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Addendum to Environmental Impact Report

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Case No.:	**2005.0161E**
Project Title:	Calaveras Dam Replacement Project
FEIR:	2005.0161E, certified January 27, 2011
Project Sponsor:	San Francisco Public Utilities Commission
Lead Agency:	San Francisco Planning Department
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REMARKS

Background

The San Francisco Planning Commission certified a Final Environmental Impact Report (FEIR) for the subject project, file number 2005.0161E, on January 27, 2011. The project analyzed in the FEIR is the replacement of the Calaveras Dam to improve the seismic safety of the dam and to modify both existing facilities and future operations of the reservoir to enhance fish and wildlife habitat. The FEIR also analyzed a project variant that included additional habitat enhancements for fish, refinements to various facility and construction components of the project, and related operational modifications. Following certification of the FEIR, the San Francisco Public Utilities Commission (SFPUC) on January 27, 2011 and the San Francisco Board of Supervisors, on March 16, 2011, approved the project variant as the final adopted project.[1] The SFPUC has awarded contract(s) for the adopted project and construction began in August 2011. The San Francisco Planning Department subsequently issued two addendums to the FEIR, dated December 13, 2012 and July 22, 2013, to incorporate modifications to the project that address geotechnical hazards related to a previously unknown landslide feature in the left dam abutment for the new dam, and to place fill at Disposal Sites F and I.

Calaveras Dam and Reservoir are part of the regional water system owned and operated by the City and County of San Francisco, through the SFPUC. Calaveras Dam is located on Calaveras Creek in the Diablo Mountain Range in Alameda County, California, approximately 12 miles south of the City of Pleasanton and 7.5 miles east of the City of Fremont. Calaveras Dam forms Calaveras Reservoir, which is situated on the border between Alameda and Santa Clara Counties.

The SFPUC initiated studies in 1998 to evaluate the structural stability and performance of the dam during projected large earthquakes. The studies indicated that the dam does not meet current safety standards for large earthquakes. Beginning in the winter of 2001, the SFPUC lowered water levels in the reservoir in response to safety concerns about the seismic stability of the dam. A mandate from the California Department of Water Resources, Division of Safety of Dams (DSOD) directed the SFPUC to undertake necessary seismic improvements to the dam and lower the reservoir water level to a maximum of 705 feet until these improvements are completed. The elevation of the lowered water level corresponds to about 38,100 acre-feet (AF) of storage, which is approximately 60 percent less than the pre-DSOD restricted total water storage volume.

[1] The final approved project – described in the EIR as the Calaveras Dam Replacement Project (CDRP) Variant – is referenced in this addendum as the "adopted project."

With the DSOD-restricted maximum elevation of 705 feet (approximately 38,100 AF) and a previous California Department of Fish and Wildlife (CDFW) established minimum lake level elevation of 690 feet (approximately 25,700 AF), usable storage at present is limited to 12,400 AF (4 billion gallons), a reduction of more than 75 percent from the 96,850 AF pre-DSOD restricted storage capacity. At this reduced volume, Calaveras Reservoir's current usable storage capacity cannot meet the SFPUC's delivery reliability objective for the Sunol Region reservoirs of up to 60 consecutive days of supply. Overall system operational flexibility and reliability have also been reduced. Replacing Calaveras Dam would allow the reservoir storage to be restored to its pre-DSOD restricted capacity of 96,850 AF, and previous level of delivery reliability. Following approximately six years of engineering studies, the SFPUC determined that the best solution to address the seismic issue was construction of a new dam to replace the existing Calaveras Dam. Construction of the replacement dam is underway immediately downstream at the foot of the existing dam, and will respond to DSOD requirements to improve seismic safety. Following construction, SFPUC will be able to fill the reservoir to a normal maximum of 756 feet and its former volume of about 96,850 AF. This will restore the previously existing yield and reliability of the SFPUC local system and provide water supply during droughts.

PROPOSED PROJECT MODIFICATIONS

The project modifications proposed by the SFPUC and addressed in this addendum are to 1) import rock for construction of Zone 5/5A of the replacement dam and other areas of the project site as needed and 2) update the approach of the Alameda Creek Diversion Dam (ACDD) Project as described in the following sections. All figures and supporting technical reports are provided at the end of the document.

Import of Material

The FEIR identified that the 764,000 cubic yards of hard rock needed to construct Zone 5/5A embankment of the dam would be obtained on-site from Borrow Area B (FEIR Figure S.3 p 1-16; Table 3.3 pg. 3-40). However, during recent excavation and geological investigations in Borrow Area B, the SFPUC has found that not all of the rock type in the borrow area is suitable for Zone 5/5A. It is currently estimated that there is approximately 175,000 cubic yards of unsuitable material (shale and siliceous schist) that would not meet the gradation criteria for the Zone 5/5A embankment. In addition, during excavation of the foundation of the dam site, due to geologic conditions, additional waste material was excavated from the dam foundation (refer to Addendum 1 of the FEIR for details) that also requires importing an increased amount of suitable material from offsite. This addendum proposes to modify the project to allow the SFPUC to import up to 350,000 cubic yards of rock needed for the Zone 5/5A embankment of the dam from off-site sources to augment suitable material that can be generated onsite. The adopted project, as analyzed in the FEIR, includes importing 298,000 cubic yards sand and gravel material from off-site commercial sources for construction of the dam embankment (Tables 3.3, p. 3-40). This addendum would increase the amount of material to be imported from 298,000 cubic yards to up to 648,000 cubic yards.

The approximately 350,000 cubic yards of rock would be imported over a 15-month period from approximately February 2016 through April 2017. The rock would be imported from commercial sources chosen by the Contractor. Potential sources include quarries located in Aromas, Cupertino, and Los Gatos, up to approximately 65 miles away. In the project vicinity, the material would be hauled in trucks with a capacity of 13 to18 cubic yards along Calaveras Road from I-680 to the Dam and is anticipated to require approximately 150 truck trips per day in and out of the project site (75 round trips). As with the other import activities identified in the FEIR, hauling would occur during weekdays from 7 a.m. to 5 p.m., or may occur at night. In order to minimize truck traffic on Calaveras Road, the SFPUC would require, via the contract documents, that import of this additional rock not overlap with previously approved import of 298,000 cubic yards of filter and drain rock. The imported rock material would be

stockpiled at currently disturbed locations within the project site already established disposal sites and/or staging areas.

Alameda Creek Diversion Dam Project

In its current configuration, the ACDD on Alameda Creek is a barrier to upstream fish migration in the Alameda Watershed. The FEIR and the adopted variant identified that, to mitigate effects of the CDRP project, the SFPUC would implement the Alameda Creek Diversion Dam (ACDD) project, comprised of installing a bypass and a fish ladder, fish screens, and associated facilities (FEIR Table 9.3, page 9-25) to bypass water around the dam and thereby provide future upstream and downstream passage for fish, including potentially steelhead (*Oncorhynchus mykiss*). The ACDD project is analyzed in the FEIR as a component of the CDRP project. The FEIR provided a conceptual level description of the fish ladder and screens. Based on current designs, this addendum provides an updated description and approach for implementation of the final fish ladder, screens, and associated facilities along with an analysis of the changes.

As required by the adopted project and CDRP regulatory permits, the ACDD project shall allow for the conveyance of the first 30 cfs of water from Alameda Creek to the fish ladder as a bypass whenever stream flows are available[2] to facilitate upstream fish passage. Creek flow greater than 30 cfs would either spill over the ACDD or up to 370 cfs (beyond the 30 cfs minimum creek flow) could be diverted via the existing Alameda Creek Diversion Tunnel (ACDT) to the Calaveras Reservoir from December 1 to March 31. The fish screen system aims to prevent entrainment and diversion of steelhead and other fish through the ACDT to Calaveras Reservoir when in operation. The SFPUC received prior approval of the fish-passage design described herein from the NMFS[3] and CDFW.

The FEIR described that the fish ladder would start approximately 150 feet downstream of the dam crest and extend approximately 400 feet upstream of the dam crest, necessitating the excavation of a 30 foot wide by 650 foot long trench (FEIR Volume 3, Figure 9.3). Under this proposed modification, the fish ladder would start at approximately the same location but would initially traverse downstream 200 feet and then turn upstream and exit approximately 100 feet upstream of the dam crest (Figure 1). The total distance of the modified fish ladder would be similar to the adopted project. The fish ladder would include options for three entrances with manually adjustable openings. The ladder exit is a "vertical slot" that would allow fish to exit (or enter when swimming downstream) the structure at different water surface elevations. The location of the ACDD within the Alameda Creek Watershed is within a steep canyon. As with the adopted project, the modified project would involve extensive grading to stabilize the slopes above the fish ladder. Grading of this area was previously identified in the FEIR for the access road and staging area (FEIR Volume 3, Figure 9.6).

For the adopted project, the FEIR described installing the fish screens on the south (left) bank of Alameda Creek near the existing trash rack[4]. This modification proposes to install the fish screens on the north (right) bank and to remove the existing trash rack as identified in the FEIR. A retaining wall would be installed to the east of the fish screens and access road to stabilize the slope as a surficial landslide was discovered on the hillside during the geotechnical investigation. To convey creek flow to the ACDT (after the first 30 cfs is conveyed to the fish ladder), a box culvert would be constructed from the upstream end of the fish screens on

[2] All flows in Alameda Creek above ACDD are natural; that is, there is no water storage facility above ACDD, and ACDD itself provides no storage of note. Therefore, flows would only be provided when water is naturally available in upper Alameda Creek. The ladder is designed to be passable by fish at flow starting from 2 cfs.

[3] Letter dated May 13, 2015 from David White (NOAA/NMFS engineer) to Mandy Morrison and Joshua Fuller approving the 95% design for the ACDD project. NMFS acted as the lead agency for fish design. CDFW also accepted a variant to the sweeping velocity criterion in 2013.

[4] The trash rack is a structure at the intake of the ACDT that blocks large debris, typically woody material, from entering and clogging the ACDT.

the north bank across Alameda Creek to the south bank where it would connect with the existing ACDT entrance.

There are currently two sluiceways[5] that transport sediment from above ACDD to downstream of the dam, Sluiceways No. 1 and No. 2. This modification proposes to rehabilitate and automate the existing sluiceways to allow remote operation in the event of storms and in case of emergency. Additionally, Sluiceway No. 2 would be extended 80 feet to the upstream side of the new box culvert in order to sluice fine material that collects behind the box culvert. Lastly, a new Sluiceway No. 3 would be installed at the upstream end of the fish ladder to enable sluicing of sediment that accumulates at the fish ladder exit and fish screens. These sluiceways would be installed within the same footprint of impact described in the FEIR for installation of the fish screen and fish ladder.

As identified in the FEIR for the adopted project, the fish ladder, screens, and sluiceways would be automated and would be controlled remotely by a Supervisory Control and Data Acquisition (SCADA) system linked to SFPUC operations by a Very Small Aperture Terminal (VSAT) communication system. Information would be transmitted through buried cables to be installed from the Control Building to a VSAT antenna 900 feet north and adjacent to Camp Ohlone Road. Cameras will be installed to assist with continuous observation of operations. The FEIR described associated power, communication, and maintenance equipment as located near an existing utility shed on the right (north) bank of Alameda Creek. This modification proposes instead to demolish the existing shed, which is small and near the end of its design life, and build a 16 x 16 foot Electrical Control Building and a 16 x 30 foot Maintenance Building in its place. Power would be supplied by a photovoltaic power system with battery storage and a pair of propane fueled stand-by generators would also be installed for back-up power.

As with the adopted project, the modified project would require bypassing the flow of Alameda Creek through the work area during construction, which is sometimes referred to as dewatering. The construction water bypass was not discussed in detail in the FEIR. Based on current designs, it is anticipated that a dam and flume pipe system would be constructed, which would generally involve the construction of a temporary gravel bag dam on the upstream side of the work area lined with polyethylene sheeting or steel plates that directs water into a flume through which creek flow would be conveyed downstream via gravity. This would isolate creek flow through the construction site and prevent it from being exposed to construction debris and potential pollutants. Dewatering pumps could also be temporarily used to remove residual seepage from the bypass or groundwater into the construction area as needed. The final creek bypass and dewatering methods would be developed in collaboration with the SFPUC's Contractor after a construction contract has been awarded. The Contractor's plan would be subject to the approval of the CDFW and RWCQB prior to implementation.

As with the adopted project, access to the site would be via the existing access road located off of Geary Road/Camp Ohlone Road However, in order to facilitate safe access by large trucks, the SFPUC has identified the need to widen the road at nine locations. This proposed modification would allow widening the road at these locations, including cut and fill, re-construction of roadside ditches, addition of road base to elevate the road, installing self-supported retaining walls, and culvert replacement and extension. All improvements would be designed, maintained, and constructed in accordance with American Association of State Highway and Transportation Officials (AASHTO) standards for the design of very low-volume roads.

The FEIR indicates that staging areas will occur in the immediate area to be used for construction of the ACDD fish ladder, screens, and associated facilities. This modification proposes to use several additional

[5] The sluiceways move (or sluice) sediment from behind ACDD around it to the other side to prevent sediment buildup and related impacts to the dam.

staging areas as shown on Figure 1. Staging Area 1-1 located on the north side of Camp Ohlone Road would be used for the permanent disposal of the approximately 25,000 cubic yards of excess spoil (soil and rock) that would be generated. To facilitate this, several trees would be removed and the spoil would be incorporated into the existing slope and seeded with a native grassland mix. Staging Area 1-2, located on each side of Camp Ohlone Road between Staging Area 1-1 and the main work area, would be used for material storage and deliveries. Staging Area 1-3, on the south side of Camp Ohlone Road adjacent to Staging Area 1-1 and the communications tower, would be used for office trailers, and a storage area. Lastly, two staging areas that were utilized during the SFPUC's recent Geary Road Bridge Project would be used: Staging Area 1-4 is on the south side of Geary Road Bridge and Staging Area 1-5 is within the East Bay Regional Park Corporation Yard. These would be used for construction trailers and equipment storage or deliveries as necessary. Upon project completion, these staging areas would be restored to approximately pre-construction conditions; i.e., non-native annual grassland, except for Staging Area 1-1 where the excess spoils would be placed. The spoils pile would vary in final contour from pre-construction condition; however it would be seeded and thus restored to non-native annual grassland.

Lastly, the FEIR described the duration of the ACDD project would be 6 months but due to the complexity of the final design and regulatory requirements that limit work within Alameda Creek to the dry season, the construction period would be approximately 24 months under the modified project and would occur over two summer seasons instead of one. Although the project would occur over two summers, the construction level of effort would be similar to the adopted project (FEIR Table 9.3) because, as described above, the total length of the modified fish ladder would be similar, fish screens, as required, are in the adopted and modified project, and the adopted project included the extensive grading to stabilize the slopes above the fish ladder. The road improvements would be done by personnel and equipment already planned to be onsite for other construction activities, and the additional staging areas would require minimal additional work and equipment to establish because they are already relatively flat.

PREVIOUS PROJECT MODIFICATIONS

On December 13, 2012, the San Francisco Planning Department, in its capacity as the CEQA lead agency, issued an addendum to the FEIR documenting that project modifications proposed by the SFPUC to abate geotechnical hazards related to a previously unknown landslide feature in the left dam abutment for the new dam would not result in any new significant impacts beyond those identified in the FEIR or substantially increase the severity of a significant impact, and that no new mitigation measures would be required.[6] The project modifications described in the December 12, 2012 addendum increased the total volume of materials required to be excavated, handled and disposed for the project associated with construction of the left dam abutment and spillway to 9.57 million cubic yards; increased the project footprint by 29.1 acres due to use of five new disposal sites (Disposal Sites A/D, F, G, H, and I); and increased the duration of construction from 4 to 7 years.

On July 22, 2013, the San Francisco Planning Department, in its capacity as the CEQA lead agency, issued an addendum to the FEIR describing project modifications proposed by the SFPUC to place approximately 390,000 cubic yards (CY) of fill containing naturally occurring asbestos (NOA) and associated metals at Disposal Sites F and I below elevation 756 feet within the future inundation zone of the reservoir, and to relocate the hard rock previously planned to protect the toe of the fill at Disposal Site 3 to the face of the fill at

[6] Addendum to Environmental Impact Report, Calaveras Dam Replacement Project, Case No, 2005.0161E, San Francisco Planning Department, December 13, 2012.

Disposal Site I. The addendum documented that the project modifications would not result in any new significant impacts beyond those identified in the FEIR, or substantially increase the severity of a significant impact, and no new mitigation measures would be required.[7]

In addition, the SFPUC has proposed various minor refinements during the course of project construction. The San Francisco Planning Department reviewed each of these project modifications, concurred that they were minor, and determined that the project as modified would not deviate from the adopted project such that it would result in any new significant impacts beyond those identified in the FEIR or substantially increase the severity of a significant impact, and that no new mitigation measures would be required. Table 1 summarizes the minor project modification (MPMs) that the Planning Department has reviewed for the project.

Table 1: Minor Project Modifications

MPM Number	Approval Date	Description
1	05/17/11	In accordance with air quality mitigation provided in FEIR, install 12 air monitoring stations in the project vicinity
2	06/02/11	Relocate two air quality monitoring stations addressed previously in MPM 1
3 *	07/11/11	Delay implementation of California Tiger Salamander mitigation to the 2011-2012 rainy season
4 *	10/19/11	Expand the limits of construction for Disposal Site 3 temporary bypass pipe and rock dike
5	10/26/11	Extend construction hours to 24 hours during 3 month site preparation at Disposal Site 3
6	N/A	Note: MPM was initiated but due to design changes, was not implemented
7 *	12/7/11	Increase the construction limits to provide additional work area at the right abutment and to provide improvements to the existing boat ramp access road
8	12/6/11	Install two survey monuments outside the construction limits
9	2/21/12	Place construction staff trailer in existing parking area and excavate an approximately 960-foot long trench (12 inches deep by 8 inches wide) to provide power from an existing power pole
10 *	2/8/12	Widen road to maintain two-way traffic while providing additional area for a wheel-wash area, required for health and safety (asbestos dust mitigation)
11 *	2/8/12	Expand the haul route to Disposal Site 7 for approximately 1 mile resulting in additional habitat impacts subject to compensatory mitigation provided in the FEIR
12 *	2/8/12	Expand the construction work area at Borrow Area B resulting in additional habitat impacts subject to compensatory mitigation provided in the FEIR
13	3/28/12	Use two Tier 2 diesel engine Dozers (D11) that do not have the California Air Resources Board (CARB) Level 3 Diesel Emission Control Strategies

[7] Addendum to Environmental Impact Report, Calaveras Dam Replacement Project, Case No, 2005.0161E, San Francisco Planning Department, July 22, 2013.

14 *	4/4/12	Modify Staging Area 6 to provide access to construction personal vehicles without having to traverse areas within the project that may contain naturally occurring asbestos
15 *	5/15/12	Modify construction method to replace use of a barge with land based approach at ADIT#2 and use of a platform extending from the shoreline at ADIT#1 due to low water levels
16 *	5/22/12	Expand Disposal Site 3 to correct a grading/ponding issue and reduce construction footprint by equivalent amount at Staging Area 3 resulting in no net change in habitat impact
17	6/17/12	Realign a portion of the west haul route to address a perceived safety issue
18 *	6/25/12	Modify the slope of the left dam abutment excavation to 2:1 (included in description of proposed project modifications addressed in this addendum)
19 *	7/11/12	Develop new Disposal Site 10 with a capacity of approximately 2 million cubic yards for the additional excavation required at the left bank of the new dam (included in description of proposed project modifications addressed in this addendum)
20 *	7/16/12	Increase capacity of Disposal Site 2 located behind the new dam and below the inundation level from 900,000 to 1.3 million cubic yards (included in description of project modifications addressed in this addendum)
21	7/30/12	Install 2 temporary geologic slope monitoring stations located outside of the approved work area, each occupying about 16 square feet of surface area and extending about 30 inches above grade and 3 feet below grade
22	11/5/12	Improve existing boat ramp
23 *	11/5/12	Restore berm at existing cattle pond that serves as relocation area for California tiger salamander as requested by CDFG with USFWS concurrence
24	3/26/13	Use a Tier 2 diesel engine 5130 excavator that does not have the California Air Resources Board (CARB) Level 3 Diesel Emission Control Strategies
25	7/26/13	Accommodate blasting on Saturday, August 3, 2013 in an area without naturally occurring asbestos (NOA).
26	1/6/14	Installation of a buried irrigation line and solar panel at the Sheep Camp Creek Bioregional Habitat Restoration (aka Koopman Road).
27	6/4/14	Concrete disposal in DS3
28	8/26/14	ACDD Geotechnical Investigation
29	10/9/14	Install air monitoring station A3b in the East Bay Regional Park
30	12/10/15	Scaling and rock netting of slope above Borrow Area B

*Planning Department approval was subject to concurrent approval from the applicable state and federal agencies, including DSOD, CDFW, RWQCB, USFWS, and/or USACE

APPROVALS REQUIRED

Approvals are required from the California Department of Fish and Wildlife, Regional Water Quality Control Board, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers for the proposed project modifications described in this addendum. No other approvals are required for the proposed project modifications.

ANALYSIS OF POTENTIAL ENVIRONMENTAL EFFECTS

Section 31.19(c)(1) of the San Francisco Administrative Code states that a modified project must be reevaluated and that, "If, on the basis of such reevaluation, the Environmental Review Officer determines, based on the requirements of CEQA, that no additional environmental review is necessary, this determination and the reasons therefore shall be noted in writing in the case record, and no further evaluation shall be required by this Chapter."

California Environmental Quality Act (CEQA) Guidelines Section 15164 provides for the use of an addendum to document the basis for a lead agency's decision not to require a subsequent FEIR for a project that is already adequately covered in a previously certified FEIR. The lead agency's decision to use an addendum must be supported by substantial evidence that the conditions that would trigger the preparation of a Subsequent FEIR, as provided in CEQA Guidelines Section 15162, are not present.

This section evaluates the potential environmental effects of the proposed modifications, herein referred to as the "modified project", relative to the impacts of the "adopted project" as disclosed in the FEIR. The FEIR on the project found that implementation of the project would result in significant unavoidable impacts during construction. Since certification, other than as explained and discussed in this addendum, in the December 13, 2012 addendum, and in the July 22, 2013 addendum, no changes have occurred in the project or in the circumstances under which the adopted project would be undertaken, and no new information has emerged that would materially change any of the analyses or conclusions of the FEIR. For the reasons discussed below, the modified project would not result in any substantial changes that would require major revisions to the FEIR, nor would new significant environmental effects or a substantial increase in the severity of previously identified significant effects occur. The modified project would not cause significant impacts relative to Utilities and Service Systems or Public Services because the impacts to these resources would be the same as analyzed in the adopted project and would be less than significant. The additional import of material on Calaveras Road associated with this modification would not substantially increase the demand for fire or other public services such that the construction of new such facilities would be required (the construction of which could have impacts on the environment) because the potential demand for fire protection services would be the same for the modified project as it would be for the adopted project at ACDD, and controls would remain in place to minimize the necessity of other public services, as defined in the Alameda Watershed Management Plan. The total amount of construction debris associated with the modified project would be minimal such that it would not result in a substantial increase that could adversely affect land fill capacity. Thus, these environmental topics are not discussed further.

The FEIR, including the significance conclusions therein for the adopted project, would thus remain the same for the modified project and all mitigation measures from the EIR would be applied as applicable. Therefore, no additional environmental review is necessary beyond this addendum.

Plans and Policies

The FEIR discusses plans and policies relevant to the adopted project. Plans and policies relevant to the modified project are identical to those for the adopted project, and the consistency of the modified project with those plans and policies is also identical to that described in FEIR. The FEIR provides an evaluation of the project's consistency with various San Francisco and applicable local plans and policies. The analysis concludes that, with mitigation, the adopted project would not conflict with these plans and policies.

The modified project would result in additional import of hard rock to construct the Zone 5/5A portion of the dam embankment and updated fish passage improvements and associated access and staging areas for the ACDD project. These modifications would not alter the nature or purpose of the project, nor would they affect planning areas that were not considered in the FEIR for the adopted project. In addition, the project is located entirely on property owned by the City and County of San Francisco (CCSF) and, consistent with California Government Code Section 53090, would not be subject to the planning and building laws of other

cities and counties, including Alameda and Santa Clara Counties. Because the proposed modifications would not change the basic characteristics of the adopted project or alter the project's overall consistency with applicable land use plans and policies, the modified project would not result in any new significant impacts beyond those identified in the FEIR or substantially increase the severity of any significant impacts, and no new mitigation measures would be required.

Land Use, Agricultural Resources, and Recreation

The FEIR determined that the project would not result in any significant land use impacts with respect to: (1) construction impacts – 4.3.1; (2) operational impacts – 4.3.2; (3) Consistency with land use plans, policies, and regulations – 4.3.3; (4) impact of construction on grazing lands – 4.3.4; (5) impacts of operation on agricultural uses – 4.3.5; (6) impacts of construction activities on established recreational uses – 4.3.6; or (7) cumulative impacts - 6.2.3.1. Existing land uses, agricultural uses, and recreational uses in the vicinity of the modified project are the same as described for the adopted project. The proposed project modifications would not result in any new significant effects on land use, agricultural resources, or recreation beyond those identified in the FEIR or an increase in the severity of a significant impact, and no new mitigation measures would be required.

The FEIR determined that the adopted project would result in temporary impacts on grazing lands from construction-related traffic, noise, and off-site emissions of dust. The proposed modifications would not affect agricultural land of statewide importance. The proposed modifications would affect a limited area of additional grazing land; however, the temporary impact on grazing land would be small compared with the total area of grazing land available in the region. Thus, as described for the adopted project, the modified project would not make a substantial contribution to any region-wide cumulative losses of agricultural land in the Bay Area, and its contribution to cumulative impacts on agricultural resources would be less than significant.

The proposed project modifications would result in an incremental increase in impacts on recreational uses from construction-related traffic, noise, and off-site emissions of dust compared with the adopted project due to additional hauling. As with the adopted project, the proposed modification associated with recreation would be mitigated to a less-than-significant level through implementation of Mitigation Measures 5.12.4a (Traffic Control Plan); 5.12.4b (Approval of Road Closures); 5.13.1a, 5.13.1b, 5.13.3a, 5.13.3b (Dust and Exhaust Emissions); and 5.14.1 (Noise Controls). Thus, the modified project would not result in any new significant effects beyond those identified in the FEIR or substantially increase the severity of a significant impact, and no new mitigation measures would be required. Further, as described for the adopted project, the modified project would not make a substantial contribution to any cumulative impact on recreation uses, and the contribution to cumulative impacts would be less than significant.

Vegetation and Wildlife

The vegetation and wildlife setting for the modified project is the same as described in the FEIR for the adopted project.

Import of additional hard rock for Zone 5/5A construction would not affect vegetation and wildlife. The activities associated with the import of additional material would be limited primarily to existing roads or other previously disturbed areas where the imported material would be stockpiled. Though less rock would utilized from Borrow Area B, the full extent of the borrow area would still be affected.

As discussed in the FEIR, construction activities for the adopted project would impact wetlands, other aquatic habitats (i.e., creeks and riparian), and upland habitats where the following special status species may occur: California red-legged frog, which is listed as threatened under the federal Endangered Species Act (FESA) and is a state species of special concern; California tiger salamander, which is a state and federally threatened species; Alameda whipsnake, which is a state and federally threatened species; foothill yellow-legged frog, which is a state species of special concern; and western pond turtle; a state species of special concern. The ACDD project is part of the overall CDRP project and contributes only a small portion

of the total habitat impacts from implementation of the CDRP project. The FEIR, and subsequent addendums and project modifications, disclosed that the project would have 66 acres of temporary and 606.5 acres of permanent impacts on upland habitat (672.5 total acres) and 34.07 acres of temporary and 5.26 acres of permanent impacts on aquatic habitats (39.33 total acres), inclusive of creeks, wetlands and riparian habitats.

The proposed updates to the ACDD project would affect vegetation and wildlife (Figures 2a and 2b). The majority of the additional impacts would occur in upland habitat. The modified project would result in an additional 10.04 acres of temporary and 0.97 acres of permanent impacts to upland habitat (11.01 total acres). Relative to the total 672.5 total acres of upland impacts disclosed in the FEIR and subsequent addendums, the modified project would increase impacts by less than two percent. This represents an incremental increase in impacts on special status species upland habitat. As with the adopted project, under the modified project, pursuant to Mitigation Measures 5.4.2 (Habitat Restoration Measures), the SFPUC would restore the additional area of temporary habitat impacts. Under Mitigation Measure 5.4.3a, the SFPUC would compensate for the additional permanent impacts relating to a loss of upland habitat for California red-legged frog, California tiger salamander, and Alameda whipsnake by enhancing and/or protecting and maintaining upland habitat at one or more mitigation areas, with resource agency concurrence. Five mitigation areas are described in the FEIR: Grimes, San Antonio, Sheep Camp Creek, Goat Rock, and Goldfish Pond. Adequate and feasible opportunities are available at the Goat Rock Mitigation Area to fully compensate for the additional upland habitat impact.[8] Construction activities within this additional area would also, in turn, increase the potential to encounter and impact the special status species listed above that use upland habitat as refuge and/or dispersal habitat. As with the adopted project, measures would be implemented to avoid and minimize impacts to listed species within upland areas during construction, pursuant to Mitigation Measure 5.4.1 (Avoidance and Minimization Measures), including, wildlife exclusion fencing, pre-construction surveys, and monitoring. Therefore, the modified project would not result in any new significant effects on upland habitat and species that use this habitat beyond those identified in the FEIR or substantially increase the severity of a significant impact, and no new mitigation measures would be required.

The modified project would result in an additional 0.4 acres of temporary and 0.11 acres of permanent impacts to aquatic habitat (11.01 total acres) (Figures 2a and 2b). Relative to the total 39.33 acres of aquatic impacts disclosed in the FEIR and subsequent addendums, the modified project would increase impacts by about three percent. This represents an incremental increase in impacts on aquatic habitat for special status species. As with the adopted project, implementation of Mitigation Measures 5.4.2 (Habitat Restoration Measures) and 5.4.3 (Compensation Measures) would reduce these impacts to wetlands and other aquatic habitats to a less-than-significant level. As also with the adopted project, during construction in the additional aquatic habitat, species could be affected if present and sediment or other pollutant discharges could be released during excavation for the fish ladder and screens and during transport to the disposal site, which could degrade wetland and stream habitat. However, as also with the adopted project, implementation of Mitigation Measures 5.4.1 (Avoidance and Minimization Measures) and Mitigation Measure 5.7.1 (Storm Water Pollution Prevention Plan) would minimize or avoid these impacts to the extent feasible and would minimize water quality degradation. These same measures would be implemented under the modified project, which would similarly maintain these impacts to wetland and other aquatic habitats at less-than-significant levels. Therefore, the modified project would not result in any new significant effects on wetlands, streams or riparian habitats beyond those identified in the FEIR or substantially increase the severity of a significant impact, and no new mitigation measures would be required.

[8] Lyman, Greg, SFPUC, Email to Brett Becker, SFPUC, November 30, 2012.

The proposed modifications would not have an additional impact on habitat for callippe silverspot butterfly because habitat and the host plant for this species is not present in the additional work areas (BioMaAS 2015). Mitigation measures including preconstruction surveys (Mitigation Measure 5.4.1a) and control of dust generated (Mitigation Measures 5.9.2a and 5.13.1a) would reduce impacts to less than significant. Thus, the modified project would not result in any new significant effects beyond those identified in the FEIR or a substantial increase in the severity of a significant impact, and no new mitigation measures would be required.

The FEIR determined that construction activities for the adopted project, including the ACDD project, within Calaveras and Alameda Creeks could have a significant adverse impact on foothill yellow-legged frog and western pond turtle, which are state species of special concern. As discussed above, the modified project would have a minimal increase the area of impact in wetland and other aquatic habitats, including Alameda Creek, and thus would not be likely to substantially increase habitat impacts for these species or the area in which they could be exposed to construction activities. The FEIR concluded that other potential direct and indirect impacts to these species will be reduced to a less-than-significant level with implementation of Mitigation Measures 5.4.1 (Avoidance and Minimization Measures) and 5.7.1 (Storm Water Pollution Prevention Plan) by requiring preconstruction avoidance and minimization measures and preventing water quality degradation. Specifically, Mitigation Measure 5.4.1a requires that a qualified biologist perform preconstruction surveys of suitable foothill yellow-legged frog habitat 2 weeks before work activities begin and immediately after work commences, and to consult with USFWS and CDFW if foothill yellow-legged frogs in any life stages are found to ensure they are appropriately handled and protected. Mitigation Measure 5.4.1b requires that stream crossing construction activities be timed to minimize impacts on foothill yellow-legged frog and that stream crossings be installed and removed during dry conditions. Mitigation Measure 5.4.3 (Compensation Measures) would compensate for temporal, long-term, and permanent impacts. Implementation of these same measures during the modified project would ensure that activities associated with the modified project would not have a substantial increase in impacts on these species and that impacts to these species will remain less than significant.

The FEIR determined that construction activities for the adopted project could have a significant adverse impact on nesting raptors, migratory birds, special status bats or other species of special concern which could utilize habitats in the project area. Approximately 10.25 acres of additional temporary and 1.05 acres of additional permanent impacts to upland and aquatic habitats that could be used by migratory birds, bats, and other species of special concern would be impacted as part of the proposed modification. This impact would represent an incremental increase based on the more than 600 acres of temporary and permanent habitat impacts that was described in the FEIR. As with the adopted project, the modified project would be subject to implementation of Mitigation Measures 5.4.1a (Pre-construction Measures); 5.4.1b (Construction Measure); and 5.4.2 (Habitat Restoration Measures), and Mitigation Measure 5.4.3 (Compensation Measures), which would reduce these impacts to a less-than-significant level. Therefore, the modified project would not result in any new significant effects on nesting raptors, migratory birds or other species of special concern beyond those identified in the FEIR or substantially increase the severity of a significant impact, and no new mitigation measures would be required.

As discussed in the FEIR, the adopted project would have a significant adverse impact on oak woodland and savannah habitat. Under the modified project, an additional, approximately 0.19 acre of this habitat would be permanently impacted and 10 oak trees at the staging and access road improvement areas would also be removed. This permanent loss of habitat would represent an incremental 0.78 percent increase over the permanent loss of 24.7 acres of oak woodlands and savannah under the adopted project as disclosed in the FEIR. As with the adopted project, to compensate for impacts to this habitat type, the modified project would be subject to implementation of Mitigation Measures 5.4.3 (Compensation Measures), which requires enhancing and establishing oak woodland and savannah habitat at the San Antonio Mitigation Area. As a result, this impact would remain less than significant. Therefore, the modified project would not result in any new significant effects on oak woodland and savannah habitat beyond those identified in the FEIR, nor

would it substantially increase the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on vegetation and wildlife

As described for the FEIR for the adopted project, the geographic scope for cumulative impacts of the modified project on vegetation and wildlife resources is the Alameda Creek watershed, and the effects of past and present developments have resulted in the current baseline conditions.

As stated in the FEIR, the adopted project in combination with the projects listed in FEIR Table 6.1 (including the Little Yosemite project) would remove or diminish the quality of oak woodlands; serpentine grasslands; habitats for special-status plants; upland habitat for California tiger salamander, California red-legged frog, and Alameda whipsnake; riparian vegetation, including habitat for foothill yellow-legged frog, and California red-legged frog; and wetland habitats. The proposed project modifications would contribute to significant cumulative impacts on upland habitat for California tiger salamander, California red-legged frog, and Alameda whipsnake and on oak habitat. However, as described above, additional impacts would be incremental and implementation of Mitigation Measures 5.4.1 (Avoidance and Minimization Measures), 5.4.2 (Preconstruction Measures), 5.4.2 (Habitat Restoration Measures), and 5.4.3 (Compensation Measures), as adjusted for the modified project, would minimize the modified project's direct and indirect impacts on these resources. Therefore, the modified project would not make a substantial contribution to any new significant cumulative impacts on vegetation and wildlife beyond those identified in the FEIR or substantially increase the severity of a significant cumulative impact, and no new mitigation measures would be required.

Fisheries and Aquatic Habitat

The fisheries and aquatic habitat setting for the modified project is the same as described in the FEIR for the adopted project.

Import of additional hard rock for Zone 5/5A construction would not affect fisheries and aquatic habitat, as the associated activities are limited primarily to existing roadways and upland access routes. The upland areas used for temporary stockpiling of this material are within previously disturbed upland areas within the project site, including the top of the existing dam (FEIR Figure S.4), Disposal Site 2, and Disposal Site F (Addendum 1 Figure 3) that would be protected from erosion or sedimentation that may impact fisheries or aquatic habitat.

The fish ladder, screens, and associated facilities would be constructed to provide passage to upstream spawning and rearing habitat above the ACDD and to serve as a bypass around the ACDD for downstream passage for migrating juvenile or adult fish. As planned under the adopted project, the modified fish passage improvements will be completed in coordination with the schedule for completion of the Calaveras Dam Replacement Project. Thus, the extended duration to construct the fish passage under the modified project would not delay implementation of this component of the adopted project overall. The extended duration of the project would increase the period during which temporary sediment and turbidity impacts could occur on fisheries and aquatic habitat. However, as with the adopted project, Mitigation Measure 5.7.1 (Stormwater Pollution Prevention Plan) would be implemented during work associated with this proposed modification to minimize sediment and contaminant releases to receiving waters. As described above, the proposed modification would only have a minimal increase the area of effects within Alameda Creek because the additional staging areas, the proposed spoils disposal site and roadway improvements would be located in upland areas outside of Alameda Creek. Implementation of 5.4.2 (Habitat Restoration Measures) and 5.4.3 (Compensation Measures), as adjusted for the modified project, would reduce the modified project's minimal additional direct and indirect impacts on these resources such that they would be similar to the adopted project. Thus, the modified project would not result in any new significant effects to fisheries and aquatic habitat beyond those identified in the FEIR or substantially increase the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on fisheries and aquatic habitat

As described in the FEIR for the adopted project, the geographic scope of cumulative impacts on fisheries and aquatic habitat is the Alameda Creek watershed. The FEIR also describes the geographic scope, along with past, present, and reasonably foreseeable future projects that have resulted/would result in cumulative impacts on fisheries and aquatic habitat in the Alameda Creek watershed. The analysis for the adopted project concluded that the combined effects of past and present projects (including other changes to the creek detailed in the FEIR) have resulted in a significant adverse cumulative impact on fisheries (including steelhead) and aquatic habitat in the Alameda Creek watershed; the same analysis would apply to the modified project.

Many of the reasonably foreseeable future projects identified in the FEIR would improve future conditions for steelhead and other native fish by removing fish migration barriers from Alameda Creek and its major tributaries, enhancing fish and riparian habitats, and reducing sedimentation. Overall, the combined effect of the adopted project, including the proposed modifications, and other future projects is expected to improve habitat conditions for steelhead and other native fish species compared to current conditions. Furthermore, the adopted project's operational impacts on fisheries and aquatic habitat is intended to be an improvement over existing conditions and thus would not be expected to contribute to adverse cumulative long-term impacts. Similarly, and as stated above, the proposed project modifications would not alter the long-term operations of the adopted project or the related benefits to fisheries and aquatic habitat.

With regard to construction-related impacts, as with the adopted project, implementation of this proposed modification would contribute to cumulatively considerable construction-related water quality impacts on steelhead and other native fish. However, like the adopted project, the modified project would be undertaken in accordance with Mitigation Measure 5.7.1 (Storm Water Pollution Prevention Plan), which would require implementation of extensive project-specific BMPs during construction, as well as post-construction site restoration and stabilization to control erosion and sedimentation and to prevent the discharge of pollutants into Alameda Creek and other waterways. As a result, implementation of this measure would reduce the modified project's contribution to cumulative construction impacts to a less than cumulatively considerable level (less than significant). Therefore, the modified project would not make a substantial contribution to any new significant cumulative impacts on fisheries and aquatic habitat beyond those identified in the FEIR, or substantially increase the severity of a significant cumulative impact, and no new mitigation measures would be required.

Hydrology

Existing hydrologic conditions for the modified project are the same as described for the adopted project in the FEIR. As determined in the FEIR, neither construction nor operation of the adopted project will have a significant impact on hydrology, geomorphology, flooding hazards or groundwater. The only aspect of the modified project that would cause impacts on hydrology that differ from those of the adopted project is the extension of the construction schedule by approximately two years. As described above, a dam and flume system would be installed to bypass, or maintain, downstream creek flow through the work during construction. The system would be designed based on historic hydrology of the creek to ensure it is adequately sized to maintain flow and thus avoid any significant erosion of the banks (i.e., if water were to cut around the bypass). (Additional temporary impact on perennial stream habitat is addressed above under Vegetation and Wildlife, and Fisheries and Aquatic Habitat Sections). The proposed project would not modify operation of the dam, the ACDT, or the release schedule as called for under the adopted project. Therefore, there would be no operational effects associated with the proposed modifications as identified in the FEIR. Therefore, the modified project would not result in any new significant effects on hydrology beyond those identified for the adopted project or a substantial increase in the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on hydrology

As described in the FEIR for the adopted project, the geographic scope for potential cumulative hydrology impacts consists of the modified project site, the surrounding watershed lands, and Alameda Creek within and downstream of the Sunol Valley.

As a result of past and ongoing projects, the flow and sediment transport regimes of Alameda Creek have been greatly altered from natural conditions, which have substantially affected stream geomorphology and channel-forming mechanisms. These existing conditions, which reflect the results of past and ongoing projects in the watershed, apply to both the adopted project and the modified project.

The FEIR describes how some of the future projects listed in FEIR Table 6.1 would have long-term effects on flow in the streams of the Alameda Creek watershed. The FEIR concludes that the adopted project would not contribute to cumulative impacts on Alameda Creek, because the cumulative projects in combination with the adopted project would have offsetting effects on flows in various reaches of Alameda Creek, or would generally result in increased flows such that no adverse cumulative impacts would occur. Because the proposed project modifications would have no long-term effects on stream flows, the modified project would not alter the conclusions reached in the FEIR. In addition, construction activities required for the modified project in conjunction with the projects listed in FEIR Table 6.1 would have no significant cumulative impacts related to stream flows, flooding, or groundwater supplies because the modified project would not alter stream flows outside of the range of past operations, would not contribute to increased risk of flooding, and would not affect groundwater supply. Therefore, the modified project would not make a substantial contribution to any new significant cumulative impacts on hydrology beyond those identified in the FEIR, and would not substantially increase the severity of a significant cumulative impact. No new mitigation measures would be required.

Water Quality

Import of the additional rock for Zone 5A would not have an effect on water quality since the associated activities would primarily occur on existing roadways and access routes, and thus would not change water quality impacts compared to the adopted project. Stockpiled material would be large and would not erode or cause erosion. The proposed project modifications to the fish ladder, screens, and associated features would extend the construction period by two years and increase the construction work area compared to the adopted project. As such, there would be additional ground disturbance for a longer period of time such that construction of the modified project could increase potential impacts on water quality impacts on Alameda Creek and groundwater due to erosion and sediment discharges to the creek and/or other contaminant discharges to the creek, such as from leaking equipment. However, as described above, the majority of the additional ground disturbance would occur in upland area away from the creek, which would minimize the potential for additional water quality effects. As with the adopted project, such significant impacts would be reduced to a less-than-significant level with implementation of Mitigation Measure 5.7.1 (Storm Water Pollution Prevention Plan), which includes site-specific Best Management Practices (BMPs) to avoid or minimize erosion and the transport of sediments to water bodies. Therefore, the modified project would not result in any new significant effects on water quality associated with soil erosion and sediment discharge during construction beyond those identified in the FEIR or a substantial increase in the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on water quality

As described in the FEIR for the adopted project, the geographic scope for potential cumulative water quality impacts consists of the project site and the surrounding watershed lands. The modified project would increase the ACDD project work area but would not result in more severe effects on the water quality of Alameda Creek, for the reasons discussed above. The ongoing and future projects summarized in FEIR Table 6.1 include ground disturbance that could cause impacts on surface and groundwater quality,

including water quality within local creeks. The impacts on surface and groundwater quality associated with the modified project and the cumulative projects could be cumulatively significant. Given the increased ground disturbance by the proposed modification and increase in the duration of construction activities, the modified project's contribution to construction-related cumulative impacts on water quality would be cumulatively considerable. However, as discussed above, the modified project would largely affect additional area in upland areas away from the creek and would be undertaken in accordance with a project-specific SWPPP as reviewed by the RWQCB. As identified in Mitigation Measure 5.7.1, BMPs would be implemented during construction to minimize erosion and sediment transport, accidental spills, solid waste discharges, and dewatering activities. Mitigation Measure 5.7.1 requires frequent inspection and maintenance of the BMPs throughout project construction to ensure their effectiveness, and requires the SFPUC or its contractors to monitor and report on the effectiveness of the required BMPs. Implementation of these measures would reduce water quality impacts such that the contribution of the modified project to cumulative impacts would not be considerable. Therefore, the modified project would not result in any new significant cumulative impacts on water quality beyond those identified for the adopted project or substantially increase the severity of a significant cumulative impact, and no new mitigation measures would be required.

Geology, Soils, and Seismicity

Existing geology, soils, and seismicity conditions for the modified project are substantially the same as those described for the adopted project. Import of the additional rock for Zone 5/5A would not have an effect on geology, soils, and seismicity conditions since the associated activities would primarily occur on existing roadways and access routes, and thus would not change impacts compared to the adopted project.

At the ACDD project site, the proposed modification would increase the area of ground disturbance during construction. As a result, there is an increased potential for soil loss from wind and rain erosion. During the planning phase, geotechnical investigations identified a previously unidentified potential surficial landslide above the right bank of Alameda Creek. The updated design of the ACDD project as proposed in this modification accounts for these seismic features by including a retaining wall to protect the screens from a potential surface slide.[9] The adopted project did not specify where excess soil and rock (spoils) from the construction would be disposed. This modification includes the disposal of approximately 25,000 cubic yards of excess soil and rock material at Staging Area 1-1. As is the case for the disposal sites in the adopted project, the excess soil and rock disposed at this additional area under the modified project may be subject to settlement, differential settlement, erosion, and seismic induced failure. If a failure of the disposal site were to occur, it would pose minimal hazards to humans as no structures would be built in these areas. However, a failure could result in other impacts on the environment such as effects on sensitive habitats, fish and aquatic environments, areas for which restoration is planned.

As with the adopted project, soil loss would be minimized through implementation of Mitigation Measure 5.7.1 (Storm Water Pollution Prevention Plan) and dust control BMPs identified in Mitigation Measure 5.13.1a. In regard to geologic hazards, seismicity, and soils loss due to the landslide on the right bank of Alameda Creek and new spoils disposal area, the SFPUC is incorporating the recommendations from the geotechnical analysis conducted for ACDD into the final design plans as per the Mitigation Measure 5.8.3. These include construction benches, revegetation and incorporating surface drainage control measures to control erosion and stabilize the disposal site. In addition, the SFPUC's standard construction measures and Mitigation Measure 5.7.1 (Storm Water Pollution Prevention Plan) would reduce these impacts to a less-than-significant level by requiring the contractor to stabilize soils that may be erodible or unstable.

[9] Supplemental Geotechnical Investigation Memorandum; Fish Passage Facilities within the Alameda Creek Watershed; URS Corporation, November 2015.

Therefore, the implementation of the modified project would not result in any new significant effects beyond those identified for the adopted project or an increase in the severity of a significant impact on geology, soils, and seismicity, and no new mitigation measures would be required.

Cumulative impacts on geology, soils, and seismicity

As described in the FEIR for the adopted project, the geographic scope for cumulative geologic and seismic impacts is the area surrounding Calaveras Dam and Reservoir. Past projects, including historical and current SFPUC regional water system facilities and mining operations, have modified the topographic and geologic landscape in the vicinity of the project site.

As noted for the adopted project, none of the projects listed in FEIR Table 6.1 would contribute to any geological hazards at the project site, including landslides, squeezing ground within the outlet tunnel and adits, fault rupture, ground shaking, liquefaction, or adverse soil conditions. The FEIR determined that neither the adopted project, nor the projects listed on FEIR Table 6.1 would contribute to a significant cumulative impact resulting from substantial changes to a unique topographic or geological feature. There are no other unique topographic or geological features in the additional area that would be affected under the modified project. As discussed above, the modified project would not result in a substantial change to a unique topographic or geologic or physical feature and thus, as with the adopted project, there would be no cumulative impact. There is an area of potential surficial landslides on the right bank of Alameda Creek; however, this is a local geologic feature and the project has been addressed to design it such that activities under the modified project at this location would not contribute to greater cumulative geological, soil, and seismic conditions elsewhere.

The potential soil loss associated with the modified project due to the additional area of impact, additional duration of the project and associated with the spoils disposal site at Staging Area 1-1, and the cumulative projects in the vicinity would be cumulatively significant, and like the adopted project, the modified project's contribution would be cumulatively considerable. As described above, implementation of soil erosion protection measures as part of Mitigation Measure 5.7.1 (Storm Water Pollution Prevention Plan) would reduce this impact to a less than cumulatively considerable (less-than-significant) level. Therefore, the modified project would not make a substantial contribution to any new significant cumulative impacts related to soil loss beyond those identified for the adopted project or substantially increase the severity of a significant cumulative impact, and no new mitigation measures would be required.

Hazards and Hazardous Materials

The import of material for Zone 5/5A and the modification of the ACDD project would not change the analysis of the potential release of hazardous material to soil and groundwater, risk of fires in an area of high fire danger, release of hazardous building materials, or potential to encounter existing hazardous material in the environment during construction. The haul trucks would use the same roads as the adopted project and would thus not expose more sensitive areas to leaks and spills. As under the modified project, haul trucks would be maintained per manufacturer recommendations on a regular basis to prevent leaks and spills. With respect to NOA, as a result of the higher concentration of shale material in Borrow Area B (unsuitable for the dam), which is a non-NOA containing material, the total NOA emissions for the project will decrease, even though the whole of Borrow Area B will be excavated (the shale material is still needed elsewhere).

The proposed modifications to the fish ladder, barriers, and associated features to be done as part of the ACDD project would involve an incremental increase in the extent of the construction area and would extend the construction period by approximately two years, expanding the duration and extent of potential impacts involving release of hazardous materials. As with the modified project, potential hazards associated with this incremental increase would be mitigated to less-than-significant levels with the measures identified in the FEIR, including Mitigation Measure 5.9.2b (Construction Worker Protection); Mitigation Measure 5.9.5 (Hazardous Materials in Structures to be Demolished), which requires legal disposal of electrical equipment containing PCBs as well as fluorescent light tubes and ballasts; and Mitigation Measure

5.7.1 (Storm Water Pollution Prevention Plan), which requires preparation and implementation of a SWPPP, as required by the RWQCB. The SWPPP would specify handling, storage, and spill response requirements for hazardous materials used during construction. The proposed modifications to the fish ladder, barriers, and associated features to be done as part of the ACDD project would involve an increase in ground disturbance in areas that may contain subsurface NOA-containing geologic units. However, the potential for excavating these NOA-containing materials is small[10] such that that the modified project would result in an incremental increase in NOA emissions. Moreover, the additional extent of ground disturbance is marginal relative to the total area of the adopted project where work activities would occur in areas of NOA. As with the adopted project, impacts of the modified project associated with NOA during excavation would be minimized with implementation of the measures identified in the FEIR, including the dust control BMPs identified in Mitigation Measure 5.13.1a and Mitigation Measures 5.9.2a (Asbestos Dust Mitigation Plan and Comprehensive Air Monitoring Program). Mitigation Measures 5.9.2a requires that the SFPUC comply with the Asbestos Airborne Toxics Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations, and implement dust control and corrective actions (as needed) to ensure that visible dust emissions would not cross the work area boundaries and that project-related emissions of asbestos and naturally occurring metals would not result in an excess cancer risk. Thus the proposed modification would not substantially increase significant impacts associated with NOA.

Thus, implementation of the modified project would not result in any new significant effects related to hazards and hazardous materials beyond those identified for the adopted project or an increase in the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts of hazards and hazardous materials

As described in the FEIR for the adopted project, the geographic scope for cumulative impacts on hazards and hazardous materials includes the lands surrounding the reservoir, including the Calaveras Road corridor, and the Sunol Valley region.

The modified project would not contribute to additional cumulative impacts related to the release of contaminants such as petroleum hydrocarbons and pesticides because there no contaminated sites present in the additional areas to be excavated that would contribute to a cumulative impact. None of the projects listed in FEIR Table 6.1 would be constructed at or directly adjacent to the adopted project or modified project sites, so no cumulative impact associated with the release of contaminants from those projects would occur.

The FEIR determined that the adopted project could contribute to cumulative impacts associated with the release of NOA and metals during construction. With two possible exceptions, most projects listed in FEIR Table 6.1 are located at sufficient distances from the Calaveras Dam site such that no cumulative effects of airborne NOA would result. The two exceptions are the Geary Road Bridge and the Little Yosemite projects. The Geary Road Bridge project was completed 2014 and will thus no longer contribute to a cumulative impact. The Little Yosemite project is not expected to overlap with implementation of the proposed modifications: the anticipated start date is undetermined. Further, the Preliminary Mitigated Negative Declaration published for this project indicated no emissions of NOA were expected during construction, based on project-specific sampling conducted at the project site[11] . Under the modified project, there would be a decrease in NOA emissions associated with importing material for Zone 5/5A and other areas within the site, and an incremental increase associated with the ACDD project such that the project would not cause a substantial increase in the contribution to cumulative NOA emissions. Implementation of the dust control BMPs identified in Mitigation Measure 5.13.1a and Mitigation Measure 5.9.2a (Asbestos Dust Mitigation Plan

[10] Supplemental Geotechnical Investigation Memorandum; Fish Passage Facilities within the Alameda Creek Watershed; URS Corporation, November 2015.

[11] Preliminary Mitigated Negative Declaration for the Little Yosemite Fish Passage Project, Case No. 2014.0956E, November 20, 2014.

and Comprehensive Air Monitoring Program) during all project activities, including the proposed modification, would further reduce the project's contribution to a less-than-significant level.

As such, the project's contribution to any cumulative impact associated with airborne NOA and metals would continue to not be cumulatively considerable. Therefore, the modified project would not make a substantial contribution to any new significant cumulative impacts related to hazards and hazardous materials beyond those identified for the adopted project or substantially increase the severity of a significant cumulative impact, and no new mitigation measures would be required.

Cultural Resources

The FEIR evaluated impacts of the adopted project on cultural resources. Existing cultural resource conditions for the modified project are the same as described for the adopted project. Import of the additional rock for Zone 5/5A and other areas of the project site would not have an effect on cultural resources since the associated activities would primarily occur on existing roadways and access routes where cultural resources are not present.

Under the modified project, the project limits and associated extent of ground disturbance would slightly increase for the ACDD project features. The CEQA-Area of Potential Effects (C-APE) for the modified project has been expanded slightly, as compared with the previously approved C-APE, to include an additional 12 acres. This additional area was subjected to an intensive pedestrian archaeological survey in June 2014 and August 20, 2015.[12] The survey found one previously unrecorded cultural resource within the C-APE (ACDD CR#1). This resource will be avoided by the construction project through the construction specifications. The modified project is anticipated to have a very low potential for exposing buried archaeological resources during implementation elsewhere because the additional areas that would be used beyond the adopted project are for disposal of spoil material, staging areas, and roadway improvements where activities would be largely confined to the surface or involve only shallow soil disturbance where cultural resources are not likely to be encountered. As with the adopted project, with the implementation of Mitigation Measure 5.10.1 (Archaeological Evaluation and Monitoring, and Treatment of Human Remains) and Mitigation Measure 5.10.2 (Accidental Discovery Measures) identified in the FEIR, the modified project would not result in any new significant impacts and no substantial increase in the severity of a significant impact on archaeological resources.

Historic structure and paleontological resources were evaluated in the FEIR. There would be no new impacts to these resources with implementation of the modified project because there are no structures in the additional work area and because the geologic formations in the area as identified in the FEIR and have a low sensitivity for paleontological resources (FEIR Figure 4.8-1b).

Thus, implementation of the modified project would not result in any new significant effects beyond those identified in the FEIR or a substantial increase in the severity of a significant impact on cultural resources, and no new mitigation measures would be required.

Cumulative impacts on cultural resources

As described in the FEIR for the adopted project, the geographic scope of cumulative impacts on cultural resources includes the CDRP Cultural Resources Study Area and the Sunol Valley region.

As described above, the modified project would not result in any new significant impacts on known or unknown archaeological resources, historical architectural resources, or unknown paleontological resources beyond those identified for the adopted project. Therefore, the modified project's contribution to cumulative cultural resources impacts would be similar to those identified for the adopted project; that is, the modified project's contribution to cumulative impacts on archaeological resources and paleontological resources

[12] Memorandum; Results of Cultural Resources Survey for the Alameda Creek Diversion Dam (ACDD) Fish Passage Facility Design Update; URS , 2014, June 20, 2014; updated September 24, 2015.

could be cumulatively considerable. However, with implementation of Mitigation Measures 5.10.1 (Archaeological Evaluation and Monitoring, and Treatment of Human Remains), 5.10.2 (Accidental Discovery Measures), and 5.10.5 (Paleontological Resources), the modified project's contribution to these cumulative impacts would be less than cumulatively considerable (less than significant).

Therefore, the modified project would not make a substantial contribution to any new significant cumulative impacts on cultural resources beyond those identified in the FEIR or substantially increase the severity of a significant cumulative impact, and no new mitigation measures would be required.

Visual Resources

Existing visual resource conditions for the modified project are the same as described for the adopted project. Import of the additional rock for Zone 5/5A and other areas of the project site would not have an effect on visual resources since the associated activities would primarily occur on existing roadways and access routes.

The construction associated with ACDD would entail similar construction equipment and similar numbers of workers as the adopted project. The proposed ACDD project area at Alameda Creek is not visible from with the Sunol Regional Wilderness. Thus, the extended duration of work at the creek would not affect public views from the wilderness area. The proposed modification includes a new, permanent spoils stockpile area at Staging Area 1-1; however there are no publically accessible vantage points or designated scenic county roads in the vicinity of the site. The road widening activities to improve Camp Ohlone Road/Geary Road for use by large trucks would be visible from within the Sunol Regional Wilderness. Under the adopted project, park users will already have views of construction from the Sunol Regional Wilderness, which was disclosed in the FEIR as a significant and unavoidable impact. The additional view of the minor grading of slopes that would occur at several locations along Camp Ohlone Road/Geary Road to improve the road under the modified project would represent an incremental increase in visual effects on park users and would be limited to a short period of time. The affected areas along the road (i.e., cut and fill slopes) would be revegetated upon completion of the improvements and thus would not be discernable from the surrounding area in the long-term. Implementation of the modified project would thus not result in any new significant effects on visual resources beyond those identified in the FEIR or a substantial increase in the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on visual resources

The geographic scope for cumulative visual impacts for the project is limited to those areas of the Alameda Creek watershed where public views of the Calaveras Dam and Reservoir are available. These areas include parks in the vicinity of the dam and reservoir, particularly the Sunol Regional Wilderness, and segments of county roads in the vicinity of the reservoir.

Most of the anticipated projects identified in FEIR Table 6.1 are outside of the geographic scope of the project's visual impacts. Because the adopted project site is at the south end of the Sunol Valley, and is physically separated from the other projects, the potential for cumulative visual impacts is limited. Similar to the adopted project, the modified project would have some temporary significant and unavoidable visual impacts associated with the road improvements along Geary Road and could contribute to cumulative visual impacts. However, at locations in the Sunol Valley where views of the other projects are provided, views of the modified project would be minimal, if visible at all, due to the physical separation from the other projects. Consequently, the modified project and other projects are not expected to result in significant cumulative impacts on visual resources when viewed from locations in Sunol Valley.

As identified in the FEIR, adverse impacts on the scenic natural visual setting of Little Yosemite would result from barrier modification within Alameda Creek. However, the modified project is not anticipated to overlap with the Little Yosemite project and, like the adopted project, is visually isolated and distinct from Little Yosemite such that their effects on scenic views and visual quality could not combine to cause a cumulatively significant degradation of scenic quality.

For these reasons, the modified project would not make a substantial contribution to any new significant cumulative impacts on visual resources beyond those identified in the FEIR or result in a substantial increase in the severity of a significant cumulative impact, and no new mitigation measures would be required.

Transportation and Circulation

Existing transportation and circulation conditions for the modified project are the same as described for the adopted project because the same roads would be used and no other substantial changes have occurred that would have changed traffic conditions on these roads. The previous Addendums to the FEIR did not modify the number of trips. The EIR determined that construction traffic associated with the adopted project would result in temporary increases in traffic volumes on roadways in the immediate vicinity of the dam and along access routes north and south of the dam. Construction-related vehicle trips would include construction workers traveling to and from the project work area, and haul truck trips associated with materials and equipment deliveries. The number of construction-related vehicles traveling to and from the project work area would vary on a daily basis, depending on the construction phase, planned activity, and materials needs.

The FEIR identified that, during construction, the project would generate between about 172 and 532 vehicle trips per day, including haul truck, worker vehicle, and other truck (e.g., delivery) trips (p. 4.12-10). The subsequent addenda to the FEIR did not modify the number of trips. The FEIR described that the delivery of concrete aggregate and miscellaneous equipment from off-site would occur throughout the construction period and that hauling of materials from off site would occur during weekdays from 7 a.m. to 5 p.m., or may occur at night. The FEIR identified that a peak of 532 daily trips could occur during construction (266 trips in and 266 trips out) and would occur when the 298,000 cubic yards of sand and gravel will be imported for construction of the dam (FEIR Tables 3.3 and 4.12.2). The FEIR concluded that, during peak hours, the number of daily trips on the segment of Calaveras Road north of the dam (from I-680 to the dam) would increase traffic volume but that the volume would still remain at levels less than the carrying capacity of the roadway and thus would not have an adverse impact on traffic level of service (LOS). Under the adopted project, Calaveras Road would operate at LOS B. As this volume did not have an adverse impact on traffic LOS during peak hours, the FEIR concluded that this volume also did not have an adverse impact during non-peak hours. The FEIR also concluded that since peak construction vehicle trips associated with construction activities did not substantially affect the LOS operating conditions on Calaveras Road or I-680, that the project would therefore not impede emergency response vehicles.

Under the proposed modification, an additional 46,666 haul truck trips would occur over a 15-month period to import up to an additional 350,000 cubic yards of hard rock material for Zone 5/5A. The maximum daily number of workers (180) and their associated vehicle trips and other delivery trips (6) identified in the FEIR would not be affected by this proposed modification. Import of the additional hard rock material is proposed to occur from February 2016 through April 2017. The sand and gravel import material previously approved under the adopted project is scheduled to occur from July 2016 through November 2016 and from April 2017 through November 2017. Thus, import of the additional hard rock material would overlap with import of the sand and gravel material for six months during July through November 2016 and in April 2017.

During the periods when the hauling operations would not overlap, the peak number of daily truck trips identified in the FEIR for the adopted project would not change (i.e., would remain 532 peak trips). Although the hauling operations would overlap during July through November 2016 and in April 2017, the SFPUC would require its Contractor to schedule their hauling operations so that the import of sand and gravel and the import of hard rock for Zone 5/5A do not occur on the same day such that the daily peak trips would remain at or less than 532 as with the adopted project (see Proposed Modifications on Page 2, above). The Contractor would update their Traffic Control Plan to integrate this scheduling accordingly. Therefore, the proposed modification would not result in a substantial change in impacts to public traffic and

circulation and the LOS would remain at LOS B. The proposed modification would incrementally increase the wear and tear on Calaveras Road, because there would be an overall increase in the total number of hauling truck trips. However, the implementation of Mitigation Measure 5.12.4a, which requires repairing Calaveras Road damage to pre-construction condition, would mitigate any additional wear and tear to less-than-significant by requiring a traffic control plan including warning signs, public notice, a flagger or lights, and roadway repair as needed. This plan would be coordinated with Alameda and Santa Clara Counties.

Vehicle trips for the ACDD project under the adopted project constitute a limited number of trips identified for the overall CDRP project in the FEIR. The proposed modifications of the ACDD project would be implemented using a similar number of construction personnel, equipment and delivery and truck trips as identified for the adopted project (33 total vehicle trips per day). As a result, they would not contribute to a significant increase in traffic on Calaveras Road that could affect LOS. With the addition of Staging Areas 1-4 and 1-5, some of these daily trips would also occur along Geary Road. The CEQA document for the Geary Road Bridge Project (CCSF 2012, Case No. 2008.0386E) identified that a peak of 26 trips per day would occur along this road and that this volume not have a significant effect on LOS. At 33 trips per day on Geary Road under the modified project, a similar volume to what was analyzed for the Geary Road Bridge Project, it is reasonable to conclude that the modified project would not have a significant effect on traffic on this road.

The FEIR identified that the project would have a significant and unavoidable impact for potential traffic safety hazards. Because the proposed modification would not increase the peak total number of truck trips on any one day above that analyzed in the FEIR, there would not be a substantial change in the potential for traffic safety impacts on Calaveras Road on a daily basis. However, this modification would result in an extended duration of hauling on Calaveras Road. The previously approved hauling to import the sand and gravel would have occurred over 13–months whereas, under the modified project, hauling of import material from off-site would occur for an additional nine months on Calaveras Road, which would extend the period of time during which traffic safety impacts could occur. Except for February through May 2016, Calaveras Road from Geary Road to the project site, where the road becomes one lane, will be closed to the public which will minimize potential safety impacts associated with this additional hauling. Mitigation Measure 5.12.4a, a Traffic Control Plan (DSFJV March 2012) requires the use of measures to prevent traffic safety impacts, such as installation of traffic control devices, such as construction zone warning signs, barricades, flashing lights, reflectors, gate operators, power systems (battery or solar), use of flaggers, and other methods to slow approaching traffic at project site access points to reduce traffic hazards during construction. The continued implementation of this mitigation measure under the modified project would also minimize potential traffic safety hazards during the additional hauling period such that there would not be a substantial increase in the severity this potential impact. However, the impact would remain significant and unavoidable, as it is for the approved project.

For the reasons discussed above, construction of the modified project would not result in any new significant effects related to traffic increases on area roadways due to construction- related vehicle trips beyond those impacts identified for the adopted project or a substantial increase in the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on traffic and circulation

The cumulative traffic analysis in the FEIR estimated a maximum of 525 vehicles per hour. While the modified project would contribute to the cumulative impact of traffic on Calaveras Road, other projects and project related traffic in the Sunol Valley have greatly diminished since the FEIR. In particular, the following projects listed in FEIR Table 6.1 are now complete or largely complete with limited trips: Sunol Valley Water Treatment Plant, San Antonio Backup Pipeline, and the New Irvington Tunnel Project. As discussed above, the project-level peak daily trips would not increase under the modified project. Therefore, this modification would not increase the cumulative traffic above that disclosed in the FEIR. For these reasons, the modified project would not make a substantial contribution to any new significant cumulative impacts on traffic and circulation beyond that identified in the FEIR or result in a substantial

increase in the severity of a significant cumulative impact, and no new mitigation measures would be required.

Air Quality

Existing air quality conditions for the modified project are the same as described for the adopted project in that the project is located within the basin controlled by Bay Area Air Quality Management District (BAAQMD) and the same sensitive receptors are present. The modified project would not result in any odors and this is not discussed further.

Effects of the proposed modification on air quality were analyzed by Ramboll Environ (Ramboll Environ, 2016). The analysis is based on the same number of worker and delivery trips as identified in the FEIR because the SFPUC confirmed that they still represent a conservative number of trips for analysis purposes. As described above (see page 2), the additional hard rock for Zone 5/5A would be imported from commercial sources chosen by the Contractor, with potential sources including quarries located in Aromas, Cupertino, and Los Gatos. The furthest of these potential sources is approximately 65 miles away and thus, this air quality analysis is conservatively based on haul truck trips traveling from this maximum distance, which would be entirely within the BAAQMD air basin. Additionally, the SFPUC provided updated information regarding off-road construction equipment usage at the project site, including actual equipment usage (2011 through November 2015) and projected equipment usage during the modification period and through the end of the project. In general, the actual and projected usage of off-road construction equipment has decreased compared to the FEIR. This decrease is because the initial estimates used for the FEIR and subsequent analyses in 2012 were conservative and included both daytime and nighttime construction; however, nighttime construction has not been required. If nighttime work is necessary at all for the project, it would be less than anticipated in the FEIR, as indicated in the updated forecast of equipment to be used through project completion provided by the SFPUC (Ramboll Environ 2016).

Criteria Pollutants

The FEIR determined that impacts from the short-term increase in emissions of criteria air pollutants and precursors would be less than significant with mitigation under the BAAQMD 1999 guidelines but significant and unavoidable based on the new 2010 BAAQMD regulations for ROG and NOx, which are precursors for ozone. The BAAQMD has established daily numeric thresholds for ROG and NOx because the air district is classified as non-attainment for ozone and the California Ambient Air Quality Standard for ozone is based on a daily emissions limit. With respect to fugitive dust, the BAAQMD recommends the implementation of dust control measures to minimize dust but does not establish numeric thresholds.

The FEIR identified that average mitigated NOx and ROG emissions for the adopted project from worker commute trips, off-site, on-road hauling, and off-road heavy duty equipment used onsite (inclusive of the mitigation measures listed below), would be 394.1 lbs/day and 80.7 lbs/day, respectively, thereby exceeding the BAAQMD 2010 guideline threshold of 54 lbs/day for each of these pollutants. Under the modified project, there would be a significant number of additional truck trips to import material for Zone 5/5A that would result in an increase in criteria pollutant emissions. Criteria pollutant emissions associated with the ACDD project modifications would be similar to the adopted project because the workforce, materials delivery, and equipment for construction would be similar under the modified project. However, because of the significant decrease in off-road construction equipment usage (actual usage to date and forecast to the end of the project) compared to the FEIR estimates, overall criteria pollutant emissions under the modified project would decrease when compared to the adopted project (Ramboll Environ 2016). Estimated emissions under the modified project, inclusive of the mitigation measures listed below, would be reduced from 394.1 lbs/day to 340.1 lbs/day for NOx and 80.7 lbs/day to 15.1 lbs/day for ROG. These levels would still exceed the BAAQMD 2010 guideline thresholds for NOx but not ROG. Therefore, as with the adopted project, the modified project would continue to a have temporary, significant and unavoidable impact related to the emissions of NOx during construction.

However, there would no longer be a significant ROG impact. Thus the modified project would not result in an increase in the severity of this impact compared to the adopted project, but instead would result in a decrease in criteria pollutant emissions compared to those disclosed in the FEIR. As with the adopted project, Mitigation Measures 5.13.1b (Exhaust emissions mitigation measures), 5.13.3a (Diesel Particulate Matter Reduction – Off-road Equipment), and 5.13.3b (Diesel Particulate Matter Reduction – On-site Haul Trucks and Idling Limits) would continue to be implemented to minimize criteria pollutant emissions under the modified project to the extent feasible.

The FEIR determined that the adopted project would have a less than significant impact associated with fugitive dust with the implementation of mitigation measures. Hauling to import the additional material would largely occur on paved roads, which would not generate significant dust, and on unpaved roads within the greater project site. The additional trips on unpaved roads within the project site would result in dust emissions. The proposed modifications of the ACDD project would also result in fugitive dust emissions. However, activities in these areas would largely involve travel to and from office trailers and the staging and retrieval of construction material, which would not involve significant ground disturbance. As with the adopted project, the modified project would be subject to implementation of the dust control BMPs identified in Mitigation Measure 5.13.1a (Fugitive dust mitigation measures recommended by BAAQMD), which require watering exposed surfaces twice daily, covering haul truck transporting loose material offsite, pave applicable road surfaces as soon as possible, limit traffic speeds onsite, etc. As a result, the impact would continue to be mitigated to less-than-significant levels.

Greenhouse Gases

Neither the BAAQMD 1999 nor the 2010 guidelines establish greenhouse gas (GHG) emissions thresholds for construction-related emissions. Nevertheless, they were quantified for the adopted project in the FEIR. The FEIR identified that the adopted project would result in worst-case construction-related emissions of 45,482 pounds per day (lbs) of CO_2e. The FEIR determined that this level of emissions would not conflict with the state's goals of reducing GHGs and that the project's emissions of GHGs would thus be less than significant given, 1) the limited GHGs from the project relative to statewide emissions levels; 2) continuing implementation of the GHG reduction actions by the CCSF and SFPUC, including the Greenhouse Gas Reduction Strategy; and 3) that there would be no discernable change between existing and future GHG emission from operations-related activities. Under the modified project, excluding GHG emissions associated with the ACDD project modifications, GHG emissions would be 48,777 lbs/day (Ramboll Environ 2016). GHG emissions associated with the ACDD project modifications were not re-quantified because the workforce, materials delivery, and equipment for construction would be similar to the adopted project, as discussed in the description of this proposed modification, above (see page 5). This represents a less than seven percent increase from the adopted project, which would not be a substantial change in severity relative to the emissions disclosed in the FEIR for the adopted project, or relative to statewide GHG emissions. Moreover, the modified project would not conflict with implementation of the CCSF and SFPUC's Greenhouse Gas Reduction Strategy. Thus, as with the adopted project, the modified project would result in a less-than-significant impact related to GHG emissions.

Diesel Particulate Matter

Diesel-fueled mobile sources and stationary off-road equipment used during construction of the adopted project would emit diesel particulate matter (DPM), which could affect nearby populations. The FEIR determined that this impact would be reduced to a less-than-significant level with implementation of Mitigation Measures 5.13.1b (Exhaust emissions mitigation measures), 5.13.3a (Diesel Particulate Matter Reduction – Off-road Equipment), and 5.13.3b (Diesel Particulate Matter Reduction – On-site Haul Trucks and Idling Limits), which require scheduled tune-ups of construction vehicles and equipment, all off-road diesel construction equipment to be equipped with U.S. Environmental Protection Agency Tier 2 engines and California Air Resources Board Level 3 Diesel Emission Control Strategies, and the use of 2004 model-year or newer engines for haul trucks limited to on-site

routes.

As discussed in the FEIR, DPM emissions can result in cancer and non-cancer health risks. In determining whether sources of emissions may affect nearby sensitive receptors, a summary of research findings in the California Air Resources Board's Land Use Compatibility Handbook (2005) suggests that air pollutants from high-volume roadways are substantially reduced or can even be indistinguishable from upwind background concentrations at a distance of 1,000 feet downwind from sources such as freeways and large distribution centers. Given the scientific data on dispersion of TACs from a source, the BAAQMD recommends assessing impacts of sources of TACs on nearby receptors within a 1,000-foot radius. This radius is also consistent with CARB's Land Use Compatibility Handbook and California Health and Safety Code Section 42301.6 (Notice for Possible Source Near School). There is only one receptor within 1,000-feet of Calaveras Road where the additional truck trips would pass by: the SFPUC watershed keeper's residence located approximately 5 miles north of the dam and approximately 225 feet east of Calaveras Road. Nevertheless, the FEIR for the adopted project evaluated the effect of DPM emissions on sources further than this from the project

Although there would be a significant number of additional truck trips proposed by this modification to import material for Zone 5/5A that would result in an increase in DPM emissions, because of the significant decrease in off-road construction equipment usage project-wide, overall project-wide DPM emissions under the modified project would decrease when compared to the adopted project, as modified by previous addendum (ENVIRON 2012), and inclusive of Mitigation Measures 5.13.1b (Exhaust emissions mitigation measures) (Ramboll Environ 2016). As a result, the FEIR's estimated cancer risk for the maximum exposed individual (MEI) resident (child) decreases from 9.2 to 4.4; the estimated cancer risk for the MEI worker decreases from 9.8 to 4.0; the estimated cancer risk for the MEI camper (child) would decrease from 1.0 to 0.7; and the estimated cancer risk for the MEI hiker/day visitor (child) increases from 6.7 to 3.4. Thus, under the modified project, cancer risk would continue to be below the BAAQMD significance threshold of >10 in a million. Likewise, the chronic non-cancer hazard indices (HIs) are estimated to continue to remain below the BAAQMD CEQA significance threshold of >1.0. The non-cancer hazard indices (HI) for the MEI resident (child and adult) would decrease from 0.03 to 0.01, and the non-cancer HI for the MEI worker would decrease from 0.05 to 0.02. A chronic HI was not estimated for the campers and hikers/day visitors because exposures for these receptors are expected to be discontinuous over short durations and as such, do not allow for estimation of chronic non-cancer health effects (Ramboll ENVIRON 2016). Lastly, the annual average $PM_{2.5}$ concentration would decrease from 0.15 μg/m3 to 0.06 μg/m3 for the residential receptor locations with the highest incremental concentration, which is below the BAAQMD CEQA significance threshold of >0.3 μg/m3 for annual average $PM_{2.5}$ concentration (Ramboll Environ 2016). The workforce, materials delivery, and equipment for construction of the proposed modifications of the ACDD project would be similar to the adopted project as discussed in the description of this proposed modification, above (see page 5). Further, the ACDD project is also not within 1,000 feet of sensitive receptors (Figure 3). Therefore it can be reasonably concluded that the ACDD-related modifications would not contribute to a substantial change in DPM emissions and, as such, DPM emissions for the ACDD component of this addendum were not quantified.

Based on the above information, implementation of the modified project would not result in any new significant effects related to emissions of DPM beyond those identified in the FEIR or a substantial increase in the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on air quality

As described for the adopted project in the FEIR, the geographic scope for potential cumulative air quality impacts is the San Francisco Bay Area Air Basin (Basin). For potential cumulative impacts on air quality, all of the projects in FEIR Table 6.1 are included in the analysis, except that several projects are now complete or nearly complete.

As with the adopted project, the modified project's contribution of construction-related emissions of criteria pollutants to cumulative impacts would be reduced with implementation of Mitigation Measures 5.13.1a (Fugitive dust mitigation measures), 5.13.1b (Exhaust emissions mitigation measures), and 5.9.2a (Dust Mitigation Plan and Comprehensive Air Monitoring Plan). However, as with the adopted project, when evaluated relative to the FEIR thresholds of significance, even with mitigation, the modified project's daily construction emissions would result in levels of NOx that would exceed the project level significance thresholds. These same thresholds are considered cumulative impact thresholds by BAAQMD. Therefore, as with the adopted project, the modified project would result in a cumulatively considerable contribution to significant regional NOx air quality impacts even with implementation of the identified mitigation measures. The cumulative impact would remain significant, but the modified project would not result in a substantial increase in the severity of the impact for the reasons provided above under the analysis of project-level NOx impacts. Under the modified project, the project would no longer exceed the project-level significance thresholds for ROG and thus would no longer contribute in a considerable way to cumulative ROG air quality impacts.

The FEIR concluded that because the project would implement dust control BMP's, the project's dust emissions would have less-than-significant impacts on air quality and thus would also not contribute considerably to cumulative fugitive dust impacts. As discussed above, impacts on air quality from dust emissions would continue to be less than significant under the modified project. Therefore, as with the adopted project, with implementation of the dust control BMPs identified in Mitigation Measure 5.13.1a, fugitive dust impacts would be less than cumulatively considerable (less than significant).

The FEIR concluded that the project would contribute to a cumulative health risk impact associated with DPM emissions. As discussed above, the health risks under the modified project would decrease and thus there would not be a substantially greater cancer risk than as identified in the FEIR for the adopted project. Thus the modified project would not result in a substantial increase in a contribution to a cumulative health risk impact.

As with the adopted project, the modified project would not conflict with the state's goals of reducing GHGs because the modified project's GHG emissions would contribute minimally to statewide emissions, would continue to be consistent with the GHG reduction actions by the CCSF and SFPUC, and would continue to have no discernable change between existing and future GHG emission from operations-related activities.

For these reasons, the modified project would not make a substantial contribution to any new significant cumulative impacts to air quality beyond those identified in the FEIR or result in a substantial increase in the severity of a significant cumulative impact, and no new mitigation measures would be required.

Noise and Vibration

The information presented in the FEIR on the existing noise environment, vibration, and the regulatory framework also applies to the modified project. The nearest sensitive receptor to Calaveras Road that would be affected by additional hauling is a private residence approximately 2,000 feet west and the SFPUC watershed keeper house. The nearest sensitive receptor, a residence, to the ACDD project is approximately 1 mile from the project area. The FEIR also described hiking trails in the nearby wilderness areas are located in the vicinity of the ACDD project area. The FEIR determined that construction of the adopted project would result in temporary noise increases at distant sensitive receptors during hours beyond the time limits specified in the Alameda County and Santa Clara County noise ordinances. The FEIR concluded that Mitigation Measure 5.14.1 (Noise Controls) would reduce construction noise to ordinance limits and to levels below the sleep interference criterion.

For the adopted project, the FEIR analyzed that up to 60 vehicles and 30 trucks per hour could occur on Calaveras Road and that this level of traffic would not exceed the 70-dBA speech or 50-dBA sleep interference threshold. This modification for the import of material to Zone 5/5A would not increase truck

traffic to above 30 trucks per hour. As described above, during the additional hauling, there would be a maximum of 150 trips (75 round trip) per day. Spread out over a day, this would equate to approximately 15 trucks per hour. Thus, the modified project, associated with truck noise levels would not exceed the daytime and nighttime criteria or nighttime noise ordinance limit during hauling. As a result, the activities associated with the proposed modification for the ACDD project would not result in new noise and vibration generating activities different from the activities identified in the FEIR. The FEIR also determined that hikers would be exposed to noise for a limited duration as they pass near construction areas. These hikers would have options to utilize other trails in the area (and SFPUC would coordinate with East Bay Regional Park District to install information signs) such that this impact would be less than significant. Therefore, with continued implementation of Mitigation Measure 5.14.1 (Noise Controls), measures to minimize noise from nighttime truck traffic, this impact would remain mitigated to less-than-significant levels.

Cumulative impacts on noise and vibration

While the modified project would contribute to the cumulative impact of hauling on Calaveras Road, other project and project related noise in the Sunol Valley have greatly diminished. The cumulative traffic analysis estimated a maximum of 525 vehicles per hour and this modification would not increase the cumulative traffic above this level. As with the adopted project, Mitigation Measure 5.14.1 (Noise Controls) would be implemented during construction of the modified ACDD project to minimize noise. For these reasons, the modified project would not make a substantial contribution to any new significant cumulative impacts on noise and vibration beyond that identified in the FEIR or result in a substantial increase in the severity of a significant cumulative impact, and no new mitigation measures would be required.

Mineral and Energy Resources

As described in the FEIR, the majority of material to be used for construction will be generated onsite. The FEIR discusses that approximately 298,000 cubic yards, or 447,000 tons of sand and gravel would be imported and that this represented the use of approximately 0.1 percent of the available (permitted) 458 million tons of aggregate resources in the South San Francisco Bay Region (the region in which the project is located as mapped by the California Department of Conservation and data as of 1/1/06). The FEIR found that the use of this material would make it unavailable for use by others but that this would not represent a significant depletion of a scarce local or regional mineral resource. The proposed modification would import up to an additional 350,000 cubic yards of hard rock for construction of Zone 5/5a of the dam, which would be equivalent to 525,000 tons. Thus, with the modified project, the project would now use a total 972,000 tons of imported material. The available (permitted) aggregate resources in the South San Francisco Bay Region updated as of 1/11/11 is 404 million tons (CDC, 2012). Therefore, the project would use approximately 0.24 percent of the available aggregate resources in the South San Francisco Bay Region, which would not be a substantial increase in the use of mineral resources. The modifications associated with the ACDD project would not require a significant amount of additional aggregate materials because the fish ladder would be similar in size to the fish ladder analyzed in the adopted project and thus there would not be substantial increase in the use of concrete or other mineral resources. Therefore, as with the adopted project, the modified project would have a less than significant impact on mineral resources.

As described in the FEIR, the project would use a substantial amount of fuel consuming equipment. The proposed increase in hauling would use additional fuel. Equipment usage for the updated ACDD project would be similar to the adopted project. The FEIR found that the wasteful use of fuel would be a significant impact, which would be mitigated to less than significant with implementation of the exhaust control measures per Mitigation Measure 5.13.1b, such as limiting idling time and performing regular low-emissions tune-ups. These measures would also be implemented under the modified project to prevent the wasteful use of energy resources. The modified project would not increase the long-term use of energy because the additional hauling would be short term and the ACDD facilities would primarily use solar

power for operations. Implementation of the modified project would thus not result in any new significant effects on mineral and energy resources beyond those identified in the FEIR or a substantial increase in the severity of a significant impact, and no new mitigation measures would be required.

Cumulative impacts on mineral and energy resources

As described for the adopted project in the FEIR, the geographic scope for potential cumulative impacts on mineral and energy resources would be southern Alameda and northern Santa Clara counties and the Bay Area region. For potential cumulative impacts on mineral and energy resources, all of the projects in FEIR Table 6.1 are included in the analysis, except that several projects are now complete or nearly complete.

As with the adopted project, the modified project would use mineral and energy resources; however, as discussed above, the increase would not be substantial and therefore, the project's contribution to cumulative demand for mineral resources would continue to be less than cumulatively considerable (less than significant). Mitigation Measure Mitigation Measure 5.13.1b (exhaust control measures) would be implemented during construction of the modified project to prevent the wasteful use of fuel and there would not be a substantial increase in long-term energy use because hauling is a temporary operation and the ACDD facilities would largely be run on solar power. For these reasons, the modified project would not make a considerable contribution to any a significant cumulative impact on mineral and energy resources beyond that identified in the FEIR or result in a substantial increase in the severity of a significant cumulative impact, and no new mitigation measures would be required.

CONCLUSION

Based on the foregoing, it is concluded that the analyses conducted and the conclusions reached in the Final EIR certified on January 27, 2011 remain valid. The proposed modifications to the project will not cause new significant impacts not identified in the FEIR, and no new mitigation measures will be necessary to reduce significant impacts. Other than as described in this addendum, no project changes have occurred, and no changes have occurred with respect to circumstances surrounding the proposed project that will cause significant environmental impacts to which the project will contribute considerably, and no new information has become available that shows that the project will cause significant environmental impacts. Therefore, no supplemental environmental review is required beyond this addendum.

Date of Determination:

February 18, 2016

I do hereby certify that the above determination has been made pursuant to State and Local requirements.

Sarah B. Jones
Environmental Review Officer

cc: SFPUC

Bulletin Board / Master Decision File

Distribution List

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Figures

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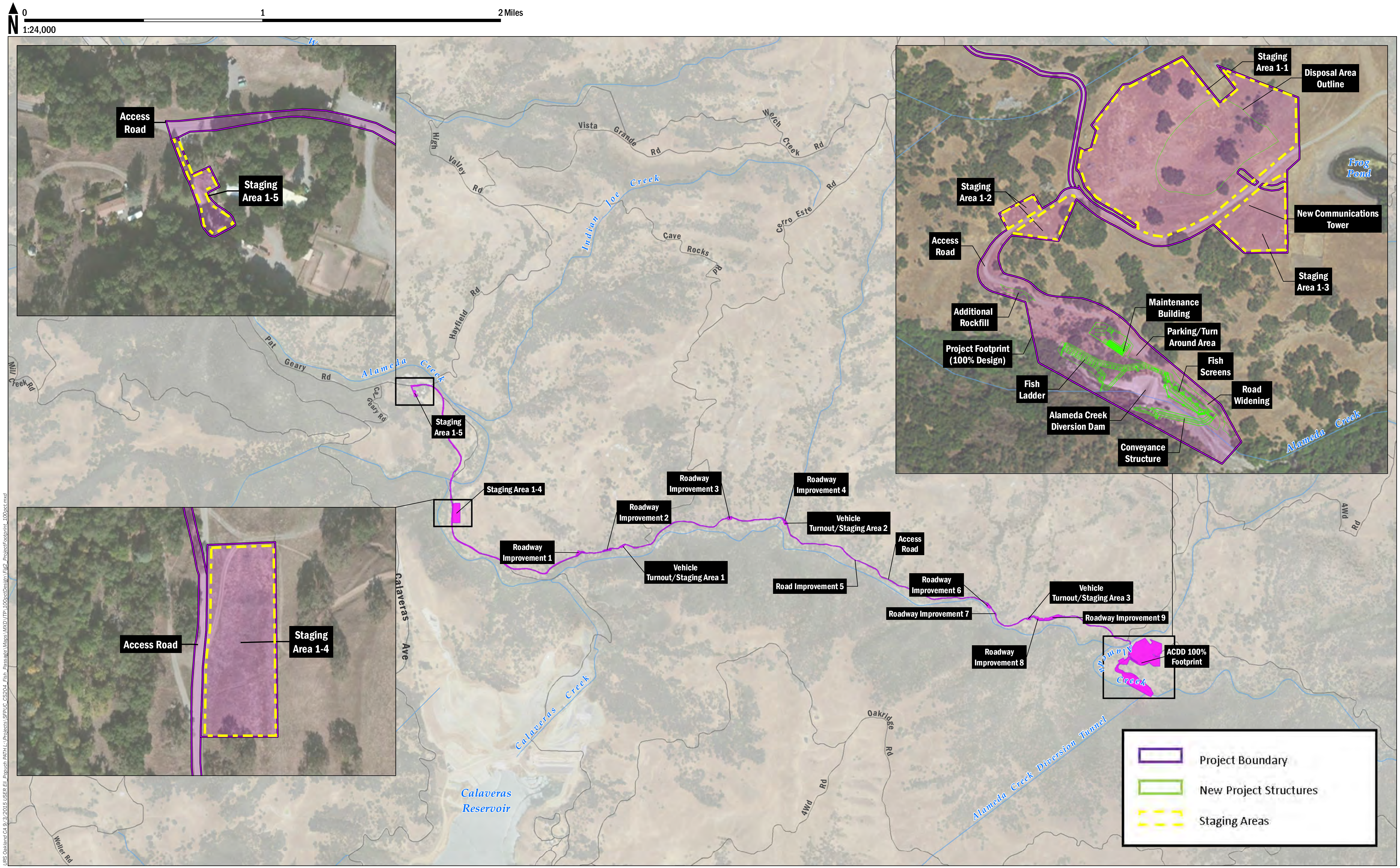

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Access Road
Staging Area 1-5
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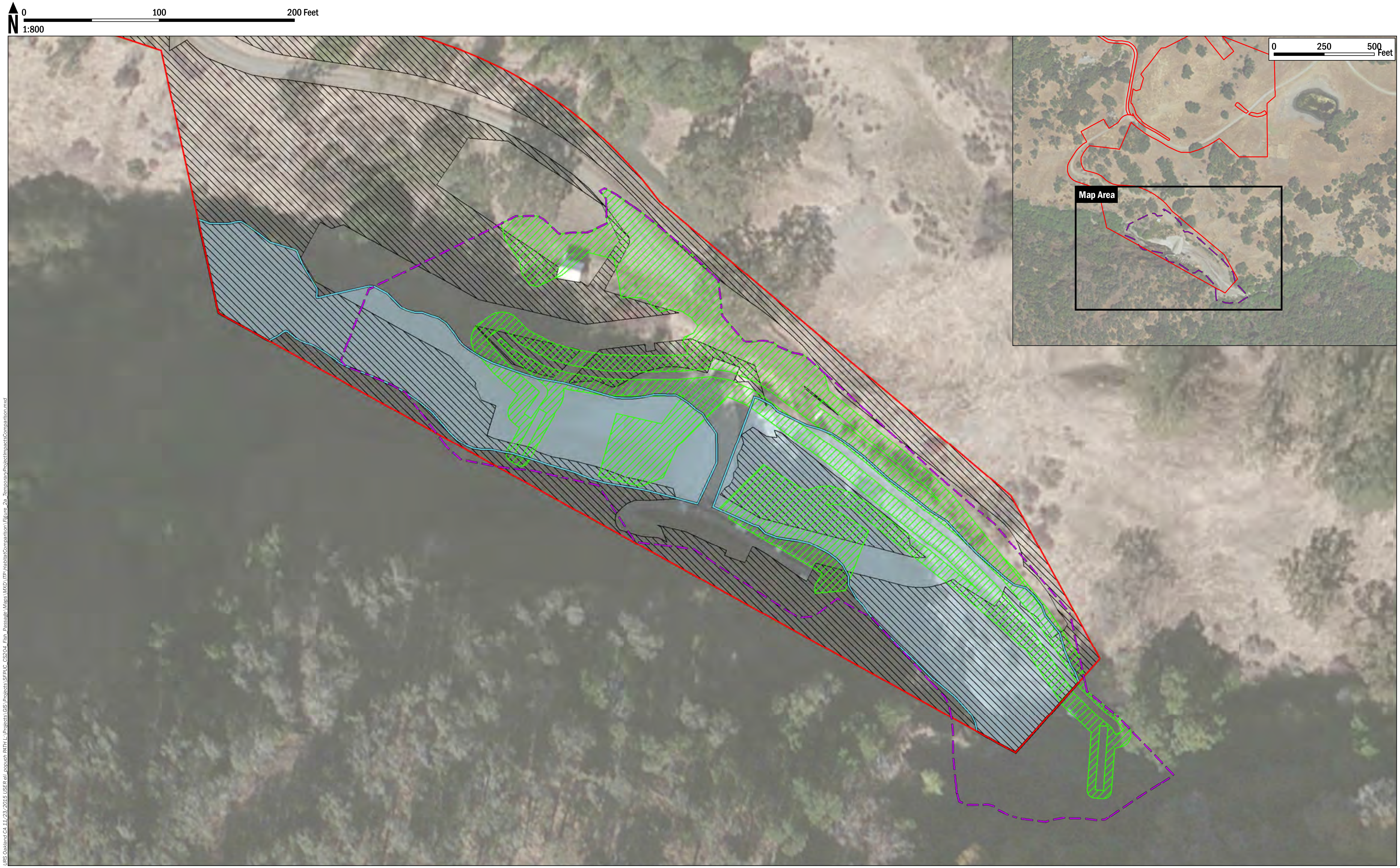
Staging Area 1-1
Disposal Area Outline
Staging Area 1-2
Access Road
New Communications Tower
Staging Area 1-3
Additional Rockfill
Maintenance Building
Parking/Turn Around Area
Project Footprint (100% Design)
Fish Screens
Fish Ladder
Road Widening
Alameda Creek Diversion Dam
Conveyance Structure
Frog Pond
Alameda Creek
Staging Area 1-5
Staging Area 1-4
Roadway Improvement 1
Roadway Improvement 2
Roadway Improvement 3
Roadway Improvement 4
Vehicle Turnout/Staging Area 1
Vehicle Turnout/Staging Area 2
Access Road
Road Improvement 5
Roadway Improvement 6
Roadway Improvement 7
Vehicle Turnout/Staging Area 3
Roadway Improvement 9
Roadway Improvement 8
ACDD 100% Footprint
Vista Grande Rd
Welch Creek Rd
High Valley Rd
Indian Joe Creek
Cerro Este Rd
Cave Rocks Rd
Hayfield Rd
Pat Geary Rd
Alameda Creek
Calaveras Ave
Calaveras Creek
Calaveras Reservoir
Oakridge Rd
4Wd Rd
Alameda Creek Diversion Tunnel
Project Boundary
New Project Structures
Staging Areas

San Francisco Water Power Sewer

Fish Passage Facilities at the Alameda Creek Diversion Dam

FIGURE 1

Project Footprint



San Francisco Water Power Sewer

Services of the San Francisco Public Utilities Commission

Fish Passage Facilities at the Alameda Creek Diversion Dam

Project Footprints

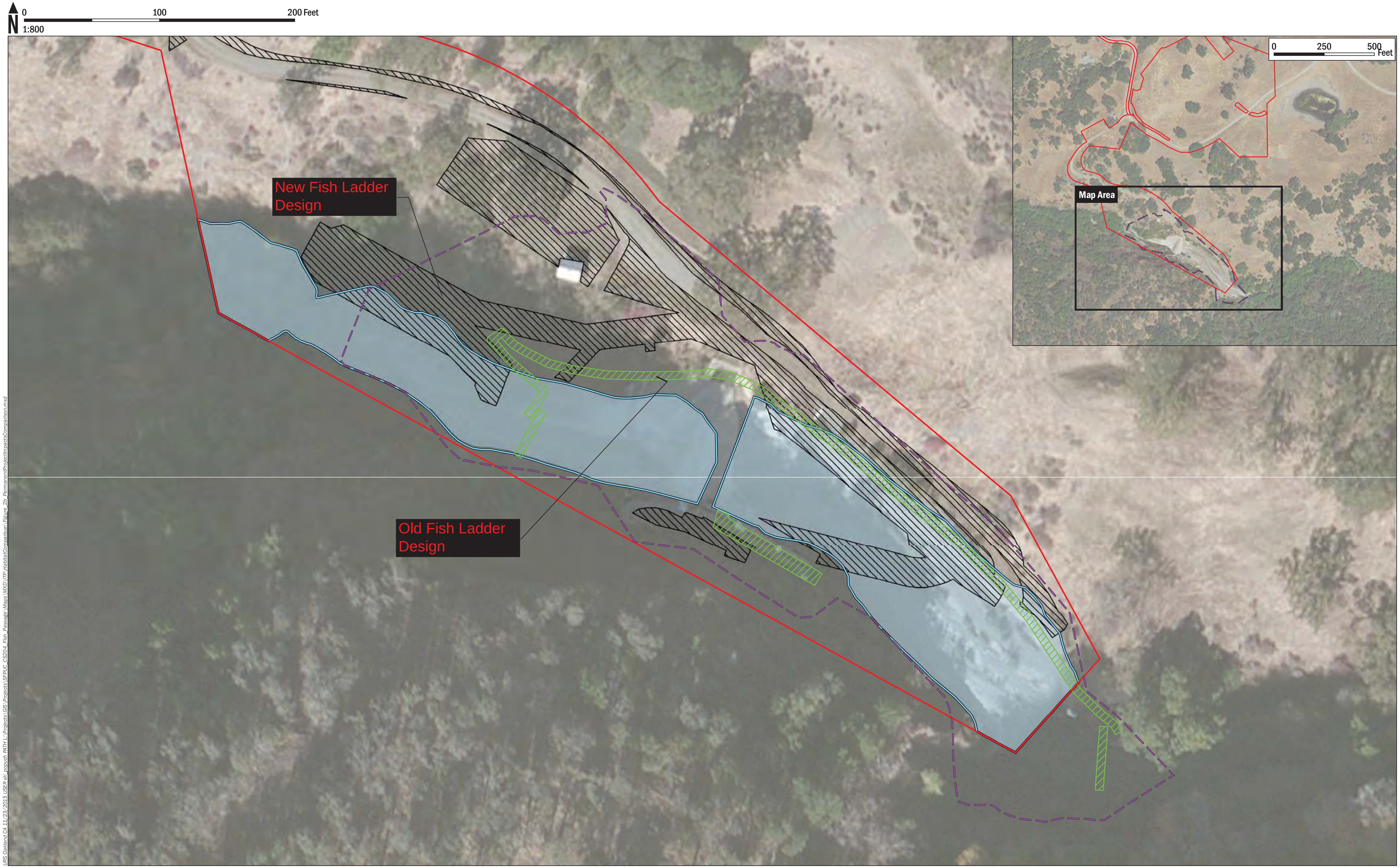
- Project footprint (95% design phase)
- CDRP EIR Study Area
- Alameda Creek

Impacts

- Temporary Impacts (95% Design)
- Temporary Impacts (CDRP EIR)

FIGURE 2A

Comparison of Current Project Temporary Impacts with the Temporary Impacts Evaluated in the CDRP EIR



San Francisco Water Power Sewer

Fish Passage Facilities at the Alameda Creek Diversion Dam

Project Footprints

- Project footprint (95% design phase)
- CDRP EIR Study Area
- Alameda Creek

Impacts

- Permanent Impacts (95% Design)
- Permanent Impacts (CDRP EIR)

FIGURE 2B

Comparison of Current Project Permanent Impacts with the Permanent Impacts Evaluated in the CDRP EIR

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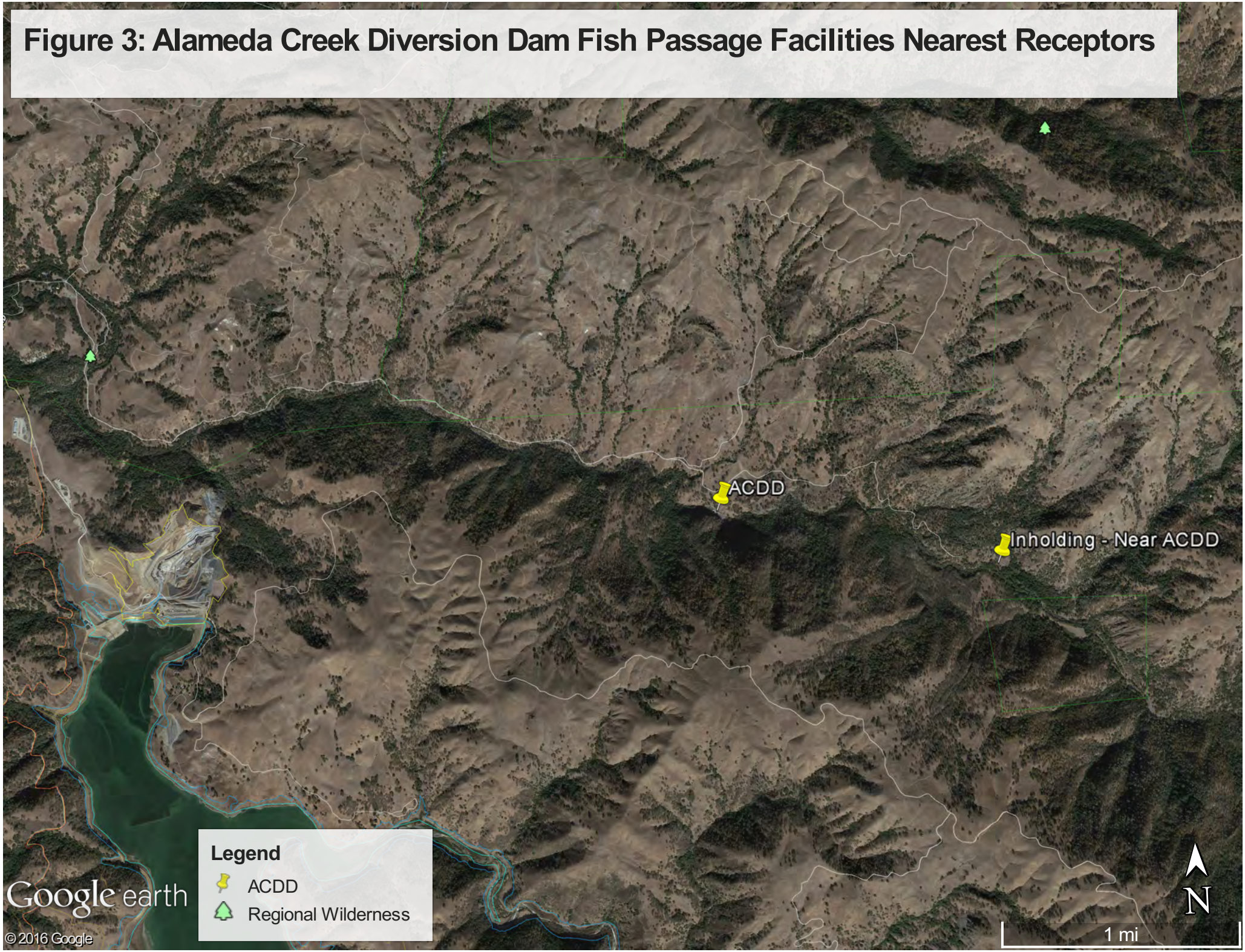
Figure 3: Alameda Creek Diversion Dam Fish Passage Facilities Nearest Receptors



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Attachments

Biological Resources Memo (2014)
Cultural Resorces Survey (2015)
Air Quality Evaluation (2016)

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BioMaAS

Date: July 3, 2014

To: Kerry O'Neill, San Francisco Public Utilities Commission, Bureau of Environmental Management

From: Bill Stagnero, BioMaAS Biologist

Subject: Biological Review of Proposed Project Modifications, *Alameda Creek Diversion Dam Modification*, Calaveras Dam Replacement Project (CUW 37401)

This memo presents an evaluation of the biological resources for a proposed modification to the Alameda Creek Diversion Dam (ACDD) Project. This evaluation supports an application for a Minor Project Modification in accordance with the San Francisco Public Utilities Commission's (SFPUC) Construction Management Procedure 054.

BACKGROUND

The proposed project modification is located within the biological resource Study Area for the Alameda Creek Diversion Dam (ACDD), a subset of the Calaveras Dam Replacement Project (CDRP) (e.g. ETJV 2006a; ETJV 2006b; ETJV 2006c and ETJV 2007). The Final Environmental Impact Report (FEIR) (SFPUC 2011) was reviewed in order to determine potential biological impacts from the proposed modification. In addition, the California Natural Diversity Database was searched for the presence of sensitive species in or adjacent to the proposed project area. The proposed project area was also traversed on foot and investigated for the presence of sensitive biological resources.

DESCRIPTION OF PROPOSED PROJECT MODIFICATIONS

The design team is requesting to expand the ACDD original project description in the CDRP FEIR (2011). These changes include an approximate three acre staging area, access road modifications in order to allow trucks to reach the ACDD, potential road stabilization at four locations on Geary Road to prevent sloughing, a sluicing study for required engineering of the upper forebay, a geotechnical investigation of a historic landslide area, and a downstream extension of the fish ladder to accommodate size requirements provided in comments by the National Marine Fisheries Service (Figure 1). This memo assesses the potential biological constraints that may be associated with the proposed project modification.

SURVEY INFORMATION AND BIOLOGICAL RESOURCES RESULTS

United States Fish and Wildlife Service (USFWS)/California Department of Fish and Wildlife (CDFW) approved biologists reviewed the biological resource data summarized by 1) ETJV (2006a, 2006b, 2006c, and 2007), 2) the CDFW Section 2081 Incidental Take Permit application (SFPUC 2010) and 3) the USFWS Biological Opinion.

Figure 1. ACDD Project Boundary and Staging Area

CDRP biologists Aaron Sunshine and Bill Stagnaro visited the proposed expansion area on May 29th, 2014 from 0900 until approximately 1100 hours. The entire site was traversed on foot. The proposed expansion area is located immediately adjacent to and north of the ACDD. The site consists of non-native annual grassland, coyote brush scrub, oak woodland, disturbed areas, and a small stand of Diablan sage scrub. Two special status wildlife species were observed during the site visit. Pacific pond turtle (*Actinemys marmorata*; SC) was observed in the stock pond east of the staging area. A San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*; SC) midden was also observed in the riparian vegetation downstream of the diversion dam. No special status plant taxa were observed during the site visit. The potential for sensitive biological resources to occur in the project area is summarized as follows:

- At present, steelhead (*Oncorhynchus mykiss*; FT) only occurs downstream of the Fremont BART weir in Alameda Creek. Genetic testing suggests that the present self-sustaining populations of resident rainbow trout in Alameda Creek (including those fish that are present in Calaveras Reservoir and upstream tributaries) may be derived from migratory steelhead that were isolated

in the upper part of the watershed by natural processes and by construction of dams and other passage obstacles (Nielsen 2003, NMFS 2004). Rainbow trout is typically not considered a special-status fish species; however, the National Marine Fisheries Service (NMFS) (2004), the California Department of Fish and Wildlife (CDFG , 2005, p. 1), and others (Leidy 2007, p. 106) have indicated the importance of conserving Alameda Creek Watershed resident rainbow trout because their genetic similarities with the federally listed CCC steelhead DPS could contribute to the recovery of that species/DPS if a sustainable steelhead population is restored in Alameda Creek. Therefore, resident trout were considered special-status in the Calaveras Dam Replacement Project Environmental Impact Report for purposes of the California Environmental Quality Act only, and not because of any regulation required by NMFS or CDFW.

- The portion of the creek in the project area may also be used as dispersal and foraging habitat for special status herpetofauna such as California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylii;* SC) and Pacific pond turtle.
- The upland habitat in the project area may also serve as dispersal habitat for these and other species such as California tiger salamander (*Ambystoma californiense;* FT, ST), Alameda whipsnake (*Masticophis lateralis euryxanthus;* FT, ST), coast horned lizard (*Phrynosoma coronatum;* SC) and ringtail (*Bassariscus astutus;* FP).
- Certain microhabitat characteristics of the staging area, such as ground squirrel burrows and sunny grassland, may also provide suitable refugia habitat for California tiger salamander and California red-legged frog and also provide suitable oviposition sites for Pacific pond turtle.
- Common and special status avian species as well as the San Francisco dusky-footed woodrat may utilize the vegetation and rock structures within and adjacent to the project area as nesting habitat.
- Certain bat species may find the trees, rock crevices and manmade features within and adjacent to the project area suitable for roost habitat.
- Several mature oak trees (*Quercus lobata* and *Q. douglasii*) are present within the expansion area (see Figure 2).
- Potential Waters of the US or State within or adjoining the expansion area were identified based on vegetation and topography (see Figure 2). These include a ditch, seasonal wetlands and an ephemeral drainage.
- No special status plant taxa were observed within the expansion area during the 5/29/2014 survey, but the survey fell outside the blooming period for some species, including *Monardella antonina ssp. antonina* (CNPS 3; Low Occurrence Potential), *Fritillaria liliacea* (Low Potential), and *Blepharizonia plumose* (CNPS 1B2; Moderate Potential).
- No larval host plants for special status Lepidopterans were found during the survey, though the survey fell outside the blooming periods for *Viola pedunculata* (host for Callippe silverspot, *Speyeria callippe callippe*) and *Plantago erecta* (host for Bay checkerspot, *Euphydryas editha bayensis*).

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Figure 2. Mature oak trees and potential jurisdictional features observed within and adjacent to the project area.
W1. Possible ditch wetland. Contains *Polypogon* sp., whose ACOE wetland indicator status is Facultative Wetland.
W2. Gully where culvert drains under road.
W3. Depression, 10 ft. diameter, possible seasonal wetland.
W4. Possible seasonal wetland, 10 ft. x 20 ft. depression. Contains *Festuca perennis* (*Lolium perenne*), whose ACOE wetland indicator status is Facultative, along with some non-wetland species.
W5. Possible ditch wetland.
W6. Shallow depression, possible seasonal wetland. Contains a few *Cyperus* sp. (probably *C. eragrostis*), whose ACOE wetland indicator status is Facultative Wetland (*C. eragrostis*) or Obligate Wetland. Also several vinegarweed (*Trichostema lanceolatum*), however, whose indicator status is Facultative Upland.

W7. Depression, possible seasonal wetland. *Lupinus microcarpus* and *Lupinus succulentus* (no wetland indicator status).

RECOMMENDATIONS

The following measures are brief recommendations to avoid impacts to sensitive biological resources. Appendix A should be referred to for complete mitigation measures from the Final Environmental Impact Report.

Special Status Herpetofauna

A preconstruction survey should be performed by a qualified biologist prior to ground disturbance in the project area in order to determine the presence of special status herpetofauna. In addition, a biological monitor should be present during initial ground disturbance in accordance with resource agency permits and mitigation measure 5.4.1a and a barrier fence should be installed around appropriate areas per mitigation measure 5.4.1b. If sensitive herpetofauna are unearthed during ground disturbance activities, they should be relocated to suitable habitat that has been pre-approved by resource agency staff. Complete mitigation measures are described in Appendix A.

Breeding Birds

Nesting birds generally occur between February 15 and August 15. If this work is required during this time period, a qualified biologist should conduct a breeding bird survey in the Project Area and within suitable habitat in accordance with mitigation measure 5.4.1a.

Woodrats and Ringtail

Preconstruction surveys should be performed by a qualified biologist in order to determine potential woodrat occupancy in accordance with the project's CDFW Streambed Alteration Agreement. If young are detected during nest disassembly, disassembly shall discontinue. The qualified biologist may return at least 48 hours later to determine if the young were relocated due to the initial disturbance. If the nest is vacant, nest disassembly may proceed. If young are still present, the qualified biologist will make an age estimate during nest re-inspection to predict when the young will leave based on the species life history. The nest shall not be re-disturbed until the young are predicted to have left.

Bats

At least 6 months prior to the start of construction, a qualified biologist should identify potential bat maternity sites within 500 feet of construction areas. During the months of November through February, a qualified biologist should supervise the installation of screens at potential roosts to prevent bat use (after verifying that no bats would be trapped by screening).

If potential maternity roost sites cannot be screened in advance, pre-construction surveys should be conducted by a qualified biologist, in suitable rock outcrop and developed habitat for Townsend's big-eared bat (*Corynorhinus townsendii*), pallid bat (*Antrozous pallidus*), and western mastiff bat (*Eumops perotis californicus*), no more than 14 days and no less than 7 days prior to the beginning of any construction activity between March 1 and October 31. The survey area should include all potential maternity sites located within 500 feet of the area to be disturbed.

If an active maternity site is found within 500 feet of the project, a determination will be made by a qualified biologist, in coordination with the CDFW, as to whether or not construction work will affect the site or disrupt reproductive behavior. Criteria used for this evaluation will include, but not be limited to, presence of visual and audio screening between the site and construction activities. If construction activities have the potential to threaten the viability of an active maternity site discovered during the survey, then a minimum 500-foot buffer will be flagged around the site and designated a construction-free zone until the site is no longer active or other appropriate avoidance measures, including a reduced buffer size, approved by CDFW, are implemented to ensure that the site is adequately protected. Exact implementation of this measure should be based on specific information at the site.

Plants

No special status plant taxa or larval host plants for special status Lepidopterans were observed within the expansion area during the 5/29/2014 survey, but the survey fell outside the blooming period for some species. An additional rare plant and host plant survey to cover the species missed is recommended.

Construction activities should not occur within the drip lines of the mature oak trees present in and adjacent to the project area. Orange construction fencing is recommended to delineate the area to be avoided.

Wetlands and Waters

The ditch, seasonal wetlands and ephemeral drainage should be avoided if feasible. If avoidance is not possible, a formal wetland delineation is recommended to determine impacts to potential jurisdictional features.

Mitigation Measure 5.4.1a and 5.4.1b from the Final Environmental Impact Report is available for reference in Appendix A.

REFERENCES

California Department of Fish and Game (CDFG). 2005. Comments on the Draft Environmental Impact Report, Notice of Preparation for the Calaveras Dam Replacement Project. Letter from Robert W. Floerke, Regional Manager, CDFG Central Coast Region, to Diana Sokolove, City and County of San Francisco Planning Department, November 22, 2005.

EDAW & Turnstone Joint Venture (ETJV). 2006a (November 10). Calaveras Dam Replacement Project Botanical Survey Technical Report. Prepared by May and Associates for San Francisco Public Utilities Commission and EDAW/Turnstone Joint Venture.

EDAW & Turnstone Joint Venture (ETJV). 2006b (July). Delineation of Waters of the United States, Calaveras Dam Replacement Project, Alameda and Santa Clara Counties, California. Prepared by May and Associates for USACE on behalf of San Francisco Public Utilities Commission.

EDAW & Turnstone Joint Venture (ETJV). 2006c. California Red-legged Frog and California Tiger Salamander Habitat Assessment for the Calaveras Dam Replacement Project. Field work from April-May 2006, unpublished. EDAW, Sacramento, CA.

EDAW & Turnstone Joint Venture (ETJV). 2007. California tiger salamander and California red-legged frog habitat assessment field notes by Stephanie Coppeto, 21 March 2007, unpublished.

Leidy, R.A. 2007. Ecology, Assemblage Structure, Distribution, and Status of Fishes in Streams Tributary to the San Francisco Estuary, California. San Francisco Estuary Institute, April 2007. Contribution No. 530.

National Marine Fisheries Service (NMFS). 2004. Proposed Listing Determinations for 27 ESUs of West Coast Salmonids: Proposed Rule June 14, 2004 69 FR 113, pages 33102-33179.

Nielsen, J. 2003. Population Genetic Structure of Alameda Creek Rainbow/Steelhead – 2002. U.S. Geological Survey Alaska Science Center, Anchorage, Alaska. Report prepared for the Alameda Creek Fisheries Restoration Workgroup.

San Francisco Public Utilities Commission (SFPUC) 2010. Application for Incidental Take Permit. Prepared for the California Department of Fish and Game. Submitted November 2010.

San Francisco Public Utilities Commission (SFPUC) 2011. Calaveras Dam Replacement Project, Final Environmental Impact Report. Final EIR Certification Date: January 27, 2011.

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Appendix A

Final Environmental Impact Report
Mitigation Measures 5.4.1a and 5.4.1b

5.4.1a Pre-Construction Measures

• **Wetland Buffers.** Except for those areas specifically identified in Table 4.4.9, Impacts of Construction on Wetlands and Other Waters of the State and United States, where impacts cannot be practicably avoided, a minimum 100-foot buffer surrounding all wetlands, ponds, streams, drainages, and other aquatic habitats located on or within 100 feet of the project site shall be clearly designated on the final project construction plans and marked on the site with orange construction fencing or silt fence. If the area is on a slope, silt fencing or other comparable management measures will be installed to prevent polluted runoff, as well as equipment, from entering the buffer area. Signs shall be installed every 100 feet on or adjacent to the buffer fence that read, "Environmentally Sensitive Area – Keep Out." Fencing and management measures shall be installed and inspected prior to initial project construction and maintained through the construction period. No equipment mobilization, grading, clearing, storage of equipment or machinery, vehicle or equipment washing, or similar activity, may occur until a representative of the SFPUC has inspected and approved the fencing and/or management measures installed around these features.

• **Temporary Stream Crossings.** The final project construction plans shall be designed to minimize the number of temporary stream crossings necessary for project site access and construction. Stream crossings shall be located to the maximum extent practicable in previously disturbed areas lacking riparian vegetation, pools, side ponds, or other sensitive habitat features.

• **Worker Education Program.** A worker education program shall be implemented to familiarize workers, including all vehicle operators, of the importance of avoidance of harm to special-status species and sensitive natural communities. The training shall include a discussion of the importance of maintaining speed limits, appropriate disposing of trash and waste materials, and respecting exclusion zones. The SFPUC and its construction contractor shall confirm that all workers have been trained appropriately.

• **Aquatic Habitat Pre-construction Survey.** For 2 weeks prior to the commencement of work activities and immediately prior to commencement of work, a qualified biologist will survey aquatic habitat that is suitable for the California red-legged frog, California tiger salamander, foothill yellow-legged frog, and western pond turtle and that would be affected by the project. If individuals in any life stages of these species are found, the biologist will contact the USFWS and/or California Department of Fish and Game (CDFG) to determine whether relocating any life stages is appropriate. The aquatic habitat areas that cannot feasibly be avoided during project construction (Table 4.4.9, Impacts of Construction on Wetlands and Other Waters of the State and United States), will be dewatered prior to construction (except Calaveras Reservoir). Areas that would be dewatered (assuming seasonal flows or water is present) are Pond 9 and freshwater marsh, and perennial streams, including Calaveras Creek downstream of the dam. A qualified full-time monitor will be present until ponds and streams are fully dewatered. Intake screens will not exceed a mesh size of 5 millimeters. If any of these species are found during dewatering, the qualified biologist will contact the U.S. Fish and Wildlife Service (USFWS) and/or CDFG to determine whether relocating individuals during any life stages is appropriate. The qualified biologist will remove and/or destroy any individuals of non-native species, such as bullfrogs, crayfish, and centrarchid fishes from within the dewatered habitat, to the maximum extent possible.

• **California Tiger Salamander Pre-construction Survey.** A preconstruction survey will be conducted at each work site where there would be ground disturbing activities to identify suitable California tiger salamander burrow aestivation areas. Aestivation habitat will be defined as the presence of two or more small mammal burrows greater than 1 inch in diameter within a 10-footdiameter area and within 10 feet of proposed construction sites (i.e., the presence of a single isolated gopher hole would not be

considered habitat). As feasible within the context of the work area, aestivation areas will be temporarily fenced and avoided. A California tiger salamander salvage and relocation plan will be prepared in coordination with USFWS and CDFG. A qualified biologist will carry out the salvage and relocation operations at construction sites where upland habitat has been identified. Surveys and trapping of California tiger salamanders will occur in the rainy season prior to construction or as directed by resource agency permits. The effort shall be appropriately timed with respect to salamander activity for the year and proposed construction activities. Drift fences and pitfall traps within or on the perimeter of construction sites will be used to capture and relocate animals to suitable areas nearby that will not be affected by construction. USFWS trapping protocols will be followed. Exclusion fencing (described in Mitigation Measure 5.4.2, Construction Measures) will be regularly maintained and monitored until the start of and throughout construction.

• **Johnny Jump-up.** Prior to commencement of ground-disturbing activities, a qualified botanist shall flag and oversee fence installation around all stands of johnny jump-up (*Viola pedunculata*) mapped during studies for this project (ETJV 2006 and Entomological Consulting Services 2004) within the construction footprint that can be avoided. These fenced areas shall be avoided during construction.

• **Bald Eagle Pre-construction Survey**. A qualified biologist will conduct monitoring in the months of December, January, and February, before construction begins, to determine whether bald eagles are nesting at Calaveras Reservoir. A minimum 660-foot no-disturbance buffer will be established around any active bald eagle nest near the construction site. If an active bald eagle nest is observed within 660 feet of the west haul road, the haul route would not be used without additional coordination with USFWS and CDFG. If the project cannot be altered to ensure that project construction, including the use of the barge haul route, would avoid potentially causing a bald eagle nest to fail, SFPUC will coordinate with CDFG and USFWS to determine whether hazing measures may be appropriate.1 Hazing measures (e.g., frequent human activity at the nest site, use of loud noises at nest trees) would be implemented to prevent use of the nest only if egg laying had not yet commenced and would be implemented early enough in the nesting season for the eagles to use an alternate location. If hazing is not effective, a structure to exclude bald eagles from any constructed nests (e.g., a cone-shaped enclosure that would preclude eagles from accessing the nest) may be installed. Take authorization, if allowed, under the Bald and Golden Eagle Act2 would be required for such measures.

• **Ground-nesting Raptor, Burrowing Owl and Northern Harrier Preconstruction Surveys.** No more than 2 weeks before construction, a survey for ground-nesting raptors, burrowing owls and northern harriers, will be conducted by a qualified biologist in suitable habitat within 500 feet of the project. Surveys will also be conducted through the reservoir refilling period in suitable habitat in the area that would be inundated by the reservoir. Surveys will conform to the protocol described by the California Burrowing Owl Consortium, which includes up to four surveys on different dates if there are suitable burrows present (Burrowing Owl Consortium 2009). This protocol would be suitable to identify northern harrier nests concurrent with burrowing owl surveys. If occupied owl burrows or harrier nests are found within the survey area, a determination will be made by a qualified biologist, in coordination with the CDFG, as to whether or not work or refilling of the reservoir will disrupt reproduction. If it is determined that construction will not affect occupied burrows or northern harrier nests or disrupt breeding behavior, construction will proceed without any restriction or mitigation measures. If it is determined that construction or refilling of the reservoir will affect occupied burrows during August through February, subject owls will be passively relocated from the occupied burrow(s) using one-way doors installed at the entrance. There will be at least two unoccupied burrows suitable for burrowing owls within 300 feet of the occupied burrow (or the limit of construction or re-filling) before one-way doors are installed.

Artificial burrows will be in place at least 1 week before one-way doors are installed on occupied burrows. One-way doors will be in place for a minimum of 48 hours before burrows are excavated. If it is determined that construction will physically affect occupied owl burrows or active northern harrier nests or disrupt reproductive behavior during the nesting season (March through July), then avoidance is the only mitigation available. Construction will be delayed within 300 feet of occupied owl burrows or northern harrier nests until it is determined that the subject owls or harriers are not nesting or until a qualified biologist determines that juvenile owls or harriers are self-sufficient or are no longer using the natal burrow or nests as their primary source of shelter. Alternatively, other appropriate avoidance measures, as approved by CDFG may be implemented to ensure that the nest is protected. If it is determined that reservoir refilling will flood occupied burrows or active nests, or disrupt reproductive behavior during the nesting season (March through July) then SFPUC will, subject to approval by CDFG, prevent the death of viable eggs or young by relocating them to an appropriate wildlife care facility or implementing other measures recommended by CDFG.

• **Other Tree- or Cliff-Nesting Raptor Pre-construction Survey.** A survey to identify active nests for tree- or cliff-nesting raptors (including bald eagles) will be conducted by a qualified biologist no more than 2 weeks before the start of construction at project sites from February 1 through July 30. Active raptor nests located within 500 feet (0.25 mile for golden eagle and bald eagle or falcons) of the project will be mapped, to the extent allowed by access. If an active bald eagle nest is found, implement nest protection measures described previously for bald eagles. If an active raptor nest is found within 500 feet (0.25 mile for golden eagle or falcons) of the project, a determination will be made by a qualified biologist, in coordination with the CDFG, as to whether or not construction work will affect the active nest or disrupt reproductive behavior. Criteria used for this evaluation will include, but not be limited to, presence of visual screening between the nest and construction activities, and behavior of adult raptors in response to the surveyors or other ambient human activity. Alternatively, other appropriate avoidance measures, as approved by CDFG may be implemented to ensure that the nest is protected. If it is determined that construction will not affect an active nest or disrupt breeding behavior, construction will proceed without any restriction or mitigation measure. If it is determined that construction will affect an active raptor nest or disrupt reproductive behavior, then avoidance is the only mitigation available. Construction will be delayed within 300 feet (0.25 mile for golden eagle or falcons) of such a nest until a qualified biologist determines that the subject raptors are not nesting. In coordination with CDFG, trees with unoccupied raptor nests (excluding golden and bald eagle) may only be removed prior to March 1 or following the determination that subject raptors are not nesting.

• **Loggerhead Shrike, Grasshopper Sparrow, and Tricolored blackbird Preconstruction Surveys.** Pre-construction surveys shall be conducted by a qualified biologist, in suitable habitat, for loggerhead shrike, grasshopper sparrow, and tricolored blackbird no more than 14 days prior to the beginning of any construction activity between March 1 and August 15. The survey area shall include all potential nesting sites located within 100 feet of the area to be disturbed. If an active nest of one of these species is found within 100 feet of the project, a determination will be made by a qualified biologist, in coordination with the CDFG, as to whether or not construction work will affect the active nest or disrupt reproductive behavior. Criteria used for this evaluation will include, but not be limited to, presence of visual screening between the nest and construction activities, and behavior of the adult birds in response to the surveyors or other ambient human activity. If construction activities have the potential to threaten the viability of an active nest discovered during the survey, then either a minimum 100-foot buffer will be flagged around the active nest and designated a construction-free zone until the nest is no longer active or other appropriate avoidance measures, including a reduced buffer size, approved by

CDFG, are implemented to ensure that the nest is adequately protected. Exact implementation of this measure shall be based on specific information at the project site.

• **Swallow Exclusion.** At least 6 months prior to the start of construction, a qualified biologist shall identify swallow colonies nesting within 100 feet of construction areas. During the months of September through February, a qualified biologist shall supervise the installation of netting or screens to prevent colonies from becoming established on or near structures or cliffs that would be destroyed by construction (after verifying that no swallows would be trapped).

• **Bat Exclusion.** At least 6 months prior to the start of construction, a qualified biologist shall identify potential bat maternity sites within 500 feet of construction areas. During the months of November through February, a qualified biologist shall supervise the installation of screens at potential roosts to prevent bat use (after verifying that no bats would be trapped by screening).

If potential maternity roost sites cannot be screened in advance, pre-construction surveys shall be conducted by a qualified biologist, in suitable rock outcrop and developed habitat for Townsend's big-eared bat, pallid bat, and western mastiff bat, no more than 14 days and no less than 7 days prior to the beginning of any construction activity between March 1 and October 31. The survey area shall include all potential maternity sites located within 500 feet of the area to be disturbed. If an active maternity site is found within 500 feet of the project, a determination will be made by a qualified biologist, in coordination with the CDFG, as to whether or not construction work will affect the site or disrupt reproductive behavior. Criteria used for this evaluation will include, but not be limited to, presence of visual and audio screening between the site and construction activities. If construction activities have the potential to threaten the viability of an active maternity site discovered during the survey, then a minimum 500-foot buffer will be flagged around the site and designated a construction-free zone until the site is no longer active or other appropriate avoidance measures, including a reduced buffer size, approved by CDFG, are implemented to ensure that the site is adequately protected. Exact implementation of this measure shall be based on specific information at the project site.

• **Most Beautiful Jewel-flower Buffer.** Before the initiation of any ground disturbing or vegetation-clearing activities at Disposal Site 7 and Disposal Site 7 haul roads, a qualified botanist shall supervise the installation of barrier fencing on the perimeter of the work area within 200 feet of mapped most beautiful jewel-flower populations and Diablo helianthella populations. Signs shall also be installed every 100 feet on the fence line to identify the sensitive area (e.g., "Environmentally Sensitive Area – Keep Out"). No construction-related activities shall be permitted within the limits of the populations. The contractor shall maintain the fencing throughout construction of the CDRP.

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5.4.1b Construction Measures

• **Wetlands and Other Waters.** Construction activities shall be avoided in saturated or ponded wetlands and streams (typically during the spring and winter) to the maximum extent practicable. Where wetlands or other water features must be disturbed, the minimum area of disturbance necessary for construction shall be identified and the area outside of that minimum area shall be avoided.

• **Exclusion Fencing.** The SFPUC shall ensure that the temporary exclusion fencing and/or other protective measures are continuously maintained until construction activities in the area of interest are completed. Exclusion fencing for establishing protective buffers shall be clearly visible (e.g., orange plastic). Barrier fencing for the California tiger salamander and Alameda whipsnake may be constructed of various materials but shall be buried deep enough (6–8 inches) and shall be tall enough (at least 24 inches above ground) to prevent the passage of target species. No construction activities, including movement of equipment, storage of materials or temporary stockpiling of spoils, will be allowed within fenced areas protecting sensitive habitats. All exclusion fencing shall be removed at the end of construction activities.

• **Wetland Soils and Vegetation.** To minimize the degradation of saturated wetland soils and vegetation where avoidance is not practicable, protective practices such as use of geotextile cushions and other materials (e.g., timber pads, prefabricated equipment pads, thick vegetative slash, geotextile fabric free of plastic monofilament and nylon wire) and/or vehicles with balloon tires will be employed.

• **Streams and Drainages.** Stabilize banks of all streams and drainages disturbed during construction, including banks of Alameda and Calaveras Creeks, using a non-vegetative material that will protect the soil from erosion by wind or water initially and break down within a few years (e.g., jute matt). To minimize entrapment of amphibians and snakes, any geotextile fabrics used shall be free of plastic monofilament and nylon wire. If visual evidence of erosion (e.g., rilling or scour) is observed, geotextile mats, excelsior blankets, or other soil stabilization products shall also be used.

• **Vegetation Removal.** During construction, immediately remove trees, shrubs, debris, soils, or construction materials that are inadvertently deposited below the ordinary high-water mark of any streams, drainages, ponds, wetlands, riparian areas, and Calaveras Reservoir in a manner that minimizes disturbance of the drainage bed and bank (e.g., manually). Such materials will be placed either in soil stock piles or appropriately managed waste collection containers until the materials can be properly disposed of.

• **Stream Crossing Locations.** Whenever possible, stream crossings shall be located on straight, relatively flat stream segments.

• **Use of Stream Crossings.** Stream crossing construction activities shall be timed to minimize impacts on wildlife and fish, including but not limited to the foothill yellow-legged frog. Installation or removal of crossings shall occur during dry conditions, preferably in summer when water flows are minimal. If necessary, stream flow shall be diverted through temporary culverts, conduits or like feature while stream crossings are being installed. Diversion culverts or conduits shall be sized to accommodate flows from flash flooding.

• **Culvert design.** Culverts for temporary stream crossings in fish-bearing streams must allow for fish passage, and the outflow of the culvert shall not create a waterfall. If possible, install and remove culverts when the streambed is dry. In a flowing stream channel, use sediment basins, a temporary diversion channel, or a dam and pump set-up to divert water during installation and removal of culverts.

• **Construction of Stream Crossings.** Temporary stream crossings constructed using temporary bridges shall have clean gravel approach ramps. Temporary culverts shall be backfilled with clean gravel/cobbles

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and topped with a gravel road base. Earth and rockfill material shall not be placed in stream channels. Approaches shall be stabilized using an appropriate type of geotextile covered with clean rock. Material shall extend at least 50 feet on both sides of the crossing if soft soil conditions exist or if they will be used for construction traffic during the rainy season.

• **Alameda Whipsnake Avoidance.** Vegetation clearing and initial ground disturbance activities in stands of scrub habitat that are potentially occupied by Alameda whipsnake and that cannot be avoided will be monitored by a qualified biologist. The biologist will conduct surveys and relocate any whipsnakes immediately prior to equipment clearing. Prior to clearing, escape routes that include natural vegetative cover will be provided to allow Alameda whipsnakes to move from the scrub habitat to other habitat outside of the construction area. Stands of Alameda whipsnake scrub habitat that cannot be avoided will be handcleared, or a qualified biologist will do surveys and relocate any whipsnakes immediately prior to equipment clearing. Prior to clearing, escape routes that include natural vegetative cover shall be provided to allow Alameda whipsnakes to move from the scrub habitat to other habitat outside of the construction area. Trenches or pits constructed in scrub or rock outcrop habitat will include escape ramps constructed of earthfill or wooden planks inspected by a qualified biologist to prevent entrapment of Alameda whipsnake and other animals. SFPUC will install barrier fencing at selected locations to exclude Alameda whipsnakes from entering construction areas, haul roads, and access roads. Fencing locations will be based on observations of Alameda whipsnakes or the presence of habitats that are likely to support higher densities of this species. Other portions of the haul route and construction work areas would not be fenced, based on coordination with CDFG and USFWS. SFPUC shall monitor disturbance areas to determine whether additional fencing is necessary to minimize potential impacts.

URS

Memorandum

Date: September 24, 2015

To: File

From: Jay Rehor, Senior Archaeologist
URS Corporation
1333 Broadway, Suite 800
Oakland, CA 94612

Subject: **Results of Cultural Resources Surveys for the Alameda Creek Diversion Dam (ACDD) Fish Passage Facilities Design Update**

This memorandum documents the results of a cultural resources study conducted to assist the San Francisco Public Utilities Commission (SFPUC) in meeting cultural resources compliance requirements of the California Environmental Quality Act (CEQA) and ensure that no significant impacts will occur to historical resources or unique archaeological resources as a result of implementation of the ACCD project. The ACCD and immediate vicinity were initially studied as part of the Final Environmental Impact Report (FEIR) for the Calaveras Dam Replacement Project (2011). At the time, the diversion dam and appurtenant structures were recorded and determined not eligible for listing in the California Register of Historical Resources (CRHR) or the National Register of Historic Places (NRHP). However, subsequently the ACDD project required modifications to the original project description in the FEIR. These changes included an approximately 3 acre staging area, access road modification in order to allow trucks to reach the ACDD, potential road stabilization at 4 locations on Geary Road to prevent sloughing, sluicing study required engineering of upper forebay, geotechnical investigation of historic landslide area, and downstream extension of fish ladder to accommodate size requirements provided in comments by the National Marine Fisheries Service. All of these activities are occurring within 0.5 mile of the original 2011 ACDD cultural resources study area (Figure 1). The results of the cultural resources study that was conducted to account for these changes are discussed in a memorandum dated June 20, 2014, previously submitted to the SFPUC.

The following memorandum addresses additional modifications to the project since June 2014. These changes include nine additional road improvements, three culvert repairs and/or replacements, an expanded staging area and sediment stock pile. A cultural resources study was conducted to account for these additional changes in the project description and ensure that effects to cultural resources as a result of the ACDD project are adequately addressed. The current cultural resources study consisted of a cultural resources field survey of the updated project footprint (Figure 1).

REGULATORY CONTEXT

California Environmental Quality Act (CEQA): CEQA Guidelines (California Code of Regulations, Title 14, Section 15064.5) provides specific guidance for determining the significance of impacts on historic architectural and archaeological resources. Under CEQA these significant resources are called

"historical resources" whether they are of historic or prehistoric age. CEQA (Public Resources Code Section 21084.1) defines historical resources as those listed, or eligible for listing, in the CRHR, or those listed in the historical register of a local jurisdiction (county or city). Cultural resources listed on the NRHP and located in California are considered historical resources for the purposes of CEQA. The CRHR criteria for listing cultural resources are based on, and are very similar to, the NRHP criteria. CEQA (Public Resources Code) Section 21083.2 and CEQA Guidelines Section 15064.5(c) provide further definitions and guidance for archaeological sites and their treatment.

Under CEQA an historical resource is defined as any resource that:

A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

B. Is associated with lives of persons important in our past;

C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

D. Has yielded, or may be likely to yield, information important on prehistory or history.

Section 15064.5 also prescribes a process and procedures for addressing the existence of, or probable likelihood, of Native American human remains, as well as the accidental discovery of any human remains within the Project. This includes consultations with appropriate Native American tribes about the treatment of known or found Native American human remains, before such remains are recovered.

Guidelines for the implementation of CEQA define procedures, types of activities, persons, and public agencies required to comply with CEQA. Appendix G in Section 15023 provides an Environmental Checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

CEQA also addresses impacts to unique archaeological resources. Section 21083.2 defines "unique archaeological resources" as "any archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and show that there is a demonstrable public interest in that information.
- It has a special and particular quality, such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event."

FIELD SURVEY

A thorough pedestrian survey of the project area was conducted on August 20, 2015. Survey transects were spaced approximately 5 to 10 meters apart, and covered all areas of potential ground disturbance shown on Figure 1. Surface visibility and terrain were variable. The terrain ranged from relatively flat and open areas to moderately sloping to steep hillsides. The majority of the survey area, primarily the hill slopes, was covered with tall dry grasses and ground visibility was limited to rodent burrows and exposed areas around rock outcrops. The few relatively flat and open areas were often characterized by low lying vegetation. In both cases, ground visibility was increased by making intermittent boot scrapes along transect lines.

RESULTS

No cultural resources were identified as a result of this field survey. The majority of the project area is located in upland areas with shallow surface soils developed on decomposing bedrock. Those portions of the project within Alameda Creek are located on active channel deposits. In both cases, there is little or no potential for buried archaeological resources not evident at the surface. As such, the proposed ACDD project is anticipated to have a very low potential for encountering unanticipated archaeological resources during implementation.

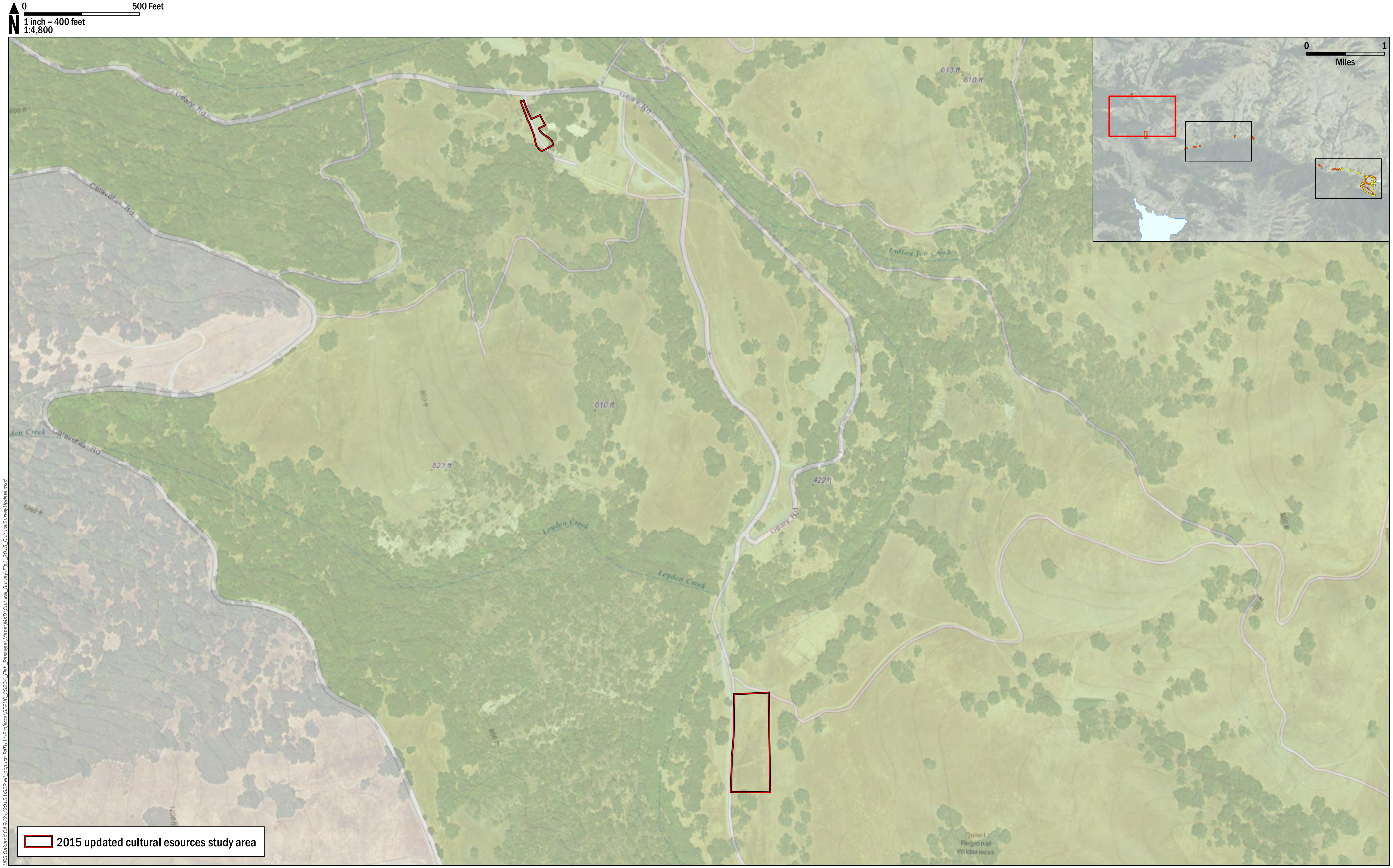
RECOMMENDATIONS

No new cultural resources were located as a result of the August 20, 2015 survey. The June 20, 2014 memorandum identified one previously unrecorded prehistoric cultural resource (ACDD CR#1) and two historic-era resources (ACDD CR#2 and ACDD CR#3). None of these resources were formally evaluated for CRHR or NRHP eligibility. The 2014 memorandum recommends that these resources can be avoided through project design and adoption of management practices (see June 2014 memorandum for further detail). Based on the August 20, 2015 survey, no additional recommendations are warranted.

With implementation of the proposed avoidance measures identified in the June 2014 memorandum (exclusion fencing and avoidance), and those mitigation measures already identified in the 2011 FEIR, the ACDD project is not anticipated to cause substantial adverse effects to any known historical resources or unique archaeological resources. The proposed project is not anticipated to have any impacts on any of the prehistoric or historic-era resources identified during the June 2014 cultural resources study. However, if design and associated impacts of the ACDD project change, the cultural resources identified in that report may require further investigation, documentation, and evaluation prior to project implementation.

URS

Figures

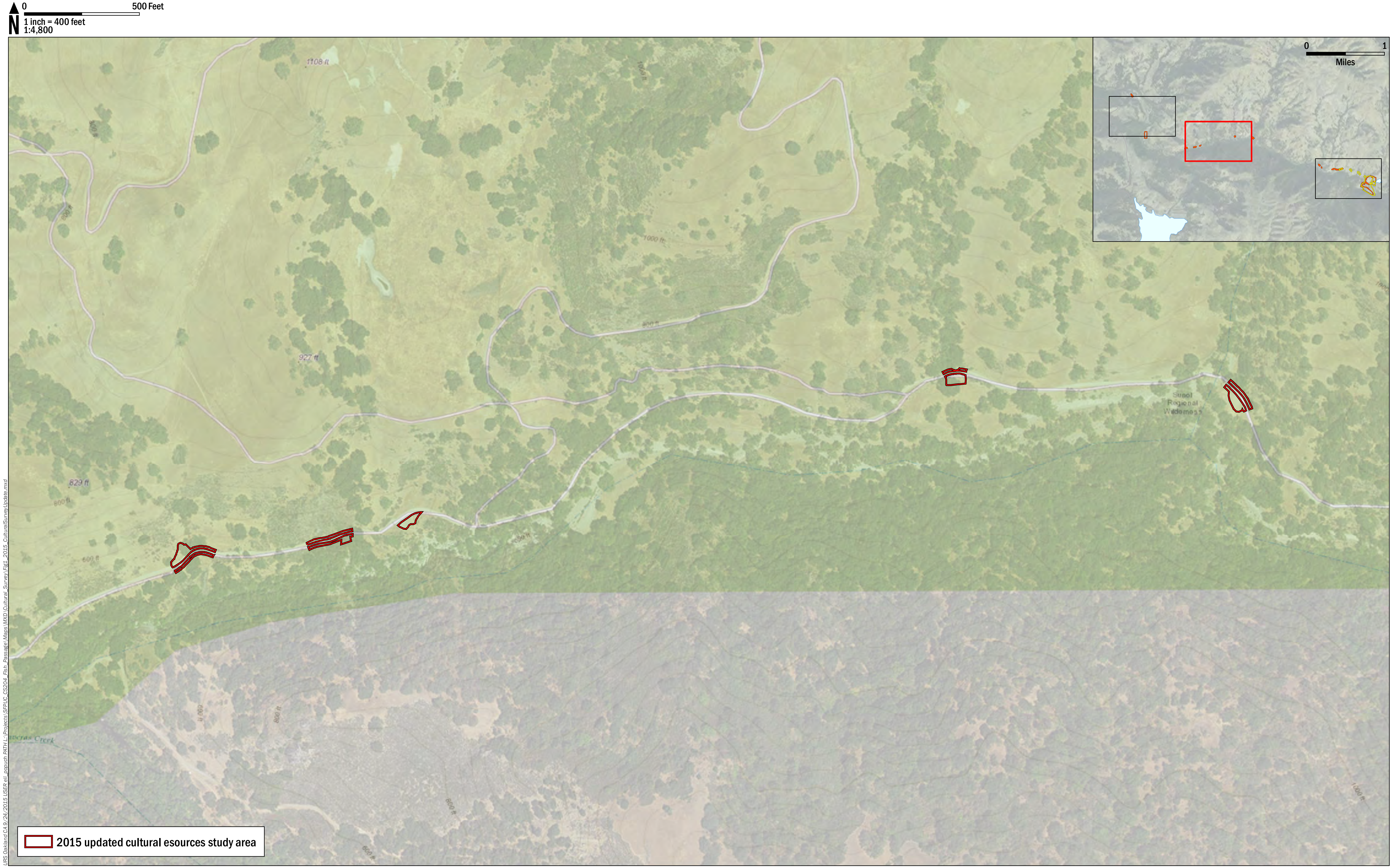


San Francisco Water Power Sewer

Fish Passage Facilities at the Alameda Creek Diversion Dam

FIGURE 1: (PAGE 1 OF 3)

Cultural Resources Study Results

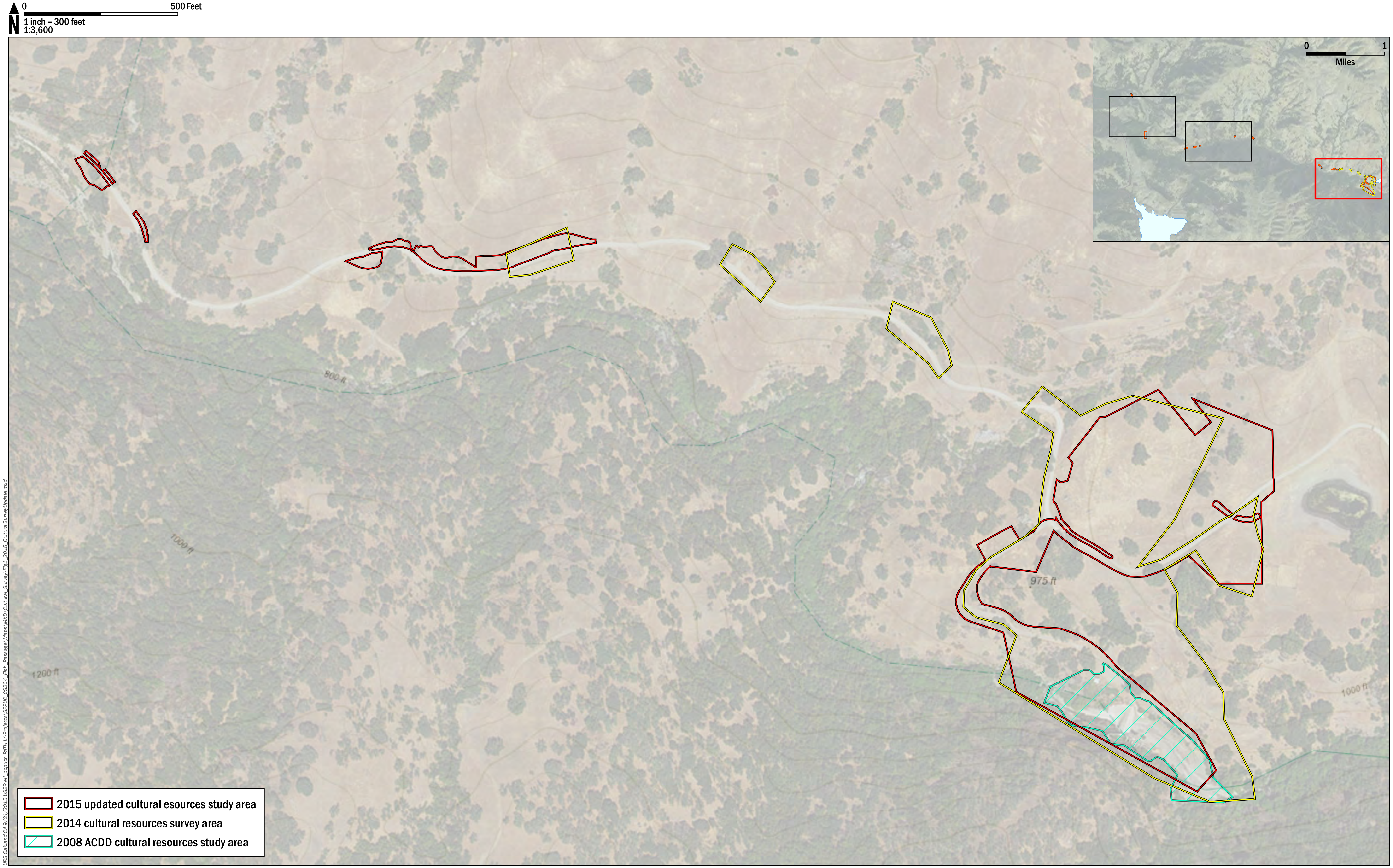


San Francisco Water Power Sewer

Fish Passage Facilities at the Alameda Creek Diversion Dam

FIGURE 1: (PAGE 2 OF 3)

Cultural Resources Study Results



San Francisco Water Power Sewer

Fish Passage Facilities at the Alameda Creek Diversion Dam

FIGURE 1: (PAGE 3 OF 3)

Cultural Resources Study Results

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RAMBOLL ENVIRON

ENVIRONMENT & HEALTH

MEMO

Date **February 2, 2016**
To **Kimberly Stern Liddell, SFPUC**
Jonathan Mates-Muchin, SFPUC
From **Ted Bowie, Ramboll Environ**
Douglas Daugherty, Ramboll Environ

Re: Evaluation of Proposed 2016 Project Modification on Air Quality Human Health Risks and Criteria Air Pollutants/Greenhouse Gases for the Calaveras Dam Replacement Project, Alameda County, California

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Introduction

As part of the technical analyses supporting the approved Final Environmental Impact Report (FEIR) for San Francisco Public Utility Commission's (SFPUC)'s Calaveras Dam Replacement Project (CDRP) in Alameda County, California (SFPD 2011), Ramboll Environ[1] previously performed an ambient air quality health risk screening analysis (HRSA) of diesel particulate matter (DPM) emissions from construction activities associated with the CDRP ("the adopted project"). A summary of this analysis was presented in our previous report (ENVIRON 2009a) and the accompanying data report (ENVIRON 2009b). In December 2012, Ramboll Environ conducted a screening evaluation of a proposed project modification ("the 2012 modified project") on air quality and associated lifetime excess cancer risks and chronic non-cancer hazards, and the results of that analysis were summarized in a memorandum to SFPUC (ENVIRON 2012).

It is our understanding that SFPUC is proposing to make some additional modifications to the project ("the proposed 2016 modified project") that may cause potential health risks, criteria air pollutant (CAP) emissions, and greenhouse gas (GHG) emissions to change compared to the 2012 modified project. Specifically, the proposed 2016 modified project would allow SFPUC to import hard rock for construction of Zone 5/5A for the upstream shell of the replacement dam. The FEIR identified that 764,000 cubic yards of rock is needed for Zone 5/5A and that all of this rock would be quarried onsite from Borrow Area B and the Stilling Basin. At this time, SFPUC is proposing

[1] As of May 1, 2015, ENVIRON International Corporation's name has been changed to Ramboll Environ US Corporation (Ramboll Environ).

a modification that will allow the importing of up to approximately 350,000 cubic yards of the hard rock needed for Zone 5/5A from off-site locations. The remaining required material will still be quarried onsite as defined in the FEIR. The rock will be imported from commercial sources chosen by the contractor from within the greater Bay Area.

According to information provided by SFPUC, the rock will be imported over an estimated 15-month period from February 2016 through April 2017 ("period of proposed 2016 modification").[2] The material will be hauled in 15 cubic yard trucks along Calaveras Road from I-680 to the Calaveras Dam and is anticipated to require approximately 150 round trip truck trips per day. This modification is expected to increase the total number of haul trucks by 23,333 round trips or 46,666 one-way trips. Based on information provided by SFPUC, the material is assumed to be hauled a distance of 65 miles. The total number of mobile source trips, including those impacted by the modification, is summarized in Table 1. Hauling activities will occur during weekdays from 7 a.m. to 5 p.m., or may occur at night.

The remainder of this memorandum summarizes the impact of the proposed modification on air quality health risks and hazards as well as CAP and GHG emissions.

Analysis of Air Quality Health Risks and Hazards

Ramboll Environ performed this screening risk assessment following the same methodology used in our previous reports (ENVIRON 2009a, ENVIRON 2012). To evaluate the impact of the proposed modification on the estimated DPM health risks, Ramboll Environ first evaluated how the proposed modification would impact the DPM emission estimates presented for the 2012 modified project. To update the DPM emissions, Ramboll Environ solicited information from SFPUC, such as updates to the number of mobile source trips and the locations where those trucks would travel. The updated mobile source DPM emissions, including those impacted by the proposed 2016 modification, are summarized in Table 2 (running emissions) and Table 3 (idling emissions). In addition, Ramboll Environ solicited information from SFPUC on offroad construction equipment usage, including actual equipment usage (2011 through November 2015) and projected equipment usage during the modification period and through the end of the project. The updated offroad construction equipment usage and the associated emissions are summarized in Tables 4 and 5, respectively. In general, the usage of offroad equipment decreased because the initial estimates used for the FEIR and subsequent analysis in 2012 were very conservative and included both daytime and nighttime construction, but nighttime construction has not been required.

[2] At the time of starting this analysis, SFPUC anticipated that the modification would occur over a 15-month period from December 2015 through October 2016 and December 2016 through March 2017. The results presented in this memorandum correspond to the originally anticipated 15-month period. The modified start date is expected to have a minimal impact on the results presented in this memorandum. While risk results for the proposed 2016 modified project may increase slightly compared to what is presented in this memorandum due to the additional two months of engine deterioration associated with offroad equipment, the maximum estimated risks are well below the CEQA significance thresholds established by BAAQMD, and this conclusion is not expected to change based on the schedule update. In addition, the criteria pollutant and greenhouse gas emissions for the period of the proposed 2016 modification are expected to decrease slightly compared to what is presented in this memorandum due to vehicle fleet improvements.

The proposed 2016 modified project includes a potential work/idling area (i.e., Disposal Site I) that was not included in the 2009 HRSA; however, since this new work/idling area is close to (and partially overlapping with) the existing Disposal Site 3 work/idling area, Ramboll Environ assigned idling emissions from the new haul truck trips to Disposal Site 3, which was previously evaluated and modelled for the adopted project. Similarly, Ramboll Environ conservatively estimated truck running DPM emissions based on the assumption that the trucks associated with the proposed 2016 modification would travel the farthest possible route (i.e., from I-680 to Disposal Site 7). This analysis was otherwise conducted in a manner that was consistent with the methods previously presented in the FEIR (SFPD 2011) and the 2012 modified project memorandum (ENVIRON 2012).

Risk results associated with construction of the proposed 2016 modified project are summarized in Table 6. The maximum cancer risks, maximum non-cancer risks, and largest increment in annual average fine particulate matter less than 2.5 micrometer in diameter ($PM_{2.5}$) concentrations have all decreased when compared to the values presented in our 2012 memorandum (ENVIRON 2012). Although the proposed 2016 modified project has additional truck trips, the emissions from these trucks would be offset by the reduction in offroad equipment usage, since SFPUC is now proposing a modification that will allow the importing of up to approximately 350,000 cubic yards of the hard rock needed for Zone 5/5A from off-site locations, which previous analyses assumed would have been mined onsite.

When compared to the values presented in our 2012 memorandum (ENVIRON 2012), the estimated cancer risk for the maximum exposed individual (MEI) resident (child) would decrease from 9.2 to 4.4; the estimated cancer risk for the MEI worker would decrease from 9.8 to 4.0; the estimated cancer risk for the MEI camper (child) would decrease from 1.0 to 0.7; and the estimated cancer risk for the MEI hiker/day visitor (child) would decrease from 6.7 to 3.4. In addition, the cancer risks associated with construction of the proposed 2016 modified project would continue to remain below the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) significance threshold of >10 in a million.

Chronic non-cancer hazard indices (HIs) are also estimated to decrease when compared to the 2012 modified project and would continue to remain below the BAAQMD CEQA significance threshold of >1.0. Specifically, the non-cancer HI for the MEI resident (child and adult) would decrease from 0.03 to 0.01, and the non-cancer HI for the MEI worker would decrease from 0.05 to 0.02. A chronic HQ is not estimated for the campers and hikers/day visitors because exposures are expected to be discontinuous over short durations and do not allow for estimation of chronic non-cancer health effects. In addition, when compared to the 2012 modified project, the largest increment in annual average $PM_{2.5}$ concentrations (which is primarily driven by DPM emissions and is therefore assumed to be equivalent to DPM concentrations) would decrease from 0.15 $\mu g/m^3$ to 0.06 $\mu g/m^3$ for the residential receptor locations with the highest incremental concentration, which is below the BAAQMD CEQA significance threshold of >0.3 $\mu g/m^3$ for annual average $PM_{2.5}$ concentration.

The locations of the MEI receptors (i.e., resident, worker, and hiker/day visitor) for the proposed 2016 modified project would be located in the same general areas as the 2012 modified project. Locations of the MEIs (resident, worker, and recreational user) for the proposed 2016 modified project are shown in Figure 1.

Analysis of Criteria Air Pollutant and Greenhouse Gas Emissions

To evaluate criteria air pollutant (CAP) emissions during the period of the proposed 2016 project modification, Ramboll Environ estimated emissions for this period and compared those emissions to the BAAQMD's CEQA construction mass emission thresholds as well as to the emissions reported in the FEIR (SFPD 2011). Emissions for offroad construction equipment used during the proposed 2016 project modification were estimated using the SFPUC Screening Tool (ENVIRON 2014). Emissions for the haul trucks associated with the proposed 2016 project modification were estimated using the California Emissions Estimator Model (CalEEMod®) (CAPCOA 2015), based on the following key assumptions: 1) 46,666 one-way haul truck trips with a one-way trip length of 65 miles; 2) project modification duration of 15 months (327 days); and 3) haul trucks are model year 2004 or newer in accordance with Mitigation Measure 5.13.3b in the FEIR (SFPD 2011). Based on information provided by SFPUC, worker commute trips and material delivery trucks not related to the proposed 2016 project modification were conservatively assumed to remain the same as analyzed in the FEIR "worst case" scenario (i.e., worker commute emissions assume 130 commuters per shift, 2 shifts per day, and 20 miles per one way trip; and material delivery truck emissions assume 124 one way trips per day and 15 miles per one way trip). The CAP emissions during the period of the proposed 2016 project modification are presented in Table 7.

The 2010 BAAQMD CEQA Guideline (BAAQMD 2010) establishes significance thresholds for construction-related CAPs and precursors. The significance threshold for reactive organic gases (ROG), exhaust respirable particulate matter less than 2.5 microns in aerodynamic diameter ($PM_{2.5}$), and nitrogen oxides (NO_x) is an average daily emission rate greater than 54 pounds per day (lb/day). The significance threshold for exhaust respirable particulate matter less than 10 micrometers in aerodynamic diameter (PM_{10}) is an average daily emission rate greater than 82 lb/day. The 2010 BAAQMD CEQA Guideline has no significance thresholds for construction-related emissions of sulfur dioxide (SO_2), carbon monoxide (CO), or greenhouse gases (GHGs).

As summarized in Table 7, the construction-related emissions for the CAPs with CEQA significance thresholds established by BAAQMD (i.e., ROG, NO_x, $PM_{2.5}$, and PM_{10}) would be less during the period of the proposed 2016 project modification than those reported in the FEIR. In addition, while NO_x would remain significant above the BAAQMD mass emission threshold of 54 lb/day, ROG would not be significant during the period of the proposed 2016 project modification as it would drop below the BAAQMD mass emission threshold of 54 lb/day. Since BAAQMD has not established CEQA significance thresholds for SO_2 and CO, emissions of these pollutants are not quantified by the SFPUC Screening Tool. However, since emissions of all of the other CAPs that are quantified by the SFPUC Screening Tool are calculated to decrease

during the period of the proposed 2016 project modification when compared to the emissions reported in the FEIR (SFPD 2011), emissions of SO_2 and CO are also expected to decrease during this time due to the substantial decrease in offroad equipment activity.

In the FEIR (SFPD 2011), a single GHG emission estimate was provided for all construction sources (i.e., worker commute vehicles, material delivery trucks, and offroad equipment). To determine the GHG emissions during the proposed 2016 project modification, Ramboll Environ estimated the GHG emissions for each of these sources, and then added the emissions from the haul trucks associated with the proposed 2016 modification. GHG emissions for worker commute vehicles and material delivery trucks were estimated using CalEEMod® (CAPCOA 2015) based on the following key assumptions that were used in the FEIR: 1) worker commute emissions assume 130 commuters per shift, 2 shifts per day, and 20 miles per one way trip; and 2) material delivery truck emissions assume 124 one way trips per day and 15 miles per one way trip. Similar to CAP emissions, GHG emissions from offroad construction equipment used during the proposed 2016 project modification were estimated using the SFPUC Screening Tool (ENVIRON 2014), and GHG emissions from the haul trucks associated with the proposed 2016 project modification were estimated using CalEEMod® (CAPCOA 2015) and the same assumptions outlined above under the CAP emissions summary.

As shown in Table 8, which contains a summary of GHG emissions, the GHG emissions during the proposed modification period represent an approximately 7% increase over what was reported in the FEIR (SFPD 2011). This increase is in GHG emissions is likely due to the additional haul trucks, which have a larger contribution to GHG emissions than offroad equipment. Thus, the potential increase in GHG emissions as a result of the proposed 2016 project modification is not expected to be substantial. In addition, Ramboll Environ notes that the "less than significant" determination for GHG emissions in the FEIR (SFPD 2011) was not based on the amount of GHG emissions since BAAQMD has not established a quantitative threshold for GHGs under CEQA, but instead was based on the project's incorporation of best management practices. The proposed 2016 modified project would be required to incorporate the project's best management practices to reduce GHG emissions.

Conclusions

Based on the screening analyses described above:

1. Total DPM emissions for the proposed 2016 modified project are expected to decrease when compared to the 2012 modified project. Although the proposed 2016 modified project requires additional truck trips, the emissions from these trucks would be offset by the reduction in offroad equipment usage.
2. Estimated DPM cancer risks for the proposed 2016 modified project are expected to decrease when compared to the 2012 modified project, and remain below the BAAQMD's CEQA significance threshold of >10 in a million. Specifically, the estimated cancer risk for the MEI resident (child) would decrease from 9.2 to 4.4; the estimated cancer risk for the MEI worker would decrease from 9.8 to 4.0; the estimated cancer risk for the MEI camper

(child) would decrease from 1.0 to 0.7; and the estimated cancer risk for the MEI hiker/day visitor (child) would decrease from 6.7 to 3.4.

3. Estimated maximum chronic non-cancer HIs for the proposed 2016 modified project are expected to decrease when compared to the 2012 modified project and remain below the BAAQMD CEQA significance threshold of >1.0. Specifically, the estimated non-cancer HI for the MEI resident would decrease from 0.03 to 0.01, and the estimated non-cancer HI for the MEI worker would decrease from 0.05 to 0.02.
4. The annual $PM_{2.5}$ concentration increment at the MEI resident location is expected to decrease when compared to the 2012 modified project, and would remain below the BAAQMD CEQA threshold of >0.3 $\mu g/m^3$. Specifically, the estimated annual average DPM incremental concentration for the MEI resident would decrease from 0.15 $\mu g/m^3$ to 0.06 $\mu g/m^3$.
5. During the period of the proposed 2016 modification, construction-related emissions for the CAPs with CEQA significance thresholds established by BAAQMD (i.e., ROG, NO_x, $PM_{2.5}$, and PM_{10}) would be less than those reported in the FEIR. In addition, while NO_x would remain significant above the BAAQMD's CEQA mass emission threshold of 54 lb/day as originally determined in the FEIR, ROG would not be significant during the period of the proposed 2016 project modification as it would drop below the BAAQMD's CEQA mass emission threshold of 54 lb/day during this time period. In addition, during the period of the proposed 2016 modification, the emissions of CAPs without BAAQMD CEQA significance thresholds for construction (i.e., SO_2 and CO) are expected to be lower than what was reported in the FEIR due to the significant decrease in offroad equipment activity.
6. Construction-related GHG emissions emitted during the proposed 2016 project modification could potentially increase daily GHG emissions by approximately 7%.

References

/1/ Bay Area Air Quality Management District (BAAQMD). 1999. BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans. December.

/2/ BAAQMD. 2010. BAAQMD CEQA Guidelines. May.

/3/ California Air Pollution Control Officers Association (CAPCOA). 2015. CalEEMod version 2013.2.2.

/4/ ENVIRON International Corporation (ENVIRON). 2009a. Health Risk Screening Analysis of Diesel Particulate Emissions Associated with the Calaveras Dam Replacement Project, Alameda and Santa Clara Counties, California. August.

/5/ ENVIRON. 2009b. Data Report for Health Risk Screening Analysis of Diesel Particulate Emissions Associated with Calaveras Dam Replacement Project Alameda and Santa Clara Counties, California. August.

/6/ ENVIRON. 2012. Screening Evaluation of Proposed Project Modifications on Air Quality Risks and Hazards for the Calaveras Dam Replacement Project, Alameda County, California. December.

/7/ ENVIRON. 2014. SFPUC Screening Tool, version 4.7.1.

/8/ San Francisco Planning Department (SFPD). 2011. Final Environmental Impact Report San Francisco Public Utilities Commission Calaveras Dam Replacement Project. January.

Table 1: Number of Trips for Proposed 2016 Modified Project
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Description	Traffic Location	Total Number of Round Trips[1] [trips/project]	Maximum Daily Round Trips[2] [trips/day]	Covered by Proposed 2016 Project Modification?
Spoils/Fill Hauling				
Disposal Area 3	*Traffic travels between Disposal Area 3 and the replacement dam area*	*82,666*	*42*	No
Disposal Area A/D	*Traffic travels between Disposal Area A/D and the replacement dam area*	*39,166*	*20*	No
Disposal Area H	*Traffic travels between Disposal Area H and the replacement dam area*	*6,666*	*4*	No
Disposal Area I	*Traffic travels between Disposal Area I and the replacement dam area*	*36,666*	*19*	No
Disposal Area 3[3]	Traffic travels between Disposal Area 3, A/D, H, I, and the replacement dam area	165,164	85	No
Disposal Area 7	*Traffic travels between Disposal Area 7 and the replacement dam area*	*48,666*	*25*	No
Disposal Area F	*Traffic travels between Disposal Area F and the replacement dam area*	*15,000*	*8*	No
Disposal Area G	*Traffic travels between Disposal Area G and the replacement dam area*	*13,333*	*8*	No
Disposal Area 7[4]	Traffic travels between Disposal Area 7, F, G, and the replacement dam area	76,999	41	No
Import Filter/Drain for Disposal Sites[5]	Traffic travels along Calaveras Road to the replacement dam area	1,600	41	No
Import Filter/Drain for Dam[6]	Traffic travels along Calaveras Road to the replacement dam area	23,300	65	No
Import for Construction Zone 5/5A[7]	Traffic travels along Calaveras Road to Disposal Site 7, Disposal Site I, or Disposal Site 3	23,333	150	Yes
Core Material	Traffic travels along the West Haul Route between Borrow Area E and the replacement dam area	38,100	109	No
Rockfill/ Riprap/ Coarse Filter	*Traffic travels between Borrow Area B and the replacement dam area*	*34,500*	*99*	No
Disposal Area 2	*Traffic travels between Disposal Area 2 and the replacement dam area*	*36,667*	*19*	No
Rockfill/ Riprap/ Coarse Filter[8]	Traffic travels between Borrow Area B, Disposal Area 2, and the replacement dam area	71,167	118	No
Excavation	70% of the traffic travels between the replacement dam area and Disposal Area 3; the remaining 30% of the traffic travels between the replacement dam area and Disposal Area 7	63,300	182	No
Concrete Aggregate	Traffic travels along Calaveras Road to the replacement dam area	600	5	No
Demolition Concrete	Traffic travels along Calaveras Road to the replacement dam area	600	10	No
Equipment/Material Delivery				
Miscellaneous Deliveries[9]	Traffic travels along Calaveras Road to the replacement dam area	3,900	3	No
Employee Commute				
Employee Commute	Traffic travels along Calaveras Road to the replacement dam area	414,960	238	No

Notes:

1) Total number of round-trips generated for the modified project was provided by SFPUC (SFPUC 2012, SFPUC 2015).

2) Number represents maximum daily round-trips generated during the project and includes a 25% margin above estimated daily trips. Estimated daily trips for spoils/fill hauling and equipment/material delivery except travel to and from Disposal Areas were taken from "Table 2: Estimated Construction Traffic (95 Percent Design)" (URS 2009). Estimated daily trips for travel to/from Disposal Areas were estimated assuming annual trips were spread across all days as communicated by SFPUC. Daily employee commuting trips were obtained from *Project Description* (EDAW & Turnstone 2009) and represent the time period during which the maximum number of workers would be commuting to the site. The maximum daily number of employee commuting round trips for the project was conservatively estimated assuming 238 trips/day (25% increase over the estimated average daily round trips of 190 trips/day provided in the *Project Description*).

3) Truck traffic between the replacement dam area and Disposal Areas A/D, H, and I was assumed to mirror the route between the replacement dam area and Disposal Area 3.

4) Routes between Disposal Areas F and G and the replacment dam area are assumed to mirror the route between the replacement dam and Disposal Area 7.

5) Filter/drain materials for disposal sites would be imported over approximately the first four years of construction. The “Import Filter/Drain for Disposal Sites” haul route will also involve transport of material from the stockpile to the disposal sites; however, based on discussions with SFPUC, the distance between these two areas is negligible, so that component of the route is not included in this analysis.

6) Filter/drain materials for dam would be imported over approximately 18 months in the fifth and sixth year of construction. The “Import Filter/Drain for Dam” haul route will also involve transport of material from the stockpile to the dam; however, based on discussions with SFPUC, the distance between these two areas is negligible, so that component of the route is not included in this analysis.

7) Rock for dam would be imported over approximately 15 months. All haul trucks were conservatively assumed to travel from I-680 to Calaveras Road to the Access Road to the Dam to Disposal Site 7, which results in the longest route based on the possible destinations.

8) Traffic between the replacement dam areas and Borrow Area B was assumed representative of the route between the replacement dam area and Disposal Area 2.

9) Miscellaneous deliveries include such items as fuel, steel reinforcement, pipe, cement, etc.

References:

1) EDAW & Turnstone Joint Venture. 2009. *Calaveras Dam Replacement Project Screencheck II (Draft), Chapter 3: Project Description.* March 13. Provided by Turnstone Consulting via email on May 22, 2009.

2) SFPUC. 2012. *Mobile Source Table.xlsx.* Provided by SFPUC via email on November 6, 2012. Supplemented based on discussions with SFPUC.

3) SFPUC. 2015. *CDRP_SFPUC Screening Tool v.5.9 - Phase 2 Linear Projects 2 pg.pdf.* Provided by SFPUC via email on March 5, 2015. Supplemented based on discussions with SFPUC.

4) URS. 2009. *CUW 37401 - Calaveras Dam Replacement Project - Estimated Truck Trips to Project and On-Site.* February 6. Provided by SFPUC via email on April 6, 2009.

Table 2: Summary of Diesel Particulate Matter Running Exhaust Emissions from Mobile Sources for Proposed 2016 Modified Project
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Equipment	Road Segment	Number of Volume Sources Modeled in Subsegment	Road Segment Speed	Type of Vehicle[1]	Average PM_{10} Running Exhaust Emission Factor[2]	Length of Road Segment[3]		Segment Traveled per Trip	Nominal Number of Round Trips[4]	Percent Diesel[5]	Project Normalized PM_{10} Emission Rate[6]	Maximum Number of Daily Round Trips[7]	Maximum 24-Hour PM_{10} Emission Rate[8]
			[mph]		[g/VMT]	[m]	[miles]	[#/trip]	[trip/project]		[g/s]	[trip/day]	[g/s]
Trucks - Transport of Spoils/Fill	Calaveras south bound on-ramp	22	50	100% HHDT	4.3E-01	275	0.2	1	24,717	100%	7.2E-06	115	9.7E-05
	Calaveras south bound off-ramp	44	50	100% HHDT	4.3E-01	750	0.5	1	24,717	100%	2.0E-05	115	2.7E-04
	Calaveras north bound on-ramp	34	50	100% HHDT	4.3E-01	340	0.2	1	24,717	100%	8.9E-06	115	1.2E-04
	Calaveras north bound off-ramp	40	50	100% HHDT	4.3E-01	390	0.2	1	24,717	100%	1.0E-05	115	1.4E-04
	Calaveras (Geary to Dam)	230	25	100% HHDT	4.9E-01	4,850	3.0	2	49,433	100%	5.8E-04	230	7.8E-03
	Calaveras (I680 to Geary)	297	50	100% HHDT	4.3E-01	6,369	4.0	2	49,433	100%	6.6E-04	230	9.0E-03
	Access Road to Dam	222	15	100% HHDT	8.1E-01	1,725	1.1	2	49,433	100%	3.4E-04	230	4.6E-03
	Access Road to West Haul Route	108	15	100% HHDT	2.2E-01	981	0.6	2	38,100	100%	4.0E-05	109	3.3E-04
	Excavation Haul Route - Dam and Disposal Area 3	96	15	100% HHDT	2.2E-01	875	0.5	2	44,310	100%	4.1E-05	127	3.5E-04
	Excavation Haul Route - Dam and Disposal Area 7	190	15	100% HHDT	2.2E-01	1,740	1.1	2	18,990	100%	3.5E-05	55	3.0E-04
	Rockfill/Riprap	80	15	100% HHDT	2.2E-01	725	0.5	2	71,167	100%	5.5E-05	118	2.7E-04
	West Haul Rt North	190	25	100% HHDT	1.9E-01	2,300	1.4	2	38,100	100%	8.3E-05	109	7.0E-04
	West Haul Rt South	124	25	100% HHDT	1.9E-01	3,000	1.9	2	38,100	100%	1.1E-04	109	9.1E-04
	Disposal Area 3 Haul Route	96	15	100% HHDT	2.2E-01	875	0.5	2	165,164	100%	1.5E-04	85	2.3E-04
	Disposal Area 7 Haul Route	190	15	100% HHDT	2.2E-01	1,740	1.1	2	100,332	100%	1.9E-04	191	1.0E-03
	North Access Road Borrow Area E	52	15	100% HHDT	2.2E-01	475	0.3	2	38,100	100%	1.9E-05	109	1.6E-04
Trucks - Transport of Equipment/Materials	Calaveras south bound on-ramp	22	50	65% HHDT	4.3E-01	275	0.2	1	1,950	100%	3.7E-07	2	1.1E-06
	Calaveras south bound off-ramp	44	50	65% HHDT	4.3E-01	750	0.5	1	1,950	100%	1.0E-06	2	3.0E-06
	Calaveras north bound on-ramp	34	50	65% HHDT	4.3E-01	340	0.2	1	1,950	100%	4.5E-07	2	1.4E-06
	Calaveras north bound off-ramp	40	50	65% HHDT	4.3E-01	390	0.2	1	1,950	100%	5.2E-07	2	1.6E-06
	Calaveras (Geary to Dam)	230	25	65% HHDT	4.9E-01	4,850	3.0	2	3,900	100%	3.0E-05	3	6.6E-05
	Calaveras (I680 to Geary)	297	50	65% HHDT	4.3E-01	6,369	4.0	2	3,900	100%	3.4E-05	3	7.6E-05
	Access Road to Dam	222	15	65% HHDT	8.1E-01	1,725	1.1	2	3,900	100%	1.8E-05	3	3.9E-05
	Calaveras south bound on-ramp	22	50	25% MHDT	1.7E-01	275	0.2	1	1,950	86%	4.9E-08	2	1.5E-07
	Calaveras south bound off-ramp	44	50	25% MHDT	1.7E-01	750	0.5	1	1,950	86%	1.3E-07	2	4.0E-07
	Calaveras north bound on-ramp	34	50	25% MHDT	1.7E-01	340	0.2	1	1,950	86%	6.0E-08	2	1.8E-07
	Calaveras north bound off-ramp	40	50	25% MHDT	1.7E-01	390	0.2	1	1,950	86%	6.9E-08	2	2.1E-07
	Calaveras (Geary to Dam)	230	25	25% MHDT	3.0E-01	4,850	3.0	2	3,900	86%	5.9E-06	3	1.3E-05
	Calaveras (I680 to Geary)	297	50	25% MHDT	1.7E-01	6,369	4.0	2	3,900	86%	4.5E-06	3	1.0E-05
	Access Road to Dam	222	15	25% MHDT	4.3E-01	1,725	1.1	2	3,900	86%	3.1E-06	3	6.9E-06
	Calaveras south bound on-ramp	22	50	10% LHDT2	3.5E-02	275	0.2	1	1,950	42%	1.9E-09	2	5.8E-09
	Calaveras south bound off-ramp	44	50	10% LHDT2	3.5E-02	750	0.5	1	1,950	42%	5.3E-09	2	1.6E-08
	Calaveras north bound on-ramp	34	50	10% LHDT2	3.5E-02	340	0.2	1	1,950	42%	2.4E-09	2	7.2E-09
	Calaveras north bound off-ramp	40	50	10% LHDT2	3.5E-02	390	0.2	1	1,950	42%	2.8E-09	2	8.3E-09
	Calaveras (Geary to Dam)	230	25	10% LHDT2	6.1E-02	4,850	3.0	2	3,900	42%	2.4E-07	3	5.4E-07
	Calaveras (I680 to Geary)	297	50	10% LHDT2	3.5E-02	6,369	4.0	2	3,900	42%	1.8E-07	3	4.0E-07
	Access Road to Dam	222	15	10% LHDT2	8.9E-02	1,725	1.1	2	3,900	42%	1.2E-07	3	2.8E-07
Vehicles - Employee Vehicles (Commuting Vehicles)	Calaveras south bound on-ramp	22	50	50% LDA	7.9E-02	275	0.2	1	207,480	0.17%	9.3E-09	119	1.6E-08
	Calaveras south bound off-ramp	44	50	50% LDA	7.9E-02	750	0.5	1	207,480	0.17%	2.5E-08	119	4.3E-08
	Calaveras north bound on-ramp	34	50	50% LDA	7.9E-02	340	0.2	1	207,480	0.17%	1.2E-08	119	1.9E-08
	Calaveras north bound off-ramp	40	50	50% LDA	7.9E-02	390	0.2	1	207,480	0.17%	1.3E-08	119	2.2E-08
	Calaveras (Geary to Dam)	230	25	50% LDA	1.4E-01	4,850	3.0	2	414,960	0.17%	1.1E-06	238	1.9E-06
	Calaveras (I680 to Geary)	297	50	50% LDA	7.9E-02	6,369	4.0	2	414,960	0.17%	8.7E-07	238	1.5E-06
	Access Road to Dam	222	15	50% LDA	2.0E-01	1,725	1.1	2	414,960	0.17%	5.9E-07	238	9.9E-07
	Calaveras south bound on-ramp	22	50	50% LDT2	5.0E-02	275	0.2	1	207,480	0.16%	5.7E-09	119	9.5E-09
	Calaveras south bound off-ramp	44	50	50% LDT2	5.0E-02	750	0.5	1	207,480	0.16%	1.5E-08	119	2.6E-08
	Calaveras north bound on-ramp	34	50	50% LDT2	5.0E-02	340	0.2	1	207,480	0.16%	7.0E-09	119	1.2E-08
	Calaveras north bound off-ramp	40	50	50% LDT2	5.0E-02	390	0.2	1	207,480	0.16%	8.0E-09	119	1.3E-08
	Calaveras (Geary to Dam)	230	25	50% LDT2	8.7E-02	4,850	3.0	2	414,960	0.16%	6.9E-07	238	1.2E-06
	Calaveras (I680 to Geary)	297	50	50% LDT2	5.0E-02	6,369	4.0	2	414,960	0.16%	5.2E-07	238	8.8E-07
	Access Road to Dam	222	15	50% LDT2	1.3E-01	1,725	1.1	2	414,960	0.16%	3.6E-07	238	6.0E-07

Notes:

1) Based on EMFAC vehicle classes (ARB 2007).
LDA: Passenger Cars
LDT2: Light-Duty Trucks (3,751-5,750 lbs)
LHDT2: Light-Heavy-Duty Trucks (10,001-14,000 lbs)
MHDT: Medium-Heavy-Duty Trucks (14,001-33,000 lbs)
HHDT: Heavy-Heavy-Duty Trucks (33,001-60,000 lbs)
The percentages of different vehicle classes were determined based on discussions with SFPUC.

2) Determined using EMFAC (ARB 2007). DPM is conservatively assumed to be equivalent to PM_{10}.

3) Measured using Geographical Information Systems (GIS).

4) Determined based on the traffic location and associated total number of round trips presented in Table 1. This value does not take into account the percentage of diesel vehicles.

5) Determined using EMFAC (ARB 2007). All %diesel values taken from EMFAC except for HHDT, which was conservatively assumed to be 100% diesel.

6) Project Normalized Emission Rate [g/s] = Total Project Emissions [g/project] * [project/8 years] * [1 year/365 days] * [1 day/24 hours] * [1 hour/3,600 seconds], where:
Total Project Emissions [g/project] = Average PM_{10} Running Exhaust Emission Factor [g/VMT] * Total Diesel Vehicle Miles Travelled [VMT/project], where
Total Diesel Vehicle Miles Traveled [VMT/project] = Total Diesel Vehicle Round Trips [trips/project] * Length of Road Segment [miles/trip] * Number of Times Segment Traveled per Trip, where:
Total Diesel Vehicle Round Trips [trips/project] = Nominal Number of Round Trips [trips/project] * $\%_{diesel}$ * $\%_{vehicleclass}$

7) Determined based on the traffic location and associated maximum daily round trips presented in Table 1. This value does not take into account the percentage of diesel vehicles.

8) Maximum 24-Hour Emission Rate [g/s] = Maximum Daily Running Emissions [g/day] * [1 day/24 hours] * [1 hour/3,600 seconds], where:
Maximum Daily Running Emissions [g/day] = Average PM_{10} Running Exhaust Emission Factor [g/VMT] * Maximum Daily Diesel Vehicle Miles Traveled [VMT/day], where:
Maximum Daily Diesel Vehicle Miles Traveled [VMT/day] = Maximum Daily Diesel Vehicle Round Trips [trips/day] * Length of Road Segment [miles/trip] * Number of Times Segment Traveled per Trip (#/trip), where:
Maximum Daily Diesel Vehicle Round Trips [trips/day] = Maximum Number of Daily Round Trips [trips/day] * $\%_{diesel}$ * $\%_{vehicleclass}$

Note: $\%_{vehicleclass}$ represents the type of vehicle class and is listed in the table above under the "Type of Vehicle" column.

Shaded rows include mobile source trips that are covered by the proposed 2016 project modifications.

References:

1) Air Resources Board (ARB), 2007. *EMFAC 2007 (Version 2.30) User's Guide (DRAFT)*. April.
2) EDAW & Turnstone Joint Venture. 2009. *Calaveras Dam Replacement Project Screencheck II (Draft), Chapter 3: Project Description*. March 13. Provided by Turnstone Consulting via email on May 22, 2009.
3) SFPUC. 2012. *Mobile Source Table.xlsx*. Provided by SFPUC via email on November 6, 2012. Supplemented based on discussions with SFPUC.
4) URS. 2009. *CUW 37401 - Calaveras Dam Replacement Project - Estimated Truck Trips to Project and On-Site*. February 6. Provided by SFPUC via email on April 6, 2009.

Table 3: Summary of Diesel Particulate Matter Idling Emissions from Mobile Sources for Proposed 2016 Modified Project
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Equipment	Area	Type of Vehicle[1]	Average PM_{10} Idle Exhaust Emission Factor[2]	Average Idling Time/Trip[3]	Nominal Number of Round Trips[4]	Percent Diesel[5]	Project Normalized PM_{10} Emission Rate[6]	Maximum Daily Round Trips[7]	Maximum 24-Hour PM_{10} Emission Rate[8]
			[g/idle-hr]	[minutes]	[trips/project]		[g/s]	[trip/day]	[g/s]
Trucks - Transport of Spoils/Fill	Dam & Spillway Area (Replacement Dam)	100% HHDT	4.78E-01	5	440,830	100%	7.0E-05	615	2.8E-04
	Borrow Area B	100% HHDT	4.16E-01	5	71,167	100%	9.8E-06	118	4.7E-05
	Borrow Area E	100% HHDT	4.16E-01	5	38,100	100%	5.2E-06	109	4.4E-05
	Disposal Area 3	100% HHDT	4.16E-01	5	232,807	100%	3.2E-05	362	1.5E-04
	Disposal Area 7	100% HHDT	4.16E-01	5	95,989	100%	1.3E-05	96	3.8E-05
Transport of Equipment/ Materials	Dam & Spillway Area (Replacement Dam)	65% HHDT	1.47E+00	5	3,900	100%	1.2E-06	3	2.8E-06
	Dam & Spillway Area (Replacement Dam)	25% MHDT	8.82E-01	5	3,900	86%	2.4E-07	3	5.5E-07
	Dam & Spillway Area (Replacement Dam)	10% LHDT2	9.69E-01	5	3,900	42%	5.2E-08	3	1.2E-07

Notes:

1) Based on EMFAC vehicle classes (ARB 2007).

LHDT2: Light-Heavy-Duty Trucks (10,001-14,000 lbs)

MHDT: Medium-Heavy-Duty Trucks (14,001-33,000 lbs)

HHDT: Heavy-Heavy-Duty Trucks (33,001-60,000 lbs)

The percentages of different vehicle classes were determined based on discussions with SFPUC.

2) Determined using EMFAC (ARB 2007). DPM is conservatively assumed to be equivalent to PM10. For spoils/fill trucks in the Dam and Spillway Area, the idling exhaust emission factor is based on the weighted average of onsite and offsite trucks.

3) Determined based on discussions with SFPUC and URS.

4) Determined based on the traffic location and associated total number of round trips presented in Table 1. This value does not take into account the percentage of diesel vehicles.

5) Determined using EMFAC (ARB 2007). All $\%_{diesel}$ values taken from EMFAC except for HHDT, which was conservatively assumed to be 100% diesel.

6) Project Normalized PM_{10} Emission Rate [g/s] = Total Project PM_{10} Emissions [g/project] * [project/8 years] * [1 year/365 days] * [1 day/24 hours] * [1 hour/3,600 seconds], where:

Total Project PM_{10} Emissions [g/project] = Average PM_{10} Idling Exhaust Emission Factor [g/idle-hr] * Average Idle Time per Trip [minutes/trip] * [1 hour/60 minutes] * Total Diesel Vehicle Round Trips [trips/project], where:

Total Diesel Vehicle Round Trips [trips/project] = Nominal Number of Round Trips [trips/project] * $\%_{diesel}$ * $\%_{vehicleclass}$

7) Determined based on the traffic location and associated maximum daily trip number presented in Table 1. This value does not take into account the percentage of diesel vehicles.

8) Maximum 24-hour PM_{10} Emission Rate [g/s] = Maximum Daily PM_{10} Emissions [g/day] * [1 day/24 hours] * [1 hour/3,600 seconds], where:

Maximum Daily PM_{10} Emissions [g/day] = Average PM_{10} Idling Exhaust Emission Factor [g/idle-hr] * Average Idle Time per Trip [minutes/trip] * [1 hour/60 minutes] * Maximum Daily Diesel Vehicle Round Trips [trips/day], where:

Maximum Daily Diesel Vehicle Round Trips [trips/day] = Maximum Daily Vehicle Round Trips [trips/day] * $\%_{diesel}$ * $\%_{vehicleclass}$

Note: $\%_{vehicleclass}$ represents the type of vehicle class and is listed in the table above under the "Type of Vehicle" column.

Shaded rows include mobile source trips that are covered by the proposed 2016 project modifications.

References:

1) Air Resources Board (ARB), 2007. EMFAC 2007 (Version 2.30) User's Guide (DRAFT). April.

2) EDAW & Turnstone Joint Venture. 2009. *Calaveras Dam Replacement Project Screencheck II (Draft), Chapter 3: Project Description.* March 13. Provided by Turnstone Consulting via email on May 22, 2009.

3) URS. 2009. *CUW 37401 - Calaveras Dam Replacement Project - Estimated Truck Trips to Project and On-Site.* February 6. Provided by SFPUC via email on April 6, 2009.

Table 4: Offroad Construction Equipment Usage for Proposed 2016 Modified Project
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Location	Equipment	Horse power	Engine Year	Engine Tier	Summary of Construction Equipment Hours of Operation[1]																																																																																				
					2011 (actual)	2012 (actual)												2013 (actual)												2014 (actual)												2015 (actual through November, projected for December)												2016 (projected)												2017 (projected)												2018 (projected)											
					D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Dam and Spillway Area (Includes Haul Road Construction)	Rubber Tired Dozers	435	2006	TIER 2																																																																	140	161	147	147	161	140	154	154	147	322	280	294	147	161	140	154	154	140	161	147	147
	Rubber Tired Dozers	240	2006	TIER 2																																																																	140	161	147	147	161	140	154	154													
	Rubber Tired Dozers	875	2009	TIER 2																																																																	280	322	294	294	322	280	308	308													
	Excavators	513	2007	TIER 2																																																																										161	140	147	147	161	140	154	154	140	161	147	147
	Graders	300	2006	TIER 2																																																																	280	322	294	294	322	280	308	308		161	140	147	147	161	140	154	154	140	161	147	147
	Rubber Tired Loaders	215	2007	TIER 2																																																																										161	140	147	147	161	140	154	154	140	161	147	147
	Cranes	280	2007	TIER 2																																																																										161	140	147	147	161	140	154	154	140	161	147	147
	Rollers	250	2006	TIER 2																																																																	420	483	441	441	483	420	462	462	147	161	140	147	147	161	140	154	154	140	161	147	
	Off-Highway Trucks	450	2006	TIER 2																																																																	280	322	294	294	322	280	308	308		322	280	294									
	Scrapers	600	2006	TIER 2																																																																	560	644	588	588	644	560	616	616		322	280	294									
	Air Compressors	300	2006	TIER 3					56	56	14	14	14	3																																																																											
	Skid Steer Loaders	85	2013	TIER 4I																																														32																																							
	Skid Steer Loaders	81	2008	TIER 3				80	80	80																																																																															
	Graders	300	2006	TIER 3			40	56	112	251	339	270	138	115	281	212	92	328	305	315	305	394	357	390	363	220	225	85	109	114	111	138	115	162	165	214	221	219	240	139	42	141	81	150	96	109	104	72	145	76	150	43																																					
	Graders	183	2010	TIER 3	153.4		40																																																																																		
	Bore/Drill Rigs	110	2005	TIER 2																															54	78	87	71	71	20	10	10	12				7				24																																						
	Bore/Drill Rigs	114	2004	TIER 3															90	90	90	90	90	90	110	110	110	110	85	122	135	135	120																																																								
	Bore/Drill Rigs	115	2006	TIER 2																																															32																																						
	Bore/Drill Rigs	120	2008	TIER 3																										115	115	115	133																																																								
	Bore/Drill Rigs	155	2011	TIER 3											60	60	60	60	60	60	60	55	55	55					45	45			40																																																								
	Bore/Drill Rigs	174	2007	TIER 3																														38	38	25	51	25	25																																																		
	Bore/Drill Rigs	174	2009	TIER 3																														157	300	116	128	116	116	135	119	119	127	98	103	43	8																																										
	Bore/Drill Rigs	200	2009	TIER 3				40	40	40																																																																															
	Bore/Drill Rigs	209	2003	TIER 2																																				42	5	5	5																																														
	Bore/Drill Rigs	220	2006	TIER 3											120	120	120	120	120		125	120	120	95	95	95	95	95	80					5	96	146	142	138	138	120	92	92	80				8	142	142	140	1																																						
	Bore/Drill Rigs	220	2007	TIER 3											111	120	120		20	20	20																																																																				
	Bore/Drill Rigs	225	2006	TIER 3											115	126	126		20	20	20																																																																				
	Bore/Drill Rigs	350	2010	TIER 3				80	80																																																																																
	Bore/Drill Rigs	439	2001	TIER 2					100	100																																																																															
	Bore/Drill Rigs	474	2009	TIER 3				120																																																																																	
	Bore/Drill Rigs	54	2006	TIER 3																																												189	45	45																																							
	Bore/Drill Rigs	580	2008	TIER 3								15																																																																													
	Air Compressors	174	1999	TIER 1																																															16																																						
	Air Compressors	275	2004	TIER 3																																															32																																						
	Cranes	130	2012	TIER 3																				110	115	120																																																															
	Cranes	130	2012	TIER 4I											24	120	136	160	140	172	183	11																																																																			
	Cranes	175	2010	TIER 3				40	40																																																																																
	Cranes	215	2000	TIER 1	8.5	8																																																																																			
	Cranes	225	2009	TIER 3													136	155	118	137	168	208	213	240	145	144	80	96	66	59	39	50	76	133	103	83	52	46	70	96	47	87	93	37	33	61	135	142	168	24	93	78																																					
	Cranes	225	2011	TIER 3											16	120																																																																									
	Cranes	280	2007	TIER 3					10	10	26	30	50	50																																																																											
	Cranes	325	2010	TIER 3																																										45	156	94	65	88	89	100																																					
	Cranes	400	2009	TIER 3								64	64	10	104																																																																										
	Cranes	300	2008	TIER 3																																10	43	77	50	5	23	28	24	82	68	61	86	98	40	32	180	98																																					
	Rubber Tired Dozers	100	2008	TIER 3	66	40	32	80	99.5	104	178	174	174	15	50	55	24	140	65	38	19	115	47	16	32	45	47	33	28	28	22	27	36	18	55	49	44	127	83	96	33	95	51	33	114	50	37	31	51	53	90	22																																					
	Rubber Tired Dozers	410	2006	TIER 3	85																																																																																				
	Rubber Tired Dozers	410	2011	TIER 3																																		67	90																																																		
	Rubber Tired Dozers	575	2007	TIER 3															75	67	30		61																																																																		
	Rubber Tired Dozers	580	2006	TIER 3			88	192	285	620	541	506	134	67	383	344	136	342	422	487	585	553	425	603	451	514	198	145	165	223	127	181	241	362	324	429	438	398	312	186	63	313	91	226	151	99	113	169	119	210	244	45																																					
	Rubber Tired Dozers	580	2010	TIER 3														128	195	10																			110																																																		
	Rubber Tired Dozers	875	2009	TIER 2		80	60	120	139	191	177	132	29	22	239	157	135	247	199	183	263	281	260	246	208	228	9																																																														
	Rubber Tired Dozers	200	2008	TIER 3		16	4																																																																																		
	Rubber Tired Dozers	410	2006	TIER 3	42.5	45	60	68	59	124	120	109	38.5	42	92.5	52.5	16.5	86.5	84.5	86.5	121	127	124	98.5	102	108	55.5	34.5	38	13	32.5	8.5																																																									
	Rubber Tired Dozers	464	2006	TIER 3					69.5	127	78.5	78.5	7.75	10	65.5	66	36	96	54.5	81	72.5	79.5	74	104																																																																	
	Rubber Tired Dozers	580	2006	TIER 3	74	60	62.5		63.5	91.5	53	61.5	51.5	62.5	62.5	82	67.5	128	90.5	87.5	77.5	95	82	110	102	74	66																																																														
	Excavators	202	2008	TIER 3	21	40	30																																																																																		
	Excavators	400	2007	TIER 3	72	60	62.5		3																																																																																
	Forklifts	110	2000	TIER 3	5	8	50																																																																																		
	Forklifts	122	2008	TIER 3	38	40	20	20	8	24	5																																																																														
	Tractors/Loaders/Backhoes	287	2008	TIER 3	4	4																																																																																			
	Tractors/Loaders/Backhoes	687	2007	TIER 3	40	4	20	60	2	59	7	4.5	24.5	1.5	3	10	3		3	24																																																																					
	Scrapers	540	2006	TIER 3			28	80	143	460	311	346	46	0.5	162	156	120	262	238	216	242	256	364	329	183	99.5	31.5																																																														
	Scrapers	540	2005	TIER 3				20	9	34	78	80.5	4		32.5	26	28.5	44.5	1	7	5	12.5	17	27																																																																	
	Scrapers	540	2004	TIER 4I							55	41	1.5		2.5	25	17	34.5	11.5	5	20	53	56	56.5	38.5	29.5	11																																																														
	Rollers	134	2007	TIER 3	4																																																																																				
	Scrapers	600	2006	TIER 3	87.2		170	180	247	327	714	577	120	0.5	304	382	198	504	463	449	610	667	577	614	502	340	70.5																																																														
	Scrapers	600	2007	TIER 3	2		20		29.5		95	82	4		40.5	48	31	88	71	69	97	97.5	71	85.5	75	55.5	15																																																														
	Skid Steer Loaders	150	2007	TIER 3	12	16	12																																																																																		
	Excavators	114	2004	TIER 3	348	336																																																																																			
	Excavators	114	2006	TIER 3				80	20																																																																																
	Excavators	114	2009	TIER 3																																						110	115	89	90	48	8																																										
	Bore/Drill Rigs	115	2006	TIER 3				120	120	120																																																																															
	Excavators	148	2011	TIER 3																									40	46	53	53			52	23																																																					
	Excavators	155	2008	TIER 3																														40	40	128	116	128	128	120	109	109	93	75	120	68	6																																										
	Excavators	202	2008	TIER 3				100	148	256	192	207	183	84	120	70	59	138	107	136	202	144	168	89	84	84	104	111	83	44	37	107	64	94	87	79	98	62	148	107	46	193	75	49	89	58	77	25	58	16	31	6																																					
	Excavators	204	2009	TIER 3	90.5	60	104																																																																																		
	Excavators	362	2013	TIER 4I																																		102	102																																																		
	Excavators	400	2007	TIER 3	144			160		6	243	164	187	177	195	111	93	160	146	130	213	186	183	214	238	103	131	57	117	138	95	66	183	243	112	181	229	199	247	145	54	159	128	148	148	134	67	24	69	84	90	45																																					
	Excavators	405	2006	TIER 3					48	242	206	10																																																																													
	Excavators	410	2008	TIER 3																				223	204	269	184	121	103	118	93	175	99	149	97	154	199	167	201	178	103	166	117	171	118	95	69	36	92	63	70	44																																					
	Excavators	425	2011	TIER 4I	51	8	24	120	189	224	198	104	104	146	197	132	74	123	162	229	290	309	238	242	166	196	170	16	2	94	8	102	133	136	101	137	166	218	194	131	98	208	165	186	111	26	35	47	135	150	148	71																																					
	Excavators	425	2012	TIER 4F																																									132	125				112	23																																						
	Excavators	425	2012	TIER 4I																									47	82	78	78																																																									
	Excavators	426	2014	TIER 4I																																	50	12																																																			
	Excavators	476	2011	TIER 3																																										104	74	115	115			23																																					
	Excavators	513	2013	TIER 3							10	46	46	75	228	152	68	172	175	187	233	157	77	68	125	74	11	33	60	33	37	33	26	23	85	58	5	64	58	49	14	28	51	68	72				58	128	86																																						
	Excavators	696	2003	TIER 2																		115	173	204	185	185	195	54	97	33	75	111	77	156	174	185	220	187	198	84	25	127	32	89	41	22		62	49	14	10																																						
	Forklifts	110	2000	TIER 3	10																																																																																				
	Forklifts	110	2008	TIER 3				80	80																																																																																
	Forklifts	110	2014	TIER 4I																																											115	85	85																																								
	Forklifts	111	2010	TIER 3																														111	170	232	232	232	232	202	202	202	105	110	162	63	5	65	80	60	40																																						
	Forklifts	125	2006	TIER 3													10	4	40	42	120	59	80																																																																		
	Forklifts	125	2008	TIER 3																		60	10	50		60	60	10						10	25	116	106	110	110	95	40	40	42				4	86	86	72	8																																						
	Forklifts	130	2011	TIER 3																																												82	40	130	65	26																																					
	Forklifts	142	2010	TIER 3									10	96	108																			85	98	67	76	61	215	125	132	185	124	144	150	120	110	92	50	65	110	114																																					
	Forklifts	99	2006	TIER 3				80	106	106	5	12	14	14						45	55	52	52	52	61	61	61	61	65	65	85	99	46																																																								
	Generator	315	2007	TIER 3																																															72																																						
	Generator	315	2008	TIER 3				120	120	120			10	10																																																																											
	Lift	100	2013	TIER 3																				65	38	42																																																															
	Lift	125	2010	TIER 3								67	6	104	146	92	145	148	135	86	142	166	124	80	20	20	20	20	35																																																												
	Lift	130	2011	TIER 3								79	146	44	67																																																																										
	Lift	130	2012	TIER 3																																												91	95	62																																							
	Lift	140	2010	TIER 3																																																5																																					
	Lift	159	2012	TIER 4I											60	97	8	41	125	15	27	121	26	91																																																																	
	Lift	63	2014	TIER 3																																				20	15	55					25	109																																									

Summary of Construction Equipment Hours of Operation[1]

Location	Equipment	Horse power	Engine Year	Engine Tier	2011 (actual)	2012 (actual)												2013 (actual)												2014 (actual)												2015 (actual through November, projected for December)												2016 (projected)												2017 (projected)												2018 (projected)											
					D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Dam and Spillway Area (Includes Haul Road Construction) (cont)	Lift	37	2011	TIER 4I																																														26	23	16																																										
	Lift	42	2012	TIER 3																														228	79	29	46	7	160	160	70	40	36	36	63	34	74	142	46	31	75	52																																									
	Lift	49	2011	TIER 4I																																																	32																																										
	Lift	50	2006	TIER 3																68	19	22	22	22	67	67	67	67	37	37	37	37	36	74	74		35	35	35	25	25	25	28	22	44		3	30	30	30																																										
	Lift	50	2011	TIER 4I																																																	20																																										
	Lift	60	2004	TIER 2	4	8																																																																																						
	Lift	86	2012	TIER 3																																												45	65	65	16																																												
	Tractors/Loaders/Backhoes	117	2014	TIER 4I																																															3																																												
	Tractors/Loaders/Backhoes	125	2009	TIER 3	348	336																																																																																						
	Tractors/Loaders/Backhoes	215	2008	TIER 3				80	80	80	1																																																																																	
	Tractors/Loaders/Backhoes	262	2006	TIER 3				32	28																																																																																					
	Tractors/Loaders/Backhoes	273	2011	TIER 4I									92	28																																																																															
	Tractors/Loaders/Backhoes	286	2006	TIER 3						144	156	109	93	83	55	28	37	109	37	47	73	62	111	185	148	101	219	57	113	79	82	96	114	133	124	138	56	112	149	120	64	89	58	15	99	56	71	25	57	124	51	41																																										
	Tractors/Loaders/Backhoes	286	2013	TIER 4I																							85																																																																
	Tractors/Loaders/Backhoes	294	2014	TIER 4F																												79	77	163	48	178	145	181	140	126	64	107	118	166	221	155	120	140	126	124	102	93																																										
	Tractors/Loaders/Backhoes	92	2011	TIER 3											10																																																																															
	Other Construction Equipment	413	2011	TIER 3																																			40																																																						
	Off-Highway Trucks	469	2006	TIER 3	58	32	40	48	9	100	134	75	45	47																																																																																		
	Off-Highway Trucks	469	2007	TIER 3	16	24	32	64	2	67	61	78	133	43																																																																																		
	Off-Highway Trucks	474	2011	TIER 3													34	8																																																																									
	Off-Highway Trucks	705	2007	TIER 3																														5	239	328	373	293	399	132	48																																																					
	Off-Highway Trucks	705	2009	TIER 3	600.77	8	72	160	76	153	6		24	155	195	46		109	95	157	77	116	89	70	105	92	286	65	74	13	23	53	46	188	207	174	271	293	386	68	24																																																				
	Off-Highway Trucks	740	2007	Tier 2				80	27	97			29	81	131	62	5	117	85	161	119	141	97	148	156	176	68	68	65	47	86	92	46	143	141	157	189	144	165	72	32																																																				
	Off-Highway Trucks	740	2007	TIER 3	890.94		88	240	136	318	12		75	224	363	225	10	339	224	361	285	404	296	429	419	454	546	136	249	92	211	201	175	402	208	286	410	414	526	220	48																																																				
	Crushing/Proc. Equipment	112	2010	TIER 3	145.3																																																																																						
	Bore/Drill Rigs	717	2009	TIER 3	348	336																																																																																						
	Other Construction Equipment	78	2008	TIER 3																																35																8																																										
	Plate Compactors	156	2009	TIER 3				120	102	151	42	2		33	122	92																																																																										
	Plate Compactors	354	2014	TIER 3																																												69																																														
	Plate Compactors	354	2010	TIER 3	367.9																																																																																						
	Pumps	121	2013	TIER 4I																																																32																																											
	Pumps	78	2011	TIER 3				40	40	40	4	4		9																																																																														
	Rollers	156	2009	TIER 3	66																																																																																				
	Rubber Tired Dozers	498	2006	TIER 3			40	40		180	179			11	48	6		10		7		1																																																																					
	Scrapers	600	2006	TIER 3	174.4																																																																																				
	Scrapers	600	2007	TIER 3	4																																																																																				
	Skid Steer Loaders	86	2007	TIER 3						80																													50																																																						
	Skid Steer Loaders	62	2006	TIER 2		8																																																																																					
	Skid Steer Loaders	79	2003	TIER 1		40																																																																																					
	Skid Steer Loaders	98	2010	TIER 3					30	30																																																																																	
	Skid Steer Loaders	87	2011	TIER 3					22	126	70	16																																																																															
	Skid Steer Loaders	80	2012	TIER 3											10	2																																																																									
	Tractors/Loaders/Backhoes	124	2011	TIER 3			40	40	23	63	60	66	133	86	53	51	73	66	43	130	48	54	52	35	46	28	90	56	52	28	39	23	36	40	28	62	31	26	49	45	79	83	60	27	36	45	46	11	25	23	40	31																																										
	Tractors/Loaders/Backhoes	125	2010	TIER 3											25	25	25																																																																						
	Tractors/Loaders/Backhoes	180	2007	TIER 3	52	40	32																																																																																			
	Tractors/Loaders/Backhoes	200	2008	TIER 3									132	91	51	39																																																																									
	Tractors/Loaders/Backhoes	249	2012	TIER 3																																			50																																																						
	Tractors/Loaders/Backhoes	310	2013	TIER 4I																						93	14																																																															
	Tractors/Loaders/Backhoes	355	2012	TIER 3																															46	65																																																							
	Tractors/Loaders/Backhoes	410	2005	TIER 3																				22	204	171	43																																																																	
	Tractors/Loaders/Backhoes	410	2011	TIER 3																																			90																																																							
	Off-Highway Trucks	750	2006	TIER 3																																																	1932	1764	1764	1008	840	924	84																														
	Graders	250	2006	TIER 3																																																	483	441	441	21																																	
	Excavators	500	2006	TIER 3																																																	1449	1323	1323	525	420	462	42																														
	Other Construction Equipment	327	2006	TIER 3																																																	1127	1029	1029	511	420	462	42																														
	Crawler Tractors	500	2006	TIER 3																																																	644	588	588	336	280	308	28																														
	Bore/Drill Rigs	250	2006	TIER 3																																																	184	168	168	184	160	176	176	168	184	168	168		168	176	160	176																							
	Bore/Drill Rigs	120	2007	TIER 3																																																	161	147	147	126																																						
	Air Compressors	250	2006	TIER 3																																																	161	147	147	126																																						
	Off-Highway Trucks	450	2007	TIER 2																																																																	840	966	882	882	966	840	924	924		483	420	441									
Borrow Area B	Rubber Tired Dozers	435	2008	TIER 2																																																																280	322	294	294	322	280	308														
	Excavators	513	2011	TIER 2																																																																280	322	294	294	322	280	308														
	Rubber Tired Loaders	215	2008	TIER 2																																																																140	161	147	147	161	140	154														
	Bore/Drill Rigs	620	2005	TIER 2																																																																280	483	294	441	322	420	308														
	Bore/Drill Rigs	206	2003	TIER 2																																												62	62																																												
	Bore/Drill Rigs	190	2011	TIER 3																																		101																																																									
	Bore/Drill Rigs	220	2007	TIER 3																										48	46	35			117	117	104	104	68		67	67		26		36					138	134																																											
	Bore/Drill Rigs	220	2010	TIER 3																		57	35	140	46	46	46	46	52	56	32																																																																	
	Bore/Drill Rigs	220	2014	TIER 3																																												56	56	138	134																																										
	Bore/Drill Rigs	224	2006	TIER 3																				45	122	122	50	35						125	125	113	113	86		79	79		24																																																			
	Bore/Drill Rigs	225	2010	TIER 3																		63		156	116	116	60	40	48	52	38	8																																																																
	Off-Highway Trucks	464	2006	TIER 3																																														62	95	51.5																																									
	Off-Highway Trucks	464	2011	TIER 3																																													36	67																																											
	Off-Highway Trucks	464	2011	TIER 4I																																													32	46	41																																									
	Off-Highway Trucks	464	2012	TIER 4I																																													16	32.5	33																																									
	Off-Highway Trucks	464	2014	TIER 4I																																													44	77.5	36.5																																									
	Off-Highway Trucks	484	2011	TIER 4I																																															16.5																																									
	Off-Highway Trucks	484	2013	TIER 4I																																															11.5																																									
	Off-Highway Trucks	705	2007	TIER 3																																								266	82	158	69	76	14.5	90.5			3	5.5																																						
	Off-Highway Trucks	705	2009	TIER 3																																								60.5	29	71	12.5	9	5																																												
	Off-Highway Trucks	740	2007	TIER 3																																								58	12.5	45.5	24																																														
	Off-Highway Trucks	821	2014	TIER 4F																																				3	3		14				9	10	68			5.5	3.5																																								
	Tractors/Loaders/Backhoes	500	2006	TIER 3																																																			161	147	147	7																																						
	Other Construction Equipment	327	2006	TIER 3																																																		322	294	294	14																																						
	Excavators	500	2006	TIER 3																																																		322	294	294	322	280	308	308	294	322	294	294		294	308	280	308																							
	Crawler Tractors	500	2006	TIER 3																																																		644	588	588	336	280	308	308	294	322	294	294		294	308	280	308																							
	Off-Highway Trucks	750	2006	TIER 3																																																		966	882	882	966	840	924	924	882	966	882	882		882	924	840	924																							
	Bore/Drill Rigs	120	2007	TIER 3																																																		161	147	147	161	140	14																																		
	Bore/Drill Rigs	120	2003	TIER 2																																																		161	147	147	161	140	14																																		
	Off-Highway Trucks	450	2007	TIER 2																																																																140	161	147	147	161	140	154														
Borrow Area E	Rubber Tired Dozers	240	2008	TIER 2																																																																280	322	294	294	322	280	308	308	294	322	280	294									
	Rubber Tired Loaders	565	2008	TIER 2																																																																280	322	294	294	322	280	308	308	294	322	280	294									
	Off-Highway Trucks	450	2004	TIER 2																																																																560	644	588	588	644	560	616	616	294	322	280	294									
	Off-Highway Trucks	450	2007	TIER 2																																																																280	322	294	294	322	280	308	308	294	322	280	294									

Location	Equipment	Horse power	Engine Year	Engine Tier	Summary of Construction Equipment Hours of Operation[1]																																																																																	
					2011 (actual)	2012 (actual)												2013 (actual)												2014 (actual)												2015 (actual through November, projected for December)												2016 (projected)												2017 (projected)												2018 (projected)											
					D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Disposal Site 2	Rubber Tired Dozers	240	2006	TIER 2																																																																140	161	147	147	161	140				161	140	147	147	161	140	154	154	140			
	Forklifts	102	2015	TIER 4I																																																59																																							
	Forklifts	103	2015	TIER 4I																																															32	61																																							
	Forklifts	122	2008	TIER 3																				42	55	76	110	110	110	117	80	131	162	246	182	252	182	165	86	372	252	143	104	189	339	346	255	258	164	33	77	56	84																																				
	Forklifts	82	2008	TIER 3																					125	20	85	105	157	58	120	8																						54																																					
	Rubber Tired Loaders	565	2007	TIER 2																																																															140	161	147	147	161	140				161	140	147	147	161	140	154	154	140			
	Excavators	515	2006	TIER 2																																																															180	207	189	189	207	180				207	180	189	189	207	180	198	198	180			
	Off-Highway Trucks	450	2006	TIER 2																																																															140	161	147	147	161	140				161	140	147	147	161	140	154	154	140			
	Plate Compactors	354	2006	TIER 2																																																															140	161	147	147	161	140				161	140	147	147	161	140	154	154	140			
Disposal Site 3	Rubber Tired Dozers	240	2008	TIER 2																																																															280	322	294	294	322	280	308	308													
	Rubber Tired Dozers	200	2008	TIER 3		16	4																																																																																				
	Rubber Tired Dozers	410	2006	TIER 3	42.5	45	60	68	59	124	120	109	38.5	42	92.5	52.5	16.5	86.5	84.5	86.5	121	127	124	98.5	102	108	55.5	34.5	38	13	32.5	8.5																																																												
	Rubber Tired Dozers	464	2006	TIER 3					69.5	127	78.5	78.5	7.75	10	65.5	66	36	96	54.5	81	72.5	79.5	74	104																																																																									
	Rubber Tired Dozers	580	2006	TIER 3	74	60	62.5		63.5	91.5	53	61.5	51.5	62.5	62.5	82	67.5	128	90.5	87.5	77.5	95	82	110	102	74	66																																																																						
	Excavators	202	2008	TIER 3	21	40	30																																																																																					
	Excavators	400	2007	TIER 3	72	60	62.5		3																																																																																		
	Forklifts	110	2000	TIER 3	5	8	50																																																																																					
	Forklifts	122	2008	TIER 3	38	40	20	20	8	24	5																																																																																	
	Tractors/Loaders/Backhoes	287	2008	TIER 3	4	4																																																																																						
	Tractors/Loaders/Backhoes	687	2007	TIER 3	40	4	20	60	2	59	7	4.5	24.5	1.5	3	10	3		3	24																																																																							
	Scrapers	540	2006	TIER 3			28	80	143	460	311	346	46	0.5	162	156	120	262	238	216	242	256	364	329	183	99.5	31.5																																																																					
	Scrapers	540	2005	TIER 3				20	9	34	78	80.5	4		32.5	26	28.5	44.5	1	7	5	12.5	17	27																																																																									
	Scrapers	540	2004	TIER 4I							55	41	1.5		2.5	25	17	34.5	11.5	5	20	53	56	56.5	38.5	29.5	11																																																																					
	Rollers	134	2007	TIER 3	4																																																																																							
	Scrapers	600	2006	TIER 3	87.2		170	180	247	327	714	577	120	0.5	304	382	198	504	463	449	610	667	577	614	502	340	70.5																																																																					
	Scrapers	600	2007	TIER 3	2		20		29.5		95	82	4		40.5	48	31	88	71	69	97	97.5	71	85.5	75	55.5	15																																																																					
	Skid Steer Loaders	150	2007	TIER 3	12	16	12																																																																																					
	Rubber Tired Loaders	215	2008	TIER 2																																																																280	322	294	294	322	280	308	308													
	Off-Highway Trucks	450	2006	TIER 2																																																																140	161	147	147	161	140	154	154													
	Crawler Tractors	500	2006	TIER 3																																																	322	294	294	322	280	28																																					
	Excavators	500	2006	TIER 3																																																	322	294	294	322	280	28																																					
	Tractors/Loaders/Backhoes	500	2006	TIER 3																																																	161	147	147	161	140	14																																					
Disposal Site 7	Rubber Tired Dozers	240	2008	TIER 2																																																															140	161	147	147	161	140	154	154	147												
	Off-Highway Trucks	464	2006	TIER 3																																													62	95	51.5																																								
	Off-Highway Trucks	464	2011	TIER 3																																												36	67																																									
	Off-Highway Trucks	464	2011	TIER 4I																																												32	46	41																																								
	Off-Highway Trucks	464	2012	TIER 4I																																												16	32.5	33																																								
	Off-Highway Trucks	464	2014	TIER 4I																																												44	77.5	36.5																																								
	Off-Highway Trucks	484	2011	TIER 4I																																														16.5																																								
	Off-Highway Trucks	484	2013	TIER 4I																																														11.5																																								
	Off-Highway Trucks	705	2007	TIER 3																																				266	82	158	69	76	14.5	90.5			3	5.5																																									
	Off-Highway Trucks	705	2009	TIER 3																																				60.5	29	71	12.5	9	5																																												
	Off-Highway Trucks	740	2007	TIER 3																																				58	12.5	45.5	24																																														
	Off-Highway Trucks	821	2014	TIER 4F																																		3	3		14				9	10	68			5.5	3.5																																									
	Rubber Tired Dozers	875	2009	TIER 2							160	229	93	119	247	196	134	242	239	232	277	307	246	206	271	251	222	112	148	121	141	170	60	238	174	249	264	246	265	111		123	79	79	55	21	61	163	72	71	141																																									
	Plate Compactors	156	2009	TIER 3													6	41	3	23	73	53	111	210	144	67	106	46	42	20	1	22	28	48	38	51	14	22	46	21	20	13	9	6	13	5	23	71	16	29	53	14																																							
	Plate Compactors	354	2006	TIER 3			40	80	26.5	54	5		5	1	12	13	6							159	49	51	56	20	16	17	4	19	9	22	31	33	8	6		2																																																				
	Off-Highway Trucks	450	2004	TIER 2																																																																140	161	147	147	161	140	154	154	147												
	Plate Compactors	354	2006	TIER 2																																																																140	161	147	147	161	140	154	154	147												

Note:

1) Data provided by SFPUC. Actual data (2011 through November 2015) is from SFPUC 2016. Projected data for the modification period is from SFPUC 2015a, and projected data for the remainder of the project following the modification (April 2017 through December 2018) is from SFPUC 2015b.

References:

1) SFPUC. 2015a. SFPUC Screening Tool v.4.7.1 - Phase 1 (Area projects)_CDRP-off road 2016.xlsx. Provided by SFPUC via email on December 11, 2015.
2) SFPUC. 2015b. Copy of Offroad Eqpt Usage2015 estimate.xlsx. Provided by SFPUC via email on December 16, 2015.
3) SFPUC. 2016. 2011-2015 cumulative offroad equipmentv3.xls. Provided by SFPUC via email on January 8, 2016.

Table 5: Offroad Construction Equipment Diesel Particulate Matter Emissions for Proposed 2016 Modified Project
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Location[1]	Equipment[2]	Horsepower[1]	Engine Year[1]	Engine Tier[1]	PM Emission Factor[3]	PM Deterioration Rate[4]	Maximum Cumulative Hours of Operation[5]								Load Factor[6]	PM Mitigation[7]	PM Fuel Correction Factor[8]	Project Normalized PM Emission Rate (g/s)[9]	Peak Month Maximum 24 Hour PM Emission Rate (g/s)[10]
					[g/hp-hr]	[g/hp-hr^2]	2011	2012	2013	2014	2015	2016	2017	2018					
Dam and Spillway Area (Includes Haul Road Construction)	Rubber Tired Dozers	435	2006	TIER 2	0.15	5.6E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	21,315	0.59	85%	0.8	1.2E-04	0.0E+00
	Rubber Tired Dozers	240	2006	TIER 2	0.15	5.8E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	2.1E-05	0.0E+00
	Rubber Tired Dozers	875	2009	TIER 2	0.15	5.8E-06	4,767	6,356	7,945	9,534	11,123	12,712	15,120	16,709	0.59	85%	0.8	1.4E-04	0.0E+00
	Excavators	513	2007	TIER 2	0.15	5.8E-06	6,980	8,376	9,772	11,168	12,564	13,960	15,356	17,155	0.57	85%	0.8	6.2E-05	0.0E+00
	Graders	300	2006	TIER 2	0.15	5.6E-06	5,574	6,503	7,432	8,361	9,290	10,219	12,627	14,426	0.61	85%	0.8	8.2E-05	0.0E+00
	Rubber Tired Loaders	215	2007	TIER 2	0.15	5.8E-06	4,785	5,742	6,699	7,656	8,613	9,570	10,527	12,326	0.54	85%	0.8	2.2E-05	0.0E+00
	Cranes	280	2007	TIER 2	0.15	5.6E-06	6,260	7,512	8,764	10,016	11,268	12,520	13,772	15,571	0.43	85%	0.8	2.4E-05	0.0E+00
	Rollers	250	2006	TIER 2	0.15	5.6E-06	4,170	4,865	5,560	6,255	6,950	7,645	11,404	13,056	0.56	85%	0.8	7.8E-05	0.0E+00
	Off-Highway Trucks	450	2006	TIER 2	0.15	5.6E-06	11,748	13,706	15,664	17,622	19,580	21,538	23,946	25,904	0.57	85%	0.8	1.2E-04	0.0E+00
	Scrapers	600	2006	TIER 2	0.15	5.8E-06	6,552	7,644	8,736	9,828	10,920	12,012	16,828	17,920	0.72	85%	0.8	2.9E-04	0.0E+00
	Air Compressors	300	2006	TIER 3	0.15	5.6E-06	4,890	5,705	6,520	7,335	8,150	8,965	9,780	10,595	0.48	85%	0.8	2.0E-06	0.0E+00
	Skid Steer Loaders	85	2013	TIER 4I	0.015	4.3E-06	834	1,668	2,502	3,336	4,170	5,004	5,838	6,672	0.55	0%	0.8	1.6E-07	0.0E+00
	Skid Steer Loaders	81	2008	TIER 3	0.3	1.8E-05	3,336	4,170	5,004	5,838	6,672	7,506	8,340	9,174	0.55	85%	0.8	1.9E-06	0.0E+00
	Graders	300	2006	TIER 3	0.15	5.6E-06	5,574	7,480	10,876	12,756	13,923	14,852	15,781	16,710	0.61	85%	0.8	1.5E-04	0.0E+00
	Graders	183	2010	TIER 3	0.15	5.6E-06	1,858	2,787	3,716	4,645	5,574	6,503	7,432	8,361	0.61	85%	0.8	1.7E-06	0.0E+00
	Bore/Drill Rigs	110	2005	TIER 2	0.22	2.1E-05	5,677	6,488	7,299	8,110	8,921	9,732	10,543	11,354	0.75	85%	0.8	6.9E-06	0.0E+00
	Bore/Drill Rigs	114	2004	TIER 3	0.22	2.9E-05	6,488	7,299	8,364	9,175	9,986	10,797	11,608	12,419	0.75	85%	0.8	3.0E-05	0.0E+00
	Bore/Drill Rigs	115	2006	TIER 2	0.22	2.1E-05	4,866	5,677	6,488	7,299	8,110	8,921	9,732	10,543	0.75	85%	0.8	5.1E-07	0.0E+00
	Bore/Drill Rigs	120	2008	TIER 3	0.22	1.2E-05	3,244	4,055	4,866	5,677	6,488	7,299	8,110	8,921	0.75	85%	0.8	5.9E-06	0.0E+00
	Bore/Drill Rigs	155	2011	TIER 3	0.22	1.0E-05	811	1,622	2,433	3,244	4,055	4,866	5,677	6,488	0.75	85%	0.8	9.6E-06	0.0E+00
	Bore/Drill Rigs	174	2007	TIER 3	0.22	1.2E-05	4,055	4,866	5,677	6,488	7,299	8,110	8,921	9,732	0.75	85%	0.8	3.7E-06	0.0E+00
	Bore/Drill Rigs	174	2009	TIER 3	0.22	1.2E-05	2,433	3,244	4,055	5,242	6,053	6,864	7,675	8,486	0.75	85%	0.8	3.0E-05	0.0E+00
	Bore/Drill Rigs	200	2009	TIER 3	0.15	5.8E-06	2,433	3,244	4,055	4,866	5,677	6,488	7,299	8,110	0.75	85%	0.8	1.4E-06	0.0E+00
	Bore/Drill Rigs	209	2003	TIER 2	0.15	6.5E-06	7,299	8,110	8,921	9,732	10,543	11,354	12,165	12,976	0.75	85%	0.8	9.1E-07	0.0E+00
	Bore/Drill Rigs	220	2006	TIER 3	0.15	5.8E-06	4,866	5,677	6,837	7,714	8,525	9,336	10,147	10,958	0.75	85%	0.8	4.5E-05	0.0E+00
	Bore/Drill Rigs	220	2007	TIER 3	0.15	5.8E-06	4,055	4,866	5,677	6,488	7,299	8,110	8,921	9,732	0.75	85%	0.8	5.8E-06	0.0E+00
	Bore/Drill Rigs	225	2006	TIER 3	0.15	5.8E-06	4,866	5,677	6,488	7,299	8,110	8,921	9,732	10,543	0.75	85%	0.8	6.3E-06	0.0E+00
	Bore/Drill Rigs	350	2010	TIER 3	0.15	5.6E-06	1,622	2,433	3,244	4,055	4,866	5,677	6,488	7,299	0.75	85%	0.8	3.3E-06	0.0E+00
	Bore/Drill Rigs	439	2001	TIER 2	0.15	6.5E-06	8,921	9,732	10,543	11,354	12,165	12,976	13,787	14,598	0.75	85%	0.8	6.7E-06	0.0E+00
	Bore/Drill Rigs	474	2009	TIER 3	0.15	5.6E-06	2,433	3,244	4,055	4,866	5,677	6,488	7,299	8,110	0.75	85%	0.8	3.4E-06	0.0E+00
	Bore/Drill Rigs	54	2006	TIER 3	0.3	2.1E-05	4,866	5,677	6,488	7,299	8,110	8,921	9,732	10,543	0.75	85%	0.8	2.5E-06	0.0E+00
	Bore/Drill Rigs	580	2008	TIER 3	0.15	5.8E-06	3,244	4,055	4,866	5,677	6,488	7,299	8,110	8,921	0.75	85%	0.8	5.4E-07	0.0E+00
	Air Compressors	174	1999	TIER 1	0.6	2.8E-05	10,595	11,410	12,225	13,040	13,855	14,670	15,485	16,300	0.48	85%	0.8	6.2E-07	0.0E+00
	Air Compressors	275	2004	TIER 3	0.15	5.8E-06	6,520	7,335	8,150	8,965	9,780	10,595	11,410	12,225	0.48	85%	0.8	4.2E-07	0.0E+00
	Cranes	130	2012	TIER 3	0.22	1.0E-05	1,252	2,504	3,756	5,008	6,260	7,512	8,764	10,016	0.43	85%	0.8	2.4E-06	0.0E+00
	Cranes	130	2012	TIER 4I	0.015	1.0E-05	1,252	2,504	3,756	5,008	6,260	7,512	8,764	10,016	0.43	0%	0.8	8.2E-06	0.0E+00
	Cranes	175	2010	TIER 3	0.15	5.6E-06	2,504	3,756	5,008	6,260	7,512	8,764	10,016	11,268	0.43	85%	0.8	4.9E-07	0.0E+00
	Cranes	215	2000	TIER 1	0.4	2.8E-05	15,024	16,276	17,528	18,780	20,032	21,284	22,536	23,788	0.43	85%	0.8	6.0E-07	0.0E+00
	Cranes	225	2009	TIER 3	0.15	5.8E-06	3,756	5,008	6,778	8,030	9,282	10,534	11,786	13,038	0.43	85%	0.8	3.3E-05	0.0E+00
	Cranes	225	2011	TIER 3	0.15	5.6E-06	1,252	2,504	3,756	5,008	6,260	7,512	8,764	10,016	0.43	85%	0.8	1.0E-06	0.0E+00
	Cranes	280	2007	TIER 3	0.15	5.6E-06	6,260	7,512	8,764	10,016	11,268	12,520	13,772	15,024	0.43	85%	0.8	1.9E-06	0.0E+00
	Cranes	325	2010	TIER 3	0.15	5.6E-06	2,504	3,756	5,008	6,260	7,512	8,764	10,016	11,268	0.43	85%	0.8	8.1E-06	0.0E+00
	Cranes	400	2009	TIER 3	0.15	5.6E-06	3,756	5,008	6,260	7,512	8,764	10,016	11,268	12,520	0.43	85%	0.8	3.5E-06	0.0E+00
	Cranes	300	2008	TIER 3	0.15	5.6E-06	5,008	6,260	7,512	8,764	10,016	11,268	12,520	13,772	0.43	85%	0.8	1.3E-05	0.0E+00
	Rubber Tired Dozers	100	2008	TIER 3	0.22	1.8E-05	6,356	7,945	9,534	11,123	12,712	14,301	15,890	17,479	0.59	85%	0.8	3.3E-05	0.0E+00
	Rubber Tired Dozers	410	2006	TIER 3	0.15	5.6E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	2.0E-06	0.0E+00

Location[1]	Equipment[2]	Horsepower[1]	Engine Year[1]	Engine Tier[1]	PM Emission Factor[3]	PM Deterioration Rate[4]	Maximum Cumulative Hours of Operation[5]								Load Factor[6]	PM Mitigation[7]	PM Fuel Correction Factor[8]	Project Normalized PM Emission Rate (g/s)[9]	Peak Month Maximum 24 Hour PM Emission Rate (g/s)[10]
					[g/hp-hr]	[g/hp-hr^2]	2011	2012	2013	2014	2015	2016	2017	2018					
Dam and Spillway Area (Includes Haul Road Construction) (Cont)	Rubber Tired Dozers	410	2011	TIER 3	0.15	5.6E-06	1,589	3,178	4,767	6,356	7,945	9,534	11,123	12,712	0.59	85%	0.8	3.3E-06	0.0E+00
	Rubber Tired Dozers	575	2007	TIER 3	0.15	5.8E-06	7,945	9,534	11,123	12,712	14,301	15,890	17,479	19,068	0.59	85%	0.8	8.1E-06	0.0E+00
	Rubber Tired Dozers	580	2006	TIER 3	0.15	5.8E-06	9,534	12,830	17,720	21,004	22,784	24,373	25,962	27,551	0.59	85%	0.8	5.5E-04	0.0E+00
	Rubber Tired Dozers	580	2010	TIER 3	0.15	5.6E-06	3,178	4,767	6,356	7,945	9,534	11,123	12,712	14,301	0.59	85%	0.8	1.4E-05	0.0E+00
	Rubber Tired Dozers	875	2009	TIER 2	0.15	5.8E-06	4,767	6,356	8,480	10,069	11,658	13,247	14,836	16,425	0.59	85%	0.8	1.7E-04	0.0E+00
	Rubber Tired Dozers	200	2008	TIER 3	0.15	5.8E-06	6,356	7,945	9,534	11,123	12,712	14,301	15,890	17,479	0.59	85%	0.8	2.2E-07	0.0E+00
	Rubber Tired Dozers	410	2006	TIER 3	0.15	5.6E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	5.0E-05	0.0E+00
	Rubber Tired Dozers	464	2006	TIER 3	0.15	5.6E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	3.1E-05	0.0E+00
	Rubber Tired Dozers	580	2006	TIER 3	0.15	5.8E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	6.1E-05	0.0E+00
	Excavators	202	2008	TIER 3	0.15	5.8E-06	5,584	6,980	8,376	9,772	11,168	12,564	13,960	15,356	0.57	85%	0.8	9.4E-07	0.0E+00
	Excavators	400	2007	TIER 3	0.15	5.6E-06	6,980	8,376	9,772	11,168	12,564	13,960	15,356	16,752	0.57	85%	0.8	4.1E-06	0.0E+00
	Forklifts	110	2000	TIER 3	0.22	5.0E-05	21,600	23,400	25,200	27,000	28,800	30,600	32,400	34,200	0.3	85%	0.8	1.4E-06	0.0E+00
	Forklifts	122	2008	TIER 3	0.22	1.2E-05	7,200	9,000	10,800	12,600	14,400	16,200	18,000	19,800	0.3	85%	0.8	8.7E-07	0.0E+00
	Tractors/Loaders/Backhoes	287	2008	TIER 3	0.15	5.6E-06	3,768	4,710	5,652	6,594	7,536	8,478	9,420	10,362	0.55	85%	0.8	1.0E-07	0.0E+00
	Tractors/Loaders/Backhoes	687	2007	TIER 3	0.15	5.8E-06	4,710	5,652	6,594	7,536	8,478	9,420	10,362	11,304	0.55	85%	0.8	8.7E-06	0.0E+00
	Scrapers	540	2006	TIER 3	0.15	5.8E-06	6,552	8,402	10,622	11,714	12,806	13,898	14,990	16,082	0.72	85%	0.8	1.5E-04	0.0E+00
	Scrapers	540	2005	TIER 3	0.15	5.8E-06	7,644	8,736	9,828	10,920	12,012	13,104	14,196	15,288	0.72	85%	0.8	1.6E-05	0.0E+00
	Scrapers	540	2004	TIER 4I	0.015	6.0E-06	8,736	9,828	10,920	12,012	13,104	14,196	15,288	16,380	0.72	0%	0.8	4.4E-05	0.0E+00
	Rollers	134	2007	TIER 3	0.22	1.2E-05	3,475	4,170	4,865	5,560	6,255	6,950	7,645	8,340	0.56	85%	0.8	3.7E-08	0.0E+00
	Scrapers	600	2006	TIER 3	0.15	5.8E-06	6,552	9,770	14,564	15,656	16,748	17,840	18,932	20,024	0.72	85%	0.8	3.7E-04	0.0E+00
	Scrapers	600	2007	TIER 3	0.15	5.8E-06	5,460	6,552	7,644	8,736	9,828	10,920	12,012	13,104	0.72	85%	0.8	4.3E-05	0.0E+00
	Skid Steer Loaders	150	2007	TIER 3	0.22	1.2E-05	4,170	5,004	5,838	6,672	7,506	8,340	9,174	10,008	0.55	85%	0.8	4.3E-07	0.0E+00
	Excavators	114	2004	TIER 3	0.22	2.9E-05	11,168	12,564	13,960	15,356	16,752	18,148	19,544	20,940	0.57	85%	0.8	1.2E-05	0.0E+00
	Excavators	114	2006	TIER 3	0.22	2.1E-05	8,376	9,772	11,168	12,564	13,960	15,356	16,752	18,148	0.57	85%	0.8	1.3E-06	0.0E+00
	Excavators	114	2009	TIER 3	0.22	1.8E-05	4,188	5,584	6,980	8,376	9,772	11,168	12,564	13,960	0.57	85%	0.8	5.6E-06	0.0E+00
	Bore/Drill Rigs	115	2006	TIER 3	0.22	2.1E-05	4,866	5,677	6,488	7,299	8,110	8,921	9,732	10,543	0.75	85%	0.8	5.0E-06	0.0E+00
	Excavators	148	2011	TIER 3	0.22	1.0E-05	1,396	2,792	4,188	5,584	6,980	8,376	9,772	11,168	0.57	85%	0.8	2.9E-06	0.0E+00
	Excavators	155	2008	TIER 3	0.22	1.2E-05	5,584	6,980	8,376	9,772	11,168	12,564	13,960	15,356	0.57	85%	0.8	1.8E-05	0.0E+00
	Excavators	202	2008	TIER 3	0.15	5.8E-06	5,584	7,003	8,453	9,849	11,245	12,641	14,037	15,433	0.57	85%	0.8	5.0E-05	0.0E+00
	Excavators	204	2009	TIER 3	0.15	5.8E-06	4,188	5,584	6,980	8,376	9,772	11,168	12,564	13,960	0.57	85%	0.8	2.5E-06	0.0E+00
	Excavators	362	2013	TIER 4I	0.015	3.8E-07	1,396	2,792	4,188	5,584	6,980	8,376	9,772	11,168	0.57	0%	0.8	2.3E-06	0.0E+00
	Excavators	400	2007	TIER 3	0.15	5.6E-06	6,980	8,376	10,254	12,146	13,542	14,938	16,334	17,730	0.57	85%	0.8	1.4E-04	0.0E+00
	Excavators	405	2006	TIER 3	0.15	5.6E-06	8,376	9,772	11,168	12,564	13,960	15,356	16,752	18,148	0.57	85%	0.8	1.1E-05	0.0E+00
	Excavators	410	2008	TIER 3	0.15	5.6E-06	5,584	6,980	8,376	10,109	11,505	12,901	14,297	15,693	0.57	85%	0.8	8.9E-05	0.0E+00
	Excavators	425	2011	TIER 4I	0.015	5.6E-06	1,396	2,916	5,059	6,577	7,973	9,369	10,765	12,161	0.57	0%	0.8	2.3E-04	0.0E+00
	Excavators	425	2012	TIER 4F	0.015	5.6E-06	1,396	2,792	4,188	5,584	6,980	8,376	9,772	11,168	0.57	0%	0.8	1.6E-05	0.0E+00
	Excavators	425	2012	TIER 4I	0.015	5.6E-06	1,396	2,792	4,188	5,584	6,980	8,376	9,772	11,168	0.57	0%	0.8	9.8E-06	0.0E+00
	Excavators	426	2014	TIER 4I	0.015	3.8E-07	1,396	2,792	4,188	5,584	6,980	8,376	9,772	11,168	0.57	0%	0.8	8.2E-07	0.0E+00
	Excavators	476	2011	TIER 3	0.15	5.6E-06	1,396	2,792	4,188	5,584	6,980	8,376	9,772	11,168	0.57	85%	0.8	1.0E-05	0.0E+00
	Excavators	513	2013	TIER 3	0.15	3.8E-07	1,396	2,792	4,188	5,584	6,980	8,376	9,772	11,168	0.57	85%	0.8	6.3E-05	0.0E+00
	Excavators	696	2003	TIER 2	0.15	6.0E-06	12,564	13,960	15,356	16,881	18,277	19,673	21,069	22,465	0.57	85%	0.8	1.5E-04	0.0E+00
	Forklifts	110	2000	TIER 3	0.22	5.0E-05	21,600	23,400	25,200	27,000	28,800	30,600	32,400	34,200	0.3	85%	0.8	2.0E-07	0.0E+00
	Forklifts	110	2008	TIER 3	0.22	1.8E-05	7,200	9,000	10,800	12,600	14,400	16,200	18,000	19,800	0.3	85%	0.8	9.5E-07	0.0E+00
	Forklifts	110	2014	TIER 4I	0.015	1.0E-06	1,800	3,600	5,400	7,200	9,000	10,800	12,600	14,400	0.3	0%	0.8	7.3E-07	0.0E+00
	Forklifts	111	2010	TIER 3	0.22	1.8E-05	3,600	5,400	7,200	9,000	10,800	12,600	14,400	16,200	0.3	85%	0.8	1.5E-05	0.0E+00
	Forklifts	125	2006	TIER 3	0.22	1.2E-05	10,800	12,600	14,400	16,200	18,000	19,800	21,600	23,400	0.3	85%	0.8	2.5E-06	0.0E+00
	Forklifts	125	2008	TIER 3	0.22	1.2E-05	7,200	9,000	10,800	12,600	14,400	16,200	18,000	19,800	0.3	85%	0.8	7.9E-06	0.0E+00
	Forklifts	130	2011	TIER 3	0.22	1.0E-05	1,800	3,600	5,400	7,200	9,000	10,800	12,600	14,400	0.3	85%	0.8	2.0E-06	0.0E+00
	Forklifts	142	2010	TIER 3	0.22	1.2E-05	3,600	5,400	7,200	9,000	10,800	12,600	14,400	16,200	0.3	85%	0.8	1.6E-05	0.0E+00

Location[1]	Equipment[2]	Horsepower[1]	Engine Year[1]	Engine Tier[1]	PM Emission Factor[3]	PM Deterioration Rate[4]	Maximum Cumulative Hours of Operation[5]								Load Factor[6]	PM Mitigation[7]	PM Fuel Correction Factor[8]	Project Normalized PM Emission Rate (g/s)[9]	Peak Month Maximum 24 Hour PM Emission Rate (g/s)[10]
					[g/hp-hr]	[g/hp-hr^2]	2011	2012	2013	2014	2015	2016	2017	2018					
Dam and Spillway Area (Includes Haul Road Construction) (Cont)	Forklifts	99	2006	TIER 3	0.3	2.1E-05	10,800	12,600	14,400	16,200	18,000	19,800	21,600	23,400	0.3	85%	0.8	1.0E-05	0.0E+00
	Generator	315	2007	TIER 3	0.15	5.6E-06	8,149	9,778	11,408	13,038	14,667	16,297	17,927	19,556	0.78	85%	0.8	1.9E-06	0.0E+00
	Generator	315	2008	TIER 3	0.15	5.6E-06	6,519	8,149	9,778	11,408	13,038	14,667	16,297	17,927	0.78	85%	0.8	8.7E-06	0.0E+00
	Lift	100	2013	TIER 3	0.22	4.3E-06	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	85%	0.8	7.9E-07	0.0E+00
	Lift	125	2010	TIER 3	0.22	1.2E-05	1,582	2,373	3,369	4,160	4,951	5,742	6,533	7,324	0.5	85%	0.8	1.2E-05	0.0E+00
	Lift	130	2011	TIER 3	0.22	1.0E-05	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	85%	0.8	2.4E-06	0.0E+00
	Lift	130	2012	TIER 3	0.22	1.0E-05	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	85%	0.8	2.0E-06	0.0E+00
	Lift	140	2010	TIER 3	0.22	1.2E-05	1,582	2,373	3,164	3,955	4,746	5,537	6,328	7,119	0.5	85%	0.8	4.6E-08	0.0E+00
	Lift	159	2012	TIER 4I	0.015	1.0E-05	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	0%	0.8	5.6E-06	0.0E+00
	Lift	63	2014	TIER 3	0.3	1.0E-06	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	85%	0.8	1.0E-06	0.0E+00
	Lift	37	2011	TIER 4I	0.22	2.7E-05	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	0%	0.8	1.2E-06	0.0E+00
	Lift	42	2012	TIER 3	0.3	1.2E-05	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	85%	0.8	4.8E-06	0.0E+00
	Lift	49	2011	TIER 4I	0.22	2.7E-05	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	0%	0.8	8.1E-07	0.0E+00
	Lift	50	2006	TIER 3	0.3	2.1E-05	4,746	5,537	6,328	7,119	7,910	8,701	9,492	10,283	0.5	85%	0.8	6.0E-06	0.0E+00
	Lift	50	2011	TIER 4I	0.22	8.6E-06	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	0%	0.8	4.0E-07	0.0E+00
	Lift	60	2004	TIER 2	0.3	2.9E-05	6,328	7,119	7,910	8,701	9,492	10,283	11,074	11,865	0.5	85%	0.8	8.5E-08	0.0E+00
	Lift	86	2012	TIER 3	0.3	4.3E-06	791	1,582	2,373	3,164	3,955	4,746	5,537	6,328	0.5	85%	0.8	1.2E-06	0.0E+00
	Tractors/Loaders/Backhoes	117	2014	TIER 4I	0.015	1.0E-06	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	0%	0.8	1.2E-08	0.0E+00
	Tractors/Loaders/Backhoes	125	2009	TIER 3	0.22	1.2E-05	2,826	3,768	4,710	5,652	6,594	7,536	8,478	9,420	0.55	85%	0.8	5.8E-06	0.0E+00
	Tractors/Loaders/Backhoes	215	2008	TIER 3	0.15	5.8E-06	3,768	4,710	5,652	6,594	7,536	8,478	9,420	10,362	0.55	85%	0.8	2.4E-06	0.0E+00
	Tractors/Loaders/Backhoes	262	2006	TIER 3	0.15	5.6E-06	5,652	6,594	7,536	8,478	9,420	10,362	11,304	12,246	0.55	85%	0.8	7.7E-07	0.0E+00
	Tractors/Loaders/Backhoes	273	2011	TIER 4I	0.015	5.6E-06	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	0%	0.8	1.5E-06	0.0E+00
	Tractors/Loaders/Backhoes	286	2006	TIER 3	0.15	5.6E-06	5,652	6,594	7,856	9,123	10,065	11,007	11,949	12,891	0.55	85%	0.8	5.8E-05	0.0E+00
	Tractors/Loaders/Backhoes	286	2013	TIER 4I	0.015	3.8E-07	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	0%	0.8	6.8E-07	0.0E+00
	Tractors/Loaders/Backhoes	294	2014	TIER 4F	0.015	3.8E-07	942	1,884	2,826	4,027	5,499	6,441	7,383	8,325	0.55	0%	0.8	2.3E-05	0.0E+00
	Tractors/Loaders/Backhoes	92	2011	TIER 3	0.3	8.6E-06	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	85%	0.8	7.6E-08	0.0E+00
	Other Construction Equipment	413	2011	TIER 3	0.15	5.6E-06	690	1,380	2,070	2,760	3,450	4,140	4,830	5,520	0.62	85%	0.8	8.1E-07	0.0E+00
	Off-Highway Trucks	469	2006	TIER 3	0.15	5.6E-06	11,748	13,706	15,664	17,622	19,580	21,538	23,496	25,454	0.57	85%	0.8	1.7E-05	0.0E+00
	Off-Highway Trucks	469	2007	TIER 3	0.15	5.6E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	1.4E-05	0.0E+00
	Off-Highway Trucks	474	2011	TIER 3	0.15	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	85%	0.8	9.4E-07	0.0E+00
	Off-Highway Trucks	705	2007	TIER 3	0.15	5.8E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	8.4E-05	0.0E+00
	Off-Highway Trucks	705	2009	TIER 3	0.15	5.8E-06	5,874	7,832	9,790	11,748	13,706	15,664	17,622	19,580	0.57	85%	0.8	1.8E-04	0.0E+00
	Off-Highway Trucks	740	2007	Tier 2	0.15	5.8E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	1.5E-04	0.0E+00
	Off-Highway Trucks	740	2007	TIER 3	0.15	5.8E-06	9,790	11,748	15,890	19,083	21,041	22,999	24,957	26,915	0.57	85%	0.8	4.8E-04	0.0E+00
	Crushing/Proc. Equipment	112	2010	TIER 3	0.22	1.8E-05	1,910	2,865	3,820	4,775	5,730	6,685	7,640	8,595	0.78	85%	0.8	1.5E-06	0.0E+00
	Bore/Drill Rigs	717	2009	TIER 3	0.15	5.8E-06	2,433	3,244	4,055	4,866	5,677	6,488	7,299	8,110	0.75	85%	0.8	2.9E-05	0.0E+00
	Other Construction Equipment	78	2008	TIER 3	0.3	1.8E-05	2,760	3,450	4,140	4,830	5,520	6,210	6,900	7,590	0.62	85%	0.8	3.8E-07	0.0E+00
	Plate Compactors	156	2009	TIER 3	0.22	1.2E-05	1,800	2,464	3,064	3,664	4,264	4,864	5,464	6,064	0.43	85%	0.8	5.3E-06	0.0E+00
	Plate Compactors	354	2014	TIER 3	0.15	3.8E-07	600	1,200	1,800	2,400	3,000	3,600	4,200	4,800	0.43	85%	0.8	7.5E-07	0.0E+00
	Plate Compactors	354	2010	TIER 3	0.15	5.6E-06	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	0.43	85%	0.8	4.2E-06	0.0E+00
	Pumps	121	2013	TIER 4I	0.015	1.0E-05	403	806	1,209	1,612	2,015	2,418	2,821	3,224	0.74	0%	0.8	3.2E-07	0.0E+00
	Pumps	78	2011	TIER 3	0.3	8.6E-06	403	806	1,209	1,612	2,015	2,418	2,821	3,224	0.74	85%	0.8	1.2E-06	0.0E+00
	Rollers	156	2009	TIER 3	0.22	1.2E-05	2,085	2,780	3,475	4,170	4,865	5,560	6,255	6,950	0.56	85%	0.8	6.7E-07	0.0E+00
	Rubber Tired Dozers	498	2006	TIER 3	0.15	5.6E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	1.5E-05	0.0E+00
	Scrapers	600	2006	TIER 3	0.15	5.8E-06	6,552	7,644	8,736	9,828	10,920	12,012	13,104	14,196	0.72	85%	0.8	6.7E-06	0.0E+00
	Scrapers	600	2007	TIER 3	0.15	5.8E-06	5,460	6,552	7,644	8,736	9,828	10,920	12,012	13,104	0.72	85%	0.8	1.5E-07	0.0E+00
	Skid Steer Loaders	86	2007	TIER 3	0.3	1.8E-05	4,170	5,004	5,838	6,672	7,506	8,340	9,174	10,008	0.55	85%	0.8	1.2E-06	0.0E+00
	Skid Steer Loaders	62	2006	TIER 2	0.3	2.1E-05	5,004	5,838	6,672	7,506	8,340	9,174	10,008	10,842	0.55	85%	0.8	5.5E-08	0.0E+00
	Skid Steer Loaders	79	2003	TIER 1	0.6	5.0E-05	7,506	8,340	9,174	10,008	10,842	11,676	12,510	13,344	0.55	85%	0.8	8.4E-07	0.0E+00

Location[1]	Equipment[2]	Horsepower[1]	Engine Year[1]	Engine Tier[1]	PM Emission Factor[3]	PM Deterioration Rate[4]	Maximum Cumulative Hours of Operation[5]								Load Factor[6]	PM Mitigation[7]	PM Fuel Correction Factor[8]	Project Normalized PM Emission Rate (g/s)[9]	Peak Month Maximum 24 Hour PM Emission Rate (g/s)[10]
					[g/hp-hr]	[g/hp-hr^2]	2011	2012	2013	2014	2015	2016	2017	2018					
Dam and Spillway Area (Includes Haul Road Construction) (Cont)	Skid Steer Loaders	98	2010	TIER 3	0.3	1.8E-05	1,668	2,502	3,336	4,170	5,004	5,838	6,672	7,506	0.55	85%	0.8	5.3E-07	0.0E+00
	Skid Steer Loaders	87	2011	TIER 3	0.3	8.6E-06	834	1,668	2,502	3,336	4,170	5,004	5,838	6,672	0.55	85%	0.8	1.7E-06	0.0E+00
	Skid Steer Loaders	80	2012	TIER 3	0.3	4.3E-06	834	1,668	2,502	3,336	4,170	5,004	5,838	6,672	0.55	85%	0.8	7.7E-08	0.0E+00
	Tractors/Loaders/Backhoes	124	2011	TIER 3	0.22	1.0E-05	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	85%	0.8	1.9E-05	0.0E+00
	Tractors/Loaders/Backhoes	125	2010	TIER 3	0.22	1.2E-05	1,884	2,826	3,768	4,710	5,652	6,594	7,536	8,478	0.55	85%	0.8	6.2E-07	0.0E+00
	Tractors/Loaders/Backhoes	180	2007	TIER 3	0.15	5.8E-06	4,710	5,652	6,594	7,536	8,478	9,420	10,362	11,304	0.55	85%	0.8	1.1E-06	0.0E+00
	Tractors/Loaders/Backhoes	200	2008	TIER 3	0.15	5.8E-06	3,768	4,710	5,652	6,594	7,536	8,478	9,420	10,362	0.55	85%	0.8	2.9E-06	0.0E+00
	Tractors/Loaders/Backhoes	249	2012	TIER 3	0.15	5.6E-06	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	85%	0.8	5.6E-07	0.0E+00
	Tractors/Loaders/Backhoes	310	2013	TIER 4I	0.015	3.8E-07	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	0%	0.8	9.3E-07	0.0E+00
	Tractors/Loaders/Backhoes	355	2012	TIER 3	0.15	5.6E-06	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	85%	0.8	1.8E-06	0.0E+00
	Tractors/Loaders/Backhoes	410	2005	TIER 3	0.15	5.6E-06	6,594	7,536	8,478	9,420	10,362	11,304	12,246	13,188	0.55	85%	0.8	9.3E-06	0.0E+00
	Tractors/Loaders/Backhoes	410	2011	TIER 3	0.15	5.6E-06	942	1,884	2,826	3,768	4,710	5,652	6,594	7,536	0.55	85%	0.8	1.6E-06	0.0E+00
	Off-Highway Trucks	750	2006	TIER 3	0.15	6.5E-06	11,748	13,706	15,664	17,622	19,580	25,964	27,922	29,880	0.57	85%	0.8	5.2E-04	1.4E-02
	Graders	250	2006	TIER 3	0.15	5.6E-06	5,574	6,503	7,432	8,361	9,290	10,219	11,148	12,077	0.61	85%	0.8	2.1E-05	9.0E-04
	Excavators	500	2006	TIER 3	0.15	5.8E-06	8,376	9,772	11,168	12,564	14,013	18,108	19,504	20,900	0.57	85%	0.8	1.9E-04	5.8E-03
	Other Construction Equipment	327	2006	TIER 3	0.15	5.6E-06	4,140	4,830	5,520	6,210	7,337	10,830	11,520	12,210	0.62	85%	0.8	9.1E-05	2.6E-03
	Crawler Tractors	500	2006	TIER 3	0.15	5.8E-06	6,078	7,091	8,104	9,117	10,130	12,258	13,271	14,284	0.64	85%	0.8	9.2E-05	2.6E-03
	Bore/Drill Rigs	250	2006	TIER 3	0.15	5.6E-06	4,866	5,677	6,488	7,299	8,110	9,998	10,809	11,620	0.75	85%	0.8	4.7E-05	4.1E-04
	Bore/Drill Rigs	120	2007	TIER 3	0.22	1.2E-05	4,055	4,866	5,677	6,488	7,299	8,110	8,921	9,732	0.75	85%	0.8	7.8E-06	2.7E-04
	Air Compressors	250	2006	TIER 3	0.15	5.6E-06	4,890	5,705	6,520	7,335	8,150	8,965	9,780	10,595	0.48	85%	0.8	6.6E-06	2.3E-04
	Off-Highway Trucks	450	2007	TIER 2	0.15	5.6E-06	9,790	11,748	13,706	15,664	17,622	19,580	26,804	28,762	0.57	85%	0.8	3.1E-04	0.0E+00
Borrow Area B	Rubber Tired Dozers	435	2008	TIER 2	0.15	5.6E-06	6,356	7,945	9,534	11,123	12,712	14,301	16,401	17,990	0.59	85%	0.8	6.2E-05	0.0E+00
	Excavators	513	2011	TIER 2	0.15	5.6E-06	1,396	2,792	4,188	5,584	6,980	8,376	10,476	11,872	0.57	85%	0.8	6.1E-05	0.0E+00
	Rubber Tired Loaders	215	2008	TIER 2	0.15	5.8E-06	3,828	4,785	5,742	6,699	7,656	8,613	9,663	10,620	0.54	85%	0.8	1.2E-05	0.0E+00
	Bore/Drill Rigs	620	2005	TIER 2	0.15	5.8E-06	5,677	6,488	7,299	8,110	8,921	9,732	12,280	13,091	0.75	85%	0.8	1.2E-04	0.0E+00
	Bore/Drill Rigs	206	2003	TIER 2	0.15	6.5E-06	7,299	8,110	8,921	9,732	10,543	11,354	12,165	12,976	0.75	85%	0.8	2.0E-06	0.0E+00
	Bore/Drill Rigs	190	2011	TIER 3	0.15	5.6E-06	811	1,622	2,433	3,244	4,055	4,866	5,677	6,488	0.75	85%	0.8	1.2E-06	0.0E+00
	Bore/Drill Rigs	220	2007	TIER 3	0.15	5.8E-06	4,055	4,866	5,677	6,488	7,299	8,110	8,921	9,732	0.75	85%	0.8	1.6E-05	0.0E+00
	Bore/Drill Rigs	220	2010	TIER 3	0.15	5.6E-06	1,622	2,433	3,244	4,055	4,866	5,677	6,488	7,299	0.75	85%	0.8	7.4E-06	0.0E+00
	Bore/Drill Rigs	220	2014	TIER 3	0.15	3.8E-07	811	1,622	2,433	3,244	4,055	4,866	5,677	6,488	0.75	85%	0.8	4.6E-06	0.0E+00
	Bore/Drill Rigs	224	2006	TIER 3	0.15	5.8E-06	4,866	5,677	6,488	7,299	8,110	8,921	9,732	10,543	0.75	85%	0.8	1.7E-05	0.0E+00
	Bore/Drill Rigs	225	2010	TIER 3	0.15	5.6E-06	1,622	2,433	3,244	4,055	4,866	5,677	6,488	7,299	0.75	85%	0.8	9.4E-06	0.0E+00
	Off-Highway Trucks	464	2006	TIER 3	0.15	5.6E-06	11,748	13,706	15,664	17,622	19,580	21,538	23,496	25,454	0.57	85%	0.8	6.8E-06	0.0E+00
	Off-Highway Trucks	464	2011	TIER 3	0.15	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	85%	0.8	2.6E-06	0.0E+00
	Off-Highway Trucks	464	2011	TIER 4I	0.015	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	6.9E-06	0.0E+00
	Off-Highway Trucks	464	2012	TIER 4I	0.015	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	4.7E-06	0.0E+00
	Off-Highway Trucks	464	2014	TIER 4I	0.015	3.8E-07	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	2.5E-06	0.0E+00
	Off-Highway Trucks	484	2011	TIER 4I	0.015	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	1.0E-06	0.0E+00
	Off-Highway Trucks	484	2013	TIER 4I	0.015	3.8E-07	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	1.9E-07	0.0E+00
	Off-Highway Trucks	705	2007	TIER 3	0.15	5.8E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	3.7E-05	0.0E+00
	Off-Highway Trucks	705	2009	TIER 3	0.15	5.8E-06	5,874	7,832	9,790	11,748	13,706	15,664	17,622	19,580	0.57	85%	0.8	8.2E-06	0.0E+00
	Off-Highway Trucks	740	2007	TIER 3	0.15	5.8E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	7.1E-06	0.0E+00
	Off-Highway Trucks	821	2014	TIER 4F	0.015	2.5E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	6.8E-06	0.0E+00
	Tractors/Loaders/Backhoes	500	2006	TIER 3	0.15	5.8E-06	5,652	6,594	7,536	8,478	9,420	10,362	11,304	12,246	0.55	85%	0.8	1.3E-05	5.5E-04
	Other Construction Equipment	327	2006	TIER 3	0.15	5.6E-06	4,140	4,830	5,520	6,210	6,900	7,590	8,280	8,970	0.62	85%	0.8	1.7E-05	7.4E-04
	Excavators	500	2006	TIER 3	0.15	5.8E-06	8,376	9,772	11,168	12,564	13,960	17,264	18,660	20,056	0.57	85%	0.8	1.5E-04	1.3E-03
	Crawler Tractors	500	2006	TIER 3	0.15	5.8E-06	6,078	7,091	8,104	9,117	10,130	14,036	15,049	16,062	0.64	85%	0.8	1.9E-04	2.6E-03
	Off-Highway Trucks	750	2006	TIER 3	0.15	6.5E-06	11,748	13,706	15,664	17,622	19,580	29,492	32,180	34,138	0.57	85%	0.8	9.4E-04	6.9E-03
	Bore/Drill Rigs	120	2007	TIER 3	0.22	1.2E-05	4,055	4,866	5,677	6,488	7,299	8,110	8,921	9,732	0.75	85%	0.8	1.0E-05	2.7E-04

Location[1]	Equipment[2]	Horsepower[1]	Engine Year[1]	Engine Tier[1]	PM Emission Factor[3]	PM Deterioration Rate[4]	Maximum Cumulative Hours of Operation[5]								Load Factor[6]	PM Mitigation[7]	PM Fuel Correction Factor[8]	Project Normalized PM Emission Rate (g/s)[9]	Peak Month Maximum 24 Hour PM Emission Rate (g/s)[10]
					[g/hp-hr]	[g/hp-hr^2]	2011	2012	2013	2014	2015	2016	2017	2018					
Borrow Area B (cont)	Bore/Drill Rigs	120	2003	TIER 2	0.22	1.7E-05	7,299	8,110	8,921	9,732	10,543	11,354	12,165	12,976	0.75	85%	0.8	1.4E-05	3.5E-04
	Off-Highway Trucks	450	2007	TIER 2	0.15	5.6E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	3.5E-05	0.0E+00
Borrow Area E	Rubber Tired Dozers	240	2008	TIER 2	0.15	5.8E-06	6,356	7,945	9,534	11,123	12,712	14,301	17,003	18,592	0.59	85%	0.8	6.1E-05	0.0E+00
	Rubber Tired Loaders	565	2008	TIER 2	0.15	5.8E-06	3,828	4,785	5,742	6,699	7,656	8,613	11,315	12,272	0.54	85%	0.8	1.1E-04	0.0E+00
	Off-Highway Trucks	450	2004	TIER 2	0.15	5.8E-06	15,664	17,622	19,580	21,538	23,496	25,454	30,564	32,522	0.57	85%	0.8	2.4E-04	0.0E+00
	Off-Highway Trucks	450	2007	TIER 2	0.15	5.6E-06	9,790	11,748	13,706	15,664	17,622	19,580	22,282	24,240	0.57	85%	0.8	1.2E-04	0.0E+00
Disposal Site 2	Rubber Tired Dozers	240	2006	TIER 2	0.15	5.8E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	4.0E-05	0.0E+00
	Forklifts	102	2015	TIER 4I	0.015	1.0E-06	1,800	3,600	5,400	7,200	9,000	10,800	12,600	14,400	0.3	0%	0.8	1.4E-07	0.0E+00
	Forklifts	103	2015	TIER 4I	0.015	1.0E-06	1,800	3,600	5,400	7,200	9,000	10,800	12,600	14,400	0.3	0%	0.8	2.2E-07	0.0E+00
	Forklifts	122	2008	TIER 3	0.22	1.2E-05	7,200	9,000	10,800	13,053	14,958	16,758	18,558	20,358	0.3	85%	0.8	3.2E-05	0.0E+00
	Forklifts	82	2008	TIER 3	0.3	1.8E-05	7,200	9,000	10,800	12,600	14,400	16,200	18,000	19,800	0.3	85%	0.8	4.3E-06	0.0E+00
	Rubber Tired Loaders	565	2007	TIER 2	0.15	5.8E-06	4,785	5,742	6,699	7,656	8,613	9,570	10,527	11,871	0.54	85%	0.8	7.0E-05	0.0E+00
	Excavators	515	2006	TIER 2	0.15	5.8E-06	8,376	9,772	11,168	12,564	13,960	15,356	16,752	18,480	0.57	85%	0.8	1.0E-04	0.0E+00
	Off-Highway Trucks	450	2006	TIER 2	0.15	5.6E-06	11,748	13,706	15,664	17,622	19,580	21,538	23,496	25,454	0.57	85%	0.8	7.8E-05	0.0E+00
	Plate Compactors	354	2006	TIER 2	0.15	5.6E-06	3,600	4,200	4,800	5,400	6,000	6,600	7,496	8,840	0.43	85%	0.8	3.2E-05	0.0E+00
Disposal Site 3	Rubber Tired Dozers	240	2008	TIER 2	0.15	5.8E-06	6,356	7,945	9,534	11,123	12,712	14,301	16,709	18,298	0.59	85%	0.8	4.0E-05	0.0E+00
	Rubber Tired Dozers	200	2008	TIER 3	0.15	5.8E-06	6,356	7,945	9,534	11,123	12,712	14,301	15,890	17,479	0.59	85%	0.8	2.2E-07	0.0E+00
	Rubber Tired Dozers	410	2006	TIER 3	0.15	5.6E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	5.0E-05	0.0E+00
	Rubber Tired Dozers	464	2006	TIER 3	0.15	5.6E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	3.1E-05	0.0E+00
	Rubber Tired Dozers	580	2006	TIER 3	0.15	5.8E-06	9,534	11,123	12,712	14,301	15,890	17,479	19,068	20,657	0.59	85%	0.8	6.1E-05	0.0E+00
	Excavators	202	2008	TIER 3	0.15	5.8E-06	5,584	6,980	8,376	9,772	11,168	12,564	13,960	15,356	0.57	85%	0.8	9.4E-07	0.0E+00
	Excavators	400	2007	TIER 3	0.15	5.6E-06	6,980	8,376	9,772	11,168	12,564	13,960	15,356	16,752	0.57	85%	0.8	4.1E-06	0.0E+00
	Forklifts	110	2000	TIER 3	0.22	5.0E-05	21,600	23,400	25,200	27,000	28,800	30,600	32,400	34,200	0.3	85%	0.8	1.4E-06	0.0E+00
	Forklifts	122	2008	TIER 3	0.22	1.2E-05	7,200	9,000	10,800	12,600	14,400	16,200	18,000	19,800	0.3	85%	0.8	8.7E-07	0.0E+00
	Tractors/Loaders/Backhoes	287	2008	TIER 3	0.15	5.6E-06	3,768	4,710	5,652	6,594	7,536	8,478	9,420	10,362	0.55	85%	0.8	1.0E-07	0.0E+00
	Tractors/Loaders/Backhoes	687	2007	TIER 3	0.15	5.8E-06	4,710	5,652	6,594	7,536	8,478	9,420	10,362	11,304	0.55	85%	0.8	8.7E-06	0.0E+00
	Scrapers	540	2006	TIER 3	0.15	5.8E-06	6,552	8,402	10,622	11,714	12,806	13,898	14,990	16,082	0.72	85%	0.8	1.5E-04	0.0E+00
	Scrapers	540	2005	TIER 3	0.15	5.8E-06	7,644	8,736	9,828	10,920	12,012	13,104	14,196	15,288	0.72	85%	0.8	1.6E-05	0.0E+00
	Scrapers	540	2004	TIER 4I	0.015	6.0E-06	8,736	9,828	10,920	12,012	13,104	14,196	15,288	16,380	0.72	0%	0.8	4.4E-05	0.0E+00
	Rollers	134	2007	TIER 3	0.22	1.2E-05	3,475	4,170	4,865	5,560	6,255	6,950	7,645	8,340	0.56	85%	0.8	3.7E-08	0.0E+00
	Scrapers	600	2006	TIER 3	0.15	5.8E-06	6,552	9,770	14,564	15,656	16,748	17,840	18,932	20,024	0.72	85%	0.8	3.7E-04	0.0E+00
	Scrapers	600	2007	TIER 3	0.15	5.8E-06	5,460	6,552	7,644	8,736	9,828	10,920	12,012	13,104	0.72	85%	0.8	4.3E-05	0.0E+00
	Skid Steer Loaders	150	2007	TIER 3	0.22	1.2E-05	4,170	5,004	5,838	6,672	7,506	8,340	9,174	10,008	0.55	85%	0.8	4.3E-07	0.0E+00
	Rubber Tired Loaders	215	2008	TIER 2	0.15	5.8E-06	3,828	4,785	5,742	6,699	7,656	8,613	11,021	11,978	0.54	85%	0.8	2.8E-05	0.0E+00
	Off-Highway Trucks	450	2006	TIER 2	0.15	5.6E-06	11,748	13,706	15,664	17,622	19,580	21,538	23,496	25,454	0.57	85%	0.8	4.1E-05	0.0E+00
	Crawler Tractors	500	2006	TIER 3	0.15	5.8E-06	6,078	7,091	8,104	9,117	10,130	11,348	12,361	13,374	0.64	85%	0.8	5.0E-05	1.3E-03
	Excavators	500	2006	TIER 3	0.15	5.8E-06	8,376	9,772	11,168	12,564	13,960	15,356	16,752	18,148	0.57	85%	0.8	5.0E-05	1.3E-03
	Tractors/Loaders/Backhoes	500	2006	TIER 3	0.15	5.8E-06	5,652	6,594	7,536	8,478	9,420	10,362	11,304	12,246	0.55	85%	0.8	2.1E-05	5.5E-04
Disposal Site 7	Rubber Tired Dozers	240	2008	TIER 2	0.15	5.8E-06	6,356	7,945	9,534	11,123	12,712	14,301	15,890	17,479	0.59	85%	0.8	2.2E-05	0.0E+00
	Off-Highway Trucks	464	2006	TIER 3	0.15	5.6E-06	11,748	13,706	15,664	17,622	19,580	21,538	23,496	25,454	0.57	85%	0.8	6.8E-06	0.0E+00
	Off-Highway Trucks	464	2011	TIER 3	0.15	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	85%	0.8	2.6E-06	0.0E+00
	Off-Highway Trucks	464	2011	TIER 4I	0.015	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	6.9E-06	0.0E+00
	Off-Highway Trucks	464	2012	TIER 4I	0.015	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	4.7E-06	0.0E+00
	Off-Highway Trucks	464	2014	TIER 4I	0.015	3.8E-07	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	2.5E-06	0.0E+00
	Off-Highway Trucks	484	2011	TIER 4I	0.015	5.6E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	1.0E-06	0.0E+00
	Off-Highway Trucks	484	2013	TIER 4I	0.015	3.8E-07	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	1.9E-07	0.0E+00
	Off-Highway Trucks	705	2007	TIER 3	0.15	5.8E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	3.7E-05	0.0E+00
	Off-Highway Trucks	705	2009	TIER 3	0.15	5.8E-06	5,874	7,832	9,790	11,748	13,706	15,664	17,622	19,580	0.57	85%	0.8	8.2E-06	0.0E+00
	Off-Highway Trucks	740	2007	TIER 3	0.15	5.8E-06	9,790	11,748	13,706	15,664	17,622	19,580	21,538	23,496	0.57	85%	0.8	7.1E-06	0.0E+00

Location[1]	Equipment[2]	Horsepower[1]	Engine Year[1]	Engine Tier[1]	PM Emission Factor[3]	PM Deterioration Rate[4]	Maximum Cumulative Hours of Operation[5]								Load Factor[6]	PM Mitigation[7]	PM Fuel Correction Factor[8]	Project Normalized PM Emission Rate (g/s)[9]	Peak Month Maximum 24 Hour PM Emission Rate (g/s)[10]
					[g/hp-hr]	[g/hp-hr^2]	2011	2012	2013	2014	2015	2016	2017	2018					
Disposal Site 7 (Cont).	Off-Highway Trucks	821	2014	TIER 4F	0.015	2.5E-06	1,958	3,916	5,874	7,832	9,790	11,748	13,706	15,664	0.57	0%	0.8	6.8E-06	0.0E+00
	Rubber Tired Dozers	875	2009	TIER 2	0.15	5.8E-06	4,767	6,356	9,109	11,148	12,737	14,326	15,915	17,504	0.59	85%	0.8	3.5E-04	0.0E+00
	Plate Compactors	156	2009	TIER 3	0.22	1.2E-05	1,800	2,400	3,319	3,919	4,519	5,119	5,719	6,319	0.43	85%	0.8	1.3E-05	0.0E+00
	Plate Compactors	354	2006	TIER 3	0.15	5.6E-06	3,600	4,200	4,800	5,400	6,000	6,600	7,200	7,800	0.43	85%	0.8	9.5E-06	0.0E+00
	Off-Highway Trucks	450	2004	TIER 2	0.15	5.8E-06	15,664	17,622	19,580	21,538	23,496	25,454	27,412	29,370	0.57	85%	0.8	5.1E-05	0.0E+00
	Plate Compactors	354	2006	TIER 2	0.15	5.6E-06	3,600	4,200	4,800	5,400	6,000	6,600	7,951	8,551	0.43	85%	0.8	1.9E-05	0.0E+00

Notes:

1) Based on information obtained from SFPUC (2015a, 2015b, 2016). Emissions for each location (i.e., Borrow Area E, Borrow Area B, etc.) are assumed to be evenly distributed across that entire location. For locations with multiple work areas (such as Dam and Spillway Area (including Haul Road Construction)), Ramboll Environ apportioned emissions based on the size of the work area. The Dam and Spillway Area (including Haul Road Construction) is assumed to include the Existing Dam, Replacement Dam, Proposed Spillway, and West Haul Route Construction. For work areas new to the modified project, Ramboll Environ mapped the emissions onto overlapping work areas from the adopted project. Where no overlap existed, Ramboll Environ mapped the emissions to nearby work areas.

2) This category is assumed to be the most representative within OFFROAD (ARB 2006) for the type of equipment required for the project.

3) PM emission factor is based on the engine tier and size. Emissions standards available online at http://www3.epa.gov/otaq/nonroad-diesel.htm.

4) PM deterioration rate was taken from OFFROAD (ARB 2006).

5) This represents the maximum cumulative hours of operation for a single piece of equipment. This represents a conservative (i.e. high end) estimate because it is assumed that the equipment can be used on other projects and is not replaced. Cumulative hours of operation were calculated using the following methodology:
Cumulative Hours = Maximum Possible Hours During Project + Hours Prior to the Project, where:
Maximum Possible Hours During Project for a single unit was calculated based on the maximum of either the project hours or default OFFROAD (ARB 2006) activity per year.
Hours Prior to the Project was calculated using the default activity (hr/yr) from OFFROAD (ARB 2006), assuming that the engine was new in the model year specified by SFPUC (2015a, 2015b, 2016).
Usage data for the Calaveras Dam Replacement Project was provided by SFPUC. Actual data (2011 through November 2015) is from SFPUC 2016. Projected data for the modification period is from SFPUC 2015a, and projected data for the remainder of the project following the modification (April 2017 through December 2018) is from SFPUC 2015b.

6) Load factor taken from OFFROAD (ARB 2006). The load factor indicates the average proportion of rated power used, taking into account the effect of operation at idle and partial load conditions, as well as transient operation.

7) PM mitigation was determined based on discussions with SFPUC. PM mitigation represents ARB verified Level 3 control (i.e. ≥ 85%). Information on ARB Level 3 PM controls is available online (http://www.arb.ca.gov/diesel/verdev/verdev.htm). Tier 4 engines are assumed to have no PM mitigation on top of those already incorporated into those engines.

8) Fuel correction factors were applied to account for lower sulfur and aromatics in California diesel fuel (ARB 2005).

9) Project Normalized PM Emission Rate [g/s] = Project Emissions [g/project] * [project/8 years] * [1 year/365 days] * [1 days/24 hours] * [1 hour/3,600 seconds], where
Project Emissions [g/project] = Horsepower [hp] * Total Project Work Hours [hrs/year] * Deteriorated PM Emission Factor [g/hp-hr] * Load Factor [%] * (1-PM Mitigation [%]) * Fuel Correction Factor, where
Deteriorated PM Emission Factor [g/hp-hr] = PM Emission Factor [g/hp-hr] + PM Deterioration Rate [g/hp-hr^2] * Maximum Cumulative Hours of Operation [hrs], and
Project Emissions are calculated for each year and then summed across all 8 years.

10) Maximum 24-hour PM Emission Rate [g/s] = Maximum Daily PM Emissions [g/day] * [1 days/24 hours] * [1 hour/3,600 seconds], where
Maximum Daily PM Emissions [g/day] = Horsepower [hp] * Deteriorated PM Emission Factor [g/hp-hr] * Maximum Daily Equipment Hours [hr/day] * Load Factor [%] * (1-PM Mitigation [%]) * Fuel Correction Factor, where
Deteriorated PM Emission Factor [g/hp-hr] = PM Emission Factor [g/hp-hr] + PM Deterioration Rate [g/hp-hr] * Maximum Cumulative Hours of Operation [hrs], and
Deteriorated PM Emission Factor is calculated for the month (December 2015) with the highest estimated horsepower hour combination; and
Maximum Daily Equipment Hours [hrs/day] is calculated as the hours per month divided by the days of activity in that month.

References:

1) Air Resources Board (ARB). 2005. OFFROAD Exhaust Emissions Inventory – Fuel Correction Factors (DRAFT). March. Available online: http://www.arb.ca.gov/msei/offroad/techmemo/off-2006-01.pdf

2) Air Resources Board (ARB). 2006. Off-Road Emissions Inventory Program (OFFROAD2007). Available Online: http://www.arb.ca.gov/msei/categories.htm

3) SFPUC. 2015a. SFPUC Screening Tool v.4.7.1 - Phase 1 (Area projects)_CDRP-off road 2016.xlsx. Provided by SFPUC via email on December 11, 2015.

4) SFPUC. 2015b. Copy of Offroad Eqpt Usage2015 estimate.xlsx. Provided by SFPUC via email on December 16, 2015.

5) SFPUC. 2016. 2011-2015 cumulative offroad equipmentv3.xls. Provided by SFPUC via email on January 8, 2016.

Table 6: Risk Characterization Results for Proposed 2016 Modified Project
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Receptor Type	Receptor ID	Receptor Location		Project Annual Average DPM Concentration [ug/m^3]	Maximum 24-Hour Average DPM Concentration [ug/m^3]	Inhalation Intake Factor [m^3/kg-day]	Cancer Potency Factor [(mg/kg-day)$^{-1}$]	Cancer Risk[2] [in a million]	BAAQMD Cancer Risk Threshold [in a million]	Above BAAQMD Cancer Risk Threshold?	Chronic REL [ug/m^3]	Chronic HQ[3]	BAAQMD Chronic HQ Threshold	Above BAAQMD Chronic HQ Threshold?
		UTM$_X$ [meters][1]	UTM$_Y$ [meters][1]											
MEIR (Adult)	AR11343	601,200	4,152,800	0.06	--	3.3E-02	1.1	2.3	10	No	5	0.01	1	No
MEIR (Child)	CR11343	601,200	4,152,800	0.06	--	6.4E-02	1.1	4.4	10	No	5	0.01	1	No
MEIW	PW3950	603,200	4,152,550	0.10	--	3.8E-02	1.1	4.0	10	No	5	0.02	1	No
MEI (Adult Camper)	AC4349	603,250	4,152,750	--	1.79	1.9E-04	1.1	0.4	10	No	5	-- [4]	1	N/A
MEI (Child Camper)	CC4349	603,250	4,152,750	--	1.79	3.6E-04	1.1	0.7	10	No	5	-- [4]	1	N/A
MEI (Adult Hiker/Day Visitor)	AH194	604,350	4,151,500	0.23	--	5.1E-03	1.1	1.3	10	No	5	-- [4]	1	N/A
MEI (Child Hiker/Day Visitor)	CH194	604,350	4,151,500	0.23	--	1.3E-02	1.1	3.4	10	No	5	-- [4]	1	N/A

Notes:

1) UTM coordinates are provided in NAD83.

2) Lifetime cancer risk estimated for residents, workers, and hikers/day visitors according to the following formula:

Lifetime Cancer Risk = Project Annual Average DPM Concentration (µg/m^3) * Conversion Factor (mg/1000µg) * Inhalation Intake Factor (m^3/kg-day) * Cancer Potency Factor ([mg/kg-day]$^{-1}$) * T where:

Inhalation Intake Factors were calculated following the same methodology presented in Ramboll Environ's original HRSA report (see Tables 4-1, 4-2, and 4-3 in ENVIRON 2009), except the exposure duration was increased from 4 years to 8 years; and

T = Schedule overlap time adjustment for workers and hikers/day visitors. An adjustment factor of 3.36 was conservatively applied to the project annual average concentration prediction (based on 24 hours per day) to account for a construction schedule of approximately 10 hours per day and 5 days per week [(24/10) * (7/5) = 3.36];

Lifetime cancer risk estimated for campers according to the following formula:

Lifetime Cancer Risk = Maximum 24-Hour Average DPM Concentration (µg/m^3) * Conversion Factor (mg/1000 µg) * Inhalation Intake Factor (m^3/kg-day) * Cancer Potency Factor ([mg/kg-day]$^{-1}$)

Inhalation Intake Factors were calculated following the same methodology presented in Ramboll Environ's original HRSA report (see Tables 4-1, 4-2, and 4-3 in ENVIRON 2009), except the exposure duration was increased from 4 years to 8 years.

3) Chronic Hazard Quotient = Project Annual Average DPM Concentration (ug/m^3)/Chronic Reference Exposure Level (ug/m^3).

4) A chronic HQ is not estimated for the campers and hikers/day visitors because exposures are expected to be discontinuous over short durations and do not allow for estimation of chronic non-cancer health effects.

5) The cancer risk at the MEIR location is conservative. The residents at this receptor location were assumed to be full-time residents. However, since November 2012, the residents/property owners have vacated the property and lease the house to SFPUC. Based on the lease, the residents can only stay overnight on weekends and City holidays and they can only be onsite during the weekdays for a maximum of 8 hours.

6) The cancer risk at the MEIW location is conservative. Park workers were assumed to work 10 hours per day, but according to SFPUC they only work part time.

Units:

ug = microgram
m^3 = cubic meters
kg = kilogram

Abbreviations:

BAAQMD = Bay Area Air Quality Management District
DPM = Diesel particulate matter
HQ = Hazard quotient
MEI = Maximum Exposed Individual
MEIR = Maximum Exposed Individual Resident
MEIW = Maximum Exposed Individual Worker
N/A = Not applicable
REL = Reference exposure level
USEPA = United States Environmental Protection Agency
UTM = Universal Transverse Mercator

References:

1) ENVIRON International Corporation (ENVIRON). 2009.*Health Risk Screening Analysis of Diesel Particulate Emissions Associated with the Calaveras Dam Replacement Project, Alameda and Santa Clara Counties, California*August.

Table 7: Comparison of Criteria Air Pollutant Emissions from FEIR and Period of Proposed 2016 Project Modification
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Description	ROG	NOx	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
FEIR Maximum Daily Emissions (lb/day)[1]				
Worker Commute Vehicle Exhaust	2.2	2.7	0.5	0
Off-Site, On-Road Material Delivery Truck Exhaust	3.1	37.9	1.5	1.3
On-Site, Offroad Heavy Duty Equipment Exhaust	79.4	441.9	26.0	23.9
Total Unmitigated FEIR Maximum Daily Emissions (lb/day)	84.7	482.5	28.0	25.2
Total Mitigated FEIR Maximum Daily Emissions (lb/day)	**80.7**	**394.1**	**28.0**	**25.2**
Maximum Daily Emissions During Period of Proposed 2016 Project Modification (lb/day)				
Worker Commute Vehicle Exhaust[2]	2.2	2.7	0.5	0
Off-Site, On-Road Material Delivery Truck Exhaust[2]	3.1	37.9	1.5	1.3
On-Site, Offroad Heavy Duty Equipment Exhaust[3]	3.7	216.0	1.9	1.8
Additional Haul Trucks Associated with Proposed 2016 Project Modification[4]	6.1	83.4	1.3	1.2
Total Mitigated Daily Emissions During Period of Proposed 2016 Project Modification (lb/day)	**15.1**	**340.1**	**5.2**	**4.3**
Exceeds FEIR Maximum Daily Emissions?	**No**	**No**	**No**	**No**

Notes:

1. Emissions from Table 4.13.5 in CDRP FEIR (SFPD 2011). Emissions from the FEIR were based on CARB (e.g., EMFAC) and USEPA (i.e., AP-42) emission factors contained in the Construction Emission Model, Version 5.2 and URBEMIS 8.70.

2. Worker trips and material delivery trucks not related to the Proposed 2016 Project Modification were conservatively assumed to be the same as analyzed in the FEIR maximum daily scenario. Worker commute emissions assume 130 commuters per shift, 2 shifts per day, and 20 miles per one way trip. Material delivery truck emissions assume 124 one way trips per day and 15 miles per one way trip. These material delivery trucks include trucks for the import and export of sand and gravel.

3. Emissions for the on-site, offroad heavy duty equipment during the Proposed 2016 Project Modification were estimated using the SFPUC Screening Tool (ENVIRON 2014). Offroad equipment was evaluated for the same time period as the additional haul truck trips associated with the Proposed 2016 Project Modification.

4. Emissions for the haul trucks associated with the Proposed 2016 Project Modification were estimated using California Emissions Estimator Model (CalEEMod) (CAPCOA 2015), based on the following key assumptions:

> 46,666 one-way haul truck trips with a one-way trip length of 65 miles;
> Duration of Proposed 2016 Project Modification assumed to be 15 months (327 days); and
> When estimating running exhaust emissions, haul trucks assumed to be model year 2004 or newer in accordance with Mitigation Measure 5.13.3b in the FEIR (SFPD 2011).

5. This analysis has been performed for pollutants with construction mass emission thresholds established in the BAAQMD CEQA guidelines (BAAQMD 2010).

Abbreviations:

BAAQMD - Bay Area Air Quality Management District
CalEEMod - California Emissions Estimator Model
CARB - California Air Resources Board
CDRP - Calaveras Dam Replacement Project
CEQA - California Environmental Quality Act
FEIR - Final Environmental Impact Report
lb - pound
NOx - nitrogen oxides
PM - particulate matter
ROG - reactive organic gases
SFPUC - San Francisco Public Utility Commission
USEPA - United States Environmental Protection Agency

Sources:

Bay Area Air Quality Management District (BAAQMD). 2010. *BAAQMD CEQA Guidelines.* May.

California Air Pollution Control Officers Association (CAPCOA). 2015. *CalEEMod version 2013.2.2*.

ENVIRON International Corporation (ENVIRON). 2014. *SFPUC Screening Tool, version 4.7.1.*

San Francisco Planning Department (SFPD). 2011. *Final Environmental Impact Report San Francisco Public Utilities Commission Calaveras Dam Replacement Project.* January.

Table 8: Comparison of GHG Emissions from FEIR and Period of Proposed 2016 Project Modification
Calaveras Dam Replacement Project
Alameda and Santa Clara Counties, California

Description	CO_2e
Mitigated Daily Emissions (lb/day) Reported in FEIR [1]	**45,482**
Maximum Daily Emissions During Period of Proposed 2016 Project Modification (lb/day)	
Worker Commute Vehicle Exhaust [2]	7,839
Off-Site, On-Road Material Delivery Truck Exhaust [2]	5,966
On-Site, Offroad Heavy Duty Equipment Exhaust [3]	339
Additional Haul Trucks Associated with Proposed 2016 Project Modification [4]	34,633
Total Mitigated Daily Emissions During Period of Proposed 2016 Project Modification (lb/day)	**48,777**

Notes:

1. Emissions from Table 4.13.5 in CDRP FEIR (SFPD 2011). Emissions from the FEIR were based on BAAQMD and Climate Change Action Registry factors.

2. Worker trips and material delivery trucks not related to the Proposed 2016 Project Modification were conservatively calculated based on the same key assumptions used in the FEIR maximum daily scenario, including:

> Worker commute emissions assume 130 commuters/shift, 2 shifts/day, and 20 miles/trip (one way) with each worker commuting round trip;

> Material delivery truck emissions assume 124 one way trips/day and 15 miles/trip (one way).

Note that the material delivery trucks include trucks for the import and export of sand and gravel.

3. Emissions for the on-site, offroad heavy duty equipment during the Proposed 2016 Project Modification were estimated using the SFPUC Screening Tool (ENVIRON 2014). Offroad equipment was evaluated for the same time period as the additional haul truck trips associated with the Proposed 2016 Project Modification.

4. Emissions for the haul trucks associated with the Proposed 2016 Project Modification were estimated using California Emissions Estimator Model (CalEEMod) (CAPCOA 2015), based on the following key assumptions:

> 46,666 one-way haul truck trips with a one-way trip length of 65 miles;

> Duration of Proposed 2016 Project Modification assumed to be 15 months (327 days); and

> When estimating running exhaust emissions, haul trucks assumed to be model year 2004 or newer in accordance with Mitigation Measure 5.13.3b in the FEIR (SFPD 2011).

Abbreviations:

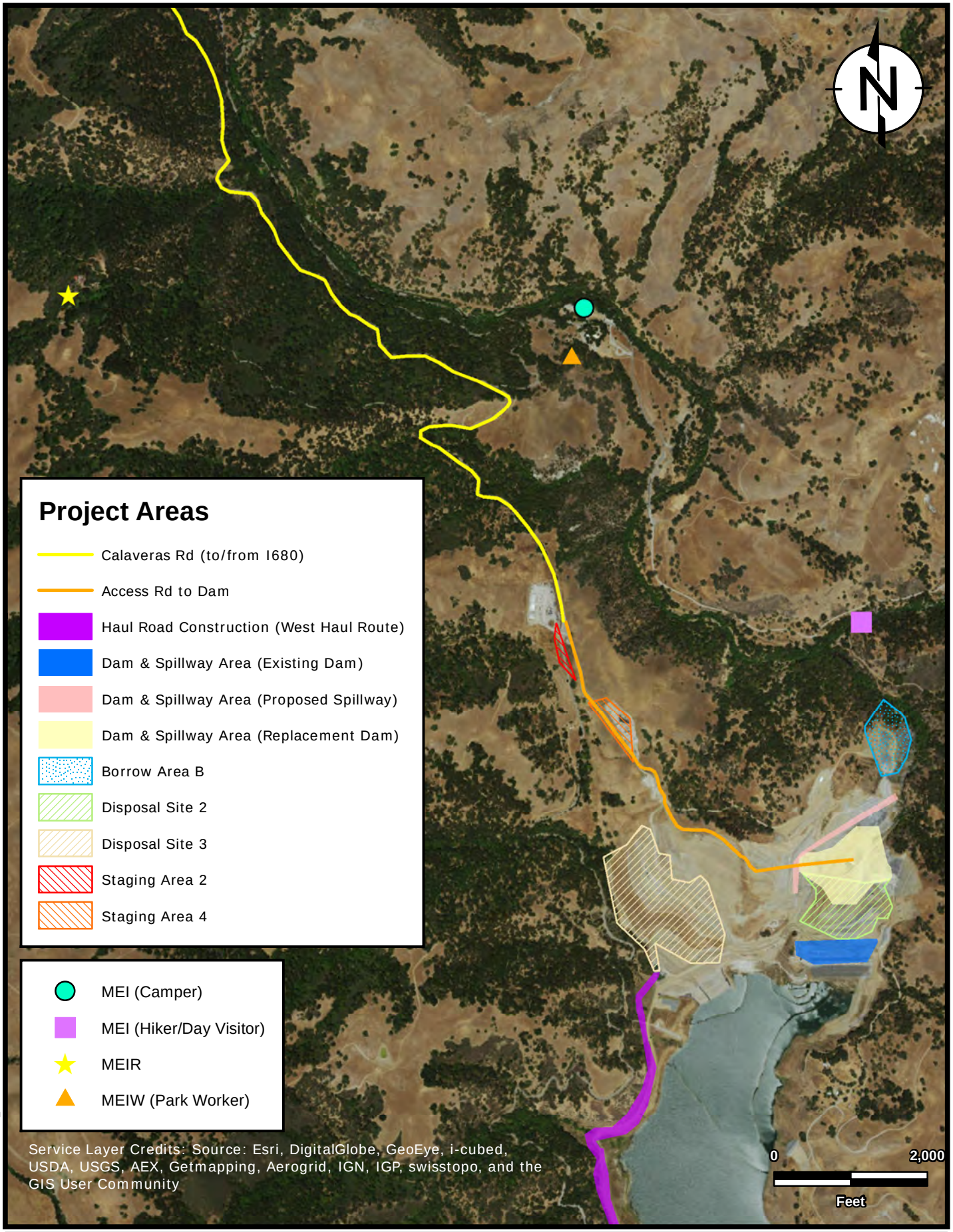
BAAQMD - Bay Area Air Quality Management District
CalEEMod - California Emissions Estimator Model
CO_2e - carbon dioxide equivalent
FEIR - Final Environmental Impact Report
GHG - greenhouse gas
lb - pound
SFPUC - San Francisco Public Utility Commission

Sources:

California Air Pollution Control Officers Association (CAPCOA). 2015. *CalEEMod version 2013.2.2*.

ENVIRON International Corporation (ENVIRON). 2014. *SFPUC Screening Tool, version 4.7.1.*

San Francisco Planning Department (SFPD). 2011. *Final Environmental Impact Report San Francisco Public*



U:\SFPUC\Calaveras\GIS\2015\1 Locations of MEIs_rev Jan 2016.mxd

RAMBOLL ENVIRON

DRAFTED BY: MJH | DATE: 1/15/2016

Locations of MEIs for Cancer Risk and Non-Cancer Hazard Quotient

Calaveras Dam Replacement Project

Alameda and Santa Clara Counties, California

FIGURE 1

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Minor Project Modifications
25-30

MINOR PROJECT MODIFICATION

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
WATER SYSTEM IMPROVEMENT PROGRAM

Minor Project Modification Number:	**025**		**Date: 7/29/2013**
Project Title:	**Calaveras Dam Replacement Project**		
EP Case No./Project No.	**2005.0161E/CUW37401**		
MPM Prepared By:	**Cullen Wilkerson-ECM/J.T. Mates-Muchin ECC**		
MPM Triggered By:	☒ RFD	☐ PCO	☐ Other:
Landowner:	**SFPUC**		
Vegetative Cover/Land Use:	N/A	**Net Acreage Affected:** 0	
Modification to:	☐ Mitigation Measure:		X Other: FEIR Project Description
	☐ Permit:		

Detailed Description of Minor Project Modification:

The San Francisco Public Utilities Commission (SFPUC) is requesting a modification to the Calaveras Dam Replacement Project (CDRP) Project Description to accommodate blasting on Saturday, August 3, 2013 in an area without naturally occurring asbestos (NOA).

Page 3-55, 3. Project Description, Section 3.5.1.9 Blasting and Page 4.14-24, Impact 4.14.3 of the CDRP Final Environmental Impact Report (FEIR) states:

> *"Blasting would be confined to daylight hours, Monday through Friday."*

Mitigation Measure 5.14.3 – Blasting Noise Control of the CDRP Final Environmental Impact Report (FEIR) states:

> *"If peak noise events associated with controlled blasting are found to exceed the Alameda County Noise Ordinance maximum noise limit of 70 dBA (L_{max}) at any Alameda County residential receptors or 75 dBA (L_{max}) at any Santa Clara County residential receptors, blasting charges shall be modified to be consistent with these noise limits, which would require blasting charges to be reduced so that noise levels do not exceed 112 dBA (L_{max}) at 50 feet or 106 dBA (L_{max}) at 100 feet. Alternatively, if blasting charges cannot be reduced sufficiently, then frequency of blasting (number of blast events during any given day or hour) shall be reduced to meet ordinance noise limits."*

Specifically, the SFPUC is proposing a blast on Saturday, August 3, 2013, in an area that does not contain NOA, in order to execute a time critical rock moving and hauling period. Attachment A shows the location of the noise monitoring and blasting area. The FEIR identified a noise monitoring location approximately 5 miles from Borrow

Area B. The monitoring location was modified to monitor much closer to the dam and at the closest permanent sensitive receptor (Mitchell Residence) which is 2.5 miles from Borrow Area B. There has been no exceeddance of the Alameda County Noise ordinance maximum noise limit of 70 dBA (Lmax). from previous blast days as the noise data did not reach above 70dBA in any circumstance (Attachment B). Although there were several potentially elevated noise readings noted in the summery sheet of the weekly reports, none of these elevated readings were associated with the blasting. All of the elevated noise readings were attributed to wildlife or local mechanical equipment (perhaps an air quality pump). The noise monitoring equipment malfunctioned on April 23, 2013 and was repaired on May 1, 2013. This affected the April 26, 2013 blast reading (which was marked as N/A). In addition, there have been no noise complaints since the start of construction (Attachment C).

ENVIRONMENTAL IMPACTS

There would be no impacts beyond those analyzed in the Calaveras Dam Replacement FEIR.

Attachments:

Attachment A –Noise Monitoring Location

Attachment B – Noise Data from Blast days

Attachment C – Noise Complaint Information

Biological ☐Yes ☒ No	**Cultural** ☐ Yes ☒ No	**Photos** ☐ Yes ☒ No	**Other** ☐ Yes ☒ No

Resources:

Biological ☐ No Resources Present ☐ Resources Present ☒ NA

Previous Biological Survey Report Reference:

N/A

Cultural ☐ No Resources Present ☐ Resources Present ☒ Within Project APE

☐ NA (paved/graveled area and no ground disturbance)

Previous Cultural Survey Report Reference:

N/A

Conditions of Approval or Reasons for Denial

SFPUC Required Signatures for Environmental Approval:

ECCM: Kerry O'Neill Date: 07/29/13

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

SFPUC agrees that Contractor will abide by the mitigation measures detailed in the CEQA document and project permit requirements and have appropriate Specialty Environmental Monitors present where required.

Charge Code: CUW37401

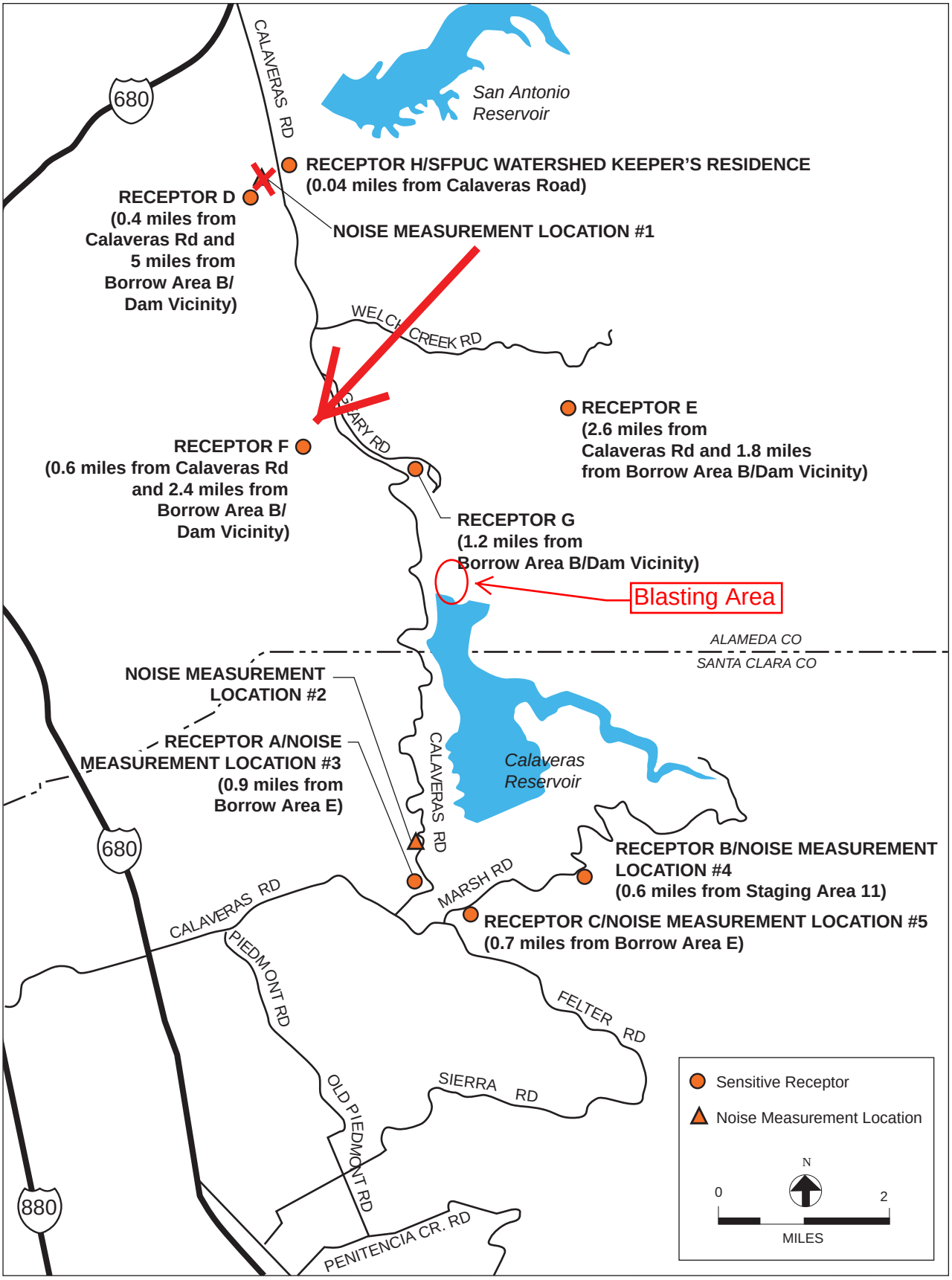
EP Required Signatures for Approval:

Signee: Chris Kern Digitally signed by Chris Kern DN: dc=org, dc=sfgov, dc=cityplanning, ou=CityPlanning, ou=Environmental Planning, cn=Chris Kern, email=chris.kern@sfgov.org Date: 2013.07.30 15:49:59 -07'00' Date: 7/30/13

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

CEQA SECTION	APPLICABLE	(Y) Define Potential Impact or (N) Briefly Explain Why CEQA Section isn't Applicable
Geology, Soils and Seismicity	☐ Y	There would be no new significant geology, soil or seismicity impacts beyond those analyzed in the FEIR.
	☒ N	
Hazardous Materials and Waste	☐ Y	There would be no hazardous material or waste impacts beyond those identified in the FEIR (see Attachment B & C).
	☒ N	
Hydrology	☐ Y	There would be no new significant hydrology or water quality impacts beyond those analyzed in the FEIR.
	☒ N	
Cultural Resources	☐ Y	There would be no new significant Cultural Resource impacts beyond those identified in the FEIR.
	☒ N	
Traffic and Circulation	☐ Y	There would be no new significant traffic and circulation impacts beyond those identified in the FEIR.
	☒ N	
Air Quality	☐ Y	There would be no new air quality impacts beyond those identified in the FEIR.
	☒ N	
Noise and Vibration	☒ Y	There will not be additional new significant noise and vibration impacts beyond what was analyzed in the FEIR. The noise data (Attachment B) show that there has not been any peak noise events associated with controlled blasting that exceed the Alameda County Noise ordinance maximum noise limit of 70 dBA (Lmax). The project will continue to implement mitigation measure 5.14.3 – Blasting Noise Control that states: *"If peak noise events associated with controlled blasting are found to exceed the Alameda County Noise Ordinance maximum noise limit of 70 dBA (Lmax) at any Alameda County residential receptors or 75 dBA (Lmax) at any Santa Clara County residential receptors, blasting charges shall be modified to be consistent with these noise limits, which would require blasting charges to be reduced so that noise levels do not exceed 112 dBA (Lmax) at 50 feet or 106 dBA (Lmax) at 100 feet. Alternatively, if blasting charges cannot be reduced sufficiently, then frequency of blasting (number of blast events during any given day or hour) shall be reduced to meet ordinance noise limits."*
	☐ N	
Visual Resources	☐ Y	There will be no new visual resource impacts beyond those analyzed in the FEIR.
	☒ N	
Vegetation and Wildlife	☐ Y	There will be no new vegetation and wildlife impacts beyond those analyzed in the FEIR.
	☒ N	

Attachment A



SOURCE: EDAW&Turnstone JV

CALAVERAS DAM REPLACEMENT PROJECT

FIGURE 4.14.1: NOISE MEASUREMENT AND SENSITIVE RECEPTOR LOCATIONS

Attachment B – Noise Data from Blast days

CDRP Blast Dates	Time	Noise compliant (Y/N)	Comments
2/25/2013	1530	Y	
3/25/2013	1408	Y	
4/8/2013	1530	Y	65 dBA READING AT 4-5 pm
4/18/2013	1500	Y	
4/22/2013	1500	Y	
4/26/2013	1530	n/a	data logger crashed and was unavalable until May 1
5/1/2013	1530	Y	
5/22/2013	1559	Y	
5/29/2013	1530	Y	
6/11/2013	1530	Y	68 dBA reading before noon
6/12/2013	1548	Y	
7/9/2013	1530	Y	
7/16/2013	1650	Y	78 dBA reading at 6pm

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MEMORANDUM

DATE: 4 March 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-02-25 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week.

• • •

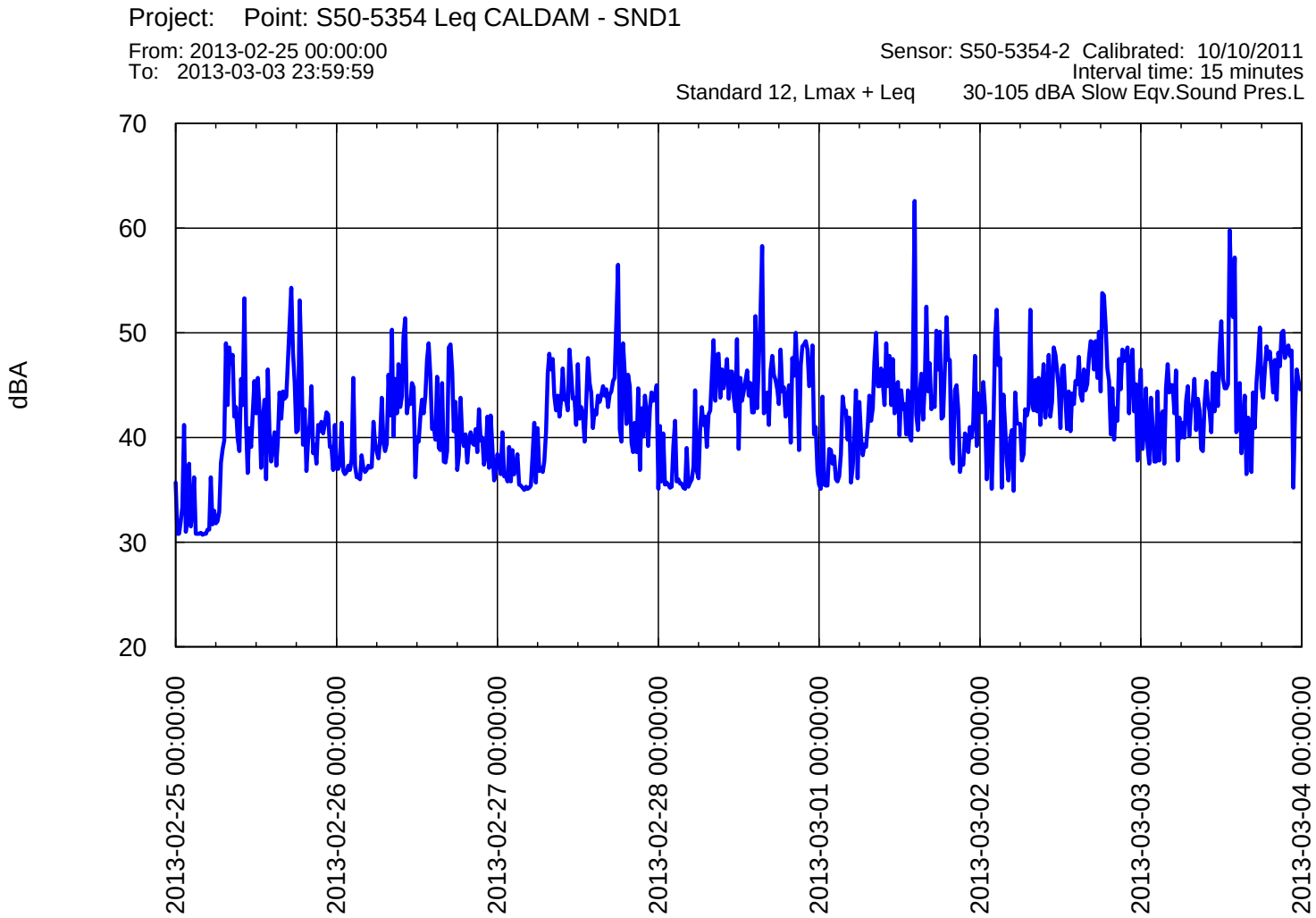
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-02-25
Leq Noise Levels: Data in 15-minute Periods



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MEMORANDUM

DATE: 1 April 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-03-25 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week. The exceedances on 28 March 2013 appear to be caused by planes flying overhead. The exceedances on 30 March 2013 appear to be caused by car driving up the driveway, dogs barking, heavy rains, as well as local mechanical equipment (perhaps the air quality pump?).

• • •

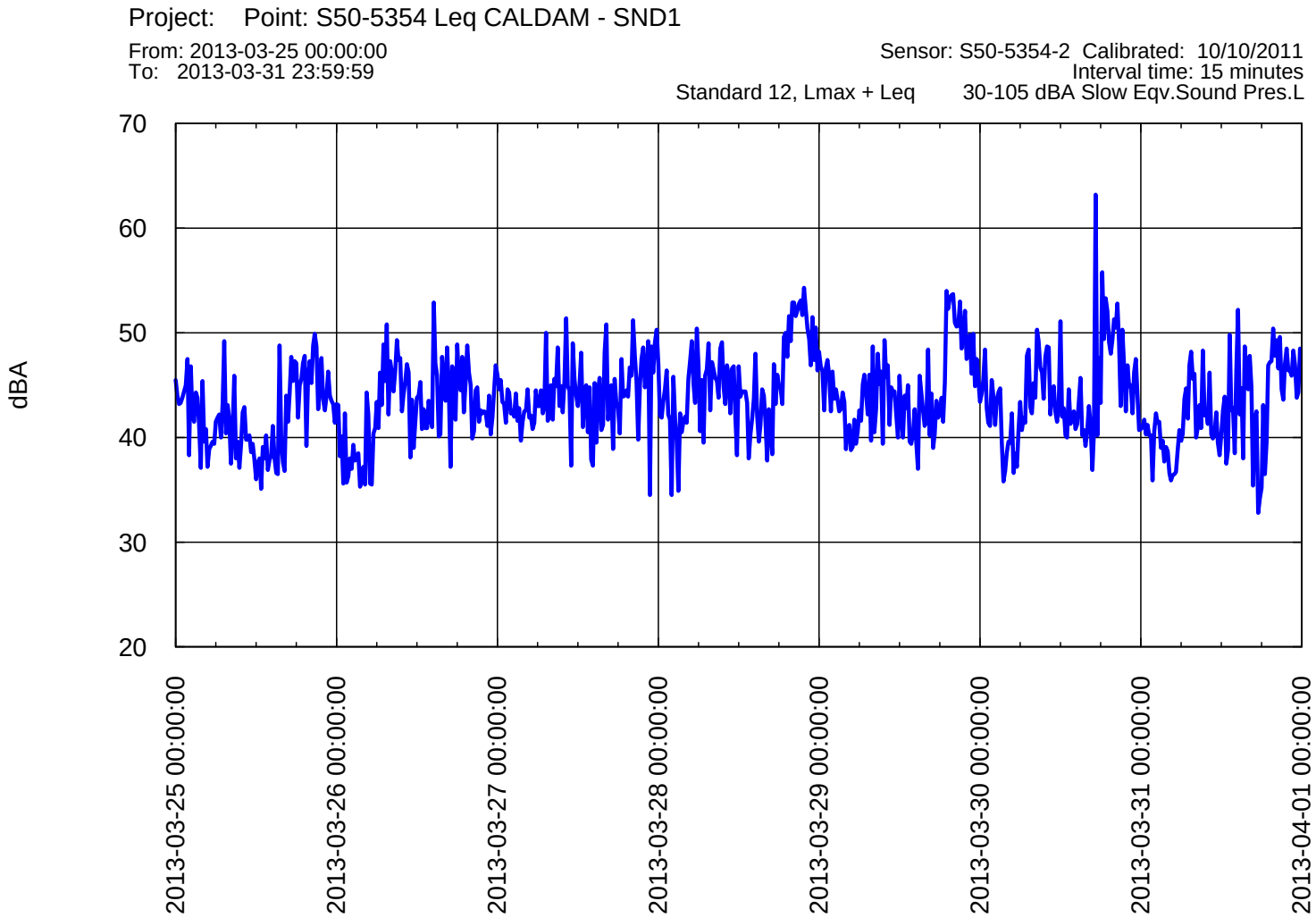
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-03-25
Leq Noise Levels: Data in 15-minute Periods



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MEMORANDUM

DATE: 15 April 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-04-08 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week. The exceedances on 14 April 2013 morning and night appear to be caused by birds, dogs barking, as well as local mechanical equipment (perhaps the air quality pump?).

• • •

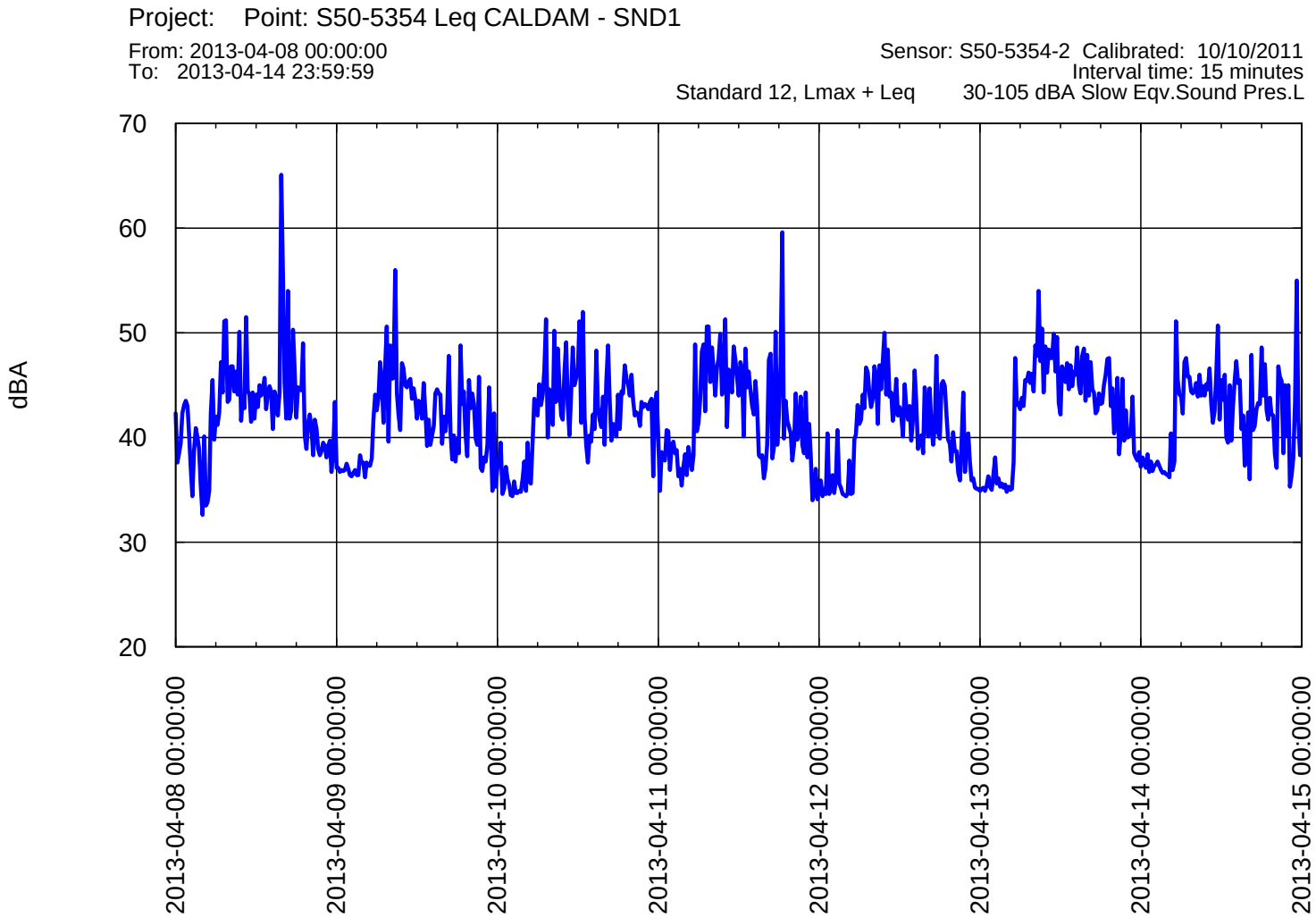
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-04-08
Leq Noise Levels: Data in 15-minute Periods



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MEMORANDUM

DATE: 22 April 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-04-15 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week. The exceedances on 17 April 2013 early morning appear to be caused by dogs barking.

• • •

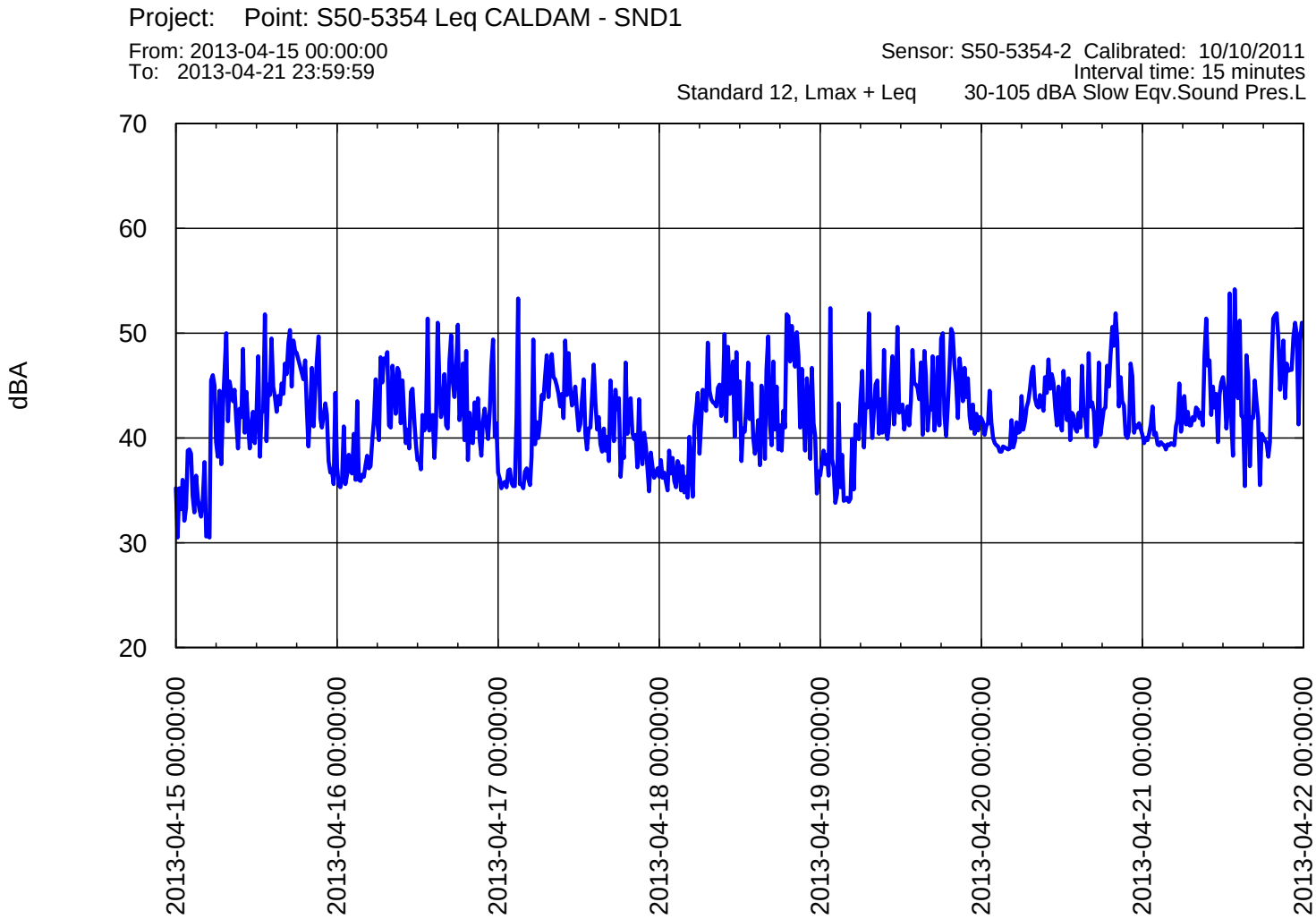
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-04-15
Leq Noise Levels: Data in 15-minute Periods



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MEMORANDUM

DATE: 3 May 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-04-22 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data shows data only till 23 April 2013 early morning as the datalogger crashed. We fixed the issue on 1 May 2013 and the equipment is up and running again this week. The monitoring data do not show any noise exceedances from construction activities on 22 April 2013.

• • •

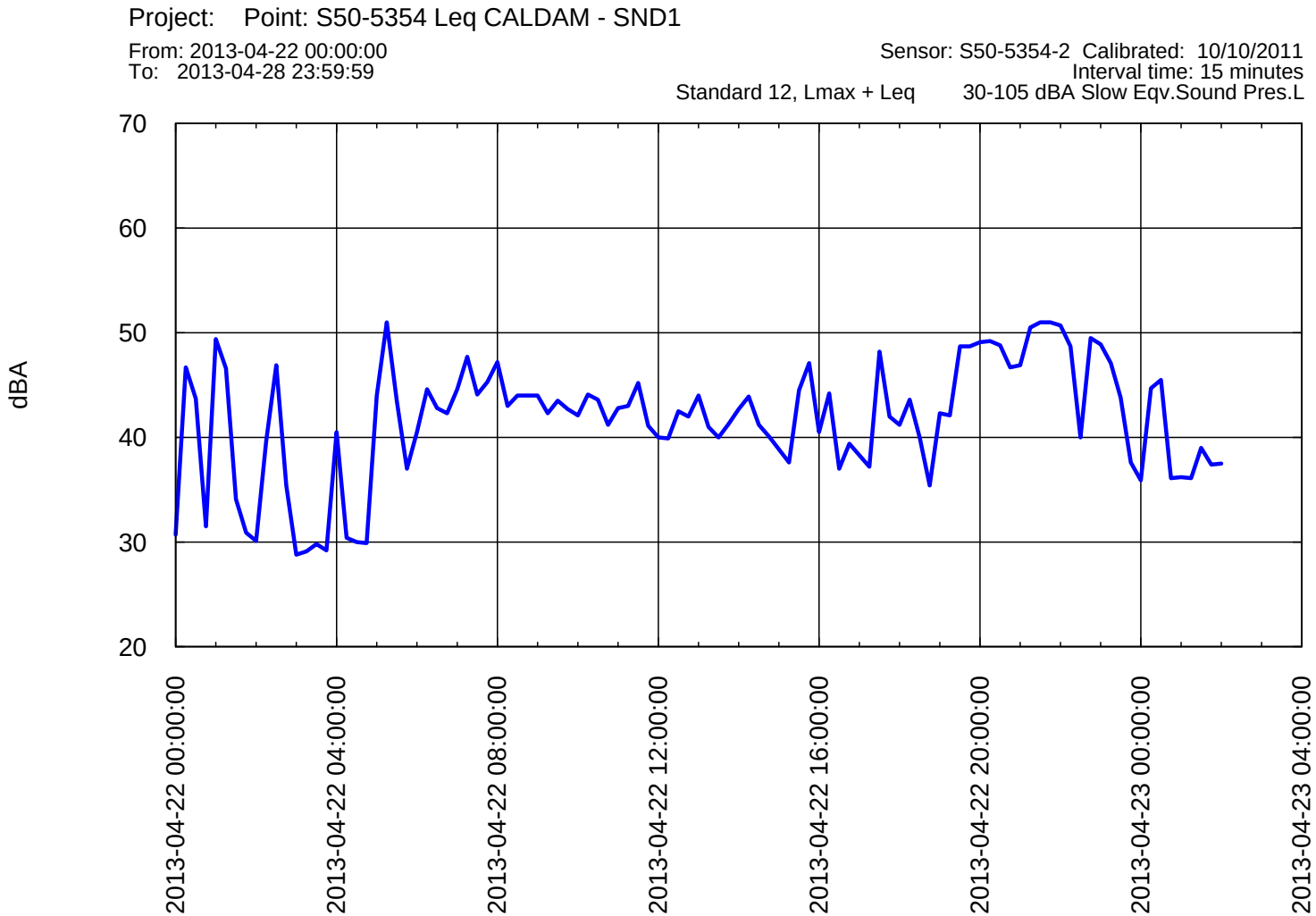
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-04-22
Leq Noise Levels: Data in 15-minute Periods



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MEMORANDUM

DATE: 6 May 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-04-29 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

We fixed the datalogger issue on 1 May 2013 and the equipment was up and running again last week. The monitoring data do not show any noise exceedances from construction activities from 1 May 2013 onwards. The exceedances on 5 May 2013 morning appear to be caused by birds, as well as local mechanical equipment (perhaps the air quality pump?).

• • •

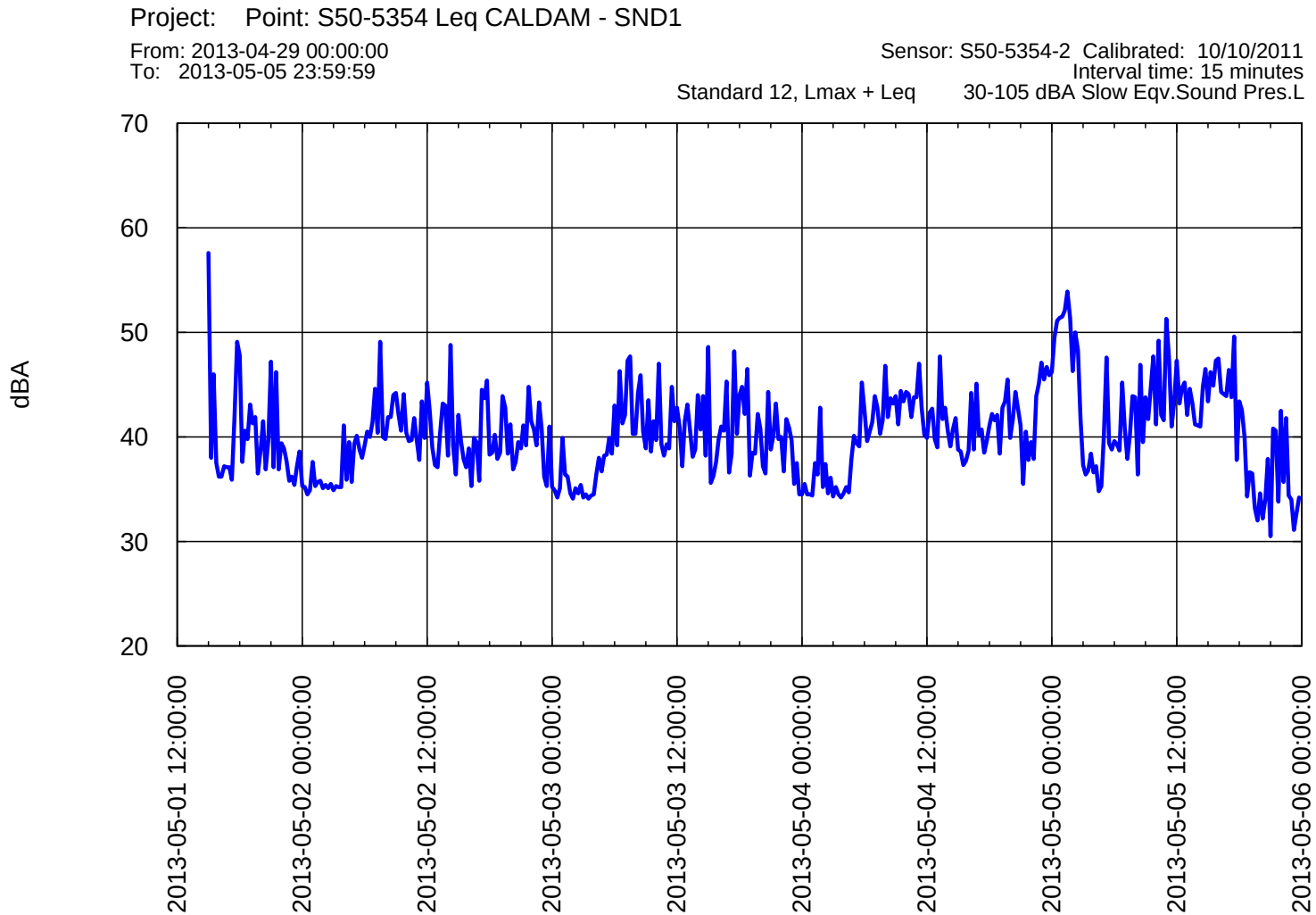
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-04-29
Leq Noise Levels: Data in 15-minute Periods



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MEMORANDUM

DATE: 28 May 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-05-20 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week. The exceedances on 25 May 2013 early morning appear to be caused by birds, dogs barking, as well as local mechanical equipment (perhaps the air quality pump?).

• • •

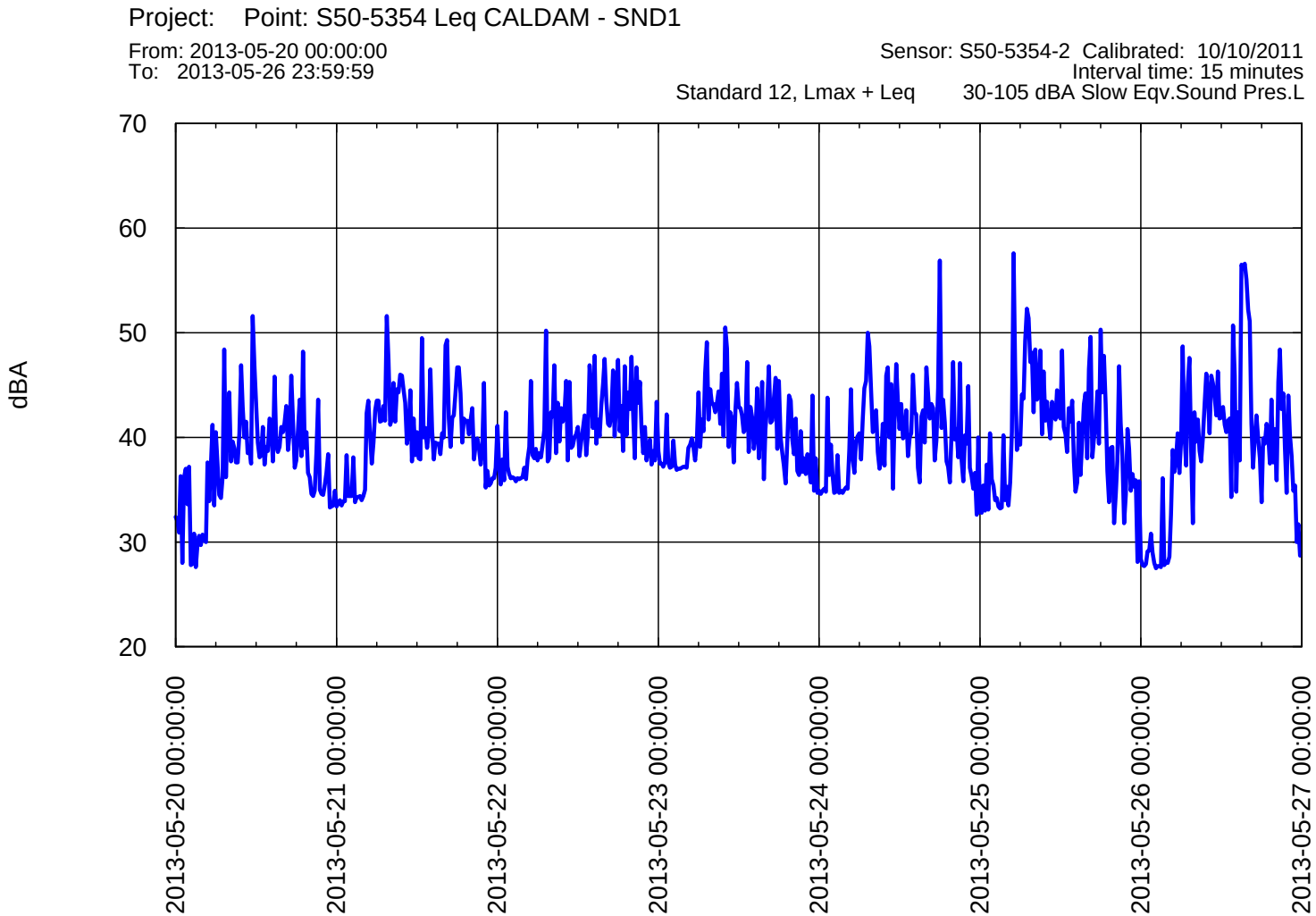
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-05-20
Leq Noise Levels: Data in 15-minute Periods



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http://www.va-consult.com

MEMORANDUM

DATE: 3 June 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
CC: Karen Hurd, Dragados/Flatiron/Sukut **EMAIL:** khurd@dragados-usa.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-05-27 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week.

• • •

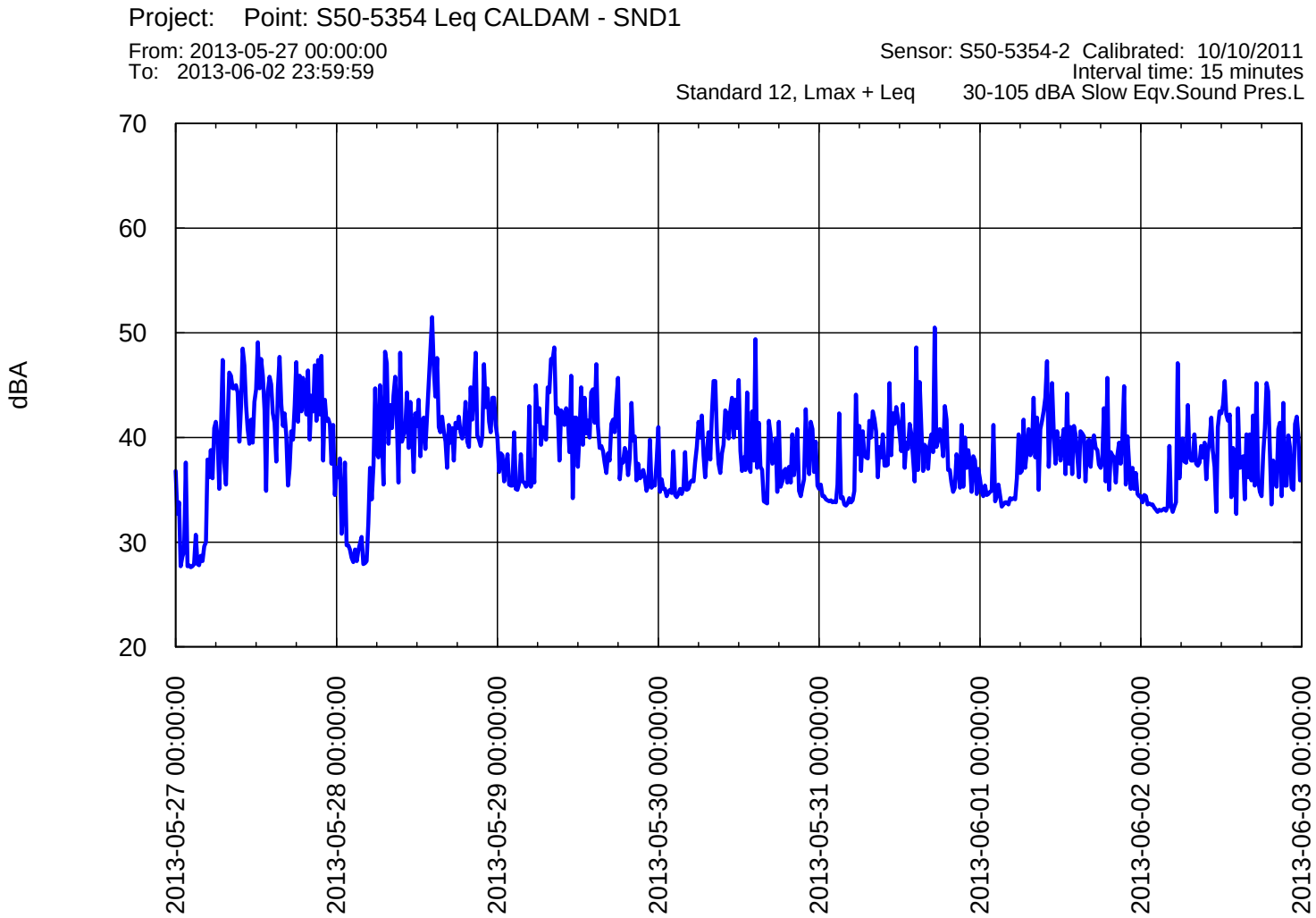
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-05-27
Leq Noise Levels: Data in 15-minute Periods



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http://www.va-consult.com

MEMORANDUM

DATE: 17 June 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
CC: Karen Hurd, Dragados/Flatiron/Sukut **EMAIL:** khurd@dragados-usa.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-06-10 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week.

* * *

Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

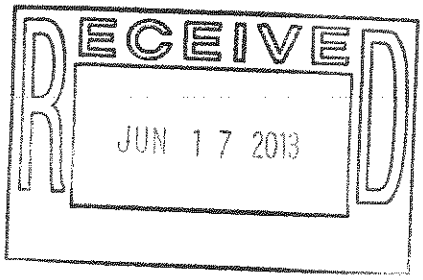
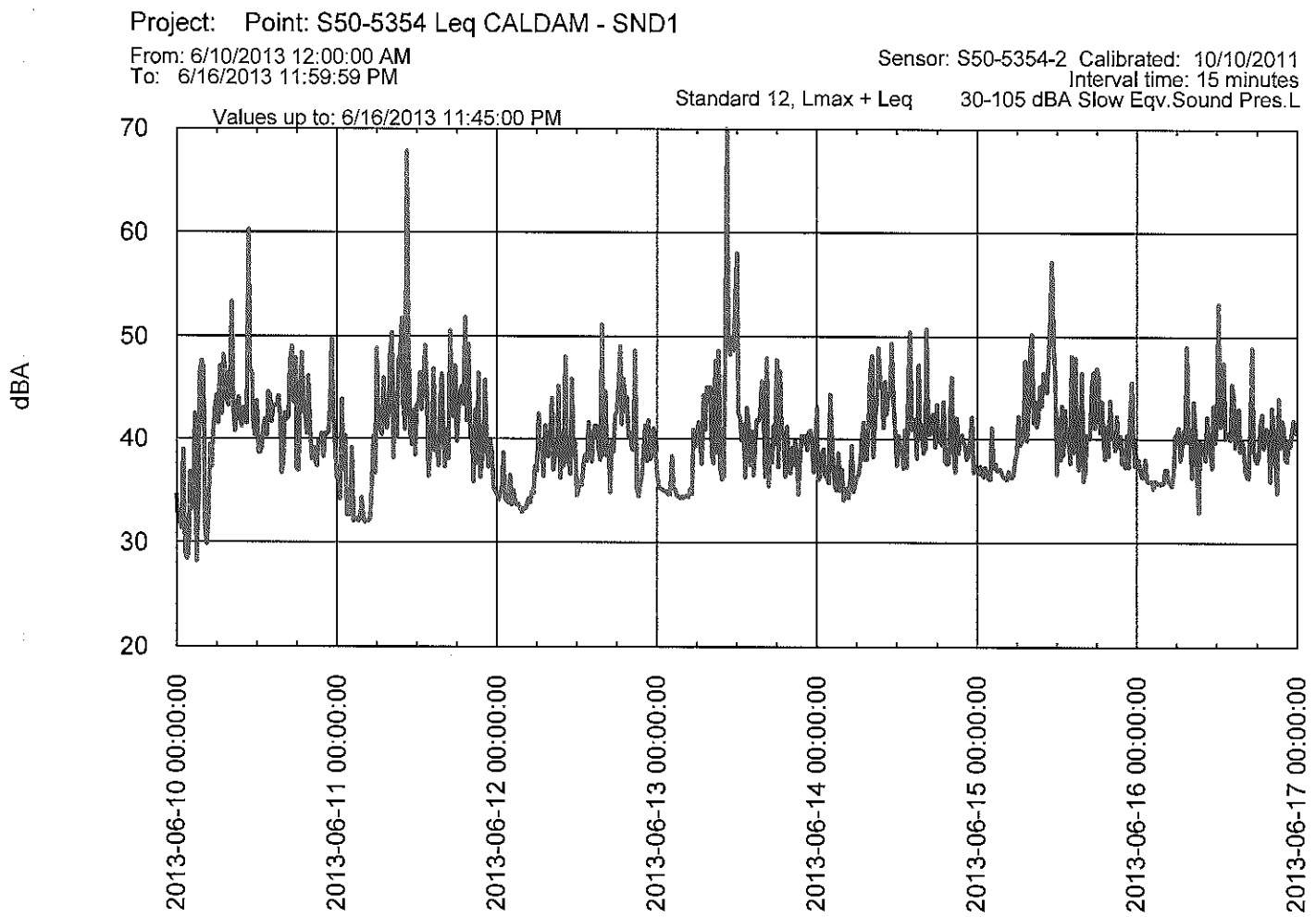


Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-06-10
Leq Noise Levels: Data in 15-minute Periods



VACC, Inc. dba
VIBRO-ACOUSTIC CONSULTANTS

490 Post Street • Suite 1427
San Francisco • CA • 94102 • USA
Tel / Fax: (+1) 415-693-0424 / 1398
http://www.va-consult.com

MEMORANDUM

DATE: 15 July 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
CC: Karen Hurd, Dragados/Flatiron/Sukut **EMAIL:** khurd@dragados-usa.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-07-08 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week.

• • •

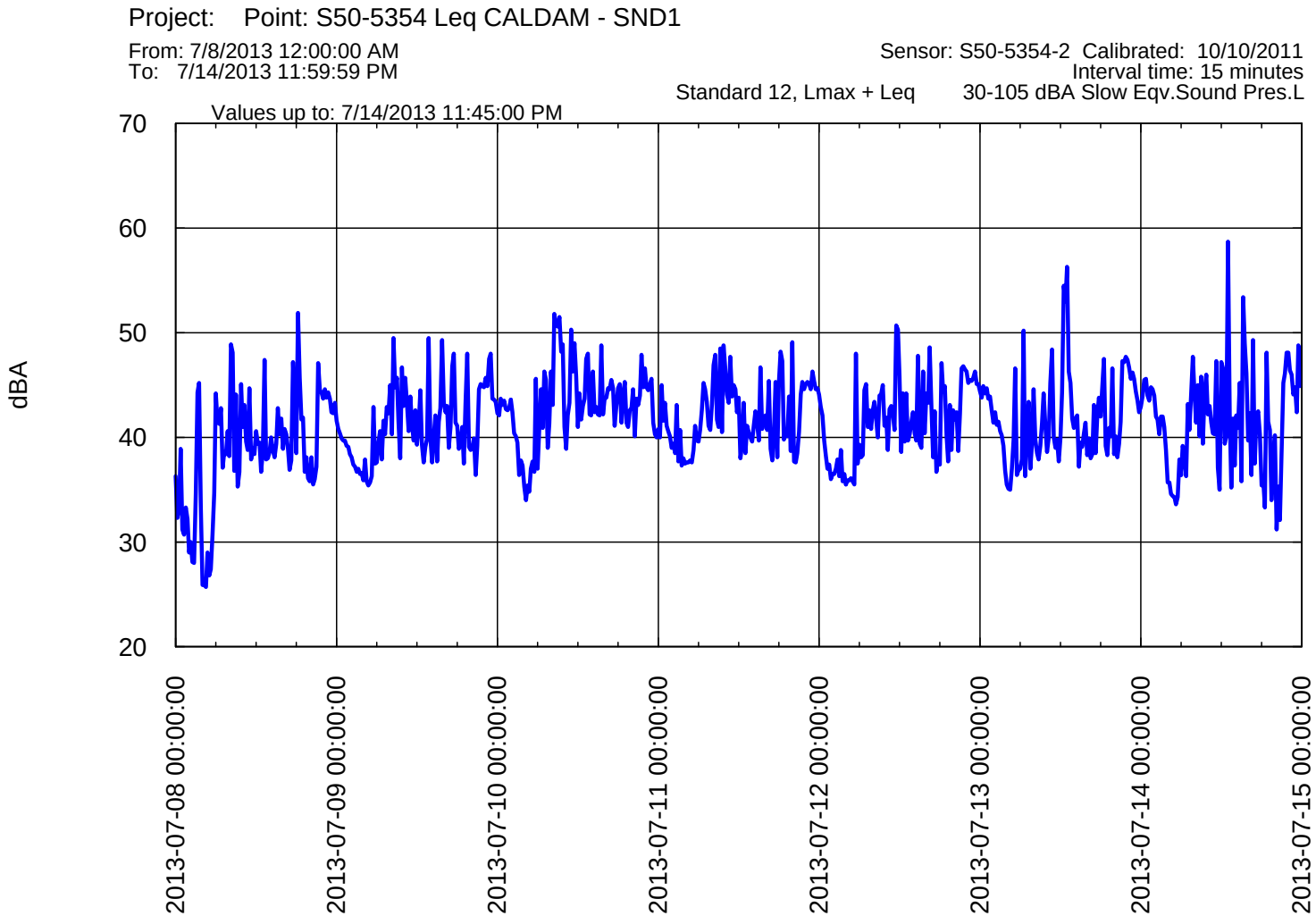
Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-07-08
Leq Noise Levels: Data in 15-minute Periods



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490 Post Street • Suite 1427
San Francisco • CA • 94102 • USA
Tel / Fax: (+1) 415-693-0424 / 1398
http://www.va-consult.com

MEMORANDUM

DATE: 22 July 2013
TO: Jason Phillips, Dragados/Flatiron/Sukut **EMAIL:** JPhillips@flatironcorp.com
CC: Karen Hurd, Dragados/Flatiron/Sukut **EMAIL:** khurd@dragados-usa.com
FROM: Aditya Balani, VACC **EMAIL:** aditya@va-consult.com
SUBJECT: Calaveras Dam – Noise Monitoring Report for Week of 2013-07-15 (00674)

Dear Jason,

We are pleased to submit this weekly noise monitoring report for the Calaveras Dam Replacement project. The following table presents the noise limits for the sensitive receivers B and F:

Table 1: Hourly Noise Limits (dBA)

Alameda County		M-F	Sat.	Sun.	Notes
Monitoring Station M1/Receiver F	7am~7pm	No limits	---	---	The ordinance exempts construction noise from limits during 7am~7pm M-F, and 8am~5pm Sat and Sun. The ordinance does not contain specific guidelines for holidays.
	7pm~10pm	58	---	---	
	10pm~7am	53	---	---	
	7am~8am	---	58	58	
	8am~5pm	---	No limits	No limits	
	5pm~10pm	---	58	58	
	10pm~7am	---	53	53	
Santa Clara County		**M-F**	**Sat.**	**Sun.**	**Notes**
Monitoring Station M2/Receiver B	7am~7pm	60/75	60/75	53	On weekdays and Saturdays, "mobile equipment" has a limit of 75 dBA. Federal holidays are treated as Sundays.
	7pm~10pm	53	53	53	
	10pm~7am	50	50	50	

Receiver F/Monitor M1 (12163 Calaveras Road)

The monitoring data do not show any noise exceedances from construction activities during the week. The exceedances on 16 July 2013 evening appear to be caused by birds, as well as local mechanical equipment (perhaps the air quality pump?).

• • •

Please feel free to call if you have any questions; we may be reached in our San Francisco office by telephone at (+1) 415-693-0424 or via email at aditya@va-consult.com.

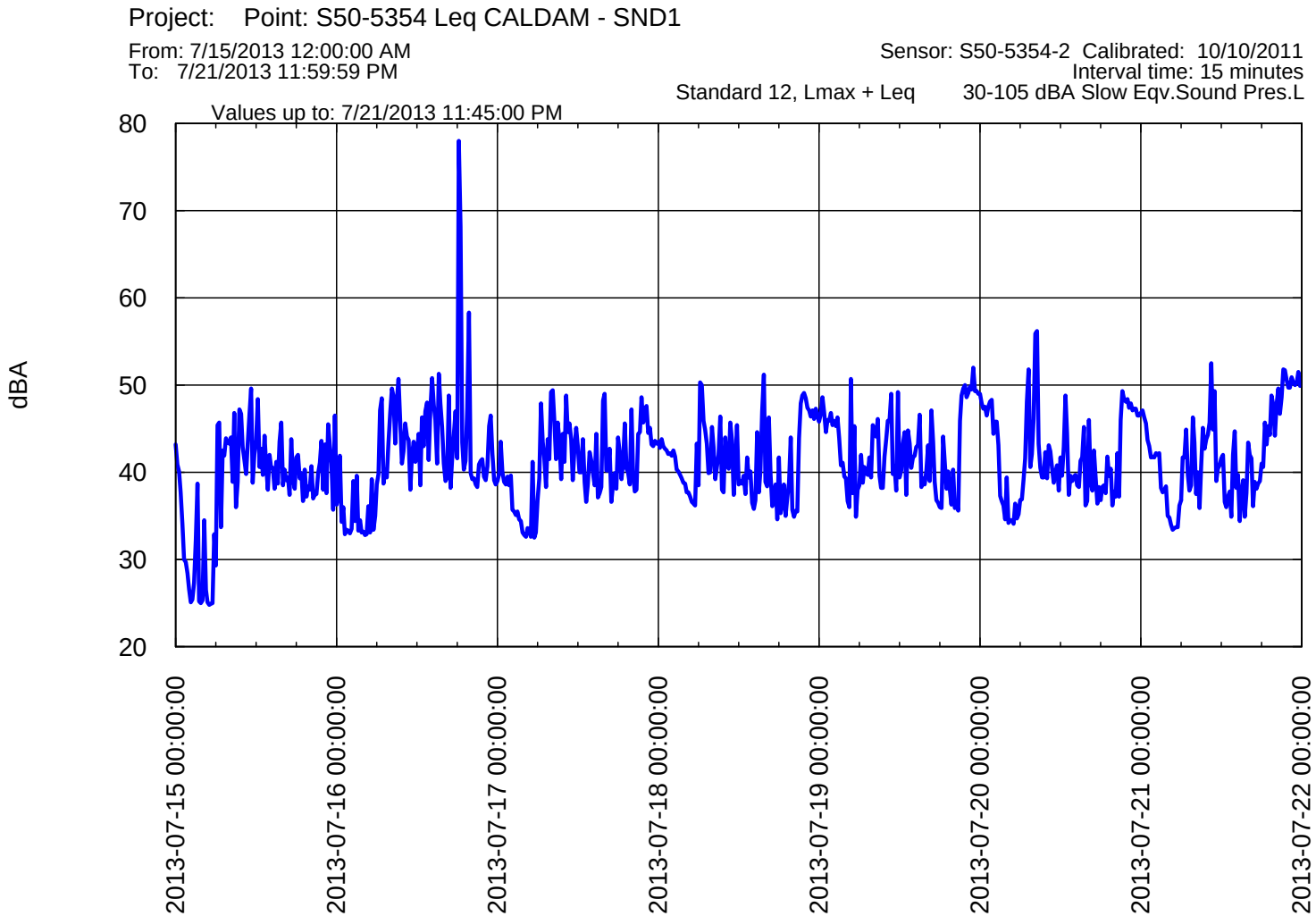
Sincerely,

AGBalani

Aditya Balani, Vibro-Acoustic Consultants

RECEIVED
By SFPUC CDRP CM Team at 12:30 pm, Jul 22, 2013

Figure 1 – Noise Monitoring at Receiver F/M1 (12163 Calaveras Road) – Week of 2013-07-15
Leq Noise Levels: Data in 15-minute Periods



Attachment C

Mates-Muchin, JT

From: Le, Maria
Sent: Monday, July 29, 2013 7:42 AM
To: Wilkerson, Cullen
Cc: Mates-Muchin, JT; Lauppe Rhodes, Betsy
Subject: Calaveras Dam Replacement Project - Noise

Cullen,
Since the beginning of construction in August 2011, there have been zero complaints from the public related to noise for the Calaveras Dam Replacement Project.

If you have any questions, please let me know.

Regards,
Maria Le
Communications Liaison
Calaveras Dam Replacement / New Irvington Tunnel Projects
Calaveras Dam Office: 925-493-4535 / NIT Office: 925-232-4059
Mobile: 925-963-9749
mle@sfwater.org
24- hour Answer Line: 866-973-1476
Visit our website: sfwater.org/sunolvalley

From: Wilkerson, Cullen
Sent: Monday, July 29, 2013 6:56 AM
To: Le, Maria
Cc: Mates-Muchin, JT
Subject: Noise Complaints

Maria,

Can you send me an email describing all the noise complaints received for this project? We are trying to determine if we are able to pursue a Minor Project Modification for blasting on a Saturday.

Thank You,

Cullen Wilkerson

Environmental Compliance Manager
Calaveras Dam Replacement Project

Office: (925) 493-4537 | Cell: (510) 685-1497 | CWilkerson@sfwater.org

Attachment C

Hetch Hetchy Regional Water System

Operated by San Francisco Water, Power, and Sewer | Services of the San Francisco Public Utilities Commission

O'Neill, Kerry

From: Smith, Steve <steve.smith@sfgov.org>
Sent: Monday, January 06, 2014 2:00 PM
To: O'Neill, Kerry
Subject: RE: MPM 026 - Sheep Camp Creek BHR Site Irrigation Line and Solar Panel
Attachments: MPM 026 Sheep Camp Irrigation Line_Solar Panel.docx

Approval attached…

Steven H. Smith, AICP
Senior Environmental Planner

Planning Department|City and County of San Francisco
1650 Mission Street, Suite 400, San Francisco, CA 94103
Direct: 415-558-6373|Fax: 415-558-6409
Email: steve.smith@sfgov.org
Web: www.sfplanning.org

From: O'Neill, Kerry [mailto:KO'Neill@sfwater.org]
Sent: Monday, January 06, 2014 10:39 AM
To: Smith, Steve
Subject: RE: MPM 026 - Sheep Camp Creek BHR Site Irrigation Line and Solar Panel

Steve, I'm at (650) 532-1836 today if you need to call me too.

From: O'Neill, Kerry
Sent: Monday, January 06, 2014 10:29 AM
To: Smith, Steve
Cc: Dakin, Robin
Subject: RE: MPM 026 - Sheep Camp Creek BHR Site Irrigation Line and Solar Panel

---

From: Smith, Steve [mailto:steve.smith@sfgov.org]
Sent: Monday, January 06, 2014 9:52 AM
To: O'Neill, Kerry
Cc: Dakin, Robin
Subject: RE: MPM 026 - Sheep Camp Creek BHR Site Irrigation Line and Solar Panel

Thanks Kerry –

1 – can you also point out where in the EIR this modified project activity is described and/or analyzed, or at least what project component it directly relates to? **See Volume 3, Appendix C, C.3 Evaluation of the Proposed Koopmann Road Mitigation Area for the Calaveras Dam Replacement Project. Koopmann Road Mitigation Area is now named the Sheep Camp Creek BHR site. Also there is a brief mention of this site in Volume 3, Appendix C, Appendix C.2 Update to the June 18, 2009, Evaluation of Areas Proposed as Compensation for Impacts of the Calaveras Dam Replacement Project. The mitigation sites are also described briefly in EIR 4.4-72-4.4-74:**

> *"Koopmann Road Mitigation Area*
> *The Koopmann Road Mitigation Area is approximately 463 acres of SFPUC land east of Interstate 680 and north of State Route 84 in the northwest portion of the Alameda*

watershed. The SFPUC has determined that the site is not essential for water supply purposes and designated it as surplus land, appropriate for sale for other uses, including potential development. Selected in this case for use as a mitigation area, it contains four stock ponds; willow riparian (0.6 acres); oak woodlands (87 acres); sycamore alluvial woodlands (7 acres); and non-native annual grasslands (362 acres). The mitigation area provides opportunities to enhance or establish about 0.51 acres of seasonal wetlands; 1.22 acres (7,277 lf) of ephemeral channel; 0.61 acre (2,570 lf) of intermittent stream; and 1.14 acres of stock ponds. Aquatic habitat for the California red-legged frog and California tiger salamander is impaired by the presence of non-native predators and could be improved by removing these predators."

2 – can you explain why the well component is planned to be submitted as a separate modification? **The Arroyo 2 BHR site is not covered under the Calaveras FEIR it is covered under the BDPL 5 project which is why a separate MPM will be submitted for the well component.**

Steve

Steven H. Smith, AICP
Senior Environmental Planner

Planning Department|City and County of San Francisco
1650 Mission Street, Suite 400, San Francisco, CA 94103
Direct: 415-558-6373|Fax: 415-558-6409
Email: steve.smith@sfgov.org
Web: www.sfplanning.org

From: O'Neill, Kerry [mailto:KO'Neill@sfwater.org]
Sent: Monday, January 06, 2014 7:56 AM
To: Smith, Steve
Cc: Dakin, Robin
Subject: RE: MPM 026 - Sheep Camp Creek BHR Site Irrigation Line and Solar Panel

No agency review/approval/concurrence is required. The irrigation line that will be installed outside of the limits of Sheep Camp Creek will be installed in the roadway (developed habitat). The work that will be performed within the limits of Sheep Camp Creek (e.g., solar panel) will be performed in accordance with existing project permits.

From: Smith, Steve [mailto:steve.smith@sfgov.org]
Sent: Friday, January 03, 2014 4:12 PM
To: O'Neill, Kerry
Cc: Dakin, Robin
Subject: RE: MPM 026 - Sheep Camp Creek BHR Site Irrigation Line and Solar Panel

Hi Kerry – does this action require any resource agency review/approval/concurrence?

Steve

Steven H. Smith, AICP
Senior Environmental Planner

Planning Department|City and County of San Francisco
1650 Mission Street, Suite 400, San Francisco, CA 94103
Direct: 415-558-6373|Fax: 415-558-6409
Email: steve.smith@sfgov.org
Web: www.sfplanning.org

From: O'Neill, Kerry [mailto:KO'Neill@sfwater.org]
Sent: Friday, January 03, 2014 12:05 PM
To: Smith, Steve

Cc: Dakin, Robin
Subject: MPM 026 - Sheep Camp Creek BHR Site Irrigation Line and Solar Panel

Steve, attached is a Minor Project Modification request for installation of a buried irrigation line and solar panel at the Sheep Camp Creek Bioregional Habitat Restoration (BHR) site (aka Koopmann Road). The Sheep Camp Creek BHR site is addressed in the Calaveras Dam Replacement Project FEIR and identified as Koopmann Road in the FEIR.. If you have any questions please email me are call me on my cell phone at (415) 601-8578.

MINOR PROJECT MODIFICATION

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
WATER SYSTEM IMPROVEMENT PROGRAM

Minor Project Modification Number: 026 **Date:** January 3, 2014

Project Title: Calaveras Dam Replacement Project – Sheep Camp Creek BHR (aka Koopmann Road)

MEA Case No./Project No. No. 2006.0161E/CUW388.02

MPM Prepared By: Robin Dakin, Environmental Compliance Manager

MPM Triggered By: ☐ RFD ☐ PCO ☒ Other: SFPUC

Landowner: ☒ SFPUC ☐ Other:

Vegetative Cover/Land Use: Developed **Net Acreage Affected:** 0.02 acres

Modification From: ☐ Mitigation Measure: ☒ Other: EIR
☐ Permit:

Detailed Description of Minor Project Modification:

In order to provide water for cattle and plant irrigation at the Sheep Camp Creek BHR site (aka Koopmann Road), a new well site[1] has been identified on SFPUC property within the limits of Arroyo 2 Bioregional Habitat Site in Sunol, California. The proposed well site and irrigation line within the limits of Arroyo 2 will be addressed in a separate Minor Project Modification for Arroyo 2 which is associated with a separate Final Environmental Impact Report (i.e., EP Case Number 2005.0146E). The scope of this Minor Project Modification includes the installation of an irrigation line from the eastern boundary of the Arroyo de la Laguna site to the western boundary of the Sheep Camp Creek BHR (aka Koopman Road). The layout of the pipe will traverse from the Arroyo 2 boundary under the Pleasanton Sunol Road (see Attachments 1a and 1b). This will necessitate the closure of the southbound lane of Pleasanton Sunol Road for one night and the closure of the northbound lane for a second night. Continuing east, the buried pipe will follow the south shoulder of Koopmann Road and continue into the Sheep Camp Creek (aka Koopmann Road) project site, connecting with the site's water supply pipe system at the entrance to the site. Attachment 1 shows the proposed layout of the pipe. The trench will be 42 inches in depth, 18 inches wide. The estimated total length of the pipeline from Sunol-Pleasanton Road to the project's site entrance is 536 feet. Attachment 2 is a photograph of the developed habitat along the irrigation line alignment.

A 15-foot by 30-foot solar panel will supply power to the proposed well. The panel will be set at a 20-

[1] Note that construction of the well test bore hole was included in Minor Project Modification 001 for the Bay Division Pipeline Reliability Upgrade Project – Note to File No. 2 for Secondary Impacts of Mitigation- Arroyo de la Laguna Willow Riparian Scrub & Riparian Habitat Restoration (Arroyo 2 restoration area, or Arroyo 2) (EP Case Number 2005.0146E. Minor Project Modification 002 is currently being developed for installation of a well at the well test bore hole location and installation of a buried irrigation line between the proposed well and the eastern boundary of Arroyo 2).

degree angle on three 8-inch diameter cast-in-place steel poles to achieve a minimum ground clearance of 2 feet, and a maximum panel height of 12 feet. Attachment 1 shows the proposed location of the solar panel which will be approximately 600 feet east of Koopmann Road and located within the limits of Sheep Camp Creek (aka Koopmann Road). Attachment 3 is a photograph of the annual grassland habitat at the proposed location of the panel.

Attachments:

Attachment 1a – Alignment of trench for irrigation line at the shoulder of Koopmann Road

Attachment 1b - Alignment of trench for irrigation line and solar panel at Sheep Camp Creek (aka Koopmann Road) BHR site

Attachment 2 – Photo- Developed habitat within alignment of trench for irrigation line

Atttachment 3 - Proposed location for solar panel.

Attachment 4 – Cultural Resources Report for MPM - Irrigation Line, Koopman Road Intersection with Pleasanton-Sunol Road Approximately 600 feet West to Koopman Road West of I-680, Sunol, Alameda County (October 2013) prepared by Basin Research Assoc.

Attachment 5 - Biological Memorandum for an Off-site Irrigation Line for the Sheep Camp Creek BHR Project (aka Koopman Road) (November 2012) prepared by Robin Dakin

Attachments:			
Biological ☒ Yes ☐ No	**Cultural** ☒ Yes ☐ No	**Photos** ☒ Yes ☐ No	**Other** ☐ Yes ☒ No

Resources:

Biological ☐ No Resources Present ☒ Resources Present ☐ NA

Previous Biological Survey Report Reference: Biological Assessment San Francisco Public Utilities Commission 2010 Habitat Reserve Program Alameda Watershed, ICF International (2010)

Cultural ☒ No Resources Present ☐ Resources Present ☐ Within Project APE ☐ NA (no ground disturbance)

Previous Cultural Survey Report Reference: Historic Context and Archaeological/Architectural Survey Report for the Habitat Reserve Program, Alameda, San Mateo, Santa Clara, and Tuolumne Counties, California. Pacific Legacy (2002)

Conditions of Approval or Reasons for Denial

SFPUC Required Signatures for Environmental Approval:

ECCM: Kerry O'Neill Date: 1/3/14

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

SFPUC agrees that Contractor will abide by the mitigation measures detailed in the CEQA document and project permit requirements and have appropriate Specialty Environmental Monitors present where required.

Environmental Planning (EP) Required Signatures for Approval:

Signee: Steven H. Smith	Date:1/6/14
☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied	

CEQA SECTION	Applicable	(Y) Define Potential Impact or (N) Briefly Explain Why CEQA Section isn't Applicable
Geology, Soils and Seismicity	☒ Y ☐ N	No grading is required and only minor surface ground disturbance would occur for installation of the irrigation line in a shoulder adjacent to the roadway and for roadway crossings. For installation of the solar panel, restoration will include decompaction of topsoil (raking) to ensure that existing seedbank will germinate during rainy season. As a result, impacts would be consistent with those described in the EIR and would remain less than significant.
Hazardous Materials and Waste	☐ Y ☒ N	This modification would not result in any increase in hazardous materials and Waste over and above what was analyzed in the FEIR.
Hydrology	☒ Y ☐ N	This modification would result in a very minor increase in disturbance to surface soils (approximately 0.02 acre), so will not result in an increase in impacts to Hydrology. The Contractor would implement all appropriate best management practices to prevent sediment from leaving the work area per mitigation measure 5.7.1. As a result, impacts would be consistent with the EIR and would remain less than significant.
Cultural Resources	☒ Y ☐ N	The proposed work for the installation of the solar panel is in the Sheep Camp Creek APE. No cultural resources have been identified for the area to be impacted by installation of the irrigation line. See the attached Cultural Resources Report in Attachment 4. Any unexpected cultural or paleontological discoveries would be handled as per the mitigation monitoring and reporting program. There are no buildings in this area that could be historic. As a result, impacts would be consistent with the EIR and remain less than significant.
Traffic and Circulation	☒ Y ☐ N	This modification will not result in a short-term significant change in traffic and circulation patterns over and above what was analyzed in the FEIR. A project-specific traffic control plan will be developed to address changes in traffic that will result from lane closures needed to complete this work. As a result, impacts would be consistent with similar activities described in the EIR and would remain less than significant.
Air Quality	☒ Y ☐ N	This modification will not result in any change to air quality over and above what was analyzed in the FEIR. Minimal ground disturbance would occur in the proposed work area but would not be enough to generate significant dust that would impact air quality. Applicable fugitive dust mitigation measures recommended by the Bay Area Air Quality Management District and included in mitigation measure 5.13.1a will be implemented. As a result, use of this area would be consistent with similar uses described in the EIR and would remain less than significant.
Noise and Vibration	☐ Y ☒ N	This modification will not result in any change in noise and vibration over and above what was analyzed in the FEIR.
Visual Resources	☒ Y ☐ N	Construction activities related to installation of the irrigation line will be visible from Koopmann Road and Interstate 680. Work in the proposed area would not result in a substantial change to the visual setting, as work would be short-term and the disturbed area would be restored. The proposed solar panel will not be visible from Interstate 680, which is a designated scenic road. The project would not result in any significant changes to visual resources over and above what was analyzed in the FEIR.

Vegetation and Wildlife	☒ Y ☐ N	This modification will result in 0.02 acres of temporary impacts to developed habitat outside of the boundary to Sheep Camp Creek (aka Koopmann Road) and .00001 acres of permanent impacts to grassland habitat within the boundaries of Sheep Camp Creek. The habitat compensation activities at the Sheep Camp Creek site are intended to mitigate for impacts on special-status species and sensitive habitats. As such, the actions at the Sheep Camp Creek site will have a beneficial effect on biological resources. However, short-term construction activities related to trenching activities could have unintended impacts on special-status wildlife (see Attachment 5 biological resources report). Nevertheless, the habitat compensation actions at the Sheep Camp Creek site have been designed to avoid impacts on sensitive habitats and species, in addition applicable mitigation measures identified in the Project EIR (including Mitigation Measures 5.4.1a and 5.4.1b) and the Project's Biological Opinion (i.e., all ground squirrel burrows within the action area that could be used by aestivating California tiger salamander or California red-legged frogs will be flagged and avoided), will ensure that impacts on biological resources will not result in any new significant effects beyond those identified in the EIR.

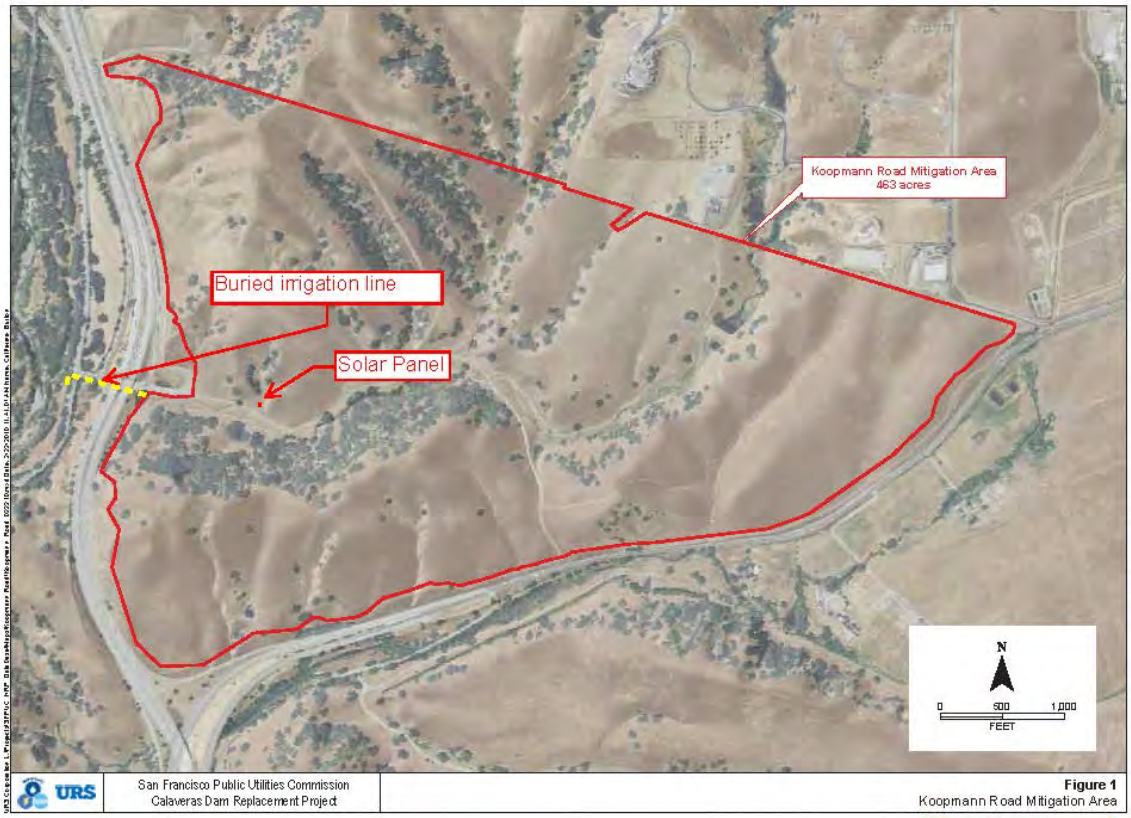
Attachment 1a. Alignment of trench for irrigation line at the shoulder of Koopmann Road

Proposed Trench and Solar Panel Locations

Map Date 11-7-13

0 150 300 600 Feet

Attachment 1b. Alignment of trench for irrigation line and solar panel at Sheep Camp Creek (aka Koopmann Road) BHR site



Attachment 2. Developed habitat within alignment of trench for irrigation line.

Attachment 3. Proposed location for solar panel.

Biological Memorandum for an Off-site Irrigation Line for the Sheep Camp Creek BHR Project (aka Koopmann Road)

November 12, 2012
Prepared by Robin Dakin, Avila Associates

Project Description

In order to provide water for cattle and plant irrigation at the Sheep Camp Creek BHR site (aka Koopmann Road), a new well site has been identified on SFPUC property adjacent to the Arroyo de la Laguna stream in Sunol, California. The site is located approximately 200 feet southwest of the intersection of Pleasanton Sunol Road and Koopmann Road in Sunol, CA – just west of the Sheep Camp Creek project site and Interstate 680. Figure 1 shows the location of the exploratory bore hole. The scope of this project will include the installation of irrigation line from the eastern boundary of the Arroyo de la Laguna site to the western boundary of the Sheep Camp Creek BHR. The irrigation between the proposed well and the eastern boundary of the Arroyo de la Laguna site is being discussed in the Bay Division Pipeline Reliability Upgrade Project – Note to File No. 2 for Secondary Impacts of Mitigation- Arroyo de la Laguna Willow Riparian Scrub & Riparian Habitat Restoration (Arroyo 2 restoration area, or Arroyo 2 MEA Case Number 2005.0146E).

To connect the well with the Sheep Camp Creek project site, a buried pipeline is proposed. The pipe will be installed in an open trench which will traverse Sunol Pleasanton Road then follow the south shoulder of Koopmann Road where it will connect with the existing water supply pipe system for the Sheep Camp Creek project. The trench will be 42 inches in depth, 18 inches wide. The estimated total length of the pipeline from Sunol-Pleasanton Road to the project's site entrance is 536 feet. Figure 1 shows the proposed layout of the pipe. Figure 2 is a photograph of the alignment.

A 15-foot by 30-foot solar panel will supply power to the developed well. The panel will be set at a 20-degree angle on three 8-inch diameter cast-in-place steel poles to achieve a minimum ground clearance of 2 feet, and a maximum panel height of 12 feet. The panel will be set approximately 600 feet east of the entrance gate at Koopmann Road. Figure 1 shows the proposed location of the solar panel. Figure 3 is a photograph of the location.

Habitats and Plant Species

The irrigation line will be placed in developed habitat through Sunol Pleasanton Road and at the shoulder of Koopmann Road. Immediately adjacent to Sunol Pleasanton and Koopmann Roads is oak woodland and annual grassland habitat. The trench will be offset as far as possible from the trunk of adjacent live oak trees to avoid impacts to the root system. The substrate in which the irrigation line will be excavated does not serve as habitat for any plant or animal species. The live oak trees are potentially suitable nesting and foraging habitat for migratory bird species. Where the trench will be excavated under Interstate 680, the freeway overpass is used as nesting habitat for a mixed colony

of white-throated swift, northern rough-winged swallows, and cliff swallows. Figure 4 shows the overpass and pylon habitat.

The solar panel will be set in annual grassland habitat. The exact location of the solar panel will be chosen so that poles upon which the panel will sit will avoid small mammal burrows.

Waters/Wetlands

The irrigation line and solar panels will not impact any waters or wetlands.

Project Impacts

Feature	Habitat	Acreage	Temporary/Permanent
Irrigation line.	Developed	0.02 acre	Temporary
Solar Panel	Annual Grassland	<0.0001 acre	Permanent

Migratory Birds and Raptors

Work is expected to be completed prior to February. If work is conducted past February 15, a preconstruction survey for nesting migratory birds will be conducted in accordance with Mitigation Measure Vegetation and Wildlife 5.4.1a . Pylons supporting the Interstate 680 overpass over Koopmann Road as well as the underside of the 680 overpass are used as nesting habitat by a mixed colony of white-throated swifts, northern rough-winged swallows and cliff swallows. The colony will not become active until late March or early April, when work is anticipated to be completed.

Trenching of the irrigation line will be done outside of the breeding season for raptors and will require no tree or shrub removal. There is no evidence of past nesting by raptors within a 200-foot radius of the proposed location. A temporary increase in the human presence will result, but the work is anticipated to be complete before the breeding season is underway.

Mammals

No impacts to special-status mammals are anticipated to result from this work. There is no habitat for special-status mammals in the alignment of the irrigation trench. The exact location of the solar panel that is within the work limits of Sheep Camp Creek (aka Koopmann Road) will be chosen to avoid small mammal burrows.

Protected Wildlife

California tiger salamander (CTS): The proposed solar panel location is within the limits of Sheep Camp Creek (aka Koopmann Road Mitigation site) and will disturb less than 0.0001 acres of migration and foraging habitat and no aestivation habitat for CTS. The migration and habitat for the California tiger salamander that will be permanently impacted represents a very small portion of the available undisturbed habitat. The work is anticipated to be completed outside of the rainy season when CTS are expected to be migrating from aestivation habitat to breeding ponds that occupy the site. There is no habitat for CTS within the alignment of the trench for the irrigation line.

California red-legged frog (CRLF): The annual grassland habitat in which the solar panel will be placed could potentially serve as an overland migration route, but the panel will have no impact on foraging or refuge habitat for CRLF. The project will permanently impact less than 0.0001 acres of potentially suitable migration habitat for CRLF. There is no habitat for CRLF within the alignment of the trench for the irrigation line.

Alameda whipsnake (AWS): Annual grassland habitat in the proposed solar panel location is marginally suitable foraging and migratory habitat for AWS. Project activities could potentially impact foraging and migratory habitat for AWS but the impact will affect a very small portion of the available habitat relative to that which will remain untouched.

Roosting and Foraging Bat Species: Annual grasslands, trees and man-made structures may be used as foraging and roosting habitat by pallid bat. Project activities will have no direct impacts to trees or structures but an increased human presence in the area may result in temporary (approximately one week) disturbance to areas immediately adjacent to roosting habitat. The project will not result in any impacts to foraging habitat.

Biological Surveys

Biological surveys were conducted in the proposed work areas on October 10, 2013 by agency-approved biologist Robin Dakin. No special-status species or evidence of their presence was found in the proposed work area during the biological surveys.

Mitigation Measures

Mitigation Measures Vegetation and Wildlife 5.4.1a and Water Quality 5.7.1 established under the project EIR will mitigate impacts to special-status wildlife species and adjacent wetlands and waters. In addition, a wildlife survey will be conducted immediately in advance of project implementation, and daily wildlife surveys will be conducted prior to ground-breaking activities in undisturbed areas.

Figure 1. Proposed location of Irrigation Line and Solar Panel

Figure 2. Alignment (looking east from the corner of Koopmann and Sunol-Pleasanton Roads) of irrigation line, falls within developed habitat that is part of the shoulder of Koopmann Road.

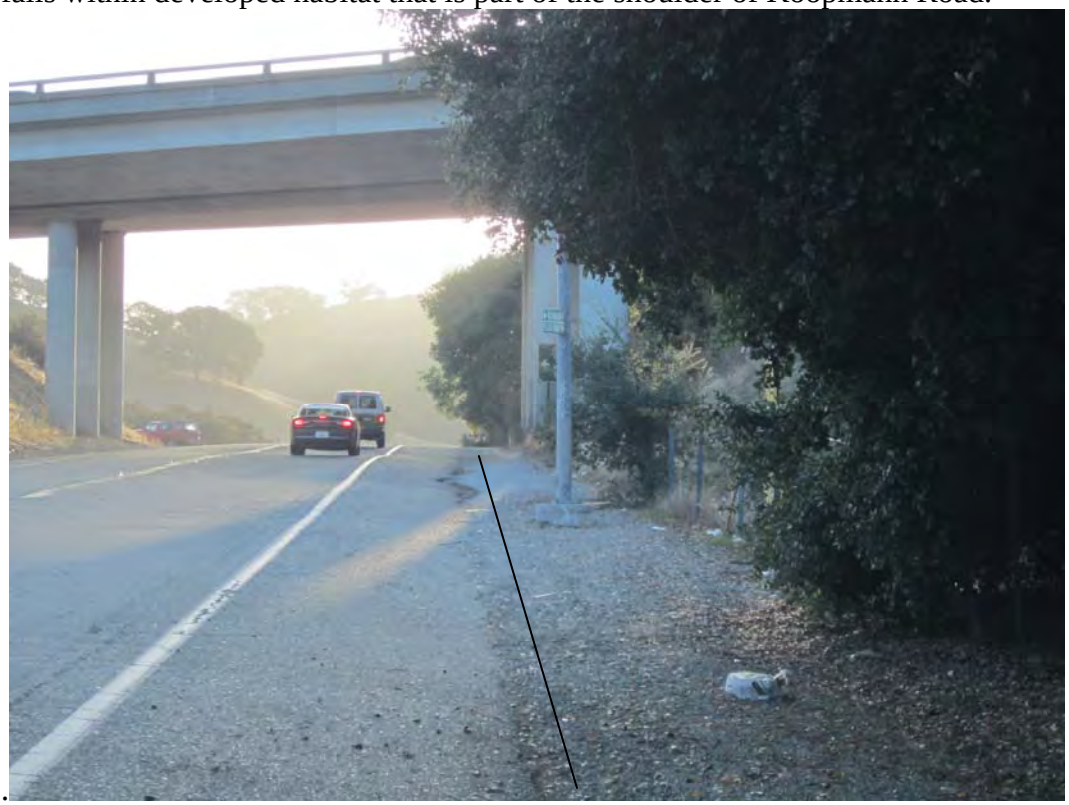


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Figure 3. Proposed location of solar panel.

Figure 4. Pylons and underpass used as nesting substrate by birds.

MINOR PROJECT MODIFICATION

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
WATER SYSTEM IMPROVEMENT PROGRAM

Minor Project Modification Number:	**027**		**Date: 6/4/2014**
Project Title:	**Calaveras Dam Replacement Project**		
EP Case No./Project No.	**2005.0161E/CUW37401**		
MPM Prepared By:	**Cullen Wilkerson-ECM/J.T. Mates-Muchin ECC**		
MPM Triggered By:	☐ RFD	☐ PCO	☒Other: Differing Site Condition
Landowner:	**SFPUC**		
Vegetative Cover/Land Use:	N/A	**Net Acreage Affected:** 0	
Modification to:	☐ Mitigation Measure:		X Other: FEIR Project Description
	☐ Permit:		

Detailed Description of Minor Project Modification:

The San Francisco Public Utilities Commission (SFPUC) is requesting a modification to the Calaveras Dam Replacement Project (CDRP) Project Description to accommodate the disposal of existing concrete from the spillway, bridge, and stilling basin into Disposal Site 3.

Page 3-37, 3. Project Description, Section 3.5.1.3 Excavation and Construction of the Spillway of the CDRP Final Environmental Impact Report (FEIR) states:
"The portion of the old spillway located upstream of the replacement dam footprint would be filled with about 86,000 cubic yards of material in the fourth year of construction to create an access road to the location of the new intake shaft (URS 2008c)."

The slide feature observed on the Left Abutment required removal of the upper spillway and bridge. As a result, the SFPUC is proposing to dispose of non-hazardous concrete (Spillway, Bridge, and Stilling Basin) in an upland area of Disposal Site 3. The volume of material requested for disposal is approximately 18,000 cubic yards. This amount does not exceed the maximum amount of material scheduled for Disposal Site 3 (2.48 million cubic yards) or the additional amount added as part of Addendum 1 to Disposal Site A/D (1.175 million cubic yards), which overlaps with Disposal Site 3.

The change in the project description will not require any new mitigation. The concrete for disposal is inert and the upland area identified for disposal does not contain groundwater features. The location is more than 1,000 linear feet from the reservoir high water mark (elevation 756') and approximately 100 vertical feet from elevation 756', which is the future inundation level of the reservoir. Title 22 metals testing and leachate test results show that the concrete material is not hazardous and will not leach from the concrete into groundwater. The Regional Water Quality Control Board approved the change in location of the concrete disposal (see Attachment A). Attachment B shows an aerial photo of the location of the concrete disposal area within Disposal Site 3 (DS3) and the original location of the spillway and bridge. Attachment C shows the locations of the sand finger drains installed in the

"engineered fill" to prevent water from infiltrating the disposal site and impacting the DS-3 structure. Attachment D shows the survey location of the concrete disposal area and the actual finger drains. Attachment E contains the test results from the Title 22 metals, and leachate tests. Attachment F has representative photographs.

ENVIRONMENTAL IMPACTS

There would be no impacts beyond those analyzed in the Calaveras Dam Replacement Project FEIR.

Attachments:

Attachment A - Regional Water Quality Control Board approval letter

Attachment B –Aerial Photo of Concrete location and original location of spillway and bridge disposal

Attachment C – Contract Drawings of DS-3

Attachment D – Survey of Concrete Disposal Location and Sand Filter Drain As-Built

Attachment E – Title 22 metal and Leachate Test Results

Attachment F – Representative photographs of Concrete

Biological ☐Yes ☒ No	**Cultural** ☐ Yes ☒ No	**Photos** ☒ Yes ☐ No	**Other** ☒ Yes ☐ No

Resources:

Biological ☐ No Resources Present ☐ Resources Present ☒ NA

Previous Biological Survey Report Reference:

N/A

Cultural ☐ No Resources Present ☐ Resources Present ☒ Within Project APE

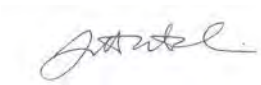
☐ NA (paved/graveled area and no ground disturbance)

Previous Cultural Survey Report Reference:

N/A

Conditions of Approval or Reasons for Denial

SFPUC Required Signatures for Environmental Approval:

ECCM:  for Kerry O'Neill Date: 06/10/14

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

SFPUC agrees that Contractor will abide by the mitigation measures detailed in the CEQA document and project permit requirements and have appropriate Specialty Environmental Monitors present where required.

Charge Code: CUW37401

EP Required Signatures for Approval:

Signee: Steven H. Smith (electronic) Date: 6/10/2014

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

CEQA SECTION	APPLICABLE	(Y) Define Potential Impact or (N) Briefly Explain Why CEQA Section isn't Applicable
Geology, Soils and Seismicity	☐ Y	There would be no new significant geology, soil or seismicity impacts beyond those analyzed in the FEIR.
	☒ N	
Hazardous Materials and Waste	☐ Y	The concrete has been tested (Attachment E) and has similar constituent elements as the native material because the original concrete used in the dam construction was sourced from onsite material. The cement was the only imported material. While the concrete has been broken apart and the rebar removed, the concrete is in large pieces which will minimize leaching (reduced surface area to volume ratio). Therefore, there would be no hazardous material or waste impacts beyond those identified in the FEIR.
	☒ N	
Hydrology	☐ Y	There would be no new significant hydrology or water quality impacts beyond those analyzed in the FEIR.
	☒ N	
Cultural Resources	☐ Y	There would be no new significant Cultural Resource impacts beyond those identified in the FEIR.
	☒ N	
Traffic and Circulation	☐ Y	In order to transport the material from the spillway to DS3, approximately 600 on-site, off-road heavy duty haul truck trips would be required. There would be no additional off-site, on-road hauling of concrete. Therefore, no new significant traffic and circulation impacts would occur beyond those identified in the FEIR.
	☒ N	
Air Quality	☐ Y	Material would be transported onsite from the spillway to Disposal Site 3. The additional onsite hauling will not conflict with or obstruct the implementation of the applicable air quality plan related to criteria air pollutant and ozone precursor emissions as analyzed in the FEIR and Addendum. Existing mitigation for on-site hauling including road capping and dust suppression with water trucks would be in effect. Therefore, there would be no new air quality impacts beyond those identified in the FEIR.
	☒ N	
Noise and Vibration	☐ Y	There would be no new noise and vibration impacts beyond those identified in the FEIR.
	☒ N	
Visual Resources	☐ Y	There will be no new visual resource impacts beyond those analyzed in the FEIR.
	☒ N	
Vegetation and Wildlife	☐ Y	There will be no new vegetation and wildlife impacts beyond those analyzed in the FEIR.
	☒ N	

Attachment A

May 30, 2014
Order No. R2-2011-0013
CIWQS Place ID 743933

Sent via electronic mail: No hard copy to follow

San Francisco Public Utilities Commission
525 Golden Gate Avenue
San Francisco, CA 94102
Attn.: Mr. JT Mates-Muchin
Email: JMates-Muchin@sfwater.org

Subject: Approval of Concrete Disposal at the Calaveras Dam Replacement Project Site, Alameda and Santa Clara Counties

Dear Mr. Mates-Muchin:

We have reviewed the results of the concrete sampling and analysis for the Calaveras Dam Replacement Project (Report). Approval is granted for the request to dispose of the concrete material onsite within engineered fill in Disposal Site 3 above the 756-foot elevation and in conformance with the description in the Report.

The Report was submitted to the San Francisco Bay Regional Water Quality Control Board (Water Board) on May 15, 2014, pursuant to Condition 25 of the Waste Discharge Requirements and Water Quality Certification for the Calaveras Dam Replacement Project (Order No. R2-2011-0013). The Report included a request to bury approximately 18,000 cubic yards of inert concrete remaining from the demolition of an onsite bridge and existing dam spillway. The concrete material will be disposed of approximately 30 to 40 feet beneath the land surface and approximately 75 to 100 feet above finger drains that were constructed to collect and convey groundwater.

The solid material was analyzed for the metals as listed in the California Code of Regulations, Title 22, Chapter 11, Article 3, and a synthetic precipitation leaching procedure (SPLP) was conducted on the samples to determine the potential for metals to leach from the materials when in contact with groundwater and rain water. The laboratory analytical results were compared to the San Francisco Bay Water Quality Control Plan water quality objectives, environmental screening levels, and the Title 22 total and soluble threshold limit concentrations. Of the analyzed parameters, barium, chromium, and vanadium were detected as a result of the SPLP, but concentrations

were less than the water quality objectives, screening levels, and threshold concentrations.

As a result, we have determined that the material is inert and it is therefore acceptable to bury the concrete within Disposal Site 3 above the 756-foot elevation. Any remaining visible rebar that is encountered during the concrete burial activities shall be removed.

Within 60 days of completing the disposal of the concrete and the placement of the engineered fill and topsoil cap, the San Francisco Public Utilities Commission shall submit a report that contains the following elements:

1. Narrative description of the disposal quantity and procedures; and

2. Figure(s)/area map(s) including plan view and cross-section design plans that depict the disposal area, engineered fill and cap, and the ground elevation contours.

Any substantive change to the information provided in the Report must be submitted to the Water Board and receive written approval before the changes are implemented.

If you have any questions, please contact Melissa Gunter at (510) 622-2390 or by e-mail at megunter@waterboards.ca.gov.

Sincerely,

Bruce Wolfe
Executive Officer

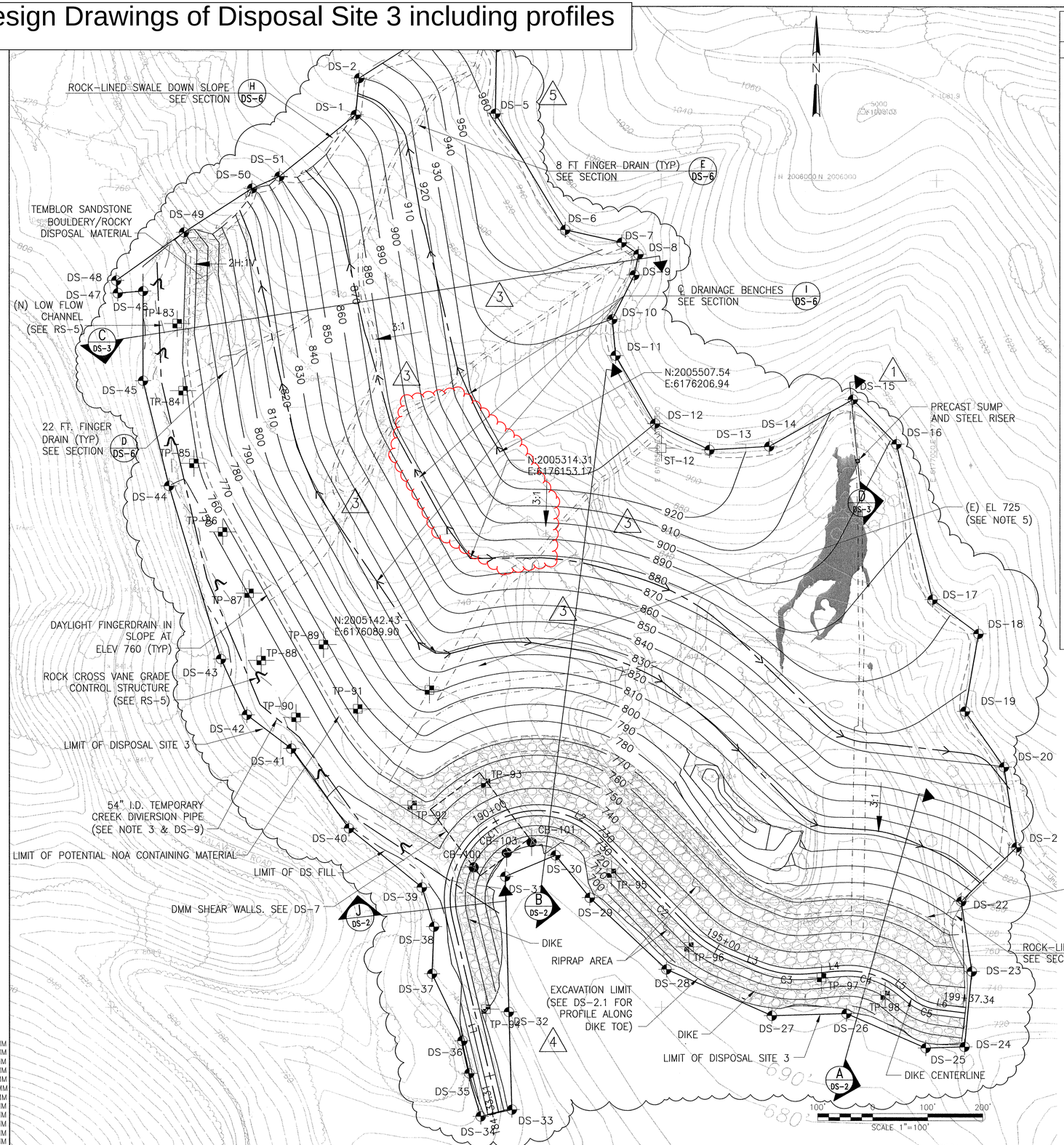
Cc: SFPUC: Kerry O'Neill, KONeill@sfwater.org
Cullen Wilkerson, CWilkerson@sfwater.org

Attachment B


Disposal Site 3 (DS3) and Spillway
Proposed concrete disposal area at DS3
location of demolished spillway and bridge

Attachment C

Design Drawings of Disposal Site 3 including profiles



DISPOSAL SITE 3 POINT BOUNDARY TABLE		
POINT I.D.	NORTHING	EASTING
DS-1	2006117.374	6175945.200
DS-2	2006183.555	6175951.584
DS-3	2006278.221	6176100.748
DS-4	2006240.249	6176200.748
DS-5	2006120.383	6176198.846
DS-6	2005910.173	6176325.487
DS-7	2005887.167	6176428.028
DS-8	2005865.848	6176458.492
DS-9	2005828.321	6176451.062
DS-10	2005748.516	6176410.910
DS-11	2005682.615	6176416.831
DS-12	2005559.261	6176488.502
DS-13	2005511.240	6176586.949
DS-14	2005517.840	6176695.546
DS-15	2005603.436	6176847.542
DS-16	2005522.323	6176926.740
DS-17	2005240.556	6176992.396
DS-18	2005178.332	6177075.711
DS-19	2005037.785	6177051.192
DS-20	2004936.741	6177121.925
DS-21	2004790.965	6177144.572
DS-22	2004692.809	6177044.138
DS-23	2004565.971	6177063.247
DS-24	2004429.053	6177049.907
DS-25	2004426.764	6176979.539
DS-26	2004489.467	6176835.461
DS-27	2004485.182	6176699.895
DS-28	2004569.209	6176508.760
DS-29	2004699.049	6176369.661
DS-30	2004775.983	6176307.520
DS-31	2004737.411	6176216.216
DS-32	2004492.044	6176222.621
DS-33	2004315.191	6176228.014
DS-34	2004302.814	6176171.491
DS-35	2004359.918	6176153.970
DS-36	2004459.617	6176131.976
DS-37	2004561.114	6176083.191
DS-38	2004646.179	6176086.855
DS-39	2004717.381	6176064.948
DS-40	2004824.011	6175932.593
DS-41	2004968.818	6175828.180
DS-42	2005029.943	6175747.536
DS-43	2005130.861	6175700.508
DS-44	2005445.094	6175606.180
DS-45	2005635.687	6175558.989
DS-46	2005797.924	6175559.132
DS-47	2005794.321	6175513.071
DS-48	2005817.177	6175510.307
DS-49	2005903.872	6175633.490
DS-50	2005983.629	6175757.288
DS-51	2006005.574	6175807.102

NOTES:

1. STRIPPING DEPTH IN DRAINAGE BOTTOM AND EXCAVATION SURFACE UNDER ROCKFILL RETENTION DIKE SHALL BE DETERMINED BASED ON DATA FROM EXPLORATION BORINGS DRILLED AND TEST PITS EXCAVATED BY OTHERS PRIOR TO NTP. LOCATIONS OF NEW BORINGS AND DEPTHS ARE APPROXIMATE.
2. FINAL GRADE OF DISPOSAL AREA WILL BE ADJUSTED IN THE FIELD BY THE CITY REPRESENTATIVE BASED ON QUANTITIES OF MATERIALS DISPOSED. CONTOURS ARE SHOWN ONLY TO INDICATE INTENT OF SHAPING OF FINAL SURFACE.
3. PROVIDE DIVERSION OF STREAM DURING CONSTRUCTION OF DISPOSAL SITE 3 IN ACCORDANCE WITH SECTION 02210.
4. COORDINATE FOR RELOCATION OF AIR MONITORING STATION WITH CITY REPRESENTATIVE. CITY REPRESENTATIVE WILL RELOCATE STATION.
5. STOCKPILE TOPSOIL STRIPPED BELOW EL. 725 SEPARATELY FROM OTHER TOPSOIL AND REUSE ON DISPOSAL SITE ABOVE EL. 800.

LEGEND:

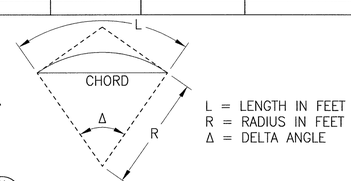
- CB-100 — NEW CORE BORING
- ST-12 — AIR MONITORING STATION
- TP-83 — TEST PITS
- DS-23 — BOUNDARY POINTS
- WETLAND

DISPOSAL SITE 3 CORE BORING AND TEST PIT SCHEDULE (N.I.C. – BY OTHERS PRIOR TO NTP)			
POINT I.D.	NORTHING	EASTING	DEPTH
CB-100	2004765.796	6176160.552	40
CB-101	2004826.605	6176276.507	40
TP-83	2005738.807	6175621.015	15*
TP-84	2005617.507	6175631.783	15*
TP-85	2005485.708	6175651.362	15*
TP-86	2005361.475	6175703.605	15*
TP-87	2005250.545	6175751.469	15*
TP-88	2005128.364	6175773.712	15*
TP-89	2005157.532	6175886.529	15*
TP-90	2005025.305	6175836.928	15*
TP-91	2005040.862	6175948.771	15*
TP-92	2004866.175	6176047.467	15*
TP-93	2004906.687	6176180.827	15*
TP-94	2004497.018	6176180.827	15*
TP-95	2004743.384	6176409.157	15*
TP-96	2004609.956	6176549.327	15*
TP-97	2004554.922	6176790.125	15*
TP-98	2004522.688	6176905.715	15*

* OR 2 FEET INTO ROCK, WHICH EVER IS LESS.

DISPOSAL SITE 3 DIKE ALIGNMENT TABLE

TAG#	DELTA ANGLE (d)	RADIUS	LENGTH	DIRECTION	START STATION	END STATION	CHORD LENGTH	PI POINT	
								NORTHING	EASTING
L1			358.39'	N13° 25' 22"W	184+33.31'	187+91.71'			
C1	149.13	160.00'	416.45'		187+91.71'	192+08.16'	308.460'	2005223.61	6175986.07
L2			232.79'	S44° 17' 29"E	192+08.16'	194+40.95'			
C2	23.57	200.00'	82.28'		194+40.95'	195+23.24'	81.707'	2004612.28	6176582.45
L3			56.26'	S67° 51' 52"E	195+23.24'	195+79.50'			
C3	27.16	200.00'	94.82'		195+79.50'	196+74.32'	93.938'	2004557.15	6176717.99
L4			58.89'	N84° 58' 14"E	196+74.32'	197+33.22'			
C4	44.28	150.00'	115.93'		197+33.22'	198+49.15'	113.069'	2004571.90	6176885.59
L5			23.60'	S50° 44' 46"E	198+49.15'	198+72.76'			
C5	32.28	100.00'	56.34'		198+72.76'	199+29.10'	55.599'	2004500.03	6176973.54
L6			49.21'	S83° 01' 39"E	199+29.10'	199+78.32'			



L = LENGTH IN FEET
R = RADIUS IN FEET
Δ = DELTA ANGLE

CURVE DEFINITION

ELEVATION DATUM NGVD29

CONTRACT NO. WD-2551

URS
1333 BROADWAY, SUITE 800
OAKLAND, CA 94612
PHONE: (510) 893-3600

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
INFRASTRUCTURE DIVISION
ENGINEERING MANAGEMENT BUREAU

CALAVERAS DAM REPLACEMENT PROJECT

DISPOSAL SITE 3
PLAN AND SECTIONS

XXXXXX | DRAWN N. HUTTON
XXX | DESIGNED D. BANKS
XXX XXXX | CHECKED J. ROADIFER/M. FORREST

CIVIL	ELECT.	MECH.	PIPING	GEOTECH.

NO.	DATE	DESCRIPTION	BY	APPR'D
5	5/16/12	PCO NO. 015	JWR	MPF
4	12/20/11	PCO NO. 003	JWR	MPF
3	11/17/11	REVISED DRAINAGE BENCH, RFI-51	JWR	MPF
2	10/17/11	PCO NO. 003	JWR	MPF
1	3/16/11	ADDENDUM NO. 5	JWR	MPF

REVISIONS

REGISTERED PROFESSIONAL ENGINEER No. 27855 CIVIL STATE OF CALIFORNIA 6/4/12

CHECKED / APPROVED | DRAWN | SCALE AS SHOWN
SECTION MANAGER | DESIGNED | DATE
APPROVED | APPROVED
MANAGER, ENGINEERING MANAGEMENT BUREAU | MANAGER, WATER SUPPLY AND TREATMENT DIVISION

SHEET — OF | PLAN NO. DS-1 | DRAWING NO. E-22025 | REVISION NO. 5

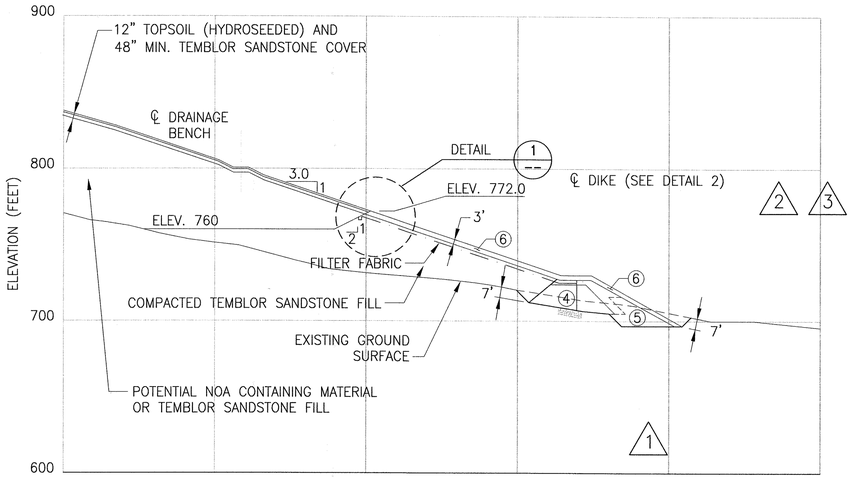
ARCH.	CIVIL	ELECT.	MECH	PIPING	STRUC.	OTHERS

PLOT: EXTEND
SCALE: 1:1
BORDER: 2025

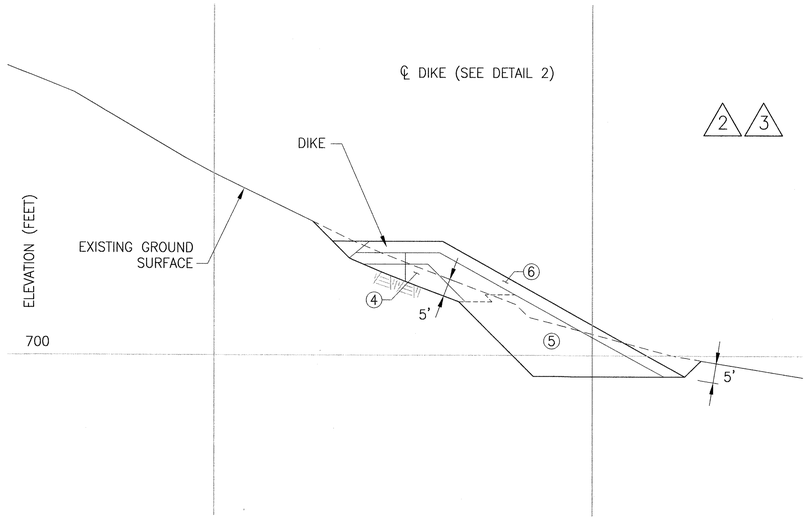
COLOR:	No.
RED	0.70MM
YELLOW	0.20MM
GREEN	0.25MM
CYAN	0.40MM
BLUE	0.50MM
MAGENTA	0.20MM
WHITE	0.35MM
GRAY	0.15MM
9	0.15MM
10	1.00MM
11	0.70MM
12	0.60MM
100	0.70MM
210	0.60MM

FILE: P:\24B – CADD\Sheets\DS-1 R5.dwg May 25, 2012 – 4:22pm

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 4



SECTION A
SCALE 1"=50'
DS-1

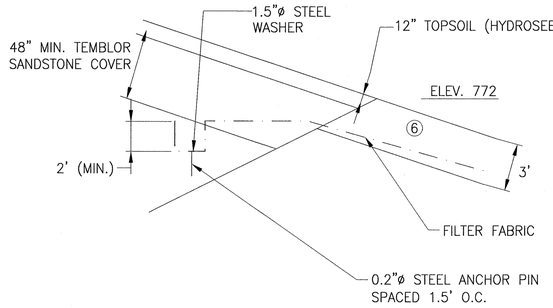


SECTION J
SCALE 1"=20'
DS-1

NOTE:

1. ZONE 5 AT THIS LOCATION SHALL HAVE A MAXIMUM PARTICLE SIZE OF 12 INCHES.
2. WHERE DIKE TOE IS BELOW WATER LEVEL, EXCAVATE TO ELEVATION 698. (W.S. AT ELEVATION 700.)

2



FILTER FABRIC KEY-IN DETAIL 1
NTS
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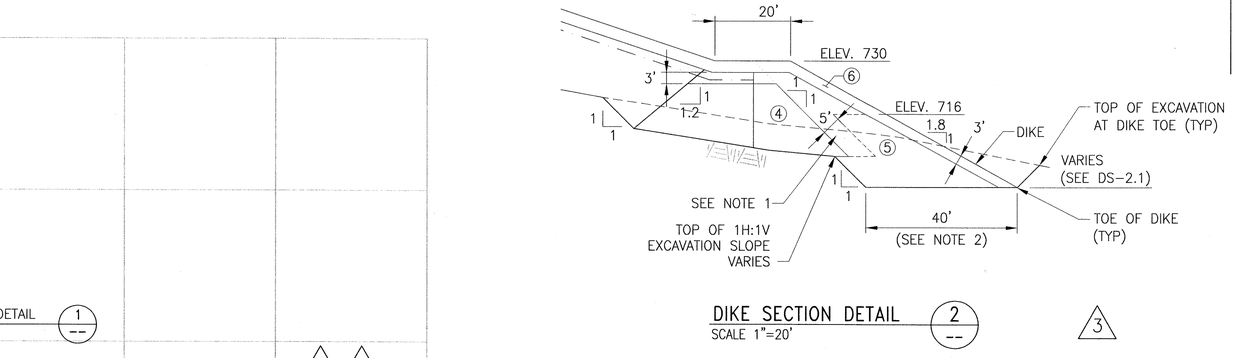
SECTION B
SCALE 1"=50'
DS-1



DIKE SECTION DETAIL 2
SCALE 1"=20'
--

3

20' 0 20' 40'
SCALE 1"=20'

50' 0 50' 100'
SCALE 1"=50'

ELEVATION DATUM
NGVD29

DS-6

REGISTERED PROFESSIONAL ENGINEER
MICHAEL PAUL FORREST
No. 27855
CIVIL
STATE OF CALIFORNIA
6/4/12

CONTRACT NO. WD–2551

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
INFRASTRUCTURE DIVISION
ENGINEERING MANAGEMENT BUREAU

CALAVERAS DAM REPLACEMENT PROJECT

DISPOSAL SITE 3
SECTIONS AND DETAILS 3
SHEET 1 OF 3

URS
1333 BROADWAY, SUITE 800
OAKLAND, CA 94612
PHONE: (510) 893-3600

XXXXXX		DRAWN	N. HUTTON
XXX		DESIGNED	D. BANKS
XXX XXXX		CHECKED	J. ROADIFER/M. FORREST
CIVIL	ELECT.	MECH.	PIPING / GEOTECH.

NO.	DATE	DESCRIPTION	BY	APPR'D
4	5/16/12	PCO NO. 015		
3	12/8/11	PCO NO. 003	JWR	MPF
2	10/17/11	PCO NO. 003	JWR	MPF
1	2/11/11	ADDENDUM NO. 1	JWR	MPF

REVISIONS

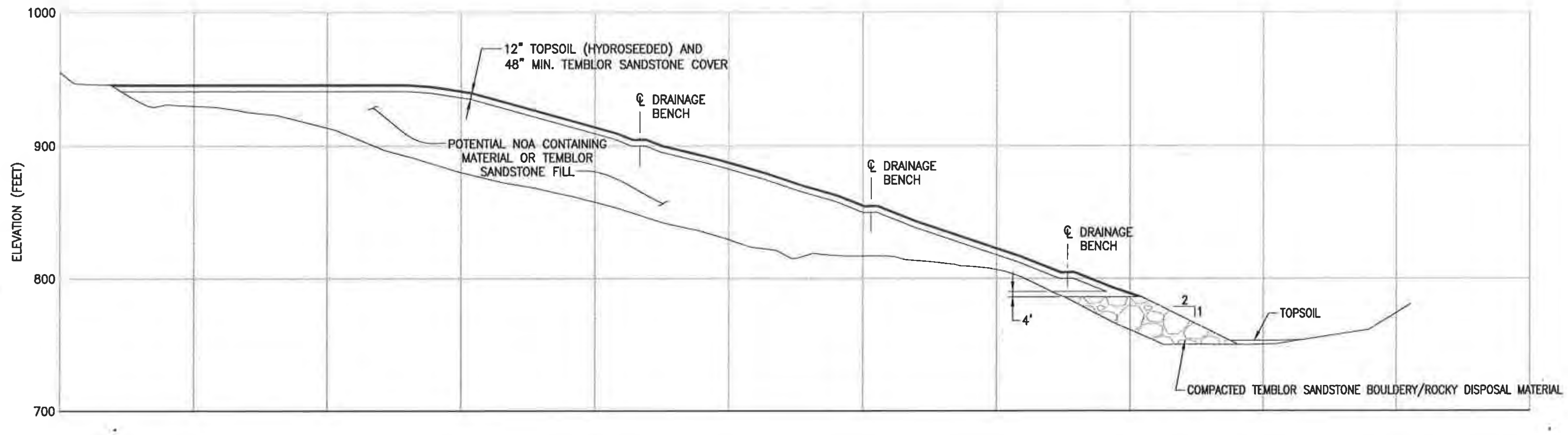
CHECKED / APPROVED		DRAWN	SCALE AS SHOWN
SECTION MANAGER		DESIGNED	DATE
APPROVED		APPROVED	
MANAGER, ENGINEERING MANAGEMENT BUREAU		MANAGER, WATER SUPPLY AND TREATMENT DIVISION	

SHEET	PLAN NO.	DRAWING NO.	REVISION NO.
— OF	DS-2	E-22026	4

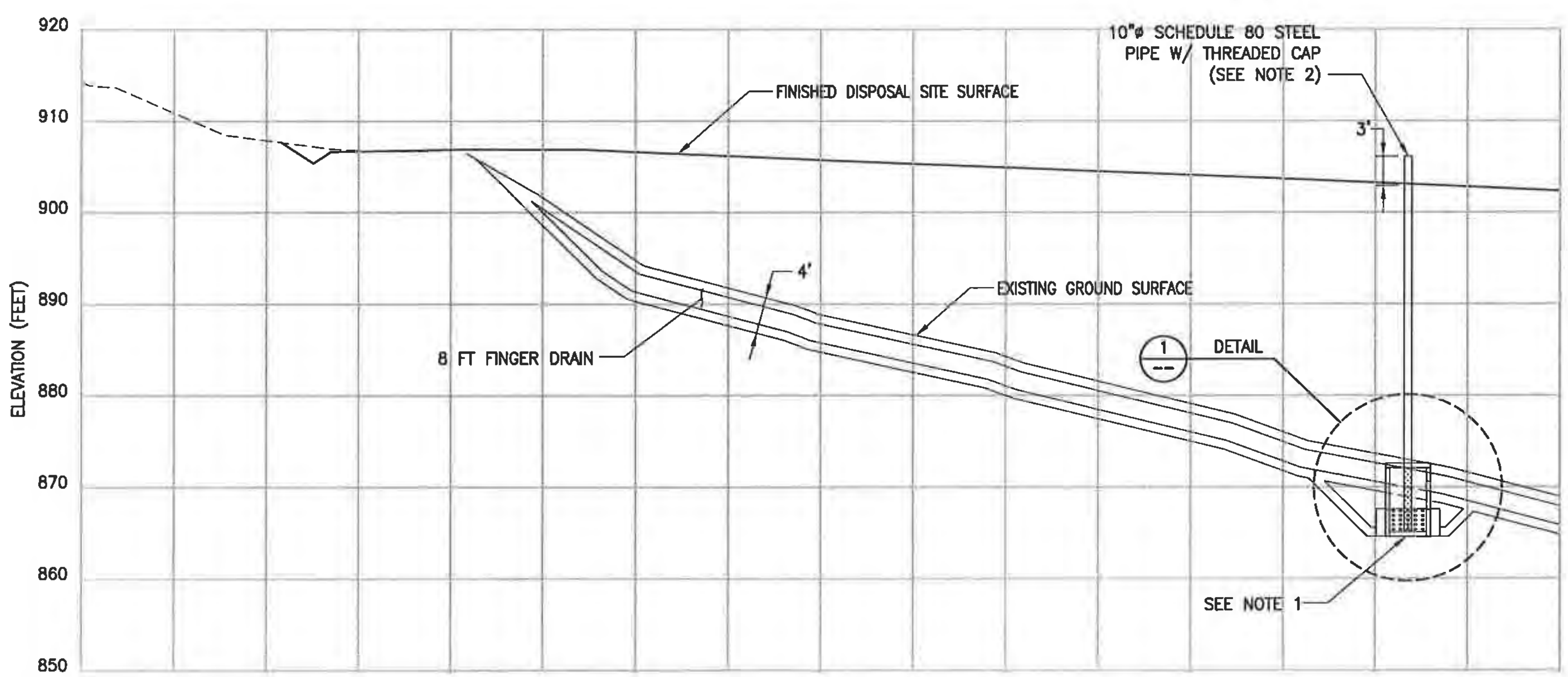
ARCH.	CIVIL	ELECT.	MECH.	PIPING	STRUC.	OTHERS

PLOT: EXTEND
SCALE: 1:1
BORDER: 22,34
COLOR: No.
RED 0.70MM
YELLOW 0.20MM
GREEN 0.25MM
CYAN 0.40MM
BLUE 0.50MM
MAGENTA 0.20MM
WHITE 0.35MM
GRAY 0.15MM
9 0.15MM
10 1.00MM
11 0.70MM
12 0.60MM
100 0.70MM
210 0.60MM FILE: P:\24B – CADD\Sheets\DS-2 R4.dwg May 25, 2012 – 4:19pm

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 4



SECTION C DS-1
SCALE 1"=50'

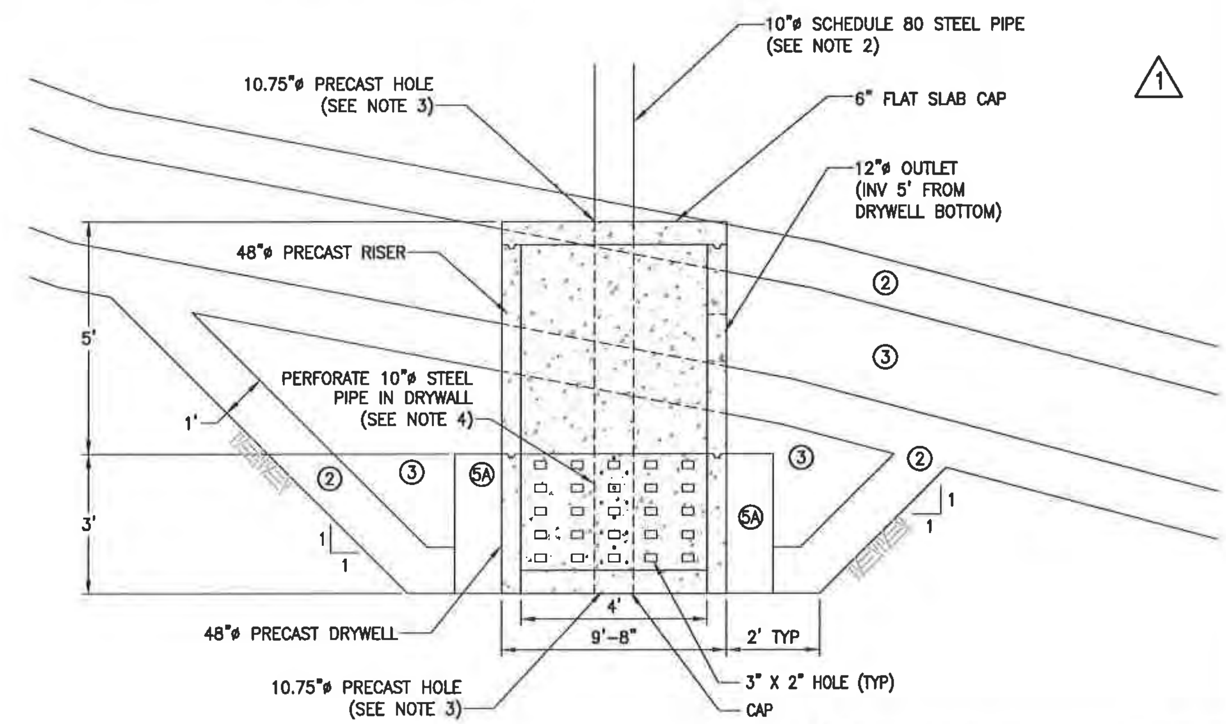


PRECAST SUMP AND STEEL RISER D DS-1
SCALE 1"=10'

△1

NOTES: △1

1. EXCAVATE AREA OF SPRING AND PLACE PRECAST SUMP NEAR SPRING. LOCATION OF PRECAST SUMP TO BE FIELD ADJUSTED BY CITY REPRESENTATIVE.
2. EXTEND 10"ø SCHEDULE 80 STEEL PIPE IN 5' SECTIONS TO DISPOSAL SITE SURFACE AS MATERIAL IS PLACED IN DISPOSAL SITE.
3. SEAL SCHEDULE 80 STEEL PIPE TO PRECAST RISER AND DRYWELL WITH JOINT SEALANT PER SECTION 02726.
4. PROVIDE 8 PERFORATIONS FOR EVERY 6 INCHES OF PIPE WITHIN PRECAST DRYWELL PORTION OF SUMP. PERFORATIONS SHALL BE 1/2"ø AND SHALL BE EQUALLY SPACED AROUND THE PIPE.



DETAIL 1
SCALE 1/2"=1'

FOR THE SOLE USE OF THE DOCUMENT RECIPIENT – DO NOT CITE, COPY, OR CIRCULATE WITHOUT THE EXPRESSED PERMISSION OF THE SFPUC.

50' 0 50' 100'
SCALE 1"=50'
10' 0 10' 20'
SCALE 1"=10'

ELEVATION DATUM NGVD29

PLOT: EXTEND
SCALE: 1:1
BORDER: 22,34
COLOR: No.
RED 0.70MM
YELLOW 0.20MM
GREEN 0.25MM
CYAN 0.40MM
BLUE 0.50MM
MAGENTA 0.20MM
WHITE 0.35MM
GRAY 0.15MM
9 0.15MM
10 1.00MM
11 0.70MM
12 0.60MM
100 0.70MM
210 0.60MM FILE: \\S021emc2\calaverasdam\CADD\Sheets\Disposal Site 3 Mod 0911\DS-3.dwg Dec 08, 2011 - 1:10pm

FOR REDUCED PLANS ORIGINAL SCALE IS IN INCHES 0 1 4

URS
1333 BROADWAY, SUITE 800
OAKLAND, CA 94612
PHONE: (510) 893-3600

DRAWN E. HULBERT
DESIGNED V. CHIO
CHECKED J. ROADIFER/M. FORREST

NO.	DATE	DESCRIPTION	BY	APP'D
△2	12/8/11	PCO NO. 003		
△1	3/16/11	ADDENDUM NO. 5	JWR	MPF

REVISIONS

CONTRACT NO. WD-2551

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION
INFRASTRUCTURE DIVISION
ENGINEERING MANAGEMENT BUREAU

CALAVERAS DAM REPLACEMENT PROJECT

DISPOSAL SITE 3
SECTIONS AND DETAILS
SHEET 3 OF 3 △2

SCALE AS SHOWN
PLAN NO. DS-3
DRAWING NO. E-22027
REVISION NO. △2

Attachment D

Concrete and Finger drain elevations

FINGERDRAIN = 802

TOP OF STOCKPILE
= 875 - 885

FINGERDRAIN = 785

CONCRETE STOCK PILE
05-08-2014

N:2005545.36
E:6176830.99
Z:881.1

N:2005501.32
E:6176828.52
Z:875.9

N:2005500.31
E:6176829.84
Z:970.0

N:2005481.39
E:6176844.16
Z:869.1

N

0 100 200 300

DRAGADOS USA | FLATIRON | SUKUT CONSTRUCTION, INC. a joint venture

DFS-JV

CONCRETE STOCK PILE
DS-3 05-08-2014

1:100 | 05-08-2014 | SHEET__ OF __

C:\DRP1\Drawings\Models\Excavation\Topo\Topo BA-B StockPile_2014-05-02.dwg, 11x17

Attachment E


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 256425
ANALYTICAL REPORT

Black & Veatch	Project : 168784.3333
2999 Oak Road	Location : CDRP (Calaveras Dam Replacement)
Walnut Creek, CA 94597	Level : II

Sample ID	Lab ID
BR-N	256425-001
BR-S	256425-002
SP-N	256425-003
SP-S	256425-004

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 05/14/2014

Mike J. Dahlquist
Project Manager
mike.dahlquist@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**256425**
Client:	**Black & Veatch**
Project:	**168784.3333**
Location:	**CDRP (Calaveras Dam Replacement)**
Request Date:	**05/06/14**
Samples Received:	**05/06/14**

This data package contains sample and QC results for four soil samples, requested for the above referenced project on 05/06/14. The samples were received cold and intact.

Metals (EPA 6010B and EPA 7471A) Soil:
No analytical problems were encountered.

Metals (EPA 6010B and EPA 7470A) SPLP Leachate:
No analytical problems were encountered.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510)486-0900 Phone
(510)486-0532 Fax

CHAIN OF CUSTODY

Chain of Custody # : _____

C&T LOGIN # 256425

Project No:

Project Name: Calaveras Dam Replacement Project

EDD Format: _____ **Rpt Level:** ☐ II ☐ III ☐ IV

Turnaround Time: x RUSH _next day____ ☐ Standard

Sampler: Gabe Fuson

Report To: Bradley Erskine

Company : Kleinfelder

Telephone: 707-738-4917

Email: berskine@kleinfelder.com

Lab No.	Sample ID.	Sampling		Matrix					Chemical Preservative					Analytical Request	
		Date	Time	Water	Soil			# of Containers	HCl	H_2SO_4	HNO_3	NaOH	None	Title 22 metals	SPLP
1	BR-N	4/23/2014			x			1					x	x	x
2	BR-S	4/24/2014			x			1					x	x	x
3	SP-N	4/25/2014			x			1					x	x	x
4	SP-S	4/26/2014			x			1					x	x	x

Notes:

Concrete samples to arrive from ATEM Labs. Please see email from Bradley Erskine dated 5/6/14.

SAMPLE RECEIPT

☐ Intact ☐ Cold

☐ On Ice ☐ Ambient

RELINQUISHED BY:

Bradley G. Erskine DATE/TIME

DATE/TIME

DATE/TIME

RECEIVED BY:

5/6/14 1130 DATE/TIME

DATE/TIME

DATE/TIME

256425

ASBESTOS TEM LABORATORIES CHAIN OF CUSTODY – www.asbestostemlabs.com

CALIFORNIA: 630 Bancroft Way, Berkeley, CA 94710 Phone (510) 704-8930 Fax (510) 704-8429
NEVADA: 1350 Freeport Blvd. #104, Sparks, NV 89431 Phone (775) 359-3377 Fax (775) 359-2798

Company: Black & Veatch	Contact: Bradley Erskine	Phone/Fax:	Email: berskine@kleinfelder.com
Address: 12750 Calaveras Rd.	City: Fremont	State: CA Zip: 94539	Country: USA
Job Site: CDRP		Job No: 168784.3333	P.O. No:

Reporting	☐ Fax	☐ Phone	☑ Email	☐ Mail	☐ FTP	☐ EDD/State Form	☐ Verbal	☐ Pickup	**Billing**	☐ Fax	☐ Email	☐ Mail	☐ Pre-Paid	☐ 3rd Party	
Results Due:*	☐ 2 hr	☐ 4 hr	☐ 6 hr	☐ 8 hr	☐ 24 hr	☑ 48 hr	☐ 3 day	☐ 4 day	☐ 5 day	☐ 10 day	☐ Time due:____	* Contact lab to confirm TAT			
Asbestos Air	☐ PCM (NIOSH 7400A	☐ TEM AHERA	☐ TEM CARB Mod. AHERA	☐ TEM EPA Yamate Level	☐ TEM NIOSH 7402, Issue 2	☐ ISO 10312	☐ ISO 13794								
Asbestos Bulk	☐ PLM Standard (EPA 600/R-93-1	☐ PLM 400 PC	☐ PLM 1000 PC	☐ PLM 400 PC Grav. Red.	☐ PLM 1000 PC Grav. Red.	☐ TEM EPA Qualitative	☐ TEM EPA Quantitatve								
	☐ TEM Chatfield (Semi-Quant)	☐ PLM Vermiculite Attic Insulation	☐ Custom Analysis: Type:												
Asbestos Soils	☐ CARB 435 Prep Only	☐ CARB 435 PLM 400 PC	☐ CARB 435 PLM 1000 PC	☐ EPA Soil Screening Qualitative	☐ TEM EPA/CARB Quantitative										
Asbestos Dust	☐ ASTM D-5755 Fiber Count	☐ ASTM D-5756 Wt. %	☐ ASTM D-5756 Mass	☐ ASTM D-6840-99 Dust Wipe	☐ Total Particulates (Grav.) *										
Asbestos Water	☐ 100.2 Potable Drinking Water	☐ 100.1 Non Potable Water													
Lead	☐ Paint Chips	☐ Dust Wipe	☐ Air Cassette	☐ Soil	Lead Waste Characterization:	☐ TTLC	☐ STLC	☐ TCLP							
Sample Storage	*☐ No Test, Hold Sample Until: _____	*☐ Post Test, Hold Sample Until: _____													
Custom Order	☐ Reanalysis by: _____	☐ Sensitivity: _____	☑ Composite	☑ Other:											

Sample #	Sample Type	Date Collected	Time On	Time Off	Total Time (min)	Flow Rate (lpm) On	Flow Rate (lpm) Off	Flow Rate (lpm) Average	Volume or Area Sampled	8 Hour TWA Requested	Description
BR-N		4/23/14	Please composite the 5 pieces in this sample.							☐	northern portion of bridge concrete rockpile, DS 3.
BR-S			Please composite the 5 pieces in this sample.							☐	southern portion of bridge concrete rockpile, DS 3.
SP-S			Please composite the 5 pieces in this sample.							☐	southern portion of spillway concrete rockpile, DS 3.
SP-N			Please composite the 5 pieces in this sample.							☐	northern portion of spillway concrete rockpile, DS 3.
										☐	
										☐	☆ Please analyze by CARB-435 TEM AHERA.
										☐	Analyze regulated asbestos only as specified
										☐	in EPA and Cal/OSHA regulations.
										☐	
										☐	
										☐	
										☐	
										☐	
										☐	

CCF 4/23/14

Submitted By	BRADLEY ERSKINE	Received By	
Date/Time Submitted	4/24/14	Date/Time Received	
Submitted By	ATEM DRT	Received By	Pat Hanby
Date/Time Submitted	5/6/14 11:10 AM	Date/Time Received	5/6/14 11:10 AM

*All samples will be held for 3 months from the date of receipt at ATEM. Additional sample storage time may be obtained through ATEM Customer Service

PLEASE RUN BOTH PLM & TEM
Per ATEM
04-24-14 P03:46 IN

PLEASE SCRUB/CLEAN SAMPLES w/ Fiber-free WATER

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 256425 Date Received 5/6/14 Number of coolers 0
Client B&V Project Calaveras Dam Replacement Project

Date Opened 5/6/14 By (print) MT (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc)_____ YES (NO)
   Shipping info_____

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
   How many _____ Name_____ Date_____
2B. Were custody seals intact upon arrival? _____ YES NO (N/A)
3. Were custody papers dry and intact when received?_____ (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form)___ (YES) NO
6. Indicate the packing in cooler: (if other, describe)_____

☐ Bubble Wrap ☐ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☐ Wet ☐ Blue/Gel ☒ None Temp(°C)_____

☐ Samples received on ice & cold without a temperature blank; temp taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present?_____ YES (NO)
   If YES, what time were they transferred to freezer?_____
9. Did all bottles arrive unbroken/unopened?_____ (YES) NO
10. Are there any missing / extra samples? _____ YES (NO)
11. Are samples in the appropriate containers for indicated tests? _____ (YES) NO
12. Are sample labels present, in good condition and complete? _____ (YES) NO
13. Do the sample labels agree with custody papers? _____ (YES) NO
14. Was sufficient amount of sample sent for tests requested? _____ (YES) NO
15. Are the samples appropriately preserved? _____ YES NO (N/A)
16. Did you check preservatives for all bottles for each sample? _____ YES NO (N/A)
17. Did you document your preservative check? _____ YES NO (N/A)
18. Did you change the hold time in LIMS for unpreserved VOAs? _____ YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? _____ YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? _____ YES NO (N/A)
21. Was the client contacted concerning this sample delivery? _____ YES (NO)
   If YES, Who was called?_____ By_____ Date:_____

COMMENTS

_____
_____
_____
_____
_____
_____

Rev 10, 10/11

Curtis & Tompkins, Ltd.

Detections Summary for 256425

Client : Black & Veatch
Project : 168784.3333
Location : CDRP (Calaveras Dam Replacement)

Client Sample ID : BR-N Laboratory Sample ID : 256425-001

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	4.2		0.27	0.078	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	180		0.27	0.058	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Beryllium	0.37		0.11	0.013	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cadmium	0.83		0.27	0.027	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Chromium	280		0.27	0.068	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cobalt	12		0.27	0.032	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Copper	33		0.27	0.090	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Lead	3.1		0.27	0.075	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Mercury	0.024		0.016	0.0011	mg/Kg	As Recd	1.000	EPA 7471A	METHOD
Molybdenum	9.1		0.27	0.053	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Nickel	48		0.27	0.071	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Vanadium	42		0.27	0.061	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Zinc	45		1.1	0.060	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	41		5.0	1.0	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Chromium	16		5.0	0.57	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Vanadium	10		5.0	0.67	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A

Client Sample ID : BR-S Laboratory Sample ID : 256425-002

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	4.8		0.27	0.078	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	180		0.27	0.058	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Beryllium	0.45		0.11	0.013	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cadmium	0.85		0.27	0.027	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Chromium	200		0.27	0.068	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cobalt	10		0.27	0.032	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Copper	19		0.27	0.090	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Lead	2.2		0.27	0.075	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Mercury	0.032		0.017	0.0011	mg/Kg	As Recd	1.000	EPA 7471A	METHOD
Molybdenum	4.3		0.27	0.053	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Nickel	53		0.27	0.071	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Silver	1.4		0.27	0.043	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Vanadium	43		0.27	0.061	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Zinc	42		1.1	0.060	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	57		5.0	1.0	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Chromium	11		5.0	0.57	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Vanadium	7.2		5.0	0.67	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A

Curtis & Tompkins, Ltd.

Client Sample ID : SP-N Laboratory Sample ID : 256425-003

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Arsenic	4.6		0.23	0.068	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	170		0.23	0.050	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Beryllium	0.41		0.093	0.012	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cadmium	0.87		0.23	0.024	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Chromium	210		0.23	0.059	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cobalt	10		0.23	0.028	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Copper	20		0.23	0.078	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Lead	2.6		0.23	0.065	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Mercury	0.051		0.017	0.0011	mg/Kg	As Recd	1.000	EPA 7471A	METHOD
Molybdenum	4.6		0.23	0.046	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Nickel	66		0.23	0.061	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Silver	1.5		0.23	0.037	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Vanadium	43		0.23	0.053	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Zinc	43		0.93	0.052	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	52		5.0	1.0	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Chromium	17		5.0	0.57	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Vanadium	8.8		5.0	0.67	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A

Client Sample ID : SP-S Laboratory Sample ID : 256425-004

Analyte	Result	Flags	RL	MDL	Units	Basis	IDF	Method	Prep Method
Antimony	0.53		0.49	0.15	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Arsenic	5.0		0.24	0.071	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	260		0.24	0.052	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Beryllium	0.41		0.097	0.012	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cadmium	0.73		0.24	0.025	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Chromium	190		0.24	0.061	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Cobalt	10		0.24	0.029	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Copper	19		0.24	0.081	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Lead	2.5		0.24	0.068	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Mercury	0.029		0.016	0.0011	mg/Kg	As Recd	1.000	EPA 7471A	METHOD
Molybdenum	4.1		0.24	0.047	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Nickel	53		0.24	0.064	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Selenium	0.98		0.49	0.16	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Silver	1.5		0.24	0.039	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Vanadium	37		0.24	0.055	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Zinc	40		0.97	0.054	mg/Kg	As Recd	1.000	EPA 6010B	EPA 3050B
Barium	80		5.0	1.0	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Chromium	14		5.0	0.57	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A
Vanadium	6.4		5.0	0.67	ug/L	SPLP	1.000	EPA 6010B	EPA 3010A

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	BR-N	Basis:	as received
Lab ID:	256425-001	Diln Fac:	1.000
Matrix:	Soil	Sampled:	04/23/14
Units:	mg/Kg	Received:	05/06/14

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	0.54	210807	05/06/14	05/07/14	EPA 3050B	EPA 6010B
Arsenic	4.2	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Barium	180	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Beryllium	0.37	0.11	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cadmium	0.83	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Chromium	280	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cobalt	12	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Copper	33	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Lead	3.1	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Mercury	0.024	0.016	210844	05/07/14	05/07/14	METHOD	EPA 7471A
Molybdenum	9.1	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Nickel	48	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Selenium	ND	0.54	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Silver	ND	0.27	210807	05/06/14	05/07/14	EPA 3050B	EPA 6010B
Thallium	ND	0.54	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Vanadium	42	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Zinc	45	1.1	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	BR-S	Basis:	as received
Lab ID:	256425-002	Diln Fac:	1.000
Matrix:	Soil	Sampled:	04/24/14
Units:	mg/Kg	Received:	05/06/14

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	0.54	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Arsenic	4.8	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Barium	180	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Beryllium	0.45	0.11	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cadmium	0.85	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Chromium	200	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cobalt	10	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Copper	19	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Lead	2.2	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Mercury	0.032	0.017	210844	05/07/14	05/07/14	METHOD	EPA 7471A
Molybdenum	4.3	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Nickel	53	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Selenium	ND	0.54	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Silver	1.4	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Thallium	ND	0.54	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Vanadium	43	0.27	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Zinc	42	1.1	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	SP-N	Basis:	as received
Lab ID:	256425-003	Diln Fac:	1.000
Matrix:	Soil	Sampled:	04/25/14
Units:	mg/Kg	Received:	05/06/14

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	ND	0.47	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Arsenic	4.6	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Barium	170	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Beryllium	0.41	0.093	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cadmium	0.87	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Chromium	210	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cobalt	10	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Copper	20	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Lead	2.6	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Mercury	0.051	0.017	210844	05/07/14	05/07/14	METHOD	EPA 7471A
Molybdenum	4.6	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Nickel	66	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Selenium	ND	0.47	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Silver	1.5	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Thallium	ND	0.47	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Vanadium	43	0.23	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Zinc	43	0.93	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	SP-S	Basis:	as received
Lab ID:	256425-004	Diln Fac:	1.000
Matrix:	Soil	Sampled:	04/26/14
Units:	mg/Kg	Received:	05/06/14

Analyte	Result	RL	Batch#	Prepared	Analyzed	Prep	Analysis
Antimony	0.53	0.49	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Arsenic	5.0	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Barium	260	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Beryllium	0.41	0.097	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cadmium	0.73	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Chromium	190	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Cobalt	10	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Copper	19	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Lead	2.5	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Mercury	0.029	0.016	210844	05/07/14	05/07/14	METHOD	EPA 7471A
Molybdenum	4.1	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Nickel	53	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Selenium	0.98	0.49	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Silver	1.5	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Thallium	ND	0.49	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Vanadium	37	0.24	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B
Zinc	40	0.97	210807	05/06/14	05/06/14	EPA 3050B	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	EPA 3050B
Project#:	168784.3333	Analysis:	EPA 6010B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC739113	Batch#:	210807
Matrix:	Soil	Prepared:	05/06/14
Units:	mg/Kg	Analyzed:	05/06/14

Analyte	Result	RL
Antimony	ND	0.50
Arsenic	ND	0.25
Barium	ND	0.25
Beryllium	ND	0.10
Cadmium	ND	0.25
Chromium	ND	0.25
Cobalt	ND	0.25
Copper	ND	0.25
Lead	ND	0.25
Molybdenum	ND	0.25
Nickel	ND	0.25
Selenium	ND	0.50
Silver	ND	0.25
Thallium	ND	0.50
Vanadium	ND	0.25
Zinc	ND	1.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	EPA 3050B
Project#:	168784.3333	Analysis:	EPA 6010B
Matrix:	Soil	Batch#:	210807
Units:	mg/Kg	Prepared:	05/06/14
Diln Fac:	1.000	Analyzed:	05/06/14

Type: BS Lab ID: QC739114

Analyte	Spiked	Result	%REC	Limits
Antimony	100.0	94.70	95	80-120
Arsenic	50.00	48.23	96	80-120
Barium	100.0	96.89	97	80-120
Beryllium	2.500	2.616	105	80-120
Cadmium	10.00	10.06	101	80-120
Chromium	100.0	98.10	98	80-120
Cobalt	25.00	24.48	98	80-120
Copper	12.50	12.36	99	80-120
Lead	100.0	95.29	95	80-120
Molybdenum	20.00	18.82	94	80-120
Nickel	25.00	24.46	98	80-120
Selenium	50.00	47.40	95	80-120
Silver	10.00	9.422	94	80-120
Thallium	50.00	46.59	93	80-120
Vanadium	25.00	24.50	98	80-120
Zinc	25.00	24.36	97	80-120

Type: BSD Lab ID: QC739115

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	100.0	101.9	102	80-120	7	20
Arsenic	50.00	51.84	104	80-120	7	20
Barium	100.0	103.5	103	80-120	7	20
Beryllium	2.500	2.796	112	80-120	7	20
Cadmium	10.00	10.76	108	80-120	7	20
Chromium	100.0	105.0	105	80-120	7	20
Cobalt	25.00	26.60	106	80-120	8	20
Copper	12.50	13.21	106	80-120	7	20
Lead	100.0	101.1	101	80-120	6	20
Molybdenum	20.00	20.27	101	80-120	7	20
Nickel	25.00	26.10	104	80-120	6	20
Selenium	50.00	50.63	101	80-120	7	20
Silver	10.00	10.05	100	80-120	6	20
Thallium	50.00	49.83	100	80-120	7	20
Vanadium	25.00	26.28	105	80-120	7	20
Zinc	25.00	25.89	104	80-120	6	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	EPA 3050B
Project#:	168784.3333	Analysis:	EPA 6010B
Field ID:	BR-N	Batch#:	210807
MSS Lab ID:	256425-001	Sampled:	04/23/14
Matrix:	Soil	Received:	05/06/14
Units:	mg/Kg	Prepared:	05/06/14
Basis:	as received	Analyzed:	05/06/14
Diln Fac:	1.000		

Type: MS Lab ID: QC739116

Analyte	MSS Result	Spiked	Result	%REC	Limits
Antimony	0.4990	105.3	35.55	33	9-120
Arsenic	4.244	52.63	52.10	91	72-120
Barium	179.9	105.3	268.0	84	50-133
Beryllium	0.3721	2.632	2.865	95	80-120
Cadmium	0.8337	10.53	9.551	83	72-120
Chromium	282.8	105.3	377.5	90	61-120
Cobalt	12.38	26.32	32.87	78	60-120
Copper	33.20	13.16	45.59	94	47-149
Lead	3.090	105.3	84.83	78	52-122
Molybdenum	9.072	21.05	26.32	82	68-120
Nickel	48.22	26.32	68.32	76	46-135
Selenium	<0.1718	52.63	46.77	89	70-120
Silver	0.07426	10.53	10.92	103	67-120
Thallium	<0.1510	52.63	37.75	72	64-120
Vanadium	42.26	26.32	66.81	93	54-137
Zinc	44.94	26.32	64.91	76	39-141

Type: MSD Lab ID: QC739117

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	102.0	32.87	32	9-120	5	26
Arsenic	51.02	47.94	86	72-120	5	30
Barium	102.0	252.5	71	50-133	5	43
Beryllium	2.551	2.647	89	80-120	5	20
Cadmium	10.20	8.790	78	72-120	5	22
Chromium	102.0	345.7	62	61-120	8	31
Cobalt	25.51	30.61	71	60-120	5	39
Copper	12.76	42.63	74	47-149	6	32
Lead	102.0	78.05	73	52-122	5	49
Molybdenum	20.41	24.09	74	68-120	7	23
Nickel	25.51	64.25	63	46-135	5	37
Selenium	51.02	42.97	84	70-120	5	26
Silver	10.20	9.874	96	67-120	7	25
Thallium	51.02	34.61	68	64-120	6	20
Vanadium	25.51	61.91	77	54-137	6	31
Zinc	25.51	60.86	62	39-141	5	37

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	METHOD
Project#:	168784.3333	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Type:	BLANK	Batch#:	210844
Lab ID:	QC739261	Prepared:	05/07/14
Matrix:	Soil	Analyzed:	05/07/14
Units:	mg/Kg		

Result	RL
ND	0.017

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	METHOD
Project#:	168784.3333	Analysis:	EPA 7471A
Analyte:	Mercury	Batch#:	210844
Matrix:	Soil	Prepared:	05/07/14
Units:	mg/Kg	Analyzed:	05/07/14
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC739262	0.2083	0.2199	106	80-120		
BSD	QC739263	0.2083	0.2157	104	80-120	2	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	METHOD
Project#:	168784.3333	Analysis:	EPA 7471A
Analyte:	Mercury	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	210844
MSS Lab ID:	256103-001	Sampled:	04/28/14
Matrix:	Miscell.	Received:	04/28/14
Units:	mg/Kg	Prepared:	05/07/14
Basis:	as received	Analyzed:	05/07/14

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC739264	0.04371	0.1984	0.2319	95	69-136		
MSD	QC739265		0.2049	0.2472	99	69-136	4	35

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	BR-N	Diln Fac:	1.000
Lab ID:	256425-001	Sampled:	04/23/14
Matrix:	SPLP Leachate	Received:	05/06/14
Units:	ug/L	Prepared:	05/13/14

Analyte	Result	RL	Batch#	Analyzed	Prep	Analysis
Antimony	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Arsenic	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Barium	41	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Beryllium	ND	2.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cadmium	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Chromium	16	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cobalt	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Copper	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Lead	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Mercury	ND	0.20	211041	05/13/14	METHOD	EPA 7470A
Molybdenum	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Nickel	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Selenium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Silver	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Thallium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Vanadium	10	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Zinc	ND	20	211054	05/14/14	EPA 3010A	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	BR-S	Diln Fac:	1.000
Lab ID:	256425-002	Sampled:	04/24/14
Matrix:	SPLP Leachate	Received:	05/06/14
Units:	ug/L	Prepared:	05/13/14

Analyte	Result	RL	Batch#	Analyzed	Prep	Analysis
Antimony	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Arsenic	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Barium	57	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Beryllium	ND	2.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cadmium	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Chromium	11	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cobalt	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Copper	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Lead	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Mercury	ND	0.20	211041	05/13/14	METHOD	EPA 7470A
Molybdenum	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Nickel	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Selenium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Silver	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Thallium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Vanadium	7.2	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Zinc	ND	20	211054	05/14/14	EPA 3010A	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	SP-N	Diln Fac:	1.000
Lab ID:	256425-003	Sampled:	04/25/14
Matrix:	SPLP Leachate	Received:	05/06/14
Units:	ug/L	Prepared:	05/13/14

Analyte	Result	RL	Batch#	Analyzed	Prep	Analysis
Antimony	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Arsenic	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Barium	52	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Beryllium	ND	2.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cadmium	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Chromium	17	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cobalt	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Copper	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Lead	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Mercury	ND	0.20	211041	05/13/14	METHOD	EPA 7470A
Molybdenum	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Nickel	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Selenium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Silver	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Thallium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Vanadium	8.8	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Zinc	ND	20	211054	05/14/14	EPA 3010A	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

California Title 22 Metals

Lab #:	256425	Project#:	168784.3333
Client:	Black & Veatch	Location:	CDRP (Calaveras Dam Replacement)
Field ID:	SP-S	Diln Fac:	1.000
Lab ID:	256425-004	Sampled:	04/26/14
Matrix:	SPLP Leachate	Received:	05/06/14
Units:	ug/L	Prepared:	05/13/14

Analyte	Result	RL	Batch#	Analyzed	Prep	Analysis
Antimony	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Arsenic	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Barium	80	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Beryllium	ND	2.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cadmium	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Chromium	14	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Cobalt	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Copper	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Lead	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Mercury	ND	0.20	211041	05/13/14	METHOD	EPA 7470A
Molybdenum	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Nickel	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Selenium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Silver	ND	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Thallium	ND	10	211054	05/14/14	EPA 3010A	EPA 6010B
Vanadium	6.4	5.0	211054	05/14/14	EPA 3010A	EPA 6010B
Zinc	ND	20	211054	05/14/14	EPA 3010A	EPA 6010B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	METHOD
Project#:	168784.3333	Analysis:	EPA 7470A
Analyte:	Mercury	Batch#:	211041
Matrix:	Water	Prepared:	05/13/14
Units:	ug/L	Analyzed:	05/13/14
Diln Fac:	1.000		

Type	Lab ID	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC740079	2.500	2.571	103	80-120		
BSD	QC740080	2.500	2.472	99	80-120	4	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	METHOD
Project#:	168784.3333	Analysis:	EPA 7470A
Analyte:	Mercury	Batch#:	211041
Field ID:	BR-N	Sampled:	04/23/14
MSS Lab ID:	256425-001	Received:	05/06/14
Matrix:	SPLP Leachate	Prepared:	05/13/14
Units:	ug/L	Analyzed:	05/13/14
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC740088	<0.04000	2.500	2.449	98	57-127		
MSD	QC740089		2.500	2.421	97	57-127	1	42

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	METHOD
Project#:	168784.3333	Analysis:	EPA 7470A
Analyte:	Mercury	Diln Fac:	1.000
Type:	BLANK	Batch#:	211041
Lab ID:	QC740092	Prepared:	05/13/14
Matrix:	SPLP Leachate	Analyzed:	05/13/14
Units:	ug/L		

Result	RL
ND	0.20

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	EPA 3010A
Project#:	168784.3333	Analysis:	EPA 6010B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC740155	Batch#:	211054
Matrix:	SPLP Leachate	Prepared:	05/13/14
Units:	ug/L	Analyzed:	05/14/14

Analyte	Result	RL
Antimony	ND	10
Arsenic	ND	5.0
Barium	ND	5.0
Beryllium	ND	2.0
Cadmium	ND	5.0
Chromium	ND	5.0
Cobalt	ND	5.0
Copper	ND	5.0
Lead	ND	5.0
Molybdenum	ND	5.0
Nickel	ND	5.0
Selenium	ND	10
Silver	ND	5.0
Thallium	ND	10
Vanadium	ND	5.0
Zinc	ND	20

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

California Title 22 Metals

Lab #:	256425	Location:	CDRP (Calaveras Dam Replacement)
Client:	Black & Veatch	Prep:	EPA 3010A
Project#:	168784.3333	Analysis:	EPA 6010B
Matrix:	SPLP Leachate	Batch#:	211054
Units:	ug/L	Prepared:	05/13/14
Diln Fac:	1.000	Analyzed:	05/14/14

Type: BS Lab ID: QC740156

Analyte	Spiked	Result	%REC	Limits
Antimony	2,000	1,989	99	78-120
Arsenic	1,000	991.0	99	80-120
Barium	2,000	2,001	100	80-120
Beryllium	50.00	51.25	103	80-120
Cadmium	200.0	205.2	103	80-120
Chromium	2,000	1,946	97	80-120
Cobalt	500.0	486.3	97	80-120
Copper	250.0	244.8	98	79-120
Lead	2,000	1,929	96	80-120
Molybdenum	400.0	397.5	99	80-120
Nickel	500.0	482.1	96	80-120
Selenium	1,000	999.8	100	80-120
Silver	200.0	188.1	94	80-120
Thallium	1,000	988.5	99	80-120
Vanadium	500.0	488.7	98	80-120
Zinc	500.0	491.8	98	80-120

Type: BSD Lab ID: QC740157

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Antimony	2,000	2,030	102	78-120	2	20
Arsenic	1,000	1,017	102	80-120	3	20
Barium	2,000	2,010	100	80-120	0	20
Beryllium	50.00	52.65	105	80-120	3	20
Cadmium	200.0	210.8	105	80-120	3	20
Chromium	2,000	1,997	100	80-120	3	20
Cobalt	500.0	498.5	100	80-120	2	20
Copper	250.0	251.3	101	79-120	3	20
Lead	2,000	1,981	99	80-120	3	20
Molybdenum	400.0	406.2	102	80-120	2	20
Nickel	500.0	495.2	99	80-120	3	20
Selenium	1,000	1,030	103	80-120	3	20
Silver	200.0	193.1	97	80-120	3	20
Thallium	1,000	1,006	101	80-120	2	20
Vanadium	500.0	502.4	100	80-120	3	20
Zinc	500.0	503.9	101	80-120	2	20

RPD= Relative Percent Difference

Attachment F

Attachment F - Photos of concrete in Disposal Site 3

Overview photo from dam access road showing the extent of concrete disposal area.

Photo taken from south of disposal area.

Photo from north of disposal area.

Photos of concrete rubble with < 1% of rebar.

MINOR PROJECT MODIFICATION

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
WATER SYSTEM IMPROVEMENT PROGRAM

Minor Project Modification Number:	**028**	**Date: 8/26/2014**

Project Title:	**Calaveras Dam Replacement Project**		
EP Case No./Project No.	**2005.0161E/CUW37401**		
MPM Prepared By:	**Cullen Wilkerson-ECM/J.T. Mates-Muchin ECC**		
MPM Triggered By:	☒ RFD	☐ PCO	☐ Other:
Landowner:	**SFPUC**		
Vegetative Cover/Land Use:	Grassland and scrub	**Net Acreage Affected:**	0.07ac
Modification to:	☐ Mitigation Measure:		X Other: FEIR Project Description
	☐ Permit:		

Detailed Description of Minor Project Modification:

The San Francisco Public Utilities Commission (SFPUC) is requesting a modification to the Calaveras Dam Replacement Project (CDRP) Project Description to accommodate a geotechnical investigation at the Alameda Creek Diversion Dam Site (ACDD, covered under the CDRP EIR). The geotechnical investigation was requested by the designer to assess the base of the existing landslides above the right bank of Alameda Creek near the fish screens and to assess the depth to bedrock and characterize the overlying materials near the downstream end of the proposed fish ladder. The designer needs to assess the nature of the landslide to ensure that the retaining wall is adequately designed and sufficient to protect the fish screens. The fish ladder needs to be built on a competent foundation. The investigation will assess the nature of the soils beneath the fish ladder and whether other measure may need to be implemented to provide a competent foundation.

Page 9-28, Figure 9.6 Work Areas for Proposed Fisheries Improvements at Alameda Creek Diversion Dam, would need to be updated to include minor grading and boring, 3 of which are outside the project area defined in Figure 9.6. The activities associated with this geotechnical investigation, grading and drilling, are covered in the EIR. There are mitigation measures that adequately address this activity. Please see Attachment A, which defines the extent of the boring and the access. Attachment B and C are biological resources surveys and cultural resources surveys, respectively.

ENVIRONMENTAL IMPACTS

There would be no impacts beyond those analyzed in the Calaveras Dam Replacement Project FEIR. There is a minor change in the project area.

Attachments:

Attachment A – Figure 1

Attachment B – Biological Resources Survey

Attachment C – Cultural Resources Survey

Biological ☒ Yes ☐ No	**Cultural** ☒ Yes ☐ No	**Photos** ☒ Yes ☐ No	**Other** ☐ Yes ☒ No

Resources:

Biological ☐ No Resources Present ☒ Resources Present ☐ NA

Previous Biological Survey Report Reference:
N/A

Cultural ☐ No Resources Present ☒ Resources Present ☐ Within Project APE

☐ NA (paved/graveled area and no ground disturbance)

Previous Cultural Survey Report Reference:
N/A

Conditions of Approval or Reasons for Denial

SFPUC Required Signatures for Environmental Approval:

ECCM: for Kerry O'Neill Date: 08/26/14

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

SFPUC agrees that Contractor will abide by the mitigation measures detailed in the CEQA document and project permit requirements and have appropriate Specialty Environmental Monitors present where required.

Charge Code: CUW37401

EP Required Signatures for Approval:

Signee: Steven H. Smith (electronic) Date: 8/26/2014

☐ Approved ☒ Approved with Conditions (see conditions above) ☐ Denied

CEQA SECTION	APPLICABLE	(Y) Define Potential Impact or (N) Briefly Explain Why CEQA Section isn't Applicable
Geology, Soils and Seismicity	☐ Y	There would be no new significant geology, soil or seismicity impacts beyond those analyzed in the FEIR.
	☒ N	
Hazardous Materials and Waste	☒ Y	Drill cuttings will be contained in a 55 gallon drum(s) and tested prior to disposal at an appropriate facility. Hazardous materials are not anticipated, but if they were found they would be disposed of at an appropriate facility in accordance with Mitigation Measure 5.7.1. Therefore, there would be no hazardous material or waste impacts beyond those identified in the FEIR.
	☐ N	
Hydrology	☒ Y	Silt fence and fiber rolls will be used to control any potential runoff from the site. Grassland will be maintained to the greatest extent possible and water will be directed into upland area to prevent impacts to water quality. Preservation of vegetation and restoration for stormwater protection will be implemented per Mitigation Measure 5.7.1. There would be no new significant hydrology or water quality impacts beyond those analyzed in the FEIR.
	☐ N	
Cultural Resources	☒ Y	Based on a pedestrian survey of the location, there are no cultural resource sites identified at the locations where the boring would occur. If cultural resources are discovered, the project would implement accidental discovery measures in Mitigation Measure 5.10.2. There would be no new significant Cultural Resource impacts beyond those identified in the FEIR.
	☐ N	
Traffic and Circulation	☐ Y	No new significant traffic and circulation impacts would occur beyond those identified in the FEIR.
	☒ N	
Air Quality	☐ Y	There would be no new air quality impacts beyond those identified in the FEIR.
	☒ N	
Noise and Vibration	☐ Y	There would be no new noise and vibration impacts beyond those identified in the FEIR.
	☒ N	
Visual Resources	☐ Y	There will be no new visual resource impacts beyond those analyzed in the FEIR.
	☒ N	
Vegetation and Wildlife	☒ Y	Minor grading will occur but not above the level of impact described in the FEIR. The grading will occur within the footprint of the ACDD project as described. Pre-construction surveys would occur in accordance with Mitigation Measure 5.4.1a and 5.4.1b. There will be no new vegetation and wildlife impacts beyond those analyzed in the FEIR.
	☐ N	

From:	Smith, Steve (CPC)
To:	Mates-Muchin, JT
Subject:	RE: CDRP MPM 029 Monitoring Station A3b
Date:	Thursday, October 09, 2014 6:53:14 PM
Attachments:	image001.jpg MPM029-CDRP A3b Station (final).doc

Approval attached.

Steven H. Smith, AICP
Senior Environmental Planner

Planning Department¦City and County of San Francisco
1650 Mission Street, Suite 400, San Francisco, CA 94103
Direct: 415-558-6373¦Fax: 415-558-6409
Email: steve.smith@sfgov.org
Web: www.sfplanning.org

From: Mates-Muchin, JT [mailto:JMates-Muchin@sfwater.org]
Sent: Thursday, October 09, 2014 1:21 PM
To: Smith, Steve (CPC)
Subject: CDRP MPM 029 Monitoring Station A3b

Hi Steve,
I made the change and include a tracked changes and clean version of the document. I removed the traffic control mitigation measure because it really does not apply. We are installing the station in the middle of the EBPark so there will be no need for traffic control. I think this was a remnant from the original MPM. Otherwise, hopefully I cleaned it up appropriately. Please let me know if you have any additional concerns.
Regards,
JT

Jonathan Mates-Muchin, Ph.D.
Biologist/Env. Construction Compliance Coordinator
SFOffice: 415.934.5754 | CDRP Office: 925.493.4519
jmatesmuchin@sfwater.org

MINOR PROJECT MODIFICATION

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
WATER SYSTEM IMPROVEMENT PROGRAM

Minor Project Modification Number:	**029**		**Date: 10/6/14**
Project Title:	**Calaveras Dam Replacement Project**		
EP Case No./Project No.	**2005.0161E/CUW37401**		
MPM Prepared By:	**Cullen Wilkerson, ECM**		
MPM Triggered By:	☐ RFD	☐ PCO	☒Other: SFPUC
Landowner:	**SFPUC**		East Bay Regional Park District
Vegetative Cover/Land Use:	grassland		**Net Acreage Affected:** **< 0.001 acre** (32 sq. ft.)
Modification to:	☐ Mitigation Measure:		☒ Other: Project Design
	☐ Permit:		

Detailed Description of Minor Project Modification:

This MPM proposes to install an Air Monitoring station (A3b) on a grassland plateau in the East Bay Regional Park – Sunol Regional Wilderness near the Geary Road Bridge and overflow parking area (Figure 1). The proposed A3b station would utilize existing access roads. The new location for A3 is described below:

Ambient Air Quality Monitoring Station 3b (Station A3b)

The proposed new location for the Ambient Air Quality Monitoring Station 3b is on East Bay Regional Park District property, approximately 1500 feet south east of the existing A3 location (Figure 1). The air quality monitoring station is a temporary facility (4 feet by 8 feet) that would be removed following completion of the Calaveras Dam. The proposed structure will provide a secure location for pumps, meters, solar panels and batteries that will be used to collect air samples for the analyses of asbestos and/or metals.

ENVIRONMENTAL IMPACTS

The proposed A3b air quality monitoring site is located on level ground and would require minimal site preparation within an area measuring approximately 32 square feet. Site preparation may include clearing rocks (if present) and installing four ½-inch-thick rebar to secure the chain link enclosure. These components would be removed after completion of the monitoring program. The proposed A3b air monitoring station would not result in new or additional impacts to the physical, biological, and cultural historic environment beyond those analyzed in the Calaveras Dam Replacement FEIR. The installation of air monitoring stations is in compliance with perimeter monitoring requirements identified in FEIR Mitigation Measure 5.9.2a to mitigate the impact of a release of airborne naturally occurring asbestos (NOA) and naturally occurring metals during CDRP construction.

Attachments:

- Figure 1. Proposed Location of Air Quality Monitoring Station A3b (Aerial)
- Figure 2. Approximate on the Ground Location of the A3b Station
- Figure 3. Example of Monitoring Station

Biological ☐ Yes ☒ No	**Cultural** ☐ Yes ☒ No	**Photos** ☒ Yes ☐ No	**Other** ☐ Yes ☒ No

Resources:

Biological ☒ No Resources Present ☐ Resources Present ☐ NA

Previous Biological Survey Report Reference:

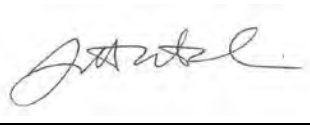
Cultural ☒ No Resources Present ☐ Resources Present ☐ Within Project APE

☐ NA (paved/graveled area and no ground disturbance)

Cultural Survey Report Reference:

Conditions of Approval or Reasons for Denial

SFPUC Required Signatures for Environmental Approval:

ECCM:  Date: October 6, 2014

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

SFPUC agrees that Contractor will abide by the mitigation measures detailed in the CEQA document and project permit requirements and have appropriate Specialty Environmental Monitors present where required.

Charge Code:

EP Required Signatures for Approval:

Signee: _____ Date: _____

☐ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

CEQA SECTION	APPLICABLE	(Y) Define Potential Impact or (N) Briefly Explain Why CEQA Section isn't Applicable
Geology, Soils and Seismicity	☐ Y	Due to the relocation of Air Quality Monitoring Station A3b, there would be no new significant geology, soil or seismicity impacts beyond those analyzed in the Calaveras Dam Replacement Project (CDRP) FEIR.
	☒ N	
Hazardous Materials and Waste	☐ Y	No hazardous materials or wastes would be stored at the air monitoring station. Equipment and vehicles used to install the stations would contain fuel and other hazardous materials. Impacts associated with accidental release of hazardous materials from equipment are analyzed in the FEIR. As discussed in the FEIR, in accordance with state and federal laws, the spill prevention and control measures identified for the project would be adhered to. As a result, there would be no impacts beyond those identified in the CDRP FEIR.
	☒ N	
Hydrology	☐ Y	The air monitoring station would all be installed on disturbed grassland. The station would not be located within wetlands, drainage channels, creek beds, or riparian habitat. The station would be installed on the surface, requiring no excavation or grading, and would not significantly alter site hydrology. There would be no new significant hydrology or water quality impacts beyond those analyzed in the CDRP FEIR.
	☒ N	
Cultural Resources	☐ Y	The proposed monitoring station location is in a grassland area adjacent to roads and other facilities. There would be no ground disturbance related to installation of the A3b station except for four ½ inch rebar stakes to secure the station. There would be no new significant cultural resource impacts beyond those analyzed in the CDRP FEIR.
	☒ N	
Traffic and Circulation	☐ Y	The proposed monitoring station location is adjacent to an existing paved road within SFPUC lands/EBRPD land. The installation of the air monitoring station and associated periodic monitoring activities do not necessitate a volume of vehicles that could exceed Level of Service (LOS) and capacity of existing paved roads or contribute to traffic congestion or impede vehicular circulation. There would be no new traffic and circulation impacts beyond those identified in the CDRP FEIR.
	☒ N	
Air Quality	☐ Y	Installation of the air monitoring station A3b would not involve excavations, soil disturbance, or other potential dust-generating activities. The station would be installed on grassland. No significant fugitive dust emissions are expected. The relatively small number of vehicles or equipment would not result in exhaust emissions beyond what was analyzed in the CDRP FEIR. There would be no new air quality impacts.
	☒ N	
Noise and Vibration	☐ Y	The pumps and meters enclosed within the cage air monitoring station structure will be battery/solar powered with a motor that is less than 1/20 horsepower. The noise generated by the unit will be comparable to a quiet conversation (below 60 decibels) at a distance of 5 feet. The proposed monitoring station location is in a grassland plateau away from trails or roads. Noise and vibration from installation activities would be short-term, temporary, and confined to small areas. The short-term noise associated with the pounding of the four ¼ inch rebar stakes to secure the air monitoring station would not significantly affect ambient noise levels and there would not be additional new significant noise and vibration impacts beyond what was analyzed in the CDRP FEIR.
	☒ N	
Visual Resources	☐ Y	The A3b station would be located within existing SFPUC property leased by East Bay Regional Park District. This station would be visible to the public. The approximate 8-foot tall, 32-square foot, chain link enclosure would not be substantially intrusive to the existing visual environment, and would not block views. Thus, there would no new significant visual resource impacts beyond those analyzed in the CDRF FEIR.
	☒ N	

Vegetation and Wildlife	☐ Y	The A3b station would occupy 32 square feet of grassland. There would be no surface excavation and no vegetation clearing required to install the station. A reconnaissance survey was performed on 9/22/14 and no special-status plant or wildlife species or their habitats, wetlands, riparian habitat, or other sensitive habitat occur within the location of the air monitoring station. There would be no new significant vegetation or wildlife impacts beyond those analyzed in the CDRP FEIR.
	☒ N	

MINOR PROJECT MODIFICATION

SAN FRANCISCO PUBLIC UTILITIES COMMISSION
WATER SYSTEM IMPROVEMENT PROGRAM

Minor Project Modification Number:	**030**		**Date: 12/10/15**
Project Title:	**Calaveras Dam Replacement Project**		
~~MEA~~EP Case No./Project No.	**2005.0161E/CUW37401**		
MPM Prepared By:	**Cullen Wilkerson**		
MPM Triggered By:	☐ RFD	☐ PCO	☒Other: Contractor
Landowner:	SFPUC		
Vegetative Cover/Land Use:	Rock outcrop, scrub	**Net Acreage Affected:** 0.63 acres	
Modification to:	☐ Mitigation Measure:	☒ Other: CEQA Project Limits	
	☒ Permit: USFWS B.O. and CDFW ITP 2081		

Detailed Description of Minor Project Modification:

The Contractor requests to remove loose rocks and install rock fall netting for worker safety on the steep slope above the Borrow Area B work area that is located outside the project limits just south of Staging Area 5 (see Attachments A and B for photos and a figure). The method the Contractor will use is referred to as "Rock Scaling". Rock scaling is generally defined as the removal of loose rock from slopes. This process is performed by removing loose rocks on the slope that presents a rockfall hazard using hand tools such as pry-bars and picks and allowing them to roll downhill into the project work area when no workers are present. Following scaling, the Contractor will install rock fall netting on the slope that will remain in place permanently. Netting will be heavy gauge wire attached to the slope using rock bolts. This type of netting has been installed elsewhere on the project site on slopes within the approved work area (Attachment B and see below discussion under Geology, Soils and Seismicity).

Scaling would occur on and netting would then be installed over a 0.63 acre area outside the current project limits. The SFPUC authorized the Contractor to perform a limited amount of scaling in this area already at the end of October 2015 due to an imminent safety hazard that existed where active work was occurring. The SFPUC has notified the USFWS and CDFW and will amend permits as required by these agencies. USFWS responded with concurrence to allow the rock scaling for human safety (see Attachment C).

Attachments:

Biological ☒ Yes ☐ No	**Cultural** ☐ Yes ☒ No	**Photos** ☒ Yes ☐ No	**Other** ☐ Yes ☐ No

Resources:

Biological ☐ No Resources Present ☒ Resources Present ☐ NA

Survey Report Reference: Biological Tech Memo - Environmental Review of Proposed Project Modifications, Calaveras Dam Replacement Project, November 5, 2015 (Attachment D)

Cultural ☒ No Resources Present ☐ Resources Present ☐ Within Project APE

☐ NA (paved/graveled area and no ground disturbance)

Cultural Survey Report Reference:

Archaeological Tech Memo., Cultural Resources Survey Adjacent to Borrow Area B, Calaveras Dam Replacement Project, January 10, 2012 (Attachment F). Paleontological Monitor Daily Inspection email, November 5, 2015 (Attachment E).

Conditions of Approval or Reasons for Denial

SFPUC Required Signatures for Environmental Approval:

ECCM: ***Kimberly Stern Liddell*** Date: 12/9/15

☒ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

SFPUC agrees that Contractor will abide by the mitigation measures detailed in the CEQA document and project permit requirements and have appropriate Specialty Environmental Monitors present where required. EP Approval subject to concurrence from USFWS and CDFW.

Charge Code: CUW37401CM: R14

~~ME~~AEP Required Signatures for Approval:

Signee: Steven H. Smith Date: 12/10/15

☐ Approved ☐ Approved with Conditions (see conditions above) ☐ Denied

CEQA SECTION	APPLICABLE	(Y) Define Potential Impact or (N) Briefly Explain Why CEQA Section isn't Applicable
Geology, Soils and Seismicity	☐ Y ☒ N	The FEIR requires scaling of rock faces that cannot suitably hold vegetation stating that these slopes should be cleaned of loose debris and benched for stability. Rock fall netting was identified as another measure to enhance slope stability and prevent future rock fall. These same methods would be applied in this additional slope area under the proposed modification. Therefore, there would be no new significant geology, soil or seismicity impacts beyond those analyzed in the FEIR.
Hazardous Materials and Waste	☐ Y ☒ N	Not applicable. Activities on this slope would be performed by hand. Therefore, there would be no new hazardous material or waste impacts beyond those identified in the FEIR.
Hydrology	☐ Y ☒ N	Not applicable. Activities on this slope would be performed by hand and would not affect the overall slope and hydrology. Therefore, there would be no new significant hydrology or water quality impacts beyond those analyzed in the FEIR.
Cultural Resources	☐ Y ☒ N	The slope area of this proposed modification is within the cultural resources APE identified in the FEIR (see FEIR Figure 4.10.1) and is adjacent to the area that was previously evaluated for MPM 012 in January 2012 (see Attachment F). As discussed in the memo for the previous MPM, several known resources have been identified in the vicinity of this proposed modification but none are on the slope where scaling/netting would occur. Based on the survey previously performed in January 2012 and a visual survey of the slope subject to this MPM, no known significant cultural resource will be impacted. The project Archaeologist will periodically evaluate additional rock material that is scaled for fossils. If any significant cultural resources are discovered, the project will implement accidental discovery Mitigation Measures 5.10.1 and 5.10.2. Due to the steepness of the slope where scaling/rock netting will occur, it is not feasible for the paleontologist to perform a pre-construction survey. A limited amount of scaling was done at the end of October 2015 due to an imminent safety hazard. The project Paleontologist reviewed the rocks that had fallen into the work around and some invertebrate fossils were noted but were not considered to be significant and were not complete enough to warrant collection (see Attachment E). Additional invertebrate fossils could

		be affected with further scaling proposed by this modification; however, the additional scaling is anticipated to be limited and such fossils are not typically considered to be significant. The proposed modification does not involve excavation on the slope, which is when there is greater potential to unearth buried significant vertebrate fossils. The project Paleontologist will periodically evaluate additional rock material that is scaled for fossils. If any significant paleontological resources are discovered, the project will implement Mitigation measure 5.10.5b. Therefore, there would be no new substantial cultural or paleontological impacts beyond those identified in the FEIR.
Traffic and Circulation	☐ Y ☒ N	Not applicable. Activities on this slope would be performed by hand and would not require additional truck trips. There would be no new significant traffic and circulation impacts beyond those identified in the FEIR.
Air Quality	☐ Y ☒ N	Activities on this slope would be performed by hand and would not require additional equipment that could result in additional emissions. In accordance with Mitigation Measure 5.13.1a of the FEIR, measures would be implemented to minimize dust as feasible. Therefore, there would be no new substantial air quality impacts beyond those identified in the FEIR.
Noise and Vibration	☐ Y ☒ N	Activities on this slope are within the greater work area and would be performed by hand and thus would not generate a new source of substantial noise beyond those noise sources and levels analyzed in the EIR. Therefore, there would be no new substantial noise and vibration impacts beyond those identified in the FEIR.
Visual Resources	☐ Y ☒ N	Impacts of construction activities on scenic vistas, scenic resources, and visual character when viewed from the Sunol Wilderness (Impact 4.11.1) were determined to be Significant and Unavoidable (temporary). Impacts of site disturbance on scenic vistas, scenic resources, and visual character when viewed from the Sunol Wilderness (Impact 4.11.2) for the grading and excavation of Borrow Area B were analyzed and per the FEIR analysis determined that it would permanently alter the profiles of these features when viewed from the Sunol Wilderness. These impacts were also determined to have a significant impact on scenic vistas from the park and on scenic resources and the visual character of the dam site and its surroundings. The additional 0.63 acre area where rock fall scaling and netting is proposed on the slope above Borrow Area B may be visible from the Sunol Wilderness but this area will revegetate over time and represents an incremental increase that will not be substantial relative to visual effects from work throughout the several hundred acre site. Therefore, there will be no new substantial visual resource impacts beyond those analyzed in the FEIR.
Vegetation and Wildlife	☒ Y ☐ N	A biological review of the modification was performed by Biomass (Attachment D). Vegetation and wildlife could be affected as workers walk along the slope and rocks are rolling down the hill. This area could be used by Alameda whipsnake and other wildlife identified in the FEIR. To minimize impacts, a USFWS/CDFW approved biologists will perform an environmental tailgate re-training to enable the crew to identify and avoid this species and biologists will perform a pre-con survey of the area to the extent safely feasible per Mitigation Measures 5.4.1a & b. Additionally, work would be performed outside the nesting bird season. It is difficult to anticipate the extent of disturbance that may occur. It is anticipated that affected areas would revegetate naturally over time. In other areas of the project site where rock netting was installed, grasses and shrubs have become restablished even with the netting (i.e., grows through the netting). Under Mitigation Measures 5.4.2 (Habitat Restoration Measures), the SFPUC would seed the affected area to the extent feasible and under Mitigation Measure 5.4.3a, the SFPUC will provide off-site compensation for affects to the additional 0.63 acre area. The SFPUC has notified the USFWS and CDFW and will amend permits as required by these agencies. USFWS responded with concurrence to allow the rock scaling for human

		safety (see Attachment C).


Attachment B
Scaling & Netting Limits
Approx. Project Limits
Scaling & Netting Limits
Total Area = 1.01 Acres
(43,888 SF)
Total Area Outside Project Limits = 0.63 Acres
(27,500 SF)
Staging Area 5
100 ft