ADUP** SampType: **DUP** TestCode: **8015GAS_S** Units: **mg/Kg** Prep Date: RunNo: **103946**
Client ID: **ZZZZZZ** Batch ID: **E15VS126** TestNo: **EPA 8015B** Analysis Date: **11/3/2015** SeqNo: **2124857**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	ND	1.0						0	0	20	
Surr: Chlorobenzene - d5	115.599		100.0		116	46	154		0		

Sample ID: **N017444-016AMS** SampType: **MS** TestCode: **8015GAS_S** Units: **mg/Kg** Prep Date: RunNo: **103946**
Client ID: **ZZZZZZ** Batch ID: **E15VS126** TestNo: **EPA 8015B** Analysis Date: **11/3/2015** SeqNo: **2124859**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	4.979	1.0	5.000	0	99.6	46	155				
Surr: Chlorobenzene - d5	103.827		100.0		104	46	154				

Sample ID: **N017444-016AMSD** SampType: **MSD** TestCode: **8015GAS_S** Units: **mg/Kg** Prep Date: RunNo: **103946**
Client ID: **ZZZZZZ** Batch ID: **E15VS126** TestNo: **EPA 8015B** Analysis Date: **11/3/2015** SeqNo: **2124860**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
GRO	5.006	1.0	5.000	0	100	46	155	4.979	0.541	20	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015GAS_S

Sample ID: **N017444-016AMSD** SampType: **MSD** TestCode: **8015GAS_S** Units: **mg/Kg** Prep Date: RunNo: **103946**
Client ID: **ZZZZZZ** Batch ID: **E15VS126** TestNo: **EPA 8015B** Analysis Date: **11/3/2015** SeqNo: **2124860**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: Chlorobenzene - d5	105.328		100.0		105	46	154		0		

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 9045_S

Sample ID: **N017444-006ADUP** SampType: **DUP** TestCode: **9045_S** Units: **pH Units** Prep Date: RunNo: **103952**
Client ID: **ZZZZZZ** Batch ID: **R103952** TestNo: **EPA 9045C** Analysis Date: **11/2/2015** SeqNo: **2125548**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
pH	8.410	0.10						8.410	0	20	
Temp. at time of pH Analysis	26.900	0						26.90	0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CHAIN OF CUSTODY RECORD

5.8°C IR#2

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other:

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5900
Fax: " " 5915

Project Name: ALA 580
Project #: E8721-02-38
Sampler: D. WATTS (Signature) WATTS

Relinquished by: (Signature and Printed Name)	Date	Time	Received by: (Signature and Printed Name)	Date	Time
WATTS	10/30/15	1600	GSO	10/30/15	1600
GSO TRK# 5297939111				10/31/15	0831

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/21/15 (Print Name / Date)
Signature: WATTS

Send Report To: Attn: Co: "CLIENT" Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments: Analyze Rinse BLK (RB) for Total Pb

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE CT Legal ☐ SWRCB ☐ Logcode _____ OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	8010B (Total Metal) - Pb	8015B (GRO) ~~reserved~~	8015B (DRO) / MO	TITLE 22 / CAM 17 (6010 / 7000)	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	N017444-1	G-1A-0	10/30/15	0924						X	X				X							5-Day	1	T P	C	
	-2	-1A-2		↓				X																		
	-3	-1B-0		0927				X																		
	-4	-1B-2		↓				X	X																	
	-5	-2A-0		0941							X															
	-6	-2A-2		↓				X					X													
	-7	-2B-0		0947				X																		
	-8	-2B-2		↓				X																		
	-9	-3A-0		1007				X																		
	-10	-3A-2		↓					X		X															

☐ TAT starts 8AM the following day if samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

CHAIN OF CUSTODY RECORD

5.8°C IR#2

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOLOW
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5900
Fax: " " 5915

Project Name: ALA 580
Project #: E8721-02-38
Sampler: D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name) SEE Pg 1 Date: Time: Received by: (Signature and Printed Name) Date: Time:
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/21/15
Print Name Date
[signature] Signature

Send Report To: Attn: Co: "CLIENT" Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☐ Legal ☐ SWRCB ☐ Logcode _____ OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal) - Pb	8015B (GRO)	8015B (DRO) / mo	TITLE 22 / CAM 17 (6010 / 7000)	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	N07444-11	G-3B-0	10/30/15	1014				X								X						5-Day	1	T	P	C
	-12	-3B-2	↓	↓				X		X						↓						↓	↓	↓	↓	↓
	-13	-4A-0	↓	1024						X	X					↓						↓	↓	↓	↓	↓
	-14	-4A-2	↓	↓				X								↓						↓	↓	↓	↓	↓
	-15	-4B-0	↓	1029				X								↓						↓	↓	↓	↓	↓
	-16	-4B-2	↓	↓				X	X							↓						↓	↓	↓	↓	↓
	-17	-5A-0	↓	1041							X					↓						↓	↓	↓	↓	↓
	-18	-5A-2	↓	↓				X					X			↓						↓	↓	↓	↓	↓
	-19	-5B-0	↓	1051				X								↓						↓	↓	↓	↓	↓
	-20	-5B-2	↓	↓				X								↓						↓	↓	↓	↓	↓

- TAT starts 8AM the following day if samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs. ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

5.8°C IR#2 Page 3 of 4

CHAIN OF CUSTODY RECORD

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5900
Fax: " " 5915

Project Name: ALA 580
Project #: E8721-02-38
Sampler: D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name) SEE Pg 1 Date: Time: Received by: (Signature and Printed Name) Date: Time:
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:
Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/21/15 (Print Name, Date)
[signature] (Signature)

Send Report To: Attn: Co: "CLIENT" Addr: City: State: Zip:

Bill To: Attn: Co: Addr: City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☐ Legal ☐ SWRCB ☐ Logcode _____ OTHER _____

ITEM	LAB USE ONLY: Batch #: Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal) Pb	8015B (GRO) ~~BTEX~~ / MO	8015B (DRO)	TITLE 22 / CAM 17 (6010 / 7000)	pH	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Type	PRESERVATION	REMARKS
	N07444-21	G-6A-0	10/30/15	0738				X							X							5-day	1	T	P	C	
	-22	-6A-2		↓					X		X															
	-23	-6B-0		0744				X																		
	-24	-6B-2		↓				X		X																
	-25	-7A-0		0755						X	X															
	-26	-7A-2		↓				X																		
	-27	-7B-0		0801				X																		
	-28	-7B-2		↓				X	X																	
	-29	-8A-0		0811							X															
	-30	-8A-2		↓				X					X													

■ TAT starts 8AM the following day if samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives: H=HCl N=HNO_3 S=H_2SO_4 C=4°C Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

CHAIN OF CUSTODY RECORD

5.8°C IR#2

ADVANCED TECHNOLOGY LABORATORIES
3151 W. Post Road, Las Vegas, NV 89118
Tel: (702) 307-2659 • Fax: (702) 307-2691

P.O. #: _____ Quote #: _____
Logged By: _____ Date: _____

NOTE: Please include your Quote No. to ensure proper pricing of your project.

FOR LABORATORY USE ONLY

Method of Transport: ☐ Client ☐ ATL ☐ FedEx ☐ OnTrac ☐ GSO ☐ Other: _____

Sample Condition Upon Receipt:
1. CHILLED Y ☑ N ☐
2. HEADSPACE (VOA) Y ☐ N ☐
3. CONTAINER INTACT Y ☑ N ☐
4. SEALED Y ☐ N ☑
5. # OF SPLS MATCH COC Y ☑ N ☐
6. PRESERVED Y ☐ N ☑

Client: GEOCON
Attention: L. BEADLE
Address: 6671 BRISA ST
City: LIVERMORE State: CA Zip Code: 94550
Tel: 925-371-5900
Fax: " " 5915

Project Name: ALA 580 Project #: E8721-02-38 Sampler: D. WATTS (Signature) [signature]

Relinquished by: (Signature and Printed Name) SEE Pg 1 Date: Time: Received by: (Signature and Printed Name) Date: Time:

Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:

Relinquished by: (Signature and Printed Name) Date: Time: Received by: (Signature and Printed Name) Date: Time:

I hereby authorize ATL to perform the work indicated below:
Project Mgr/Submitter: D. WATTS 10/21/15
Print Name Date
[signature]
Signature

Send Report To:
Attn:
Co: "CLIENT"
Addr:
City: State: Zip:

Bill To:
Attn:
Co:
Addr:
City: State: Zip:

Special Instructions/Comments:

Sample/Records - Archival & Disposal
Unless otherwise requested by client, all samples will be disposed 45 days after receipt and records will be disposed 1 year after submittal of final report.

Storage Fees (applies when storage is requested):
- Sample :$2.00 / sample /mo (after 45 days)
- Records: $1 /ATL workorder /mo (after 1 year)

Circle or Add Analysis(es) Requested

SPECIFY APPROPRIATE MATRIX

QA/QC: RTNE ☐ CT ☑ Legal ☐ SWRCB ☐ Logcode _____ OTHER _____

ITEM	LAB USE ONLY: Batch #: / Lab No.	Sample Description: Sample ID / Location	Date	Time	8081A (Pesticides)	8082 (PCB)	8260B (Volatiles)	8270C (BNA)	6010B (Total Metal) - Pb	8015B (GRO)	8015B (DRO) / mo	TITLE 22 / CAM 17 (6010 / 7000)	SEDIMENT	SOLID	SOIL	DRINKING WATER	GROUND WATER	WASTEWATER	STORMWATER	AQUEOUS	TAT	Container(s) #	Container(s) Type	PRESERVATION	REMARKS
	N017444-31	G-8B-0	10/30/15	0821				X						X							5-DAY	1	TP	C	
	-32	G-8B-2						X																	
	-33	G-9A-0		0841				X																	
	-34	G-9A-2							X	X	X														
	-35	G-9B-0		0844				X																	Ref 0.5'
		~~G-9B-2~~						X		X															
	N017444-37	G-10A-0		0846						X	X														Ref 0.5'
		~~G-10A-2~~						X																	
	N017444-38	G-10B-0		0848				X	X																Ref 0.5'
		~~G-10B-2~~						X	X																

- TAT starts 8AM the following day if samples received after 5 PM

TAT: ☐ A = Overnight ≤ 24 hrs ☐ B = Emergency Next Workday ☐ C = Critical 2 Workdays ☐ D = Urgent 3 Workdays ☐ E = Routine 7 Workdays

Container Types: T=Tube V=VOA L=Liter P=Pint J=Jar B=Tedlar G=Glass P=Plastic M=Metal

Preservatives:
H=HCl N=HNO_3 S=H_2SO_4 C=4°C
Z=$Zn(AC)_2$ O=NaOH T=$Na_2S_2O_3$

Rev. 2010-0325

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On:	10/31/2015	Workorder:	N017444
Rep sample Temp (Deg C):	5.8	IR Gun ID:	2
Temp Blank:	☑ Yes ☐ No		
Carrier name:	Golden State Overnight		
Last 4 digits of Tracking No.:	3911	Packing Material Used:	Bubble Wrap
Cooling process:	☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None		

Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☑	NA ☐
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☑	NA ☐
16. Were there Non-Conformance issues at login?	Yes ☑	No ☐	NA ☐
Was Client notified?	Yes ☐	No ☑	NA ☐

Comments: Rinse Blank was lab preserved.

Checklist Completed B JAA 11/3/2015

Reviewed By: gog 11/4/15

GSO GOLDEN STATE OVERNIGHT

800-322-5555 www.gso.com

Ship From
GEOCON, INC.
GEOCON - LIVERMORE OFFICE
6671 BRISA STREET
LIVERMORE, CA 94550

SAT DELIV

Ship To
ADVANCED TECHNOLOGY LABS - LAS VEGAS
SAMPLE RECEIVING
3151 W. POST ROAD
LAS VEGAS, NV 89118

COD: $0.00
Weight: 50 lb(s)
Dimensions: 36 x 20 x 16 (L x W x H inches)
Reference:
GRANT LINE RD (TO-38)
Delivery Instructions:

Signature Type: REQUIRED

Tracking #: 529793911

SDS

Package 1 of 1

LABEL INSTRUCTIONS:

Do not copy or reprint this label for additional shipments - each package must have a unique barcode.

Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer. Securely attach this label to your package, do not cover the barcode.

LVS
LAS VEGAS
N89103A

44260499

Print Date:
10/30/2015 2:08 PM

November 19, 2015

Luann Beadle
Geocon Consultants, Inc.
6671 Brisa Street
Livermore, CA 94550

TEL: 925-371-5900 Ext 403
FAX: (925) 371-5915

CA-ELAP No.: 2676
NV Cert. No.: NV-00922

Workorder No.: N017444

RE: ALA 580, E8721-02-38

Attention: Luann Beadle

Enclosed are the results for sample(s) received on October 31, 2015 by ASSET Laboratories . The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

This is an addendum report. Please incorporate with documentation previously submitted.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Glen Gesmundo
QA Manager

The cover letter is an integral part of this analytical report. This Laboratory Report cannot be reproduced in part or in its entirety without written permission from the client and Advanced Technology Laboratories - Las Vegas.

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-2B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 9:47:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-007		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS BY STLC						
EPA 3010A			**WET/ EPA 6010B**			
RunID: ICP2_151116A	QC Batch: 54077				PrepDate: 11/16/2015	Analyst: **CEI**
Lead	3.8	0.25		mg/L	5	11/16/2015 03:03 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:24:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-013		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS BY STLC						
EPA 3010A			**WET/ EPA 6010B**			
RunID: ICP2_151116A	QC Batch: 54077				PrepDate: 11/16/2015	Analyst: **CEI**
Lead	12	0.25		mg/L	5	11/16/2015 03:09 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-4B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:29:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-015		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS BY STLC						
EPA 3010A			**WET/ EPA 6010B**			
RunID: ICP2_151116A	QC Batch: 54077				PrepDate: 11/16/2015	Analyst: **CEI**
Lead	5.0	0.25		mg/L	5	11/16/2015 03:16 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-5B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 10:51:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-019		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS BY STLC						
EPA 3010A			**WET/ EPA 6010B**			
RunID: ICP2_151116A	QC Batch: 54077				PrepDate: 11/16/2015	Analyst: **CEI**
Lead	2.9	0.25		mg/L	5	11/16/2015 03:23 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-6A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:38:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-021		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS BY STLC						
EPA 3010A			**WET/ EPA 6010B**			
RunID: ICP2_151116A	QC Batch: 54077				PrepDate: 11/16/2015	Analyst: **CEI**
Lead	0.48	0.25		mg/L	5	11/16/2015 03:29 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-7A-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 7:55:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-025		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS BY STLC						
EPA 3010A			**WET/ EPA 6010B**			
RunID: ICP2_151116A	QC Batch: 54077				PrepDate: 11/16/2015	Analyst: **CEI**
Lead	4.0	0.25		mg/L	5	11/16/2015 03:37 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
DO	Surrogate Diluted Out		

ASSET Laboratories

ANALYTICAL RESULTS

Print Date: *19-Nov-15*

CLIENT:	Geocon Consultants, Inc.	**Client Sample ID:**	G-7B-0
Lab Order:	N017444	**Collection Date:**	10/30/2015 8:01:00 AM
Project:	ALA 580, E8721-02-38	**Matrix:**	SOIL
Lab ID:	N017444-027		

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
ICP METALS BY STLC						
EPA 3010A			**WET/ EPA 6010B**			
RunID: ICP2_151116A	QC Batch: 54077				PrepDate: 11/16/2015	Analyst: **CEI**
Lead	2.8	0.25		mg/L	5	11/16/2015 03:43 PM

Qualifiers:				
	B	Analyte detected in the associated Method Blank	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	ND	Not Detected at the Reporting Limit
	S	Spike/Surrogate outside of limits due to matrix interference		Results are wet unless otherwise specified
	DO	Surrogate Diluted Out		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_ST

Sample ID: **MB-54077** SampType: **MBLK** TestCode: **6010_ST** Units: **mg/L** Prep Date: **11/16/2015** RunNo: **104173**
Client ID: **PBS** Batch ID: **54077** TestNo: **WET/ EPA 60 EPA 3010A** Analysis Date: **11/16/2015** SeqNo: **2139380**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.050									

Sample ID: **MB-54038-STLC** SampType: **MBLK** TestCode: **6010_ST** Units: **mg/L** Prep Date: RunNo: **104173**
Client ID: **PBS** Batch ID: **54077** TestNo: **WET/ EPA 60 EPA 3010A** Analysis Date: **11/16/2015** SeqNo: **2139381**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	ND	0.25									

Sample ID: **N017444-027A-DUP** SampType: **DUP** TestCode: **6010_ST** Units: **mg/L** Prep Date: **11/16/2015** RunNo: **104173**
Client ID: **ZZZZZZ** Batch ID: **54077** TestNo: **WET/ EPA 60 EPA 3010A** Analysis Date: **11/16/2015** SeqNo: **2139398**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	1.092	0.25						2.823	88.4	20	R

Sample ID: **LCS-54077** SampType: **LCS** TestCode: **6010_ST** Units: **mg/L** Prep Date: **11/16/2015** RunNo: **104173**
Client ID: **LCSS** Batch ID: **54077** TestNo: **WET/ EPA 60 EPA 3010A** Analysis Date: **11/16/2015** SeqNo: **2139399**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	0.534	0.050	0.5000	0	107	85	115				

Sample ID: **N017444-013A-MS** SampType: **MS** TestCode: **6010_ST** Units: **mg/L** Prep Date: **11/16/2015** RunNo: **104173**
Client ID: **ZZZZZZ** Batch ID: **54077** TestNo: **WET/ EPA 60 EPA 3010A** Analysis Date: **11/16/2015** SeqNo: **2139404**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	7.688	0.25	2.500	12.20	-181	75	125				S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

CLIENT: Geocon Consultants, Inc.
Work Order: N017444
Project: ALA 580, E8721-02-38

ANALYTICAL QC SUMMARY REPORT

TestCode: 6010_ST

Sample ID: **N017444-013A-MSD** SampType: **MSD** TestCode: **6010_ST** Units: **mg/L** Prep Date: **11/16/2015** RunNo: **104173**
Client ID: **ZZZZZZ** Batch ID: **54077** TestNo: **WET/ EPA 60 EPA 3010A** Analysis Date: **11/16/2015** SeqNo: **2139405**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Lead	7.678	0.25	2.500	12.20	-181	75	125	7.688	0.131	20	S

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits	S	Spike/Surrogate outside of limits due to matrix interference
DO	Surrogate Diluted Out		Calculations are based on raw values		

ASSET LV Sample Control

From: Glen Gesmundo <glen@assetlaboratories.com>
Sent: Thursday, November 12, 2015 10:41 AM
To: 'ASSET LV Sample Control'
Subject: FW: Lab Order N017444 (TO-38 I-580 TOS)

Please process.

Thanks,
Glen

From: Luann Beadle [mailto:beadle@geoconinc.com]
Sent: Thursday, November 12, 2015 10:06 AM
To: Glen (glen@assetlaboratories.com)
Subject: Lab Order N017444 (TO-38 I-580 TOS)

Hi Glen,

Please run the following samples for WET lead on a regular TAT:

N017444-021A	G-6A-0	Lead	52
N017444-027A	G-7B-0	Lead	52
N017444-007A	G-2B-0	Lead	53
N017444-025A	G-7A-0	Lead	89
N017444-019A	G-5B-0	Lead	120
N017444-015A	G-4B-0	Lead	190
N017444-013A	G-4A-0	Lead	210

Thank you,
Luann

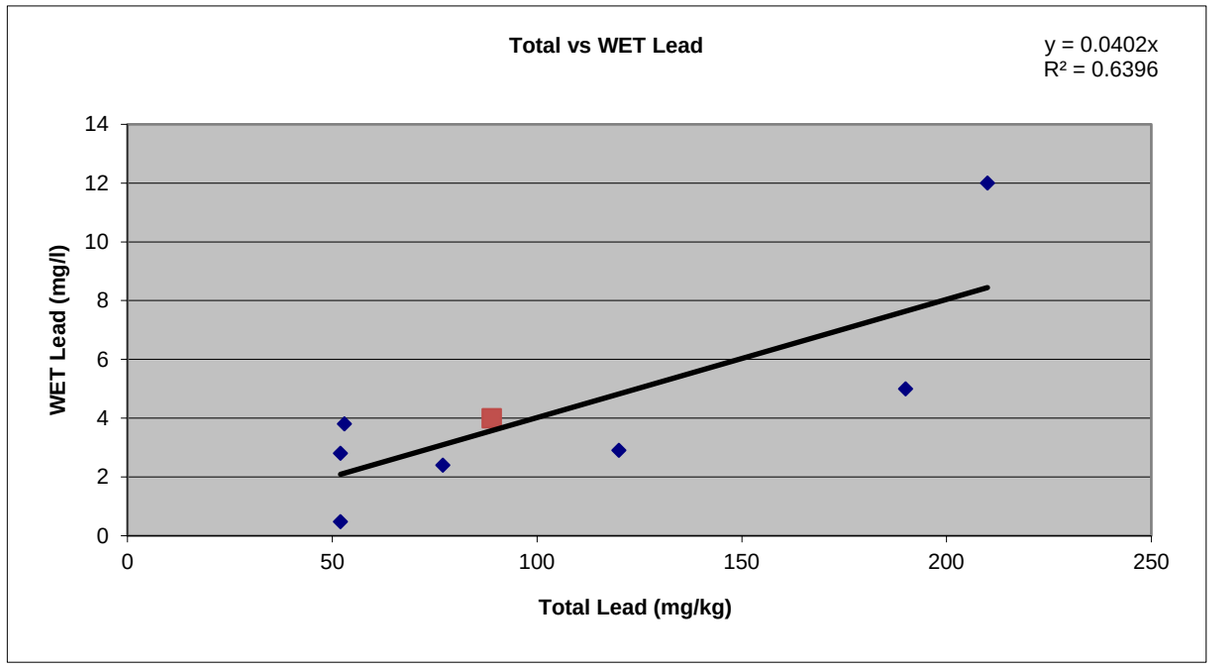
Luann Beadle | *Senior Staff Scientist*
GEOCON CONSULTANTS, INC.
6671 Brisa Street, Livermore, California 94550
P|925.371.5900 ext. 403 M|925.395.1669
beadle@geoconinc.com / www.geoconinc.com / Facebook / Linkedin

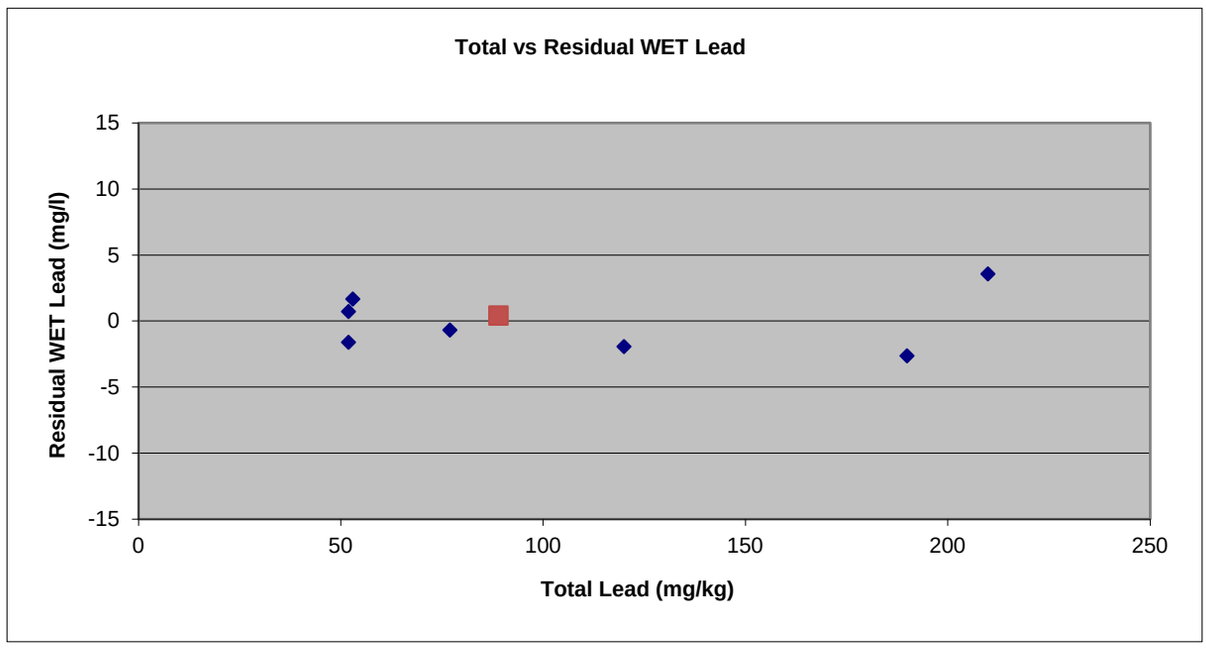
Bay Area ~ Sacramento ~ Fairfield ~ Los Angeles ~ Orange County ~ Riverside County ~ Palm Desert ~ San Diego

Geotechnical Engineering Environmental Services Engineering Geology Construction Inspection
Land Development Transportation Infrastructure Institutional Brownfields/Redevelopment Natural Resources

APPENDIX C

Sample ID	Sample Depth (feet)	Total Lead (mg/kg)	WET Lead (mg/l)	Residual WET Lead (mg/l)	Squared Residual WET Lead (mg/l)
M-4-0	0 to 0.5	77	2.4	-0.70	0.49
G-5B-0	0 to 0.5	120	2.9	-1.93	3.72
G-4B-0	0 to 0.5	190	5.0	-2.64	6.99
G-4A-0	0 to 0.5	210	12	3.55	12.62
G-2B-0	0 to 0.5	53	3.8	1.67	2.78
G-6A-0	0 to 0.5	52	0.48	-1.61	2.60
G-7B-0	0 to 0.5	52	2.8	0.71	0.50
Not Used					
G-7A-0	0 to 0.5	89	4.0	0.42	0.18





Pb - Strobridge - 0

Total Number of Observations	9
Number of Distinct Observations	6
Number of Missing Observations	0
Mean	9.51
Median	11
Std. Error of Mean	0.786
Skewness	-1.215
SD of logged Data	0.301
Minimum	4.6
Maximum	12
SD	2.357
Coefficient of Variation	0.248
Mean of logged Data	2.217
90% Standard Bootstrap UCL	**10.5**
95% Standard Bootstrap UCL	**10.7**

Pb - Strobridge - 1.5

Total Number of Observations	9
Number of Distinct Observations	9
Number of Missing Observations	0
Mean	8.42
Median	8.4
Std. Error of Mean	0.957
Skewness	0.0962
SD of logged Data	0.413
Minimum	3.0
Maximum	14
SD	2.87
Coefficient of Variation	0.341
Mean of logged Data	2.066
90% Standard Bootstrap UCL	**9.58**
95% Standard Bootstrap UCL	**9.93**

Pb - Castro Valley Blvd - 0

Total Number of Observations	9
Number of Distinct Observations	9
Number of Missing Observations	0
Mean	12.1
Median	13
Std. Error of Mean	1.311
Skewness	-0.599
SD of logged Data	0.392
Minimum	4.9
Maximum	17
SD	3.933
Coefficient of Variation	0.325
Mean of logged Data	2.434
90% Standard Bootstrap UCL	**13.7**
95% Standard Bootstrap UCL	**14.2**

Pb - Castro Valley Blvd - 1.5

Total Number of Observations	8
Number of Distinct Observations	6
Number of Missing Observations	0
Mean	9.96
Median	10.15
Std. Error of Mean	0.926
Skewness	0.871
SD of logged Data	0.254
Minimum	7.2
Maximum	15
SD	2.619
Coefficient of Variation	0.263
Mean of logged Data	2.27
90% Standard Bootstrap UCL	**11.1**
95% Standard Bootstrap UCL	**11.4**

Pb - Midway - 0

Total Number of Observations	4
Number of Distinct Observations	4
Number of Missing Observations	0
Mean	32.5
Median	20.5
Std. Error of Mean	15.08
Skewness	1.812
SD of logged Data	0.817
Minimum	12
Maximum	77
SD	30.16
Coefficient of Variation	0.928
Mean of logged Data	3.205
90% Standard Bootstrap UCL	**N/A**
95% Standard Bootstrap UCL	**N/A**

Pb - Midway - 1

Total Number of Observations	4
Number of Distinct Observations	4
Number of Missing Observations	0
Mean	17.6
Median	17.5
Std. Error of Mean	4.082
Skewness	0.0218
SD of logged Data	0.498
Minimum	9.3
Maximum	26
SD	8.164
Coefficient of Variation	0.465
Mean of logged Data	2.777
90% Standard Bootstrap UCL	**N/A**
95% Standard Bootstrap UCL	**N/A**

Pb Grant Line Road - 0

Total Number of Observations	20
Number of Distinct Observations	18
Number of Missing Observations	0
Mean	53.3
Median	31
Std. Error of Mean	12.77
Skewness	1.967
SD of logged Data	0.912
Minimum	6.8
Maximum	210
SD	57.13
Coefficient of Variation	1.071
Mean of logged Data	3.557
90% Standard Bootstrap UCL	**69.4**
95% Standard Bootstrap UCL	**74**

Pb Grant Line Road - 2

Total Number of Observations	17
Number of Distinct Observations	8
Number of Missing Observations	0
Mean	6.67
Median	3.2
Std. Error of Mean	1.148
Skewness	0.345
SD of logged Data	0.784
Minimum	1.8
Maximum	12.5
SD	4.734
Coefficient of Variation	0.71
Mean of logged Data	1.621
90% Standard Bootstrap UCL	**8.09**
95% Standard Bootstrap UCL	**8.47**

As

Total Number of Observations	24
Number of Distinct Observations	21
Number of Missing Observations	0
Mean	4.046
Median	4
Std. Error of Mean	0.458
Skewness	1.718
SD of logged Data	0.701
Minimum	0.5
Maximum	12
SD	2.244
Coefficient of Variation	0.555
Mean of logged Data	1.22
95% Standard Bootstrap UCL	**4.77**

Co

Total Number of Observations	24
Number of Distinct Observations	19
Number of Missing Observations	0
Mean	14.78
Median	12
Std. Error of Mean	1.858
Skewness	2.236
SD of logged Data	0.498
Minimum	5.7
Maximum	47
SD	9.102
Coefficient of Variation	0.616
Mean of logged Data	2.561
95% Standard Bootstrap UCL	**17.8**

Pb - Site

General Statistics

Total Number of Observations	85
Number of Distinct Observations	51
Number of Missing Observations	0
Mean	20.8
Median	11
Std. Error of Mean	3.663
Skewness	4.133
SD of logged Data	0.944
Minimum	1.8
Maximum	210
SD	33.77
Coefficient of Variation	1.624
Mean of logged Data	2.483
95% Standard Bootstrap UCL	**26.8**

Ni

Total Number of Observations	24
Number of Distinct Observations	20
Number of Missing Observations	0
Mean	57.25
Median	30.5
Std. Error of Mean	15.58
Skewness	3.072
SD of logged Data	0.861
Minimum	10
Maximum	350
SD	76.34
Coefficient of Variation	1.333
Mean of logged Data	3.597
95% Standard Bootstrap UCL	**82.4**

TPHd

Total Number of Observations	17
Number of Distinct Observations	16
Number of Missing Observations	0
Mean	57.1
Median	44
Std. Error of Mean	14.2
Skewness	1.752
SD of logged Data	1.722
Minimum	0.5
Maximum	230
SD	58.56
Coefficient of Variation	1.025
Mean of logged Data	3.241
95% Standard Bootstrap UCL	**79.8**

TPHmo

Total Number of Observations	17
Number of Distinct Observations	16
Number of Missing Observations	0
Mean	198.1
Median	130
Std. Error of Mean	46.59
Skewness	1.017
SD of logged Data	2.228
Minimum	0.5
Maximum	660
SD	192.1
Coefficient of Variation	0.97
Mean of logged Data	4.2
95% Standard Bootstrap UCL	**274**

Using ProUCL 5.0 and replacing NDs with 1/2*DL

Pb - Site

General Statistics

Total Number of Observations	86
Minimum	1.8
Maximum	210
SD	39.28
Coefficient of Variation	1.708
Mean of logged Data	2.516
Number of Distinct Observations	51
Number of Missing Observations	0
Mean	23
Median	11
Std. Error of Mean	4.236
Skewness	3.767
SD of logged Data	0.988
90% Standard Bootstrap UCL	**28.3**
95% Standard Bootstrap UCL	**29.7**

Pb - Site 0 Depth

Total Number of Observations	46
Number of Distinct Observations	32
Number of Missing Observations	39
Mean	31.7
Median	15.5
Std. Error of Mean	6.35
Skewness	3.02
SD of logged Data	0.903
Minimum	4.6
Maximum	210
SD	43.07
Coefficient of Variation	1.36
Mean of logged Data	2.962
90% Standard Bootstrap UCL	**39.7**
95% Standard Bootstrap UCL	**42.1**

Pb - Site 1 Depth

Total Number of Observations	6
Number of Distinct Observations	6
Number of Missing Observations	79
Mean	14.1
Median	10.65
Std. Error of Mean	3.377
Skewness	0.844
SD of logged Data	0.564
Minimum	7.2
Maximum	26
SD	8.272
Coefficient of Variation	0.585
Mean of logged Data	2.512
90% Standard Bootstrap UCL	**18.2**
95% Standard Bootstrap UCL	**19.1**

Pb - Site 1.5 Depth

Total Number of Observations	18
Number of Distinct Observations	15
Number of Missing Observations	67
Mean	8.9
Median	8.9
Std. Error of Mean	0.706
Skewness	0.0552
SD of logged Data	0.397
Minimum	3
Maximum	15
SD	2.994
Coefficient of Variation	0.336
Mean of logged Data	2.121
90% Standard Bootstrap UCL	**9.79**
95% Standard Bootstrap UCL	**10.0**

Pb - Site 2 Depth

Total Number of Observations	18
Number of Distinct Observations	9
Number of Missing Observations	0
Mean	6.79
Median	5
Std. Error of Mean	1.09
Skewness	0.263
SD of logged Data	0.772
Minimum	1.8
Maximum	12.5
SD	4.623
Coefficient of Variation	0.681
Mean of logged Data	1.652
90% Standard Bootstrap UCL	**8.16**
95% Standard Bootstrap UCL	**8.49**

Paleontological Mitigation Plan

Interstate 580
Freeway Performance Initiative Project

Alameda and San Joaquin Counties, California

Caltrans District 4

Interstate 580

ALA 580 (PM 0.0/8.3, 21.7/30.4), SJC 580 (PM 13.5/15.4) / ALA 205 (PM 0.0/1.0)

EA 4G1900

May 8, 2014

Paleontological Mitigation Plan

Interstate 580
Freeway Performance Initiative Project
Alameda and San Joaquin Counties, California

Caltrans District 4
Interstate 580
ALA 580 (PM 0.0/8.3, 21.7/30.4), SJC 580 (PM 13.5/15.4) / ALA 205 (PM 0.0/1.0
EA 4G1900

May 8, 2014

Prepared By: _____ Date: 05/08/14
James R. Allen, P.G. #8335
(510) 891-0024
Garcia and Associates

Approved By: _____ Date: 5/13/14
Christopher Risden, Senior Engineering Geologist
(510) 622- 8757
California Department of Transportation, District 4

For individuals with sensory disabilities, this document is available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternative formats, please write to Caltrans, Attn: Chris Risden, Office of Geotechnical Services West, 111 Grand Avenue, Oakland, CA 94623-0660; or call (510) 622-8757 (voice); or use the California Relay Service.

Summary

Project Description

This Paleontological Mitigation Plan (PMP) was written for the California Department of Transportation (Caltrans) District 4 who proposes ramp roadway rehabilitation and installation of ramp metering systems along Interstate 580 (I-580) and Interstate 205 (I-205) in Alameda and San Joaquin counties (Project).

Due to the results of a previously written Paleontological Investigation Report (PIR) by Caltrans dated October 16, 2013, and the Paleontological Evaluation Report (PER) by Garcia and Associates dated November 18, 2013, it was strongly advised that a Paleontological Mitigation Plan (PMP) be developed, following the Caltrans SER Standards for paleontological resources.

The proposed Project will provide a high capacity communications backbone that will link the traffic operation system (TOS) field elements along I-580 in the East Bay with the District 4 Transportation Management Center (TMC) and allow District 4 TOS to interface with other agencies and systems in the future.

In Alameda County, the project is located along I-580 between the San Joaquin County line (post mile [PM] 0.0) and Greenville Road (PM 8.3) and between Foothill Road (PM 21.7) and Strobridge Avenue (PM 30.4) and along I-205 from the San Joaquin County line (PM 0.0) to I-580 (PM 1.0). In San Joaquin County, the project is located along I-580, between Patterson Pass Road (PM 13.5) and the Alameda County line (PM 15.4). The linear extent of the Project is shown in Figure 1 (Appendix A).

Roadway rehabilitation will include resurfacing of pavement on-ramps, ramp metering, and ramp widening. New TOS elements will be installed as part of this project to fill in gaps in existing TOS coverage on I-580 in Alameda County.

Affected Environment

Paleontological resources include fossils, fossil localities, and stratigraphic units, which contain the preserved remains or traces of fossil organisms. Fossils may be found as individual specimens or as assemblages of many organisms. Of particular importance are fossils that are unique or unusual and that may make significant contributions to taxonomy, systematics, evolutionary theory, paleoecology, stratigraphy, or enhance our understanding of regional geologic history. Fossils found *in situ* (i.e., have not been disturbed subsequent to their burial and fossilization) provide the most useful scientific data for reconstructing taphonomic processes (i.e., conditions under which the fossils were preserved).

Most fossils are remains of now extinct organisms, and therefore are nonrenewable resources. Even if the fossils are of extant organisms, they document the state of that species at some point in the past, and likewise are nonrenewable resources. Therefore, fossils are valuable scientific and educational resources that are afforded protection under state and federal environmental laws (California Office of Historic Preservation 2006; see also Marshall 1976 and West 1991), most notably by the 1906 Federal Antiquities Act, other subsequent federal legislation and policies, and by CEQA Section 15064.5. The SVP (1995, 1996) have established guidelines and standards accepted by most professional paleontologists for the assessment and mitigation of adverse impacts on paleontological remains. Federal, State, and county laws, ordinances, and regulations (LORS) applicable to paleontological resources are summarized and briefly discussed in the following paragraphs.

The Area of Potential Affects (APE) in this PMP with respect to paleontological resources within the Project is delineated on the geologic map figures in Appendix A. Geologic units are rated for paleontological sensitivity following guidelines set by the Society of Vertebrate Paleontologists (1995 and 1996). The Cretaceous (Great Valley Group) has a moderate – unknown paleontological sensitivity rating and will require full-time monitoring until satisfactory exposure via Project excavation has revealed enough data for the Project Paleontologist. The late Miocene formations at the Project (Monterey Group, Briones Formation) have a high paleontological sensitivity rating and thus shall require full-time monitoring during construction activities in these areas of potential affects. Quaternary Alluvium is mapped in several portions of the Project area (Figure 2, Appendix A). These deposits are Pleistocene in age and therefore have a high potential to contain significant nonrenewable paleontological resources, therefore, these portions of the Project should be monitored during construction. Once initial excavations have revealed satisfactory exposure needed to quantify the deposit's paleontological sensitivity in the field, monitoring could be reduced by the Project Paleontologist. Work Limit Areas located within the boundaries of late Miocene sedimentary formations (Figure 2, Appendix A), Cretaceous sedimentary formations (Great Valley Group) and Quaternary Alluvium will also need to be monitored, initially on a full-time basis, by a qualified paleontological monitor. These areas proposed for monitoring are listed in Table S-1, and are within the APE delineated in Figure 2 (Appendix A). The Project Paleontologist may reduce/increase the amount of paleontological monitoring once excavations have revealed the paleontological nature of the bedrock (Great Valley Group, Monterey Group, Briones Formation and Pleistocene deposits in the Livermore, CA and Tracy, CA areas).

Based on the PER findings and according to the Project PIR, the geologic formations present within the Project are considered to potentially contain rare, scientifically important reptile, marine mammal and microfauna vertebrate fossils in the Cretaceous and Miocene rocks that will be

excavated during the project. Those rock types within the I-580 alignment may contain proboscidian (elephant/mammoth), camel, sloth, bison (buffalo), and rodent terrestrial mammalian taxa from the Pleistocene units. Fossil localities are known within these formations, but are not from within the proposed Project boundaries. However, the fossils found in these formations elsewhere are significant enough to suggest the formations attain a High Potential rating to contain significant fossils where they are currently undisturbed within the proposed Project area.

The goal of this PMP is to evaluate work locations for the Project, and identify those which are located within known and/or potential paleontological resources associated with the bedrock geology within the Project alignment, and which could impact significant, non-renewable paleontological resources. Based on assessment of the potential paleontological resources at the locations planned for excavation work on the Project, the PMP proposes a mitigation plan for construction monitoring in areas within the Project that contain geologic sedimentary formations that have a high sensitivity rating. These sensitive formations are found within the proposed I-580 Project area:

- Cretaceous Great Valley Group (Ku, Kd, Kcu, Kcm, Kjk, Kjkc, Kcv),
- Miocene Monterey Formation (Tcc, Tt, To) and
- Miocene-Pliocene San Pablo Group (Tbr, Tc, Tn, Tol)(all three formation crop-out along the Dublin Pass and Altamont Pass areas).
- The Late Pliocene-Pleistocene (Qpaf) and the Pleistocene (Qt) deposits, the latter two in the eastern Dublin/Livermore areas and western-Tracy, Ca. areas.

These aforementioned units/formations have a High Potential to contain significant, non-renewable paleontological resources, and a monitoring program is recommended in this PMP as a mitigation to ensure CEQA compliance. Chapter 4 of this report describes the detailed Paleontological Monitoring Plan.

The Paleontological Study Area (PSA) for this PMP includes the entire Project area as the APE (Figure 2, Appendix A).

Table S-1. Locations of Potential Impacts to Paleontological Study Areas (PSA) Proposed for Paleontological Monitoring During Ground-Disturbing Project Activities.

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
ALA	580	26.44	EB	TMS	Monterey Formation (Tcs)	Yes
ALA	580	26.24	EB	CCTV	Holocene (Qu)	No
ALA	580	26.02	WB	TMS	Great Valley Group	Yes

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
					(Ku)	
ALA	580	25.45	WB	CCTV	Great Valley Group (Ku)	Yes
ALA	580	25.05	WB	TMS	Monterey Formation (Tcs)	Yes
ALA	580	24.75	EB	TMS	Monterey Formation (Tcs)	Yes
ALA	580	24.73	WB	CCTV	Monterey Formation (Tcs)	Yes
ALA	580	24.25	WB	TMS	Monterey Formation (Tro)	Yes
ALA	580	23.92	EB	CCTV	Monterey Formation (To?)	Yes
ALA	580	23.84	EB	TMS	Monterey Formation (Tcs)	Yes
ALA	580	23.45	WB	TMS	Monterey Formation (Tro)	Yes
ALA	580	23.09	EB	CCTV	Monterey Formation (Tro)	Yes
ALA	580	22.90	EB	TMS	Monterey Formation (Tro)	Yes
ALA	580	22.50	WB	TMS	Monterey Formation (Tro)	Yes
ALA	580	22.09	WB	CCTV	San Pablo Group (Tbg)	Yes
ALA	580	8.06	EB	TMS	Late Pliocene-Pleistocene (Qpaf)	Yes (Figure 4)
ALA	580	7.34	WB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	5.94	EB	TMS	Great Valley Group (Kd)	Yes
ALA	580	5.88	WB	TMS	Great Valley Group (Kd)	Yes
ALA	580	5.87	EB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	5.50	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	5.22	WB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	5.16	EB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	5.00	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	5.00	WB	TMS	Great Valley Group	Yes

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
					(Kcu)	
ALA	580	4.54	WB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	4.50	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	4.50	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	4.43	EB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	4.05	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	4.00	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.50	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.50	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.39	EB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	3.37	WB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	3.00	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.00	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	2.50	EB	TMS	Great Valley Group (Kd)	Yes
ALA	580	2.50	WB	TMS	Great Valley Group (Kd)	Yes
ALA	580	2.45	WB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	2.41	EB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	2.00	EB	TMS	Late Pliocene-Pleistocene (Qpaf)	Yes
ALA	580	2.00	WB	TMS	Great Valley Group (Kd)	Yes
ALA	580	1.81	EB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	1.77	EB	CMS	Great Valley Group (Kd)	Yes
ALA	580	1.52	EB	TMS	Great Valley Group (Kd)	Yes
ALA	580	1.40	WB	CCTV	San Pablo Group	Yes

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
					(Tn)	
ALA	580	1.25	WB	TMS	San Pablo Group (Tn)	Yes
ALA	580	0.96	EB	TMS	San Pablo Group (Tn)	Yes
ALA	580	0.96	WB	TMS	San Pablo Group (Tn)	Yes
ALA	580	0.76	WB	CCTV	Monterey Formation (Tol)	Yes
ALA	580	0.60	EB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.60	WB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.40	WB	CCTV	Monterey Formation (Tol)	Yes
ALA	580	0.28	EB	CCTV	Monterey Formation (Tol)	Yes
ALA	580	0.10	EB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.10	WB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.50	WB	Roadway sign (2)	Monterey Formation (Tol)	Yes
ALA	580	0.40	WB	Roadway sign (2)	Monterey Formation (Tol)	Yes
ALA	580	0.30	WB	Roadway sign	Monterey Formation (Tol)	Yes
ALA	580	0.20	WB	EMS (2)	Monterey Formation (Tol)	Yes
ALA	580	0.00	WB	EMS (Overhead)	Monterey Formation (Tol)	Yes
SJ	580	15.10	WB	Roadway sign (2)	Monterey Formation (Tol)	Yes
SJ	580	14.90	WB	Roadway sign	Pleistocene deposits (Qhaf)	Yes
SJ	580	14.30	WB	TMS	Monterey Formation (Tol)	Yes
SJ	580	14.30	WB	EMS	Monterey Formation (Tol)	Yes

As part of this PMP, monitoring and mitigation methods are recommended for implementation during construction, with recommendations for monitoring derived in part from the Society of Vertebrate Paleontology (SVP) standard guidelines (1995, 1996) and the Caltrans Standard

Environmental Reference (SER), Environmental Handbook, Volume 1, Chapter 8, Paleontology. These measures and methods for in this PMP have been widely used in California and have proven to be successful in protecting and preserving significant paleontological resources while allowing for the timely completion of construction work. This PMP was prepared in order to ensure compliance a meet the requirements of NEPA (42 United States Code [USC] 4321), CEQA (Chapter 1, Section 21002), the California Public Resources Code (Chapter 1.7, Section 5097.5), the Federal-Aid Highway Act of 1935 (20 USC 78), the Antiquities Act of 1906 (16 USC 431-433), and its amendment, Archeological and Paleontological Salvage (23 USC 305).

Given that paleontological resources are preserved within the geologic units addressed above and these units occur within the I-580 Project alignment, and based on fossil localities outside the I-580 Project area, and that construction-related excavations into these geologic formations can lead to destruction of the contained paleontological resources should they be present, it is critical to a successful PMP to understand the nature and location of proposed excavation activities. Figure 2 (Appendix A) provides location information for the proposed excavations and ground disturbing work, and Table S-1 provides a summary of the monitoring recommendations.

For the I-580 Project, construction-related excavations may include boring/auguring operations, excavations for road widening and realignment, trenching to some degree, and any other ground-disturbing activities within the APE. Geologic formations known to contain sensitive, non-renewable paleontological resources mapped within the area include, from west to east, the Cretaceous Great Valley Group, Miocene Monterey Formation, late Miocene to Pliocene San Pablo Group, Pliocene-Pleistocene Livermore Gravels and Pleistocene deposits. Cretaceous-aged Coast Range Ophiolite in the Castro Valley area along I-580 will not contain paleontological resources, and is buried beneath a voluminous thickness of artificial fill. Holocene deposits, which are also present at the surface in some portions of the Project area (west of Dublin), are too recently formed to contain fossilized remains.

Conclusion and Mitigation

With implementation of this PMP for the I-580 FPI Project, there will be minimal to no negative impacts by ground-disturbing activities to the potential paleontological resources within the currently undisturbed Cretaceous Great Valley Group, Miocene Monterey Formation, Late Miocene- Pliocene San Pablo Group, Plio-Pleistocene Livermore Gravels and Pleistocene deposits located along the I-580 corridor, which are regarded as having “High Potential” to contain significant fossils. Cretaceous-aged Coast Range Ophiolite in the Castro Valley area along I-580 will not contain paleontological resources and is also buried beneath a voluminous thickness of artificial fill. Holocene deposits, which are present at the surface in some portions of the Project area (west of Dublin) are too recently formed to contain fossilized remains.

List of Abbreviated Terms

Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CCTV	Closed Circuit Television
CMS	Changeable Message Sign
EIR	Environmental Impact Report
FPI	Free Performance Initiative
MVP	Maintenance Vehicle Pullout
NEPA	National Environmental Policy Act
NNL	National Natural Landmarks
NRNL	National Registry of Natural Landmarks
PER	Paleontological Evaluation Report
PIR	Paleontological Identification Report
PMP	Paleontological Mitigation Plan
project	Interstate 580 Freeway Performance Initiative Project
SER	Standard Environmental Reference
SR	State Route
TOS	Traffic Operations System
USC	United States Code

Table of Contents

Summary.....i

List of Abbreviated Terms.....vi

Table of Contents.....ix

Tables xi

Figures xi

Chapter 1 Introduction.....12

1.2 Project Description 14

1.2.1 Project Features 14

1.3 Construction-Related Impacts 19

1.3.1 Formations and Sediments That May Be Affected 20

1.3.2 Project-Related Work That May Affect Paleontological.....20

1.4 Mitigation 20

Chapter 2 Regulatory Setting.....23

2.1 Federal Antiquities Act 24

2.2 Archaeological and Paleontological Salvage Statute and 24

Federal-Aid Highway Act.....24

2.3 National Natural Landmarks Program 25

2.4 National Environmental Policy Act 26

2.5 California Codes.....26

Chapter 3 Description of the Resource, ...28

Impacts, and Mitigation 28

3.1 Paleontological Significance Criteria.....28

3.3 Types of Rock Units and Fossils under Study.....29

3.4 Regional Geology.....29

3.5 Study Area, Geology and the Resource 30

3.5.1 Local Geology and Description of the Resource 30

3.5.2 Significance of the Resource 27

3.5.3 Construction-Related Effects on Paleontological.....27

Chapter 4 Mitigation Plan.....28

4.1 Fieldwork.....28

4.2 Laboratory Efforts 31
4.3 Paleontological Mitigation Report 34
4.4 Monitoring 34
4.5. Macrofossils 38
4.6. Microfossils 39
4.7. Permits 39
References 40

Tables

Table 1. Locations of TOS Elements. 5
Table 2. MVP locations 8
Table 3. Depth of excavation for selected project elements..... 9
Table 4. California Department of Transportation Paleontological Sensitivity Terminology.....19
Table 5. Monitoring recommendations by locations 19

Appendices

Appendix A Map Figures
Appendix B Paleontological Training Signature Sheet
Appendix C Paleontological Daily Monitoring Report Form
Appendix D Example proposed Fossil Donation Letter to Qualified museum Repository
Appendix E Project Photographs

Chapter 1 Introduction

The California Department of Transportation (Caltrans) District 4 proposes ramp roadway rehabilitation and installation of ramp metering systems along Interstate 580 (I-580) and Interstate 205 (I-205) in Alameda and San Joaquin counties (Figure 1, Appendix A:). In addition, the proposed project will provide a high capacity communications backbone that will link the traffic operation system (TOS) field elements along I-580 in the East Bay with the District 4 Transportation Management Center (TMC) and allow District 4 TOS to interface with other agencies and systems in the future. In Alameda County, the project is located along I-580 between the San Joaquin County line (post mile [PM] 0.0) and Greenville Road (PM 8.3) and between Foothill Road (PM 21.7) and Strobridge Avenue (PM 30.4) and along I-205 from the San Joaquin County line (PM 0.0) to I-580 (PM 1.0). In San Joaquin County, the project is located along I-580 between Patterson Pass Road (PM 13.5) and the Alameda County line (PM 15.4).

Roadway rehabilitation will include resurfacing of pavement on-ramps. Ramp metering will be installed at twelve on-ramps/connector ramps. Installation of ramp metering will include electrical trenching. One on-ramp will be widened, utilizing slope regarding, to provide one high occupancy vehicle (HOV) preferential lane and one mixed-flow lane, one on-ramp will be widened utilizing sliver widening to provide one mixed-flow lane and one HOV preferential lane, and one connector ramp will be modified within the existing roadway to convert two mixed-flow lanes to one HOV preferential lane and one mixed-flow lane.

New TOS elements will be installed as part of this project to fill in gaps in existing TOS coverage on I-580 in Alameda County. These elements include 21 closed circuit television (CCTV) cameras, one changeable message sign (CMS), four extinguishable message signs (EMS), eight roadway signs, and 36 one-directional traffic monitoring stations (TMS). Installation of new TOS elements will include electrical trenching and construction of metal beam guard rail (MBGR) along areas with new TOS elements.

The project includes the area between Patterson Pass Road and the city of Livermore (referred to as the Altamont Pass segment) and the area between the cities of Pleasanton and Castro Valley (referred to as the Castro Valley segment). The Altamont Pass segment of the project includes the area within the westbound (WB) side of I-580 from Patterson Pass Road to the Alameda County line (San Joaquin County PM 13.5 to PM 15.4), the eastbound (EB) and WB sides of I-580 from the San Joaquin County line to Greenville Road (PM 0.0 to PM 8.3) in Livermore, including the I-580/I-205 WB connector ramps, the EB and WB on-ramps at Grant Line Road, and the EB and WB on-ramps at North Flynn Road. The Altamont Pass segment of the project also includes I-205 from the San Joaquin County line to the intersection with I-580 (PM 0.0 to PM 1.0).

The Castro Valley segment of the project includes the area within the EB and WB sides of I-580 from Foothill Road in Pleasanton to Eden Canyon Road (PM 21.7 to PM 26.6) in Castro Valley, including the EB and WB on-ramps at Eden Canyon Road. In addition, the Castro Valley segment of the project includes the EB on-ramps at Crow Canyon Road/Grove Way (northbound [NB] and southbound [SB]) (PM 28.2 to PM 28.6); the WB on-ramp at East Castro Valley Boulevard (PM 28.2 to PM 28.6), and the EB on-ramp at Strobridge Avenue (PM 29.8 to PM 30.4).

The total length of the project is 17.1 miles. Project-related impacts will generally be confined to within 60 feet of the edge of pavement.

The purpose of this PMP is to provide technical information to define the extent to which the proposed project may affect paleontological resources, and to provide specific recommendations for the implementation of the mitigation plan.

1.1 Goals of Study

This document is a Paleontological Mitigation Plan (PMP), and was prepared to evaluate the potential impacts of construction, and to describe the proposed monitoring program that will serve as mitigation at the locations with potential to impact paleontological resources. This PMP provides information on geologic formations within the Project, provides an evaluation of the sensitivity of those geologic formations with respect to the potential occurrence of fossils, and provides a mitigation plan outlining field monitoring procedures. The mitigation measures and methods outlined herein meet the requirements of the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA), and as outlined in the Caltrans Standard Environmental Reference (SER). Mitigation measures are identified to serve as a method to ensure that effects to paleontological resources would not be adverse under NEPA and would be less than significant under CEQA. These mitigation measures have been widely used in California and have proven to be successful in protecting and preserving significant paleontological resources while allowing for the timely completion of construction work.

This PMP conforms to the procedures and format as set forth in the Caltrans Environmental Handbook, Volume 1, Chapter 8, Paleontology. This report is needed to provide methods for paleontological resource recovery operations, scope of work, decision thresholds regarding paleontological fieldwork, scheduling, a cost-estimate, a curation agreement and permitting for the proposed project.

1.2 Project Description

1.2.1 Project Features

1.2.1.1 Ramp Widening and Metering

This project proposes a combination of ramp rehabilitation (e.g., replacement of existing surface pavement) and installation of ramp metering systems for twelve on-ramps/connector ramps along I-580 and I-205 (Appendix A: Figure 2). One on-ramp will be widened, utilizing slope regarding, to provide one HOV preferential lane and one mixed-flow lane, one on-ramp will be widened utilizing sliver widening to provide one HOV preferential lane and one mixed-flow lane, and one connector ramp will be modified within the existing roadway to convert two mixed-flow lanes to one HOV preferential lane and one mixed-flow lane.

Due to the similarity of ramp metering and traffic monitoring installations at each ramp location, impacts at each site will be similar. Installation of ramp metering equipment at on-ramps will require conduit trenching. Trenches will be located on the outside edge of, but still within, the shoulder. Trenches will be 1-foot wide and a minimum of 30-inches deep. Over bridges, electrical will utilize existing conduit or new conduit will be installed on the bridge, but no trenching will occur. Base and poles for metering equipment will be installed around the limit line within the ramp.

Ramp widening that utilizes slope regarding will be implemented at Grant Line Road. Ramp widening utilizing sliver widening will be installed at East Castro Valley Boulevard.

All design installation features proposed in this project are standardized as per Caltrans Highway Design Manual and the 2000 Ramp Meter Design Guidelines (RMDG).

The proposed design features and approximate post miles for all of the on-ramps/connector ramps are listed below:

I-580/I-205 Connector Ramp (New) (PM 0.6)

I-580 WB New Connector On-ramp: Project proposes to install new ramp metering equipment.

I-580/I-205 Connector Ramp (Old) (PM 1.0)

I-580 WB Old Connector On-ramp: Project proposes to install new ramp metering equipment. In addition, the two existing mixed-flow lanes will be converted to one HOV preferential lane and one mixed-flow lane.

Grant Line Road (PM 1.4)

Grant Line Road EB On-Ramp: Project proposes to install new ramp metering equipment.

Grant Line Road WB On-ramp: Project proposes to install new ramp metering equipment. In addition, the on-ramp will be widened by utilizing slope regrading to provide one HOV preferential lane and one mixed-flow lane. Widening will require slope regrading on the right side of the ramp that will be 430 feet in length and a maximum of 88 feet in width.

North Flynn Road (EB PM 5.8) (WB PM 6.1)

North Flynn Road EB On-ramp: Project proposes to install new ramp metering equipment.

North Flynn Road WB On-ramp: Project proposes to install new ramp metering equipment.

Eden Canyon Road (PM 26.27)

Eden Canyon Road EB On-ramp: Project proposes to install new ramp metering equipment. In addition, the project will grind and overlay the existing one-lane on-ramp.

Eden Canyon Road WB On-ramp: Project proposes to install new ramp metering equipment. In addition, the project will grind and overlay the existing one-lane on-ramp.

Crow Canyon Road/Grove Way (NB PM 28.27) (SB PM 28.55)

NB Crow Canyon Road/Grove Way EB On-ramp: Project proposes to install new ramp metering equipment. In addition, the project will grind and overlay the existing one-lane on-ramp.

SB Crow Canyon Road/Grove Way EB On-ramp: Project proposes to install new ramp metering equipment. In addition, the project will grind and overlay the existing one-lane on-ramp.

East Castro Valley Boulevard (PM 28.27)

East Castro Valley Boulevard WB On-ramp: Project proposes to install new ramp metering equipment. In addition, the project will grind and overlay the existing two-lane on-ramp and the on-ramp will be widened using a sliver widening to provide one HOV preferential lane and one mixed-flow lane. Sliver widening will be constructed on the right side of the ramp and will be approximately 8 feet in width and 300 feet in length.

Strobridge Avenue (PM 30.16)

Strobridge Avenue EB On-ramp: Project proposes to install new ramp metering equipment. In addition, the project will grind and overlay the existing one-lane on-ramp.

1.2.1.2 TOS Elements

New TOS elements will be installed as part of this project to fill in gaps in existing TOS coverage on I-580 in Alameda and San Joaquin counties (Figure 2, Appendix A). These elements include 21 CCTV cameras, one CMS, four EMS, eight roadway signs, and 36 one-directional TMS. The proposed design features and approximate post miles for all of the TOS elements are listed in Table 1 below:

Table 1. Locations of TOS Elements and the geologic surface formations.

County	Route	Approximate PM	Direction	Type of TOS Element	Geologic Formation
ALA	580	26.44	EB	TMS	Monterey Formation (Tcs)
ALA	580	26.24	EB	CCTV	Holocene (Qu)
ALA	580	26.02	WB	TMS	Great Valley Group (Ku)
ALA	580	25.45	WB	CCTV	Great Valley Group (Ku)
ALA	580	25.05	WB	TMS	Monterey Formation (Tcs)
ALA	580	24.75	EB	TMS	Monterey Formation (Tcs)
ALA	580	24.73	WB	CCTV	Monterey Formation (Tcs)
ALA	580	24.25	WB	TMS	Monterey Formation (Tro)
ALA	580	23.92	EB	CCTV	Monterey Formation (To?)
ALA	580	23.84	EB	TMS	Monterey Formation (Tcs)
ALA	580	23.45	WB	TMS	Monterey Formation (Tro)
ALA	580	23.09	EB	CCTV	Monterey Formation (Tro)
ALA	580	22.90	EB	TMS	Monterey Formation (Tro)
ALA	580	22.50	WB	TMS	Monterey Formation (Tro)
ALA	580	22.09	WB	CCTV	San Pablo Group (Tbg)
ALA	580	8.06	EB	TMS	Late Pliocene-Pleistocene (Qpaf)
ALA	580	7.34	WB	CCTV	Great Valley Group (Kd)
ALA	580	5.94	EB	TMS	Great Valley Group (Kd)
ALA	580	5.88	WB	TMS	Great Valley Group (Kd)
ALA	580	5.87	EB	CCTV	Great Valley Group (Kd)
ALA	580	5.50	WB	TMS	Great Valley Group (Kcu)
ALA	580	5.22	WB	CCTV	Great Valley Group (Kcu)
ALA	580	5.16	EB	CCTV	Great Valley Group (Kcu)
ALA	580	5.00	EB	TMS	Great Valley Group (Kcu)
ALA	580	5.00	WB	TMS	Great Valley Group (Kcu)
ALA	580	4.54	WB	CCTV	Great Valley Group (Kcu)
ALA	580	4.50	EB	TMS	Great Valley Group (Kcu)
ALA	580	4.50	WB	TMS	Great Valley Group (Kcu)
ALA	580	4.43	EB	CCTV	Great Valley Group (Kcu)
ALA	580	4.05	EB	TMS	Great Valley Group (Kcu)
ALA	580	4.00	WB	TMS	Great Valley Group (Kcu)
ALA	580	3.50	EB	TMS	Great Valley Group (Kcu)
ALA	580	3.50	WB	TMS	Great Valley Group (Kcu)
ALA	580	3.39	EB	CCTV	Great Valley Group (Kcu)
ALA	580	3.37	WB	CCTV	Great Valley Group (Kcu)

ALA	580	3.00	EB	TMS	Great Valley Group (Kcu)
ALA	580	3.00	WB	TMS	Great Valley Group (Kcu)
ALA	580	2.50	EB	TMS	Great Valley Group (Kd)
ALA	580	2.50	WB	TMS	Great Valley Group (Kd)
ALA	580	2.45	WB	CCTV	Great Valley Group (Kd)
ALA	580	2.41	EB	CCTV	Great Valley Group (Kd)
ALA	580	2.00	EB	TMS	Late Pliocene-Pleistocene (Qpaf)
ALA	580	2.00	WB	TMS	Great Valley Group (Kd)
ALA	580	1.81	EB	CCTV	Great Valley Group (Kd)
ALA	580	1.77	EB	CMS	Great Valley Group (Kd)
ALA	580	1.52	EB	TMS	Great Valley Group (Kd)
ALA	580	1.40	WB	CCTV	San Pablo Group (Tn)
ALA	580	1.25	WB	TMS	San Pablo Group (Tn)
ALA	580	0.96	EB	TMS	San Pablo Group (Tn)
ALA	580	0.96	WB	TMS	San Pablo Group (Tn)
ALA	580	0.76	WB	CCTV	Monterey Formation (Tol)
ALA	580	0.60	EB	TMS	Monterey Formation (Tol)
ALA	580	0.60	WB	TMS	Monterey Formation (Tol)
ALA	580	0.40	WB	CCTV	Monterey Formation (Tol)
ALA	580	0.28	EB	CCTV	Monterey Formation (Tol)
ALA	580	0.10	EB	TMS	Monterey Formation (Tol)
ALA	580	0.10	WB	TMS	Monterey Formation (Tol)
ALA	580	0.50	WB	Roadway sign (2)	Monterey Formation (Tol)
ALA	580	0.40	WB	Roadway sign (2)	Monterey Formation (Tol)
ALA	580	0.30	WB	Roadway sign	Monterey Formation (Tol)
ALA	580	0.20	WB	EMS (2)	Monterey Formation (Tol)
ALA	580	0.00	WB	EMS (Overhead)	Monterey Formation (Tol)
SJ	580	15.10	WB	Roadway sign (2)	Monterey Formation (Tol)
SJ	580	14.90	WB	Roadway sign	Pleistocene deposits (Qhaf)
SJ	580	14.30	WB	TMS	Monterey Formation (Tol)
SJ	580	14.30	WB	EMS	Monterey Formation (Tol)

Local power will be provided by Pacific Gas & Electric Company (PG&E). Telephone services will be provided by leased telephone lines. General Packet Radio Services (GPRS) wireless modems will provide communications links between the proposed TMS and the TMC.

Conduit, cabinets, and the other elements comprise the general TOS installation. The conduit relays power, communication, and control wiring between the element, cabinets, and service points.

CCTV, CMS, and overhead EMS will be placed on poles, which will be anchored in a cast-in-drill-hole (CIDH) pile foundation having a diameter of 2 feet, 4 feet, and 3 feet respectively. The depth of a CIDH is dependent on soil conditions and is determined during project design. Loops for TMS are installed in the pavement at a maximum depth of 6 inches. The maximum length and width of the TMS controller cabinet foundation are 6 feet and 4 feet, respectively. EMS and roadway signs will be placed on poles having a diameter of 3 feet and 6 inches, respectively.

CCTV and CMS impacts are incorporated into impacts for maintenance vehicle pullouts (MVP). Impacts for overhead EMS, EMS, roadway signs, and cabinets for TMS are incorporated into impacts for electrical trenching. TMS have no permanent or temporary impact area.

Overhead EMS and cabinets for TMS will be sited off the shoulder within Caltrans's right-of- way (ROW). These will be installed within the clear recovery zone (CRZ), which is within 30 feet from the edge of the traveled way, and will therefore require protection with metal beam guard rail (MBGR). MBGR permanent impact area consists of the area between the guard rail and the roadway and varies from 2 feet to 25 feet in width; temporary impact area is an additional 5-foot buffer.

Electrical conduits will be enclosed in 1-foot wide trenches with a minimum depth of 30 inches. Trenches will be located on the outside edge of, but still within, the shoulder. Electrical trenching permanent impact area is 1 foot in width; temporary impact area is an additional 6-foot buffer.

Twenty maintenance vehicle pullouts (MVP), measuring approximately 85 feet in length and 12 feet in width, will be constructed along both the EB and WB lanes, primarily at locations where TOS elements will be installed. MVP permanent impact area is 85 feet in length by 12 feet in width; temporary impact area is an additional 15-foot buffer.

The approximate post miles for the MVPs are listed in Table 2 below:

Table 2. MVP locations

County	Route	Approximate PM	Direction
ALA	580	30.16	Strobridge Avenue EB on-ramp
ALA	580	28.55	SB Crow Canyon Road/Grove Way EB on-ramp
ALA	580	28.27	NB Crow Canyon Road/Grove Way EB on-ramp
ALA	580	26.27	Eden Canyon Road WB on-ramp
ALA	580	26.27	Eden Canyon Road EB on-ramp
ALA	580	26.24	EB

ALA	580	25.45	WB
ALA	580	24.73	WB
ALA	580	23.92	EB
ALA	580	23.09	EB
ALA	580	22.09	EB
ALA	580	7.34	WB
ALA	580	6.10	North Flynn Road WB on-ramp
ALA	580	5.87	EB
ALA	580	5.22	WB
ALA	580	4.54	WB
ALA	580	3.39	EB
ALA	580	3.37	WB
ALA	580	2.45	WB
ALA	580	2.41	EB
ALA	580	1.81	EB
ALA	580	1.77	EB
ALA	580	1.40	WB
ALA	580	1.40	Grant Line Road WB on-ramp
ALA	580	0.76	WB
ALA	580	0.40	WB
ALA	580	0.28	EB
ALA	580	0.00	WB

1.3 Construction-Related Impacts

The proposed project includes ground disturbing activities and excavation of soil between 1 and 25 feet in depth.

Table 3. Depth of excavation for selected project elements.

Project Element	Estimated Depth of Excavation (ft)
CMS	25
CCTV	10
EMS	5
MVP	1
TMS cabinet	1

Paleontological resources are presumed to occur at a minimum of 5 feet below the existing ground surface. During field observations conducted for this Project, the depth to native rock or surficial geologic deposit was determined to be approximately 5-feet below existing grade along a majority of the alignment, with exception for the Castro Valley area along I-580 which is situated atop a tremendous amount of artificial fill. Excavation for structures of the TOS (including CMS, CCTV, underground utilities) would result excavations below this limit. The formations and sediments that may be affected by excavation and other construction-related activities and how those activities could affect paleontological resources are discussed below.

1.3.1 Formations and Sediments That May Be Affected

The project area is underlain by highly sensitive formations at many locations along the alignment. These formations are the Cretaceous Great Valley Group (Ku, Kd, Kcu, Kcm, Kjk, Kjkc, Kcv), Miocene Monterey Formation (Tcc, Tt, To) and Miocene-Pliocene San Pablo Group (Tbr, Tc, Tn, Tol) (all three formation crop-out along the Dublin Pass and Altamont Pass areas). The Late Pliocene-Pleistocene (Qpaf) and the Pleistocene (Qt) deposits, the latter two in the eastern Dublin/Livermore areas and western-Tracy, Ca. areas.

1.3.2 Project-Related Work That May Affect Paleontological Resources

The primary mechanism for impacts on paleontological resources would be ground disturbance during construction. There is a potential for impact on the entire project alignment, where the highly sensitive formations have previously been mapped at the surface or near surface. Construction of the proposed project would require disturbance of large areas of soil and excavation to depths greater than 5 feet, depending on the element of the project being constructed (e.g., foundation, trenching). Project-related earthwork and excavation will encroach into the known fossiliferous formations listed above.

The formations and deposits along the I-580 Corridor proposed alignment have a high potential to contain important paleontological vertebrate fossil resources. If such resources are present at the project site, construction activities could cause adverse impacts under NEPA and significant impacts under CEQA, such as destruction and loss of possible scientifically significant paleontological vertebrate fossil resources.

1.4 Mitigation

Documented fossil content from the Cretaceous Great Valley Group, Miocene Monterey Formation, Miocene-Pliocene San Pablo Group, Late Pliocene-Pleistocene Livermore Gravels and the Pleistocene deposits in the area of the proposed project would indicate that these units should be considered highly sensitive for paleontological resources and are therefore classified herein, following Caltrans standards, as "High Potential" rock units which, based on previous studies, contain or are likely to contain significant vertebrate, significant invertebrate, or significant plant fossils.

Mitigation is required in order to reduce potential effects to paleontological resources to a level that would not be adverse under NEPA and would be less than significant under CEQA. Monitoring is recommended within this PMP as a mitigation to ensure that adverse effects under NEPA and significant impacts under CEQA would not occur. Appendix A, Figure 3 outlines the

general areas where monitoring is an appropriate mitigation, and those areas where no impact is expected due to a lack of potential paleontological resources within the excavation depths expected during the Project.

Chapter 2 Regulatory Setting

Paleontology is the study of life in past geologic time based on fossil plants and animals. Fossils furnish information about the kinds of plants and animals that existed, when they appeared and vanished, where and how they lived, and the type of environments they preferred. Fossils help us to learn how species evolved, how some descended from others, and how groups of organisms are related (California Geological Survey 2002).

Caltrans protects and enhances the environment and quality of life in accordance with the environmental, economic, and social goals of California (Caltrans 1992). Caltrans evaluates the environmental benefits and consequences of its activities and implements practices that minimize environmental impacts. As part of the project development and delivery process, Caltrans is obligated to conduct paleontological studies in response to federal, state, and local laws, regulations, and ordinances (Caltrans 2007).

Construction of this project will be funded in part with State and Federal funds. The Federal Aid Highway Act of 1956 (PL 84-627) and 1958 (PL 85-767) specifically extends the Antiquities Act of 1906 (PL 59-209) to apply to paleontological resources on highway projects funded by the Highway Act and authorizes the use of Highway Act funds for paleontological salvage to the extent approved as necessary by Caltrans (Pub. L. 85-767, Aug. 27, 1958, 72 Stat. 913; Pub. L. 86-657, Sec. 8(e), July 14, 1960, 74 Stat. 525. See also 23U.S. Code 305).

The Antiquities Act requires that any investigations be carried out by properly qualified institutions and experts. Typical federal requirements for paleontological resource management for compliance with the Antiquities Act are outlined in the Bureau of Land Management Manual Section 8270 (Bureau of Land Management 1998).

Under California law, paleontological resources are protected by CEQA, the California Administrative Code, Title 14, Section 4306 et seq., and Public Resources Code Section 5097.5. CEQA requires that public agencies not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available that would substantially lessen the significant environmental effects of such projects (Chapter 1, Section 21002). California Public Resources Code 5097 protects vertebrate paleontological sites, including fossilized footprints or any other paleontological features situated on public lands. Typical California requirements for paleontological studies and mitigation are outlined in Title 20, California Code of Regulations, Section 2012 et seq., and Caltrans' Standard Environmental Reference, Volume 1, Chapter 8 – Paleontology (Caltrans 2012).

Alameda and San Joaquin counties has policies to protect paleontological resources by requiring that discretionary development projects identify and protect from damage, destruction, and abuse, important paleontological sites. In addition, discretionary development projects must be designed to avoid potential impacts to significant paleontological or cultural resources whenever possible. Unavoidable impacts, whenever possible, must be reduced to a less than significant level and/or mitigated by extracting maximum recoverable data. Determinations of impacts, significance, and mitigation must be made by a qualified paleontologist.

The following federal and state regulations protect paleontological resources, which are understood to include fossilized remains of vertebrates, invertebrates, and plants, as well as fossil tracks and trackways.

2.1 Federal Antiquities Act

The Federal Antiquities Act of 1906 (16 United States Code [USC] 431–433) was enacted with the primary goal of protecting cultural resources in the United States. As such, it prohibits appropriation, excavation, injury, or destruction of "any historic or prehistoric ruin or monument, or any object of antiquity" located on lands owned or controlled by the federal government, without permission of the secretary of the federal department with jurisdiction. It also establishes criminal penalties, including fines or imprisonment, for these acts, and sets forth a permit requirement for collection of antiquities on federally owned lands.

Neither the Antiquities Act itself nor its implementing regulations (43 CFR 3) specifically mentions paleontological resources. However, several federal agencies—including the National Park Service, U.S. Bureau of Land Management, and U.S. Forest Service—have interpreted objects of antiquity as including fossils. Consequently, the Antiquities Act represents an early cornerstone for efforts to protect the nation's paleontological resources.

2.2 Archaeological and Paleontological Salvage Statute and Federal-Aid Highway Act

The Archaeological and Paleontological Salvage Statute (23 USC 305) amended the Antiquities Act of 1906 via the following text.

> Funds authorized to be appropriated to carry out this title to the extent approved as necessary, by the highway department of any State, may be used for archaeological and paleontological salvage in that state in compliance with the Act entitled "An Act for the preservation of American Antiquities," approved June 8, 1906 (PL 59-209; 16 USC 431-433), and State laws where applicable.

The Federal-Aid Highway Act of 1935 (20 USC 78) gives specific authority to use federal funds

for salvage of paleontological sites impacted by highway projects.

Together, the Archaeological and Paleontological Salvage Statute and Federal-Aid Highway Act permit paleontological resources salvage to be carried out under federal highway project funding, as long as the excavated materials and any information recovered from them are used for public purposes and not for private gain.

2.3 National Natural Landmarks Program

The National Natural Landmarks (NNL) Program was established in 1962 under authority of the Historic Sites Act of 1935, with the following goals.

- Encourage the preservation of sites that illustrate the nation's geological and ecological character.
- Enhance the scientific and educational value of the sites preserved.
- Strengthen public appreciation of natural history and foster increased concern for the conservation of the nation's natural heritage.

Under the NNL Program, sites that represent the nation's "best" examples of various types of biological communities or geologic features (meaning that they are in good condition and effectively illustrate the specific character of a certain type of resource) are listed on the National Registry of Natural Landmarks (NRNL). At present, the NRNL includes 587 sites, ranging in size from 7 acres to almost 1 million acres. Examples of sites designated as NNLs for their paleontological value include Sharktooth Hill in Kern County, Rancho La Brea in Los Angeles, and Rainbow Basin north of Barstow in San Bernardino County.

The NNL Program is administered by the National Park Service. However, most sites listed on the NRNL are not transferred to federal ownership, and most do not become units in the National Park System; most continue to be managed by their current owners following listing. At present, about 50% of the nation's NNLs are managed by public agencies, about 30% are privately owned and managed, and about 20% are managed through collaboration between agencies and private entities.

The National Park Service is responsible for maintaining relationships with NNL landowners and monitoring the condition of all NNLs. Based on its monitoring, the National Park Service prepares an annual report for transmission via the Secretary of the Interior to Congress, identifying NNLs at risk of damage or degradation.

2.4 National Environmental Policy Act

NEPA does not provide specific guidance regarding paleontological resources, but the NEPA requirement that federal agencies take all practicable measures to "preserve important historic cultural, and natural aspects of our national heritage" (NEPA Sec. 101[b][4]) is interpreted as applying to paleontological materials. Under NEPA, paleontological resources are typically treated in a manner similar to that used for cultural resources.

2.5 California Codes

Several sections of the California Public Resources Code protect paleontological resources. Section 5097.5 prohibits "knowing and willful" excavation, removal, destruction, injury, and defacement of any paleontologic feature on public lands (lands under state, county, city, district, or public authority jurisdiction, or the jurisdiction of a public corporation), except where the agency with jurisdiction has granted express permission. Section 30244 requires reasonable mitigation for impacts on paleontological resources that occur as a result of development on public lands.

The sections of the California Administrative Code relating to the State Division of Beaches and Parks afford protection to geologic features and "paleontological materials" but grant the director of the state park system authority to issue permits for specific activities that may result in damage to such resources, if the activities are in the interest of the state park system and for state park purposes (Title 14 California Administrative Code Sections 4307–4309).

CEQA includes in its definition of historical resources "any object [or] site … that has yielded or may be likely to yield information important in prehistory" (CEQA Guidelines Sec. 15064.5[3]), which is typically interpreted as including fossil materials and other paleontological resources. More specifically, destruction of a "unique paleontological resource or site or unique geologic feature" could be a significant impact under CEQA (CEQA Guidelines Appendix G [CEQA Checklist]). Treatment of paleontological resources under CEQA is generally similar to treatment of cultural resources, requiring evaluation of resources in a project's area of potential affect, assessment of potential impacts on significant or unique resources, and development of mitigation measures for potentially significant impacts, which may include monitoring.

Chapter 3 Description of the Resource, Impacts, and Mitigation

3.1 Paleontological Significance Criteria

For this PMP, the SVP & Caltrans Standard Environmental Reference (SER) paleontology guidelines are used herein to classify the significance of the geologic units present within the proposed project alignment. Descriptions of the guidelines are described below.

The basis for assessments of paleontological sensitivity (i.e., potential to contain scientifically important paleontological resources) followed standard Caltrans criteria (Caltrans 2012). Caltrans criteria use three categories to describe the likelihood that a geologic unit contains significant fossil materials—high potential, low potential, and no potential, defined as shown in Table 4.

Table 4. California Department of Transportation Paleontological Sensitivity Terminology.

Caltrans Sensitivity Designation	Characteristics of Geologic Units in This Category
High Potential (High Sensitivity) **Great Valley Group** **Monterey Formation** **San Pablo Group (**Briones and Neroly Formation**)** **Livermore Gravels & Unnamed Pleistocene Deposits**	This category consists of rock units known to contain important vertebrate, invertebrate, or plant fossils anywhere within their geographic extent, including sedimentary rock units that are suitable for the preservation of fossils, as well as some volcanic and low-grade metamorphic rock units. This category includes rock units with the potential to contain • abundant vertebrate fossils a few significant fossils (large or small vertebrate, invertebrate, or plant fossils) that may provide new and significant taxonomic, phylogenetic, ecologic, and/or stratigraphic data • areas that may contain datable organic remains older than Recent, including Neotoma (sp.) middens areas that may contain unique new vertebrate deposits, traces, and/or trackways Fossiliferous deposits with very limited geographic extent or an uncommon origin (e.g., tar pits and caves) are given special consideration and ranked as highly sensitive.

Low Potential (Low Sensitivity)	This category includes sedimentary rock units that are potentially fossiliferous, but have not yielded significant fossils in the past; have not yet yielded fossils, but have the potential to contain fossil remains; or contain common and/or widespread invertebrate fossils of species whose taxonomy, phylogeny, and ecology are well understood. *Note that sedimentary rocks expected to contain vertebrate fossils are considered highly sensitive, because vertebrates are generally rare and found in more localized strata.*
No Potential (No Sensitivity) **Holocene Deposits and Coast Range Ophiolite**	This category includes rock units and deposits either too young to contain fossils or are of intrusive igneous origin, most extrusive igneous rocks, and moderate- to high-grade metamorphic rocks.
Source: Caltrans 2012.	

3.3 Types of Rock Units and Fossils under Study

The PMP study area for paleontological resources is the area within the right-of-way and construction disturbance limits for the proposed Project (Project Overview Figure). The geologic formations in the limits of the proposed I-580 project are: Great Valley Group, Monterey Group, San Pablo Group and Livermore Gravels/Pleistocene deposits. These formations will be affected by any project-related excavation and are known to contain significant paleontological resources, which could be encountered during excavations for this project. Significant fossils recovered from these formations are described below.

3.4 Regional Geology

The Project is located in two geomorphic provinces, the California Coast Ranges physiographic province and the Great Valley physiographic province. The Great Valley physiographic province separates the Coast Ranges to the west from the Sierra Nevada in the east. This province is comprised of two elongated northwest- to southeast-trending basins: the Sacramento basin to the northwest and the San Joaquin basin to the southeast. This province is approximately 435 miles (700 kilometers) long and 44 to 56 miles (70 to 90 km) wide, and characterized by a thick, relatively undeformed sequence of alluvium and volcanic deposits. The present-day basin evolved from a late Jurassic to middle Tertiary (40– 150 million years [Ma]) marine fore-arc basin (Dickinson, 1981; Castillo and Zoback, 1994).

In the late Tertiary (25–30 Ma), a change in the relative motion between the Pacific and North American plates resulted in the gradual uplift of the Coast Ranges and the eventual isolation of the basin from the ocean. More recent Miocene and lower Pliocene sediments were derived from the neighboring Coast Ranges and the Sierra Nevada (Perkins, 1987). By the late Pliocene (2–3

Ma), subaerial depositional conditions prevailed and Sierra Nevada–derived sediments were deposited in the basins (Bartow, 1987).

The Coast Ranges are a north-northwest- to northwest-trending series of mountains and intervening valleys extending for 597 miles (960 km) from the Oregon border, south to the Santa Ynez River near Santa Barbara. Physiographically, the Coast Ranges can be divided into two subprovinces, the northern and southern subprovinces, separated by the San Francisco Bay and the Sacramento River Delta. The Coast Ranges are underlain by uplifted and intensely deformed Upper Jurassic (150 Ma) and younger rocks an ophiolite complex and the Salinian metamorphic and granitic complex.

3.5 Study Area, Geology and the Resource

3.5.1 Local Geology and Description of the Resource

There are numerous fossil localities within the close proximity to the Project boundaries. The Great Valley Group, members of the San Pablo Group (Briones and Neroly Fms.), Livermore Gravels and the Pleistocene deposits of the Livermore Valley and westernmost Tracy, Ca area have been known to contain significant paleontological resources and therefore are prone to having a High Potential to contain additional significant paleontological resources should they be disturbed and impacted as such may occur with work associated with the Project. This section describes the geology and the paleontological resources in each formation or unit, from oldest to youngest and largely from West to East across the I-580 alignment.

Coast Range Ophiolite

The Jurassic Coast Range Ophiolite rocks associated with the base of the Great Valley Group have been mapped along and near the westernmost portion of the site in the Castro Valley area (Wagner et al., 1991). Mapped Coast Range Ophiolite (Jb, Jgb, Sp) rocks are depicted in the geologic map figures and consist of the several lithologies. According to Graymer et al. (1999) and Wagner et al. (1991), these rocks are composed of metamorphic and volcanic rocks of Jurassic-Cretaceous age and are: Orange-weathering, white, altered silicic (quartz keratophyre) and intermediate (keratophyre) volcanic rocks locally containing red jasper, rhyolite, and rhyolite tuff also occur along the easternmost portions of the project site. Black basalt and pillow basalt, locally amygduloidal; Gabbro locally containing plagioclase-porphyry diabase, pyroxenite, and serpentinite; and serpentine locally containing pyroxenite and silica-carbonate rock. These igneous rocks, devoid sedimentary chert interbeds in the Castro Valley portion of the I-580 alignment area, do not contain fossils due to the nature of their origin.

Great Valley Group

The Early and Late Cretaceous Great Valley Group include sedimentary units ranging from shale

to conglomerate lithologies, which are mapped units of the Great Valley Group (Ku, Kd, Kcu, Kcm, Kjk, Kjkc, Kcv). Graymer et al. (1999) described as interbedded carbonaceous- biotite wacke, white-mica-carbonaceous sandstone, greenish-gray mudstone and shale, laminated fine-grained sandstone and gray shale, carbonaceous siltstone, black shale, and fine-grained mica-wacke. Kirby (1943) and Brown and Rich (1961) describe the Great Valley as a complex series of massive sandstones and turbidite deposits. According to Graymer et al. (1999), this unit contains fossil foraminifers of both Albian and Campanian age in the mapped area on the eastern side of Castro Valley to western Dublin and again throughout the Altamont Hills. According to Graymer et al. (1999), the Great Valley Group which contains the important Late Jurassic to Early Cretaceous mollusk fossils "Buchia, including both Buchia piochii and Buchia pacifica." According to Graymer at al. (1999), the Late Jurassic-early Cretaceous Knoxville Formation is composed of gray shale with concretions. Dibblee (in Graymer et al., 1999) reports Buchia fossils from the Great Valley Sequence in this area of the Coast Ranges. The formation contains important Late Jurassic to Early Cretaceous invertebrate fossils Buchia - Aucella aff. *volgensis* (Anderson, 1945 and Graymer et al., 1999). Brown and Rich (1960) report that Early Cretaceous marine invertebrate fossils were found in submarine slumps or turbidite deposits of Late Cretaceous age. Hertlein (1951) reports on Cretaceous marine invertebrate fossil localities The Great Valley Group in the general site area contains fossil foraminifers of both Albian and Campanian age (Graymer et al., 1999). The Great Valley Group also yields significant fossils of phytoplankton (dinoflagellates and diatoms), zooplankton (radiolarians), corals, bivalve mollusks (Buchia and Inoceramus), and cephalopod mollusks (ammonites), and reptiles from (Hilton (2003). Camp (1942) has described a significant fossil marine reptile (ichthyosaur) partial skull discovered in the Diablo Range that may have been from the Great Valley.

The Monterey Formation

The Monterey Formation (Tcc, Tt, To) is a widespread unit deposited in a marine environment during the Middle to Late Miocene (5 to 17 Ma). It crops out in the Project area along the I-580 corridor between Castro Valley and Dublin, CA. The shale, sandstone, and mudstone deposits of the Monterey Formation are highly siliceous, a result of organic deposition (microorganisms such as diatoms) and inorganic deposition (volcanic ash). Virtually all types of marine fossils occur in the Monterey Formation (Crittenden, 1951; Creely et al., 1982; Wagner, 1978; Hill, 1978 & 1979, Ingle, 1980). Due to the extensive collection of marine vertebrates found in the Monterey Formation, this unit is assigned a high paleontological resource sensitivity level.

Delphinidae (Miocene – Hemingfordian Stage – 20.69 to 16.3 Million years ago): Dolphin
SOURCE: Carroll, Robert, 1988 , Vertebrate Paleontology and Evolution, W.H. Freeman and Company, New York.
Lambert et al., 2005, A new kentriodontine dolphin from the middle Miocene of Portugal, Acta Palaeontol. Pol. 50 (2): 239-248.

From other parts of California, *Desmostylus hesperus* (Vanderhoof, 1937) from Santa Barbara County, the whale *Kampholophos serrulus* (Rensberger, 1969) from Alameda County, invertebrates such as *Distorsio personidae* (Puffer, 1953) and *Anadara montereyana* (Oberling, 1964) both from Contra Costa County and a plethora of microfossils such as *Pseudoparrella relizensis* (Lipps, 1965).

San Pablo Group

The San Pablo Group (Tbr, Tc, Tn, Tol) consists of three formations: Briones, Cierbo and Nerloy. The Briones and Neroly formations occur in the project area between Castro Valley and Dublin and again on the foothills on either side of Altamost Pass. The Briones Formation (middle and late Miocene ~ 15 to 10 Million years old; Graymer et al., 1996) consists of sandstone, siltstone, conglomerate and fossil shell breccia bedrock. The Briones Formation contains a tuffaceous layer with a K/Ar age of 14.5+0.4 Ma (Lindquist and Morganthaler, 1991). Vertebrate paleontological ages coupled with the volcanic age date suggest an age range of 10 to 15 million years ago for the timing of deposition of the Briones Formation. The Cierbo and Neroly overlie the Briones in that order and young to Pliocene in age. All three formations contain significant marine to non-marine paleontological resources (content from data from these formations in the immediate region (Conduit, 1938; Graymer et al., 1996; Savage, 1951; Hall, 1958; Trask, 1922). Some noteworthy, rare marine and non-marine fossils from the San Pablo Group are:

Paleomerycidae (Miocene- Barstovian Stage – 16.3 to 13.6 Million years ago): extinct form of deer and was horned, long-legged, heavy, and massive.

Source: Scott, W.B., 1913, A history of land mammal in the Western Hemisphere, the Macmillian Company, New York, 693 p.

Desmostylus fossil similar what was collected in the Briones Formation in the Mission Peak area (Left). Artist rendition of *Desmostylus* during the Miocene.

Typical near-shore, marine, fossil shell-rich sandstone of the Briones Formation.

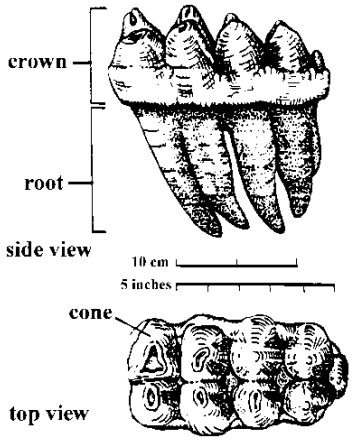
Pleistocene Deposits & Livermore Gravels

The Pleistocene deposits (Qhaf) located in the vicinity of Livermore and Tracy, Ca., including the Livermore Gravels (Qt), contain fresh water mollusks and extinct late Pleistocene vertebrate fossils. Significant paleontological resources from this unit include Ice Age fossils such as plants (pines, sycamore, willow, oak, cattail), invertebrates (fresh water mussel, clam, snail), and vertebrates (sunfish, sucker, minnow, stickleback, salamander, bull frog, mallard, turkey, peeper frog, toad, turtle, lizard, snake, goose, owls, shrew, mole, woodrat, ground squirrel, gopher, cottontail, sabercat, jaguar, wolf, coyote, fox, bear, badger; camel, antelope, deer, ox, peccary, mammoth, mastodon, giant ground sloth and horse (Savage, 1951)). This surficial deposit overlies the fossil-rich Briones Formation (Trask, 1922; Conduit, 1938; Hall, 1958).

According to Barlock (1989), the Livermore Gravels are Pliocene to early Pleistocene in age and are composed of fluvial and lacustrive deposits subdivided into two members, the Lower Livermore and the Upper Livermore. The Lower Livermore is composed predominantly of clasts of Cenozoic sandstone, graywacke, and fine-grained vein quartz. Thick, planar cross-bedded sandstone and laterally extensive lenses of siltstone and mud stone surround horizontally bedded gravel. The Lower Livermore represents deposition by sandy braided streams. The Upper Livermore is composed predominantly of clasts of Franciscan graywacke, lithic sandstone, metamorphic rock, volcanic rock, and traces of fine-grained vein quartz. Thick, horizontally bedded, clast-supported, well imbricated, gravel beds interlayered with planar cross-bedded and trough cross-bedded sandstone intervals are typical. Indistinctly bedded, matrix-supported, cobble to boulder gravel occurs rarely. The Upper Livermore represents deposition by gravelly braided streams on an alluvial fan.

Fossils from the Livermore Gravels (Herd and Brabb, 1980) and Unnamed Pleistocene deposits of the Livermore and western Tracy areas include, but are not limited to, significant paleontological resources of Ice Age fossils such as plants (pines, sycamore, willow, oak, cattail), invertebrates (fresh water mussel, clam, snail), and vertebrates (sunfish, sucker, minnow, stickleback, salamander, bull frog, mallard, turkey, peeper frog, toad, turtle, lizard, snake, goose, owls, shrew, mole, woodrat, ground squirrel, gopher, cottontail, sabercat, jaguar, wolf, coyote, fox, bear, badger; camel, antelope, deer, ox, peccary, mammoth, mastodon, giant ground sloth and horse (Savage, 1951; http://www.msnucleus.org/gordon/gordonhall.htm).

Pleistocene Mastodon fossil
(*Mammut americanum*)



Drawing shows a side view and a top view of a typical upper third molar of an American mastodon.

Geologists and Paleontologists recovering Pleistocene fossil mammoth (Left) and Dr. Savage recovering a mammoth tusk (Right) from the Irvington Formation, Bell Quarry, near Saber Cat road in Fremont, CA.

Pleistocene fossil *Smilodon californicus* (saber tooth tiger) on left. Artist rendition on right.

3.5.2 Significance of the Resource

The geologic units in the proposed project's boundaries have a "High Potential" to contain important, nonrenewable paleontological resources. Following the guidelines set by the Caltrans SER, those units are assigned high potential to contain paleontological remains of National or Scientific importance.

3.5.3 Construction-Related Effects on Paleontological Resources

The primary mechanism for impacts on paleontological resources would be ground disturbance for planned TOS construction excavation work along the I-580 roadway, hence this PMP shall be implemented. The potential for impact is uniform across the project area because the entire project area is directly underlain by geologic units with potential to contain fossils:

Ground disturbance for the construction of ancillary facilities, including supporting facilities, temporary construction offices, and construction staging areas, also could disturb native materials, with potential for impacts on paleontological resources. Depending on the location and depth of construction activities, impacts could be substantial. With implementation of the mitigation measures described in this report, these effects would be able to be reduced.

Chapter 4 Mitigation Plan

This section discusses conditions and decision criteria for how and when fieldwork (monitoring and recovery) will achieve the study goals of this PMP. More specifically referred:

- Cretaceous Great Valley Group (Ku, Kd, Kcu, Kcm, Kjk, Kjkc, Kcv),
- Miocene Monterey Formation (Tcc, Tt, To) and
- Miocene-Pliocene San Pablo Group (Tbr, Tc, Tn, Tol)(all three formation crop-out along the Dublin Pass and Altamont Pass areas).
- The Late Pliocene-Pleistocene (Qpaf) and the Pleistocene (Qt) deposits, the latter two in the eastern Dublin/Livermore areas and western-Tracy, Ca. areas.

4.1 Fieldwork

A single on-site Paleontological Monitor should be sufficient to handle observation of most excavation and ground-disturbance activities. However, additional Paleontological Monitors may be needed, as determined by the Project Paleontologist. Communication between the Resident Engineer and the Project Paleontologist and on-site Paleontological Monitor is imperative and fundamental to the success of this Project PMP and for compliance with CEQA, NEPA and Caltrans standards. The opportunity to observe sedimentary rocks within which fossils may be present will be ideal during auguring, trenching or any ground-disturbance. This monitoring will involve physical inspection of fresh bedrock exposures.

Recording of stratigraphic data will be an on-going aspect of excavation monitoring to provide context for any eventual fossil discoveries. Outcrops exposed in active cuts and finished slopes should be examined, and observed geologic features recorded on grading plans and in field notes. The goal of this work will be to delimit the nature of fossiliferous sedimentary rock units along the Project alignment, determine their areal distribution and depositional contacts, and record any evidence of structural deformation. Standard geologic and stratigraphic data collected include lithologic descriptions (color, sorting, texture, structures, and grain size), stratigraphic relationships (bedding type, thickness, and contacts), and topographic position. Measurement of stratigraphic sections should be conducted routinely, and areas containing exposures of fossiliferous sedimentary rocks should be studied in detail and fossil localities recorded on measured stratigraphic sections.

The goal of paleontological monitoring is to observe excavation activities and to implement assessment and recovery in the event that fossils are unearthed by grading, trenching, or drilling activities. When fossils are discovered the following procedures will be followed. In the event of a discovery, the Paleontological Monitor or Project Paleontologist has the authority to temporarily stop construction or grading work at the discovery location. When work is stopped, the Resident

Engineer shall be contacted immediately. The Paleontological Monitor, under direction of the Project Paleontologist, will divert, redirect, or temporarily halt ground disturbing activities in the area of discovery to allow for preliminary evaluation of potentially significant paleontological resources and to determine if additional mitigation (i.e., collection and curation) is required. The significance of the discovered resources will be determined by the Project Paleontologist in consultation with appropriate Caltrans representatives. For significant paleontological resources, a data recovery program will be initiated that will follow the general steps outlined below with some refinements based on the type and nature of the specific discovery. The types of research questions to be addressed by a particular fossil discovery are specific to the identified geologic rock units also discussed above. The main focus should be fossil preservation, care during transport, and determine paleogeography, paleo-climate and stratigraphic refinement based on previous literature. The data recovery program will largely be driven by the research questions and will incorporate appropriate field methods for data collection to answer these questions, as well as plans for the preparation, curation, and storage of recovered fossils, and an itemized scope of work and budget to accomplish the data collection and post-collection phases of fossil recovery.

Recovery methods will vary to some degree depending on the types of fossils discovered (e.g., invertebrate macrofossils, invertebrate microfossils, vertebrate macrofossils, vertebrate microfossils, or plant fossils). Many fossil specimens discovered during excavation monitoring are readily visible to the naked eye and large enough to be easily recognized and removed. Upon discovery of such macrofossils, the Paleontological Monitor will temporarily flag the discovery site for avoidance and evaluation as described above. Actual recovery of unearthed macrofossils can involve several techniques including immediate collection, hand quarrying, plaster-jacketing, and/or large-scale quarrying. The immediate collection technique will be used when there is a high level of construction activity in the vicinity of the discovery area and immediate action is required to remove an isolated specimen so as not to slow construction progress. This salvage method involves exploratory probing around a partially exposed fossil specimen to determine its dimensions, the application of consolidants (e.g., Acryloid, Butvar, or Vinac) to stabilize any damaged or weakened areas of the fossil, and removal of the specimen in a block of matrix.

Hand quarrying typically consists of site specific “mining” of fossil-rich sedimentary rock layers without establishment of a geographic grid framework. Fragile fossils are stabilized as described above. Particularly large vertebrate fossils require special handling because of their size and/or fragility and are typically recovered in a process called plaster-jacketing. The process begins by isolating a partially exposed specimen from the temporary exposure in a matrix-supported sedimentary pedestal. The pedestal is then slightly undercut at its base to form an overhanging lip and a layer of damp newsprint or tissue paper is placed on the upper surface of the block.

Strips of burlap fabric are then soaked in a mixture of Plaster-of-Paris and laid across the matrix block to dry. Depending upon the volume of the block, one, two, or more layers of plaster-soaked burlap strips are formed on the block. Especially large blocks (over two feet in length) are reinforced with wooden or metal splints. Once the plaster hardens, the supporting pedestal is undercut and the block turned over. Hand tools are then used to remove any excess matrix from the bottom of the block and a plaster and burlap cap constructed on the inverted bottom of the block using the same methods described above. When all layers of plaster are dry and hard, the completed plaster "jacket" is then labeled with a field number and north arrow and removed from the field.

The discovery of a concentration of large vertebrate fossils would require more time for recovery. In such cases the Project Paleontologist will request an immediate halt of construction activities in the area of the fossil discovery and contact the appropriate Caltrans representative. Together, the Project Paleontologist and Caltrans representative will evaluate the discovery and take action to protect or remove the resource within the shortest period of time possible.

Many significant vertebrate fossils (e.g., small mammal, bird, reptile, amphibian, or fish remains) often are too small to be readily visible in the field, but are nonetheless significant and worthy of attention. The potential discovery of microvertebrate sites is anticipated for this project and can include sites that produce remains of large vertebrate fossils from fine-grained deposits, sites with an obvious concentration of small vertebrate fossil remains, and sites that based on lithology alone (e.g., paleosols) appear to have a potential for producing small vertebrate fossil remains. Microvertebrate sites will be sampled at reasonable stratigraphic intervals (based on overall stratigraphic thickness) and should consist of either standard hand samples or by collecting bulk quantities of sedimentary matrix. An adequate bulk sample comprises approximately 12 cubic meters (6,000 pounds or 2,500 kilograms) of matrix for each formation, or as determined by the Project Paleontologist (SVP 1995). The uniqueness of the recovered fossils may dictate salvage of larger amounts. However, conditions in the field may make it impossible to recover such large samples. To avoid construction delays, bulk matrix samples will be transported to an offsite location for processing as described below.

The discovery of fossil plants is possible along the proposed Project alignment, especially in the Great Valley Group and Pleistocene units. Paleobotanical specimens typically occur in fine-grained, laminated strata (e.g., shale) and will require special recovery techniques. Large blocks (>2 cubic feet) of sedimentary rock are hand quarried from the temporary outcrop and then split along bedding plains to reveal compressed fossil plant material (e.g., leaves, stems, and flowers). Individual slabs are then wrapped in newsprint to minimize destructive dessication of the fossils.

Specimens that are delaminating or flaking badly may need to be coated with special consolidants (e.g., Vinac or Butvar).

Oriented matrix samples may be collected for paleomagnetic analysis. Such sampling will likely only be necessary in instances where long, continuous sections of stratified rocks produce fossils from several different stratigraphic horizons or where vertebrate fossils are being collected in stratigraphic sections lacking in biochronologically useful microfossils. Likewise, it may be necessary to collect stratigraphically positioned samples of fine matrices for pollen analysis to aid in addressing questions of geologic age, depositional environment, or paleoecology.

All fossil discoveries will also include the collection of stratigraphic data to delimit the nature of the fossil-bearing sedimentary rock unit, determine its areal distribution and depositional contacts, record any evidence of structural deformation, generate lithologic descriptions of fossil- bearing strata, determine stratigraphic relationships (bedding type, thickness, and contacts), and topographic position, measure stratigraphic sections, and describe taphonomic details.

4.2 Laboratory Efforts

Fossil remains collected during the monitoring and salvage portion will be cleaned, repaired, and/or screenwashed as described below. Preparation of fossil specimens will involve removal of extraneous and concealing sedimentary matrix from specimens using various mechanical methods including pneumatic air scribes, micro sandblasters, and simple hand tools (hammers, chisels, X-acto knives, brushes, dental picks, and pin vises). Fossil preparation will also involve consolidation of weak or porous specimens by the application of specialized media including polyvinyl acetate resins (e.g., Vinac), acrylic resins (e.g., Acryloid), or polyvinyl butyral resins (e.g., Butvar).

Repair of broken/damaged specimens will require the use of various adhesives including cyanoacrylate glues (e.g., Zap) polyvinyl acetate emulsions (e.g., Elmer’s glue), and polyvinyl butyral resins (e.g., Butvar). Recovery of microvertebrate fossils will be accomplished by screenwashing bulk samples of fossil-bearing sedimentary matrix. The process begins by breaking large blocks into 2-3 centimeter cubes to facilitate air-drying of the matrix. Once dry, the matrix is placed into water-filled 5 gallon plastic buckets to soak for no less than 15 minutes with stirring. The slurry is then poured onto nested 20 mesh (0.84 millimeter openings) and 30 mesh (0.59 millimeter openings) stainless steel screens placed in water-filled troughs. Manual agitation of the screens forces the fine clays and silts through the mesh and concentrates the coarser sand and fossil material on the screens. The screens are then placed at a tilt facing the sun to dry. Once dry, the coarse concentrate is transferred into plastic sample bags and labeled with all pertinent site locality data. Screenwashed concentrates can be further concentrated by the use of heavy liquids

(e.g., zinc bromide and/or tetrabromoethane) to concentrate particles of equal density. Generally, fossil bones and teeth sink along with heavy mineral grains (e.g., magnetite) while lighter quartz and feldspar mineral grains float. This separation process produces a very rich concentration of fossil remains, typically isolated teeth of small mammals (e.g., rodents).

Following preparation of salvaged fossil remains the specimens will be sorted/picked, identified, and catalogued as described below:

- Sorting/picking – Fossils require sorting/picking to group together specimens of the same taxon (e.g., species and/or genus).
- Identification – Once sorted, individual taxon lots will then be identified to the lowest taxonomic level practical (e.g., family, genus, and/or species).
- Cataloguing – Sorted and identified specimens are then assigned unique specimen catalogue numbers and entered into an electronic catalogue database. A specimen number may represent a single fossil specimen or a batch of specimens belonging to a single species. Catalogue numbers are written on individual specimens using India ink on a patch of white acrylic paint. Curation also involves placement of taxon lots into archival specimen trays with labels containing relevant curatorial information.
- Locality data – Formal descriptions of fossil collecting locality records, including geographic, geologic, taphonomic, and collecting data, need to be written and stored electronically with the specimen catalogue data.

  Where appropriate, specimens shall be analyzed by stratigraphic occurrence, and by size, taxa, or taphonomic conditions. The results shall be presented in a faunal list, a stratigraphic distribution of taxa, or evolutionary, ecological, or depositional deductions.

Adequate storage in a recognized repository institution for the recovered specimens is an essential goal of the program. Specimens shall be cataloged and a complete list shall be prepared of specimens introduced into the collections or a repository by the curator of the museum or university. Adequate storage includes curation of individual specimens into the collection of a recognized, nonprofit paleontologic specimen repository with a permanent curator, such as a museum or a university. A complete set of field notes, geologic maps, and stratigraphic sections must accompany the fossil collections.

4.3 Paleontological Mitigation Report

A final Paleontological Mitigation Report (PMR) shall be prepared by the Project Paleontologist documenting implementation of the approved PMP. The report will adhere to Caltrans SER guidelines and will include at a minimum discussions of Project effects, regulatory requirements, purpose of mitigation, regional geologic context, Project stratigraphy, stratigraphic and geographic distribution of paleontological resources, field and laboratory methods and procedures, fossil recovery, and paleontological significance. The report will also include geological cross sections and stratigraphic sections depicting fossil discovery localities and excavated rock units; maps showing the Project location and vicinity, as well as Project geology and location of discovered fossil localities; appropriate photographs or illustrations depicting monitoring conditions, field context of collecting localities, quarry maps, and laboratory activities; and appendices including an itemized listing of catalogued fossil specimens, complete descriptions of all fossil collecting localities, an explanation of report acronyms and terms, and a signed curation agreement with an approved paleontological repository.

4.4 Monitoring

Paleontological monitoring should be conducted full-time during augering or trenching in sedimentary rocks of the Great Valley, Monterey, and San Pablo Groups; and Pleistocene formations (QTl and Qti) and deposits (Qpaf)(Figures 2, 3 & 4, Appendix A). Table 5 lists the project elements for which monitoring is recommended as a mitigation measure. If, after 50% of the Project's excavations in a particular rock unit is completed, it can be demonstrated that the level of monitoring should be reduced (few or no fossils are discovered), the Project Paleontologist shall amend the mitigation program accordingly.

Table 5. Locations of Potential Impacts to Paleontological Study Areas (PSA) Proposed for Paleontological Monitoring During Ground-Disturbing Project Activities.

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
ALA	580	26.44	EB	TMS	Monterey Formation (Tcs)	Yes
ALA	580	26.24	EB	CCTV	Holocene (Qu)	No
ALA	580	26.02	WB	TMS	Great Valley Group (Ku)	Yes
ALA	580	25.45	WB	CCTV	Great Valley Group (Ku)	Yes
ALA	580	25.05	WB	TMS	Monterey Formation (Tcs)	Yes
ALA	580	24.75	EB	TMS	Monterey Formation (Tcs)	Yes

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
ALA	580	24.73	WB	CCTV	Monterey Formation (Tcs)	Yes
ALA	580	24.25	WB	TMS	Monterey Formation (Tro)	Yes
ALA	580	23.92	EB	CCTV	Monterey Formation (To?)	Yes
ALA	580	23.84	EB	TMS	Monterey Formation (Tcs)	Yes
ALA	580	23.45	WB	TMS	Monterey Formation (Tro)	Yes
ALA	580	23.09	EB	CCTV	Monterey Formation (Tro)	Yes
ALA	580	22.90	EB	TMS	Monterey Formation (Tro)	Yes
ALA	580	22.50	WB	TMS	Monterey Formation (Tro)	Yes
ALA	580	22.09	WB	CCTV	San Pablo Group (Tbg)	Yes
ALA	580	8.06	EB	TMS	Late Pliocene-Pleistocene (Qpaf)	Yes (Figure 4)
ALA	580	7.34	WB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	5.94	EB	TMS	Great Valley Group (Kd)	Yes
ALA	580	5.88	WB	TMS	Great Valley Group (Kd)	Yes
ALA	580	5.87	EB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	5.50	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	5.22	WB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	5.16	EB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	5.00	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	5.00	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	4.54	WB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	4.50	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	4.50	WB	TMS	Great Valley Group	Yes

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
					(Kcu)	
ALA	580	4.43	EB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	4.05	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	4.00	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.50	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.50	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.39	EB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	3.37	WB	CCTV	Great Valley Group (Kcu)	Yes
ALA	580	3.00	EB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	3.00	WB	TMS	Great Valley Group (Kcu)	Yes
ALA	580	2.50	EB	TMS	Great Valley Group (Kd)	Yes
ALA	580	2.50	WB	TMS	Great Valley Group (Kd)	Yes
ALA	580	2.45	WB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	2.41	EB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	2.00	EB	TMS	Late Pliocene-Pleistocene (Qpaf)	Yes
ALA	580	2.00	WB	TMS	Great Valley Group (Kd)	Yes
ALA	580	1.81	EB	CCTV	Great Valley Group (Kd)	Yes
ALA	580	1.77	EB	CMS	Great Valley Group (Kd)	Yes
ALA	580	1.52	EB	TMS	Great Valley Group (Kd)	Yes
ALA	580	1.40	WB	CCTV	San Pablo Group (Tn)	Yes
ALA	580	1.25	WB	TMS	San Pablo Group (Tn)	Yes
ALA	580	0.96	EB	TMS	San Pablo Group (Tn)	Yes

County	Route	Approx. PM	Direction	Type of TOS Element	Geologic Formation	Monitor Required
ALA	580	0.96	WB	TMS	San Pablo Group (Tn)	Yes
ALA	580	0.76	WB	CCTV	Monterey Formation (Tol)	Yes
ALA	580	0.60	EB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.60	WB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.40	WB	CCTV	Monterey Formation (Tol)	Yes
ALA	580	0.28	EB	CCTV	Monterey Formation (Tol)	Yes
ALA	580	0.10	EB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.10	WB	TMS	Monterey Formation (Tol)	Yes
ALA	580	0.50	WB	Roadway sign (2)	Monterey Formation (Tol)	Yes
ALA	580	0.40	WB	Roadway sign (2)	Monterey Formation (Tol)	Yes
ALA	580	0.30	WB	Roadway sign	Monterey Formation (Tol)	Yes
ALA	580	0.20	WB	EMS (2)	Monterey Formation (Tol)	Yes
ALA	580	0.00	WB	EMS (Overhead)	Monterey Formation (Tol)	Yes
SJ	580	15.10	WB	Roadway sign (2)	Monterey Formation (Tol)	Yes
SJ	580	14.90	WB	Roadway sign	Pleistocene deposits (Qhaf)	Yes
SJ	580	14.30	WB	TMS	Monterey Formation (Tol)	Yes
SJ	580	14.30	WB	EMS	Monterey Formation (Tol)	Yes

Paleontological monitoring should be conducted for the initial ground disturbance for each installation taking place in sedimentary rocks of the Great Valley, Monterey, and San Pablo Groups; Monterey Group; and Pleistocene deposits. The level of monitoring effort required may be reduced, modified or suspended at the discretion of the Paleontological Monitor, in consultation with the Project Paleontologist, based on field conditions and rock units identified

Monitoring is not required in the Holocene deposits (Qu). Bedrock/Depth to Pleistocene deposits

may be reached at depth BELOW the Qu, however, approximately deeper than ~10' bgs, so in some cases we have called for monitoring in the Dublin/Western Pleasanton portion of I-680 Project (See Table 1) in the Qu or what appears to be Holocene-age at the surface. During the pre-construction paleontological training, construction personnel will be specifically instructed about the kinds of material that may be encountered during excavations in those units.

It is anticipated that a single Paleontological Monitor will be sufficient to monitor construction activities; however, additional Paleontological Monitors may be needed. This determination will be made by the Project Paleontologist and will be based on construction schedules, the number of excavation areas occurring simultaneously, and the volume of material to inspect. The need for additional monitors could be due to the occurrence of simultaneous excavations and/or the discovery of significant fossil resources. Specific timing of these excavations at the Project site is unknown at this time.

How and when monitoring occurs relies upon good communication and knowledge of the day's schedule between the Resident Engineer and the Project Paleontologist and Paleontological Monitor(s). It is a top priority to work in a safe and timely manner, avoid construction delays, and preserve significant paleontological resources. In order to achieve these goals, paleontological monitoring field work will take place only when earth-moving and/or excavation are occurring during project construction. Fieldwork shall cease when all excavation work has been completed and when significant fossils, if any, are properly recovered and treated for transport to a laboratory for further processing.

4.5. Macrofossils

When invertebrate macrofossils are uncovered during excavation operations, a representative sample of well-preserved and identifiable remains will be recovered. Poorly preserved and/or unidentifiable remains may not be recovered, at the discretion of the Project Paleontologist and/or Paleontological Monitor. If unidentifiable remains are recovered, further processing will only be done if dictated by the research design for that particular geologic formation. A research design is an outline of research methods which differs depending on fossil type. If fossils are microscopic, such as algae, foraminifera, or radiolarians, the research design would involve microscope work and the necessary laboratory items required for that style of research.

When vertebrate macrofossils are uncovered during excavation operations, all well-preserved and identifiable remains will be recovered. Poorly preserved and/or unidentifiable remains may not be recovered, at the discretion of the Project Paleontologist and/or Paleontological Monitor. If unidentifiable remains are recovered, further processing will only be done if directed by the research design for that particular geologic formation.

When plant macrofossils are uncovered during excavation operations, a representative sample of well-preserved and identifiable remains will be recovered. Poorly preserved and/or unidentifiable remains may not be recovered, at the discretion of the Project Paleontologist and/or Paleontological Monitor. If unidentifiable remains are recovered, further processing will only be done if directed by the research design for that particular geologic formation.

4.6. Microfossils

When marine microfossils are discovered (or their presence suspected based on site conditions) during excavation operations, it may be necessary to collect stratigraphically-controlled matrix samples as directed by the research design for that particular geologic formation. Such samples should be taken at reasonable stratigraphic intervals (based on overall stratigraphic thickness) and should consist of standard hand samples. If initial processing of such samples shows them to be barren or sparsely fossiliferous, the Project Paleontologist may authorize suspension of further processing of the sample, and the sample may be discarded.

When vertebrate microfossils are discovered (or their presence suspected based on site conditions) during excavation operations, it may be necessary to collect stratigraphically- controlled bulk matrix samples (up to 6,000 pounds) for processing. The decision to collect such samples will be made if relatively well-preserved vertebrate microfossils are observed in hand samples in the field or if processing of a 100-pound test sample yields more than five identifiable microvertebrate fossils.

If during processing of a bulk matrix sample, too few identifiable microvertebrate fossils are recovered, the Project Paleontologist may suspend further processing of the sample and the sample may be discarded. The following criteria must be met to suspend sample processing:

- No or few identifiable microvertebrate fossils are recovered after processing 200 pounds.
- Recovered fossils are too poorly preserved to be identified.
- Recovered fossils are not taxonomically, biochronologically, or paleoenvironmentally diagnostic.

Any unidentifiable micro-vertebrate fossils salvaged during sample processing will not receive further treatment.

4.7. Permits

Implementation of this PMP, including the recovery and curation of any fossil remains salvaged during ground disturbing activities associated with the Caltrans Project, would be authorized by inclusion in the CEQA process.

References

Allen, J R.,2003, Stratigraphy and Tectonics of Neogene Strata, Northern San Francisco Bay Area, [Masters Thesis], San Jose State University, 190 p., 4 plates.

Anderson, 1945, Knoxville Series in the California Mesozoic, Geol. Soc. America Bull. v. 56, No. 10, p. 909 – 1014.

Axelrod, D. I., 1971, Fossil plants from the San Francisco Bay Region: p. 74-86 *in* Lipps, J. H. and Moores, E. M. (editors), Geologic guide to the northern Coast Ranges, Point Reyes region, CA, Annual field trip guidebook of the Geological Society of Sacramento, Sacramento, CA,135 p.

Barlock, V.E., 1989, Sedimentology of the Livermore Gravels (Miocene-Pleistocene), southern Livermore Valley, California, USGS Open-File Report: 89-131.

Bartow, J. A. 1980. Preliminary geologic maps showing Quaternary deposits of the 7.5-minute Ceres, Denair, and Montpelier quadrangles, Stanislaus and Merced Counties, California. (Open-File Report 80-607.) Reston, VA: U.S. Geological Survey.

Bartow, J. A. 1985. Map showing Tertiary stratigraphy and structure of the northern San Joaquin Valley, California. (Miscellaneous field studies map MF-1761.) Reston, VA: U.S. Geological Survey.

Bartow, J. A. 1991. *The Cenozoic evolution of the San Joaquin Valley, California.* (Professional Paper No. 1501.) Reston, VA: U.S. Geological Survey.

Bennison, A. P. 1991. Great Valley sequence east of Pacheco Pass in central California. Abstracts with Programs 23:2 (Cordilleran Section 87th Annual Meeting). Geological Society of America, Boulder, CO.

Brown, R.D. and Rich, E.I. 1960. Early Cretaceous Fossils in Submarine Slump of Late Cretaceous age, Sacramento Valley, California. *U.S. Geological Survey, Prof. Paper* 400

B.Brown, R.D. and Rich, E.I. 1961. Geologic Map of the Lodoga Quadrangle, Glenn and Colusa Counties, California. *U.S. Geological Survey, Oil and Gas Investigations* OM-210. Scale 1:62,500.

California Department of Transportation, 2013, Letter Report "Paleontological Identification Report" dated October 16, 2013, written to Ms. Valerie Shearer, District Office Chief Office of Environmental Analysis from: Mr. Ronald Karpowicz ,Engineering Geologist Office of Geotechnical Services, Division of Engineering Services and Office of Geotechnical Mr. Chris Risden, Design-West, Geotechnical Services Division of Engineering Services.

California Department of Transportation. 1992. Environmental Policy: California Department of Transportation, Directors Policy, DP-04, December 30, 1992.

California Department of Transportation, 2012, California Department of Transportation, Standard Environmental Reference, Volume 1, Chapter 8, Paleontology: http://www.dot.ca.gov/ser/vol1/sec3/physical/Ch08Paleo/chap08paleo.htm.

CaliforniaDepartment of Transportation. 2008. *Standard Environmental Reference.*

Environmental Handbook, Volume I: Guidance for Compliance. Chapter 8, "Paleontology." Available: <http://www.dot.ca.gov/ser/vol1/sec3/physical/ Ch08Paleo/chap08paleo.htm >. Accessed: September. Last updated: April 15, 2008.

California Geological Survey. 220. *Fossils.* Last revised: unknown. Available:<

http://www.conservation.ca.gov/cgs/information/publications/cgs_notes/note_51/Documents/note_51.pdf>. Accessed: August 20, 2013.

Camp, Charles L. 1942. Ichthyosaur rostra from central California, *Journal Paleontology*, Vol. 6, pp. 362-371.

Creely, S., Savage, D.E., and Ogle, B.A., 1982, Stratigraphy of upper Tertiary nonmarine rocks of central Contra Costa basin, California, in Ingersoll, R.V., and Woodburne, M.O., eds., Cenozoic nonmarine deposits of California and Arizona: Society for Economic Paleontologists and Mineralogists, Pacific Section, v. 38, 122 p.

Crittenden, M.D., 1951, Geology of the San José-Mount Hamilton area, California: California Division of Mines and Geology Bulletin 157, 74 p.Crittenden, M.D., 1951, Geology of the San Jose-Mount Hamilton Area, California: California Division of Mines Bulletin 157, 74 p.

Davis, G. H., and F. Hall. 1959. Water quality of eastern Stanislaus and northern Merced counties, California. *Geological Sciences* 6:1.

Dundas, R. G., R. B. Smith, and K. L. Verosub. 1996. The Fairmead Landfill Locality (Pleistocene,Irvingtonian), Madera County, California: Preliminary Report and Significance. *PaleoBios* 17(2–4):50–58.

Graymer, R.W, Jones, D.L., and Brabb, E.E., 1996, Preliminary geologic map emphasizing bedrock formations in Alameda County, California: A digital database: U.S. Geological Survey Open-File Report 96-252.

Hall, C.A., Jr., 1956, The Geology of the Pleasanton Area, Alameda County, California: Ph.D. dissertation in Geology, School of Mineral Sciences, Stanford University, 269 p.

Hall, C.A., Jr., 1958, Geology and Paleontology of the Pleasanton Area, Alameda and Contra Costa Counties, CA: University of California Publications in Geological Sciences, v. 34:1, 89 p.

Hansen, R. O., and E. L. Begg. 1970. Age of Quaternary sediments and soils in the Sacramento area, California by uranium and actinium series dating of vertebrate fossils. *Earth and Planetary Science Letters* 8:411–419.

Harding, John W., 1940, The Geology of the Southern Part of the Pleasanton Quadrangle, CA: Master"s thesis in Geology, U.C. Berkeley, 70 p.

Helley, E.J., Lajoie, K.R., and Burke, D.B., 1972, "Geologic Map of Late Cenozoic Deposit Alameda County, California", U.S. Geological Survey Miscellaneous Field Studies Map MF-429.

Helley, E. J., and D. S. Harwood. 1985. Geologic map of late Cenozoic deposits of the Sacramento Valley and northern Sierran foothills, California. (Miscellaneous Field Studies Map MF-1790.) Available: <http://pubs.usgs.gov/mf/1985/1790/>. Reston, VA: U.S. Geological Survey.

Herd, D.G., 1978, "Map of Quaternary Faulting Along The Northern Calaveras Fault Zone, Diablo; Las Trampas Ridge, Dublin, Niles, and La Costa 7.5 Minute Quadrangles, California", U.S. Geological Survey Open File Report 78-307 (5 sheets).

Herd, D.G., and Brabb, E.E., 1980, Faults at the General Electric test reactor site, Vallecitos Nuclear Center, Pleasanton, California. A summary review of their geometry, age of last movement, recurrence, origin, and tectonic setting and the age of the Livermore Gravels: U.S. Geological Survey Administrative Report, 77 p.

Hertlein, L.G. 1951. Invertebrate Fossils and Fossil Localities in the San Francisco Bay Region. In: Geologic Guidebook of the San Francisco Bay Counties, Calif. Div. Mines Geol. Bull. 154,392 pp.

Hill, J.M., 1978, Stratigraphy and Paleoenvironment of the Miocene Monterey Group in the East San Francisco Bay Region, California [M.S. thesis]: San José State University, 113 p.

Hill, J.M., 1979, Stratigraphy and paleoenvironment of Miocene phosphatic rocks in the East San Francisco Bay Region, California: U.S. Geological Survey Open-File Report 79- 1570, p. 1-69.

Hilton, R. P., D. C. Dailey, and H. G. McDonald. 2000. A Late Pleistocene biota from the ARCO Arena site, Sacramento, California. *Paleobios* 20(1):7–12.

Hilton, R. P., 2003, Dinosaurs and other Mesozoic reptiles of California. University of California Press, Berkeley and Los Angeles, CA.

Ingle, J.C., 1980, Cenozoic Paleobathymetry and Depositional History of Selected Sequences Within the Southern California Continental Borderland: Cushman Foundation Special Publication 19, p. 163-195.

Jefferson, G. T. 1991. *A Catalogue of Late Quaternary Vertebrates from California* (Part 2, *Mammals*). (Technical Report No. 7.) Los Angeles, CA: Natural History Museum of Los Angeles County.

Kirby, J.M. 1943. Upper Cretaceous Stratigraphy of the West Side of the Sacramento Valley south of Willows, California. *Am. Assoc. Pet. Geol. Bull*., v. 27, no. 3, pp. 279-305.

Knudsen, K.L., J.M. Sowers, R.C. Witter, C.M. Wentworth, and E.J. Helley, 2000, Preliminary Maps of Quaternary Deposits and Liquefaction Susceptibility, Nine-County San Francisco Bay Region, California: A Digital Database, U.S. Geological Survey Open-File Report 00-444. Digital Database by Wentworth, C.M., Nicholson, R.S., Wright, H.M., and Brown, K.H. Online Version 1.0.

Lipps, J. H., 1964, Oligocene in California: Nature, v. 208, p. 885-886.

Oberling, J. J., 1964, Observations on some structural features of the pelecypod shell: Sonderdruck aus den Mitteilungen der Naturforschenden Gesellschaft in Bern, Neue Folge, 20 Band, 60 p., 6 pis., 3 figs.

Payne, M. B. 1962. Type Panoche Group (Upper Cretaceous) and overlying Moreno and Tertiary strata on the west side of the San Joaquin Valley. Pages 165–175 *in* O. E. Bowen, Jr., (ed.), Geologic guide to the gas and oil fields of northern California. (Bulletin 181.) California Division of Mines and Geology, Sacramento, CA.

Puffer, E.L., 1953, *Distorsio Reticulata* vs. *Distorsio Clathrata* in the West Indies (Mollucsa: Gastropoda, Proceedings of the Biological Society of Washington, 66 : 109-124, 2 plates.

Rensberger, J.M., 1969, A New Iniid Cetacean from the Miocene of California. University of California Publications in Geological Sciences, 82:1-34.

Savage, D. E. 1951. Late Cenozoic vertebrates of the San Francisco Bay region. University of California Publications, Department of Geological Science Bulletin 28:215–314. University of California Press, Berkeley, CA.

Society of Vertebrate Paleontology Conformable Impact Mitigation Guidelines Committee. 1995. Assessment and mitigation of adverse impacts to nonrenewable paleontologic resources: standard guidelines. *Society of Vertebrate Paleontology News Bulletin* 163.

Southard, R. 2003. Formations and events of central-western California, compiled by R. Southard. Available: http://lawr.ucdavis.edu/classes/Ssc120/acrobats/GeologicTime.pdf

Vanderhoof, V. L., 1937. A Study of the Miocene sirenian *Desmostylus*. Bulletin from the Department of Geology, University of California 24(8):169-262.

Wagner, D. L., E. J. Bortugno, and R. D. McJunkin. 1991. Geologic map of the San Francisco–San Jose quadrangle, California, scale 1:250,000. (CDMG Regional Geologic Map

Series, Map No. 5A, Geology, Sheet 1 of 5.).

Wagner, D.L., Jennings, C.W., Bedrossian, T.L., and E.J. Bortugno. 1991. Geologic Map of the Sacramento Quadrangle. (Regional Geologic Map No. 7A, scale 1:250000.) Sacramento, CA: California Division of Mines and Geology. Available:< http://www.quake.ca.gov/gmaps/RGM/sacramento/sacramento.html>. Accessed: August 19, 2013.

Wagner, J. R, 1978, Late Cenozoic history of the Coast Ranges east of San Francisco Bay, University of California, Berkeley: Ph.D. dissertation. 161 p

APPENDIX A.

MAP FIGURES

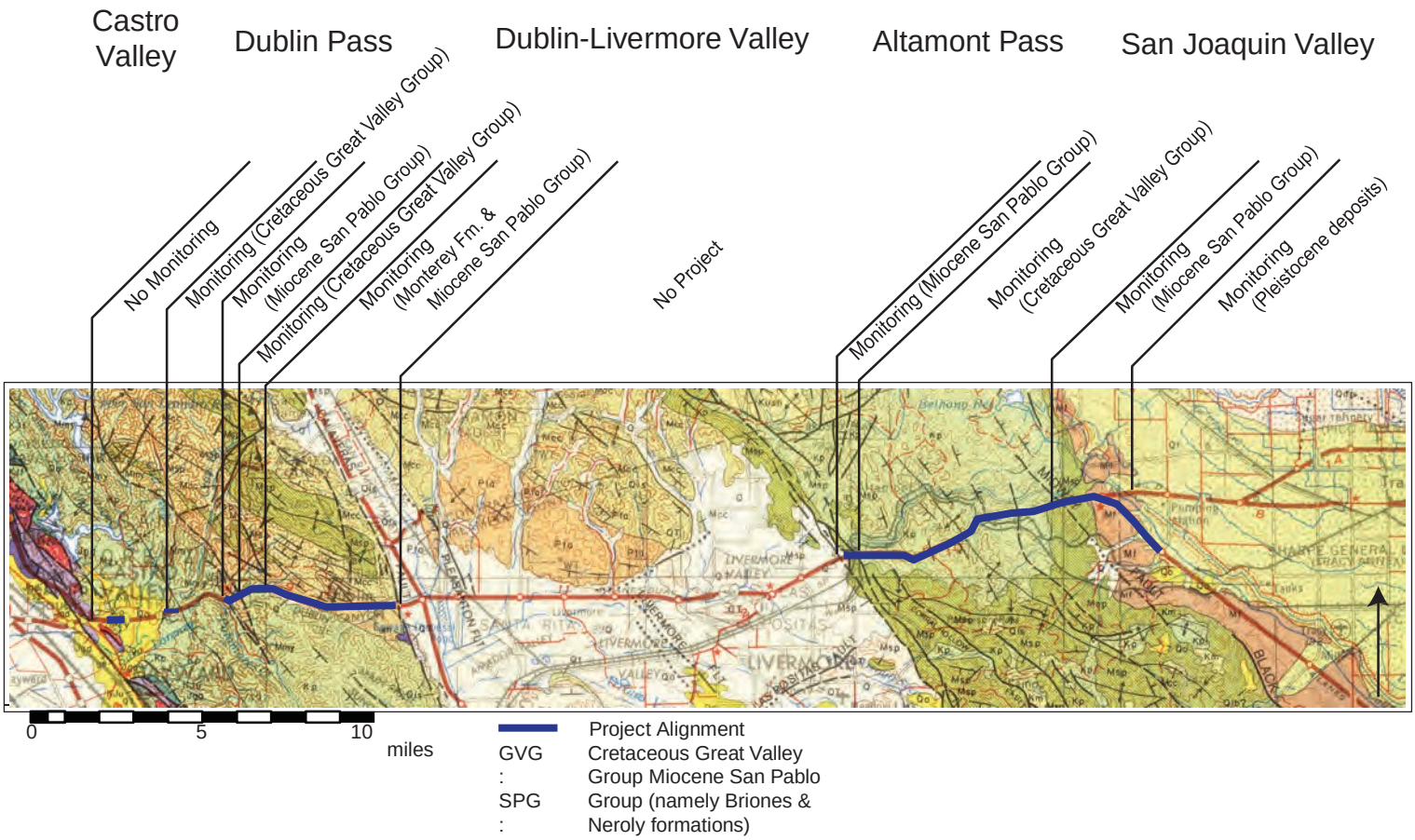


Figure 3. The I-580 Corridor and potential for paleontological resources to occur within the excavation depths proposed for the Project. Monitoring is recommended as a mitigation measure where indicated.

APPENDIX B.

Interstate 580 Freeway Performance Initiative Project:

PALEONTOLOGICAL TRAINING ACKNOWLEDGEMENT FORM

I-580 PALEONTOLOGICAL TRAINING ACKNOWLEDGMENT FORM

I hereby acknowledge that I attended paleontological training regarding the scientific importance of fossil remains; the potential for fossil remains being uncovered and/or disturbed by project-related earth moving; where such remains are most likely to be encountered during earth moving; and procedures to be employed if fossil remains are discovered during excavations. I understand the requirements to protect fossils during project construction and agree to follow the procedures outlined in the paleontological training. I understand that failure to follow these procedures may result in disciplinary action including dismissal from the job site, fines, and imprisonment.

Name (please print)	**Signature**	**Date**
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Paleontologist providing the training:

_____ _____
Name Date

APPENDIX C.

DAILY MONITORING REPORT FORM

Caltrans I-580 Project
Paleontological Resources Monitoring and Mitigation Program
DAILY MONITORING REPORT

Project Name:	Interstate 580 Freeway Performance Initiative Project – Paleontological Monitoring				
Client:	**Caltrans**		Location:	**Alameda & San Joaquin Counties, CA**	
Task No./Name:	**Monitoring of Excavations**				
Name/Title:					
Project Manager's Signature:					
Date:		Mileage Start:		Mileage Finish:	
		Start Time:		Finish Time:	

APPENDIX D.
PROPOSED LETTER DONATING FOSSILS SALVAGED TO AN APPROPRIATE MUSEUM REPOSITORY, UNIVERSITY OF CALIFORNIA MUSEUM OF PALEONTOLOGY

Caltrans
XXXX
XXXX
XXXX

Date

Dr. Patricia A. Holroyd, PhD
Collections Manager for Vertebrate Paleontology
University of California Museum of
Paleontology University of California at
Berkeley
1101 Valley Life Sciences Building
Berkeley, CA 94720

Re: Gift of Fossil Collections & Samples from Interstate 680 Freeway Performance Initiative Project

Dear Dr. Holroyd:

Caltrans, in its on-going contract with the University of California contract to curate significant fossils from Caltrans projects, hereby irrevocably and unconditionally donates, gives, and assigns to the University of California Museum of Paleontology (UCMP) absolute and unconditional ownership of fossils collected during excavations for Caltrans's "Interstate 680 Freeway Performance Initiative Project".

It is my understanding that you are already in receipt of a copy of the project Final Report authored by the Supervising Paleontologist (NAME) with Garcia and Associates. This report describes the fossil collection to which this letter refers and will suffice as a legal description of the property we are herewith donating.

This gift includes without limitation full powers of management, access, display, conservation, and disposition at UCMP's sole discretion and in exercise of its general purpose, together with all other rights associated with this property to which we are hereby assigning UCMP full title. To the best of our belief, the subject of this gift is free and clear of all encumbrances and restrictions.

We request that the fossils being donated with this letter be identified in UCMP records and, if put on display, to the public as a gift of Caltrans.

Respectfully,

(Name here)
On behalf of Caltrans
Supervising Paleontologist with Garcia and Associates

APPENDIX E

PROJECT PHOTOGRAPHS

Photo 1 – I-580 WB near Castro Valley Exit, viewing north. Cretaceous Great Valley Group shale overlain by stratified sandstone.

A. **B.**

Photo 2A and 2B – I-580 WB west of Dublin, CA, viewing north along West-bound 580. Photo A of San Pablo Group sandstone (Briones Fm.) with oyster fossil remnants. Photo B. of San Pablo Group (Briones Fm.) with external molds of pelecypods.

Photo 3 – I-580 WB near Eden Canyon Exit, viewing west. Near-surface and surface Cretaceous Great Valley Group sandstone.

Photo 4 – Grant Line Road WB on-ramp, viewing west. Quaternary deposits and older bedrock at the surface and near-to.

Photo 5 – North Flynn Road overpass showing EB on-ramp, viewing east. Area of Great Valley Group.

Photo 6 – North Flynn Road WB on-ramp, viewing west.

Photo 7 – Eden Canyon Road EB on-ramp, viewing east. Minor zone where San Pablo Group is fault bounded to the west and in depositional contact to the east both with the Great Valley Group.

Photo 8 – Strobridge Avenue EB on-ramp, viewing east. Area of Coast Range Ophiolite and thick artificial fills.

Photo 9 –I-580 WB Altamont Pass near Grant Line Road, viewing northwest. Heavily vegetated cover of San Pablo Group bedrock.

Photo 10 –I-580 EB Altamont Pass near eastern Livermore, viewing south. San Pablo Group immediately west of Livermore Fault.

Photo 11 –I-580 EB Altamont Pass, west side out of Livermore, viewing west. Recent cuts into the San Pablo Group.

Photo 12 –I-580 EB Livermore. Recent cuts into the Pleistocene deposits/Livermore gravels near Airway Exit, owing to their close proximity to the surface.

Photo 13 –I-580 EB Dublin/Livermore line, viewing east. Begin Pleistocene deposits near surface from this point to Altamont Pass grade.

Photo 14 –I-580 WB at Santa Rita Exit. Recent cuts into the Holocene deposits with a clear post-1900 sandy over bank deposit showing depth to Pleistocene in the Dublin area is significant more than in Livermore.

Photo 15 –I-580 EB view towards Tracy, CA. Pleistocene deposits near surface in this area.

Photo 16 –I-580 WB View west from Mountain House overpass towards Altamont Pass. Pleistocene deposits in foreground are near surface.

Photo 17 –I-580 EB, west side of Altamont Pass. Recent cuts into the San Pablo Group. Below the black line is native San Pablo Group exposed in recent earthwork as of 10/27/13.