SAN FRANCISCO BAY
REGIONAL WATER QUALITY CONTROL BOARD

Site Cleanup Requirements for Phillips 66 Company Line 200 Release

INITIAL STUDY &
MITIGATED NEGATIVE DECLARATION

APPENDICES

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Appendices

Appendix AQ–1

Air Quality Setting and Regulatory Context

Appendix AQ-1

Air Quality Setting and Regulatory Context

The project site is located within the San Francisco Bay Area Air Basin (Air Basin), which encompasses Alameda, Contra Costa, Santa Clara, San Francisco, San Mateo, Marin, and Napa Counties, and the southern portions of Solano and Sonoma Counties. The Air Basin is characterized by complex terrain which distorts normal wind flow patterns, consisting of coastal mountain ranges, inland valleys, and bays.

Regional Meteorology

Air quality is affected by the rate, amount, and location of pollutant emissions and the associated meteorological conditions that influence pollutant movement and dispersal. Atmospheric conditions, including wind speed, wind direction, stability, and air temperature, in combination with local surface topography (i.e., geographic features such as mountains, valleys, and San Francisco Bay), determine the effect of air pollutant emissions on local air quality.

The climate of the greater San Francisco Bay Area, including Contra Costa County, is a Mediterranean-type climate characterized by warm, dry summers and mild, wet winters. The climate is determined largely by a high-pressure system that is often present over the eastern Pacific Ocean off the West Coast of North America. In winter, the Pacific high-pressure system shifts southward, allowing storms to pass through the region. During summer and fall, air emissions generated within the Bay Area can combine with abundant sunshine under the restraining influences of topography and subsidence inversions to create conditions that are conducive to the formation of photochemical pollutants, such as ozone and secondary particulates, such as sulfates and nitrates.

The project site lies in the Diablo Valley-San Ramon Valleys climatological sub-region of the Bay Area. The Diablo Valley is a broad valley, approximately five miles wide and ten miles long. The Carquinez Strait is at its north end; in the south, it tapers into the San Ramon Valley. Major cities in the Diablo Valley are Concord and Walnut Creek. San Ramon Valley continues south from the Diablo Valley, extending from south of Walnut Creek to Dublin. San Ramon Valley is long and narrow, approximately 12 miles long and one mile wide. At its southern end it opens to the Amador Valley. Its major towns are Danville and San Ramon.[1]

The Coast Range on the west side of these valleys is 1,500 to 2,000 feet high. This is sufficiently high to block much of the marine air from reaching the valleys. During the daytime, there are two weakly predominant flow patterns: upvalley flow and westerly flow across the lower elevations of the Coast Range. On clear nights, a surface inversion sets up and separates the surface flow from the upper layer flow. When this happens, the terrain channels the flow

[1] BAAQMD. Climate, Physiography, And Air Pollution Potential – Bay Area and Its Subregions http://hank.baaqmd.gov/dst/papers/bay_area_climate.pdf

downvalley toward the Carquinez Straits. This downvalley drainage pattern can be observed all the way to Martinez at the end of the valley.

Wind speeds in these valleys rank as some of the lowest in the Bay Area. For example, in the middle of the Diablo Valley, the District station in Concord reports annual average wind speeds of 4.7 miles per hour (mph), and Danville in the middle of the San Ramon Valley reports annual average wind speeds of five mph. However, winds can pick up in the afternoon near the town of San Ramon because it is located at the eastern end of the Crow Canyon gap. Through this gap, polluted air from cities near the bay is able to travel across Hayward to the San Ramon Valley during the summer months.

Air temperatures are cooler in the winter and warmer in the summer because these valleys are further from the moderating effect of large water bodies, and because the Coast Range blocks marine air flow. In the Diablo Valley during the winter, Concord records daily maximum temperatures in the mid 50's. During the summer, average daily maximum temperatures are in the high 80's to 90 degrees. Average minimum temperatures in winter are in the low to mid 40's. Temperatures in the San Ramon Valley would be similar to Concord's.

Shielded by the Coast Range to the west, rainfall amounts in the Diablo Valley are relatively low. For example, Martinez in the north reports an annual average of 18.5 inches, while Walnut Creek reports 19 inches. Rainfall in the San Ramon Valley is expected to be similar because of the similar orientation of the terrain.

Pollution potential is relatively high in these valleys. In the winter, light winds at night, coupled with a surface-based inversion, and terrain blocking to the east and west does not allow much dispersion of pollutants. San Ramon Valley with its very narrow width, could easily have high pollution buildups from emissions contributed by the major freeway in its center, and by emissions from fireplaces and wood stoves. In the summer months, ozone can be transported into the valleys from both the Central Valley and the central Bay Area.

Local Air Quality

The BAAQMD maintains a network of monitoring stations within the Air Basin that monitor air quality and compliance with applicable ambient standards. The monitoring station closest to the project site is in Concord (Treat Boulevard), approximately 4.6 miles southwest of the project site; where levels of ozone (O_3), PM10, PM2.5, CO, NO_2, and SO_2 are recorded.

Table AQ-1 summarizes the most recent three years of data (2012 through 2014) from the Concord air monitoring station. The federal 8-hour ozone standard was exceeded twice in 2012 and 2014; while the State 1-hour ozone standard was exceeded once in 2014. The state PM10 standard (24-hour) and the federal PM2.5 standard (24-hour) were each exceeded once in 2013. No other State or federal air quality standards were exceeded during the three-year period.

The Bay Area is currently designated “nonattainment” for state and national (1-hour and 8-hour) ozone standards, for the state PM10 standards, and for state and national (annual average and 24-hour) PM2.5 standards. The Bay Area is designated “attainment” or “unclassifiable” with respect to the other ambient air quality standards.

Table AQ–1

Air Quality Data Summary (2012 through 2014

Pollutant	Standard[a]	Monitoring Data by Year 2012	2013	2014
Ozone				
Highest 1 Hour Average (ppm)[b]	0.09	0.093	0.074	**0.095**
Days over State Standard		0	0	**1**
Highest 8 Hour Average (ppm)[b]	0.075	**0.085**	0.062	**0.080**
Days over National Standard		**2**	0	**2**
Nitrogen Dioxide (NO_2)				
Highest 1 Hour Average (ppm)[b]	0.180	0.040	0.044	0.048
Days over State Standard		0	0	0
Annual Average ($\mu g/m^3$)[b]	0.030/0.053	0.008	0.009	0.008
Carbon Monoxide (CO)				
Highest 1 Hour Average (ppm)[b]	9.0	1.2	1.2	1.4
Days over State Standard		0	0	0
Highest 8 Hour Average (ppm)[b]	20	0.8	1.0	1.1
Days over State Standard		0	0	0
Coarse Particulate Matter (PM10)				
Highest 24 Hour Average ($\mu g/m^3$)[b]	50	35.0	**51.0**	43.0
Days over State Standard		0	**1**	0
State Annual Average ($\mu g/m^3$)[b]	20	12.6	16.0	14.2
Fine Particulate Matter (PM2.5)				
Highest 24 Hour Average ($\mu g/m^3$)[b]	35	32.2	**36.2**	30.6
Days over National Standard		0	**1**	0
State Annual Average ($\mu g/m^3$)[b]	12	6.5	7.6	6.6

*NOTES: Values in **bold** are in excess of at least one applicable standard.*
Generally, state standards and national standards are not to be exceeded more than once per year.
ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter.
PM_{10} is not measured every day of the year. Number of estimated days over the standard is based on 365 days per year.

Source: USEPA (http://www.epa.gov/air/data/) CARB Air Quality Data Statistics (http://www.arb.ca.gov/adam/welcome.html, 2012–2014.

The BAAQMD's Community Air Risk Evaluation (CARE) program was initiated in 2004 to evaluate and reduce health risks associated with exposure to outdoor air toxics in the Bay Area. Based on findings of the latest report, diesel particulate matter (DPM) was found to account for approximately 85 percent of the cancer risk from airborne toxics. Carcinogenic compounds from gasoline-powered cars and light duty trucks were also identified as significant contributors: 1,3-butadiene contributed four percent of the cancer risk-weighted emissions, and benzene contributed three percent. Collectively, five compounds—DPM, 1,3-butadiene, benzene, formaldehyde, and acetaldehyde—were found to be responsible for more than 90 percent of the cancer risk attributed to emissions. All of these compounds are associated with emissions from internal combustion engines. The most important sources of cancer risk-weighted emissions were combustion-related sources of DPM, including on-road mobile sources (31 percent), construction equipment (29 percent), and ships and harbor craft (13 percent). A 75 percent reduction in DPM was predicted between 2005 and 2015 when the inventory accounted for

CARB's diesel regulations. Overall, cancer risk from TAC dropped by more than 50 percent between 2005 and 2015, when emissions inputs accounted for state diesel regulations and other reductions.[2]

Modeled cancer risks from TAC in 2005 were highest near sources of DPM: near core urban areas, along major roadways and freeways, and near maritime shipping terminals. Peak modeled risks were found to be located east of San Francisco, near West Oakland, and the maritime Port of Oakland. BAAQMD has identified seven impacted communities in the Bay Area:

- Western Contra Costa County and the cities of Richmond and San Pablo.
- Western Alameda County along the Interstate 880 corridor and the cities of Berkeley, Alameda, Oakland, and Hayward.
- San Jose.
- Eastern side of San Francisco.
- Concord.
- Vallejo.
- Pittsburgh and Antioch.

The proposed project is within the city of Concord, which is part of the seven CARE program impacted communities in the Bay Area. The health impacts in the Bay Area, as determined both by pollution levels and by existing health vulnerabilities in a community, is approximately 160 cancer risk per million persons, while in Concord, the health impacts is approximately 115 cancer risk per million persons.[3]

Nearby Sensitive Receptors

BAAQMD considers the relevant zone of influence for an assessment of air quality health risks to be within 1,000 feet of a project site. The project site is generally bound by residential land uses to the south, west and east, with Concord Naval Weapons Station property to the north. The nearest existing residential land uses are within 100 feet to the southeast.

Air Quality Significance Thresholds

The significance of potential impacts was determined based on State CEQA Guidelines, Appendix G, and the BAAQMD *CEQA Air Quality Guidelines*. Using Appendix G evaluation

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2 BAAQMD. Improving Air Quality & Health in Bay Area Communities, Community Air Risk Program (CARE) Retrospective & Path Forward (2004 – 2013). April 2014. http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Documents/CARE_Retrospective_April2014.ashx?la=en

3 BAAQMD. Identifying Areas with Cumulative Impacts from Air Pollution in the San Francisco Bay Area. March 2014. http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CARE%20Program/Documents/ImpactCommunities_2_Methodology.ashx?la=en

thresholds, the proposed project would be considered to have significant air quality impacts if it were to:

A. Conflict with or obstruct implementation of the applicable air quality plan;

B. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

C. Expose sensitive receptors to substantial pollutant concentrations;

D. Create objectionable odors affecting a substantial number of people; or

E. Result in a cumulatively considerable net increase of any nonattainment pollutant, and/or health impacts (including releasing emissions that exceed quantitative thresholds for ozone precursors).

The air quality analysis follows the methodology presented in the recent CEQA Guidelines released by the BAAQMD in May 2012. However, since the May 2012 *CEQA Air Quality Guidelines* do not provide specific significance thresholds, the thresholds and methodologies from the BAAQMD's 2011 *CEQA Air Quality Guidelines* were used to evaluate the potential impacts of remediation activities. The thresholds of significance applied to assess project-level air quality impacts are:

- Average daily construction exhaust emissions of 54 pounds per day of ROG, NO_x, or PM2.5 or 82 pounds per day of PM10;
- Average daily operation emissions of 54 pounds per day of ROG, NO_x, or PM2.5 or 82 pounds per day of PM10; or result in maximum annual emissions of 10 tons per year of ROG, NO_x, or PM2.5 or 15 tons per year of PM10;
- Exposure of persons by siting a new source or a new sensitive receptor to substantial levels of TACs resulting in (a) a cancer risk level greater than 10 in one million, (b) a noncancerous risk (chronic or acute) hazard index greater than 1.0, or (c) an increase of annual average PM2.5 of greater than 0.3 micrograms per cubic meter ($\mu g/m^3$). For this threshold, sensitive receptors include residential uses, schools, parks, daycare centers, nursing homes, and medical centers; or
- Frequently and for a substantial duration, create or expose sensitive receptors to substantial objectionable odors affecting a substantial number of people.

Assessment of a significant cumulative impact if it would result in:

- Exposure of persons, by siting a new source or a new sensitive receptor, to substantial levels of TACs during either construction or operation resulting in (a) a cancer risk level greater than 100 in a million, (b) a noncancer risk (chronic or acute) hazard index greater than 10.0, or (c) annual average $PM_{2.5}$ of greater than 0.8 $\mu g/m^3$.

The BAAQMD air quality significance thresholds are found in **Table AQ-2**.

The BAAQMD *CEQA Air Quality Guidelines* identify a project-specific threshold of either 1,100 metric tons of CO_2e per year or 4.6 metric tons of CO_2e per year per service population (i.e., the number of residents plus the number of employees associated with a new development), which

is also considered a cumulatively considerable contribution to the global GHG burden and, therefore, a significant cumulative impact. This analysis applies the 1,100 metric tons of CO_2e per year significance criterion to proposed project GHG emissions.

Table AQ–2

BAAQMD Air Quality Significance Thresholds

Pollutant	Construction Thresholds	Daily Operational Thresholds	Annual Operational Thresholds
Criteria Air Pollutants			
Reactive Organic Compounds (ROG)	54	54	10
Nitrogen Oxides (NOx)	54	54	10
Coarse Particulate matter (PM10)	82	82	15
Fine Particulate Matter (PM2.5)	54	54	10
Carbon Monoxide (CO)	NA	9.0 ppm (8-hour) and 20.0 ppm (1-hour)	
Fugitive Dust	Best Management Practices	NA	
Project Health Risk and Hazards			
Excess Cancer Risk	10 per million	10 per million	
Chronic Hazard Index	1.0	1.0	
Acute Hazard Index	1.0	1.0	
Incremental Annual Average PM2.5	0.3 μg/m^3	0.3 μg/m^3	
Cumulative Health Risk and Hazards			
Excess Cancer Risk	100 per million	100 per million	
Chronic Hazard Index	10.0	10.0	
Acute Hazard Index	10.0	10.0	
Incremental Annual Average PM2.5	0.8 μg/m^3	0.8 μg/m^3	
Greenhouse Gas Emissions			
Annual Emissions	1,100 metric tons or 4.6 metric tons per capita		

SOURCE: BAAQMD Adopted Air Quality CEQA Thresholds of Significance - June 2, 2010, http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/Summary_Table_Proposed_BAAQMD_CEQA_Thresholds_May_3_2010.ashx?la=en

Appendix AQ–2

Air Quality Calculation Assumptions and Methodologies

Appendix AQ-2

Air Quality Calculation Assumptions and Methodologies

The analysis focuses on daily and annual emissions from the excavation activities (offroad equipment, haul trucks, and fugitive dust) activities. This air quality analysis is consistent with the methods described in the BAAQMD *CEQA Air Quality Guidelines* (dated June 2010, updated in May 2011, and revised in May 2012).[1] Mitigation measures are presented to reduce impacts to less than significant, as applicable.

Air quality calculations were made for combustion sources such as on-road vehicles from employees and haul trucks as well as onsite combustion equipment such as loaders and excavators. Fugitive dust from grading, loading/unloading, and vehicle movement on unpaved surfaces was also calculated.

The air quality analysis includes a review of criteria pollutant[2] emissions such as carbon monoxide (CO)[3], nitrogen oxides (NO_x), sulfur dioxide (SO_2), volatile organic compounds (VOC) as reactive organic gases (ROG)[4], particulate matter less than 10 micrometers (PM10), particulate matter less than 2.5 micrometers (PM2.5).[5] The HRA addresses diesel particulate matter (DPM) emissions from on-site offroad equipment and haul trucks and cumulative impacts from nearby roadways such as Kirker Pass Road.

Regulatory models used to estimate air quality impacts include:

- California Air Resources Board's (CARB) EMFAC[6]emissions inventory model. EMFAC is the latest emission inventory model that calculates emission inventories and emission

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1 The Air District's June 2010 adopted thresholds of significance were challenged in a lawsuit. Although the BAAQMD's adoption of significance thresholds for air quality analysis has been subject to judicial actions, the lead agency has determined that BAAQMD's Revised Draft Options and Justification Report (October 2009) provide substantial evidence to support the BAAQMD recommended thresholds. Therefore, the lead agency has determined the BAAQMD recommended thresholds are appropriate for use in this analysis.

2 Criteria air pollutants refer to those air pollutants for which the United States Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) has established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) under the Federal Clean Air Act (CAA).

3 CO is a non–reactive pollutant that is a product of incomplete combustion of organic material, and is mostly associated with motor vehicle traffic, and in wintertime, with wood–burning stoves and fireplaces.

4 VOC means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions and thus, a precursor of ozone formation. ROGs are any reactive compounds of carbon, excluding methane, CO, CO_2, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and other exempt compounds. The terms VOC and ROG are often used interchangeably.

5 PM10 and PM2.5 consists of airborne particles that measure 10 microns or less in diameter and 2.5 microns or less in diameter, respectively. PM10 and PM2.5 represent fractions of particulate matter that can be inhaled into the air passages and the lungs, causing adverse health effects.

6 CARB EMFAC User's Guide, December 20, 2012, http://www.arb.ca.gov/msei/modeling.htm

rates for motor vehicles operating on roads in California. This model reflects CARB's current understanding of how vehicles travel and how much they emit. EMFAC can be used to show how California motor vehicle emissions have changed over time and are projected to change in the future.

- CARB OFFROAD[7] emissions inventory model. OFFROAD is the latest emission inventory model that calculates emission inventories and emission rates for off-road equipment such as loaders, excavators, and off-road haul trucks operating in California. This model reflects CARB's current understanding of how equipment operates and how much they emit. OFFROAD can be used to show how California off-road equipment emissions have changed over time and are projected to change in the future.

- CalEEMod (California Emissions Estimator Model Version 2013.2.2)[8] land use emissions model estimates emissions due to demolition and construction activities and operations.

- USEPA AP-42, Compilation of Air Pollutant Emission Factors, has been published since 1972 as the primary compilation of USEPA's emission factor information. It contains emission factors and process information for more than 200 air pollution source categories. A source category is a specific industry sector or group of similar emitting sources. The emission factors have been developed and compiled from source test data, material balance studies, and engineering estimates.

- AERMOD (American Meteorological Society/USEPA Regulatory Model) is an atmospheric dispersion model which can simulate point, area, volume, and line emissions sources and has the capability to include simple, intermediate, and complex terrain along with meteorological conditions and multiple receptor locations.[9,10] AERMOD is commonly executed to yield 1-hour maximum and annual average concentrations (in $\mu g/m^3$) at each receptor.

On-Road Vehicles

Vehicular emissions were computed using the CARB's emission factor model, EMFAC, to estimate on-road emissions. Employee trips were modeled using the light-duty auto classification. Paved road dust, break wear, and tire wear particulate emissions were also accounted for and included in the analysis using EMFAC factors and methodologies from CARB and the USEPA. The proposed project would include approximately nine employees, each traveling a round trip distance of 15 miles. Employee trips are assumed to be a composite of gasoline and diesel vehicles. Vehicles speeds are assumed to be 30 miles per hour.

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7 CARB OFFROAD Instructions, http://www.arb.ca.gov/msprog/ordiesel/info_1085/oei_write_up.pdf

8 California Emissions Estimator Model User's Guide, July 2013. http://www.caleemod.com/

9 USEPA Preferred/Recommended Models, *AERMOD Modeling System*, http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod.

10 Title 40 CFR Part 51, *Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule,* http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf.

Haul trucks were modeled using the T6 classification, which is a heavy-heavy duty truck emission factor for haul trucks. Paved road dust, break wear, and tire wear particulate emissions were also accounted for and included in the analysis using EMFAC factors and methodologies from CARB and the USEPA.

Assuming 21 haul trips (one-way) per day and 482 haul trips (one-way) for the proposed project. The end dump trailers would have a capacity of 25 to 30 cubic yards and the roll-off containers would have a capacity of 12 to 15 cubic yards. Approximately five to ten haul trucks would be used at any time. A total of 7,800 cubic yards of soil material would be transported to Keller Canyon Landfill, at an average of 24 tons per truck load (or 16.2 cubic yards per truck load).

Haul trucks would only be at the loading area during operating hours when picking up a load. Haul trucks are diesel powered and assume a travel distance of 4.6 miles (9.2 miles round trip) to Keller Canyon Landfill. Haul trucks would travel through the CNWS for about 9,000 feet on about ½ gravel and ½ asphalt and then 15,000 feet north on the paved surface of Bailey Road to the Keller Canyon landfill. Vehicles speeds are assumed to be 15 miles per hour. Transport to and from Keller Canyon landfill would be conducted during the hours of 6 a.m. to 6 p.m. - five days a week (between July and November).

Trucks would idle during loading/unloading and during load weighing/financial transaction at the landfill scale house. Idling emissions were calculated using idling emission factors from the EMFAC model and idle limits of five minutes.

Criteria pollutant emissions associated with on-road vehicles were calculated by combining the activity information with emissions factors, in grams per mile and grams per idle hour, derived using the CARB EMFAC emissions model.[11] Emissions calculations were based on **Equation 1**. The EMFAC emissions factors are summarized on **Table AQ-3** for employee vehicles, haul trucks, and truck idling.

Equation 1

*Emission Rate (tons/year) = EMFAC Emission Factor (gram/mile) * trips per day * miles per trip * days/year * (453.59/2000 tons/gram)*

*Emission Rate (tons/year) = EMFAC Emission Factor (gram/hour) * total idle hours * (453.59/2000 tons/gram)*

[11] CARB EMFAC Emissions Model, http://www.arb.ca.gov/msei/modeling.htm

Table AQ-3

On-Road Vehicle Emission Factors (gram/mile and gram/hour)

Condition	ROG	CO	NOx	CO2	PM10	PM2.5
Employee Vehicles	0.044	1.73	0.114	390	0.002	0.002
Haul Trucks	0.50	1.12	9.45	1,771	0.15	0.14
Haul Trucks (idle)	6.39	34.4	66.2	7,030	0.31	0.28

Source: CARB EMFAC.
CO = carbon monoxide; NO_X = oxides of nitrogen; PM10 = particulate matter with diameter equal to or less than 10 micrometers; PM2.5 = particulate matter with diameter equal to or less than 2.5 micrometers; ROG = reactive organic gas; CO_2 = carbon dioxide

Off-Road Equipment

Operation of the proposed project would require the use of heavy-duty equipment, such as excavators, loaders, graders, and off-road haul trucks. This equipment would be used extract contaminated soil and to load and unload excavated soil. Emission factors from the OFFROAD model, as included in CalEEMod were used. Equipment load factors were adjusted using the latest information in the OFFROAD emissions model.

Parameters for off-road equipment, including equipment and fuel type, estimated horsepower and estimated annual hours of operation, were developed. Hours of off-road equipment operation were based on normal business hours of 12 hours per day (6 a.m. to 6 p.m.), six days per week (between July and November). From beginning to end the proposed project would take two months or 40 work days.

This information was applied to criteria pollutant emissions factors, in grams per horsepower-hour, primarily derived using the CARB OFFROAD emissions model (i.e., the Offroad Emissions Inventory [OEI] Database).[12] **Equation 2** outlines how off-road offroad equipment emissions were computed, and the emissions factors used in this assessment are summarized, by equipment type, on **Tables AQ-4**.

Equation 2

*Emission Rate (tons/year) = OFFROAD Emission Factor (gram/hp-hour) * size (hp) * hours of operation * Load Factor * (453.59/2000 tons/gram)*

Table AQ-4

Offroad Equipment Emission Factors (gram/hp-hour)

Equipment	ROG	CO	NOx	CO2	PM10	PM2.5
Excavator	0.23	1.32	3.21	510	0.00	0.10
Grader	0.33	1.79	3.72	512	0.00	0.14
Loader	0.33	1.37	4.78	510	0.00	0.16
Sweeper/Washer	0.83	4.10	6.89	514	0.00	0.61

Source: CARB OFFROAD.
CO = carbon monoxide; NO_X = oxides of nitrogen; PM10 = particulate matter with diameter equal to or less than 10 micrometers; PM2.5 = particulate matter with diameter equal to or less than 2.5 micrometers; ROG = reactive organic gas; CO_2 = carbon dioxide

[12] CARB OFFROAD Emissions Model, http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles

Handling and Storage

Fugitive particulate matter emissions are expected from the handling and storage of soil materials from the excavation activities. The methodology for the calculation of particulate emissions from the handling and storage of materials is described in Section 13.2.4 of EPA's AP-42 for handling and storage piles.[13] The quantity of dust emissions from handling and storage operations varies with the volume of material passing through the storage cycle. The emission factor for the quantity of emissions per quantity of material is estimated using the following equation:

$$EF = k(0.0032)\frac{\left[\frac{U}{5}\right]^{1.3}}{\left[\frac{M}{2}\right]^{1.4}}$$

where:

EF	=	emission factor (lb emissions/ton material)
k	=	particulate size multiplier (PM10 = 0.35, PM2.5 = 0.053)
U	=	mean wind speed (7.4 mph)
M	=	material moisture content (0.7 percent)

Based on available data, the emission factors for handling and storage activities are 0.0081 and 0.0012 pounds per ton of material processed (uncontrolled) of PM10 and PM2.5, respectively; and 0.0020 and 0.0003 pounds per ton of material processed (controlled) of PM10 and PM2.5, respectively. Weather data (wind speed) was acquired from the Western Regional Climate Center for Concord.[14] To account for emission controls, a control efficiency of 75 percent was applied. A silica content of 78 percent was assumed for this analysis.[15]

Unpaved Surfaces

When a vehicle travels over an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed. The emission factors were calculated using the methodology found in Section 13.2, of the USEPA's AP-42.[16] The equation for developing the emission factor is:

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13 USEPA. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Section 13.2.4 *Aggregate Handling and Storage Piles* (http://www.epa.gov/ttnchie1/ap42/ch13/final/c13s0204.pdf), November 2006.

14 Western Regional Climate Center, http://www.wrcc.dri.edu/summary/ccr.ca.html

15 Rhyolite silica content (SiO2) approximately 70 to 78 percent http://www.flashcardmachine.com/civil220-igneous-rocks.html

16 USEPA. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Section 13.2.2 *Unpaved Roads* (http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s0202.pdf), November 2006.

$$EF = k\,(S/12)^a(W/3)^b\,[(365-p)/365]\,(1-CE)$$

where:

EF	=	size-specific emission factor (lb/VMT)
k	=	empirical constant (PM10 = 1.5, PM2.5 = 0.15)
S	=	Silt content of 8.3 percent (use whole number value)
W	=	Mean vehicle weight (17.5 tons, the average of empty and full)
p	=	Number of days with measurable precipitation (68 days)
a	=	0.9 (empirical constant)
b	=	0.45 (empirical constant)
CE	=	Control efficiency rate of 84 percent

Based on available data, the emission factor for unpaved roads is 2.4 and 0.26 pounds of PM10 and PM2.5 per vehicle mile traveled (uncontrolled), respectively; and 0.3 and 0.03 pounds of PM10 and PM2.5 per vehicle mile traveled (controlled), respectively. To account for emission controls, a control efficiency of 84 percent was applied.[17] The number of days with measurable precipitation in Concord, California, were acquired from the Western Regional Climate Center.[18] The project condition provides for 21 daily and 482 total haul trips; each vehicle is presumed to be traveling a distance of 1.7 miles one-way from the project site to Bailey Road on an unpaved circulation area. A silica content of 78 percent was assumed for this analysis.[19] The length of the road would be treated with dust palliatives and watered for dust control and soil stabilization.

Storage Pile Wind Erosion

In addition to emissions from the handling of storage piles, USEPA provides a methodology for calculating emissions from wind erosion of storage piles as documented in AP-42 Section 13.2.5. The emission factor for wind-generated particulate emissions is dependent on the frequency of disturbance of the storage pile and is expressed in units of grams per square meter (g/m^2) per year. The following equations were used to calculate the emission factor.

$$EF = k\sum_{i=1}^{N} P_i$$

$$P_i = 58(u^* - u_t^*)^2 + 25(u^* - u_t^*); P_i = 0 \;\; for \;\; u^* \le u_t^*$$

[17] South Coast Air Quality Management District, Table XI-B - *Mitigation Measures Examples: Fugitive Dust From Material Handling* and *WRAP Fugitive Dust Handbook*, September 7, 2006 (http://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

[18] Western Regional Climate Center, http://www.wrcc.dri.edu/summary/ccr.ca.html

[19] Rhyolite silica content (SiO2) approximately 70 to 78 percent http://www.flashcardmachine.com/civil220-igneous-rocks.html

$$u^{\bullet} = 0.4\, u_{10} / \ln(z / zo)$$

where:

EF	=	emission factor (g/m²/yr)
k	=	aerodynamic particle size multiplier (0.5) dimensionless
P	=	erosion potential (g/m²)
N	=	number of disturbances (10 disturbances per year)
$u^{\bullet}$	=	friction velocity (m/s)
$u_t^{\bullet}$	=	threshold friction velocity (1.02 m/s) (AP42, 1995)
u_{10}	=	fastest mile wind speed (42 mph) for Concord, California
z	=	10 m
zo	=	0.1 m)

The basis of this methodology is that wind-blown dust from exposed areas will occur only when two conditions are met: the surface of the exposed area is disturbed and winds occur in excess of a threshold wind speed. Once the two conditions have been met, the emission factor is used to determine how much dust is generated. No more wind erosion occurs until the surface is again disturbed and the wind again exceeds the threshold speed. The calculation assumes the storage piles would be disturbed daily, when the 2-minute wind speed exceeds the threshold velocity of 23 mph. As a worst-case assumption, this condition was assumed to occur each day of excavation. Based on meteorological data for Concord, this occurs approximately 19 days per year.

Based on available data, the emission factor for handling and storage activities is 18.4 grams of PM10 per square meter of stockpile (uncontrolled) and 4.6 grams of PM10 per square meter of stockpile (controlled). The emission factor for handling and storage activities is 2.8 grams of PM2.5 per square meter of stockpile (uncontrolled) and 0.7 grams of PM2.5 per square meter of stockpile (controlled). To account for emission controls, a control efficiency of 75 percent was applied. A silica content of 78 percent was assumed for this analysis.[20]

Grading Activity

Fugitive dust emissions from grading equipment passes were determined using the methodology found in Section 11.9 of EPA's AP-42.[21] PM10 emission factor estimated applying a scaling factor to that of total suspended particulates (TSP). Similarly, the emission factor of PM2.5 was scaled from that of TSP. The equations used to calculate the emission factors for TSP and the scaling factors for those of PM10 and PM2.5 are presented:

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[20] Rhyolite silica content (SiO2) approximately 70 to 78 percent http://www.flashcardmachine.com/civil220-igneous-rocks.html

[21] USEPA. Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, 11.9 *Western Surface Coal Mining* (http://www.epa.gov/ttn/chief/ap42/ch11/final/c11s09.pdf), November 2006.

$$EF_{PM15} = 0.051(S)^{2.0}, \text{ and } EF_{PM10} = EF_{PM15} \times F_{PM10}$$

$$EF_{TSP} = 0.04(S)^{2.5}, \text{ and } EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$$

where:

EF = emission factor (lb/VMT)

S = mean vehicle speed (mph). The AP-42 default value is 7.1 mph

F_{PM10} = PM_{10} AP-42 default scaling factor is 0.6

$F_{PM2.5}$ = $PM_{2.5}$ AP-42 default scaling factor is 0.031

The grading dust emissions are estimated by multiplying the emission factors with the total vehicle miles traveled (VMT) for the grading equipment. The VMT are estimated based on the dimensions of the grading area and the blade width of the grading equipment. It was assumed that 0.5 acres would be graded per day. In addition, a default blade width of 12 feet was assumed based on Caterpillar's 140 Motor Grader.[22]

$$E = EF \times VMT, \text{ and}$$

$$VMT = (A_s/W_b)(43{,}560 \text{ ft}^2/\text{acre})/(5{,}280 \text{ ft/mile})$$

where:

E = emissions (lb)

EF = emission factor (lb/VMT)

VMT = vehicle miles traveled (mile)

A_s = acreage of the grading site (0.5 acres per day)

W_b = Blade width of the grading equipment (12 feet)

Based on available data, the emission factor for grading equipment activities is 12.2 and 1.3 pounds (uncontrolled) of PM10 and PM2.5, respectively; and 11.6 and 1.2 pounds (controlled) of PM_{10} and $PM_{2.5}$, respectively. To account for emission controls, a control efficiency of 5 percent was applied. A silica content of 78 percent was assumed for this analysis.[23]

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[22] Caterpillar, http://www.cat.com/en_US/products.html?x=7.

[23] Rhyolite silica content (SiO2) approximately 70 to 78 percent http://www.flashcardmachine.com/civil220-igneous-rocks.html

Appendix AQ-2

Demolition Emissions

CalEEMod Output Files

- Annual
- Summer
- Winter
- Mitigation Report

Employee Vehicle and Haul Truck Emissions

Construction Equipment Emissions

Fugitive Dust Emissions

Phillips 66 Soil Remediation Building Demolition

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	0.00	Dwelling Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Only demolition

Construction Phase - Demolition Only

Trips and VMT -

Demolition -

Grading -

Construction Off-road Equipment Mitigation - BAAQMD Enhanced Mitigation Measures

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00

tblArchitecturalCoating	EF_Residential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	250.00
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	PhaseEndDate	6/26/2015	6/28/2015
tblConstructionPhase	PhaseEndDate	6/28/2015	12/31/2015
tblConstructionPhase	PhaseStartDate	6/29/2015	1/1/2016
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.0148	0.1232	0.0966	1.4000e-004	3.0100e-003	8.8000e-003	0.0118	5.8000e-004	8.4100e-003	8.9900e-003	0.0000	12.3677	12.3677	2.2800e-003	0.0000	12.4155
Total	**0.0148**	**0.1232**	**0.0966**	**1.4000e-004**	**3.0100e-003**	**8.8000e-003**	**0.0118**	**5.8000e-004**	**8.4100e-003**	**8.9900e-003**	**0.0000**	**12.3677**	**12.3677**	**2.2800e-003**	**0.0000**	**12.4155**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	5.5100e-003	0.1077	0.0881	1.4000e-004	1.9400e-003	2.0700e-003	4.0000e-003	4.2000e-004	2.0600e-003	2.4800e-003	0.0000	12.3677	12.3677	2.2800e-003	0.0000	12.4155
Total	**5.5100e-003**	**0.1077**	**0.0881**	**1.4000e-004**	**1.9400e-003**	**2.0700e-003**	**4.0000e-003**	**4.2000e-004**	**2.0600e-003**	**2.4800e-003**	**0.0000**	**12.3677**	**12.3677**	**2.2800e-003**	**0.0000**	**12.4155**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**62.72**	**12.54**	**8.87**	**0.00**	**35.55**	**76.48**	**66.13**	**27.59**	**75.51**	**72.41**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/28/2015	5	20	
2	Site Preparation	Site Preparation	1/1/2016	12/31/2015	5	0	
3	Grading	Grading	1/1/2016	12/31/2015	5	0	
4	Building Construction	Building Construction	1/1/2016	12/31/2015	5	0	
5	Paving	Paving	1/1/2016	12/31/2015	5	0	
6	Architectural Coating	Architectural Coating	1/1/2016	12/31/2015	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	18.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	0.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.9500e-003	0.0000	1.9500e-003	2.9000e-004	0.0000	2.9000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0141	0.1194	0.0881	1.2000e-004		8.7500e-003	8.7500e-003		8.3600e-003	8.3600e-003	0.0000	10.8920	10.8920	2.2200e-003	0.0000	10.9387
Total	**0.0141**	**0.1194**	**0.0881**	**1.2000e-004**	**1.9500e-003**	**8.7500e-003**	**0.0107**	**2.9000e-004**	**8.3600e-003**	**8.6500e-003**	**0.0000**	**10.8920**	**10.8920**	**2.2200e-003**	**0.0000**	**10.9387**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.4000e-004	3.1300e-003	2.4500e-003	1.0000e-005	1.5000e-004	5.0000e-005	2.0000e-004	4.0000e-005	4.0000e-005	8.0000e-005	0.0000	0.6244	0.6244	1.0000e-005	0.0000	0.6245
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	6.2000e-004	6.0500e-003	1.0000e-005	9.1000e-004	1.0000e-005	9.2000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8513	0.8513	5.0000e-005	0.0000	0.8524
Total	**6.6000e-004**	**3.7500e-003**	**8.5000e-003**	**2.0000e-005**	**1.0600e-003**	**6.0000e-005**	**1.1200e-003**	**2.8000e-004**	**5.0000e-005**	**3.3000e-004**	**0.0000**	**1.4757**	**1.4757**	**6.0000e-005**	**0.0000**	**1.4768**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					8.8000e-004	0.0000	8.8000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8500e-003	0.1040	0.0796	1.2000e-004		2.0100e-003	2.0100e-003		2.0100e-003	2.0100e-003	0.0000	10.8920	10.8920	2.2200e-003	0.0000	10.9387
Total	**4.8500e-003**	**0.1040**	**0.0796**	**1.2000e-004**	**8.8000e-004**	**2.0100e-003**	**2.8900e-003**	**1.3000e-004**	**2.0100e-003**	**2.1400e-003**	**0.0000**	**10.8920**	**10.8920**	**2.2200e-003**	**0.0000**	**10.9387**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.4000e-004	3.1300e-003	2.4500e-003	1.0000e-005	1.5000e-004	5.0000e-005	2.0000e-004	4.0000e-005	4.0000e-005	8.0000e-005	0.0000	0.6244	0.6244	1.0000e-005	0.0000	0.6245
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.2000e-004	6.2000e-004	6.0500e-003	1.0000e-005	9.1000e-004	1.0000e-005	9.2000e-004	2.4000e-004	1.0000e-005	2.5000e-004	0.0000	0.8513	0.8513	5.0000e-005	0.0000	0.8524
Total	**6.6000e-004**	**3.7500e-003**	**8.5000e-003**	**2.0000e-005**	**1.0600e-003**	**6.0000e-005**	**1.1200e-003**	**2.8000e-004**	**5.0000e-005**	**3.3000e-004**	**0.0000**	**1.4757**	**1.4757**	**6.0000e-005**	**0.0000**	**1.4768**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527627	0.065080	0.176461	0.145848	0.036424	0.004888	0.009671	0.020781	0.001221	0.001487	0.006359	0.002101	0.002052

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/ Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/ Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Phillips 66 Soil Remediation Building Demolition

Contra Costa County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	0.00	Dwelling Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Only demolition

Construction Phase - Demolition Only

Trips and VMT -

Demolition -

Grading -

Construction Off-road Equipment Mitigation - BAAQMD Enhanced Mitigation Measures

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00

tblArchitecturalCoating	EF_Residential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	250.00
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	PhaseEndDate	6/26/2015	6/28/2015
tblConstructionPhase	PhaseEndDate	6/28/2015	12/31/2015
tblConstructionPhase	PhaseStartDate	6/29/2015	1/1/2016
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.4803	12.2981	9.6760	0.0139	0.3047	0.8802	1.1849	0.0588	0.8409	0.8996	0.0000	1,371.7228	1,371.7228	0.2512	0.0000	1,376.9980
Total	**1.4803**	**12.2981**	**9.6760**	**0.0139**	**0.3047**	**0.8802**	**1.1849**	**0.0588**	**0.8409**	**0.8996**	**0.0000**	**1,371.7228**	**1,371.7228**	**0.2512**	**0.0000**	**1,376.9980**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	0.5536	10.7541	8.8185	0.0139	0.1976	0.2066	0.4042	0.0426	0.2062	0.2487	0.0000	1,371.7228	1,371.7228	0.2512	0.0000	1,376.9980
Total	**0.5536**	**10.7541**	**8.8185**	**0.0139**	**0.1976**	**0.2066**	**0.4042**	**0.0426**	**0.2062**	**0.2487**	**0.0000**	**1,371.7228**	**1,371.7228**	**0.2512**	**0.0000**	**1,376.9980**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**62.61**	**12.55**	**8.86**	**0.00**	**35.15**	**76.53**	**65.89**	**27.58**	**75.48**	**72.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/28/2015	5	20	
2	Site Preparation	Site Preparation	1/1/2016	12/31/2015	5	0	
3	Grading	Grading	1/1/2016	12/31/2015	5	0	
4	Building Construction	Building Construction	1/1/2016	12/31/2015	5	0	
5	Paving	Paving	1/1/2016	12/31/2015	5	0	
6	Architectural Coating	Architectural Coating	1/1/2016	12/31/2015	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	18.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	0.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1947	0.0000	0.1947	0.0295	0.0000	0.0295			0.0000			0.0000
Off-Road	1.4120	11.9409	8.8138	0.0120		0.8748	0.8748		0.8359	0.8359		1,200.6386	1,200.6386	0.2451		1,205.7861
Total	**1.4120**	**11.9409**	**8.8138**	**0.0120**	**0.1947**	**0.8748**	**1.0695**	**0.0295**	**0.8359**	**0.8653**		**1,200.6386**	**1,200.6386**	**0.2451**		**1,205.7861**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0220	0.3022	0.2031	6.8000e-004	0.0157	4.6400e-003	0.0203	4.2900e-003	4.2700e-003	8.5600e-003		68.8900	68.8900	5.8000e-004		68.9022
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0550	0.6591	1.1800e-003	0.0943	7.9000e-004	0.0951	0.0250	7.2000e-004	0.0257		102.1942	102.1942	5.5000e-003		102.3097
Total	**0.0683**	**0.3572**	**0.8621**	**1.8600e-003**	**0.1100**	**5.4300e-003**	**0.1154**	**0.0293**	**4.9900e-003**	**0.0343**		**171.0842**	**171.0842**	**6.0800e-003**		**171.2119**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0876	0.0000	0.0876	0.0133	0.0000	0.0133			0.0000			0.0000
Off-Road	0.4852	10.3969	7.9564	0.0120		0.2012	0.2012		0.2012	0.2012	0.0000	1,200.6386	1,200.6386	0.2451		1,205.7861
Total	**0.4852**	**10.3969**	**7.9564**	**0.0120**	**0.0876**	**0.2012**	**0.2888**	**0.0133**	**0.2012**	**0.2144**	**0.0000**	**1,200.6386**	**1,200.6386**	**0.2451**		**1,205.7861**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0220	0.3022	0.2031	6.8000e-004	0.0157	4.6400e-003	0.0203	4.2900e-003	4.2700e-003	8.5600e-003		68.8900	68.8900	5.8000e-004		68.9022
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0463	0.0550	0.6591	1.1800e-003	0.0943	7.9000e-004	0.0951	0.0250	7.2000e-004	0.0257		102.1942	102.1942	5.5000e-003		102.3097
Total	**0.0683**	**0.3572**	**0.8621**	**1.8600e-003**	**0.1100**	**5.4300e-003**	**0.1154**	**0.0293**	**4.9900e-003**	**0.0343**		**171.0842**	**171.0842**	**6.0800e-003**		**171.2119**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527627	0.065080	0.176461	0.145848	0.036424	0.004888	0.009671	0.020781	0.001221	0.001487	0.006359	0.002101	0.002052

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Phillips 66 Soil Remediation Building Demolition

Contra Costa County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	0.00	Dwelling Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2016
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Only demolition

Construction Phase - Demolition Only

Trips and VMT -

Demolition -

Grading -

Construction Off-road Equipment Mitigation - BAAQMD Enhanced Mitigation Measures

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Nonresidential_Interior	100.00	250.00

tblArchitecturalCoating	EF_Residential_Exterior	150.00	250.00
tblArchitecturalCoating	EF_Residential_Interior	100.00	250.00
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	DPF	No Change	Level 2
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	4.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	1.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	2.00
tblConstEquipMitigation	NumberOfEquipmentMitigated	0.00	8.00
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2

tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstEquipMitigation	Tier	No Change	Tier 2
tblConstructionPhase	NumDays	0.00	20.00
tblConstructionPhase	PhaseEndDate	6/26/2015	6/28/2015
tblConstructionPhase	PhaseEndDate	6/28/2015	12/31/2015
tblConstructionPhase	PhaseStartDate	6/29/2015	1/1/2016
tblProjectCharacteristics	OperationalYear	2014	2016
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	1.4835	12.3271	9.7378	0.0138	0.3047	0.8803	1.1850	0.0588	0.8409	0.8997	0.0000	1,362.0669	1,362.0669	0.2512	0.0000	1,367.3422
Total	**1.4835**	**12.3271**	**9.7378**	**0.0138**	**0.3047**	**0.8803**	**1.1850**	**0.0588**	**0.8409**	**0.8997**	**0.0000**	**1,362.0669**	**1,362.0669**	**0.2512**	**0.0000**	**1,367.3422**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	0.5567	10.7831	8.8804	0.0138	0.1976	0.2066	0.4042	0.0426	0.2062	0.2487	0.0000	1,362.0669	1,362.0669	0.2512	0.0000	1,367.3422
Total	**0.5567**	**10.7831**	**8.8804**	**0.0138**	**0.1976**	**0.2066**	**0.4042**	**0.0426**	**0.2062**	**0.2487**	**0.0000**	**1,362.0669**	**1,362.0669**	**0.2512**	**0.0000**	**1,367.3422**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**62.47**	**12.53**	**8.81**	**0.00**	**35.15**	**76.53**	**65.89**	**27.58**	**75.48**	**72.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/28/2015	5	20	
2	Site Preparation	Site Preparation	1/1/2016	12/31/2015	5	0	
3	Grading	Grading	1/1/2016	12/31/2015	5	0	
4	Building Construction	Building Construction	1/1/2016	12/31/2015	5	0	
5	Paving	Paving	1/1/2016	12/31/2015	5	0	
6	Architectural Coating	Architectural Coating	1/1/2016	12/31/2015	5	0	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Rubber Tired Dozers	1	1.00	255	0.40
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	18.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	0.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	12.40	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Use DPF for Construction Equipment

Water Exposed Area

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.1947	0.0000	0.1947	0.0295	0.0000	0.0295			0.0000			0.0000
Off-Road	1.4120	11.9409	8.8138	0.0120		0.8748	0.8748		0.8359	0.8359		1,200.6386	1,200.6386	0.2451		1,205.7861
Total	**1.4120**	**11.9409**	**8.8138**	**0.0120**	**0.1947**	**0.8748**	**1.0695**	**0.0295**	**0.8359**	**0.8653**		**1,200.6386**	**1,200.6386**	**0.2451**		**1,205.7861**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0264	0.3182	0.2906	6.8000e-004	0.0157	4.6600e-003	0.0203	4.2900e-003	4.2900e-003	8.5800e-003		68.7297	68.7297	5.8000e-004		68.7420
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0451	0.0679	0.6334	1.0700e-003	0.0943	7.9000e-004	0.0951	0.0250	7.2000e-004	0.0257		92.6986	92.6986	5.5000e-003		92.8141
Total	**0.0715**	**0.3861**	**0.9240**	**1.7500e-003**	**0.1100**	**5.4500e-003**	**0.1154**	**0.0293**	**5.0100e-003**	**0.0343**		**161.4283**	**161.4283**	**6.0800e-003**		**161.5561**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0876	0.0000	0.0876	0.0133	0.0000	0.0133			0.0000			0.0000
Off-Road	0.4852	10.3969	7.9564	0.0120		0.2012	0.2012		0.2012	0.2012	0.0000	1,200.6386	1,200.6386	0.2451		1,205.7861
Total	**0.4852**	**10.3969**	**7.9564**	**0.0120**	**0.0876**	**0.2012**	**0.2888**	**0.0133**	**0.2012**	**0.2144**	**0.0000**	**1,200.6386**	**1,200.6386**	**0.2451**		**1,205.7861**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0264	0.3182	0.2906	6.8000e-004	0.0157	4.6600e-003	0.0203	4.2900e-003	4.2900e-003	8.5800e-003		68.7297	68.7297	5.8000e-004		68.7420
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0451	0.0679	0.6334	1.0700e-003	0.0943	7.9000e-004	0.0951	0.0250	7.2000e-004	0.0257		92.6986	92.6986	5.5000e-003		92.8141
Total	**0.0715**	**0.3861**	**0.9240**	**1.7500e-003**	**0.1100**	**5.4500e-003**	**0.1154**	**0.0293**	**5.0100e-003**	**0.0343**		**161.4283**	**161.4283**	**6.0800e-003**		**161.5561**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	12.40	4.30	5.40	26.10	29.10	44.80	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.527627	0.065080	0.176461	0.145848	0.036424	0.004888	0.009671	0.020781	0.001221	0.001487	0.006359	0.002101	0.002052

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Vegetation

Phillips 66 Soil Remediation Building Demolition

Contra Costa County, Mitigation Report

Construction Mitigation Summary

Phase	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Demolition	0.63	0.13	0.09	0.00	0.77	0.76	0.00	0.00	0.00	0.00	0.00	0.00

OFFROAD Equipment Mitigation

Equipment Type	Fuel Type	Tier	Number Mitigated	Total Number of Equipment	DPF	Oxidation Catalyst
Air Compressors	Diesel	Tier 2	1	1	Level 2	0.00
Cement and Mortar Mixers	Diesel	Tier 2	4	4	Level 2	0.00
Concrete/Industrial Saws	Diesel	Tier 2	2	2	Level 2	0.00
Cranes	Diesel	Tier 2	1	1	Level 2	0.00
Forklifts	Diesel	Tier 2	2	2	Level 2	0.00
Graders	Diesel	Tier 2	1	1	Level 2	0.00
Pavers	Diesel	Tier 2	1	1	Level 2	0.00
Rollers	Diesel	Tier 2	1	1	Level 2	0.00
Rubber Tired Dozers	Diesel	Tier 2	2	2	Level 2	0.00
Tractors/Loaders/Backhoes	Diesel	Tier 2	8	8	Level 2	0.00

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Unmitigated tons/yr						Unmitigated mt/yr					
Concrete/ Industrial Saws	7.12000E-003	4.99400E-002	3.80300E-002	6.00000E-005	3.88000E-003	3.88000E-003	0.00000E+000	5.37657E+000	5.37657E+000	5.80000E-004	0.00000E+000	5.38869E+000
Rubber Tired Dozers	1.59000E-003	1.79800E-002	1.37200E-002	1.00000E-005	8.40000E-004	7.70000E-004	0.00000E+000	1.05906E+000	1.05906E+000	3.20000E-004	0.00000E+000	1.06570E+000
Tractors/Loaders/ Backhoes	5.41000E-003	5.14800E-002	3.63800E-002	5.00000E-005	4.03000E-003	3.71000E-003	0.00000E+000	4.45638E+000	4.45638E+000	1.33000E-003	0.00000E+000	4.48432E+000

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Mitigated tons/yr						Mitigated mt/yr					
Concrete/Industrial Saws	2.40000E-003	4.95400E-002	3.85900E-002	6.00000E-005	1.00000E-003	1.00000E-003	0.00000E+000	5.37657E+000	5.37657E+000	5.80000E-004	0.00000E+000	5.38869E+000
Rubber Tired Dozers	2.70000E-004	9.33000E-003	5.85000E-003	1.00000E-005	1.00000E-004	1.00000E-004	0.00000E+000	1.05906E+000	1.05906E+000	3.20000E-004	0.00000E+000	1.06570E+000
Tractors/Loaders/ Backhoes	2.18000E-003	4.51000E-002	3.51300E-002	5.00000E-005	9.10000E-004	9.10000E-004	0.00000E+000	4.45637E+000	4.45637E+000	1.33000E-003	0.00000E+000	4.48431E+000

Equipment Type	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	Percent Reduction											
Concrete/Industrial Saws	6.62921E-001	8.00961E-003	-1.47252E-002	0.00000E+000	7.42268E-001	7.42268E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Rubber Tired Dozers	8.30189E-001	4.81090E-001	5.73615E-001	0.00000E+000	8.80952E-001	8.70130E-001	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000	0.00000E+000
Tractors/Loaders/ Backhoes	5.97043E-001	1.23932E-001	3.43595E-002	0.00000E+000	7.74194E-001	7.54717E-001	0.00000E+000	2.24397E-006	2.24397E-006	0.00000E+000	0.00000E+000	2.22999E-006

Fugitive Dust Mitigation

Yes/No	Mitigation Measure	Mitigation Input		Mitigation Input		Mitigation Input	
No	Soil Stabilizer for unpaved Roads	PM10 Reduction	0.00	PM2.5 Reduction	0.00		
No	Replace Ground Cover of Area Disturbed	PM10 Reduction	0.00	PM2.5 Reduction	0.00		

Yes	Water Exposed Area	PM10 Reduction	55.00	PM2.5 Reduction	55.00	Frequency (per day)	2.00
No	Unpaved Road Mitigation	Moisture Content %	0.00	Vehicle Speed (mph)	0.00		
Yes	Clean Paved Road	% PM Reduction	0.00				

		Unmitigated		Mitigated		Percent Reduction	
Phase	Source	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Demolition	Fugitive Dust	0.00	0.00	0.00	0.00	0.55	0.55
Demolition	Roads	0.00	0.00	0.00	0.00	0.00	0.00

Operational Percent Reduction Summary

Category	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM2.5	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction												
Architectural Coating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Consumer Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hearth	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mobile	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Indoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water Outdoor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Operational Mobile Mitigation

Project Setting:

Mitigation	Category	Measure	% Reduction	Input Value 1	Input Value 2	Input Value 3
No	Land Use	Increase Density	0.00			
No	Land Use	Increase Diversity	0.00	0.15		
No	Land Use	Improve Walkability Design	0.00			
No	Land Use	Improve Destination Accessibility	0.00			
No	Land Use	Increase Transit Accessibility	0.25			
No	Land Use	Integrate Below Market Rate Housing	0.00			
	Land Use	Land Use SubTotal	0.00			
No	Neighborhood Enhancements	Improve Pedestrian Network				
No	Neighborhood Enhancements	Provide Traffic Calming Measures				
No	Neighborhood Enhancements	Implement NEV Network	0.00			
	Neighborhood Enhancements	Neighborhood Enhancements Subtotal	0.00			
No	Parking Policy Pricing	Limit Parking Supply	0.00			
No	Parking Policy Pricing	Unbundle Parking Costs	0.00			
No	Parking Policy Pricing	On-street Market Pricing	0.00			
	Parking Policy Pricing	Parking Policy Pricing Subtotal	0.00			
No	Transit Improvements	Provide BRT System	0.00			
No	Transit Improvements	Expand Transit Network	0.00			
No	Transit Improvements	Increase Transit Frequency	0.00			
	Transit Improvements	Transit Improvements Subtotal	0.00			
		Land Use and Site Enhancement Subtotal	0.00			

No	Commute	Implement Trip Reduction Program				
No	Commute	Transit Subsidy				
No	Commute	Implement Employee Parking "Cash Out"				
No	Commute	Workplace Parking Charge				
No	Commute	Encourage Telecommuting and Alternative Work Schedules	0.00			
No	Commute	Market Commute Trip Reduction Option	0.00			
No	Commute	Employee Vanpool/Shuttle	0.00		2.00	
No	Commute	Provide Ride Sharing Program				
	Commute	Commute Subtotal	0.00			
No	School Trip	Implement School Bus Program	0.00			
		Total VMT Reduction	0.00			

Area Mitigation

Measure Implemented	Mitigation Measure	Input Value
No	Only Natural Gas Hearth	
No	No Hearth	
No	Use Low VOC Cleaning Supplies	
No	Use Low VOC Paint (Residential Interior)	100.00
No	Use Low VOC Paint (Residential Exterior)	150.00
No	Use Low VOC Paint (Non-residential Interior)	100.00
No	Use Low VOC Paint (Non-residential Exterior)	150.00
No	% Electric Lawnmower	
No	% Electric Leafblower	

No	% Electric Chainsaw	

Energy Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Exceed Title 24		
No	Install High Efficiency Lighting		
No	On-site Renewable		

Appliance Type	Land Use Subtype	% Improvement
ClothWasher		30.00
DishWasher		15.00
Fan		50.00
Refrigerator		15.00

Water Mitigation Measures

Measure Implemented	Mitigation Measure	Input Value 1	Input Value 2
No	Apply Water Conservation on Strategy		
No	Use Reclaimed Water		
No	Use Grey Water		
No	Install low-flow bathroom faucet	32.00	
No	Install low-flow Kitchen faucet	18.00	
No	Install low-flow Toilet	20.00	
No	Install low-flow Shower	20.00	

No	Turf Reduction		
No	Use Water Efficient Irrigation Systems	6.10	
No	Water Efficient Landscape		

Solid Waste Mitigation

Mitigation Measures	Input Value
Institute Recycling and Composting Services Percent Reduction in Waste Disposed	

Emission Factors (gram/mile)

	ROG	CO	NOX	CO2	PM10	PM2_5
LDA	0.044	1.725	0.114	390	0.002	0.002
T6 Moving	0.497	1.121	9.445	1,771	0.146	0.135

Emissions (pounds per day)

	ROG	TOG_RUNI	CO	NOX	CO2	PM10	PM2_5
LDA	0.01	0.02	0.51	0.03	116	0.00	0.00
T6 Moving	0.21	0.24	0.47	3.98	745	0.06	0.06
T6 Idle	0.05	0.06	0.27	0.51	54.3	0.00	0.00
T6 Total	0.26	0.29	0.74	4.49	800	0.06	0.06
Grand Total	**0.27**	**0.31**	**1.25**	**4.52**	**916**	**0.06**	**0.06**

Emsisions (tons per year)

	ROG	TOG	CO	NOX	CO2	PM10	PM2_5
LDA	0.00	0.00	0.01	0.00	2.32	0.00	0.00
T6 Moving	0.00	0.00	0.01	0.05	8.55	0.00	0.00
T6 Idle	0.00	0.00	0.00	0.01	0.62	0.00	0.00
T6 Total	0.00	0.00	0.01	0.05	9.18	0.00	0.00
Grand Total	**0.00**	**0.00**	**0.02**	**0.05**	**11.5**	**0.00**	**0.00**

15	miles round trip per day
4.55	miles per one way trip
9	employees
21	maximum trucks trips/day
482	truck trips/year
5	minutes idle
2	months (July through November)
23	Effective days of activity at maximum daily rate

Year	Equipment	Usage Factor	#	HP	Load Factor	Emission Factor (gram/hp-hour) ROG	CO	NOX	CO2	SO2	PM10	PM2.5	CH4	Emissions (pounds/day) ROG	CO	NOX	CO2	SO2	PM10	PM2.5	CH4
2015	Excavators	0.67	2	300	0.38	0.23	1.32	3.21	510	0.00	0.10	0.10	0.15	0.94	5.33	13.0	2,064	0.02	0.42	0.39	0.62
2015	Graders	0.45	1	260	0.41	0.33	1.79	3.72	512	0.00	0.14	0.13	0.15	0.41	2.26	4.69	645	0.01	0.18	0.17	0.19
2015	Tractors/Loaders/Backhoes	0.45	2	175	0.37	0.33	1.37	4.78	510	0.00	0.16	0.14	0.15	0.51	2.13	7.42	791	0.01	0.24	0.22	0.24
2015	Sweepers/Scrubbers	0.59	1	100	0.46	0.83	4.10	6.89	514	0.00	0.61	0.56	0.15	0.59	2.92	4.92	367	0.00	0.44	0.40	0.11

		ROG	CO	NOX	CO2	SO2	PM10	PM2.5	CH4
Unmitigated	pounds per day	2.45	12.6	30.0	3,866	0.04	1.28	1.18	1.15
	tons per year	0.05	0.25	0.60	77.3	0.00	0.03	0.02	0.02
Mitigated	pounds per day	0.91	11.5	26.3	3,866	0.04	0.30	0.29	0.28
	tons per year	0.02	0.23	0.53	77.3	0.00	0.01	0.01	0.01

Phillips 66 Oil Spill Remediation Fugitive Dust Emissions

Activities	Uncontrolled Emission Factor PM10	Units	Project PM10 tons/year	Project PM10 lbs/day	Controlled Emission Factor PM10	Units	Project PM10 tons/year	Project PM10 lbs/day	Uncontrolled Emission Factor PM2.5	Units	Project PM2.5 tons/year	Project PM2.5 lbs/day	Controlled Emission Factor PM2.5	Units	Project PM2.5 tons/year	Project PM2.5 lbs/day	Notes/ Source
Loading of soil onto storage piles	0.0081	lb/ton	0.05	4.09	0.0020	lb/ton	0.01	1.02	0.0012	lb/ton	0.01	0.62	0.0003	lb/ton	0.002	0.15	AP-42, Section 13.2.4 Aggregate Handling And Storage Piles Assumes 75% Control efficiency
Unpaved Roads - Equipment traffic in storage area to Bailey Road	1.9 2.4	lb/VMT lb/VMT	1.59	170	0.3	lb/VMT	0.25	22.2	0.21 0.26	lb/VMT lb/VMT	0.17	18.5	0.03	lb/VMT	0.03	2.41	AP-42, Section 13.2.2 Unpaved Roads Assumes 84% Control efficiency
Wind erosion of pile surfaces and ground areas around piles	18.4 1.63	g/m^2 m/s	0.08	102	4.61	g/m^2	0.05	25.4	2.77 1.63	g/m^2 m/s	0.01	15.3	0.69	g/m^2	0.003	3.81	AP-42, Section 13.2.5 Industrial Wind Erosion Assumes 75% Control efficiency
Loadout of soil for Transport	0.0081	lb/ton	0.05	4.09	0.0020	lb/ton	0.01	1.02	0.0012	lb/ton	0.01	0.62	0.0003	lb/ton	0.002	0.15	AP-42, Section 13.2.4 Aggregate Handling And Storage Piles Assumes 75% Control efficiency
Grading	1.5 12.2	lb/VMT lb	0.01	0.53	11.6	lb	0.01	0.50	0.2 1.3	lb/VMT lb	0.00	0.06	1.2	lb	0.001	0.05	AP-42, Section 11.9 Western Surface Coal Mining and CalEEMod Appendix Assumes 5% Control efficiency
			1.77	281			0.34	50.1			0.20	35.0			0.03	6.59	
							Total PM10 Fugitive Emissions								***Total PM2.5 Fugitive Emissions***		

	Hual Truck
Empty Weight (tons)	10.9
Full Weight (tons)	24.0
Average Weight (tons)	17.5

Annual Average Wind Speed:	7.40	mph
Maximum 2-Minute Avg	69	mph
Max 2-Minute >=23	10	days/year
Fastest mile wind speed	42	mph

Daily	72	VMT/day
Annual	1,643	VMT/year
Daily	505	tons
Annual	11,583	tons
	21	trucks trips/day
	482	truck trips/year
	24	ton truck capapcity
	17.5	ton trucks (average full/empty)
	8.3	silt content
	1.70	miles (one way) per trip on unpaved surface
	23	Effective days of activity at maximum daily rate

Unmitigated	Mitigated			
10.1	1.91	lb/hr	Silica	
1.27	0.24	g/s		
78%	78%	Content		
1.05	0.47	lb/hr	Fugitive	
0.13	0.06	g/s		
78%	78%	Content		
9.01	1.44	lb/hr	Unpaved	
1.13	0.18	g/s		
78%	78%	Content		

Appendix AQ–3

Health Risk Assessment and Methodologies

Appendix AQ-3

Health Risk Assessment Assumptions and Methodologies

A health risk assessment (HRA) is accomplished in four steps: 1) hazards identification, 2) exposure assessment, 3) toxicity assessment, and 4) risk characterization. These steps cover the estimation of air emissions, the estimation of the air concentrations resulting from a dispersion analysis, the incorporation of the toxicity of the pollutants emitted, and the characterization of the risk based on exposure parameters such as breathing rate, age adjustment factors, and exposure duration; each depending on receptor type.

This HRA was conducted in accordance with technical guidelines developed by federal, state, and regional agencies, including USEPA, California Environmental Protection Agency (CalEPA), California Office of Environmental Health Hazard Assessment (OEHHA) *Air Toxics Hot Spots Program Guidance*[1], and the BAAQMD *Health Risk Screening Analysis Guidelines*.[2]

According to CalEPA, a HRA should not be interpreted as the expected rates of cancer or other potential human health effects, but rather as estimates of potential risk or likelihood of adverse effects based on current knowledge, under a number of highly conservative assumptions and the best assessment tools currently available.

This HRA addresses the DPM emissions from on-site equipment and haul trucks, crystalline silica from fugitive dust (material handling and unpaved roads), and VOC concentrations within the soil material.

Terms and Definitions

As the practice of conducting a HRA is particularly complex and involves concepts that are not altogether familiar to most people, several terms and definitions are provided that are considered essential to the understanding of the approach, methodology and results:

> *Acute effect* – a health effect (non-cancer) produced within a short period of time (few minutes to several days) following an exposure to Toxic Air Contaminants (TACs).
> *Cancer risk* – the probability of an individual contracting cancer from a lifetime (i.e., 70 year) exposure to TAC such as DPM in the ambient air.
> *Chronic effect* – a health effect (non-cancer) produced from a continuous exposure occurring over an extended period of time (weeks, months, years).

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1 Office of Environmental Health Hazard Assessment, 2003. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, http://www.oehha.org/air/hot_spots/pdf/HRAguidefinal.pdf.

2 Bay Area Air Quality Management District, 2005. BAAQMD *Health Risk Screening Analysis Guidelines*, http://www.baaqmd.gov/pmt/air_toxics/risk_procedures_policies/hrsa_guidelines.pdf.

Hazard Index (HI) – the unitless ratio of an exposure level over the acceptable reference dose (RfC). The HI can be applied to multiple compounds in an additive manner.

Hazard Quotient (HQ) – the unitless ratio of an exposure level over the acceptable reference dose (RfC). The HQ is applied to individual compounds.

Toxic air contaminants (TAC) – any air pollutant that is capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). The current California list of TAC lists approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Human Health Effects - comprise disorders such as eye watering, respiratory or heart ailments, and other (i.e., non-cancer) related diseases.

Health Risk Assessment (HRA) – an analysis designed to predict the generation and dispersion of TAC in the outdoor environment, evaluate the potential for exposure of human populations, and to assess and quantify both the individual and population-wide health risks associated with those levels of exposure.

Incremental – under CEQA, the net difference (or change) in conditions or impacts when comparing the baseline to future year project conditions.

Maximum exposed individual (MEI) – an individual assumed to be located at the point where the highest concentrations of TACs, and therefore, health risks are predicted to occur.

Non-cancer risks – health risks such as eye watering, respiratory or heart ailments, and other non-cancer related diseases.

Receptors – the locations where potential health impacts or risks are predicted (i.e., schools, residences, and recreational sites).

Limitations and Uncertainties

There are a number of important limitations and uncertainties commonly associated with a HRA due to the wide variability of human exposures to TACs, the extended timeframes over which the exposures are evaluated and the inability to verify the results. Among these challenges are the following:

- The HRA exposure estimates do not take into account that people do not usually reside at the same location for 70 years and that other exposures (i.e., school children) are also of much shorter durations than was assumed in this analysis. Therefore, the results of the HRA are highly overstated for those cases.
- Other limitations and uncertainties associated with HRA and identified by the CalEPA include: (a.) lack of reliable monitoring data; (b.) extrapolation of toxicity data in animals to humans; (c.) estimation errors in calculating TACs emissions; (d.) concentration

prediction errors with dispersion models; and (e.) the variability in lifestyles, fitness and other confounding factors of the human population.

Hazard Identification

Diesel exhaust is a complex mixture of numerous individual gaseous and particulate compounds emitted from diesel-fueled combustion engines. Diesel particulate matter (DPM) is formed primarily through the incomplete combustion of diesel fuel. DPM is removed from the atmosphere through physical processes including atmospheric fall-out and washout by rain. Humans can be exposed to airborne DPM by deposition on water, soil, and vegetation; although the main pathway of exposure is inhalation.

In August 1998, the CARB identified DPM as an air toxic. The CARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel- Fueled Engines and Vehicles* and *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines* and approved these documents on September 28, 2000.[3,4] The documents represent proposals to reduce DPM emissions, with the goal of reducing emissions and the associated health risk by 75 percent in 2010 and by 85 percent in 2020. The program aimed to require the use of state-of-the-art catalyzed DPM filters and ultra-low-sulfur diesel fuel.

In 2001, CARB assessed the state-wide health risks from exposure to diesel exhaust and to other toxic air contaminants. It is difficult to distinguish the health risks of diesel emissions from those of other air toxics, since diesel exhaust contains approximately 40 different TACs. The CARB study detected diesel exhaust by using ambient air carbon soot measurements as a surrogate for diesel emissions. The study reported that the state-wide cancer risk from exposure to diesel exhaust was about 540 per million population as compared to a total risk for exposure to all ambient air toxics of 760 per million. This estimate, which accounts for about 70 percent of the total risk from TACs, included both urban and rural areas in the state. The estimate can also be considered an average worst-case for the state, since it assumes constant exposure to outdoor concentrations of diesel exhaust and does not account for expected lower concentrations indoors, where most of time is spent.

Exposure Assessment

Dispersion is the process by which atmospheric pollutants disseminate due to wind and vertical stability. The results of a dispersion analysis are used to assess pollutant concentrations at or near an emission source. The results of an analysis allow predicted concentrations of pollutants

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[3] California Air Resources Board. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles.* October 2000. http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf

[4] California Air Resources Board. *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines.* October 2000. http://www.arb.ca.gov/diesel/documents/rmgfinal.pdf

to be compared directly to air quality standards and other criteria such as health risks based on modeled concentrations.

A rising pollutant plume reacts with the environment in several ways before it levels off. First, the plume's own turbulence interacts with atmospheric turbulence to entrain ambient air. This mixing process reduces and eventually eliminates the density and momentum differences that cause the plume to rise. Second, the wind transports the plume during its rise and entrainment process. Higher winds mix the plume more rapidly, resulting in a lower final rise. Third, the plume interacts with the vertical temperature stratification of the atmosphere, rising as a result of buoyancy in the unstable-to-neutrally stratified mixed layer. However, after the plume encounters the mixing lid and the stably stratified air above, its vertical motion is dampened.

Molecules of gas or small particles injected into the atmosphere will separate from each other as they are acted on by turbulent eddies. The Gaussian mathematical model such as AERMOD simulates the dispersion of the gas or particles within the atmosphere. The formulation of the Gaussian model is based on the following assumptions:

- The predictions are not time-dependent (all conditions remain unchanged with time)
- The wind speed and direction are uniform, both horizontally and vertically, throughout the region of concern
- The rate of diffusion is not a function of position
- Diffusion in the direction of the transporting wind is negligible when compared to the transport flow

Dispersion Modeling Approach

This section presents the methodology used for the dispersion modeling analysis. This section addresses all of the fundamental components of an air dispersion modeling analysis including:

- Model selection and options
- Receptor locations
- Meteorological data
- Source release characteristics

Air dispersion modeling was performed to estimate the downwind dispersion of DPM exhaust emissions resulting from remediation activities. A description of the air quality modeling parameters, including air dispersion model selection, modeling domain, source exhaust parameters, meteorological data selection, and receptor network, is provided.

Model Selection and Options

AERMOD (Version 14134)[5] was used for the dispersion analysis. AERMOD is the USEPA preferred atmospheric dispersion modeling system for general industrial sources. The model can simulate point, area, volume, and line sources. AERMOD is the appropriate model for this

5 US Environmental Protection Agency, AERMOD Modeling System, http://www.epa.gov/scram001/dispersion_prefrec.htm.

analysis based on the coverage of simple, intermediate, and complex terrain. It also predicts both short-term and long-term (annual) average concentrations. The model was executed using the regulatory default options (stack-tip downwash, buoyancy-induced dispersion, and final plume rise), default wind speed profile categories, default potential temperature gradients, and assuming no pollutant decay.

The selection of the appropriate dispersion coefficients depends on the land use within three kilometers (km) of the project site. The types of land use were based on the classification method defined by Auer (1978); using pertinent United States Geological Survey (USGS) 1:24,000 scale (7.5 minute) topographic maps of the area. If the Auer land use types of heavy industrial, light-to-moderate industrial, commercial, and compact residential account for 50 percent or more of the total area, the USEPA *Guideline on Air Quality Models* recommends using urban dispersion coefficients; otherwise, the appropriate rural coefficients can be used. Based on observation of the area surrounding the project site, rural (urban is only designated within dense city centers such as downtown San Francisco) dispersion coefficients were applied in the analysis.

Receptor Locations

Some receptors are considered more sensitive to air pollutants than others, because of preexisting health problems, proximity to the emissions source, or duration of exposure to air pollutants. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because the very young, the old, and the infirm are more susceptible to respiratory infections and other air quality-related health problems than the general public. Residential areas are also considered sensitive to poor air quality because people in residential areas are often at home for extended periods. Recreational land uses are moderately sensitive to air pollution because vigorous exercise associated with recreation places having a high demand on respiratory system function.

Land uses such as schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive than the general public to poor air quality because the population groups associated with these uses have increased susceptibility to respiratory distress. Persons engaged in strenuous work or exercise also have increased sensitivity to poor air quality. The CARB has identified the following people as most likely to be affected by air pollution: children less than 14 years of age, the elderly over 65 years of age, athletes, and those with cardiovascular and chronic respiratory diseases. These groups are classified as sensitive population groups.

Residential areas are considered more sensitive to air quality conditions than commercial and industrial areas, because people generally spend longer periods of time at their residences, resulting in greater exposure to ambient air quality conditions. Recreational uses are also considered sensitive, due to the greater exposure to ambient air quality conditions and because the presence of pollution detracts from the recreational experience. According to the BAAQMD, workers are not considered sensitive receptors because all employers must follow regulations

set forth by the Occupation Safety and Health Administration to ensure the health and well-being of their employees.

BAAQMD considers the relevant zone of influence for an assessment of air quality health risks to be within 1,000 feet of a project site. The project site is generally bound by residential land uses to the south, west and east, with Concord Naval Weapons Station property to the north. The nearest existing residential land uses are within 100 feet to the southeast.

Receptors were placed at a height of 1.8 meters (typical breathing height). Terrain elevations for receptor locations were used (i.e., complex terrain) based on available USGS information for the area. **Figure AQ-1** displays the location of the sensitive receptors used in the HRA. Sensitive receptors were placed at existing residences and schools to estimate health impacts due to remediation activities on existing receptors.

Meteorological Data

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features affecting pollutant movement and dispersal. Atmospheric conditions such as wind speed, wind direction, atmospheric stability, and air temperature gradients interact with the physical features of the landscape to determine the movement and dispersal of air pollutants, and consequently affect air quality.

Hourly meteorological data from BAAQMD's Concord (Treat Boulevard) monitoring station, located approximately 4.6 miles southwest of the project site and Oakland International Airport (upper air) were used in the dispersion modeling analysis. Meteorological data from 2009 through 2013 were used. **Figure AQ-2** displays the wind rose during this period. Wind directions are predominately from the south-southwest and a high frequency of low wind speed conditions, as shown in **Figure AQ-3**. The average annual wind speed is 4.2 miles per hour.

FIGURE AQ-1

HEALTH RISK ASSESSMENT RECEPTORS

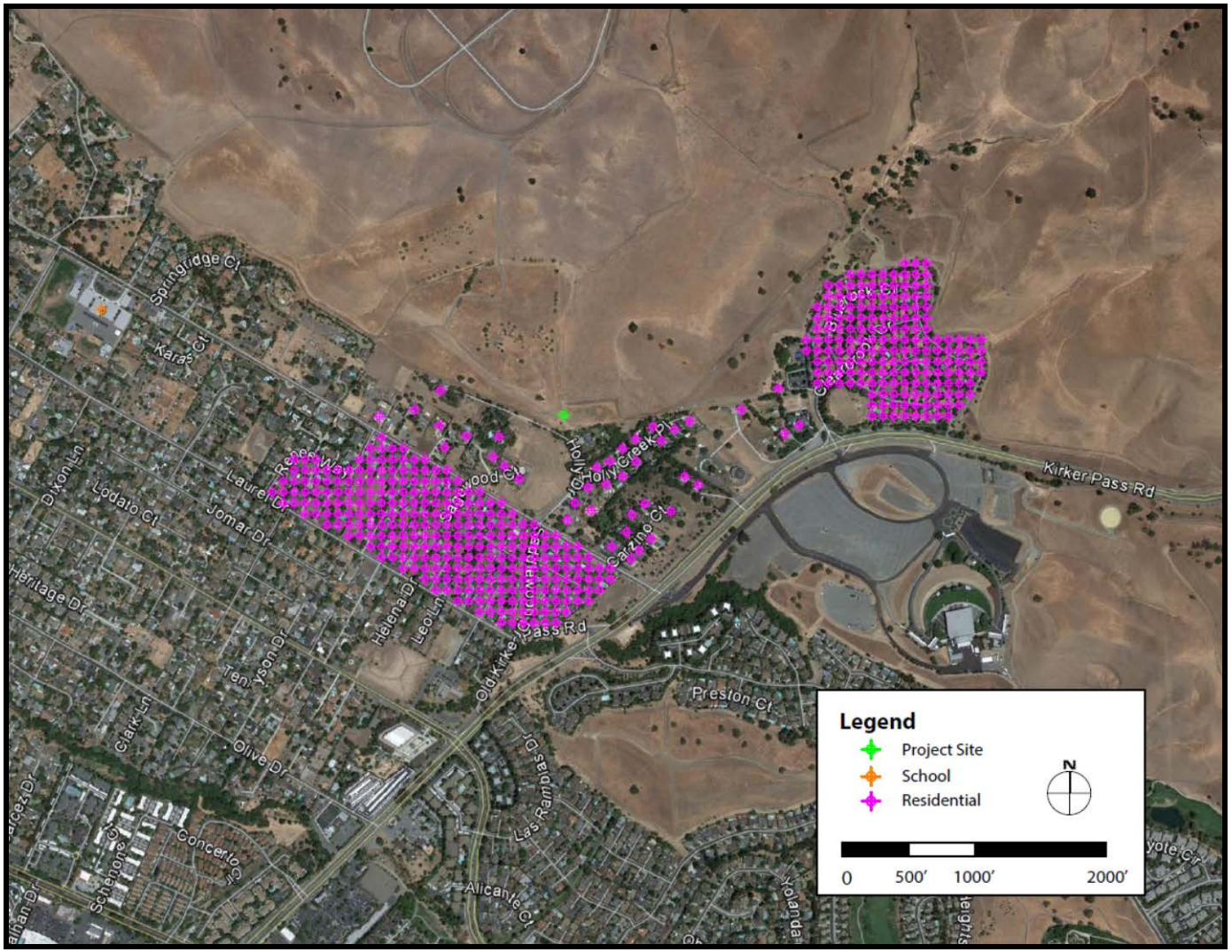


FIGURE AQ-2

WINDROSE FOR CONCORD, CA

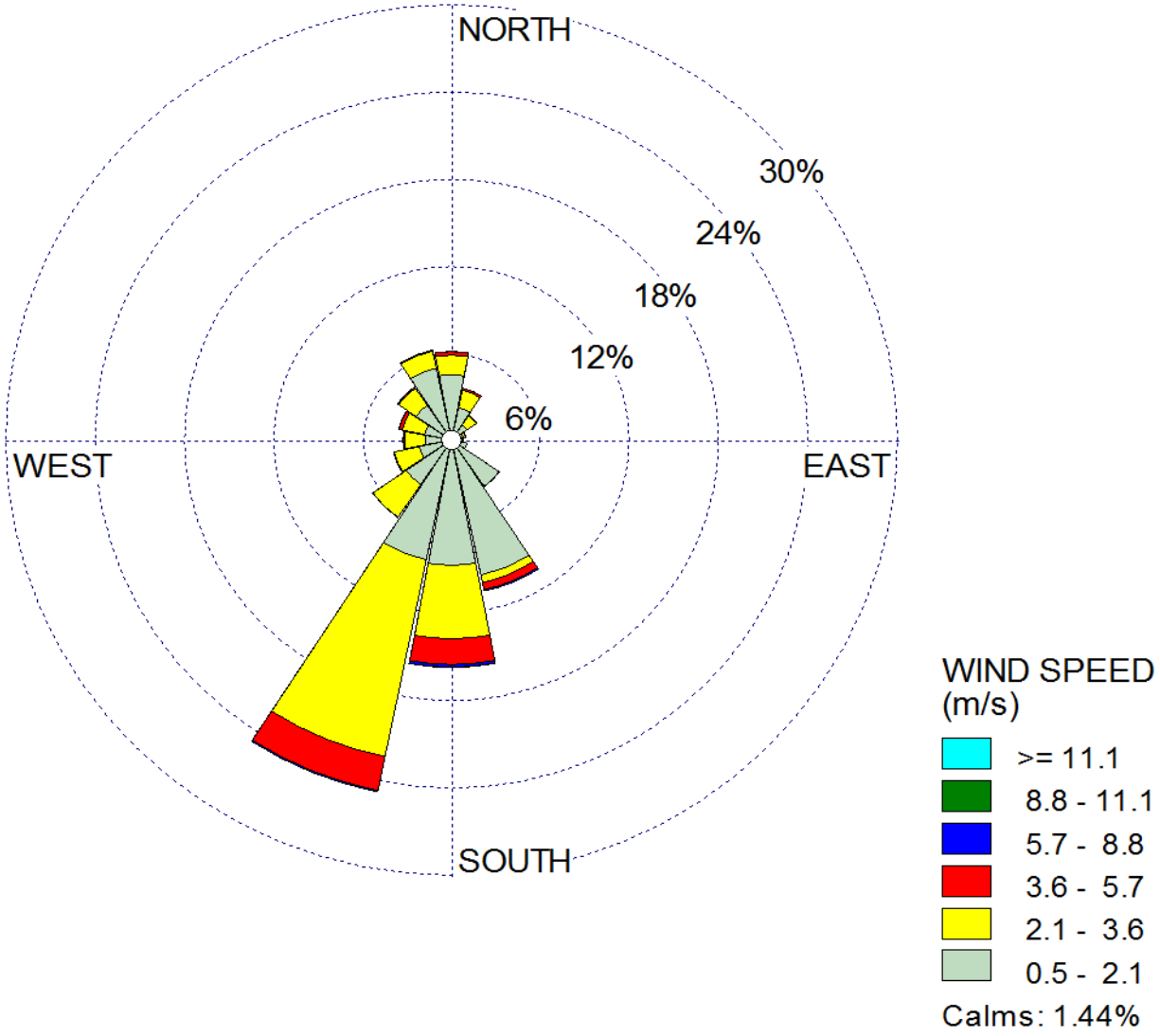
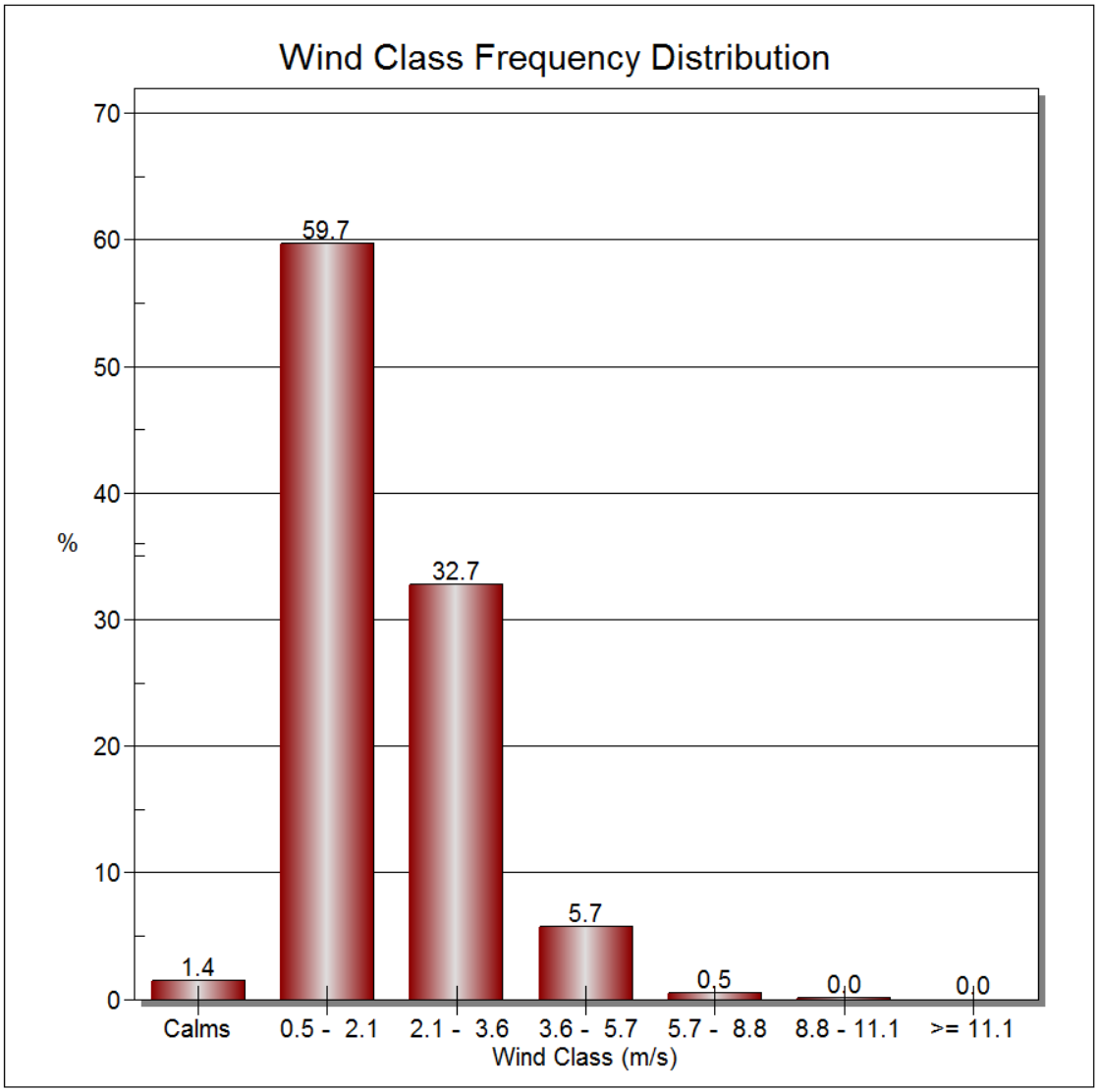


FIGURE AQ-3

WIND SPEED DISTRIBUTION FOR CONCORD, CA



Source Release Characteristics

Offorad equipment activities were treated as an area source. The release height of the off-road equipment exhaust was 3.05 meters. Haul trucks and employee trips were treated as a line source (i.e., volume sources placed at regular intervals) located along the access road. The haul trucks were assigned a release height of 3.05 meters and an initial vertical dimension of 4.15 meters, which accounts for dispersion from the movement of vehicles. Model parameters for volume sources include emission rate, release height, and plume width. Terrain elevations for emission source locations were used (i.e., complex terrain) based on available USGS DEM for the area. AERMAP (Version 11103)[6] was used to develop the terrain elevations, although the project site is generally flat.

Dispersion Modeling Results

Using AERMOD, the maximum annual and 70-year average annual concentrations were determined for DPM emissions for the emission sources of concern. These concentrations were estimated for a unit emission rate (1 gram per second) and adjusted based on the calculated emission rate.

The HRA was conducted following methodologies in BAAQMD's *Health Risk Screening Analysis Guidelines*[7] and OEHHA's *Air Toxics Hot Spots Program Guidance*[8]. This was accomplished by applying the highest estimated concentrations at the receptors analyzed to the established cancer risk estimates and acceptable reference concentrations (RfC) for non-cancer health effects.

The toxicity values used in this analysis were based on OEHHA guidance. These toxicity values are for carcinogenic effects and acute/chronic health impacts. The primary pathway for exposures was assumed to be inhalation and carcinogenic and non-carcinogenic effects were evaluated separately. The incremental risks were determined for each emission source of TAC and summed to obtain an estimated total incremental carcinogenic health risk.

The 80th percentile adult breathing rate of 302 liters per kilogram per day (L/kg-day) was used to determine cancer risks to residents from exposure to TAC. The residential exposure frequency and duration was assumed to be 350 days per year and 70 years. For children, OEHHA recommends assuming a breathing rate of 581 L/kg-day to assess potential risk via the inhalation exposure pathway. This value represents the upper 95th percentile of daily breathing rates for children. The modeled DPM concentrations were used to represent the exposure concentrations in the air. The inhalation absorption factor was assumed to be 1.

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6 USEPA, AERMAP, http://www.epa.gov/ttn/scram/dispersion_related.htm#aermap.

7 Bay Area Air Quality Management District, 2005. *BAAQMD Health Risk Screening Analysis Guidelines*, June 2005, http://www.baaqmd.gov/pmt/air_toxics/risk_procedures_policies/hrsa_guidelines.pdf).

8 Office of Environmental Health Hazard Assessment, 2003. *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, http://www.oehha.org/air/hot_spots/pdf/HRAguidefinal.pdf.

Cancer risk estimates also incorporate age sensitivity factors (ASFs). This approach provides updated calculation procedures that factor in the increased susceptibility of infants and children to carcinogens as compared to adults. OEHHA recommends that cancer risks be weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to 2 years of age, and by a factor of 3 for exposures from 2 years through 15 years of age. For estimating cancer risks for residential receptors over a 70 year lifetime, the incorporation of the ASFs results in a cancer risk adjustment factor (CRAF) of 1.7.

For occupational receptors, BAAQMD guidance suggests that the exposure be based on 8 hours per day, 5 days per week, 245 working days per year, and a 40-year working lifetime. This is a conservative assumption, since most people do not remain at the same job for 40 years.

Based on OEHHA recommendations (see **Table AQ-5**), the cancer risk to residential receptors assumes exposure occurs 24 hours per day for 350 days per year. For children at school sites, exposure is assumed to occur 10 hours per day for 180 days (or 36 weeks) per year. Cancer risk to residential receptors based on a 70-year lifetime exposure. Cancer risk estimates for children at school sites are calculated based on 9 year exposure duration.

Table AQ-5

Health Risk Assessment Exposure Parameters

Receptor	Breathing Rate (DBR)	Cancer Risk Adjustment Factor (CRAF)	Daily Exposure	Annual Exposure	Exposure Duration (ED)
Adult	302	1.7	24 hours	350 days	70 years
Child	581	10	24 hours	350 days	3 years
School	581	3	10 hours	180 days	9 years

SOURCE: Bay Area Air Quality Management District, *Health Risk Screening Analysis Guidelines,* June 2005, http://www.baaqmd.gov/pmt/air_toxics/risk_procedures_policies/hrsa_guidelines.pdf.

Risk Characterization

Cancer risk is defined as the lifetime probability of developing cancer from exposure to carcinogenic substances. Cancer risks are expressed as the chance in one million of getting cancer (i.e., number of cancer cases among one million people exposed). The cancer risks are assumed to occur exclusively through the inhalation pathway. The cancer risk can be estimated by using the cancer potency factor (milligrams per kilogram of body weight per day [mg/kg-day]), the 70-year annual average concentration (microgram per cubic meter [$\mu g/m^3$]), and the lifetime exposure adjustment.

Following guidelines established by OEHHA, the incremental cancer risks attributable to the proposed project were calculated by applying exposure parameters to modeled DPM

concentrations in order to determine the inhalation dose (mg/kg-day) or the amount of pollutants inhaled per body weight mass per day. The cancer risks occur exclusively through the inhalation pathway; therefore, the cancer risks can be estimated from the following equation:

$$\text{Dose-inh} = \frac{C_{air} * \{DBR\} * A * CRAF * EF * ED * 10^{-6}}{AT}$$

Where:

Dose-inh = Dose of the toxic substance through inhalation in mg/kg-day

10^{-6} = Micrograms to milligrams conversion, Liters to cubic meters conversion

C_{air} = Concentration in air in microgram (μg)/cubic meter (m^3)

{DBR} = Daily breathing rate in liter (L)/kg body weight – day

A = Inhalation absorption factor

CRAF = Cancer Risk Adjustment Factor, Age Sensitivity Factor

EF = Exposure frequency (days/year)

ED = Exposure duration (years)

AT = Averaging time period over which exposure is averaged in days (25,550 days for a 70 year cancer risk)

To determine incremental cancer risk, the estimated inhalation dose attributed to the proposed project was multiplied by the cancer potency slope factor (cancer risk per mg/kg-day). The cancer potency slope factor is the upper bound on the increased cancer risk from a lifetime exposure to a pollutant. These slope factors are based on epidemiological studies and are different values for different pollutants. This allows the estimated inhalation dose to be equated to a cancer risk.

Non-cancer adverse health impacts, acute (short-term) and chronic (long-term), are measured against a hazard index (HI), which is defined as the ratio of the predicted incremental exposure concentration from the project to a published reference exposure level (REL) that could cause adverse health effects as established by OEHHA. The ratio (referred to as the Hazard Quotient [HQ]) of each non-carcinogenic substance that affects a certain organ system is added to produce an overall HI for that organ system. The overall HI is calculated for each organ system. If the overall HI for the highest-impacted organ system is greater than one, then the impact is considered to be significant.

The HI is an expression used for the potential for non-cancer health effects. The relationship for the non-cancer health effects is given by the annual concentration (in $\mu g/m^3$) and the REL (in $\mu g/m^3$). The acute hazard index was determined using the "simple" concurrent maximum approach, which tends to be conservative (i.e., overpredicts).

The relationship for the non-cancer health effects is given by the following equation:

$$HI = C/REL$$

Where:

HI	= Hazard index; an expression of the potential for non-cancer health effects.
C	= Annual average concentration ($\mu g/m^3$) during the 70 year exposure period.
REL	= Concentration at which no adverse health effects are anticipated.

The chronic REL for DPM was established by the California OEHHA[9] as 5 $\mu g/m^3$. There is no acute REL for DPM. However, diesel exhaust does contain acrolein and other compounds, which do have an acute REL. BAAQMD's DPM speciation table (based on profile 4674 within the USEPA Speciate 4.2)[10] was used to assess the acute impacts. Acrolein emissions are approximately 1.3 percent of the total emissions. The acute REL for acrolein was established by the California OEHHA[11] as 2.5 $\mu g/m^3$.

In 2005, the California OEHHA added a chronic REL for crystalline silica. The chronic REL for crystalline silica was established by the California OEHHA[12] as 3.0 $\mu g/m^3$. Silica is a hazardous substance when it is inhaled, and the airborne dust particles that are formed when the material containing the silica is broken, crushed, or sawn pose potential risks. A silica content of 78 percent was assumed for this analysis

The site chemicals of potential concern are benzene, toluene, ethylbenzene, and total xylenes; polycyclic aromatic hydrocarbons; and naphthalene. **Table AQ-6** provides the inhalation slope factor, acute and chronic REL for the contaminants within the soil sampling. For these contaminants, the HRA was performed using the maximum sample value within the soil sample network (see Revised Excavation Interim Remedial Measure Work Plan, dated October 2014).

9 California Office of Environmental Health Hazards Assessment Toxicity Criteria Database, 2010, http://www.oehha.ca.gov//.
10 Provides for a speciation faction of 1.3 percent of acrolein per DPM emission rate, http://www.epa.gov/ttnchie1/software/speciate/
11 California Office of Environmental Health Hazards Assessment Toxicity Criteria Database, 2010, http://www.oehha.ca.gov//.
12 California Office of Environmental Health Hazards Assessment Toxicity Criteria Database, 2010, http://www.oehha.ca.gov//.

Table AQ-6

Inhalation Slope factor and Reference Exposure Levels

Pollutant	Inhalation Slope Factor (mg/kg-day)	Acute REL (µg/m3)	Chronic REL (µg/m3)
benzene	0.1	27	3
ethylbenzene	0.0087		2000
toluene		37000	300
xylene		22000	700
acenaphthene			
acenaphthylene			
anthracene			
benzo[a]anthracene	0.39		
benzo[a]pyrene	3.9		
benzo[b]fluoranthene	0.39		
benzo[g,h,i]perylene			
benzo[k]fluoranthene	0.39		
chrysene	0.039		
dibenz(a,h)anthracene	4.1		
indeno[1,2,3-cd]pyrene	0.39		
naphthalene	0.12		9

SOURCE: California Office of Environmental Health Hazards Assessment Toxicity Criteria Database, 2010, http://www.oehha.ca.gov//

Cumulative Sources

The BAAQMD's *CEQA Air Quality Guidelines* include standards and methods for determining the significance of cumulative health risk impacts.[13] The method for determining cumulative health risk requires the tallying of health risk from permitted sources and major roadways in the vicinity of a project (i.e., within a 1,000-foot radius of the location of the new project-related receptors), then adding the project impacts to determine whether the cumulative health risk thresholds are exceeded.

BAAQMD has developed a geo-referenced database of permitted emissions sources throughout the San Francisco Bay Area, and has developed the *Stationary Source Risk & Hazard Analysis Tool*

13 Bay Area Air Quality Management District. CEQA Air Quality Guidelines. May 2012. http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/CEQA/BAAQMD%20CEQA%20Guidelines_Final_May%202012.ashx?la=en

for estimating cumulative health risks from permitted sources. No permitted sources are located within 1,000 feet of the proposed project.

BAAQMD has also developed a geo-referenced database of roadways throughout the San Francisco Bay Area and has developed the *Highway Screening Analysis Tool* for estimating cumulative health risks from roadways. No major roadways are located within 1,000 feet of the proposed project. BAAQMD *CEQA Air Quality Guidelines* also require the inclusion of surface streets within 1,000 feet of the project with annual average daily traffic of 10,000 or greater.[14] Upon review of nearby roadways, Kirker Pass Road meets the criteria. The nearby existing residences are approximately 950 feet of this roadway.

14 Bay Area Air Quality Management District County Surface Street Screening Tables, May 2011 and CEHTP Traffic Linkage Service Demonstration, http://www.ehib.org/traffic_tool.jsp.

Appendix AQ–4

Greenhouse Gas Setting and Regulatory Context

Appendix AQ-4

Greenhouse Gas Setting and Regulatory Context

"Global warming" and "global climate change" are the terms used to describe the increase in the average temperature of the earth's near-surface air and oceans since the mid-20th century and its projected continuation. Warming of the climate system is now considered to be unequivocal (IPCC, 2007), with global surface temperature increasing approximately 1.33 degrees Fahrenheit (°F) over the last 100 years. Continued warming is projected to increase global average temperature between 2 and 11°F over the next 100 years.

Natural processes and human actions have been identified as the causes of this warming. The International Panel on Climate Change (IPCC) concludes that variations in natural phenomena such as solar radiation and volcanoes produced most of the warming from pre-industrial times to 1950 and had a small cooling effect afterward. After 1950, however, increasing GHG concentrations resulting from human activity such as fossil fuel burning and deforestation have been responsible for most of the observed temperature increase. These basic conclusions have been endorsed by more than 45 scientific societies and academies of science, including all of the national academies of science of the major industrialized countries. Since 2007, no scientific body of national or international standing has maintained a dissenting opinion.

Increases in GHG concentrations in the earth's atmosphere are thought to be the main cause of human-induced climate change. GHGs naturally trap heat by impeding the exit of solar radiation that has hit the earth and is reflected back into space. Some GHGs occur naturally and are necessary for keeping the earth's surface inhabitable. However, increases in the concentrations of these gases in the atmosphere during the last 100 years have decreased the amount of solar radiation that is reflected back into space, intensifying the natural greenhouse effect and resulting in the increase of global average temperature.

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse does. The accumulation of GHGs has been implicated as the driving force for global climate change. The primary GHGs are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), ozone, and water vapor.

While the presence of the primary GHGs in the atmosphere are naturally occurring, CO_2, CH_4, and N_2O are also emitted from human activities, accelerating the rate at which these compounds occur within earth's atmosphere. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas methane results from off-gassing associated with agricultural practices and landfills. Other GHGs include hydrofluorocarbons, perfluorocarbons, and sulfur

hexafluoride, and are generated in certain industrial processes. Greenhouse gases are typically reported in "carbon dioxide-equivalent" measures (CO_2e).[1]

There is international scientific consensus that human-caused increases in GHGs have and will continue to contribute to global warming. Potential global warming impacts in California may include, but are not limited to, loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years. Secondary effects are likely to include a global rise in sea level, impacts to agriculture, changes in disease vectors, and changes in habitat and biodiversity.[2]

City of Concord Climate Action Plan

A Citywide Climate Action Plan (CAP)[3] has been prepared for Concord in response to mandates from the State of California intended to reduce the emission of greenhouse gases statewide, because of their contribution to global climate change. The City has identified the ways it will take action to support the State's goals while supporting the local economy and quality of life.

Concord's 2005 community-wide GHG emissions were slightly less than one million metric tons carbon dioxide equivalent (928,497 MTCO2e). Concord is similar to other cities in California without significant industrial energy users: transportation emissions and buildings are the two largest sources. On- and off-road vehicles emit 58 percent of Concord's GHGs, and electricity and natural gas serving buildings emit another 32 percent.

Assembly Bill 32 (California Global Warming Solutions Act of 2006)

California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and

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[1] Because of the differential heat absorption potential of various GHGs, GHG emissions are frequently measured in "carbon dioxide-equivalents," which present a weighted average based on each gas's heat absorption (or "global warming") potential.

[2] 2006 Final Climate Action Team Report to the Governor and Legislature. March 2006. http://www.climatechange.ca.gov/climate_action_team/reports/2006report/2006-04-03_FINAL_CAT_REPORT.PDF.

[3] City of Concord, Citywide Climate Action Plan, March 2013, http://www.cityofconcord.org/pdf/dept/planning/EIR/climate_study_review.pdf

develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions enough to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. Under AB 32, CARB must adopt regulations to achieve reductions in GHGs to meet the 1990 emissions cap by 2020.

Climate Change Scoping Plan

In October of 2013, the CARB submitted the First Update to the Climate Change Scoping Plan for public review and comment. The First Update to the Scoping Plan was approved by the CARB on May 22, 2014, and builds upon the initial Scoping Plan with new strategies and recommendations. The First Update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The First Update defines CARB's climate change priorities for the next five years, and also sets the groundwork to reach long-term goals set forth in Executive Orders S-3-05 and B-16-2012. The Update highlights California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use.

In the First Update to the Climate Change Scoping Plan, nine key focus areas were identified (energy, transportation, agriculture, water, waste management, and natural and working lands), along with short-lived climate pollutants, green buildings, and the cap-and-trade program. These key focus areas have overlapping and complementary interests that will require careful coordination in California's future climate and energy policies. These focus areas were selected to address issues that underlie multiple sectors of the economy. As such, each focus area is not contained to a single economic sector, but has far-reaching impacts within many economic sectors.

Greenhouse Gas Regional Emission Estimates

In 2013, the United States emitted about 6.673 billion tons of CO_2e. Of the four major sectors nationwide - residential, commercial, industrial, and transportation – electrical generation accounts for the highest fraction of GHG emissions (approximately 31 percent); these emissions are entirely generated from direct fossil fuel combustion. . United States emissions increased by 2.0 percent from 2012 to 2013. Recent trends can be attributed to multiple factors including increased emissions from electricity generation, an increase in miles traveled by on-road vehicles, an increase in industrial production and emissions in multiple sectors, and year-to-

year changes in the prevailing weather. Greenhouse gas emissions in 2013 were 9 percent below 2005 levels.[4]

The composition of gross GHG emissions in the United States in 2013 (expressed in terms of CO_2e) were as follows:

- CO_2 accounted for 82 percent;
- CH_4 accounted for 10 percent;
- N_2O accounted for 5 percent; and
- Fluorinated gases (HFCs, PFC, and SF_6) accounted for 3 percent.[5]

California's gross emissions of GHG decreased by 1.6 percent from 466.3 million metric tons of CO_2e in 2000 to 458.7 million metric tons in 2012, with a maximum of 492.7 million metric tons in 2004. During the same period, California's population grew by 11 percent from 34 to 37.8 million people. As a result, California's per capita GHG emissions have generally decreased over the last 12 years from 13.7 in 2000 to 12.1 million metric tons of CO_2e per person in 2012.[6] California has one of the lowest per capita GHG emission rates in the country, due to the success of its energy efficiency and renewable energy programs and commitments that have lowered the state's GHG emissions rate of growth by more than half of what it would have been otherwise. Another factor that has reduced California's fuel use and GHG emissions is its mild climate compared to that of many other states.

The transportation sector remains the largest source of GHG emissions in 2012, accounting for 36 percent of California's GHG emission inventory. Contributions from the transportation sector include emissions from on-road and off-road vehicles, aviation, rail and water-borne vehicles, and some other minor sources. Transportation-related GHG emissions have dropped 12 percent since reaching a maximum in 2007. In 2012, emissions from the on-road category decreased by 0.5 percent from the previous year.[7]

In the San Francisco Bay Area, the transportation sector and industrial/commercial sector represent the largest sources of GHG emissions, accounting for 36.4 percent each of the Bay Area's 95.8 million tons of CO_2e in 2007. Electricity/co-generation sources account for about 15.9 percent of the Bay Area's GHG emissions, followed by residential fuel usage at about 7.1

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4 USEPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2013, April 2015,* http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf

5 USEPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2013, April 2015,* http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Main-Text.pdf

6 CARB, *2014 Edition California Greenhouse Gas Emission Inventory 2000 – 2012*, May, 2014, http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf

7 CARB, *2014 Edition California Greenhouse Gas Emission Inventory 2000 – 2012*, May, 2014, http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf

percent. Off-road equipment and agricultural/farming sources currently account for approximately three percent and 1.2 percent of the total Bay Area GHG emissions, respectively.[8]

Thresholds of Significance

Separate thresholds of significance are established for operational GHG emissions from stationary sources (such as generators, furnaces, and boilers) and non-stationary sources (such as on-road vehicles). As no threshold has been established for construction-related emissions, the operational emissions thresholds apply. The threshold for stationary sources is 10,000 metric tons of CO_2e per year (i.e., emissions above this level may be considered significant). For non-stationary sources, three separate thresholds have been established:

- Compliance with a Qualified Greenhouse Gas Reduction Strategy (i.e., if a project is found to be out of compliance with a Qualified Greenhouse Gas Reduction Strategy, its GHG emissions may be considered significant); or
- 1,100 metric tons of CO_2e per year (i.e., emissions above this level may be considered significant); or
- 4.6 metric tons of CO_2e per service population per year (i.e., emissions above this level may be considered significant). Service population is the sum of residents plus employees expected for a development project.

[8] BAAQMD, Source Inventory of Bay Area Greenhouse Gas Emissions, February 2010, http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx?la=en

Appendix BIO–1

Biological Resources Analysis

BIOLOGICAL RESOURCE ANALYSIS
PHILLIPS 66 LINE 200 REMEDIATION, MAINTENANCE, RESTORATION AND MITIGATION PROJECT
CONCORD, CALIFORNIA

November 24, 2015

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1. INTRODUCTION AND PROJECT DESCRIPTION

Monk & Associates, Inc. (M&A) prepared this biological resource analysis for the Phillips 66 (the applicant) Line 200 Remediation and Maintenance Project (the project). Line 200 carries crude oil from oil wells located in the south San Joaquin Valley to the Phillip 66 Refinery located in Rodeo California. The project follows an emergency spill response that was implemented by the applicant in 2011-2012 at the Concord Naval Weapons Station (CNWS) near the City of Concord, Contra Costa County, California (the project site) (Figures 1 and 2). The emergency response occurred when a "pinhole" leak in Line 200 was detected in November 2011. Line 200 is under high pressure and the crude oil contamination plume from that leak extended underground southward onto an adjacent private property located at 330 Holly Drive in the City of Concord, immediately south of the CNWS. CNWS remains in the ownership of the U.S. Navy but is slated for transfer of ownership to the City of Concord under a reuse and development plan sometime in 2016-17. The private property at 330 Holly Drive was acquired by the applicant in August 2015.

The remediation project under review herein is no longer considered an emergency response since the original leak was repaired in 2011 and the bulk of necessary remediation occurred as part of the emergency response in 2011 and 2012. Following the emergency response, extensive testing through soil borings occurred to map the areal extent of impacts in subsoils. On October 14, 2014, AECOM Technical Services, Inc. prepared and submitted a *Revised Excavation Interim Remedial Measure Work Plan* to the Regional Water Quality Control Board (hereinafter Water Board) (Water Board Case No./GeoTracker I.D. #T10000004219) describing the remaining proposed remedial actions to be conducted on the project site. These actions include remediation of groundwater by natural attenuation processes with monitoring. Implementation of this work plan is the final effort to remove and remediate to the entire area impacted by the 2011 pipeline leak.

Upon notification of the leak, and prior to all emergency response actions except the immediate termination of crude oil flows in Line 200, M&A wetland biologists were dispatched to the leak site in November 2011 to map all likely waters of the U.S./State in the leak area and adjacent areas. M&A's baseline preliminary wetlands map (Sheet 1) was then used to track the effects of the remediation project on likely waters of the U.S./State. Emergency pipeline repairs and remediation ("clean-up") that ensued immediately following the detection of the leak in 2011 and 2012 resulted in impacts (i.e., excavation and then fill) of approximately 0.21-acre of likely jurisdictional waters of the U.S. and State (Sheet 2).

In response to the Line 200 emergency remediation efforts completed by the applicant on the CNWS in 2011 and 2012, pursuant to the Federal Endangered Species Act (FESA), a Biological Opinion (BO) was prepared by the U.S. Fish and Wildlife Service (USFWS) for Mr. Chris Hoidal of the Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation (DOT) (USFWS File No. 08ESMF00-2013-F-0629). The BO concluded the emergency response impacted potential habitat of the federally listed threatened California red-legged frog (*Rana draytonii*) and the federally listed threatened Central Distinct Population Segment (DPS) of the California tiger salamander (*Ambystoma californiense*). The BO also

concluded that the emergency response "may affect but is not likely to adversely affect" the federally listed endangered San Joaquin kit fox (*Vulpes macrotis mutica*). The BO covered all areas of the emergency response project area, which includes the currently proposed remediation project on the CNWS. It did not cover the proposed remediation measures on the private property at 330 Holly Drive located immediately south of the CNWS.

To compensate for impacts to federally listed species protected pursuant to the FESA for the emergency project, the USFWS's BO stipulated that the applicant purchase 3.6 acres of conservation credits for permanent impacts, 4.7 acres for semi-permanent impacts, and 1.4 acres of credit for temporary impacts (totaling 9.7 acres) to the California tiger salamander and the California red-legged frog. Complying with the BO, in August 2013 the applicant purchased 9.7 acres of California tiger salamander credits from the Burke Ranch Conservation Bank and 9.7 acres of California red-legged frog credits from the Ohlone Preserve Conservation Bank for a total of 19.4 acres.

The proposed project under review herein is likely to affect California tiger salamander habitat. There are California Natural Diversity Data Base records for California tiger salamander on the CNWS. However, the portion of the project site on the CNWS is highly disturbed from remediation during the emergency response. Ongoing boring and testing procedures that have continued since the emergency response have maintained this portion of the project site in a state of perpetual disturbance through today.

The portion of the private property at 330 Holly Drive where proposed remediation would be implemented currently supports a single-family home, a pump house with apartment, concrete parking areas, sidewalks, and extensive irrigated landscaping. This property was not impacted by the emergency response and remediation project in 2011 and 2012; however, subsequent to the emergency response project the landscaped lawn area of the private property was disturbed by soil borings to define the hydrocarbon plume extending southward off of the CNWS. Owing to extensive remediation measures that are to be implemented on the private property at 330 Holly Drive, the applicant purchased this property in August 2015.

The developed and otherwise highly landscaped lawn area at 330 Holly Drive that is proposed to be impacted by the remediation project under review herein is unlikely to provide habitat that would be used by the California tiger salamander or California red-legged frog. However, running north to south through the middle of the private property there is a defined swale that was used by the former resident as a vegetable gardening area. This swale currently supports eight, roughly 8 by 20-foot raised planter boxes. This swale receives storm event runoff from the CNWS, flows through this swale, and discharges into a creek channel headwater on the southern border of the private property. The remediation project includes mitigation restoration of the swale to a natural condition. The vegetable boxes and non-native vegetation will be removed from the swale and a seasonal wetland would be constructed in an upland area within this swale. The eastern half of the 330 Holly Drive private property is dominated by non-native annual grassland and will not be disturbed by remediation or restoration activities.

The swale on the property likely provides a California tiger salamander migration corridor and/or over-summering habitat. In addition, the raised vegetable beds occur in an area of the Residential

parcel that about 12 years ago supported a pond with a California red-legged frog population (pers. com. between Nicole Kozicki and Geoff Monk). The pond and these frogs apparently were extirpated by the development south of the project site. The remediation project calls for reshaping/contouring the swale into a seasonal wetland. Also, the formerly occupied areas of the private property, after the residence and all buildings are removed, will be graded into a swale watershed that supports seasonal wetlands that will be recreated on the CNWS. These recreated wetlands will overflow and drain through the seasonal wetland created on the private property at 330 Holly Drive.

In accordance with the BO prepared as part of the emergency project measures will have to be implemented to ensure that migrating California tiger salamander and California red-legged frog do not wander into the remediation and restoration areas during excavation. Because the remediation project could affect federal listed species in an area not previously covered by the USFWS' BO, a revised "incidental take permit" will have to be issued by USFWS covering the property at 330 Holly Drive that will be affected by the remediation project. In addition, as the private property at 330 Holly Drive is not under the ownership of the federal government like the CNWS, an incidental take permit will also be required from the California Department of Fish and Wildlife (CDFW) for remediation and restoration work that will be completed on this private property.

The project is currently going through "after the fact" permitting with the U.S. Army Corps of Engineers (Corps) and the Water Board for impacts that occurred to waters of the U.S. and State (respectively) during the initial emergency response in 2011 and 2012. The Corps regulates impacts to waters of the U.S. through administration of Section 404 of the Clean Water Act while the Water Board regulates impacts to waters of the state through administration of Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. Corps and Water Board permitting was delayed pending full understanding of the total remediation project. The project under review herein is the final remediation project and thus the full extent of impacts to waters of the U.S. and State are now quantifiable.

To compensate for impacts to waters of the U.S. and State both the Corps and the Water Board maintain a no net loss policy requiring applicants to re-create impacted wetlands or via the purchase of wetland conservation credits from an approved conservation bank. There are no wetland conservation banks approved for use by the San Francisco Regulatory District of the Corps and/or the Water Board available for use by the applicant to compensate for impacts to waters of the U.S./State from the initial remediation emergency response. Thus, to mitigate impacts to waters of the U.S. and State the applicant is proposing to recreate seasonal wetlands and other water swales at the project in the same immediate area where these features were impacted.

Additional compensatory mitigation includes that the private property at 330 Holly Drive will be restored to a natural landscape condition. All structures will be removed down to the dirt. Also, the vegetable beds and landscape vegetation will be removed from a drainage swale on this property. In addition, the applicant will implement a native oak woodland planting plan on the western one half of the private property where the structures are being removed. Upon completion of the remediation and restoration projects at 330 Holly Drive 1.4 acres of this

property will be preserved in perpetuity via recordation of an open space Perpetual Deed Restriction that is recorded on the title of the private property. The native oak tree restoration project will create a wildlife oasis between residential subdivisions south of the former Residential residence and the CNWS.

M&A confirmed in a meeting with the City of Concord on September 18, 2015, that under the City of Concord Reuse Plan for the CNWS, that the area of the CNWS affected by the proposed remediation project and significant contiguous acreage to the north of this area will be deeded directly from the U.S. Navy to the East Bay Regional Park District to be managed as open space/park land. Thus, in consideration that an existing conservation easement occurs immediately south of the private property at 330 Holly Drive, and 1.4 acres of the private property at 330 Holly Drive will be permanently protected as open space via the recordation of an open space Perpetual Deed Restriction, the restored and preserved private property will add to a significant regional open space. Approximately 0.6 acre of the 2 acre 330 Holly Drive property is being held out of the preservation area to accommodate road alignments. Part of this held-out acreage is within the Holly Drive right-of-way and must be maintained as roadway. In addition, an unimproved access road (gravel drive) will be created immediately parallel with the Holly Drive right-of-way to provide maintenance operators with access to Phillip 66's Line 200 pipeline off of Holly Drive.

The effects of the emergency response and newly proposed remediation impacts on biological resources are analyzed in this report. Biological resources under review include impacts to common plant and animal species, and special-status plants and animals as designated by the USFWS, CDFW, National Marine Fisheries Service (NMFS), and other resource organizations including the California Native Plant Society. Biological resources also include waters of the United States and State, as regulated by the Corps, Water Board, and CDFW.

This biological resources analysis also provides mitigation measures for "potentially significant" and "significant" impacts that occurred to biological resources during the emergency response and that could occur during the final remediation efforts (the project). Upon implementation, the prescribed mitigation measures significant impacts are reduced to levels considered less than significant pursuant to the California Environmental Quality Act (CEQA).

2. PROJECT LOCATION

The approximately 8.9-acre project site is made up of a private property located at 330 Holly Drive in Concord, California and a small portion on the southern boundary of the Concord Naval Weapons Station (CNWS) (Figures 1, 2 and 3). The south edge of the project site is bordered by Holly Creek, and further to the south is a high density residential housing development. The north side of the project site abuts CNWS lands. To the east and west there are also CNWS lands.

The private property at 330 Holly Drive is approximately 2 acres and currently supports a large single-family residential home with well house and associated concrete pathways, a large paved parking lot, and landscaping including; vineyard and lawn. The east half of the project site is defined by a swale that separates the main western property from the eastern half, which also

contains eight roughly 8 by 20 foot raised planter boxes and open space non-native grassland. The east side of the private property supports non-native annual grassland.

The remediation project site includes 6.9 acres of the Concord Naval Weapons Station property and a portion of the 2 acre private property at 330 Holly Drive. All of the 2 acre private property is considered part of the proposed project as all of it will be restored to a natural condition upon completion of the remediation work. The CNWS is a 5,028-acre site that has been extensively altered as a result of historical agricultural and military use, including localized farming, grazing, munitions storage, and other related activities. The portion of the CNWS affected by the emergency and proposed remediation projects supports mostly non-native annual grassland. Elevations in the vicinity of the project site range from approximately 395 feet to approximately 460 feet above sea level. Vegetation communities on the CNWS are dominated by grazed and non-grazed non-native annual grassland. Seasonal wetlands are also present within the project area on the CNWS. These habitats are further described below.

3. THE REMEDIATION PROJECT

The remediation project includes the removal of all soils with elevated hydrocarbon content to a level established and approved by the Water Board. Affected soils would be removed via excavation to the Keller Canyon Landfill, a permitted disposal facility qualified to accept these soils. Clean overburden consisting of recontoured unaffected soils and/or import of clean soils would be used to reestablish site contours. The remediation project includes remediation of groundwater by natural attenuation processes with monitoring. A remediation plan submitted previously to the Water Board details the technical aspects of the remediation project. Please note that the full project description is included in the Initial Study/Mitigated Negative Declaration prepared for the proposed project.

4. PROJECT SITE ACCESS

Access to the pipeline remediation project site is via a gate located on Bailey Road, 0.5-mile northeast of the intersection of Bailey Road and Myrtle Road. Approximately 1.2 miles of paved road extend to the southeast to 0.6 mile of existing dirt road that is periodically used to gain access to this remote area of the CNWS property. The project site is located immediately adjacent to the existing dirt road (Figures 2 and 3). All construction equipment is limited to the dirt road, the designated staging area, and the project site footprint.

5. ANALYSIS METHODS

5.1 Background Research

Prior to preparing this biological resource analysis, M&A researched the most recent version of the California Department of Fish and Wildlife's (CDFW) Natural Diversity Database, RareFind 3.1 application (CNDDB 2015) for special-status species known to occur in the region of the project site. All special-status species records were compiled in tables. M&A examined all known record locations for special-status species to determine if special-status species could occur on the project site or within an area of affect.

5.2 Site Investigation

M&A were present as daily biological monitors during the emergency response in 2011 and 2012. We have been conducting follow-up biological investigation tracking redevelopment of wetlands in the impacted area since the emergency response project ended in 2012. As necessary to focus on a CEQA level reporting effort, and as necessary to include the private property at 330 Holly Drive in this analysis, M&A biologists Mr. Geoff Monk and Ms. Bridgett Downs conducted a general survey of the project site on March 6, 2015. During all site visits biological resources were recorded. Using our extensive working knowledge with the California red-legged frog, the California tiger salamander, and with rare plants, M&A evaluated the effects of the project's special-status species and waters of the U.S. and State. The general survey involved searching all habitats on the site and recording all plant and wildlife species observed. M&A then cross-referenced the habitats found on the project site against the habitat requirements of local or regionally known special-status species to determine if the project could directly or indirectly impact such species.

5.3 Wetland Delineation

To map the extent of seasonal wetlands and other waters, on November 15, 2011 M&A principal biologist Mr. Geoff Monk visited the project site immediately upon notification of the spill and prior to any excavation and/or remediation work. Using Global Positioning System (GPS) technology with sub-meter accuracy, Mr. Monk mapped the extent of other waters and wetlands within the project site. This delineation effort was based upon apparent hydrology and the presence of hydrophytic vegetation visible prior to disturbance of the project site. To the extent that soil was not impacted, soils characteristics were also used to delineate and differentiate seasonal wetlands, other waters, and uplands. Owing to the emergency conditions and the requirement for immediate clean-up, a formal delineation could not be completed, but the best possible delineation was completed under the constraints of the emergency effort that immediately commenced.

On December 15, 2011, subsequent to Mr. Monk mapping waters of the U.S./State on the project site, remediation work commenced. During this remediation effort, a formal wetland delineation of the project site and immediate surroundings was conducted by M&A biologists Ms. Hope Kingma, Ms. Sadie McGarvey, and Mr. Tim O'Donnell. The full extent of wetlands as affected by the remediation effort was mapped.

The wetland delineations were conducted according to the Corps' 1987 *Wetlands Delineation Manual* (Corps 1987) in conjunction with the Regional Supplement for the Arid West Region (Corps 2008). Vegetation, hydrology, and soils information from selected data points were recorded on data sheets. Data points and potential wetland areas were mapped using a Trimble Pro-XR GPS having sub-meter accuracy. GPS data were corrected using base station files from California Survey and Drafting. The delineation map was made from the GPS files using ArcMap 10.0. All spatial data were projected into the California State Plane, NAD 83 coordinate system, Zone 2. Using GPS technology, the boundaries (within 30 inches) of each delineated wetland was transferred to an aerial photograph of the project, as depicted on Sheet 1 (Attached).

The results of our literature research and wetland field assessments are provided in the sections below.

6. RESULTS OF RESEARCH AND PROJECT SITE ANALYSES

6.1 Topography and Hydrology

While the footprints of the project are nearly level, elevations in the vicinity of the project site range from approximately 395 feet to approximately 460 feet above mean sea level. The portion of the property on the CNWS has a 2-5% slope along the boundary with private property at 330 Holly Drive. A raised building pad was constructed in the 1960s and now supports the residence at 330 Holly Drive. Water flowing down an ephemeral tributary from the CNWS flow souths through the portion of the CNWS affect by the proposed project (Sheet 1). Water draining from the CNWS through this drainage accumulates at the toe of the residence pad where seasonal wetlands formed. [These wetlands were impacted by the Emergency Response in 2011 and 2012]. When water exceeds the capacity of these seasonal wetlands it continues to flow along the CNWS property boundary (west to east) and then flows southward into the private property at 330 Holly Drive. It continues to flow through this property and joins Holly Creek immediately south of 330 Holly Drive.

As shown on Sheet 1, four moderate-sized potential seasonal wetlands (W1, W3, W4, and W5) bisect the project site, however only one seasonal wetland and one "other water" was impacted by the original emergency response project (Sheet 2). The drainage feature on the project site that will be permanently affected is highly ephemeral and characterized by an eroded gully that flows from the watershed to the north of the site on the CNWS, and slopes to the flatter topography of the project site, emptying into the seasonal wetland at the southeastern corner of the project site.

6.2 Plant Communities and Associated Wildlife Habitats

A complete list of plant species observed on the project site is presented in Table 1. Nomenclature used for plant names follows *The Jepson Manual* Second Edition (Baldwin 2012) and changes made to this manual as published on the Jepson Interchange Project website (http://ucjeps.berkeley.edu/interchange/index.html). Table 2 is a list of wildlife species observed on the project site. Nomenclature for wildlife follows the CDFW's *Complete list of amphibian, reptile, bird, and mammal species in California* (2014) and any changes made to species nomenclature as published in scientific journals since the publication of the Department's list.

The CNWS portion of the project site and eastern portion of the private property at 330 Holly Drive are characterized as non-native annual grassland. There are seasonal wetlands dispersed throughout the project site and an ephemeral drainage. The single family home is surrounded by an anthropogenic community. Complete descriptions are provided below.

6.2.1 Non-Native Annual Grassland

Prior to European settlement of California, the valley and coastal grasslands were dominated by a mix of native, perennial bunchgrasses and spring-flowering forbs (broad-leaved plants) accustomed to intermittent, low-pressure grazing, browsing, and trampling by deer and other

native ungulates such as tule elk (*Cervus elaphus nannodes*) and pronghorn (*Antilocapra americana*). Native plants commonly found in California at that time were purple-needle grass (*Stipa pulchra*), California oat grass (*Danthonia californica*), and blue wildrye (*Elymus glaucus*). European settlement resulted in the introduction of Mediterranean and Eurasian grasses and forbs for horticulture, agriculture and forage as well as unintentional introductions of exotic species in the fur and digestive systems of livestock. Introduced, annual grasses flourished under the high grazing pressure of cattle while native, perennial bunchgrasses diminished under the same conditions. Introduced species tolerant of high grazing pressure, particularly annual grasses of Eurasian ancestry, have displaced native bunchgrasses and created a shift in plant species composition toward a non-native annual grassland.

The majority of the CNWS portion of the project site and a small area on the eastern 1/3 of the private property at 330 Holly Drive is characterized as non-native annual grassland dominated by slender wild oats (*Avena barbata*), ripgut grass (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), foxtail barley (*Hordeum murinum* var. *leporinum*), and ryegrass (*Festuca perennis*, formerly known as *Lolium multiflorum*). Other species present in the grassland community include creeping wildrye (*Elymus triticoides* var. *triticoides*, formerly known as *Leymus triticoides*), Harding grass (*Phalaris aquatica*), Mediterranean linseed (*Bellardia trixago*), black mustard (*Brassica nigra*), wild mustard (*Sinapis arvensis*), yellow star thistle (*Centaurea solstitialis*), Italian thistle (*Carduus pycnocephalus* var. *pycnocephalus*), bull thistle (*Cirsium vulgare*), bristly-ox tongue (*Helminthotheca echioides*), and wild radish (*Raphanus sativa*), and woody plants such as coyote brush (*Baccharis pilularis* var. *consanguinea*). Trees found in the non-native annual grassland include a decadent remnant of an old walnut orchard (*Juglans regia*), a few scattered valley oaks (*Quercus lobata*), several black locust (*Robinia pseudoacacia*), and an ash (*Fraxinus* sp.) on the hillsides near the project site.

6.2.2 SEASONAL WETLAND

Seasonal wetlands are habitats that may appear dry in the summer and fall months, but following the first winter rains become saturated or hold water for a period of several weeks to months at a time. Seasonal wetlands may remain inundated for a prolonged period of time typically due to the presence of impervious soils and/or confining topography such as topographic low areas.

Four moderate-sized potential seasonal wetlands (W1, W3, W4, and W5; Sheet 1) bisect the CNWS portion of the project site. These potential wetland features support a mix of both hydrophytic (wetland) and upland vegetation. Non-native species that occur within these features include Mediterranean barley (*Hordeum marinum* var. *gussoneanum*), Italian ryegrass, black locust (*Robinia* pseudoacacia), and curly dock (*Rumex crispus*). Native species that occur within the potential seasonal wetlands include Hairy willow-herb (*Epilobium ciliatum*), Arroyo willow (*Salix lasiolepis*), American stinging nettle (*Urtica dioica gracilis*), alkali bulrush (*Bolboschoenus maritimus* var. *paludosus*), and Baltic rush (*Juncus balticus* var. *ater*). All areas mapped as seasonal wetlands were characterized by a visible dominance of hydrophytic vegetation and a visible wetland margin while their adjacent upland areas were dominated by upland vegetation.

6.2.3 EPHEMERAL DRAINAGE

An ephemeral drainage ("other water") enters the project site from the north (Sheet 1). This drainage funnels storm event driven sheet flows through the project site where stormwater collects in topographic low areas prior to then flowing southward off the CNWS through a swale on the private property at 330 Holly Drive. This swale then delivers water to Holly Creek immediately south of 330 Holly Drive. Scattered vegetation growing along the drainage includes upland species such as wild oats, smooth brome, and sporadic occurrences (less than dominant cover) of Mediterranean barley, saltgrass (*Distichlis spicata*), and Baltic rush.

6.2.4 ANTHROPOGENIC COMMUNITIES (RESIDENTIAL PROPERTY)

Communities dominated by plants introduced by man and established or maintained by human disturbance are "anthropogenic communities." Some of these are entirely artificial communities such as cultivated row crops, lawns, vineyards, etc. Others are assemblages of weedy species that have invaded disturbed areas, sometimes in spite of human efforts to control them (Holland and Keil 1989). There are many different types of anthropogenic communities; below we talk about the "urban mix" found onsite.

The single-family home on the private property at 330 Holly Drive is surrounded by landscaped paved parking areas, landscaped lawns with concrete curb borders, a vineyard, and ornamental trees and shrubs such as rosemary (*Rosmarinus officinalis*), olive tree (*Olea europaea*), almond tree (*Prunus dulcis*), redwood (*Sequoia sempervirens*), incense cedar (*Calocedrus decurrens*), weeping willow (*Salix babylonica*), pine tree (*Pinus* sp.), Mexican fan palm (*Washingtonia robusta*), lemon tree (*Citrus limon*), grapefruit tee (*Citrus x paradisi*), and orange tree (*Citrus x sinensis*).

Wildlife species seen on the project site during M&A's March 6, 2015 investigation included mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), western scrub jay (*Aphelocoma californica*), bushtit (*Psaltriparus minimus*), ruby-crowned kinglet (*Regulus calendula*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), yellow-rumped warbler (*Dendroica coronata*), dark-eyed junco (*Junco hyemalis*), house finch (*Carpodacus mexicanus*), and fox squirrel (*Sciurus niger*). A complete list of observed wildlife species is provided in Table 2.

7. SPECIAL-STATUS SPECIES ISSUES

7.1 Definitions

For purposes of this analysis, special-status species are plants and animals that are legally protected under the California and Federal Endangered Species Acts (CESA and FESA, respectively) or other regulations, and species that are considered rare by the scientific community (for example, the CNPS). Special-status species are defined as:

- plants and animals that are listed or proposed for listing as threatened or endangered under the CESA (Fish and Game Code §2050 *et seq*.; 14 CCR §670.1 *et seq.*) or the FESA (50 CFR 17.12 for plants; 50 CFR 17.11 for animals; various notices in the Federal Register [FR] for proposed species);

- plants and animals that are candidates for possible future listing as threatened or endangered under the FESA (50 CFR 17; FR Vol. 64, No. 205, pages 57533-57547, October 25, 1999); and under the CESA (California Fish and Game Code §2068);

- plants and animals that meet the definition of endangered, rare, or threatened under the California Environmental Quality Act (CEQA) (14 CCR §15380) that may include species not found on either State or Federal Endangered Species lists;

- Plants occurring on Ranks 1A, 1B, 2, 3, and 4 of CNPS' *Electronic Inventory* (CNPS 2001). The California Department of Fish and Wildlife recognizes that Ranks 1A, 1B, and 2 of the CNPS inventory contain plants that, in the majority of cases, would qualify for State listing, and CDFW requests their inclusion in EIRs. Plants occurring on CNPS Ranks 3 and 4 are "plants about which more information is necessary," and "plants of limited distribution," respectively (CNPS 2001). Such plants may be included as special-status species on a case by case basis due to local significance or recent biological information;

- migratory nongame birds of management concern listed by U.S. Fish and Wildlife Service (Migratory Nongame Birds of Management Concern in the United States: The list 1995; Office of Migratory Bird Management; Washington D.C.; Sept. 1995);

- animals that are designated as "species of special concern" by CDFW (2015);

- Animal species that are "fully protected" in California (Fish and Game Codes 3511, 4700, 5050, and 5515).

In the paragraphs below we provide further definitions of legal status as they pertain to the special-status species discussed in this report or in the attached tables.

Federal Endangered or Threatened Species. A species listed as Endangered or Threatened under the FESA is protected from unauthorized "take" (that is, harass, harm, pursue, hunt, shoot, trap) of that species. If it is necessary to take a Federal listed Endangered or Threatened species as part of an otherwise lawful activity, it would be necessary to receive permission from the USFWS prior to initiating the take.

State Threatened Species. A species listed as Threatened under the state Endangered Species Act (§2050 of California Fish and Game Code) is protected from unauthorized "take" (that is, harass, pursue, hunt, shoot, trap) of that species. If it is necessary to "take" a state listed Threatened species as part of an otherwise lawful activity, it would be necessary to receive permission from CDFW prior to initiating the "take."

California Species of Special Concern. These are species in which their California breeding populations are seriously declining and extirpation from all or a portion of their range is possible. This designation affords no legally mandated protection; however, pursuant to the CEQA

Guidelines (14 CCR §15380), some species of special concern could be considered "rare." Pursuant to its rarity status, any unmitigated impacts to rare species could be considered a "significant effect on the environment" (§15382). Thus, species of special concern must be considered in any project that will, or is currently, undergoing CEQA review, and/or that must obtain an environmental permit(s) from a public agency.

CNPS Rank Species. The California Native Plant Society (CNPS) maintains an inventory of special status plant species. This inventory has four lists of plants with varying rarity. These lists are: Rank 1, Rank 2, Rank 3, and Rank 4. Although plants on these lists have no formal legal protection (unless they are also state or federal listed species), the California Department of Fish and Wildlife requests the inclusion of Rank 1 species in environmental documents. In addition, other state and local agencies may request the inclusion of species on other lists as well. Rank 1 species have the highest priority: Rank 1A species are thought to be extinct, and Rank 1B species are known to still exist but are considered "rare, threatened, and endangered in California and elsewhere." All of the plants constituting Rank 1B meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the Department Code, and are eligible for state listing (CNPS 2001). Rank 2 species are rare in California, but more common elsewhere. Ranks 3 and 4 contain species about which there is some concern, and are review and watch lists, respectively. Additionally, in 2006 CNPS updated their lists to include "threat code extensions" for each list. For example, Rank 1B species would now be categorized as Rank 1B.1, Rank 1B.2, or Rank 1B.3. These threat codes are defined as follows: .1 is considered "seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)"; .2 is "fairly endangered in California (20-80% of occurrences threatened)"; .3 is "not very endangered in California (less than 20% of occurrences threatened or no current threats known)."

Under the CEQA review process only CNPS Rank 1 and 2 species are considered since these are the only CNPS species that meet CEQA's definition of "rare" or "endangered." Impacts to Rank 3 and 4 species are not regarded as significant pursuant to CEQA.

Fully Protected Birds. Fully protected birds, such as the white-tailed kite and golden eagle, are protected under California Fish and Game Code (§3511). Fully protected birds may not be "taken" or possessed (i.e., kept in captivity) at any time.

7.2 Special-Status Plants Known from the Project Site Vicinity

Figure 4 provides a graphical illustration of the closest known records for special-status species within 2 miles of the project site and helps readers visually understand the number of sensitive species that occur in the vicinity of the project site. No special-status plants have been mapped on or adjacent to the project site. However, according to the CNPS *Inventory* and CDFW's CNDDB, a total of 29 special-status plant species are known to occur within the Clayton U.S. Geological Survey 7.5 minute quadrangle and within 2 miles of the project site (Table 4). Many of these plants occur in specialized habitats such as chaparral, cismontane woodland, lower montane coniferous forest, broad-leaf upland forest, broad-leafed upland forest, coastal scrub, riparian woodland, vernal pools, serpentinite soils, foothill woodland, chenopod scrub, meadows, coastal scrub, interior dunes, marshes, and swamps, which are not present onsite. Prior to the

emergency response remediation measures, valley and foothill grassland occurred on the CNWS portion of the project site. However, this area has been extensively modified during multiple remediation efforts where soils have been excavated, removed, and replaced in the remediation area footprint. Accordingly, the CNWS portion of the project site is so heavily disturbed from the original spill and clean up that all proposed disturbed areas now only support ruderal herbaceous plants. The area of the private property at 330 Holly Drive where remediation activities are proposed is heavily landscaped. A small area of non-native annual grassland occurs on the eastern 1/3 of this parcel, but will not be affected by the project. It is M&A's professional opinion that the project site does not provide habitat for special-status plant species owing to a history of intensive use and modification. Accordingly, no impacts to special-status plants are expected from implementation of the project.

7.3 Special-Status Animals Known from the Project Site Vicinity

Figure 4 provides a graphical illustration of the closest known records for special-status species within 2 miles of the project site and helps readers visually understand the number of sensitive species that occur in the vicinity of the project site. According to the CDFW's CNDDB, A total of 11 special-status animal species are known to occur in the region of the project site (Table 4). The project site does not provide suitable habitat for most special-status animals know from the region for the reasons provided in Table 4. However, the Townsend's big-eared bat (*Corynorhinus townsendii townsendii*) and pallid bat (*Antrozous pallidus*) are two special-status animal species that could roost on the Residential single family home and associated structure (although unlikely). Also the California tiger salamander (*Ambystoma californiense*) and California red-legged frog (*Rana draytonii*) were assumed to be impacted by the initial emergency response. Thus, these species are further discussed below. While not expected to be impacted by the project, owing to regional sensitivity the Alameda whipsnake (*Masticophis lateralis euryxanthus*), western burrowing owl (*Athene cunicularia hypugaea*), and San Joaquin kit fox (*Vulpes macrotis mutica*) these species are also further discussed below.

7.3.1 California Tiger Salamander

The California tiger salamander (*Ambystoma californiense*) has different state and federal legal protections. The Santa Barbara Distinct Population Segment (DPS) of the California tiger salamander was federally listed as endangered on January 19, 2000. The Sonoma County DPS of the California tiger salamander was federally listed as endangered on July 22, 2002. Finally, the Central California DPS of the California tiger salamander was federally listed as threatened on August 4, 2004. On August 19, 2010, the California tiger salamander was also state listed as a threatened species under the California Endangered Species Act (CESA).

The project site falls into the range of the Central California Distinct Population Segment (DPS) of the California tiger salamander. The USFWS designated critical habitat for the Central California DPS in 2005. The project site is located *outside* of the closest mapped critical habitat for the Central California DPS. *The project site is located approximately 16.2 miles northeast of Critical Habitat Unit CV 18* (Figure 5).

Projects may not impact the California tiger salamander without incidental taking authority from both the USFWS and CDFW. Prior to impacting habitat that supports the California tiger

salamander; the USFWS must prepare an incidental take permit pursuant to either Section 7 or Section 10 of the Federal Endangered Species Act (FESA). Similarly, projects that impact the California tiger salamander also require incidental taking authority from CDFW. Under Section 2081 of CESA an incidental take permit may be authorized by CDFW for projects that impact the California tiger salamander. Finally, under Title 14, CCR 41 (1996), the California tiger salamander is also a protected amphibian that may only be "taken or possessed" under a special permit issued by CDFW pursuant to sections 650 and 670.7 of these regulations, or Section 2081 of the Fish and Game Code.

California tiger salamanders occur in grasslands and open oak woodlands that provide suitable over summering and/or breeding habitats. California tiger salamanders spend the majority of their lives underground. They typically only emerge from their subterranean refugia for a few nights each year during the rainy season to migrate to breeding ponds. Adult California tiger salamanders have been observed up to 2,092 meters (1.3 miles) from breeding ponds (USFWS 2004). As such, unobstructed migration corridors are an important component of California tiger salamander habitat.

California tiger salamanders emerge during the first heavy, warm rains of the year, typically in late November and early December. In most instances, larger movements of California tiger salamanders do not occur unless it has been raining hard and continuously for several hours. Typically, for larger movements of California tiger salamanders to occur nighttime temperatures also must be above 48° F. California tiger salamanders are able to move over, through or around almost all obstacles. Significant obstructions that block California tiger salamander movements include freeways and other major (heavy traffic) roads, rivers, and deep, vertical or near vertical sided, concrete irrigation/flood control ditches.

During the spring, summer, and fall months, most known populations of the California tiger salamander predominately use California ground squirrel burrows as over-summering habitat (Jennings and Hayes 1994; G. Monk personal observation). Other secondary subterranean refugia, or primary refugia where California ground squirrels are absent, likely include Botta's pocket gopher burrows, deep fissures in desiccated clay soils, and debris piles (e.g. downed wood, rock piles).

Stock ponds, seasonal wetlands, and deep vernal pools typically provide most of the breeding habitat used by the California tiger salamander. In such locations California tiger salamanders attach their eggs to rooted, emergent vegetation, and other stable filamentous objects in the water column. Eggs are gelatinous and are laid singly or occasionally in small clusters. Eggs range in size from about ¾ the diameter of a dime to the full diameter of a dime. Occasionally California tiger salamanders are found breeding in slow-moving, streams or ditches. Ditches and/or streams that are subject to rapid flows, even if only on occasion, typically will not support or sustain California tiger salamander egg attachment through hatching, and thus, are not usually used successfully by the California tiger salamander for breeding (G. Monk and S. Lynch, pers. observations). Similarly, streams and/or ditches that support predators of California tiger salamander or their eggs and larvae such as fish, bullfrogs, red swamp crayfish, or signal crayfish, almost never constitute suitable breeding habitat.

Typically seasonal wetlands that are used for breeding must hold water into the month of May to allow enough time for larvae to fully metamorphose. In dry years, seasonal wetlands may dry too early to allow enough time for California tiger salamander larvae to successfully metamorphose. Under such circumstances, desiccated California tiger salamander larvae can be found in dried pools. In addition, as pools dry down to very small areas of inundation, California tiger salamander larvae become concentrated and are very susceptible to predation. However, in years exhibiting wet springs, these same pools can remain inundated long enough through continual rewetting to allow California tiger salamander larvae ample time to successfully metamorphose.

The closest known CNDDB record for the California tiger salamander is from 2005 and is located approximately 0.41 mile northeast of the project site in a stockpond surrounded by heavily grazed grassland on the CNWS (CNDDB Occurrence No. 949). Nine larvae were found in a wetland during spring dip net surveys conducted by independent biologists. As this species routinely over summers in rodent burrows within 1.3 mile of breeding sites, impacts from the initial emergency response were assumed to have impacted the California tiger salamander.

In response to the Line 200 emergency remediation efforts completed by the applicant on the CNWS in 2011 and 2012, a Biological Opinion (BO) was prepared by the U.S. Fish and Wildlife Service (USFWS) for Mr. Chris Hoidal of the Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation (DOT) (USFWS File No. 08ESMF00-2013-F-0629). The BO concluded the emergency response impacted potential habitat of the federally listed threatened California red-legged frog and the federally listed threatened Central Distinct Population Segment (DPS) of the California tiger salamander. The BO also concluded that the emergency response "may affect but is not likely to adversely affect" the federally listed endangered San Joaquin kit fox. The BO covered all areas of the emergency response project area, which includes the currently proposed remediation project on the CNWS. It did not cover the proposed remediation measures on the private property at 330 Holly Drive. During the emergency remediation efforts on the CNWS portion of the project site, avoidance and protection measures were implemented to minimize impacts to this salamander, and impacts to the California tiger salamander were mitigated.

To compensate for impacts to federal listed species protected pursuant to the FESA, the USFWS's BO stipulated that the applicant purchase 3.6 acres of conservation credits for permanent impacts, 4.7 acres for semi-permanent impacts, and 1.4 acres of credit for temporary impacts (totaling 9.7 acres) to the California tiger salamander and the California red-legged frog. Complying with the BO, in August 2013, the applicant purchased 9.7 acres of California tiger salamander credits from the Burke Ranch Conservation Bank and 9.7 acres of California red-legged frog credits from the Ohlone Preserve Conservation Bank.

The California tiger salamander is known to occur on the CNWS. The project site on the CNWS is highly disturbed; extensive remediation grading occurred on the CNWS portion of the project site during the emergency remediation response and through subsequent boring and testing procedures that have been ongoing since the initial emergency response. Much of the private property at 330 Holly Drive that will be affected by the remediation project is highly developed with a single-family home, well house, outbuildings, and concrete or asphalted surfaces. All

residential use areas are highly landscaped. These residential use areas do not provide California tiger salamander habitat.

However, running north to south through the middle of 330 Holly Drive there is a defined swale that was used by the former resident of the private property as a vegetable gardening area. It currently supports eight, roughly 8 by 20-foot raised planter boxes. It also is full of landscape plants. This swale accepts storm event runoff through a drainage on the CNWS (OW 1, 2, and 3 Sheet 1), delivering flows to Holly Creek immediately south of 330 Holly Drive. The remediation project includes restoring this swale on 330 Holly Drive to natural landscape. In addition, a seasonal wetland would be created in an upland area within this swale (Sheet 3).

The eastern half of the private property at 330 Holly Drive is open dominated by non-native annual grassland and will not be disturbed by restoration activities. The central swale area with vegetable beds could provide California tiger salamander migration and/or over-summering habitat. BMPs will have to be implemented to ensure that migrating California tiger salamander do not wander into the remediation area during excavation. Consequently incidental take permits from USFWS and CDFW are required for the project on the portion of the project that would be disturbed on the private property at 330 Holly Drive.

With implementation of the avoidance and mitigation measures that have been implemented in the past in compliance with the USFWS BO and those listed in the "Impacts and Mitigations" section below, impacts to the California tiger salamander can be mitigated to a level considered less than significant pursuant to the CEQA.

7.3.2 CALIFORNIA RED-LEGGED FROG

The California red-legged frog (*Rana draytonii*) was federally listed as threatened on May 23, 1996 (Federal Register 61: 25813-25833) and as such is protected pursuant to the Federal Endangered Species Act. On March 16, 2010 the USFWS issued the final designation for California red-legged frog Critical Habitat (USFWS 2010). The 2010 Critical Habitat maps (Federal Register dated March 17, 2010 (Volume 75, Number 51:12815-12864) show that the project site is located approximately 4.2 miles north of, *outside* of, Critical Habitat Unit CCS-2A (Figure 5).

This frog is also a California "species of special concern." California "species of special concern" are species in which their California breeding populations are seriously declining and extirpation from all or a portion of their range is possible. This title affords no legally mandated protection for this species; however, pursuant to CEQA (14 CCR §15380), any project-related impacts to this species would be regarded as significant.

California red-legged frogs are typically found in slow-flowing portions of perennial streams, and in intermittent streams, and hillside seeps that maintain pool environments or saturated soils throughout the summer months. Larval California red-legged frogs require 11-20 weeks of permanent water to reach metamorphosis (i.e., to change from a tadpole into a frog), in water depths of 10 to 20 inches (USFWS 2002). Riparian vegetation such as willows and emergent vegetation such as cattails are preferred red-legged frog habitats, though not necessary for this species to be present. This frog is also found in human-made ponds. Populations of the

California red-legged frog will be reduced in size or eliminated from ponds supporting non-native species such as bullfrogs (*Rana catesbeiana*), Centrarchid fish species (such as sunfish, blue gill, or largemouth bass), and signal and red swamp crayfish (*Pacifastacus leniusculus* and *Procambarus clarkii*, respectively), all known California red-legged frog predators.

The closest known CNDDB record for California red-legged frog is from 2000 and was located immediately adjacent and south of the private property at 330 Holly Drive (pers. communication between Nicole Kozicki of the CDFW and Geoff Monk). This population was extirpated when the pond was removed by the developer that constructed the subdivision immediately south of the private property at 330 Holly Drive. The closest likely extant CNDDB record is located approximately 1.3 miles east of the project site in a stockpond surrounded by heavily grazed grassland on the north side of Kirker Pass Road (CNDDB Occurrence No. 566). Four adults and five egg masses were observed at this record location. It is likely that direct take of the California red-legged frog did not occur from the initial emergency response and remediation.

During the initial emergency remediation efforts on the CNWS in 2011 and 2012 avoidance and protection measures were implemented and impacts to potential California red-legged frog habitat were mitigated.

To compensate for impacts to federal listed species protected pursuant to the FESA, the USFWS's BO stipulated that the applicant purchase 3.6 acres of conservation credits for permanent impacts, 4.7 acres for semi-permanent impacts, and 1.4 acres of credit for temporary impacts (totaling 9.7 acres) to the California tiger salamander and the California red-legged frog. Complying with the BO, in August 2013, the applicant purchased 9.7 acres of California tiger salamander credits from the Burke Ranch Conservation Bank and 9.7 acres of California red-legged frog credits from the Ohlone Preserve Conservation Bank for a total of 19.4 acres.

The project site on the CNWS is highly disturbed; extensive remediation grading occurred on the CNWS portion of the project site during the emergency remediation response and through subsequent boring and testing procedures that have been ongoing since the initial emergency response. The residential use area of the private property at 330 Holly Drive is developed with a single-family home, a pump house, concreate and asphalted covered areas, and manicured landscaping. These areas do not provide California red-legged frog habitat.

However on the east half of the project site there is a defined swale that separates the main western property from the eastern half, which also contains eight roughly 8 by 20 foot raised planter boxes and open space non-native grassland. The vegetable box area used to support a pond that supported California red-legged frogs, approximately 12 years ago [pers. com. between Ms. Nicole Kozicki (CDFW) and Geoff Monk]. The pond and these frogs apparently were extirpated by the development south of the project site. Thus, they are not expected to be impacted by restoration activities that will be implemented either on the CNWS or at 330 Holly Drive. Regardless, BMPs will have to be implemented to ensure that migrating California red-legged frogs do not wander into the remediation area during excavation. Consequently an incidental take permit from the USFWS is required for the project on the portion of the project that would be disturbed at 330 Holly Drive.

With implementation of the avoidance and mitigation measures that have been implemented in the past in compliance with the USFWS BO and those listed in the "Impacts and Mitigations" section below, impacts to the California red-legged frog can be mitigated to a level considered less than significant pursuant to the CEQA.

7.3.3 ALAMEDA WHIPSNAKE

The Alameda whipsnake (*Masticophis lateralis euryxanthus*) is a state and federal listed threatened species. The U.S. Fish and Wildlife Service designated critical habitat for this species on October 2, 2006 (Federal Register 71:58176-58231). The project site is located *outside* of the USFWS critical habitat Unit 4 designated for Alameda and Contra Costa Counties, which is located approximately 1.7 miles southwest of the project site (Figure 5).

The Alameda whipsnake is a slender snake with adults reaching a length of 3 to 5 feet. The dorsal surface is colored sooty black or dark brown with a distinct yellow-orange stripe down each side. This extremely fast-moving snake holds its head high off the ground to peer over grass or rocks for potential prey. It is an active daytime predator. Rock outcrops are an important feature of Alameda whipsnake habitat because they provide retreat opportunities for whipsnakes and promote lizard populations. Lizards, especially the western fence lizard (*Sceloporus occidentalis*), appear to be the most important prey item of whipsnakes, although other prey items are taken, including skinks, frogs, snakes, and birds.

Adult whipsnakes appear to have a bimodal seasonal activity pattern with a large peak during the spring mating season and a smaller peak during late summer and early fall. Although short above-ground movements may occur during the winter, Alameda whipsnakes generally retreat in November into a hibernacula (shelter used during the snake's dormancy period) and emerge in March. Courtship and mating occur from late-March through mid-June. During this time, males move around throughout their home ranges, while females appear to remain at or near their hibernaculum, where mating occurs.

Alameda whipsnakes are typically found in chaparral and coastal sage scrub communities (i.e., communities dominated by chamise or coastal sage plants). Recent telemetry data indicate that, although home ranges of Alameda whipsnakes are centered on shrub communities, they venture up to 150 meters (500 feet) into adjacent habitats, including grassland, oak savanna, and occasionally oak-bay woodland. In fact, recent analysis of habitat types used by Alameda whipsnakes indicates that Alameda whipsnakes are found outside "typical" habitat (that is, chaparral or coastal scrub habitat) about 29 percent of the time, and are found in annual grassland, oak woodland, and riparian habitats, and other open habitats that are associated with chaparral/scrub communities. Telemetry data indicate that whipsnakes remain in grasslands for periods ranging from a few hours to several weeks at a time. Grassland habitats are used by male whipsnakes most extensively during the mating season in spring. Female whipsnakes use grassland areas most extensively after mating, possibly in their search for suitable egg-laying sites.

Core areas (areas of concentrated use) of the Alameda whipsnake most commonly occur on east, south, southeast, and southwest facing slopes. However, recent information indicates that whipsnakes do make use of west, north, and northwest facing slopes in more open stands of

scrub habitat. Alameda whipsnakes inhabit the inner coast range in western and central Contra Costa and Alameda counties. There are five remaining populations (Sobrante Ridge, Oakland Hills, Hayward Hills, Mount Diablo vicinity and the Black Hills, Wauhab Ridge) with little or no genetic flow between them.

The closest known CNDDB record for Alameda whipsnake is from 2003 and is located approximately 3.0 miles southwest of the project site in chaparral (CNDDB Occurrence No. 61). Core habitat for the Alameda whipsnake is not present at the project site or within several miles of the project site as there is no chaparral or scrub habitat with rocky outcrops on which this species depends. The closest core habitat is 2.8 miles southeast of the project site and is separated by the project site by extensive residential developments and roads. As there is no core habitat located within migration distance of this snake, there is no potential for Alameda whipsnake to occur on or be impacted by the project. **Accordingly, pursuant to CEQA, no significant impacts to Alameda whipsnake are expected from implementation of the project.**

7.3.4 WESTERN BURROWING OWL

The western burrowing owl (*Athene cunicularia hypugaea*) is a California "species of special concern." Its nest, eggs, and young are also protected under California Fish and Game Code (§3503, §3503.5, and §3800). The burrowing owl is also protected from direct take under the Migratory Bird Treaty Act (50 CFR 10.13). Finally, based upon this species' rarity status, any unmitigated impacts to rare species would be considered a "significant effect on the environment" pursuant to §21068 of the CEQA Statutes and §15382 of the CEQA Guidelines. Thus, this owl species must be considered in any project that will, or is currently, undergoing CEQA review, and/or that must obtain an environmental permit(s) from a public agency. When these owls occur on project sites, typically, mitigation requirements are mandated in the conditions of project approval from the CEQA lead agency.

Burrowing owl habitat is usually found in annual and perennial grasslands, characterized by low-growing vegetation. Often, the burrowing owl utilizes rodent burrows, typically California ground squirrel (*Spermophilus beecheyi*) burrows, for nesting and cover. They may also on occasion dig their own burrows, or use man-made objects such as concrete culverts or rip-rap piles for cover. They exhibit high site fidelity, reusing burrows year after year. Occupancy of suitable burrowing owl habitat can be verified at a site by observation of these owls during the spring and summer months or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement (white wash) at or near a burrow. Burrowing owls typically are not observed in grasslands with tall vegetation or wooded areas because the vegetation obscures their ability to detect avian and terrestrial predators. Since burrowing owls spend the majority of their time sitting at the entrances of their burrows, grazed grasslands seem to be their preferred habitat because it allows them to view the world at 360 degrees without obstructions.

The closest CNDDB record to the project site where western burrowing owls have been recorded is from 1999 and is located 1.8 miles north of the project site in rolling hills (CNDDB Occurrence No. 1999). Owing to the extensive disturbance that has continually occurred on the CNWS, and the fact that the private property at 330 Holly Drive is heavily landscaped and was occupied by residents with dogs for many years up until the property was purchased by the

applicant in August 2015, there is no potential for the western burrowing owl to occur on the project site. **Accordingly, pursuant to CEQA, no significant impacts to western burrowing owls are expected from implementation of the project.**

7.3.5 TOWNSEND'S BIG-EARED BAT

Townsend's big-eared bat (*Corynorhinus townsendii*) is a California "species of special concern"; it is also a candidate for state listing. It has no special federal status. Once considered common in California, this species is found in all but subalpine and alpine habitats. Although these bats eat a variety of beetles and other soft-bodied insects, small moths make up the principle food source for this species. It is believed that roosting sites are the most important limited resource for Townsend's big-eared bat. This species requires caves, mines, tunnels, buildings, or other human-made structures for roosting and for maternity sites, potentially using separate sites for day, night, hibernation, or maternity roosts. Although this species shows high site fidelity if undisturbed, it is extremely sensitive to disturbance of roosting sites (a single visit may result in abandonment of the roost).

The closest known CNDDB record for the Townsend's big-eared bat is from 1977 and is located approximately 4.9 miles south of the project site (CNDDB Occurrence No. 424). Four specimens were collected at this location in 1977. The buildings and structures on the project site are modern and do not have opening to attics or other likely roost or maternity sites. Accordingly, these structures provide marginal roosting habitat for this bat along the eaves of the house and pump house. As this bat is extremely sensitive to disturbance it is highly unlikely that it would occur on the project site. Regardless, out of an abundance of caution, preconstruction surveys will be conducted to ensure that there are no impacts to this special-status bat species. **With implementation of the avoidance and mitigation measures presented in the "Impacts and Mitigations" section below, impacts to the Townsend's big-eared bat can be mitigated to a level considered less than significant pursuant to the CEQA.**

7.3.6 PALLID BAT

The pallid bat (*Antrozous pallidus*) is a California "species of special concern." It has no federal status. The "species of special concern" status designation does not provide any special legally mandated protection for this bat species. However, this status designation likely meets the definition of "rare" pursuant to the California Environmental Quality Act (CEQA) (14 CCR §15380(2)(A)). As such, potential impacts to this bat species should be considered during any CEQA review. Any unmitigated impacts to this species would likely be regarded by the resource agencies (CDFW and the USFWS) as a significant adverse impact pursuant to CEQA (§21068).

This bat is a locally common species of low elevations in California. It occurs throughout California except for the high Sierra Nevada from Shasta to Kern Counties, and the northwestern corner of the state from Del Norte and western Siskiyou counties to northern Mendocino County. It occurs in a wide variety of habitats. It is most common in open, dry habitats with rocky areas for roosting. Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings. Roost must protect bats from high temperatures. Night roosts may be in more open sites such as porches and open buildings. A social bat; roosts in groups of 20 or more.

The closest known CNDDB record for the pallid bat is from 1942 and is located approximately 2.4 miles northwest of the project site (CNDDB Occurrence No. 136). One male specimen was collected at this location in 1942. The trees are mostly small and only provide marginal roosting habitat for the pallid bat. The buildings and structures on the project site are modern and do not have opening to attics or other likely roost or maternity sites. Accordingly, these structures provide marginal roosting habitat for this bat along the eaves of the house and pump house.

Due to the level of disturbance on the project site it is highly unlikely that this bat would occur. Regardless, out of an abundance of caution preconstruction surveys will be conducted to ensure that there are no impacts to this special-status bat species. **With implementation of the avoidance and mitigation measures presented in the "Impacts and Mitigations" section below, impacts to the pallid bat can be mitigated to a level considered less than significant pursuant to the CEQA.**

7.3.7 SAN JOAQUIN KIT FOX

San Joaquin kit fox (*Vulpes macrotis* ssp. *mutica*) is a federally listed endangered species and a California listed threatened species. This species' distribution is primarily limited to the San Joaquin Valley and adjacent regions. The San Joaquin kit fox is the smallest fox species in North America, typically weighing between four and six pounds. It has large ears, long legs, and is generally a buffy tan color with a black-tipped tail. Kit fox live primarily in the lowlands of the San Joaquin Valley of California, but are also known to occur in several counties in the coast mountain ranges including Santa Barbara, San Luis Obispo, Monterey, San Benito, Santa Clara, Contra Costa and Alameda Counties.

This fox species is usually found in open grassland and shrubland communities, but has also been observed in orchards that border grassland or shrubland plant communities. Kit fox are carnivorous, usually feeding on small rodents such as pocket mice (*Perognathus inornatus*), deer mice (*Peromyscus maniculatus*), western harvest mice (*Reithrodontomys megalotis*), kangaroo rats (*Dipodomys* spp.) and larger rodents such California ground squirrel. Kit fox also prey upon lagomorphs such as black-tailed hare (*Lepus californicus*) and desert cottontail (*Sylvilagus audubonii*). It relies on dens for breeding, and to provide escape cover from potential predators. Kit fox are reputedly poor diggers, so dens are excavated in loose-textured soils, generally in areas with low to moderate relief, or they will utilize holes left by other species. They will utilize burrows dug by rabbits, ground squirrels, and on occasion, badgers (*Taxidea taxus*). Man-made structures, such as well-casings, culverts, and abandoned pipelines, are also occasionally used for dens. Typically, dens are small enough to discourage easy predation by coyotes. Populations of kit fox are thought to be related to the availability of denning sites, particularly natal denning sites, which are often moved several times throughout the season.

The closest known CNDDB record for San Joaquin kit fox (SJKF) is from 1992 and is located approximately 3.8 miles east of the project site (CNDDB Occurrence No. 555). This record dates from 1992 and consists of one individual that was photographed in the vicinity of Black Diamond Mines Regional Park. The CNDDB record is regarded as questionable by many biologists that routinely work with the San Joaquin kit fox. Such doubt is raised by Mr. Monk who examined the photograph, and found the identification to be questionable. Regardless, CNDDB Occurrence Number 555 is the western-most known occurrence of SJKF and is several

miles east of the project site. Thus, there are no records of SJKF on, or in the immediate vicinity of the project site. Furthermore, SJKF have not been recently detected in the northern part of their historic range (Smith, et al 2006).

It is also highly unlikely that SJKF would migrate to the CNWS as high density urban and commercial development, along with highly-impacted major traffic corridors, have substantially fragmented the historic northern range of this species, rendering the remnant patches of habitat unsuitable.

No impacts are expected to occur to the San Joaquin kit fox would not be found on the project site. Corroborating this conclusion, the USFWS' BO for the emergency response in 2011-2012 concluded that the emergency response "may affect but is not likely to adversely affect" the federally listed endangered San Joaquin kit fox. **Accordingly, pursuant to CEQA, no significant impacts to San Joaquin kit fox are expected from implementation of the project.**

8. REGULATORY FRAMEWORK FOR NATIVE WILDLIFE, FISH, AND PLANTS

This section provides a discussion of those laws and regulations that are in place to protect native wildlife, fish, and plants. Under each law we discuss their pertinence to the proposed development.

8.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) forms the basis for the federal protection of threatened or endangered plants, insects, fish and wildlife. FESA contains four main elements, they are as follows:

Section 4 (16 USCA §1533): Species listing, Critical Habitat Designation, and Recovery Planning: outlines the procedure for listing endangered plants and wildlife.

Section 7 (§1536): Federal Consultation Requirement: imposes limits on the actions of federal agencies that might impact listed species.

Section 9 (§1538): Prohibition on Take: prohibits the "taking" of a listed species by anyone, including private individuals, and State and local agencies.

Section 10: Exceptions to the Take Prohibition: non-federal agencies can obtain an incidental take permit through approval of a Habitat Conservation Plan.

In the case of salt water fish and other marine organisms, the requirements of FESA are enforced by the National Marine Fisheries Service (NMFS). The USFWS enforces all other cases. Below, Sections 9, 7, and 10 of FESA are discussed since they are the sections most relevant to the project.

Section 9 of FESA as amended, prohibits the "take" of any fish or wildlife species listed under FESA as endangered. Under Federal regulation, "take" of fish or wildlife species listed as threatened is also prohibited unless otherwise specifically authorized by regulation. "Take," as

defined by FESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." "Harm" includes not only the direct taking of a species itself, but the destruction or modification of the species' habitat resulting in the potential injury of the species. As such, "harm" is further defined to mean "an act which actually kills or injures wildlife; such an act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering" (50 CFR 17.3). A December 2001 decision by the 9th Circuit Court of Appeals (Arizona Cattle Growers' Association, Jeff Menges, vs. the U.S. Fish and Wildlife Service and Bureau of Land Management, and the Southwest Center for Biological Diversity) ruled that the USFWS must show that a threatened or endangered species is present on a project site and that it would be taken by the project activities. According to this ruling, the USFWS can no longer require mitigation based on the probability that the species could use the site. Rather they must show that it is actually present.

Section 9 applies to any person, corporation, federal agency, or any local or State agency. If "take" of a listed species is necessary to complete an otherwise lawful activity, this triggers the need to obtain an incidental take permit either through a Section 7 Consultation as discussed further below (for federal actions or private actions that are permitted or funded by a federal agency), or requires preparation of a Habitat Conservation Plan (HCP) pursuant to Section 10 of FESA (for state and local agencies, or individuals, and projects without a federal "nexus").

Section 7(a)(2) of the Act requires that each federal agency consult with the USFWS to ensure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat for listed species. Critical habitat designations mean: (1) specific areas within a geographic region currently occupied by a listed species, on which are found those physical or biological features that are essential to the conservation of a listed species and that may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by a listed species that are determined essential for the conservation of the species.

The Section 7 consultation process only applies to actions taken by federal agencies that are considering authorizing discretionary projects. Section 7 is by and between the NMFS and/or the USFWS and the federal agency contemplating a discretionary approval (that is, the "federal nexus agency," for example, the Corps or the Federal Highway Administration). Private parties, cities, counties, etc. (i.e., applicants) may participate in the Section 7 consultation *at the discretion of the federal agencies conducting the Section 7 consultation*. The Section 7 consultation process is triggered by a determination of the "action agency" – that is, the federal agency that is carrying out, funding, or approving a project - that the project "may affect" a listed species or critical habitat. If an action is likely to adversely affect a listed species or designated critical habitat, formal consultation between the nexus agency and the USFWS /NMFS is required. As part of the formal consultation, the USFWS /NMFS may resolve any issues informally with the nexus agency or may prepare a formal Biological Opinion assessing whether the proposed action would be likely to result in "jeopardy" to a listed species or if it could adversely modify designated critical habitat. If the USFWS /NMFS prepare a Biological Opinion it will contain either a "jeopardy" or "non-jeopardy" decision. If the USFWS /NMFS concludes

that a proposed project would result in adverse modification of critical habitat or would jeopardize the continued existence of a federal listed species (that is, it will issue a jeopardy decision), the nexus federal agency would be most unlikely to authorize its discretionary permit. If the USFWS /NMFS prepare a "non-jeopardy" Biological Opinion, the nexus federal agency may authorize the discretionary permit making all conditions of the Biological Opinion conditions of its discretionary permit. A non-jeopardy Biological Opinion constitutes an "incidental take" permit that allows applicants to "take" federally listed species while otherwise carrying out legally sanctioned projects.

For non-federal entities, for example private parties, cities, counties that are considering a discretionary permit, Section 10 provides the mechanism for obtaining take authorization. Under Section 10 of FESA, the applicant for an "incidental take permit" is required to submit a "conservation plan" to USFWS or NMFS that specifies, among other things, the impacts that are likely to result from the taking, and the measures the permit applicant will undertake to minimize and mitigate such impacts, and the funding that will be available to implement those steps. Conservation plans under FESA have come to be known as "habitat conservation plans" or "HCPs" for short. The terms incidental take permit, Section 10 permit, and Section 10(a)(1)(B) permit are used interchangeably by USFWS. Section 10(a)(2)(B) of FESA provides statutory criteria that must be satisfied before an incidental take permit can be issued.

8.1.1 RESPONSIBLE AGENCY

FESA gives regulatory authority over terrestrial species and non-anadromous fish to the USFWS. The NMFS has authority over marine mammals and anadromous fish.

8.1.2 APPLICABILITY TO THE PROJECT

The unnamed drainage that flows through the project site is a highly ephemeral tributary, which only has water in it during major storm events. Therefore, it does not provide fisheries habitat. Hence, no fish species would be impacted by the project. Thus, consultation with NMFS is not required for this project. Similarly, the project will not affect any federally listed plants as there are no suitable habitats for any federally listed plants onsite.

In response to the Line 200 emergency remediation efforts completed by the applicant on the CNWS in 2011 and 2012, a Biological Opinion (BO) was prepared by the U.S. Fish and Wildlife Service (USFWS) for Mr. Chris Hoidal of the Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation (DOT) (USFWS File No. 08ESMF00-2013-F-0629). The BO concluded the emergency response impacted potential habitat of the federally listed threatened California red-legged frog and the federally listed threatened Central Distinct Population Segment (DPS) of the California tiger salamander. The BO also concluded that the emergency response "may affect but is not likely to adversely affect" the federally listed endangered San Joaquin kit fox. The BO covered all areas of the emergency response project area, which includes the currently proposed remediation project on the CNWS. It did not cover the proposed remediation measures that will be implanted at 330 Holly Drive.

To compensate for impacts to federal listed species protected pursuant to the FESA, the USFWS's BO stipulated that the applicant purchase 3.6 acres of conservation credits for permanent impacts, 4.7 acres for semi-permanent impacts, and 1.4 acres of credit for temporary

impacts (totaling 9.7 acres) to the California tiger salamander and the California red-legged frog. Complying with the BO, in August 2013, the applicant purchased 9.7 acres of California tiger salamander credits from the Burke Ranch Conservation Bank and 9.7 acres of California red-legged frog credits from the Ohlone Preserve Conservation Bank for a total of 19.4 acres. Proof of the purchase of the required mitigation credits was provided to the USFWS on February 20, 2014.

The California tiger salamander is known to occur on the CNWS. The project site on the CNWS is highly disturbed; extensive remediation grading occurred on the CNWS portion of the project site during the emergency remediation response and through subsequent boring and testing procedures that have been ongoing since the initial emergency response. The private property portion of the project site at 330 Holly Drive is highly developed with a single-family home, other out-buildings, paved parking areas, concrete walkways, and supports manicured and irrigated landscaping (explained in the special-status species section above). It does not provide suitable habitat conditions for the California tiger salamander or the California red-legged frog. However the eastern half of the private property at 330 Holly Drive supports a swale that receives runoff from the CNWS. The former resident used this swale as a vegetable garden and constructed large raised planter boxes (each approximately 8 x 20 feet). This defined swale area with vegetable beds could provide California tiger salamander migration and/or over-summering habitat. In addition, the vegetable box area used to support a pond that supported California red-legged frogs, approximately 12 years ago (pers. com. between Nicole Kozicki and Geoff Monk). The pond and these frogs apparently were extirpated by the development south of the project site. That said the eastern half of the private property, which supports non-native grassland, would not be impacted by the proposed project and thus the only habitat that could be affected by the remediation project is the restoration of the swale, which is a mitigation measure. The swale will not be disturbed by remediation measures. Proposed restoration includes removing the raised planter boxes and landscape vegetation and the creation of a seasonal wetland in an upland portion of this swale.

Avoidance measures will have to be implemented by the project to ensure that migrating California tiger salamander and California red-legged frog do not wander into the remediation and restoration areas during excavation. Consequently, a Section 7 "incidental take permit" issued by USFWS to the Corps will be required for the project that covers not only the portion of the project on the CNWS, but also that covers proposed restoration work that would be implemented at 330 Holly Drive.

8.2 Federal Migratory Bird Treaty Act

The Migratory Bird Treaty Act of 1918 (16 U.S.C. §§703-712, July 3, 1918, as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986 and 1989) makes it unlawful to "take" (kill, harm, harass, shoot, etc.) any migratory bird listed in Title 50 of the Code of Federal Regulations, Section 10.13, including their nests, eggs, or young. Migratory birds include geese, ducks, shorebirds, raptors, songbirds, wading birds, seabirds, and passerine birds (such as warblers, flycatchers, swallows, etc.).

8.2.1 APPLICABILITY TO THE PROJECT

All migratory birds including many common passerine birds (perching birds) that likely nest onsite would be protected pursuant to the Migratory Bird Treaty Act. As long as there is no direct mortality of species protected pursuant to this Act caused by development of the project site, there should be no constraints to development of either of the sites. To comply with the Migratory Bird Treaty Act, all active nest sites would have to be avoided while such birds were nesting. Upon completion of nesting, the project could commence as otherwise planned. Please review specific requirements for avoidance of nest sites for potentially occurring species in the Impacts and Mitigations section below.

8.3 **State Endangered Species Act**

8.3.1 SECTION 2081 OF THE STATE ENDANGERED SPECIES ACT

In 1984, the state legislated the California Endangered Species Act (CESA) (Fish and Game Code §2050). The basic policy of CESA is to conserve and enhance endangered species and their habitats. State agencies will not approve private or public projects under their jurisdiction that would impact threatened or endangered species if reasonable and prudent alternatives are available. Because CESA does not have a provision for "harm" (see discussion of FESA, above), CDFW considerations pursuant to CESA are limited to those actions that would result in the direct take of a listed species.

If CDFW determines that a proposed project could impact a State listed threatened or endangered species, CDFW will provide recommendations for "reasonable and prudent" project alternatives. The CEQA lead agency can only approve a project if these alternatives are implemented, unless it finds that the project's benefits clearly outweigh the costs, reasonable mitigation measures are adopted, there has been no "irreversible or irretrievable" commitment of resources made in the interim, and the resulting project would not result in the extinction of the species. In addition, if there would be impacts to threatened or endangered species, the lead agency typically requires project applicants to demonstrate that they have acquired "incidental take" permits from CDFW and/or USFWS (if it is a Federal listed species) prior to allowing/permitting impacts to such species.

If proposed projects would result in impacts to a State listed species, an "incidental take" permit pursuant to §2081 of the Fish and Game Code would be necessary (versus a Federal incidental take permit for Federal listed species). CDFW will issue an incidental take permit only if:

1) The authorized take is incidental to an otherwise lawful activity.
2) The impacts of the authorized take are minimized and fully mitigated.
3) Measures required to minimize and fully mitigate the impacts of the authorized take:
    a) are roughly proportional in extent to the impact of the taking on the species;
    b) maintain the project applicant’s objectives to the greatest extent possible; and,
    c) capable of successful implementation.

And-

4) Adequate funding is provided to implement the required minimization and mitigation measures and to monitor compliance with, and the effectiveness of, the measures.

If an applicant is preparing a habitat conservation plan (HCP) as part of the federal 10(a) permit process, the HCP might be incorporated into the §2081 permit if it meets the substantive criteria of §2081(b). To ensure that an HCP meets the mitigation and monitoring standards in Section 2081(b), an applicant should involve CDFW staff in development of the HCP. If a final Biological Opinion (federal action) has been issued for the project pursuant to Section 7 of the federal Endangered Species Act, it might also be incorporated into the §2081 permit if it meets the standards of §2081(b).

No §2081 permit may authorize the take of a species for which the Legislature has imposed strict prohibitions on all forms of "take." These species are listed in several statutes that identify "fully protected" species and "specified birds." *See* Fish and Game Code §§ 3505, 3511, 4700, 5050, 5515, and 5517. If a project is planned in an area where a "fully protected" species or a "specified bird" occurs, an applicant must design the project to avoid all take.

In September 1997, Assembly Bill 21 (Fish and Game Code §2080.1) was passed. This bill allows an applicant who has obtained a "non-jeopardy*"* federal Biological Opinion pursuant to Section 7, or who has received a federal 10(a) permit (federal incidental take permit), to submit the federal opinion or permit to CDFW for a determination as to whether the federal document is "consistent" with CESA. If after 30 days CDFW determines that the federal incidental take permit is consistent with state law, and that all state listed species under consideration have been considered in the federal Biological Opinion, then no further permit or consultation is required under CESA for the project. However, if CDFW determines that the federal opinion or permit is not consistent with CESA, or that there are state listed species that were not considered in the federal Biological Opinion, then the applicant must apply for a state permit under Section 2081(b). The process provided in Fish and Game Code §2080.1 (Assembly Bill 21) may be of use when the incidental take would occur to species that are listed under both the federal and state endangered species acts. Assembly Bill 21 is of no use if an affected species is state-listed, but not federally listed.

State and federal incidental take permits are issued on a discretionary basis, and are typically only authorized if applicants are able to demonstrate that impacts to the listed species in question are unavoidable, and can be mitigated to an extent that the reviewing agency can conclude that the proposed impacts would not jeopardize the continued existence of the listed species under review. Typically, if there would be impacts to a listed species, mitigation that includes habitat avoidance, preservation, and creation of endangered species habitat is necessary to demonstrate that projects would not threaten the continued existence of a species. In addition, management endowment fees are usually collected as part of the agreement for the incidental take permit(s). The endowment is used to manage any lands set-aside to protect listed species, and for biological mitigation monitoring of these lands over (typically) a five-year period.

8.3.2 Applicability to The Project

State agencies including the CDFW have no jurisdiction over federal government owned properties including the U.S. Navy owned CNWS (pers. communication between Geoff Monk and Nicole Kozicki). [An exception is the Water Board which by agreement between state and federal governments implements Section 401 of the federal Clean Water Act.] No habitat that

would support state listed plant species occurs on the project site and thus there will be no impacts to state listed plants from the project (Table 3). The California tiger salamander is a state listed species known to occur on the CNWS. The project site on the CNWS is highly disturbed; extensive remediation grading occurred on the CNWS portion of the project site during the emergency remediation response and through subsequent boring and testing procedures that have been ongoing since the initial emergency response.

The portion of the remediation project at 330 Holly Drive is a highly developed area that now supports a single-family home, a pump house/apartment, extensive hardscapes and irrigated landscaping (explained in the special-status species section above). These developed surfaces do not provide suitable California tiger salamander habitat. However on the east half of the project site there is a broad drainage swale that separates the residential developed western property from the undeveloped eastern half of the parcel. The swale also contains eight, roughly 8 by 20 foot raised planter boxes and so also has been extensively disturbed in the recent past. Regardless the swale area that supports raised vegetable beds is now overgrown with landscape vegetation and is wide open to California tiger salamander migration from the CNWS. Thus, this area may provide over-summering habitat for the California tiger salamander. This drainage swale will be restored to a naturalized condition via removal of raised vegetable beds. In addition, a seasonal wetland will be created in an upland area within this swale.

Avoidance measures will have to be implemented to ensure that migrating California tiger salamanders do not wander into the remediation and restoration areas during excavation as such salamanders would be harmed or killed. Consequently, an "incidental take permit" issued by CDFW pursuant to Section 2081 of the Fish and Game Code is required for the proposed restoration of the swale that seasonally flows through 330 Holly Drive. This drainage swale potentially supports oversummering habitat of the California tiger salamander.

8.4 Applicable CEQA Regulations

Section 15380 of CEQA defines "endangered" species as those whose survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors. "Rare" species are defined by CEQA as those who are in such low numbers that they could become endangered if their environment worsens; or the species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the FESA. The CEQA Guidelines also state that a project will normally have a significant effect on the environment if it will "substantially affect a rare or endangered species of animal or plant or the habitat of the species." The significance of impacts to a species under CEQA, therefore, must be based on analyzing actual rarity and threat to that species despite its legal status or lack thereof.

8.4.1 Applicability to The Project

This document addresses potential impacts to species that would be defined as endangered or rare pursuant to Section 15380 of the CEQA. This document is suitable for use by the CEQA lead agency for incorporation into an initial study or any other CEQA review document prepared for the project.

8.5 California Fish and Game Code § 3503, 3503.5, 3511, and 3513

California Fish and Game Code §3503, 3503.5, 3511, and 3513 prohibit the "take, possession, or destruction of birds, their nests or eggs." Disturbance that causes nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered "take." Such a take would also violate federal law protecting migratory birds (Migratory Bird Treaty Act).

All raptors (that is, hawks, eagles, owls) their nests, eggs, and young are protected under California Fish and Game Code (§3503.5). Additionally, "fully protected" birds, such as the white-tailed kite (*Elanus leucurus*) and golden eagle (*Aquila chrysaetos*), are protected under California Fish and Game Code (§3511). "Fully protected" birds may not be taken or possessed (that is, kept in captivity) at any time.

8.5.1 Applicability to the Project

Preconstruction nesting surveys for raptors, and other nesting birds (passerines, for example) would have to be conducted to ensure that there is no direct take of nesting birds including their eggs, or young. Any active nests that were found during preconstruction surveys would have to be avoided by the project. Suitable non-disturbance buffers would have to be established around nest sites until the nesting cycle is complete. More specifics on the size of buffers are provided below in the Impacts and Mitigations section.

8.6 City of Concord General Plan

8.6.1 Chapter 6- Parks, Open Space and Conservation

GOAL POS-3: WELL-PLANNED NATURAL RESOURCE CONSERVATION
Principle POS-3.1: Preserve and Protect Water Quality.

> Policy POS-3.1.1: Enhance and maintain the natural values of creeks and major drainage ways. This could include restoration measures along Galindo, Mount Diablo, and Pine Creeks to improve ecological systems, slow peak storm runoff, and increase infiltration.
>
> Policy POS-3.1.2: Preserve and restore native riparian vegetation and wildlife, and establish riparian corridors along all creeks.
>
> Policy POS-3.1.3: Require adequate building setbacks for development adjacent to creek banks and major drainage ways to protect neighboring properties from erosion and flooding. The Development Code will include standards for development near creeks.
>
> Policy POS-3.1.4: Support improvements along creeks in consultation and cooperation with creek restoration and design professionals.
>
> Policy POS-3.1.7: Improve the quality of underground and surface waters in Concord through coordination with outside agencies.

Principle POS-3.2: Preserve and Protect Wetlands.

Policy POS-3.2.3: For wetlands that are not adjacent to Suisun Bay, follow management and protection measures that are consistent with state and federal requirements.

Principle POS-3.4: Preserve and Protect Wildlife and Vegetation Resources.

Policy POS-3.4.1: Conserve wildlife habitat and wildlife corridors, including seasonal migration routes, and require appropriate mitigation in the event such areas are impacted by development,

Policy POS-3.4.2: Protect rare, threatened, or endangered species and their habitats through the environmental review process and in accordance with State and Federal law.

Project-level environmental review will assess the potential impact of proposed development on special-status species and sensitive natural communities and could require mitigation measures and monitoring to ensure protection of sensitive biological resources.

Policy POS-3.4.3: Retain significant vegetation, including native vegetation and heritage trees, where feasible, Concord 2030 General Plan 6-32 and require replacement plantings as appropriate for mitigation.

The Development Code will include standards and review criteria to implement this policy.

Policy POS-3.4.4: Plant vegetation to increase benefits to wildlife. Policy POS-3.4.5: Coordinate with appropriate regulatory and trustee agencies to enhance protection of special status species and sensitive natural communities.

Coordination with regulatory and trustee agencies will include, but not be limited to, the California Department of Fish and Game, U.S. Fish and Wildlife Service, and the Board.

Policy POS-3.4.6: Avoid construction-related activities during breeding and nesting seasons for special status species.

Construction-related activities within sensitive habitat of special status species will generally not be allowed during the breeding season or season of greatest effect on their survival. If project activities cannot avoid these seasons, the project applicant will have to arrange for surveys of any special status species in accordance with state and federal standards and follow applicable trustee agency protocol for species protection.

Policy POS-3.4.7: Promote habitat restoration in areas of special status species.

The City will coordinate with appropriate agencies and the community to improve habitat restoration efforts throughout the Planning Area, and will include special status species

habitat restoration requirements in the Development Code. Plans for the Community Reuse Project include restoration of habitat along Mount Diablo Creek and in the Los Medanos Hills.

8.6.2 APPLICABILITY TO THE PROJECT

The project is consistent with Principle POS-3.1, Preserve and Protect Water Quality, because the project will improve water quality by cleaning up impacted soils that were in the seasonal wetlands and drainage on the project site. The project is consistent with Principle POS-3.2, Preserve and Protect Wetlands, as it is consistent with state and federal requirements. The project is also consistent with Principle POS-3.4, Preserve and Protect Wildlife and Vegetation Resources, as impacts to habitat will be mitigated and habitats will be restored where possible. The applicant has purchased a 2 acre parcel at 330 Holly Drive. A private residence, associated outbuildings, all hardscapes and all landscaping will be removed. Upon completion of the remediation project, this property will be restored to a California native plant community. It will also be preserved in perpetuity as open space.

8.7 Concord Municipal Code: Chapter 18.310 Tree Preservation and Protection

While the CNWS is federal property that is not subject to the jurisdiction of the City of Concord, the private property at 330 Holly Drive is within the City of Concord and subject to this City's Municipal Codes. Accordingly, the City of Concord's Tree Ordinance is relevant to the CEQA review undertaken for the project. The City of Concord Tree Preservation and Protection ordinance is as follows:

A. Protected Trees. A protected tree is:

1. Any of the following listed native trees with a diameter of 12 inches or more as measured 54 inches above the ground (e.g., diameter at breast height) or a multi-stemmed native tree on the list below where the sum of all stem diameters is 12 inches or more as measured 54 inches above the ground: Valley oak (*Quercus lobata*), Blue oak (*Quercus douglasii*), Coast live oak (*Quercus agrifolia*), California bay (*Umbellularia californica*), California buckeye (*Aesculus californica*), California black walnut (*Juglans hindsii*), and California sycamore (*Platanus racemosa*).

2. Other trees with a diameter of 24 inches or more as measured 54 inches above the ground (e.g., diameter at breast height) or more or a multi-stemmed nonnative tree where the sum of all stem diameters is 24 inches or more as measured 54 inches above the ground;

3. Any tree which has been previously designated as a heritage tree by planning commission resolution;

4. A tree required to be planted, relocated, or preserved as a condition of approval of a tree permit or other discretionary permit, and/or as environmental mitigation for a discretionary permit; and

5. A tree with a trunk diameter of six inches or more or one component trunk of a multi-stemmed tree with a diameter of four inches or more as measured 54 inches above the ground that is located within the structure setback of creeks or streams as defined in CDC 18.305.040(A) (Structure Setbacks for Unimproved Channels).

B. Exempt Trees or Non Protected Trees. Includes any member of the genus Eucalyptus, any member of the genus Acacia, any common palm tree (*Arecaceae*), Monterey pine (*Pinus radiata*), Tree of Heaven (*Ailanthus altissima*) and any member of the genus Ligustrum (commonly referred to as privet), unless such tree has been specifically designated a "heritage tree" by resolution of the planning commission.

C. Tree Protection Zone (TPZ). A tree protection zone shall be established for each protected tree at the outer edge of the tree canopy or drip zone in all directions, unless a larger area is required by an ISA certified arborist ("arborist").

D. Activities Requiring a Tree Permit. Any activity that is subject to a planning permit as required in Division VII of this title (Permits and Permit Procedures) shall be required to obtain a tree permit prior to:

1. The relocation, removal, cutting-down, or other act that causes the damage or destruction of a protected tree;

2. Any grading, paving, or other ground-disturbing activity within the tree protection zone (TPZ) where the encroachment exceeds 20 percent of the protected zone.

E. Exemptions. The removal or relocation of a protected tree is exempt from the provisions of this chapter when a protected tree:

1. Interferes with traffic and circulation safety pursuant to CMC 8.40.070;

2. Poses an imminent threat to the public safety or general welfare pursuant to CMC 8.40.030(c);

3. Possess an immediate threat to existing electrical power or communication lines;

4. Is planted, grown, or held for sale by a nursery, tree farm, orchard or similar commercial operation;

5. Is determined by an ISA certified arborist ("arborist") to be a host for a parasitic plant or insect which may endanger other trees in the area and cannot reasonably be controlled through less drastic means; or

6. Is determined by an arborist to be dead or dying and as a result has become hazardous or unsightly, and provides limited habitat value. [Ord. 12-4. DC 2012 §122-826].

8.7.1 APPLICATION

A. Application Contents. Each tree permit application shall include the following information and materials.

1. General Content Requirements. The application shall include the required information contained in the application checklist on file with the planning division, and shall include an arborist's report in compliance with CDC 18.310.040, and be accompanied by the required application fees set forth in the city's fee schedule.

2. Homeowners' Association Approval. If the site is subject to conditions, covenants, and restrictions (CC&Rs) that address tree removal and are administered by an active homeowners' association, the application shall include a letter from the homeowners' association authorizing the tree removal.

B. Application Filing. An application for a tree permit shall be submitted at the time of application for any required permit. [Ord. 12-4. DC 2012 § 122-827].

8.7.2 GENERAL REQUIREMENTS FOR THE TREE PROTECTION ZONE (TPZ)

The following procedures shall apply to all encroachments in the tree protection zone (TPZ) associated with development and construction activities. All tree permits related to such activities shall incorporate the provisions of this chapter unless otherwise recommended by the arborist and approved by the planning division and/or public works department.

A. Trenching Procedures. Trenching within the TPZ, when permitted, shall only be conducted with hand tools, or use of an air spade, or as otherwise directed by an arborist, to avoid root injury.

B. Cutting Roots.

1. Minor roots less than one inch in diameter may be cut, but damaged roots shall be traced back and cleanly cut behind any split, cracked or damaged area.

2. Major roots over one inch in diameter may not be cut without approval of an arborist. Depending upon the type of improvement being proposed, bridging techniques or a new site design may need to be employed to protect the root and the tree.

C. Ground Surface Fabric. If any ground surface fabric within the TPZ is removed for any reason, it shall be replaced within 48 hours.

D. Irrigation Systems. An independent low flow drip irrigation system may be required for establishing drought-tolerant plants within the TPZ. Irrigation shall be gradually reduced and discontinued over a two-year period.

E. Plant Material Under Oaks. Planting live material under native oak trees is generally discouraged, and will not be permitted within six feet of a trunk of a native oak tree with a

diameter of 18 inches or less at 54 inches above ground, or within 10 feet of a trunk with a diameter of more than 18 inches at 54 inches above ground. Only drought-tolerant plants will be permitted within the protected zone of native oak trees.

F. Temporary Protective Fencing During Construction or Grading Activities.

1. Type of Fencing. Prior to construction or grading activities, a minimum five-foot-high chain link or substitute fence shall be installed at the outermost edge of the TPZ for each protected tree or groups of protected trees. Exceptions to this policy may occur in cases where protected trees are located on slopes that will not be graded. Approval shall be obtained from the planning division prior to omitting fences in any area of the project.

2. Fence Installation. Temporary fences shall be installed in accordance with an approved fencing plan prior to the commencement of any grading operations or other such time as determined by the review authority.

3. Signing. Signs shall be installed on the fence in four equidistant locations around each TPZ. The size of each sign shall be a minimum of two feet by two feet and shall contain the following language:

"WARNING: THIS FENCE SHALL NOT BE REMOVED OR
RELOCATED WITHOUT WRITTEN AUTHORIZATION FROM
THE CONCORD PLANNING DIVISION"

Signs placed on fencing around a grove of protected trees shall be placed at approximately 50-foot intervals.

4. Fence Removal. Fences shall remain in place throughout the entire construction period and shall be removed at the end of construction.

G. Retaining Walls and Root Protection. Where a building permit has been approved for construction of a retaining wall within the TPZ, the applicant shall provide for the immediate protection of exposed roots from moisture loss during the time prior to the completion of the wall. The retaining wall shall be constructed within 72 hours after completion of grading.

H. Preservation Devices. If required, preservation devices such as aeration systems, tree wells, drains, special foundation systems, special paving, and cabling systems must be installed per approved plans and certified by an arborist.

I. Grading.

1. Every effort shall be made to avoid cut and/or fill slopes within or in the vicinity of the TPZ.

2. No grade changes are permitted which cause water to drain to within twice the longest radius of the TPZ.

3. No grade changes are permitted that will lower the ground on all sides of the TPZ.

K. Certification Letters. Certification letters shall be required for all regulated activities within the TPZ. The arborist shall be required to submit a certification letter to the planning division within five working days of completing any regulated activity, attesting that all work was conducted in accordance with the appropriate permits and the requirements of this chapter.

L. On-Site Information. The following information shall be posted on site during any construction activity within the TPZ:

1. Arborist's report and any subsequent modifications;

2. Tree location map with a copy of the tree fencing plan;

3. Tree permit;

4. Approved construction plans;

5. Tree preservation guidelines; and

6. Approved planting and irrigation drawings.

M. Information Standards. The applicant shall be responsible for informing all subcontractors and individuals who will be performing work around protected trees of the requirements of this section and the conditions of approval for the project. This information shall be provided in writing to the subcontractors and employees by the general contractor or applicant.

N. Utility Trenching Pathway Plan. As a condition of the tree permit, the applicant shall be required to submit a utility trenching plan with the improvement or civil plans, prior to issuance of permits.

O. Final Certification of Tree Work. All of the tree preservation measures required by the conditions of approval and the arborist reports shall be completed and certified by the arborist prior to issuance of an occupancy permit.

P. Pruning. Pruning of trees that are retained shall be conducted in compliance with International Society of Arboriculture (ISA) best management practices and ANSI A 300 or other applicable and comparable accepted standard. [Ord. 12-4. DC 2012 § 122-829].

8.7.3 Replacement Trees

Where it has been determined that preservation of protected trees associated with a construction and/or development project is infeasible, replacement plantings shall be required as follows:

A. Replacement Ratio. The review authority shall condition any tree permit for the removal of protected trees with replacement trees, at a minimum ratio of three replacement trees for every

one that is removed. The number and size of the replacement trees shall be determined based on the age, condition, and species, and loss of canopy cover for each tree removed.

B. Location and Specifications.

1. Replacement trees shall be planted on site, except in instances where on-site planting and future tree survival is shown to be infeasible, in which case the review authority shall authorize other off-site locations where maintenance will be guaranteed.

2. All replacement trees shall be of the same species as the trees being replaced, except when a replacement tree is approved in a location characterized by nonnative species, such as within a narrow roadway median where existing trees are ornamental nonnatives, or as part of residential lot landscaping.

3. Up to 50 percent of the required replacement trees may have a five-gallon container size when an arborist determines that long-term tree health and survival will be improved by starting with a smaller container size.

4. Replacement trees shall be in addition to any trees required by any other provisions of this title (e.g., required parking lot landscaping or street trees).

C. Revegetation Program. The review authority may authorize implementation of a revegetation program based upon an arborist's determination that a revegetation program is superior to use of replacement trees.

1. The applicant shall enter into a written agreement with the city that sets forth the requirements of the revegetation program.

2. A performance security or bond for 100 percent of the cost of the revegetation program shall be required to ensure that the agreement is fulfilled.

3. The revegetation program shall propagate trees from seed using currently accepted methods, and shall identify the seed source of the trees to be propagated, the location of the plots, and the methods to be used to ensure the program's success.

4. A revegetation program shall not be considered complete until the trees to be propagated have survived in a healthy state for a minimum of 10 years, unless alternative success criteria have been approved. [Ord. 12-4. DC 2012 §122-830].

8.7.4 Applicability to The Project

The applicant will need to request a tree removal permit as part of the demolition and grading permit applications for the portion of the project at 330 Holly Drive. Ed Brennan, a consulting arborist, evaluated all of the trees on the project site. Of the 15 trees evaluated, 13 will be impacted by the project. These 13 trees are detailed in the table below. The project will remove 13 trees, however only one of these trees is protected, a California black walnut (*Juglans hindsii*).

Trees Growing Within Area of Excavation

Tree #	Tree Species	Tree Diameter (inches)	Condition	Protection
62	European olive	19 multi-stemmed	4	Not protected
63	Mexican fan palm	10	3	Not protected
64	European olive	10 multi-stemmed	3	Not protected
65	California black walnut	42 multi-stemmed	2	Protected
66	European olive	16 multi-stemmed	3	Not protected
67	Mexican fan palm	24	4	Not protected
68	Mexican fan palm	26	4	Not protected
69	Valley oak	8	4	Not protected
70	California black walnut	8	4	Not protected
71	Valley oak	9	4	Not protected
72	Coast redwood	13 multi-stemmed	3	Not protected
73	Coast redwood	9 multi-stemmed	3	Not protected
74	Coast redwood	12 multi-stemmed	3	Not protected

Trees growing within the area of excavation would be removed. Trees growing adjacent to the excavation area will be preserved.

Tree ratings:

5: A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.

4: Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.

3: Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.

2: Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.

1: Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.

The one “protected” tree proposed for removal has a condition of 2; the tree is in decline, it has epicormic growth, it has extensive dieback of medium to large branches, and it has significant structural defects that cannot be abated.

According to Concord Municipal Code, all trees that are legally removed shall be replaced according to the following:

- A minimum ratio of three replacement trees for every one that is removed.
- The number and size of the replacement trees shall be determined based on the age, condition, and species, and loss of canopy cover for each tree removed.
- Replacement trees shall be planted on site.
- Replacement trees shall be of the same species as the tree being replaced.
- Up to 50 percent of the required replacement trees may have a five-gallon container size when an arborist determines that long-term health and survival will be improved by starting with a smaller container size.

As mitigation for the removal of one "protected" California black walnut, the applicant proposes to plant 3, 5 Gallon size California black walnuts as the long-term tree health and survival will be improved by starting with the smaller container size.

Accordingly, impacts to trees are regarded as potentially significant pursuant to the CEQA. Mitigation could be implemented to reduce these impacts to levels regarded as less than significant pursuant to the CEQA. These conditions, and others set forth in the Impact Assessment and Proposed Mitigation section would reduce impacts to trees to a level considered less than significant.

9. REGULATORY REQUIREMENTS PERTAINING TO WATERS OF THE UNITED STATES AND STATE

This section presents an overview of the criteria used by the U.S. Army Corps of Engineers, the Water Board, the State Water Resources Control Board, and CDFW to determine those areas within a project area that would be subject to their regulation.

9.1 U.S. Army Corps of Engineers Jurisdiction and General Permitting

9.1.1 SECTION 404 OF THE CLEAN WATER ACT

Congress enacted the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (33 U.S.C. §1251(a)). Pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), the U.S. Army Corps of Engineers (Corps) regulates the disposal of dredged or fill material into "waters of the United States" (33 CFR Parts 328 through 330). This requires project applicants to obtain authorization from the Corps prior to discharging dredged or fill materials into any water of the United States.

In the Federal Register "waters of the United States" are defined as, "...all interstate waters including interstate wetlands...intrastate lakes, rivers, streams (including intermittent streams), wetlands, [and] natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce..." (33 CFR Section 328.3).

Limits of Corps' jurisdiction:

(a) Territorial Seas. The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles. (See 33 CFR 329.12)

(b) Tidal Waters of the United States. The landward limits of jurisdiction in tidal waters:

(1) Extends to the high tide line, or
(2) When adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in paragraph (c) of this section.

(c) Non-Tidal Waters of the United States. The limits of jurisdiction in non-tidal waters:

(1) In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or
(2) When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.
(3) When the water of the United States consists only of wetlands the jurisdiction extends to the limit of the wetland.

Section 404 jurisdiction in "other waters" such as lakes, ponds, and streams, extends to the upward limit of the ordinary high water mark (OHWM) or the upward extent of any adjacent wetland. The OHWM on a non-tidal water is:

- the "line on shore established by the fluctuations of water and indicated by physical characteristics such as a clear natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter or debris; or other appropriate means that consider the characteristics of the surrounding areas" (33 CFR Section 328.3[e]).

Wetlands are defined as: "...those areas that are inundated or saturated by surface or ground water at a frequency and duration to support a prevalence of vegetation adapted for life in saturated soil conditions" (33 CFR Section 328.8 [b]). Wetlands usually must possess hydrophytic vegetation (i.e., plants adapted to inundated or saturated conditions), wetland hydrology (e.g., topographic low areas, exposed water tables, stream channels), and hydric soils (i.e., soils that are periodically or permanently saturated, inundated or flooded) to be regulated by the Corps pursuant to Section 404 of the Clean Water Act.

9.1.1.1 Significant Nexus of Tributaries

On December 2, 2008, the Corps and the Environmental Protection Agency (EPA) issued joint guidance on implementing the U.S. Supreme Court decision in the consolidated cases *Rapanos v. United States* and *Carabell v. United States* (herein referred to simply as "Rapanos") (Corps 2008b) which address the jurisdiction over waters of the United States under the Clean Water Act. In this joint guidance these agencies provide guidance on where they will assert jurisdiction over waters of the U.S.

The EPA and Corps will assert jurisdiction over the following waters:

- Traditional navigable waters
- Wetlands adjacent to traditional navigable waters

- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (for example, typically three months).
- Wetlands that directly abut such tributaries.

The agencies generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The agencies will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters; and

- Significant nexus includes consideration of hydrologic and ecologic factors.

9.1.1.2 Isolated Areas Excluded from Section 404 Jurisdiction

In addition to areas that may be exempt from Section 404 jurisdiction, some isolated wetlands and waters may also be considered outside of Corps jurisdiction as a result of the Supreme Court's decision in Solid Waste Agency of Northern Cook County (SWANCC) v. United States Army Corps of Engineers (531 U.S. 159 [2001]). Isolated wetlands and waters are those areas that do not have a surface or groundwater connection to, and are not adjacent to a navigable "Waters of the U.S.," and do not otherwise exhibit an interstate commerce connection.

9.1.1.3 Permitting Corps Jurisdictional Areas

To remain in compliance with Section 404 of the Clean Water Act, project proponents and property owners (applicants) are required to be permitted by the Corps prior to discharging or otherwise impacting waters of the United States. In many cases, the Corps must visit a proposed project area (to conduct a "jurisdictional determination") to confirm the extent of area falling under their jurisdiction prior to authorizing any permit for that project area. Typically, at the time the jurisdictional determination is conducted, applicants (or their representative) will discuss the appropriate permit application that would be filed with the Corps for permitting the proposed impact(s) to "waters of the United States."

Pursuant to Section 404 of the Clean Water Act, the Corps normally provides two alternatives for permitting impacts to the type of "waters of the United States" found in the project area. The first alternative would be to use Nationwide Permit(s) (NWP). The second alternative is to apply to the Corps for an Individual Permit (33 CFR Section 235.5(2)(b)).

NWPs are a type of general permit administered by the Corps and issued on a nationwide basis that authorize minor activities that affect Corps regulated waters. Under NWP, if certain

conditions are met, the specified activities can take place without the need for an individual or regional permit from the Corps (33 CFR, Section 235.5[c][2]). In order to use NWP(s), a project must meet 27 general nationwide permit conditions, and all specific conditions pertaining to the NWP being used (as presented at 33 CFR Section 330, Appendices A and C). It is also important to note that pursuant to 33 CFR Section 330.4(e), there may be special regional conditions or modifications to NWPs that could have relevance to individual proposed projects. Finally, pursuant to 33 CFR Section 330.6(a), Nationwide permittees may, and in some cases must, request from the Corps confirmation that an activity complies with the terms and conditions of the NWP intended for use (*i.e.*, must receive "verification" from the Corps).

Prior to finalizing design plans, the applicant needs to be aware that the Corps maintains a policy of "no net loss" of wetlands (waters of the United States) from project area development. Therefore, it is incumbent upon applicants that propose to impact Corps regulated areas to submit a mitigation plan that demonstrates that impacted regulated areas would be recreated (*i.e.*, impacts would be mitigated). Typically, the Corps requires mitigation to be "in-kind" (i.e., if a stream channel would be filled, mitigation would include replacing it with a new stream channel), and at a minimum of a 1:1 replacement ratio (i.e., one acre or fraction there of recreated for each acre or fraction thereof lost). Often a 2:1 replacement ratio is required. Usually the 2:1 ratio is met by recreation or enhancement of an equivalent amount of wetland as is impacted, in addition to a requirement to preserve an equivalent amount of wetland as is impacted by the project. In some cases, the Corps allows "out-of-kind" mitigation if the compensation site has greater value than the impacted site. For example, if project designs call for filling an intermittent drainage, mitigation should include recreating the same approximate jurisdictional area (same drainage widths) at an offsite location or on a set-aside portion of the project area. Finally, there are many Corps approved wetland mitigation banks where wetland mitigation credits can be purchased by applicants to meet mitigation compensation requirements. Mitigation banks have defined service areas and the Corps may only allow their use when a project would have minimal impacts to wetlands.

9.1.2 APPLICABILITY TO THE PROJECT

As detailed in the Methods Section of the Biology analysis, the Corps has determined there are waters of the U.S. on the project site on both the CNWS and on the private property at 330 Holly Drive in Concord (pers. communication between Mr. Greg Brown of the Corps and Mr. Geoff Monk on November 12, 2015). Mapped waters of the U.S. are shown on Sheet 1.

The project is currently going through "after the fact" permitting with the U.S. Army Corps of Engineers (Corps) and the Water Board for impacts that occurred to waters of the U.S. and State (respectively) during the initial emergency response project. Those areas subject to the Corps jurisdiction are limited to the unnamed, ephemeral drainage running through the CNWS portion of the project site (an "other waters") and downstream of the CNWS, through a swale on 330 Holly Drive. There are also four seasonal wetlands that were mapped on the CNWS. The initial emergency response to the oil leak in 2011 and 2012 permanently impacted a seasonal wetland and an "other water" (shown as W1 and OW1 on Sheet 2).

There are no wetland conservation banks approved for use by the San Francisco Regulatory District of the Corps and/or the San Francisco Bay Water Board available for use by the

applicant to compensate for impacts to waters of the U.S./State from the initial remediation emergency response. Thus, to mitigate impacts to waters of the U.S. and State the applicant is proposing to re-create seasonal wetlands and other water swales at the project site in the same immediate area where these features were impacted. To mitigate for permanent impacts to 404 square feet (202 linear feet) of ephemeral drainage ("other waters") that occurred during the initial emergency response in 2011-2012, in 2012 the applicant created two new drainage swale features on the CNWS. In addition, a third drainage swale is proposed to be created on private property at 330 Holly Drive (Sheet 3). The created drainage swale on the private property will deliver storm event flows to the re-created seasonal wetlands on the project site. The new swales (other waters) total 785 linear feet providing 3.9:1 mitigation ratio for linear impacts to waters of the U.S./State. In addition, proposed re-created seasonal wetlands on the project site total 10, 650 square feet providing a 1.25:1 mitigation ratio for seasonal wetland impacts that occurred during the emergency response.

Additional compensatory mitigation includes that the applicant purchased the private property at 330 Holly Drive in August 2015, and will protect approximately 1.4 acres of this property as permanent open space via recordation of a perpetual Deed Restriction that states all use of the 1.4 acres must be consistent with the objective of conserving natural resources. All structures and hardscapes will be removed from the property at 330 Holly Drive. In addition, all landscape vegetation will be removed from this property. Finally, upon completion of the remediation work the applicant will implement a native oak woodland planting plan on the 1.4 acre Deed Restricted area of this property. A drainage swale would also be graded that provides watershed area that contributes to recreated wetlands on the CNWS.

The native oak tree restoration project will create a wildlife oasis between residential subdivisions south of the private property at 330 Holly Drive and the CNWS. While far from having a final reuse plan, it is Monk & Associates' understanding that under the City of Concord Reuse Plan for the CNWS, that the areas that include the project site and north extending further into the CNWS are slated to become dedicated open space. Thus, in consideration that an existing conservation easement occurs immediately south of the private property at 330 Holly Drive, the permanent protection of 1.4 acres of this property via recordation of a Perpetual Deed Restriction will add to a significant regional open space.

9.2 State Water Resources Control Board (SWRCB) / San Francisco Bay Regional Water Quality Control Board (Water Board)

9.2.1 Section 401 of the Clean Water Act

The SWRCB and Water Board regulate activities in "waters of the State" (which includes wetlands) through Section 401 of the Clean Water Act. While the Corps administers a permitting program that authorizes impacts to waters of the United States, including wetlands and other waters, any Corps permit authorized for a proposed project would be inoperative unless it is a NWP that has been certified for use in California by the SWRCB, or if the Water Board has issued a project specific certification or waiver of water quality. Certification of NWPs requires a finding by the SWRCB that the activities permitted by the NWP will not violate water quality standards individually or cumulatively over the term of the permit (the term is typically for five years). Certification must be consistent with the requirements of the federal Clean Water Act, the

California Environmental Quality Act, the California Endangered Species Act, and the SWRCB's mandate to protect beneficial uses of waters of the State. Any denied (i.e., not certified) NWPs, and all Individual Corps permits, would require a Water Board project specific water quality certification.

Additionally, if a proposed project would impact waters of the State, including wetlands, the project applicant must demonstrate that the project is unable to avoid these adverse impacts, or water quality certification will most likely be denied. Section 401 Certification may also be denied based on significant adverse impacts to waters of the United States/State, including wetlands. The Water Board has also adopted the Corps' policy that there shall be "no net loss" of wetlands. Thus, prior to issuing a water quality certification, the Water Board will impose avoidance mitigation requirements on project proponents that impact waters of the State.

9.2.2 APPLICABILITY TO THE PROJECT

Any Section 404 permit authorized by the Corps for the project would be inoperative without also obtaining authorization from the Water Board pursuant to Section 401 of the Clean Water Act (i.e., without obtaining water quality certification). Since the Water Board does not have a formal method for technically defining what constitutes waters of the state, M&A expect that the Water Board should remain consistent with the Corps' determination. Therefore, if the Corps exerts jurisdiction over the unnamed drainage and seasonal wetlands onsite, the Water Board will likely concur. Please refer to the applicability section of the Porter-Cologne Water Quality Control Act below for other applicable actions that may be imposed on the project by the Water Board prior to the time water quality certification is authorized for the project.

Any impacts to waters of the State would have to be mitigated to the satisfaction of the Water Board prior to the time this resource agency would issue a permit for impacts to such features. The Water Board requirements for issuance of a "401 Permit" typically parallel the Corps requirements for permitting impacts to Corps regulated areas pursuant to Section 404 of the Clean Water Act.

The project is currently going through "after the fact" permitting with the U.S. Army Corps of Engineers (Corps) and/or the Water Board for impacts that occurred to waters of the U.S. and State (respectively) during the initial emergency response. The impacts to the seasonal wetland are considered "temporary" impacts, since the wetland contours have been "restored" and the wetland area (9,301 square feet, 0.21 acre) that was disturbed by the excavation activity is expected to re-establish in the same area, thereby providing 1:1 mitigation for the temporary impacts. There are no wetland conservation banks approved for use by the San Francisco Regulatory District of the Corps and/or the Water Board available for use by the applicant to compensate for impacts to waters of the U.S./State from the initial remediation emergency response. Thus, to mitigate impacts to waters of the U.S. and State the applicant is proposing to re-create seasonal wetlands and other water swales at the project site in the same immediate area where these features were impacted (Sheet 3). To mitigate for permanent impacts to 404 square feet (202 linear feet) of ephemeral drainage ("other waters") that occurred during the initial emergency response in 2011-2012, in 2012 the applicant created two new drainage swale features on the CNWS. In addition, a third drainage swale is proposed to be created on the private property at 330 Holly Drive (Sheet 3). The created drainage swale on this property will

deliver storm event flows to the re-created seasonal wetlands on the CNWS. The new swales (other waters) total 785 linear feet providing a greater than 3.9:1 mitigation ratio for linear impacts to waters of the U.S./State. Finally, a drainage swale at 330 Holly Drive that currently supports multiple large raised vegetable beds and urban landscaping will be restored to a naturalized condition. In addition, a seasonal wetland will be created in an upland area within this swale. Accordingly, proposed created seasonal wetlands on the CNWS and at 330 Holly Drive in Concord total 10,650 square feet providing a 1.25:1 mitigation ratio for seasonal wetland impacts that occurred during the emergency response.

Additional compensatory mitigation includes that the private property at 330 Holly Drive will be restored to a natural landscape condition. All structures will be removed down to the dirt. The vegetable beds and landscape vegetation will be removed from this property. In addition, the applicant will implement a native oak woodland planting plan on the western one half of the private property where the structures are being removed. Upon completion of the remediation project the private property at 330 Holly Drive will be preserved in perpetuity via recordation of an open space Perpetual Deed Restriction that is recorded on the title of the private property. The native oak tree restoration project will create a wildlife oasis between residential subdivisions south of the former Residential residence and the CNWS. M&A also confirmed in a meeting with the City of Concord on September 18, 2015 that under the City of Concord Reuse Plan for the CNWS, that the area of the CNWS affected by the proposed remediation project, and significant contiguous acreage to the north of this area will be deeded directly from the U.S. Navy to the East Bay Regional Park District to be managed as open space/park land. Thus, in consideration that an existing conservation easement occurs immediately south of the private property at 330 Holly Drive, and 1.4 acres of the private property at 330 Holly Drive will be permanently protected as open space via the recordation of an open space Perpetual Deed Restriction, the restored and preserved private property will add to a significant regional open space.

9.2.3 PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act, Water Code §13260, requires that "any person discharging waste, or proposing to discharge waste, that could affect the waters of the State to file a report of discharge" with the Water Board through an application for waste discharge (Water Code Section 13260(a)(1). The term "waters of the State" is defined as any surface water or groundwater, including saline waters, within the boundaries of the State (Water Code § 13050(e)). It should be noted that pursuant to the Porter-Cologne Water Quality Control Act, the Water Board also regulates "isolated wetlands," or those wetlands considered to be outside of the Corps' jurisdiction pursuant to the SWANCC decision (see Corps Section above).

The Water Board generally considers filling in waters of the State to constitute "pollution." Pollution is defined as an alteration of the quality of the waters of the state by waste that unreasonably affects its beneficial uses (Water Code §13050(1)). The Water Board litmus test for determining if a project should be regulated pursuant to the Porter-Cologne Water Quality Control Act is if the action could result in any "threat" to water quality.

The Water Board requires complete pre- and post-development Best Management Practices Plan (BMPs) of any portion of the project site that is developed. This means that a water quality

treatment plan for the pre- and post-developed project site must be prepared and implemented. Preconstruction requirements must be consistent with the requirements of the National Pollutant Discharge Elimination System (NPDES). That is, a *Stormwater Pollution Prevention Plan* (SWPPP) must be developed prior to the time that a site is graded (see NPDES section below). In addition, a post construction BMPs plan, or a Stormwater Management Plan (SWMP) must be developed and incorporated into any site development plan.

9.2.4 APPLICABILITY TO THE PROJECT

As detailed on Sheet 1, the Corps has determined there are waters of the U.S. on the project site on both the CNWS and on the private property at 330 Holly Drive (pers. communication between Mr. Greg Brown of the Corps and Mr. Geoff Monk on November 12, 2015). The Water Board also has Clean Water Act 404 jurisdiction over the mapped other waters and seasonal wetlands on Sheet 1 pursuant to the Porter-Cologne Water Quality Control Act. Since any "threat" to water quality could conceivably be regulated pursuant to the Porter-Cologne Water Quality Control Act, care will be required when constructing the project to be sure that adequate pre-and post-construction Best Management Practices Plan (BMPs) are incorporated into the project implementation plans.

9.2.5 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

In 1972 the Clean Water Act was amended to state that the discharge of pollutants to waters of the United States from any point source is unlawful unless the discharge is in compliance with an NPDES permit. The 1987 amendments to the Clean Water Act added Section 402(p) which establishes a framework for regulating municipal and industrial stormwater discharges under the NPDES Program.

While federal regulations allow two permitting options for stormwater discharges (individual permits and General Permits), the SWRCB has elected to adopt only one statewide General Permit at this time that will apply to all stormwater discharges associated with construction activity, except from those on Tribal Lands, in the Lake Tahoe Hydrologic Unit, and those performed by the California Department of Transportation (CalTrans). The General Permit requires all dischargers where construction activity disturbs greater than one acre of land or those sites less than one acre that are part of a common plan of development or sale that disturbs more than one acre of land surface to:

1. Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) which specifies Best Management Practices (BMPs) that will prevent all construction pollutants from contacting stormwater with the intent of keeping all products of erosion from moving off site into receiving waters.

2. Eliminate or reduce non-stormwater discharges to storm sewer systems and other waters of the nation.

3. Perform inspections of all BMPs.

This General Permit is implemented and enforced by the nine California Regional Water Quality Control Boards (Regional Water Boards).

Types of Construction Activity Covered by the General Permit

Construction activity subject to this General Permit includes clearing, grading, and disturbances to the ground such as stockpiling, or excavation that results in soil disturbances of at least one acre or more of total land area. Construction activity that results in soil disturbances to a smaller area would still be subject to this General Permit if the construction activity is part of a larger common plan of development that encompasses greater than one acre of soil disturbance, or if there is significant water quality impairment resulting from the activity. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility, nor does it include emergency construction activities required to protect public health and safety. Project proponents (landowners) should confirm with the local Water Board whether or not a particular routine maintenance activity is subject to this General Permit.

9.2.6 2009 CHANGES TO THE NPDES PROGRAM AND USE OF THE GENERAL PERMIT

[This section excerpted in part from Morrison Foerster Legal Updates and News September 2009, by Robert L. Falk and Corinne Fratini]. The California State Water Resources Control Board ("State Water Board") has adopted a new National Pollutant Discharge Elimination System General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities ("Construction General Permit"). The new Construction General Permit which was issued pursuant to the federal Clean Water Act and is enforceable through citizens' suits, represents a dramatic shift in the State Water Board's approach to regulating new and redevelopment sites, imposing new affirmative duties and fixed standards on builders and developers. Changes to use of the General Permit became effective on July 1, 2010.

The new Construction General Permit does not completely carry forward the former qualitative and self-selected compliance approach based on preparation of a SWPPP. Instead, developers and construction contractors must implement specific BMPs, achieve quantitatively-defined (i.e., numeric) pollutant-specific discharge standards, and conduct much more rigorous monitoring based on the project's projected risk level.

The State Water Board's new quantitative standards take a two-tiered approach, depending on the risk level associated with the site in question. Exceedance of a benchmark Numeric Action Level ("NAL") measured in terms of pH and turbidity (a measure related to both the amount of sediment in and the velocity of site runoff) triggers an additional obligation to implement additional BMPs and corrective action to improve SWPPP performance. For medium- and high-risk sites, failure to meet more stringent numeric standards for pH and turbidity, known as Numeric Effluent Limitations ("NELs"), will also automatically result in a permit violation and be directly enforceable in administrative or, in the case of a citizens' group taking up the cause, judicial forums. New minimum BMPs include Active Treatment Systems, which may be necessary where traditional erosion and sediment controls do not effectively control accelerated erosion; where site constraints inhibit the ability to construct a correctly-sized sediment basin; where clay and/or highly erosive soils are present; or where the site has very steep or long slope lengths.

In addition, the new Construction General Permit includes several "post-construction" requirements. These requirements entail that site designs provide no net increase in overall site runoff and match pre-project hydrology by maintaining runoff volume and drainage concentrations. To achieve the required results where impervious surfaces such as roofs and paved surfaces are being increased, developers must implement non-structural off-setting BMPs, such as landform grading, site design BMPs, and distributed structural BMPs (bioretention cells, rain gardens, and rain cisterns). This "runoff reduction" approach is essentially a State Water Board-imposed regulatory requirement to implement Low Impact Development ("LID") design features. Volume that cannot be addressed using non-structural BMPs must be captured in structural BMPs that are approved by the Water Board with jurisdiction over the project site under review.

Finally, the new Construction General Permit requires electronic filing of all Permit Registration Documents, NOIs, SWPPPs, annual reports, Notices of Termination, and NAL/NEL Exceedance Reports. This information will be readily available to the Water Boards and citizen enforcers who can then determine whether to initiate enforcement actions—actions which can result in significant penalties and legal fees.

9.2.7 APPLICABILITY TO THE PROJECT

On September 2, 2009, the State Water Resources Control Board adopted Order No. 2009-0009-DWQ, which reissued the Construction General Permit (CGP) for projects disturbing one or more acres of land surface, or those sites less than one acre that are part of a common plan of development or sale that disturbs more than one acre of land surface. Effective July 1, 2010, the requirements of this order replaced and superseded State Water Board Orders No. 99-08-DWQ.

It is the responsibility of the applicant to obtain coverage under the General Permit prior to commencement of construction activities that disturb greater than one acre of area. As the process of receiving coverage under the General Permit became considerably more involved in July 2010, the project engineer should start this permitting loop with the Water Board at least 6 months in advance of the commencement of the project.

9.3 Water Board Municipal Storm Water Permitting Program

The Municipal Storm Water Permitting Program regulates storm water discharges from municipal separate storm sewer systems (MS4s). MS4 permits were issued in two phases. Under Phase I, which started in 1990, the Water Boards have adopted NPDES storm water permits for medium (serving between 100,000 and 250,000 people) and large (serving 250,000 people) municipalities. Most of these permits are issued to a group of co-permittees encompassing an entire metropolitan area. These permits are reissued as the permits expire.

As part of Phase II, the SWRCB adopted a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes.

The MS4 permits require the discharger to develop and implement a Storm Water Management Plan/Program (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable (MEP). MEP is the performance standard specified in Section 402(p) of the Clean Water Act. The management programs specify what best management practices (BMPs) will be used to address certain program areas. The program areas include public education and outreach; illicit discharge detection and elimination; construction and post-construction; and good housekeeping for municipal operations. In general, medium and large municipalities are required to conduct chemical monitoring, though small municipalities are not.

9.3.1 WATER BOARD PHASE I PROGRAM REQUIREMENTS

The C.3 NPDES requirements went into effect for any project (public or private) that is "deemed complete" by the City or County (Lead Agency) on or after February 15, 2005, and which will result in the creation or replacement (other than normal maintenance) of at least 10,000 square feet of impervious surface area (roofs, streets, patios, parking lots, etc.). Intended to reduce the introduction of urban pollutants into San Francisco Bay, creeks, streams, lakes, and other water bodies in the region, Provision C.3 requires the onsite treatment of stormwater prior to its discharge into downstream receiving waters. Note that these requirements are in addition to the existing NPDES requirements for erosion and sedimentation controls during project construction.

Projects subject to Provision C3 must include the capture and onsite treatment of all stormwater from the site prior to its discharge, including rainwater falling on building rooftops. Project applicants are required to implement appropriate source control and site design measures and to design and implement stormwater treatment measures in order to reduce the discharge of stormwater pollutants to the *maximum extent practicable.* While the Clean Water Act does not define "maximum extent practicable," the Stormwater Quality Management Plans required as a condition of the municipal NPDES permits identify control measures (known as Best Management Plans, or BMPs) and, where applicable, performance standards, to establish the level of effort required to satisfy the maximum extent practicable criterion. It is ultimately up to the professional judgment of the reviewing municipal staff in the individual jurisdictions to determine whether a project's proposed stormwater controls will satisfy the maximum extent practicable criterion. However, there are numeric criteria used to ensure that treatment BMPs have been adequately sized to accommodate and treat a site's stormwater. The C3 requirements are quite extensive, and their complete explanation is not provided here. However, the following are minimums that should be understood and adhered to:

- The applicant must provide a detailed and realistic site design *and impervious surface area calculations*. This site design *and calculations* will be used by the Lead Agency (County or City) to determine/*verify* the amount of impervious surface area that is being created or replaced. It should include all proposed buildings, roads, walkways, parking lots, landscape areas, etc., that are being created or redeveloped. If large (greater than 10,000 square feet) lots are being created an effort will need to be made to determine the total impervious surface area that could be created on that parcel. For example if only a portion of the lot is shown as a "building envelope" then the lead agency will need to consider that a driveway will have to be constructed to access the

envelope and that the envelope will then be developed as shown. If the C.3 thresholds are met (creation/redevelopment of 10,000 square feet of impervious surface area), a Stormwater Control Plan (SWCP) (if required by the Lead Agency, or whatever steps for compliance with Provision C3 are required locally) must accompany the application.

- If a SWCP is required by the Lead Agency for the project it must be stamped by a Licensed Civil Engineer, Architect, or Landscape Architect.

Incorporating the C3 requirements into the early phases of new project planning will speed the approval process (by reducing or eliminating the need for redesign of the site plan once it gets to the municipal review process), improve the integration of treatment into site landscaping, enhance the project's aesthetics, reduce the water quality impacts of the project, improve the natural absorption of urban pollutants into the environment, and reduce the amount of stormwater discharged from the site. If these requirements are not incorporated into the early stages of site design, a subsequent redesign of the site plan may be required in order to provide all of the required onsite water treatment, adding unnecessarily to project development costs.

9.3.2 APPLICABILITY TO THE PROJECT

The cities of Clayton, Concord, El Cerrito, Hercules, Lafayette, Martinez, Orinda, Pinole, Pittsburg, Pleasant Hill, Richmond, San Pablo, San Ramon, and Walnut Creek, the towns of Danville and Moraga, Contra Costa County, the Contra Costa County Flood Control and Water Conservation District, have joined together to form the Contra Costa Clean Water Program (Contra Costa Permittees). The Contra Costa Permittees operate under the Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater NPDES Permit Order R2-2009-0074 NPDES Permit No. CAS612008. Each of the Dischargers is individually responsible for adopting and enforcing ordinances, implementing assigned BMPs to prevent or reduce pollutants in stormwater, and providing funds for capital, operation, and maintenance expenditures necessary to implement such BMPs for the storm drain system that it owns and/or operates. Assigned BMPs to be implemented by each Discharger are listed as Performance Standards in the Plan. Enforcement actions concerning this Order will, whenever necessary, be pursued only against the individual Discharger(s) responsible for specific violations of this Order. It is the Regional Board's intent that this Order shall ensure attainment of applicable water quality objectives and protection of beneficial uses of receiving waters. This Order therefore includes requirements that discharges shall not cause or contribute to violations of water quality objectives nor shall they cause certain conditions to occur which create a condition of nuisance or water quality impairment in receiving waters. Accordingly, the Water Board is requiring that these requirements be addressed through the implementation of BMPs to reduce pollutants in stormwater as provided in Provisions C.1 through C.14 of this Order.

The CNWS portion of the proposed remediation project does not operate under the jurisdictions of any of the Contra Costa Permittees and therefore regulatory compliance with the NPDES falls to the General Storm Water Permit, Section 401 of the CWA, and the Draft Site Cleanup Tentative Order prepared by the Water Board, which is schedule to be formally adopted later this year. However, the private property at 330 Holly Drive falls within the jurisdiction of the City of

Concord, one of the Contra Costa Permittees. As a grading permit will be required for proposed remediation actions at 330 Holly Drive, the City of Concord will be required to ensure that the project remains in compliance with its MS4 permit conditions. Accordingly, the applicant will be required to submit detailed and realistic site design *and impervious surface area calculations*. As all impervious surfaces including the home, pump house, concrete parking lot, and paved driveway will all be removed by the proposed project, and will be restored to pervious surfaces, the proposed project will have little difficulty ensuring the proposed project remain in compliance with the City of Concord's MS4 permit conditions.

9.4 California Department of Fish and Wildlife Protections

9.4.1 Section 1602 of California Fish and Game Code

Pursuant to Section 1602 of the California Fish and Game Code, California Department of Fish and Wildlife regulates activities that divert, obstruct, or alter stream flow, or substantially modify the bed, channel, or bank of a stream which CDFW typically considers to include its riparian vegetation. Any proposed activity in a natural stream channel that would substantially adversely affect an existing fish and/or wildlife resource, would require entering into a Streambed Alteration Agreement (SBAA) with CDFW prior to commencing with work in the stream. However, prior to authorizing such permits, CDFW typically reviews an analysis of the expected biological impacts, any proposed mitigation plans that would be implemented to offset biological impacts and engineering and erosion control plans.

9.4.2 Applicability to the Project

The ephemeral drainage on the CNWS is not subject to Section 1602 as it is a federal property. However, this drainage swale where it drains through the private property at 330 Holly Drive is subject to regulation by CDFW pursuant to Section 1602 of Fish and Game Code. This drainage swale currently supports multiple large raised vegetable beds and urban landscaping. Proposed mitigation restoration of this swale will return it to a naturalized condition. In addition, a seasonal wetland will be created in an upland area within this swale. Any proposed changes/modifications to this drainage swale on 330 Holly Drive, a private property, would require entering into a 1602 SBAA with CDFW.

10. IMPACTS ANALYSIS

In this section we discuss potential impacts to sensitive biological resources including trees, nesting birds, special-status bats, waters of the U.S. and/or State, and Section 1602 Jurisdictional Areas. We follow each impact with a mitigation prescription that when implemented would reduce impacts to the greatest extent possible.

10.1 Significance Criteria

A significant impact is determined using CEQA and CEQA Guidelines. Pursuant to CEQA §21068, a significant effect on the environment means a substantial, or potentially substantial, adverse change in the environment. Pursuant to CEQA Guideline §15382, a significant effect on the environment is further defined as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. Other

Federal, State, and local agencies' considerations and regulations are also used in the evaluation of significance of proposed actions.

Direct and indirect adverse impacts to biological resources are classified as "significant," "potentially significant," or "less than significant." Biological resources are broken down into four categories: vegetation, wildlife, threatened and endangered species, and regulated "waters of the United States" and/or stream channels.

10.1.1 THRESHOLDS OF SIGNIFICANCE

10.1.1.1 Plants, Wildlife, Waters

In accordance with Appendix G (Environmental Checklist Form) of the CEQA Guidelines, implementing the project would have a significant biological impact if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service.

- Have a substantial adverse effect on federally protected "wetlands" as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

10.1.1.2 Waters of the United States and State.

Pursuant to Section 404 of the Clean Water Act (33 U.S.C. 1344), the U.S. Army Corps of Engineers (Corps) regulates the discharge of dredged or fill material into waters of the United States, which includes wetlands, as discussed in the bulleted item above, and also includes "other waters" (stream channels, rivers) (33 CFR Parts 328 through 330). Substantial impacts to Corps regulated areas on a project site would be considered a significant adverse impact. Similarly, pursuant to Section 401 of the Clean Water Act, and to the Porter-Cologne Water Quality Control Act, the Water Board regulates impacts to waters of the state. Thus, substantial impacts

to Water Board regulated areas on a project site would also be considered a significant adverse impact.

10.1.1.3 Stream Channels

Pursuant to Section 1602 of the California Fish and Game Code, CDFW regulates activities that divert, obstruct, or alter stream flow, or substantially modify the bed, channel, or bank of a stream which CDFW typically considers to include riparian vegetation. Any proposed activity that would result in substantial modifications to a natural stream channel would be considered a significant adverse impact.

11. IMPACT ASSESSMENT AND PROPOSED MITIGATION

11.1 Impact BIO-1. The Project Could Have a Potentially Significant Impact on Trees

According to the Concord Municipal Code: Chapter 18.310 Tree Preservation and Protection an application for a tree permit shall be submitted at the time of application to the City of Concord for any required permit. According to the Code's definition of a "protected" tree, one protected tree will be impacted by the project. Removal of a protected tree without a tree permit from the City of Concord is considered a significant adverse impact pursuant to CEQA. This impact could be reduced to a less than significant level by applying for a permit and incorporating mitigation.

11.2 Mitigation BIO-1: Mitigation for Significant Impacts to Trees

To compensate for the loss of one "protected" California black walnut, in accordance with the Concord Municipal Code, 3, five gallon California black walnuts will be planted on the project site as the smaller size will ensure higher odds of survival at the project site.

Additional compensatory mitigation includes that the private property at 330 Holly Drive will be restored to a natural landscape condition. All structures will be removed down to the dirt. The vegetable beds and landscape vegetation will be removed from a drainage swale on this property. In addition, the applicant will implement a native oak woodland planting plan on the western one half of the private property where the structures are being removed. Upon completion of the remediation project the private property at 330 Holly Drive will be preserved in perpetuity via recordation of an open space Perpetual Deed Restriction that is recorded on the title of the private property. The native oak tree restoration project will create a wildlife oasis between residential subdivisions south of the former Residential residence and the CNWS. M&A also confirmed in a meeting with the City of Concord on September 18, 2015 that under the City of Concord Reuse Plan for the CNWS, that the area of the CNWS affected by the proposed remediation project, and significant contiguous acreage to the north of this area will be deeded directly from the U.S. Navy to the East Bay Regional Park District to be managed as open space/park land. Thus, in consideration that an existing conservation easement occurs immediately south of the private property at 330 Holly Drive, and 1.4 acres of the private property at 330 Holly Drive will be permanently protected as open space via the recordation of an open space Perpetual Deed Restriction, the restored and preserved private property will add to a significant regional open space.

Implementation of these mitigation measures would reduce impacts to trees to a level considered less than significant pursuant to CEQA.

11.3 Impact BIO-2. The Project Could Have a Potentially Significant Impact on Nesting Birds

The project provides suitable nesting habitat for many passerine birds (such as jays, juncos, and towhees) and for urban nesting raptors such as the red shouldered hawk (*Buteo lineatus*). All of these birds are protected under the Migratory Bird Treaty Act (50 CFR 10.13) and their eggs and young are also protected under California Fish and Game Code Sections 3503, 3503.5. Any project-related impacts to these species would be considered a significant adverse impact. Potential impacts to these species from the project include disturbance to nesting birds, and possibly death of adults and/or young. Impacts to nesting birds from the project are regarded as potentially significant pursuant to CEQA. This impact can be mitigated to a level considered less than significant.

11.4 Mitigation Measure BIO-2. Mitigation for Significant Impacts to Nesting Birds

In order to avoid impacts to nesting birds, a nesting survey should be conducted 15 days prior to commencing with construction work or tree removal if this work would commence between February 1st and August 31st. The nesting survey should include examination of all trees within 200 feet of the entire project site (i.e., within a zone of influence of nesting birds), not just trees slated for removal. The zone of influence includes those areas off the project site where birds could be disturbed by earth- moving vibrations and/or other construction-related noise. A nest survey report should be prepared upon completion of the survey and provided to the City of Concord with any recommendations required for establishment of protective buffers as necessary to protect nesting birds.

If birds are identified nesting on or within the zone of influence of the construction project, a qualified biologist should establish a temporary protective nest buffer around the nest(s). The nest buffer should be staked with orange construction fencing or orange lath staking. The buffer must be of sufficient size to protect the nesting site from construction related disturbance and should be established by a qualified ornithologist or biologist with extensive experience working with nesting birds near and on construction sites. Nesting buffers can be up to 50 feet from the nest site or nest tree dripline for small birds and up to 300 feet for sensitive nesting birds that include several raptor species known from the region of the site. The amount, extent, and timing of disturbance are all relative parameters that must be evaluated by a qualified ornithologist to establish an effective nesting buffer that will prevent harm to the eggs and/or young. Upon completion of nesting surveys, if nesting birds are identified on or within a zone of influence of the site, a qualified ornithologist/biologist that frequently works with nesting birds should prescribe adequate nesting buffers to protect the nesting birds from harm.

No construction or earth-moving activity should occur within any established nest protection buffer prior to September 1 unless it is determined by a qualified ornithologist/biologist that the young have fledged (that is, left the nest) and have attained sufficient flight skills to avoid project construction zones, or that the nesting cycle is otherwise completed. In the region of the project site, most species complete nesting by mid-July. This date can be significantly earlier or later,

and would have to be determined by the qualified biologist. At the end of the nesting cycle, and abandonment of the nest by its occupants, as determined by a qualified biologist, temporary nest buffers may be removed and construction may commence in established nesting buffers without further regard for the nest site.

Implementation of this mitigation measure would reduce impacts to nesting birds to a level considered less than significant.

11.5 Impact BIO-3. The Project Could Have a Potentially Significant Impact on the Townsend's Big-Eared Bat and Pallid Bat

The existing buildings and trees on the project site may provide roosting and maternity habitat for the pallid bat and Townsend's western big-eared bat. These bat species are designated by the State as "species of special concern." In accordance with the CEQA Guidelines (Section 15380) which protects "rare" and "endangered" species as defined by CEQA (species of special concern meet this CEQA definition), impacts to these bat species should be considered a potentially significant adverse impact. This impact could be mitigated to a less than significant level.

11.6 Mitigation Measure BIO-3. Mitigation for Significant Impacts to Special Status Bats

In order to avoid impacts to roosting special-status bats, a biologist should survey trees and buildings on the project site 15 days prior to commencing with any removal or demolition. All bat surveys should be conducted by a biologist with known experience surveying for bats. If no special-status bats are found during the surveys, then there would be no further regard for these bat species.

If special-status bat species are found on the project site a determination should be if there are young bats present. If young are found roosting in any tree or building, impacts to the tree or building should be avoided until the young have reached independence. A non-disturbance buffer fenced with orange construction fencing should also be established around the maternity site. The size of the buffer zone should be determined by a qualified bat biologist at the time of the surveys. If adults are found roosting in a tree or building on the project site but no maternal sites are found, then the adult bats can be flushed or a one-way eviction door can be placed over the tree cavity (or building access opening) prior to the time the tree or building in question would be removed or disturbed. No other mitigation compensation would be required.

Implementation of this mitigation measure would reduce impacts to special-status bats to a level considered less than significant.

11.7 Impact BIO-4. The Project Would Have a Significant Impact on Waters of the United States and/or State

The project is currently going through "after the fact" permitting with the U.S. Army Corps of Engineers (Corps) and/or the Water Board for impacts that occurred to waters of the U.S. and State (respectively) during the initial emergency response. The Corps regulates impacts to waters of the U.S. through administration of Section 404 of the Clean Water Act while the Water Board regulates impacts to waters of the state through administration of Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act. To compensate for impacts to waters of

the U.S. and State both the Corps and the Water Board maintain a no net loss policy requiring applicants to re-create impacted wetlands or via the purchase of wetland conservation credits from an approved conservation bank. Impacts to "waters of the United States/State" from the project would be regarded as significant impacts**.** These impacts could be mitigated to levels considered less than significant pursuant to CEQA.

11.8 Mitigation Measure BIO-4. Mitigation for Impacts to Waters of the United States and/or State

Based on the Corps confirmed map, jurisdictional 0.20 acre of seasonal wetland and 0.01 acre of ephemeral drainage will be impacted by the project (Sheets 1 and 2). The applicant is applying for a Corps permit, requesting authorization to use Nationwide Permit (NWP) 20 (Oil Spill Cleanup) and 47 for impacts to 0.21 acre of waters of the U.S./State. NWP 47 authorizes activities required for the inspection, repair, rehabilitation, or replacement of any currently serviceable structure or fill for pipelines that have been identified by the Pipeline and Hazardous Materials Safety Administration's Pipeline Safety Program (PHP) within the U.S. Department of Transportation as time sensitive and additional maintenance activities done in conjunction with the time sensitive inspection and repair activities. A 401 water quality certification will be required from the Water Board to fill the waters of the State on the project site.

There are no wetland conservation banks approved for use by the San Francisco Regulatory District of the Corps and/or the Water Board available for use by the applicant to compensate for impacts to waters of the U.S./State from the initial remediation emergency response. Thus, to mitigate impacts to waters of the U.S. and State the applicant is proposing to re-create seasonal wetlands and other water swales at the project site in the same immediate area where these features were impacted (Sheet 3). To mitigate for permanent impacts to 404 square feet (202 linear feet) of ephemeral drainage ("other waters") that occurred during the initial emergency response in 2011-2012, in 2012 the applicant created two new drainage swale features on the CNWS. In addition, a third drainage swale is proposed to be created on the private property at 330 Holly Drive. The created drainage swale on this property will deliver storm event flows to the re-created seasonal wetlands on the CNWS. The new swales (other waters) total 785 linear feet providing a 3.9:1 mitigation ratio for linear impacts to waters of the U.S./State. Finally, at 330 Holly Drive an existing drainage swale that currently supports multiple large raised vegetable beds and urban landscaping will be restored to a naturalized condition. In addition a seasonal wetland will be created in an upland area within this swale (Sheet 3). Proposed re-created seasonal wetlands will total 10,650 square feet providing a 1.25:1 mitigation ratio for seasonal wetland impacts that occurred during the emergency and remediation projects.

Additional compensatory mitigation includes that the private property at 330 Holly Drive will be restored to a natural landscape condition. All structures will be removed down to the dirt. The vegetable beds and landscape vegetation will be removed from a drainage swale on this property. In addition, the applicant will implement a native oak woodland planting plan on the western one half of the private property where the structures are being removed. Upon completion of the remediation project the private property at 330 Holly Drive will be preserved in perpetuity via recordation of an open space Perpetual Deed Restriction that is recorded on the title of the private property. The native oak tree restoration project will create a wildlife oasis between

residential subdivisions south of the former Residential residence and the CNWS. M&A also confirmed in a meeting with the City of Concord on September 18, 2015 that under the City of Concord Reuse Plan for the CNWS, that the area of the CNWS affected by the proposed remediation project, and significant contiguous acreage to the north of this area will be deeded directly from the U.S. Navy to the East Bay Regional Park District to be managed as open space/park land. Thus, in consideration that an existing conservation easement occurs immediately south of the private property at 330 Holly Drive, and 1.4 acres of the private property at 330 Holly Drive will be permanently protected as open space via the recordation of an open space Perpetual Deed Restriction, the restored and preserved private property will add to a significant regional open space.

Implementation of the above mitigation measures would reduce impacts to waters of the U.S./State to a level considered less than significant pursuant to the CEQA.

11.9 Impact BIO-5. Development of the Project Would Have a Significant Impact to Section 1602 Jurisdictional Areas

CDFW will take jurisdiction over the bed, bank, and channel of the ephemeral drainage swale on the private property at 330 Holly Drive. The vegetable beds and upland landscape vegetation will be removed from this swale as part of the wetlands mitigation plan. A seasonal wetland would be constructed within this swale. Impacts to the swale drainage feature would require authorization from CDFW pursuant to 1602 of the Fish and Game Code, and would be considered a *significant impact to Section 1602 jurisdictional areas*.

This impact can be mitigated to levels considered less than significant pursuant to CEQA.

11.10 Mitigation Measure BIO-5. Mitigation for Impacts to Section 1602 Jurisdictional Areas

A swale on the on the private property at 330 Holly Drive would be restored to a naturalized condition. Landscaping would be removed and a seasonal wetland would be created in an upland area of this swale. Any proposed changes/modifications to the drainage swale would require entering into a 1602 SBAA with CDFW. The applicant may satisfy this mitigation requirement by providing the City of Concord with a fully executed copy of a SBAA with CDFW for the project. The conditions of the executed SBAA shall become a condition of project approval.

Implementation of this mitigation measure would reduce significant impacts to Section 1602 jurisdictional areas to a level considered less-than-significant pursuant to the CEQA.

11.11 Impact BIO-6. Development of the Project Would Have a Potential Significant Impact to California Tiger Salamanders

The defined swale and vegetable beds on the private property at 330 Holly Drive could constitute California tiger salamander habitat. The Central California DPS of the California tiger salamander was federally listed as threatened on August 4, 2004. On August 19, 2010, the California tiger salamander was also state listed as a threatened species under the California Endangered Species Act (CESA). Proposed projects may not impact the California tiger salamander without incidental taking authority from both the USFWS and CDFW. Prior to

impacting habitat that supports the California tiger salamander; the USFWS must prepare an incidental take permit pursuant to either Section 7 or Section 10 of the Federal Endangered Species Act (FESA). Similarly, projects that impact the California tiger salamander also require incidental taking authority from CDFW. Under Section 2081 of CESA an incidental take permit may be authorized by CDFW for proposed projects that impact the California tiger salamander. The impacts can be mitigated to levels considered less than significant pursuant to CEQA.

11.12 Mitigation Measure BIO-6. Mitigation for Potential Impacts to California Tiger Salamander

The USFWS has already provided an incidental take permit for the portion of the project on the CNWS and the work area on the CNWS will not be expanded by the project. In addition, the CNWS is exempt from state laws/regulations. Accordingly, no new incidental take permit is required for proposed remediation work on the CNWS. However, all avoidance measures required by the USFWS's BO must be implemented prior to commencing with remediation work on the CNWS.

Pursuant to Section 2081 of the Fish and Game Code, incidental taking authority must be obtained from the CDFW for mitigation restoration impacts that would occur to an existing swale located at 330 Holly Drive. Raised vegetable beds and landscaping will be removed from this swale. In addition a seasonal wetland will be created in this swale. Similarly, as the USFWS did not cover the portion of the proposed project on 330 Holly Drive with the BO issued for the emergency project. Thus, to cover potential impacts to California tiger salamander and to the California red-legged frog from proposed mitigation restoration of the existing swale on this property, USFWS must amend its BO (or decline to amend or reissue the BO) for the Corps prior to the time the Corps can issue its permit for the proposed remediation project. The proposed remediation project shall not be allowed to commence until such time that incidental take permits are issued by the CDFW and USFWS, or there is written evidence that these agencies have declined to process incidental take permits for the remediation project.

Avoidance measures that must be implemented per the USFWS' last BO include that the project area be excluded from migrating California tiger salamanders via the installation of an exclusion fence. The exclusion fence shall consist of a qualified wildlife exclusion fence material for California tiger salamanders such as silt fence or a commercially available wildlife exclusion fence such as those made by ERTEC Corporation. In lieu of ERTEC fencing, the project site could be surrounded with silt fencing backed by orange construction fence, or with an orange silt fence. The silt fencing should either be landscape stapled every three inches and/or be buried three inches deep along the bottom edge to prevent animals from slipping under the fence. A qualified biologist should conduct a pre-installation survey of the fence installation area immediately prior to installation and should inspect it daily for the duration of the project.

All construction equipment and work should be limited to the area within the fenceline. This minimizes the project-related disturbance to habitats outside the footprint of the project to the maximum extent possible. In the event any state or federally listed species is encountered during the course of the remediation work an appointed onsite biologist should salvage any rescued species as approved in permits issued by the CDFW and/or USFWS.. If a federally listed species

is encountered work should pause while USFWS and CDFW avoidance measures are implemented. The required actions (i.e., correct and appropriate next steps) if a California tiger salamander is encountered in the work area will be spelled out in each respective agency's incidental take permit. These measures shall be followed by the applicant. Typically, the animal would be salvaged via use of a net and then relocated and released into a burrow that is outside of the impacted area.

Best Management Practices should be implemented to minimize the potential mortality, injury or other impacts to federally listed species. All trash items should be removed daily from the project site to reduce the potential for attracting predators such as crows and ravens. Any impacted soils and materials that are excavated should be containerized and removed from the site expeditiously to prevent local wildlife and federally listed species from becoming exposed or killed by the effects of petroleum products.

All fueling and maintenance of equipment and vehicles, and staging areas should remained at least 20 meters (67 feet) from any drainage feature, or as far away as available space allowed at the work area.

Implementation of these mitigation measures would reduce impacts to California tiger salamander to a level considered less than significant pursuant to the CEQA.

11.13 Impact BIO-7. Development of the Project Would Have a Significant Impact to California Red-Legged Frogs

The defined swale and vegetable beds that separate the main western property from the eastern half could constitute California red-legged frog habitat. The California red-legged frog (*Rana draytonii*) (CRLF) was federally listed as threatened on May 23, 1996 (Federal Register 61: 25813-25833) and as such is protected pursuant to the Federal Endangered Species Act. Proposed projects may not impact the California red-legged frog without incidental taking authority from the USFWS. Prior to impacting habitat that supports the California tiger salamander; the USFWS must prepare an incidental take permit for the Corps pursuant to Section 7 of the Federal Endangered Species Act (FESA). Finally, under Title 14, CCR 41 (1996), the California red-legged frog is also a protected amphibian that may only be "taken or possessed" under a special permit issued by CDFW pursuant to sections 650 and 670.7 of these regulations, or Section 2081 of the Fish and Game Code.

This impact can be mitigated to levels considered less than significant pursuant to CEQA.

11.14 Mitigation Measure BIO-7. Mitigation for Impacts to California Red-Legged Frogs

The USFWS has already provided an incidental take permit for the portion of the project on the CNWS and the work area on the CNWS will not be expanded by the project. Accordingly, no new incidental take permit is required for proposed remediation work on the CNWS. However, the USFWS did not cover the private property at 330 Holly Drive and thus, this agency must amend its BO (or reissue a BO) for the Corps prior to the time the Corps can issue its permit for the project. At 330 Holly Drive a drainage swale that currently supports multiple large raised vegetable beds and urban landscaping will be restored to a naturalized condition. In addition a

seasonal wetland will be created in this swale. The proposed remediation project shall not be allowed to commence until such time that an incidental take permit is issued by the USFWS for the private property at 330 Holly Drive, or there is written evidence that USFWS has declined to process a new or amended incidental take permit for the remediation project.

The project site should be staked and surrounded with silt fencing backed by orange construction fence. The silt fencing should be installed at the bottom edge either via installation of landscape staples and in lieu of landscape staples should be buried three inches deep along the bottom edge to prevent animals from slipping under the fence. A qualified biologist should conduct a pre-installation survey of the fence installation area immediately prior to installation and should inspect it daily for the duration of the project.

All construction equipment and work should be limited to the area within the fenceline. This minimizes the project-related disturbance to habitats outside the footprint of the project to the maximum extent possible. A biologist should remain onsite during the remediation work to salvage any California red-legged frog or California tiger salamander should one be encountered over the course of the remediation work. If a federally listed species is encountered then all work should be paused while USFWS is consulted for appropriate next steps.

Best Management Practices should be implemented to minimize the potential mortality, injury or other impacts to federally listed species. All trash items should be removed daily from the project site to reduce the potential for attracting predators such as crows and ravens. Any impacted soils and materials that are excavated should be containerized and removed from the site expeditiously to prevent local wildlife and federally listed species from becoming exposed or killed by the effects of petroleum products.

All fueling and maintenance of equipment and vehicles, and staging areas should remain at least 20 meters (67 feet) from any drainage feature, or as far away as available space allows at the work area.

Implementation of these mitigation measures would reduce impacts to California red-legged frog to a level considered less than significant pursuant to the CEQA.

12. LITERATURE CITED

Alvarez, *et .al*. 2005. A Compilation of Observations of Alameda Whipsnakes Outside of Typical Habitat. Trans. W. Sect. Wildl. Soc. 41:2005

Alvarez .J .A. 2006. Masticophis lateralis euryxanthus (Alameda Whipsnake) Habitat. Herpetological Review 37(2), 2006.

Baldwin D.H, Goldman D.H., Keil D.J., Patterson R, Rosatti T.J., Wilken D.H. (ed.). 2012. The Jepson Manual Vascular Plants of California: Second Edition. University of California Press, Berkeley. 1568 pps.

California Department of Fish and Wildlife (CDFW). 2014. Special animals. California Natural Diversity Data Base. 53 pp.

CDFW (California Department of Fish and Wildlife). 2014. Complete List of Amphibian, Reptile, Bird and Mammal Species in California. Published September 2008; July 2014 (updated).

CNDDB (California Natural Diversity Data Base). 2015. RareFind 3.2. Computer printout for special-status species within a 5-mile radius of the project site. California Natural Heritage Division, California Department of Fish and Game, Sacramento, CA.

CNPS (California Native Plant Society). 2001. Inventory of rare and endangered plants of California (sixth edition). Rare plant scientific advisory committee, David P. Tibor, convening editor. California Native Plant Society. Sacramento, CA. x+338 pps.

Corps (U.S. Army Corps of Engineers). 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. Department of the Army, Waterways Experiment Station, Vicksburg, MS.

Corps (U.S. Army Corps of Engineers). 2008. Regional supplement to the U.S. Army Corps of Engineers wetland delineation manual: arid west region (Version 2). Ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-06-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center. September 2008.

Jennings, M.R., M.P. Hayes, and Research Section, Animal Management Division, Metro Washington Park Zoo. 1994. Amphibian and Reptile Species of Special Concern in California. Final Report Submitted to the California Department of Fish & Game, Inland Fisheries Division. Rancho Cordova, CA. 255 pp. November 1.

Holland, V.L. & D.J. Keil. 1989. California vegetation. Biological Sciences Department/ California Polytechnic State University. San Luis Obispo, California.

Stebbins, R.C. 2003. Western reptiles and amphibians. Third edition. Houghton Mifflin Company, New York, NY. 533 pps.

Smith, D.A., K. Ralls, B.L. Cypher, H.O. Clark Jr., P.A. Kelly, D.F. Williams, and J.E. Maldonado. 2006. Relative abundance of endangered San Joaquin kit foxes (*Vulpes macrotis mutica*) based on scat-detection dog surveys. The Southwestern Naturalist 51 (2): 210-219.

USFWS (U.S. Fish & Wildlife Service). 1992. Endangered and threatened wildlife and plants; commencement of status review for a petition to list the western pond turtle and California red-legged frog. Federal Register, Vol. 57, No. 193, pp. 45761-45762.

USFWS (U.S. Fish and Wildlife Service). 2000. Endangered and threatened wildlife and plants; proposed determination of critical habitat for the Alameda whipsnake (*Masticophis lateralis euryxanthus*). Proposed rule. Federal Register: March 8, 2000 (vol. 65, number 46). pgs. 12155-12181.

USFWS (U.S. Fish and Wildlife Service). 2002. Recovery plan for the California red-legged frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon. Viii + 173 pps.

USFWS (U.S. Fish and Wildlife Service). 2004. Endangered and threatened wildlife and plants; determination of threatened status for the California tiger salamander; and special rule exemption for existing routine ranching activities; Final Rule. Federal Register Vol 69, No 149 pps. 47212-47248. August 4, 2004.

USFWS (U.S. Fish & Wildlife Service). 2005. Endangered and threatened wildlife and plants; designation of critical habitat for the California tiger salamander, central population; final rule (50 CFR Part 17, August 23, 2005).

USFWS (U.S. Fish and Wildlife Service). 2010. Endangered and Threatened Wildlife and Plants: Revised Designation of Critical Habitat for California Red-Legged Frog; Final Rule. Federal Register 50 CFR Part 17 March 17, 2010 (Volume 75, Number 51) Page 12815-12864

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White. 1988. California's wildlife, volume I, amphibians and reptiles. State of California, the Resources Agency, Department of Fish and Game, Sacramento, California.

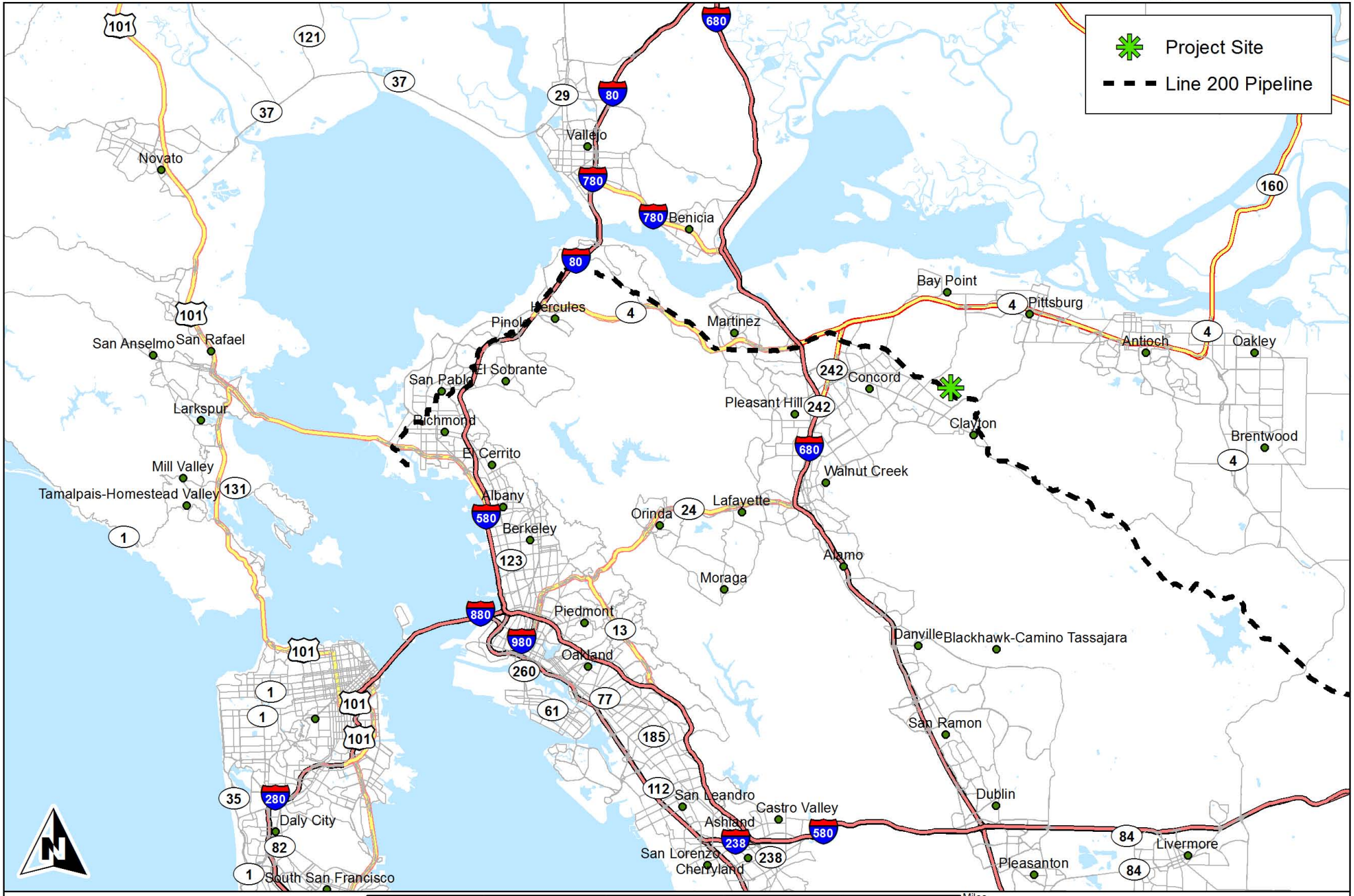

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Figure 1. Phillips 66 Pipeline Line 200 Remediation & Maintenance Project
Concord Naval Weapons Station Project Site Regional Map
Contra Costa County, California

County: Contra Costa
Map Preparation Date: May 11, 2015

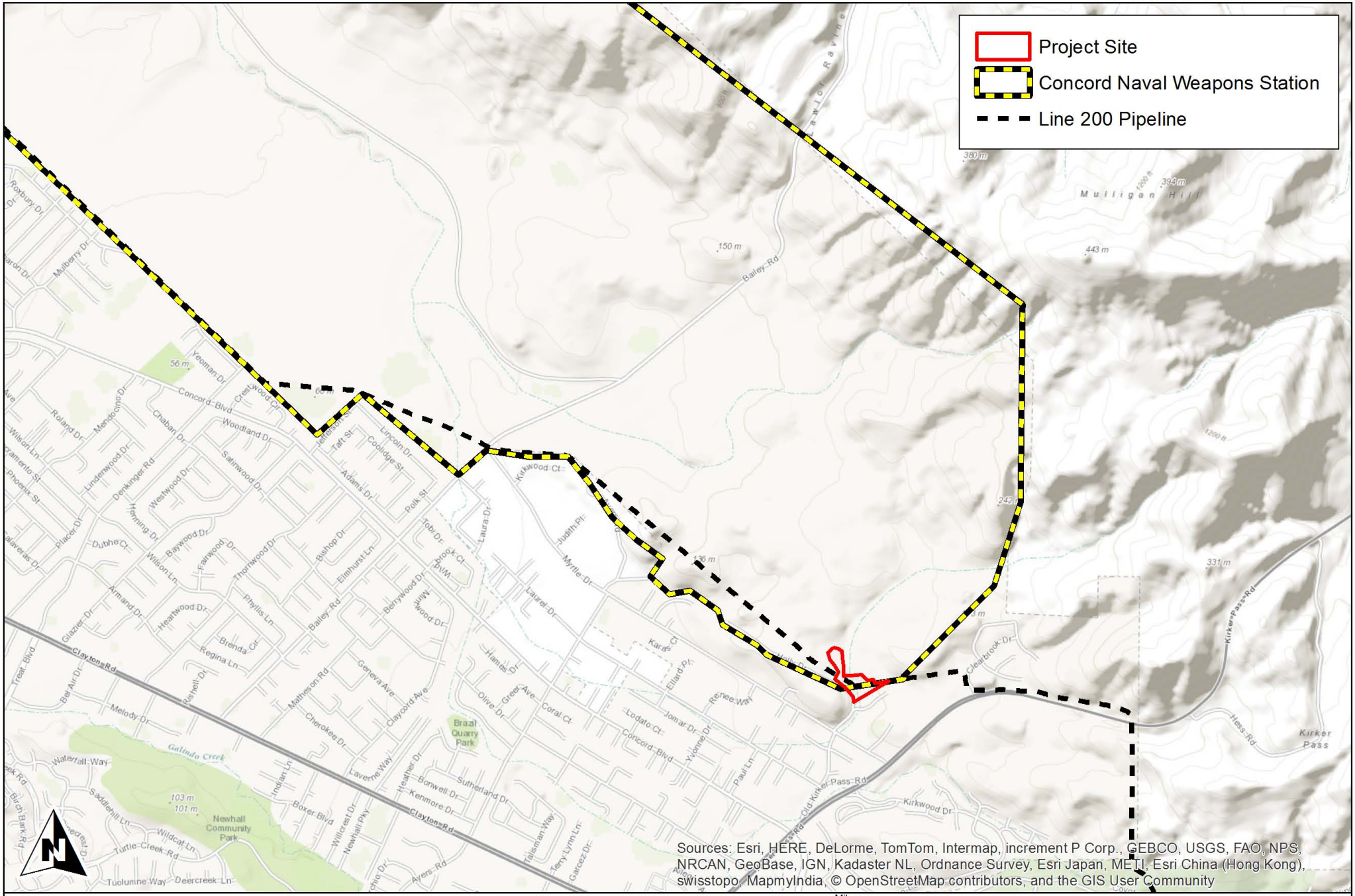

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Figure 2. Phillips 66 Pipeline Line 200 Remediation & Maintenance Project Site Location Map
Contra Costa County, California

7.5-Minute Clayton quadrangle
Topography Source: ESRI
Map Preparation Date: June 22, 2015

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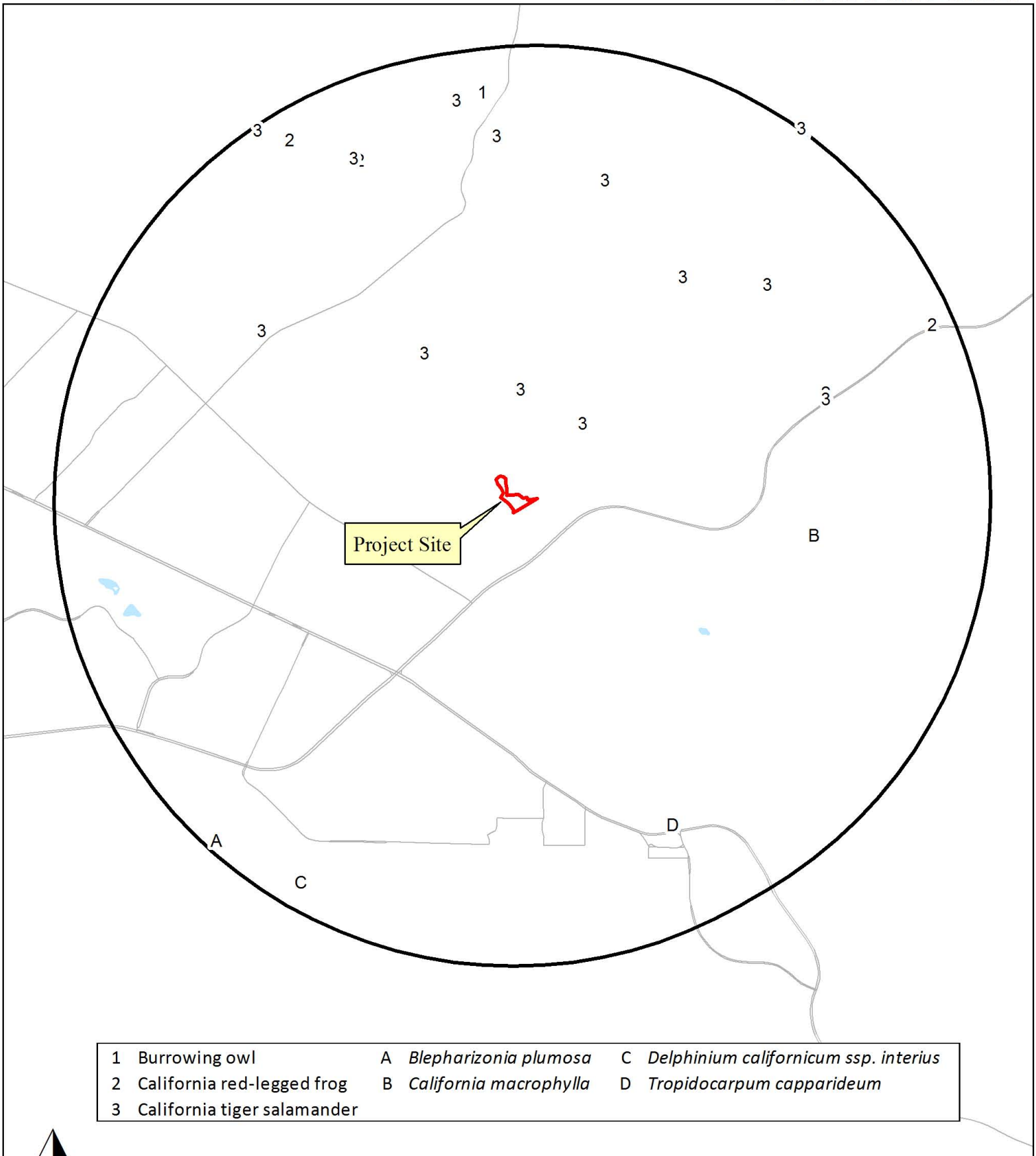
Figure 3. Aerial Photograph of the
Phillips 66 Pipeline Line 200 Remediation & Maintenance Project
Contra Costa County, California

7.5-Minute Clayton quadrangle
Aerial Photograph Source: ESRI
Map Preparation Date: June 22, 2015



1	Burrowing owl	A	*Blepharizonia plumosa*	C	*Delphinium californicum ssp. interius*
2	California red-legged frog	B	*California macrophylla*	D	*Tropidocarpum capparideum*
3	California tiger salamander				

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0 0.2 0.4 0.8 1.2 1.6 2 Miles

Figure 4. Known Special-Status CNDDB Species within 2 Miles of the Remediation & Maintenance Project Contra Costa County, California

Map Preparation Date: June 22, 2015
2-Mile Radius
Source: CDFW, California Natural Diversity Data Base, 2015

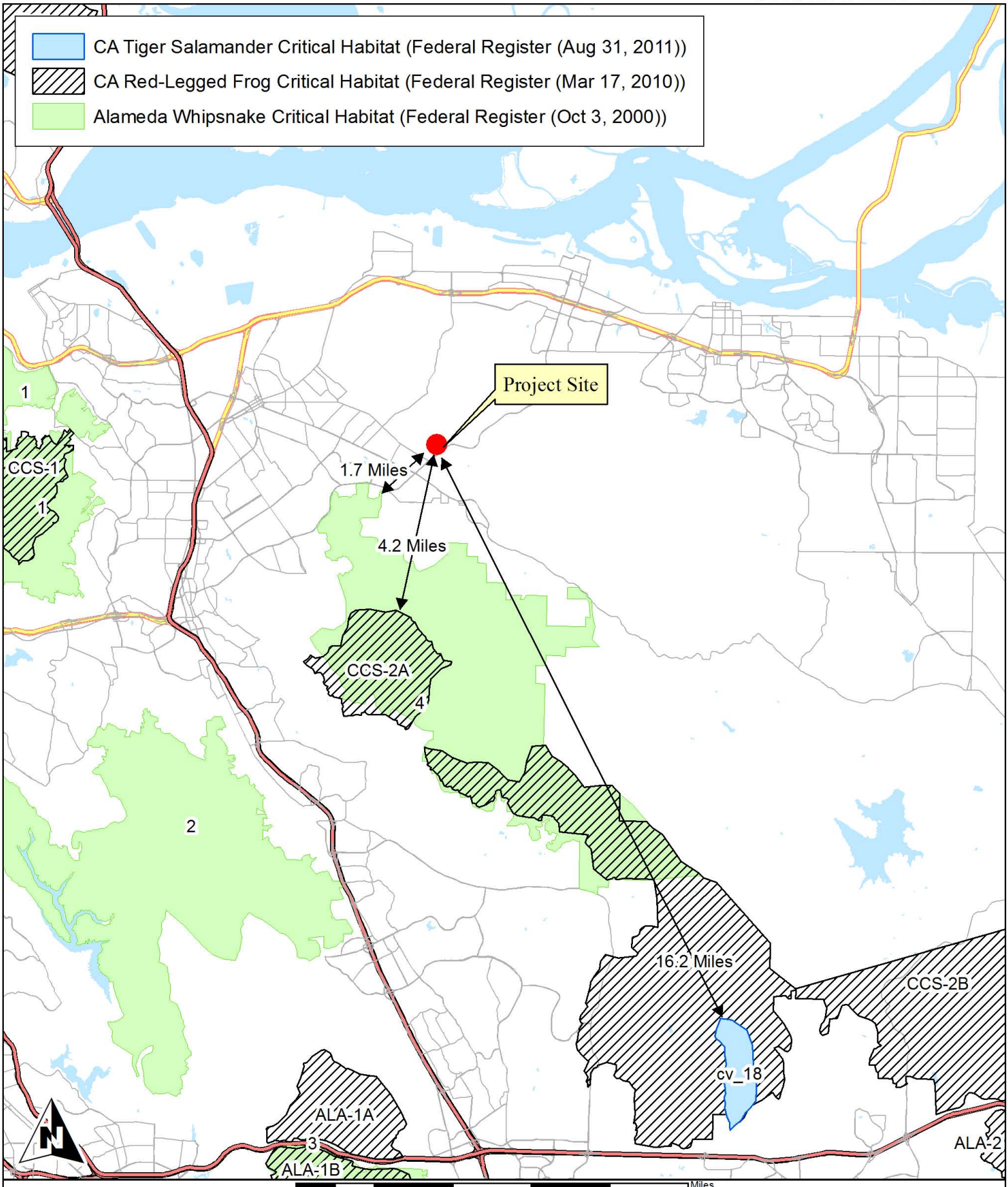

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Figure 5. USFWS Critical Habitat in the Vicinity of the Remediation & Maintenance Project Site Concord, California

Source: USFWS
Map Preparation Date: June 22, 2015

Table 1

Plant Species Observed on the Line 200 Remediation & Maintenance Project Site

Gymnosperms

Cupressaceae

Calocedrus decurrens	Incense cedar
Sequoia sempervirens	Redwood

Pinaceae

**Pinus sp.*	Pine

Angiosperms - Dicots

Asteraceae

Baccharis pilularis subsp. consanguinea	Coyote brush
**Carduus pycnocephalus subsp. pycnocephalus*	Italian thistle
**Centaurea solstitialis*	Yellow starthistle
**Cirsium vulgare*	Bull thistle
**Helminthotheca echioides*	Bristly ox-tongue
**Lactuca serriola*	Prickly lettuce
Xanthium strumarium	Cocklebur

Brassicaceae

**Brassica nigra*	Black mustard
**Raphanus sativus*	Wild radish
**Sinapis arvensis*	Wild mustard
**Sisymbrium sp.*	Sisymbrium

Euphorbiaceae

Euphorbia sp.	Euphorbia

Fabaceae

**Robinia pseudoacacia*	Black locust

Fagaceae

Quercus lobata	Valley oak

Geraniaceae

**Geranium dissectum*	Cut-leaf geranium
**Geranium molle*	Dove's-foot geranium

Juglandaceae

Juglans californica	Southern California black walnut
Juglans hindsii	Northern California black walnut
**Juglans regia*	English walnut

Lamiaceae

**Rosmarinus officinalis*	Rosemary

Malvaceae

**Malva parviflora*	Cheeseweed

Oleaceae

**Fraxinus sp.*	Ash
**Olea europaea*	Olive

* Indicates a non-native species

Table 1

Plant Species Observed on the Line 200 Remediation & Maintenance Project Site

Onagraceae	
Epilobium brachycarpum	Summer cottonweed
Epilobium ciliatum	Hairy willow-herb
Orobanchaceae	
**Bellardia trixago*	Mediterranean linseed
Polygonaceae	
**Rumex crispus*	Curly dock
Ranunculaceae	
Ranunculus aquatilis	Aquatic buttercup
Rosaceae	
**Prunus dulcis*	Almond tree
Rutaceae	
**Citrus limon*	Lemon
**Citrus x sinensis*	Sweet orange
Salicaceae	
**Salix babylonica*	Weeping willow
Salix lasiolepis	Arroyo willow
Sapindaceae	
Acer negundo	Ash-leaf maple
Urticaceae	
Urtica dioica subsp. gracilis	American stinging nettle
Vitaceae	
**Vitis vinifera*	Cultivated grape
Angiosperms -Monocots	
Arecaceae	
**Washingtonia robusta*	Mexican fan palm
Cyperaceae	
Bolboschoenus maritimus subsp. paludosus	Alkali bulrush
Carex barbarae	Whiteroot sedge
Schoenoplectus americanus	Olney's bulrush
Juncaceae	
Juncus balticus subsp. ater	Baltic rush
Poaceae	
**Avena barbata*	Slender wild oat
**Bromus diandrus*	Ripgut grass
**Bromus hordeaceus*	Soft chess
Danthonia californica	California oatgrass
Distichlis spicata	Saltgrass
Elymus glaucus	Blue wildrye
Elymus triticoides subsp. triticoides	Creeping wildrye

* Indicates a non-native species

Table 1

Plant Species Observed on the Line 200 Remediation & Maintenance Project Site

**Festuca perennis*	Italian ryegrass
**Hordeum marinum subsp. gussoneanum*	Mediterranean barley
**Hordeum murinum subsp. leporinum*	Hare barley
**Phalaris aquatica*	Harding grass
**Polypogon monspeliensis*	Annual beard grass
Stipa pulchra	Purple needlegrass

* Indicates a non-native species

Table 2
Wildlife Species Observed at the Line 200 Remediation & Maintenance Project

Amphibians	
Western toad	*Bufo boreas*
Reptiles	
Western fence lizard	*Sceloporus occidentalis*
Southern alligator lizard	*Elgaria multicarinata*
Gopher snake	*Pituophis catenifer*
Birds	
Turkey vulture	*Cathartes aura*
White-tailed kite	*Elanus leucurus*
Northern harrier	*Circus cyaneus*
Cooper's hawk	*Accipiter cooperii*
Red-tailed hawk	*Buteo jamaicensis*
Golden eagle	*Aquila chrysaetos*
Prairie falcon	*Falco mexicanus*
Wild turkey	*Meleagris gallopavo*
Rock pigeon	*Columba livia*
Mourning dove	*Zenaida macroura*
Barn owl	*Tyto alba*
Anna's hummingbird	*Calypte anna*
Black phoebe	*Sayornis nigricans*
Western scrub jay	*Aphelocoma californica*
American crow	*Corvus brachyrhynchos*
Bushtit	*Psaltriparus minimus*
Ruby-crowned kinglet	*Regulus calendula*
Western bluebird	*Sialia mexicana*
American robin	*Turdus migratorius*
Northern mockingbird	*Mimus polyglottos*
Yellow-rumped warbler	*Dendroica coronata*
Savannah sparrow	*Passerculus sandwichensis*
Dark-eyed junco	*Junco hyemalis*
Western meadowlark	*Sturnella neglecta*
House finch	*Carpodacus mexicanus*
Mammals	
Fox squirrel	*Sciurus niger*
Black-tailed hare	*Lepus californicus*
California ground squirrel	*Spermophilus beecheyi*
Botta's pocket gopher	*Thomomys bottae*
Western harvest mouse	*Reithrodontomys megalotis*
California meadow vole	*Microtus californicus*
Coyote	*Canis latrans*

Table 3

Special-Status Plant Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Family Taxon Common Name	Status*	Flowering Period	Habitat	Area Locations	Probability on Project Site
Adoxaceae					
Viburnum ellipticum Western viburnum	Fed: - State: - CNPS: Rank 2B.3	May-July	Chaparral; cismontane woodland; lower montane coniferous forest.	CNPS One Quad Search	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Apiaceae					
Sanicula saxatilis Rock sanicle	Fed: - State: CR CNPS: Rank 1B.2	April-May	Broad-leaf upland forest; chaparral; valley and foothill grassland; [rocky].	Closest record for this species located 4.2 miles south of the project site (Occurrence No. 4).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Asteraceae					
Blepharizonia plumosa Big tarplant	Fed: - State: - CNPS: Rank 1B.1	July-October	Valley and foothill grassland.	Closest record for this species located 2.1 miles southwest of the project site (Occurrence No. 55).	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.
Helianthella castanaea Diablo helianthella	Fed: - State: - CNPS: Rank 1B.2	March-June	Broadleafed upland forest; chaparral; cismontane woodland; coastal scrub; riparian woodland; valley and foothill grassland.	Closest record for this species located 2.9 miles southwest of the project site (Occurrence No. 27).	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.
Lasthenia conjugens Contra Costa goldfields	Fed: FE State: - CNPS: Rank 1B.1	March-June	Valley and foothill grassland (mesic); vernal pools.	Closest record for this species located 3.8 miles west of the project site (Occurrence No. 11).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Madia radiata Show golden madia	Fed: - State: - CNPS: Rank 1B.1	March-May	Cismontane woodland; valley and foothill grassland.	Closest record for this species located 3.7 miles east of the project site (Occurrence No. 27).	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.

Table 3

Special-Status Plant Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Family Taxon Common Name	Status*	Flowering Period	Habitat	Area Locations	Probability on Project Site
Monolopia gracilens Small-flowered monolopia	Fed: State: CNPS: Rank 1B.2	March-July	Coniferous and broadleafed upland forest openings, chaparral openings, and serpentine valley and foothill grassland. Elevation 100-1200 m.	Closest record for this species located 3.5 miles south of the project site (Occurrence No. 42).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Senecio aphanactis Chaparral ragwort	Fed: - State: - CNPS: Rank 2B.2	January-April	Foothill woodland; coastal scrub; (alkaline).	Closest record for this species located 2.9 miles east of the project site (Occurrence No. 14).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Boraginaceae					
Amsinckia grandiflora Large-flowered fiddleneck	Fed: FE State: CE CNPS: Rank 1B.1	April-May	Cismontane woodland, Valley and foothill grassland	Closest record for this species located 4.1 miles east of the project site (Occurrence No. 9).	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.
Phacelia phacelioides Mount Diablo phacelia	Fed: - State: - CNPS: Rank 1B.2	April-May	Chaparral; cismontane woodland; [rocky]; occasionally serpentine soils.	Closest record for this species located 3.8 miles south of the project site (Occurrence No. 17).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Brassicaceae					
Streptanthus albidus peramoenus Uncommon jewelflower	Fed: - State: - CNPS: Rank 1B.2	April-June	Chaparral; valley and foothill grassland; [serpentinite].	Closest record for this species located 4.9 miles south of the project site (Occurrence No. 9).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Streptanthus hispidus Mount Diablo jewelflower	Fed: - State: - CNPS: Rank 1B.3	March-June	Chaparral; valley and foothill grassland; [rocky].	Closest record for this species located 4.2 miles south of the project site (Occurrence No. 7).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.

Table 3

Special-Status Plant Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Family Taxon Common Name	Status*	Flowering Period	Habitat	Area Locations	Probability on Project Site
Tropidocarpum capparideum Caper-fruited tropidocarpum	Fed: - State: - CNPS: Rank 1B.1	March-April	Valley and foothill grassland (alkaline hills).	Closest record for this species located 0.6 mile south of the project site (Occurrence No. 10).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Campanulaceae					
Campanula exigua Chaparral harebell	Fed: - State: - CNPS: Rank 1B.2	May-June	Chaparral (rocky, usually serpentinite).	Closest record for this species located 4.5 miles south of the project site (Occurrence No. 24).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Chenopodiaceae					
Extriplex joaquinana San Joaquin spearscale	Fed: - State: - CNPS: Rank 1B.2	April-October	Chenopod scrub; meadows; valley and foothill grassland; [alkaline].	Closest record for this species located 3.7 miles west of the project site (Occurrence No. 87).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Ericaceae					
Arctostaphylos auriculata Mount Diablo manzanita	Fed: - State: - CNPS: Rank 1B.3	January-March	Chaparral (sandstone).	Closest record for this species located 2.9 miles southwest of the project site (Occurrence No. 6).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Arctostaphylos manzanita laevigata Contra Costa manzanita	Fed: - State: - CNPS: Rank 1B.2	January-February	Chaparral (rocky),	Closest record for this species located 3.2 miles east of the project site (Occurrence No. 8).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.

Table 3

Special-Status Plant Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Family Taxon Common Name	Status*	Flowering Period	Habitat	Area Locations	Probability on Project Site
Geraniaceae					
California macrophylla Round-leaved filaree	Fed: - State: - CNPS: Rank 1B.1	March-May	Cismontane woodland; valley and foothill grassland/clay.	Closest record for this species located 0.4 mile east of the project site (Occurrence No. 50).	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.
Liliaceae					
Calochortus pulchellus Mt. Diablo fairy lantern	Fed: - State: - CNPS: Rank 1B.2	April-June	Chaparral; cismontane woodland; valley and foothill grassland.	Closest record for this species located 3.3 miles east of the project site (Occurrence No. 44).	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.
Fritillaria liliacea Fragrant fritillary	Fed: - State: - CNPS: Rank 1B.2	February-April	Coastal prairie; coastal scrub; valley and foothill grassland; [often serpentinite].	CNPS One Quad Search	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.
Linaceae					
Hesperolinon breweri Brewer's western flax	Fed: - State: - CNPS: Rank 1B.2	May-July	Chaparral; cismontane woodland; valley and foothill grassland; [mostly serpentinite].	Closest record for this species located 3.6 miles south of the project site (Occurrence No. 2).	None. After the emergency spill response and initial remediation no suitable habitat was retained. The CNWS is a heavily impacted site and the residential property is landscaped.
Malvaceae					
Malacothamnus hallii Hall's bush mallow	Fed: - State: - CNPS: Rank 1B.2	May-September	Chaparral.	Closest record for this species located 2.8 miles east of the project site (Occurrence No. 36).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.

Table 3

Special-Status Plant Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Family Taxon Common Name	Status*	Flowering Period	Habitat	Area Locations	Probability on Project Site
Onagraceae					
Oenothera deltoides howellii Antioch dunes evening-primrose	Fed: FE State: CE CNPS: Rank 1B.1	March-September	Interior dunes.	Closest record for this species located 2.5 miles southwest of the project site (Occurrence No. 11).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Orobanchaceae					
Cordylanthus nidularius Mount Diablo bird's-beak	Fed: FC State: CR CNPS: Rank 1B.1	July-August	Chaparral (serpentinite).	Closest record for this species located 4.2 miles south of the project site (Occurrence No. 5).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Polemoniaceae					
Eriastrum ertterae Lime Ridge eriastrum	Fed: State: - CNPS: Rank 1B.1	June-July	Alkaline or semi-alkaline, sandy. Chaparral (openings or edges)	Closest record for this species located 3.0 miles southwest of the project site (Occurrence No. 1).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Navarretia gowenii Lime Ridge navarretia	Fed: - State: - CNPS: Rank 1B.1	May-June	Chaparral.	Closest record for this species located 3.0 miles southwest of the project site (Occurrence No. 3).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Polygonaceae					
Eriogonum truncatum Mount Diablo buckwheat	Fed: - State: - CNPS: Rank 1B.1	April-September	Chaparral; coastal scrub; valley and foothill grassland; [sandy].	Closest record for this species located 2.9 miles southwest of the project site (Occurrence No. 2).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.

Table 3

Special-Status Plant Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Family Taxon Common Name	Status*	Flowering Period	Habitat	Area Locations	Probability on Project Site
Potamogetonaceae					
Stuckenia filiformis alpina Slender-leaved pondweed	Fed: - State: - CNPS: Rank 2.2	May-July	Marshes and swamps (assorted shallow freshwter).	Closest record for this species located 4.9 miles southwest of the project site (Occurrence No. 16).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.
Ranunculaceae					
Delphinium californicum interius Hospital Canyon larkspur	Fed: - State: - CNPS: Rank 2.2	April-June	Cismontane woodland (mesic).	Closest record for this species located 1.9 miles southwest of the project site (Occurrence No. 17).	None. No suitable habitat. The CNWS is a heavily impacted site and the residential property is landscaped.

***Status**

Federal:
FE - Federal Endangered
FT - Federal Threatened
FPE - Federal Proposed Endangered
FPT - Federal Proposed Threatened
FC - Federal Candidate

State:
CE - California Endangered
CT - California Threatened
CR - California Rare
CC - California Candidate
CSC - California Species of Special Concern

CNPS:
Rank 1A - Presumed extinct in California
Rank 1B - Plants rare, threatened, or endangered in California and elsewhere
Rank 1B.1 - Seriously endangered in California (over 80% occurrences threatened/ high degree and immediacy of threat)
Rank 1B.2 - Fairly endangered in California (20-80% occurrences threatened)
Rank 1B.3 - Not very endangered in California (<20% of occurrences threatened or no current threats known)

CNPS Continued:
Rank 2 - Plants rare, threatened, or endangered in California, but more common elsewhere
Rank 2A - Extirpated in California, common elsewhere
Rank 2B.1 - Seriously endangered in California, but more common elsewhere
Rank 2B.2 - Fairly endangered in California, but more common elsewhere
Rank 2B.3 - Not very endangered in California, but more common elsewhere
Rank 3 - Plants about which we need more information (Review List)
Rank 3.1 - Plants about which we need more information (Review List) Seriously endangered in California
Rank 3.2 - Plants about which we need more information (Review List) Fairly endangered in California
Rank 4 - Plants of limited distribution - a watch list

Table 4

Special-Status Wildlife Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Species	*Status	Habitat	Closest Locations	Probability on Project Site
Amphibians				
California tiger salamander *Ambystoma californiense*	Fed: FT State: CT Other:	Central and Santa Barbara Co. DPS are Fed. Threatened. Sonoma Co. DPS is Endangered. Found in grassland habitats of the valleys and foothills. Requires burrows for aestivation and standing water until late spring (May) for larvae to metamorphose.	Closest record is from 2005 and is located approximately 0.41 mile northeast of the project site on the CNWS in a stockpond (Occurrence No. 949).	None. No suitable habitat remaining after emergency spill response, all excavated except residiential property wich is landscaped/hardpack. See text.
California red-legged frog *Rana draytonii*	Fed: FT State: CSC Other:	Occurs in lowlands and foothills in deeper pools and streams, usually with emergent wetland vegetation. Requires 11-20 weeks of permanent water for larval development.	Closest record is from 2000 and is located approximately 1.3 miles east of the project site in a stock pond (Occurrence No. 566).	None. No suitable habitat. CNWS has been extensively disturbed and the residiential property is landscaped. See text.
Reptiles				
Coast horned lizard *Phrynosoma coronatum*	Fed: -- State: CSC Other:	Range extends from northern California to the tip of Baja California. It frequents areas with abundant, open vegetation such as chaparral or coastal sage scrub with sandy substrates.	Closest record is from 2005 and is located approximately 2.7 miles south of the project site in open chaparral habitat (Occurrence No. 644).	None. No suitable habitat. CNWS has been extensively disturbed and the residiential property is landscaped.
Alameda whipsnake *Masticophis lateralis euryxanthus*	Fed: FT State: CT Other:	Coastal scrub and chaparral habitats of Contra Costa and Alameda Counties. Prefers south-facing slopes with a mosaic of shrubs, trees, and grassland.	Closest record is from 2003 and is located approximately 3.0 miles southwest of the project site in chaparral (Occurrence No. 61).	None. No suitable habitat. CNWS has been extensively disturbed and the residential property is landscaped. See text.
Birds				
Swainson's hawk *Buteo swainsoni*	Fed: - State: CT Other:	Migratory and resident raptor that breeds in open areas with scattered trees. Prefers riparian and sparse oak woodland habitats for nesting. Requires nearby grasslands, grain fields, or alfalfa for foraging.	Closest record is from 1898 and is located approximately 4.7 miles south of the project site near Mount Diablo (Occurrence No. 2657).	None. No suitable habitat. CNWS has been extensively disturbed and the residiential property is landscaped. Preconstruction surveys for nesting birds will be conducted.

Table 4

Special-Status Wildlife Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Species	*Status	Habitat	Closest Locations	Probability on Project Site
Western burrowing owl *Athene cunicularia hypugaea*	Fed: -- State: CSC Other:	Found in open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	Closest record is from 1999 and is located approximately 1.8 miles north of the project site on rolling hills (Occurrence No. 337).	None. No suitable habitat. CNWS has been extensively disturbed and the residiential property is landscaped. See text.
Suisun song sparrow *Melospiza melodia maxillaris*	Fed: -- State: CSC Other:	Resident of brackish marshes surrounding Suisun Bay. Prefers cattails, tules, sedges, and pickleweed. Also found in tangles bordering sloughs.	Closest record is from 1924 and is located approximately 4.4 miles northeast of the project site (Occurrence No. 39).	None. No suitable habitat. CNWS has been extensively disturbed and the residiential property is landscaped. Preconstruction surveys for nesting birds will be conducted.
Mammals				
Townsend's big-eared bat *Corynorhinus townsendii townsendii*	Fed: -- State: CSC Other: CC	Occurs in humid coastal regions of northern and central California. Roosts in limestone caves, lava tubes, mines, and buildings. Extremely sensitive to disturbance.	Closest record is from 1977 and is located approximately 4.9 miles south of the project site (Occurrence No. 424).	Low. Modern house will be removed, unlikely roosting habitat. Preconstruction surveys will be conducted. See text.
Pallid bat *Antrozous pallidus*	Fed: - State: CSC Other:	Occurs in deserts, grasslands, shrublands, woodlands, and forests. Most common in dry habitats with rocky areas for roosting. Roosts in caves, crevices, mines, and occasionally hollow trees. Night roosts in open areas such as porches and open buildings.	Closest record is from 1942 and is located approximately 2.4 miles northwest of the project site (Occurrence No. 136).	Low. Modern house will be removed, unlikely roosting habitat. Preconstruction surveys will be conducted. See text.
Berkeley kangaroo rat *Dipodomys heermanni berkeleyensis*	Fed: -- State: CSC Other:	Closely resembles the Tulare kangaroo rat (D. h. tularensis); is distinguished by generally darker hairs, especially along the back, and darker broad stripes along the sides and tail; smaller patches of lighter hairs on ears and face.	Closest record is from 1936 and is located approximately 4.9 miles south of the project site (Occurrence No. 4).	None. No suitable habitat. CNWS has been extensively disturbed and the residiential property is landscaped.
San Joaquin kit fox *Vulpes macrotis mutica*	Fed: FE State: CT Other:	Inhabits open grasslands with scattered shrubs. Needs loose-textured sand soils for burrowing.	Closest record is from 1992 and is located approximately 3.8 miles east of the project site (Occurrence No. 555).	None. No suitable habitat. SJKF not known from CNWS; greater known range is east of CNWS. See text.

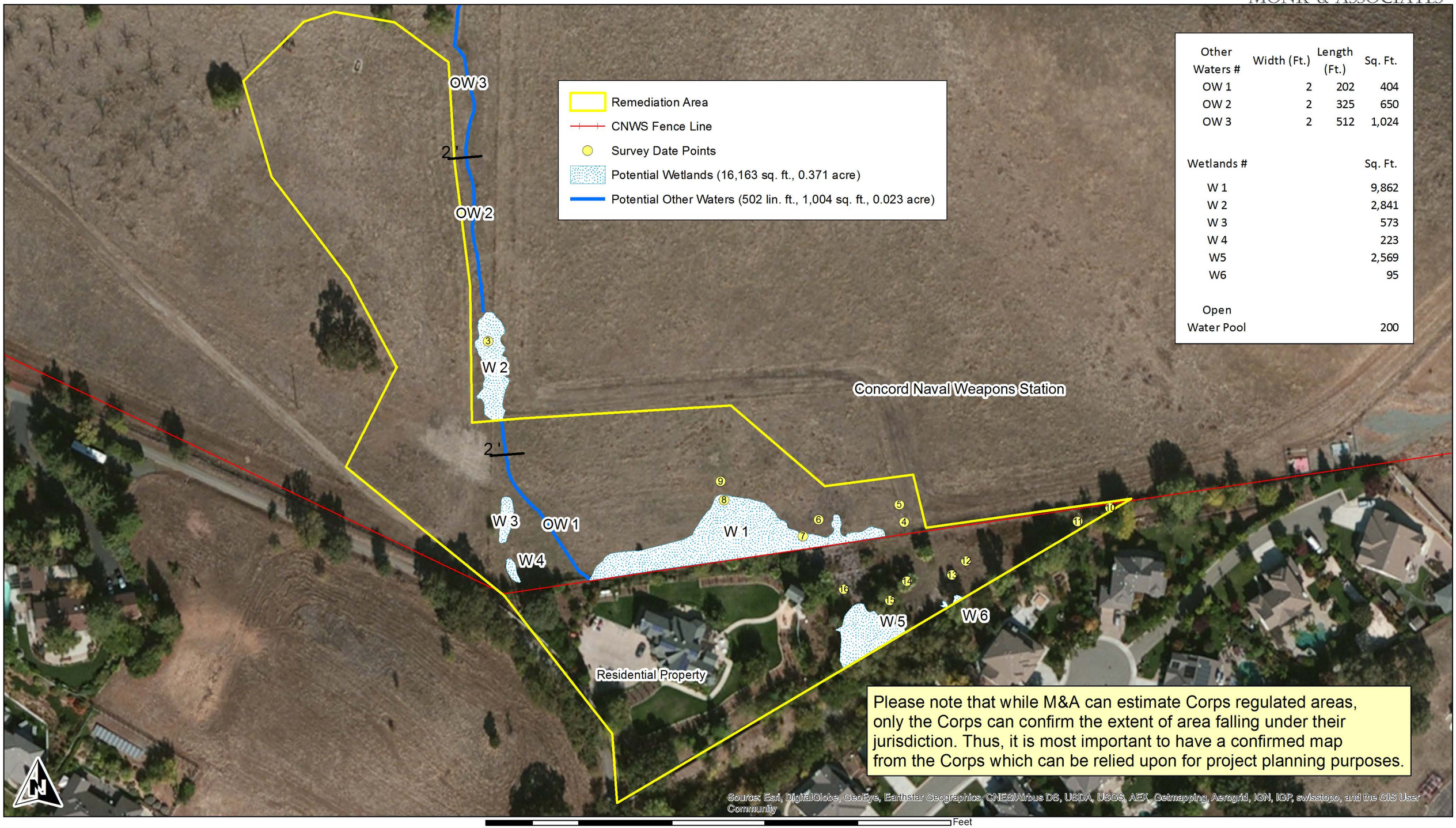
Table 4

Special-Status Wildlife Species Known to Occur in the Vicinity of the Line 200 Remediation & Maintenance Project

Species	*Status	Habitat	Closest Locations	Probability on Project Site

***Status**

Federal:	State:
FE - Federal Endangered	CE - California Endangered
FT - Federal Threatened	CT - California Threatened
FPE - Federal Proposed Endangered	CR - California Rare
FPT - Federal Proposed Threatened	CC - California Candidate
FC - Federal Candidate	CSC - California Species of Special Concern
FPD - Federally Proposed for delisting	FP - Fully Protected
	WL - Watch List. Not protected pursuant to CEQA



Other Waters #	Width (Ft.)	Length (Ft.)	Sq. Ft.
OW 1	2	202	404
OW 2	2	325	650
OW 3	2	512	1,024

Wetlands #	Sq. Ft.
W 1	9,862
W 2	2,841
W 3	573
W 4	223
W5	2,569
W6	95
Open Water Pool	200

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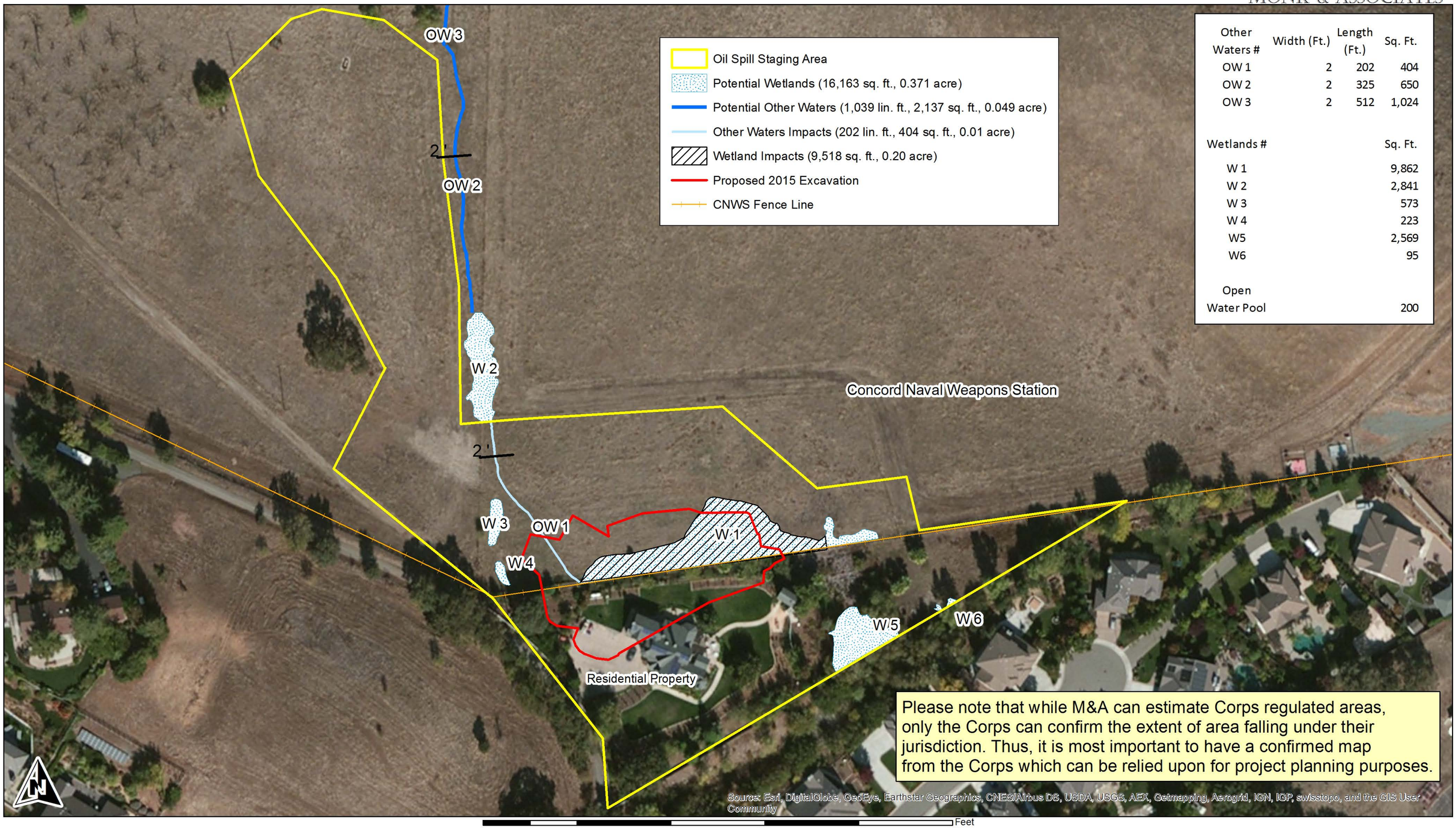
Sheet 1. Phillips 66
Line 200 Remediation and Maintenance Project
Preliminary Wetland Delineation

Aerial Photograph Source: ESRI
Map Preparation Date: May 4, 2015



Other Waters #	Width (Ft.)	Length (Ft.)	Sq. Ft.
OW 1	2	202	404
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W5	2,569
W6	95
Open Water Pool	200

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Sheet 2. Phillips 66
Impact Areas
Remediation & Maintenance Project

Aerial Photograph Source: ESRI
Map Preparation Date: May 4, 2015

Monk & Associates
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Sheet 3. Phillips 66 Pipeline Line 200
Wetland Mitigation Areas
Remediation & Maintenance Project Site

Map Preparation Date:
June 10, 2015
Aerial Photograph Source: ESRI

ED BRENNAN
CONSULTING ARBORIST

June 11, 2015

Geoff Monk
Monk & Associates, Inc.
1136 Saranap Avenue, Suite Q
Walnut Creek, CA 94595

Subject: 330 Holly Drive, Concord

Dear Mr. Monk:

Monk & Associates is managing the environmental review of planned mitigation for an oil spill that occurred at the subject site. You requested that I provide information on trees growing on the site that are potentially impacted by mitigation activities. This letter responds to your request.

Observations at the site
I visited the site on May 12, 2015. While there I reviewed the document Sheet 2, Phillips 66 Impact Areas, which showed the limits of proposed excavation. Information was collected for trees growing within the area of excavation and directly adjacent to it. The information collected included the following:

1. Identifying the tree as to species;
2. Tagging each tree with an identifying number;
3. Measuring the trunk diameter at a point 54" above grade;
4. Evaluating the health and structural condition using a scale of 1 – 5:
   - ***5*** - A healthy, vigorous tree, reasonably free of signs and symptoms of disease, with good structure and form typical of the species.
   - ***4*** - Tree with slight decline in vigor, small amount of twig dieback, minor structural defects that could be corrected.
   - ***3*** - Tree with moderate vigor, moderate twig and small branch dieback, thinning of crown, poor leaf color, moderate structural defects that might be mitigated with regular care.
   - ***2*** - Tree in decline, epicormic growth, extensive dieback of medium to large branches, significant structural defects that cannot be abated.
   - ***1*** - Tree in severe decline, dieback of scaffold branches and/or trunk; most of foliage from epicormics; extensive structural defects that cannot be abated.

Fifteen trees were evaluated. Five species were present. Mexican fan palm (*Washingtonia robusta*) was the most common species with four trees. There were also three trees each of coast redwood (*Sequoia sempervirens*), European olive (*Olea europaea*), and valley oak (*Quercus lobata*). Two California black walnuts (*Juglans hindsii*) were also present.

Overall condition of the trees was good (eight trees) to fair (six trees). Only one tree, the California black oak #65, was in poor condition.

Of the 15 trees evaluated 13 grew within the area of excavation (Table 1). Two trees grew adjacent to it (Table 2).

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edbrennanarborist@sbcglobal.net

Table 1: Trees Growing Within Area Of Excavation

Tree No.	Species	Trunk diameter (inches)	Condition
62	European olive	9,6,4	4
63	Mexican fan Palm	10	3
64	European olive	5,5	3
65	Calif. black walnut	28,14	2
66	European olive	5,4,4,3	3
67	Mexican fan Palm	24	4
68	Mexican fan Palm	26	4
69	Valley oak	8	4
70	Calif. black walnut	8	4
71	Valley oak	9	4
72	Coast redwood	8,5	3
73	Coast redwood	6,3	3
74	Coast redwood	5,4,3	3

Trees growing within the area of excavation would be removed. Trees growing adjacent to the excavated area could be preserved. Preservation of these trees is predicated on following the **Tree Preservation Guidelines** that follow.

Table 2: Trees Growing Adjacent to the Area Of Excavation

Tree No.	Species	Trunk diameter (inches)	Condition
61	Mexican fan Palm	26	4
75	Valley oak	18,12,21	5

Tree Preservation Guidelines

The goal of tree preservation is not merely tree survival during development but maintenance of tree health and beauty for many years. Trees retained on sites that are either subject to extensive injury during construction or are inadequately maintained become a liability rather than an asset. The response of individual trees will depend on the amount of excavation and grading, the care with which demolition is undertaken, and the construction methods. Coordinating any construction activity inside the Tree Protection Zone can minimize these impacts.

Recommendations for tree protection during construction

1. No grading, construction, demolition or other work shall occur within the **TREE PROTECTION ZONE**. Any modifications must be approved and monitored by the Consulting Arborist.

2. Grading within the dripline of any tree shall be monitored by the consulting arborist.

3. Any root pruning required for construction purposes shall receive the prior approval of, and be supervised by, the Consulting Arborist.

4. Supplemental irrigation shall be applied as determined by the Consulting Arborist.

5. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.

6. No excess soil, chemicals, debris, equipment or other materials shall be dumped or stored within the **TREE PROTECTION ZONE**.

7. Any additional tree pruning needed for clearance during construction must be performed by a Certified Arborist and not by construction personnel.

Sincerely,

Ed Brennan

Certified Arborist #WE-0105A

979 Lincoln Street, Benicia CA 94510 • (707)751-0869 Office/Fax • edbrennanarborist@sbcglobal.net

Appendix HM–1

Cleanup Goals and Previous Subsurface Test Results

TABLE 2
Soil Cleanup Goals, By Parcel, Exposure Media and Exposure Route(s), Depth Interval, and COPC

				COPCs															
				TPHg	**TPHd**	**TPHmo**	**TPH-Total**		**Benzene**			**Ethyl Benzene**			**Napthalene**			**PAHs as B(a)P Eq.**	
EXPOSURE MEDIA	EXPOSURE ROUTE(S)	LAND USES	Units	Odor: ESL Table H-1, Odor Index < 100	Odor: ESL Table H-1, Odor Index < 100	Odor: ESL Table H-1, Vapor Pressure < 1 torr	Odor: Sum of TPH fractions	LTCP General Criteria f: Remove Secondary Source (≤ 1% Residual LNAPL)	LTCP Criteria: Table 1, Residential	Site-Specific Outdoor Air Evaluation, per LTCP, Table 1, Note 2	Odor Nuisance, ESL Table H-3 (for Comparison Purposes Only)	LTCP Criteria: Table 1, Residential	Site-Specific Outdoor Air Evaluation, per LTCP, Table 1, Note 2	Odor Nuisance, ESL Table H-3 (for Comparison Purposes Only)	LTCP Criteria: Table 1, Residential	Site-Specific Outdoor Air Evaluation, per LTCP, Table 1, Note 2	Odor Nuisance, ESL Table H-3 (for Comparison Purposes Only)	LTCP Criteria: Table 1, Residential	Odor Nuisance, ESL Table H-3 (for Comparison Purposes Only)
330 HOLLY DRIVE, CONCORD, CA - FUTURE PERPETUAL, OPEN-SPACE DEED RESTRICTION; AND CONCORD NAVAL WEAPONS STATION - FUTURE PERPETUAL, OPEN-SPACE																			
EXPOSURE MEDIA	EXPOSURE ROUTE(S)	LAND USES	Units	Odor: ESL Table H-1, Odor Index < 100	Odor: ESL Table H-1, Odor Index < 100	Odor: ESL Table H-1, Vapor Pressure < 1 torr	Odor: Sum of TPH fractions	LTCP General Criteria f: Remove Secondary Source (≤ 1% Residual LNAPL)	LTCP Criteria: Table 1, Utility Worker	Site-Specific Outdoor Air Evaluation, per LTCP, Table 1, Note 2	Odor Nuisance, ESL Table H-2: shallow soil & industrial/ commercial (for Comparison Purposes Only)	LTCP Criteria: Table 1, Utility Worker	Site-Specific Outdoor Air Evaluation, per LTCP, Table 1, Note 2	Odor Nuisance, ESL Table H-2: shallow soil & industrial/ commercial (for Comparison Purposes Only)	LTCP Criteria: Table 1, Utility Worker	Site-Specific Outdoor Air Evaluation, per LTCP, Table 1, Note 2	Odor Nuisance, ESL Table H-2: shallow soil & industrial/ commercial (for Comparison Purposes Only)	LTCP Criteria: Table 1, Utility Worker	Odor Nuisance, ESL Table H-2: shallow soil & industrial/ commercial (for Comparison Purposes Only)
SHALLOW & DEEP SOIL, 0 TO 10 FEET BGS	DC, ING, INH	Current CNWS: Industrial and Agricultural; Future (2016) CNWS: Transfer to EBRPD; designated as open space. Utility Worker Exposure; Current 330 Holly Drive: Residential; Future (2016) 330 Holly Drive: Owned by Phillips 66. Record a Perpetual, Open-Space Deed Restriction over 1.4 acres, and 0.6-acre superior easment for existing Holly Drive road easement, and future access road easement for pipeline maintenance. Utility Worker Exposure;	mg/kg	N/A	N/A	N/A	N/A	N/A	14	N/A	N/A	314	N/A	N/A	**219**	N/A	N/A	**4.5**	N/A
	Odor Nuisance	see above	mg/kg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	870	N/A	N/A	400	N/A	N/A	1,000	N/A	1,000 (1)
SECONDARY SOURCE MATERIAL, 0 TO 10+ FEET BGS	N/A	see above	mg/kg	N/A	N/A	N/A	N/A	**2,000**	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
OUTDOOR AIR, 0 to 10 FEET BGS	INH	see above	mg/kg	N/A	N/A	N/A	N/A	N/A	N/A	55(2)	N/A	N/A	2,814(2)	N/A	N/A	537,676(2)	N/A	N/A	N/A
OUTDOOR AIR, Downwind	INH	Existing Residential	mg/kg	N/A	N/A	N/A	N/A	N/A	N/A	**2.5(3),(4)**	N/A	N/A	**162(3),(4)**	N/A	N/A	>219(3),(4)	N/A	N/A	N/A
INDOOR AIR	INH	see above	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
GROUNDWATER	ING, Crop ING, DC, INH	see above	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SURFACE WATER	ING, DC, Ecotoxicity	see above	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

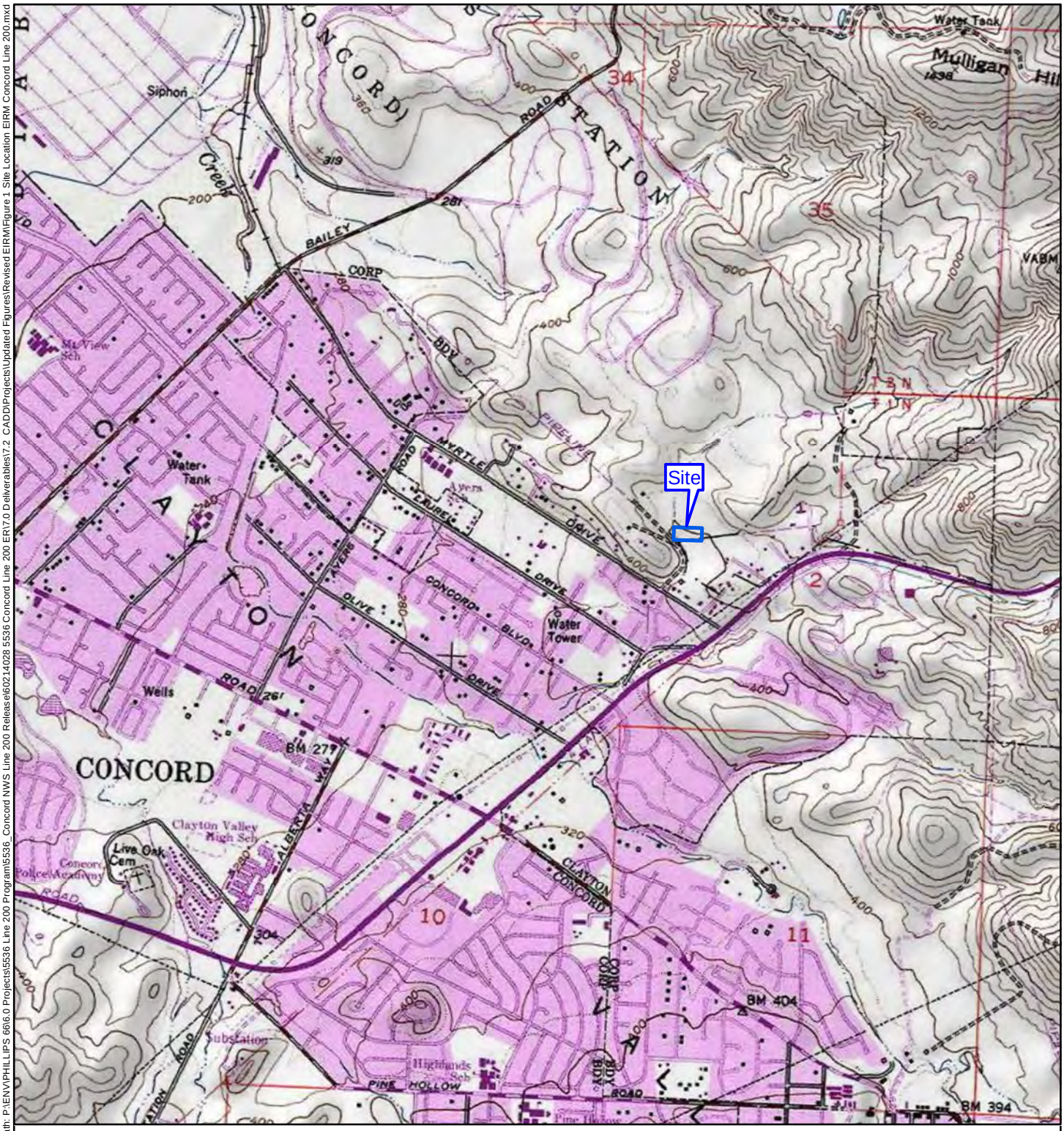
Notes:
ING = Ingestion; DC = Dermal Contact; INH = Inhalation
PAHs as B(a)P Eq. = Total Polyaromatic Hydrocarbons, Expressed as Benzo(a)Pyrene Equivalents, less Naphthalene (which has a distinct soil cleanup goal).
BGS = Below Ground Surface
TPHg = Gasoline-range total petroleum hydrocarbons (C5 - C12) by 8015B or 8260B.
TPHd = Diesel-range total petroleum hydrocarbons (C12 - C22) by 8015B, with Silica Gel Cleanup.
TPHmo = Motor Oil-range total petroleum hydrocarbons (C23 - C32) by 8015B, with Silica Gel Cleanup.
TPH-Total = TPHg + TPHd + TPHmo
COPC: Chemical of Potential Concern
CNWS: Concord Naval Weapons Station
Phillips 66: Phillips 66 Company
EBRPD: East Bay Regional Parks District
N/A = Not Applicable
Controlling Cleanup Goal each for depth inteval and COPC is indicated in bold.

(1) 500 mg/L (residential) and 1,000 mg/L (industrial/commercial) nuisance ceiling value is for Benzo(a)Pyrene only.

(2) See Appendix I, Technical Memorandum I-1, Table I-2: site-specific soil cleanup goal calculated to result in 1E-06 cancer risk for Utility Worker for outdoor air exposure pathway for South Source Area (i.e., 330 Holly Drive, Concord, CA).

(3) See Appendix I, Technical Memorandum I-1, Table I-10; and Technical Memorandum I-2,Table I-5: site-specific soil cleanup goal calculated (via air dispersion modeling and risk assessment) to result in 1E-06 cancer risk/chemical for inhalation exposure to the nearest existing residential receptor. Exposure from combined air emissions from 1) the controlling residential soil cleanup goals for CNWS (listed above) and 2) from controlling industial worker soil cleanup goals for 330 Holly Drive (listed above). ESL Table H-3 values are included for comparison purposes only, and are not cleanup goals.

(4) Subsequent to the analysis described in Note (3) above, the City reported to Phillips 66, in a meeting on September 18, 2015, that the project-affected area on the CNWS will be transferred in fee title from the U.S. Navy directly to EBRPD.
The project affected area is currently designed as conservation open space (Concord 2030 General Plan, and Concord Reuse Project Area Plan), and EBRPD current planning documents designate it as a "conservation zone 1 (no park uses)".
Therefore, the affected area of CNWS will be remediated to utility worker-based cleanup goals (rather than residential-based, as evaluated in Technical Memoranda I-1 and I-2).
The Site-Specific, Outdoor Air Residential Soil Cleanup Goals presented above were not recalculated to reflect the change from residential-based to utility-worker-based soil cleanup goals for the 3,787-ft2 area of CNWS to be transferred to EBRPD.
However, if recalculated, the resulting, revised Site-Specific, Outdoor Air Residential Soil Cleanup Goals would be lower than indicated above (see Work Plan text).
However the analysis in Technical Memoranda I-1 and I-2 is sufficiently conservative that the RWQCB determined (in a December 3, 2015 teleconference with Phillips 66 and AECOM) that the Site-Specific, Outdoor Air Residential Soil Cleanup Goals presented above are an acceptable approximation of cleanup goals for this area (that will be remediated, and become future park land), and are adequately protective of the downwind residential subdivision. Conservative assumptions made in Technical Memoranda I-1 and I-2 include (but are not limited to):
1) no vadose zone biodegradation occurs during volatilization of residual soil COPCs (even though site data indicates the presence of an active vadose soil bioattenuation zone),
2) the petroleum source does not attenuate with time (even though site data indicates that MNA is occurring), and
3) residential receptors are exposed to outdoor air 24 hours per day for 30 years (even though MNA will shorten the duration of any potential exposure to much less than 30 years).



REFERENCE:
USGS 7.5 Minute Quadrangle; Clayton
Township 1 N
Range 1 W
Section 2 S

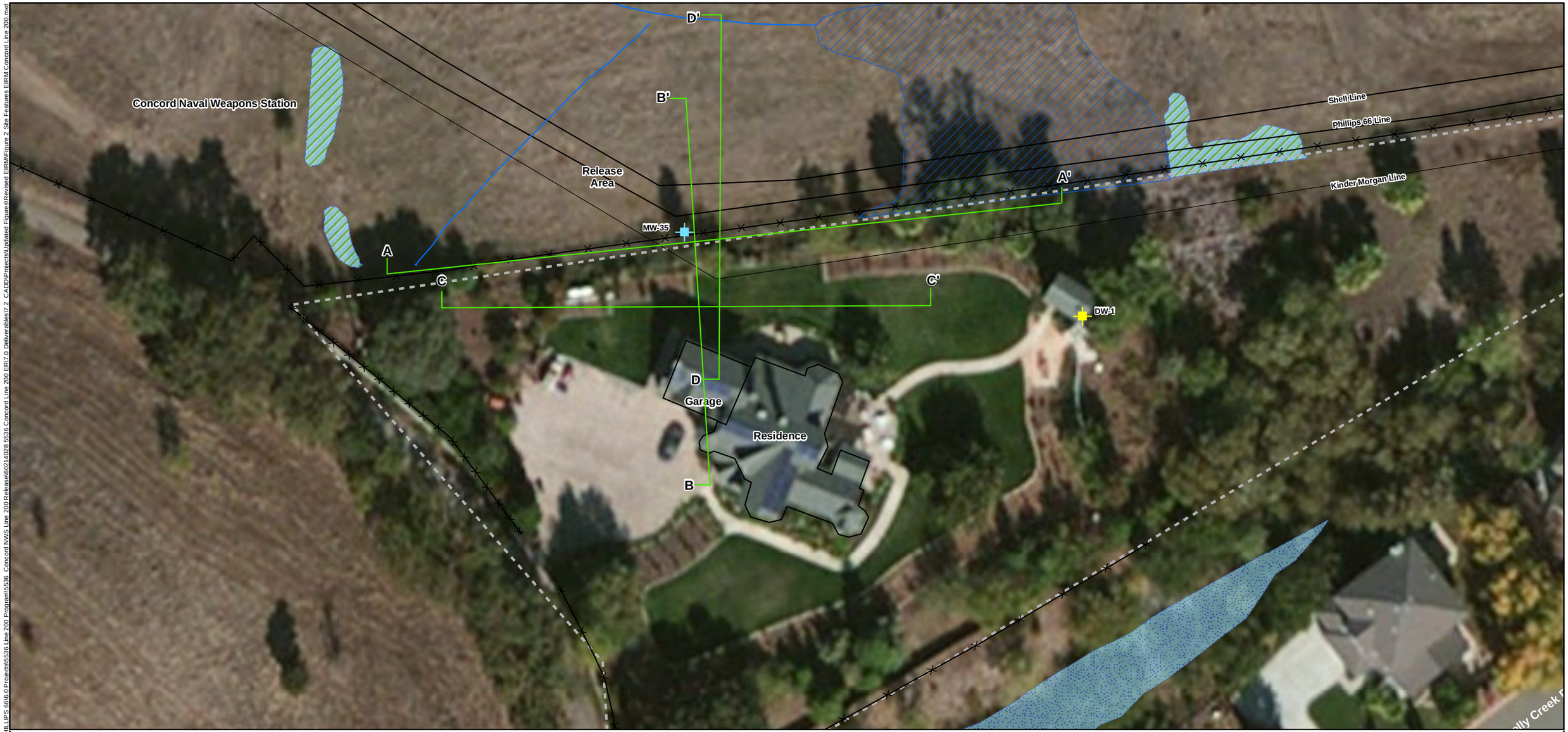
Path: P:\ENV\PHILLIPS 66\6.0 Projects\5536 Line 200 Program\5536_Concord NWS Line 200 Release\602140028 5536 Concord Line 200 ER\7.0 Deliverables\7.2 CADD\Projects\Updated Figures\Revised EIRM\Figure 1 Site Location EIRM Concord Line 200.mxd

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/22/2014

Site Location

AECOM

Figure: 1



Legend

- Monitoring Well
- Domestic Well
- A A' Cross Section Location
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Potential Wetland
- Restored Seasonal Wetland
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)
- Restored Drainages

N

0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/21/2014

Site Features

AECOM

Figure 2

Concord Naval Weapons Station

Release Area

Shell Line

Phillips 66 Line

Kinder Morgan Line

Garage

Residence

SB-59 SB-58 SB-57 SB-33 MW-33 KM-Z2-01 WP-WW 01&02 KM-Z2 02&03 SB-32 MW-32 SB-68 SB-67 SVL-10 SVL-11 SB-2 MW-2 SVL-12 SB-8 SB-66 SB-50 SB-49 SB-3 MW-3 SB-7 SB-5 SB-9 SB-65 SB-63 SH-Z7 EW-7 SH-Z5 NW-4 & 7 SH-Z6 EW-NS SB-64 SB-62 CP-Z9 NW-4 & 7 EP-NW 03/04 SB-47 SB-46 Shell EX1-3 EP-NW 01/02 EP-EW-01 SVL-9 West-1-6 SB-69 WP-SW 01 & 02 SB-60 KM-Z5 NW-4&7 SB-61 COP-Z8 NW-4&7 EP-SW 03/04 EP-SW 01/02 SB-6 MW-6 SB-11 SB-51 SB-70 SH-Z6 EW-SS COP-Z7 NW-4 & 7 CP-Z9 SW-4 & 7 SB-45 SB-17 SB-4 MW-4 SB-31 SB-71 KM-Z5 SW-4&7 CP-Z7 SW-4 & 7 COP-Z8 SW-4&7 SB-56 SB-55 SB-54 SVL-13 SB-12 SVL-14 KM-Z6 SW-4&7 SB-35 MW-35 SB-72 SVL-16 SB-15 MW-15 SB-16 SVL-17 SB-36 MW-36 SB-13 MW-13 SVL-15 SB-14 MW-14 EW-2 SB-21 MW-21 SB-30 SB-53 SB-79 SB-18 GB-2 SB-19 PZ-1 EW-3 SB-20 SB-25 SB-24 MW-47 SB-78 SB-23 SB-44 MW-44 DW-1 GB-1 SVL-20 SB-84 SVL-19 GB-3 SB-37 SVL-3 SB-27 MW-27 SB-26 MW-26 SVL-4 MW-48 SB-22 SVL-21 SVL-22 SB-29 SS-2 SS-1 EW-1 SVL-2 SVL-5 SB-34 MW-34 SB-28 MW-28 SS-3 CS-2 MW-50B MW-50A SB-82 SB-81 SB-80 CS-1 SB-83 CS-3 SB-39 MW-39 SVL-6 IP-34 IP-33 IP-32 IP-31 IP-30 IP-29 IP-28 IP-27 IP-26 IP-25 IP-24 IP-23 IP-22 IP-21 IP-20 IP-19 IP-18 IP-17 IP-16 IP-15 IP-14 IP-13 IP-12 IP-11 IP-10 IP-9 IP-8 IP-7 IP-6 IP-5 IP-4 IP-3 IP-2 IP-1 SB-40 MW-40 SVL-1 CS-4 SVL-7 SVL-8 MW-45 SB-38 MW-38 SB-42 MW-42 MW-46 SB-41 MW-41 MW-49 SB-43 MW-43 SVL-26 SVL-25 SVL-24 SVL-23

Legend

- Soil Borings
- Post-Excavation Sidewall Samples
- Soil Borings and Monitoring Wells
- Extraction Well
- Domestic Well
- Soil Gas Probe
- Injection Point
- CS Crawlspace Sample Location
- SS Subslab Sample Location
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Excavation Area During Release Response

N

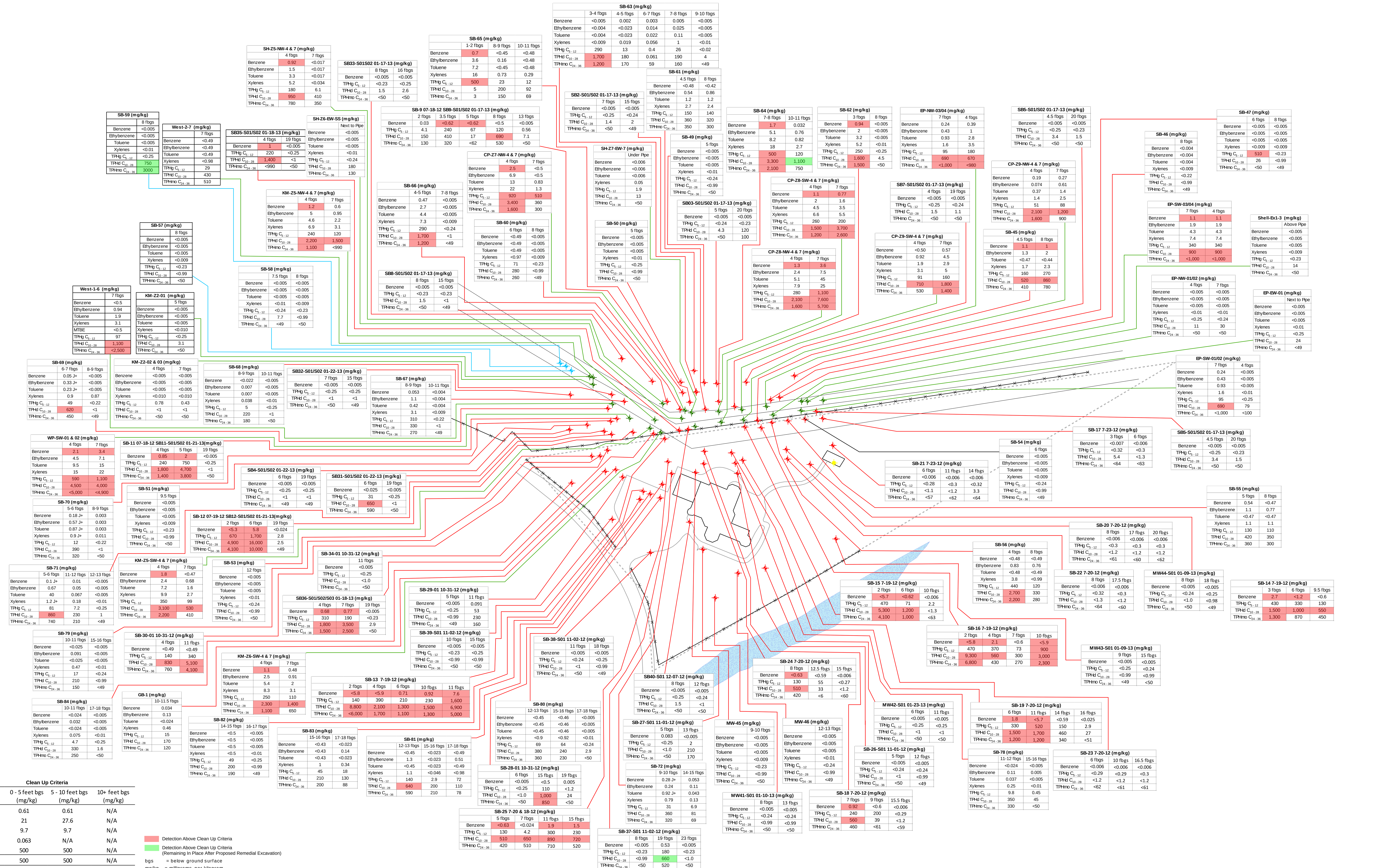
0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/21/2014

Sampling Location Map

AECOM

Figure 3



Clean Up Criteria

	0 - 5 feet bgs (mg/kg)	5 - 10 feet bgs (mg/kg)	10+ feet bgs (mg/kg)
Benzene	0.61	0.61	N/A
Ethylbenzene	21	27.6	N/A
Naphthalene	9.7	9.7	N/A
PAHs (BaP e)	0.063	N/A	N/A
TPHg	500	500	N/A
TPHd	500	500	N/A
TPHmo	1,000	1,000	N/A
TPH-Total	2,000	2,000	2,000

Detection Above Clean Up Criteria

Detection Above Clean Up Criteria (Remaining In Place After Proposed Remedial Excavation)

bgs = below ground surface
mg/kg = milligrams per kilogram
BaP e = benzo(a)pyrene toxicity equivalent
TPH-Total = TPHg + TPHd/SGC + TPHmo/SGC

Legend

- Soil Borings
- Pipeline Relocation Borings
- Post-Excavation Sidewall Samples
- Domestic Well
- Pipeline Location
- Fence Line
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)

0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60302969.5536 Date:10/23/2014

Soil Analytical Results

AECOM
Figure 4

Path: P:\ENV\PHILLIPS 66\6.0 Projects\5536 Line 200 Program\5536_Concord NWS Line 200 Release\60214028 5536 Concord Line 200 ER\7.0 Deliverables\7.2_CADD\Projects\Updated Fiures\Corrective Action Plan\Updated\Figure 5 Corrective Action Plan Concord Line 200.mxd

G-1 (Grape-1) (mg/kg)

	8/30/2012
Acetone	<0.21
Benzene	<0.021
Carbon Disulfide	<0.021
4-Isopropyl toluene	<0.021
Toluene	<0.021
Acenaphthylene	<0.21
1-Methylnaphthalene	<0.21
Naphthalene	<0.21

Rosemary-1 (mg/kg)

	4/10/2013
Acetone	<30
Benzene	<3
Carbon Disulfide	<3
4-Isopropyl toluene	45
Toluene	<3
Acenaphthylene	1
1-Methylnaphthalene	<0.3
Naphthalene	0.37

G-2 (Grape-2)(mg/kg)

	8/30/2012
Acetone	<0.27
Benzene	<0.027
Carbon Disulfide	<0.027
4-Isopropyl toluene	<0.027
Toluene	<0.027
Acenaphthylene	<0.054
1-Methylnaphthalene	<0.054
Naphthalene	<0.054

G-3 (Grape-3)(mg/kg)

	8/30/2012
Acetone	<0.24
Benzene	<0.024
Carbon Disulfide	<0.024
4-Isopropyl toluene	<0.024
Toluene	<0.024
Acenaphthylene	<0.24
1-Methylnaphthalene	<0.24
Naphthalene	<0.24

Concord Naval Weapons Station

Shell Line

Phillips 66 Line

Kinder Morgan Line

Release Area

Rosemary-2 (mg/kg)

	4/10/2013
Acetone	<65
Benzene	<6.5
Carbon Disulfide	<6.5
4-Isopropyl toluene	70
Toluene	<6.5
Acenaphthylene	9.9
1-Methylnaphthalene	0.51
Naphthalene	0.28

Mint-BKRND (mg/kg)

	4/10/2013
Acetone	10
Benzene	<0.26
Carbon Disulfide	<0.26
4-Isopropyl toluene	0.61
Toluene	<0.26
Acenaphthylene	ND
1-Methylnaphthalene	ND
Naphthalene	0.14

Lemon Tree-1 (mg/kg)

	4/10/2013
Acetone	1.8
Benzene	<0.056
Carbon Disulfide	<0.056
4-Isopropyl toluene	1.6
Toluene	<0.056
Acenaphthylene	0.62
1-Methylnaphthalene	<0.22
Naphthalene	<0.22

DW-1

Garage

Residence

Mint-1 (mg/kg)

	4/10/2013
Acetone	3.5
Benzene	<0.14
Carbon Disulfide	<0.14
4-Isopropyl toluene	1.5
Toluene	<0.14
Acenaphthylene	<0.057
1-Methylnaphthalene	<0.057
Naphthalene	<0.057

Lemon-BKRND (mg/kg)

	4/10/2013
Acetone	<0.5
Benzene	<0.05
Carbon Disulfide	<0.05
4-Isopropyl toluene	<0.05
Toluene	<0.05
Acenaphthylene	<0.5
1-Methylnaphthalene	<0.5
Naphthalene	<0.5

Orange Tree-2 (mg/kg)

	4/10/2013
Acetone	0.72
Benzene	<0.034
Carbon Disulfide	<0.034
4-Isopropyl toluene	<0.034
Toluene	<0.034
Acenaphthylene	<0.69
1-Methylnaphthalene	<0.69
Naphthalene	<0.69

Orange Tree-1 (mg/kg)

	4/10/2013
Acetone	1.2
Benzene	<0.049
Carbon Disulfide	<0.049
4-Isopropyl toluene	<0.049
Toluene	<0.049
Acenaphthylene	<0.98
1-Methylnaphthalene	<0.98
Naphthalene	<0.98

G-4 (Grape-4 BKRND)(mg/kg)

	8/30/2012
Acetone	<0.24
Benzene	<0.024
Carbon Disulfide	<0.024
4-Isopropyl toluene	<0.024
Toluene	<0.024
Acenaphthylene	<0.055
1-Methylnaphthalene	<0.055
Naphthalene	<0.055

Mint-2 (mg/kg)

	4/10/2013
Acetone	5.1
Benzene	0.34
Carbon Disulfide	0.18
4-Isopropyl toluene	1.6
Toluene	0.48
Acenaphthylene	<0.36
1-Methylnaphthalene	<0.36
Naphthalene	<0.36

Mint-2A (mg/kg)

	4/30/2013
Acetone	0.27
Benzene	<0.025
Carbon Disulfide	0.28
4-Isopropyl toluene	<0.025
Toluene	<0.025
Acenaphthylene	<0.01
1-Methylnaphthalene	<0.01
Naphthalene	<0.01

Orange BKRND (mg/kg)

	4/10/2013
Acetone	<0.3
Benzene	<0.03
Carbon Disulfide	<0.03
4-Isopropyl toluene	<0.03
Toluene	<0.03
Acenaphthylene	<0.3
1-Methylnaphthalene	<0.3
Naphthalene	<0.3

Legend

Fruit Sampling Locations

- Orange Tree
- Grapes
- Lemon Tree
- Mint
- Rosemary

- Pipeline Location
- Fence Line
- Residential Property Boundary

mg/kg Milligrams per Kilogram

fbgs Feet Below Ground Surface

N

0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/22/2014

Crop Concentrations

AECOM

Figure 5

Path: P:\ENV\PHILLIPS 66\6.0 Projects\5536 Line 200 Program\5536_Concord NWS Line 200 Release\60214028 5536 Concord Line 200 ER\7.0 Deliverables\7.2 CADD\Projects\Updated Figures\Revised EIRM\Figure 6 Benzene Vapor Dec 2013 EIRM.mxd

Concord Naval Weapons Station

Release Area

Shell Line

Phillips 66 Line

Kinder Morgan Line

100

10,000

500,000

100,000

10,000

100

SVL-1 ND
SVL-2 ND
SVL-3 ND
SVL-4 150,000
SVL-5 ND
SVL-6 ND
SVL-7 ND
SVL-8 ND
SVL-9 ND
SVL-10 ND
SVL-11 ND
SVL-12 ND
SVL-13 ND
SVL-14 200,000
SVL-15 790,000
SVL-16 660,000
SVL-17 450,000
SVL-18 ND
SVL-19 ND
SVL-20 2,900
SVL-21 ND
SVL-22 ND
SVL-23 ND
SVL-24 ND
SVL-25 ND
SVL-26 ND
SS-1 ND
SS-2 ND
SS-3 ND
CS-1 ND
CS-2 ND
CS-3 ND
CS-4 ND

Garage

Residence

Legend

- Phase 1 Soil Gas Probe
- SVL-1 — Nested Soil Gas Probe Designation
- 2,900 — Maximun Benzene Concentration, ug/m^3, December 2013
- CS — Crawlspace Sample Location
- SS — Subslab Sample Location
- Pipeline Location
- Fence Line
- Residential Property Boundary

Benzene Concentration Contour

- 100 ug/m^3
- 10,000 ug/m^3
- 100,000 ug/m^3
- 500,000 ug/m^3

Dashed Where Inferred

- ug/m^3 — Micrograms per Cubic Meter
- ND — Indicates Not Detected at a 30 ug/m^3 reporting limit

N

0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/22/2014

Lateral Distribution of Maximum Benzene Vapor Concentration (December 2013)

AECOM

Figure 6

Path: P:\ENV\PHILLIPS 66\16.0 Projects\5536 Line 200 Program\5536_Concord NWS Line 200 Release\60214028 5536 Concord Line 200 ER\7.0 Deliverables\7.2_CADD\Projects\Updated Figures\Revised EIRM\Figure 7 TPHg Vapor Dec 2013 EIRM.mxd

Concord Naval Weapons Station

Release Area

Shell Line

Phillips 66 Line

Kinder Morgan Line

100,000

1,000,000

50,000,000

SVL-1 ND
SVL-2 ND
SVL-3 ND
SVL-4 26,000,000
SVL-5 ND
SVL-6 ND
SVL-7 ND
SVL-8 ND
SVL-9 ND
SVL-10 ND
SVL-11 ND
SVL-12 ND
SVL-13 ND
SVL-14 11,000,000
SVL-15 54,000,000
SVL-16 46,000,000
SVL-17 38,000,000
SVL-18 ND
SVL-19 ND
SVL-20 580,000
SVL-21 ND
SVL-22 ND
SVL-23 ND
SVL-24 ND
SVL-25 ND
SVL-26 ND

SS-1 ND
SS-2 ND
SS-3 ND

CS-1 ND
CS-2 ND
CS-3 ND
CS-4 ND

Garage

Residence

Legend

- Phase 1 Soil Gas Probe
- SVL-1 Nested Soil Gas Probe Designation
- 580,000 Maximun TPHg Concentration, ug/m^3, December 2013
- CS Crawlspace Sample Location
- SS Subslab Sample Location
- Pipeline Location
- Fence Line
- Residential Property Boundary

TPHg Concentration Contour

- 100,000 ug/m^3
- 1,000,000 ug/m^3
- 50,000,000 ug/m^3
- Dashed Where Inferred

ug/m^3 Micrograms per Cubic Meter

ND Indicates Not Detected at a 10,000 ug/m^3 reporting limit

N

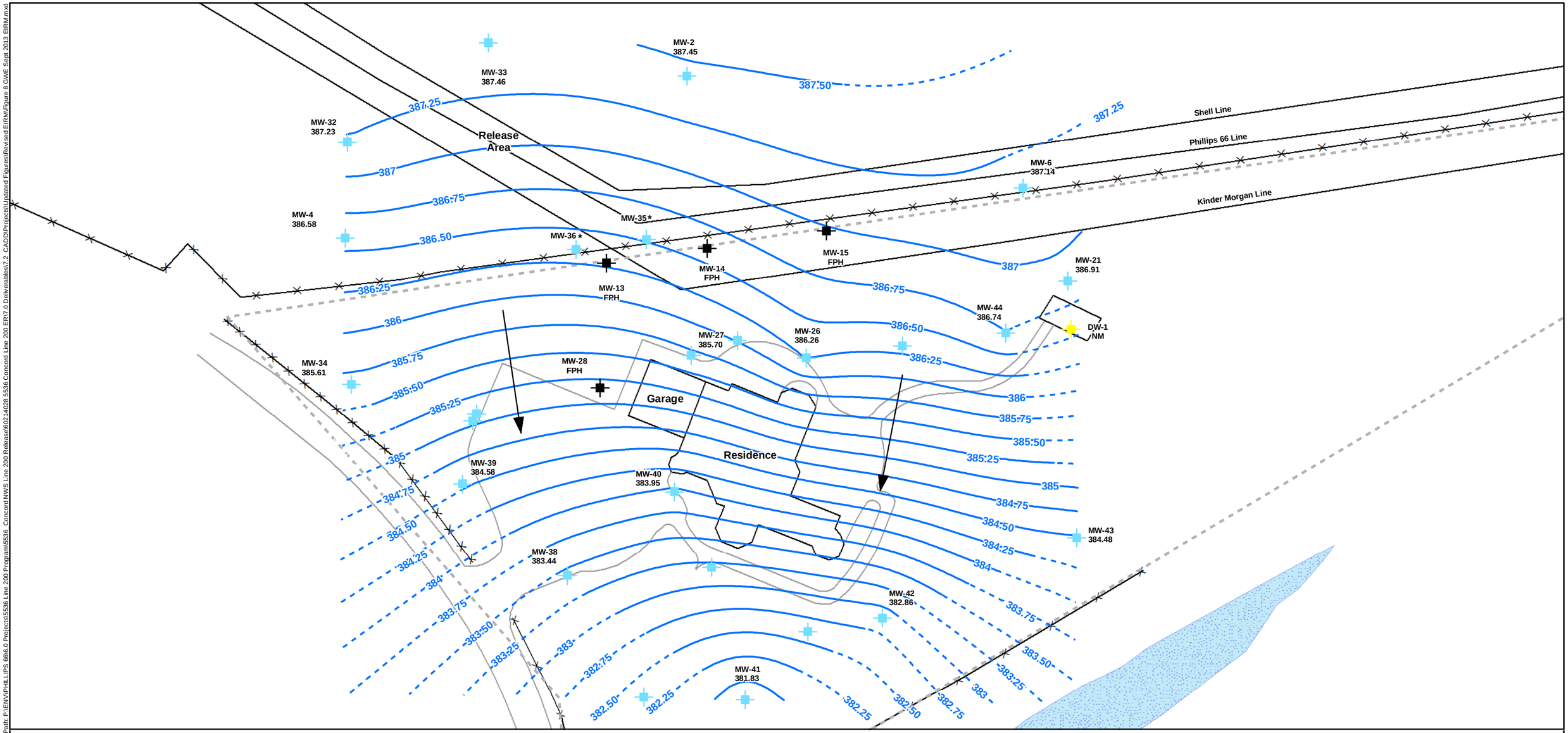
0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/22/2014

Lateral Distribution of Maximum
Total Petroleum Hydrocarbons as Gasoline Vapor Concentration
(December 2013)

AECOM

Figure 7



Legend

- Monitoring Well
- Monitoring Well Containing FPH During Both Monitoring Events
- Domestic Well
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)
- Groundwater Elevation Contours (Dashed Where Inferred)
- Groundwater Flow Direction
- FPH Free Phase Hydrocarbons Observed in Groundwater
- * Due to hydrocarbon interference, the water elevations in these wells were not used to for contouring

N

0 30 60 Feet

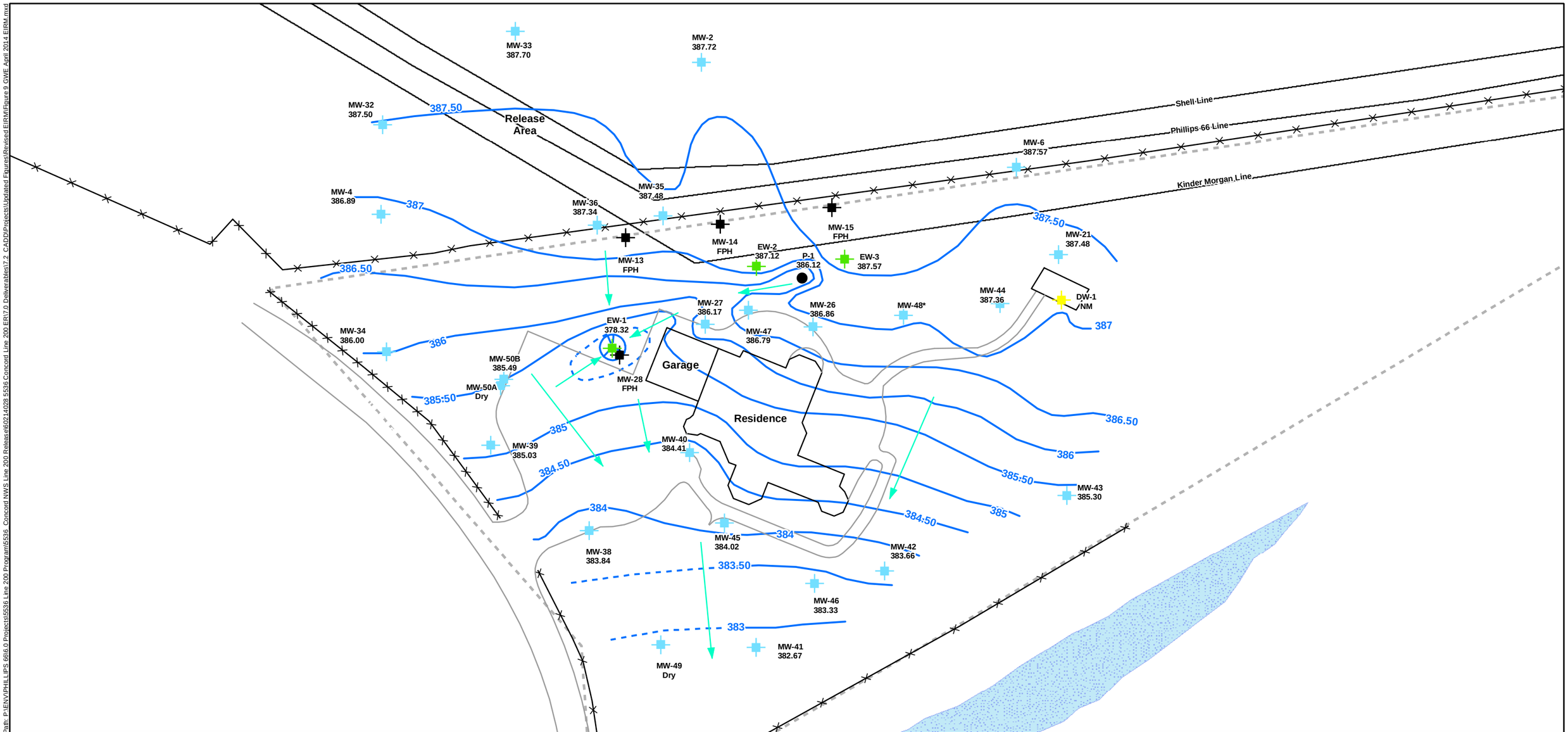
Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/22/2014

Groundwater Monitoring Well Locations and Groundwater Elevation Contours September 2013

AECOM

Figure 8

Path: P:\ENV\PHILLIPS 6606.0 Projects\5536 Line 200 Program\5536 Concord NWS Line 200 Release\60214028 5536 Concord Line 200 ER\7.0 Deliverables\7.2 CADD\Projects\Updated Figures\Revised EIRM\Figure 8 GWE Sept 2013 EIRM.mxd



Legend

- Monitoring Well
- Monitoring Well Containing FPH During Both Monitoring Events
- Extraction Well
- Domestic Well
- Piezometer
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)
- Groundwater Elevation Contours (Dashed Where Inferred)
- Groundwater Flow Direction
- FPH — Free Phase Hydrocarbons Observed in Groundwater (Due to FPH interference, the water elevations in these wells were not used for contouring)
- * — Well not used for contouring

N

0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/22/2014

Groundwater Monitoring Well Locations and Groundwater Elevation Contours
April 2014

AECOM

Figure 9

MW-33 385.81
MW-2 385.81
MW-32 385.62
Release Area
MW-4 385.00
MW-35 385.53
MW-36 385.49
MW-6 385.52
Shell Line
Phillips 66 Line
Kinder Morgan Line
MW-14 FPH
MW-13 FPH
MW-15 FPH
EW-2 379.05
P-1 385.02
EW-3 379.45
MW-21 385.26
MW-44 385.02
DW-1 NM
MW-27 384.27
MW-47 385.59
MW-26 384.60
MW-48 384.87
EW-1 377.89
MW-34*
MW-50B 383.51
MW-50A*
MW-28 FPH
Garage
Residence
MW-40 382.51
MW-39 382.93
MW-43 383.12
MW-38 381.88
MW-45 382.06
MW-42 381.56
MW-46 381.24
MW-41 380.62
MW-49 379.38
385.5
385
384.5
384
383.5
383
382.5
382
381.5
381
380.5
380
379.5

Legend

- Monitoring Well
- Monitoring Well Containing FPH
- Extraction Well
- Domestic Well
- Piezometer
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)
- Groundwater Elevation Contours (Dashed Where Inferred)
- Groundwater Flow Direction
- FPH — Free Phase Hydrocarbons Observed in Groundwater (Due to FPH interference, the water elevations in these wells were not used for contouring)
- * — Well inaccessible

N

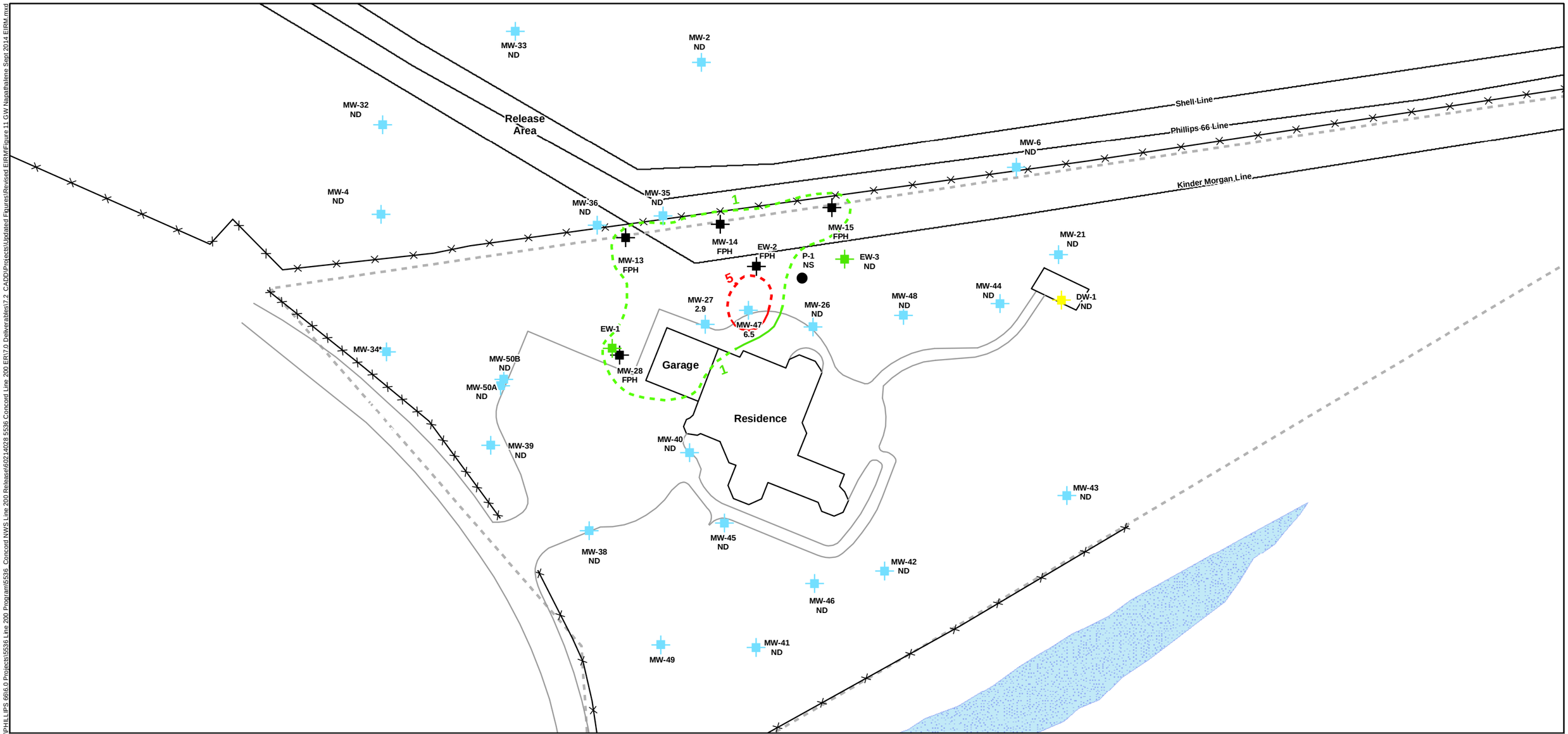
0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/24/2014

Groundwater Monitoring Well Locations and Groundwater Elevation Contours September 2014

AECOM

Figure 10



Legend

- Monitoring Well
- Monitoring Well Containing FPH
- Extraction Well
- Domestic Well
- Piezometer
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)

Naphthalene Concentration Contour

- 1 ug/L
- 5 ug/L
- Dashed Where Inferred

ug/L	Micrograms per Liter
FPH	Free Phase Hydrocarbons Observed in Groundwater
ND	Non Detect Above 0.5 ug/L
*	Well inaccessible

N

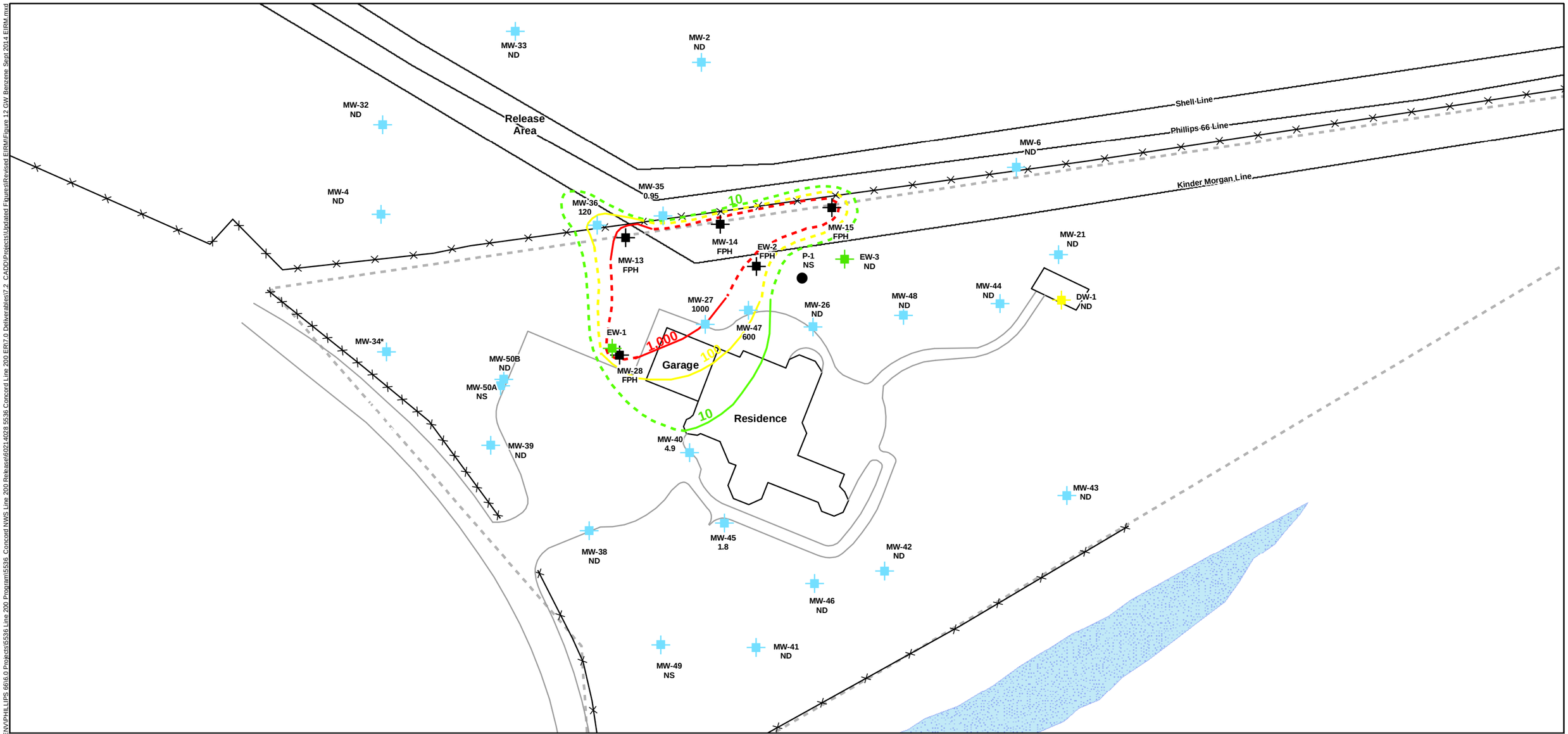
0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/24/2014

Naphthalene in Groundwater
Isoconcentration Contours
September 2014

AECOM

Figure 11



Legend

- Monitoring Well
- Monitoring Well Containing FPH
- Extraction Well
- Domestic Well
- Piezometer
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)

Benzene Concentration Contour

- 10 ug/L
- 100 ug/L
- 1,000 ug/L
- Dashed Where Inferred

ug/L	Micrograms per Liter
FPH	Free Phase Hydrocarbons Observed in Groundwater
ND	Non Detect Above 0.5 ug/L
*	Well inaccessible

N

0 40 80 Feet

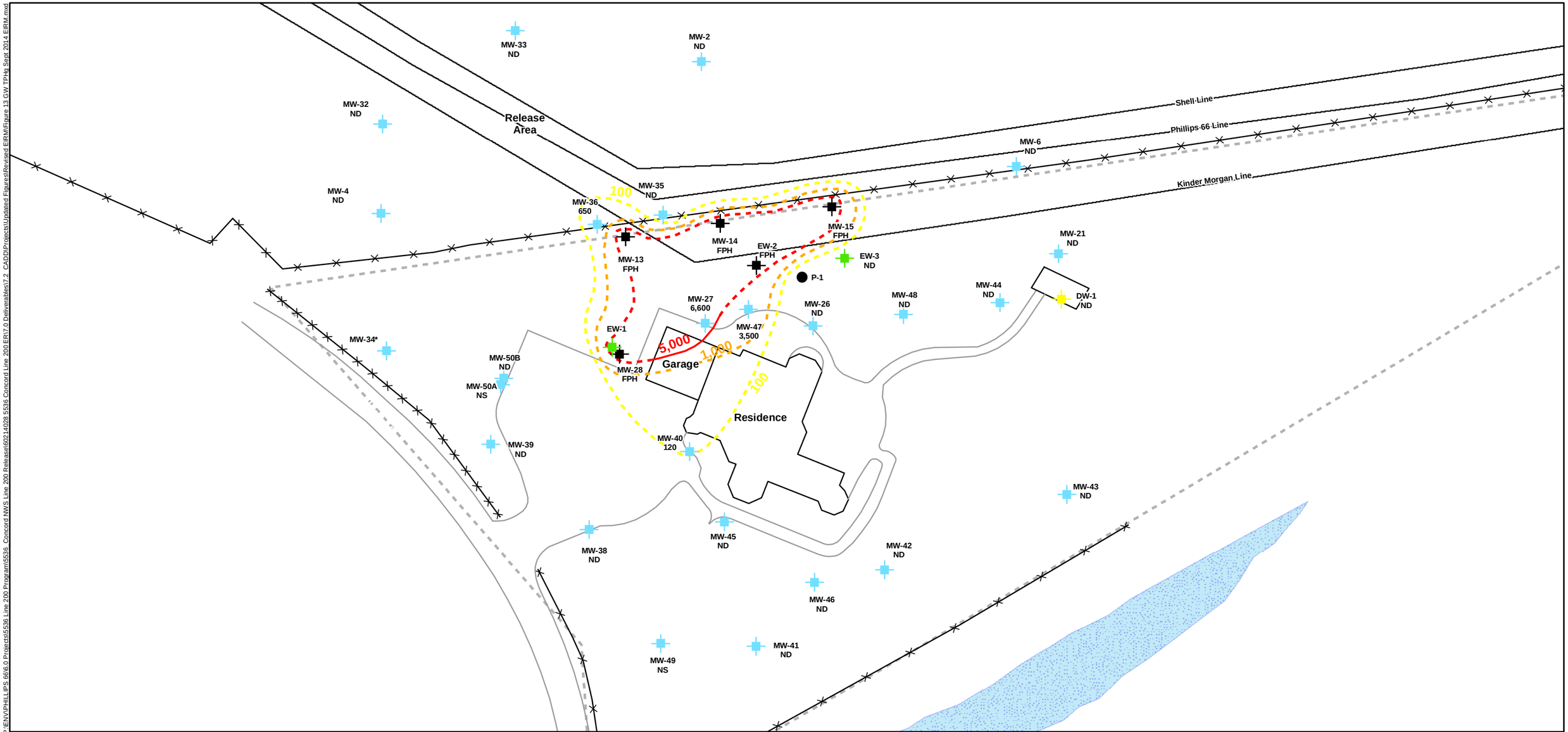
Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/23/2014

Benzene in Groundwater
Isoconcentration Contours
September 2014

AECOM

Figure 12

Path: P:\ENV\PHILLIPS 66\6.0 Projects\55536 Line 200 Program\55536 Concord NWS Line 200 Release\6021402855536 Concord Line 200 ER\7.0 Deliverables\7.2 CADD\Projects\Updated Figures\Revised EIRM\Figure 12 GW Benzene Sept 2014 EIRM.mxd



Legend

- Monitoring Well
- Monitoring Well Containing FPH
- Extraction Well
- Domestic Well
- Piezometer
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Tributary of Mt Diablo Creek Drainage (January 2007, Contra Costa Co. Department of Conservation & Development)

TPHg Concentration Contour

- 100 ug/L
- 1,000 ug/L
- 5,000 ug/L
- Dashed Where Inferred

ug/L	Micrograms per Liter
FPH	Free Phase Hydrocarbons Observed in Groundwater
ND	Non Detect Above 50 ug/L
TPHg	Total Petroleum Hydrocarbons as Gasoline (Hyrdocarbon Chain Range C_5 to C_{12})
*	Well inaccessible

N

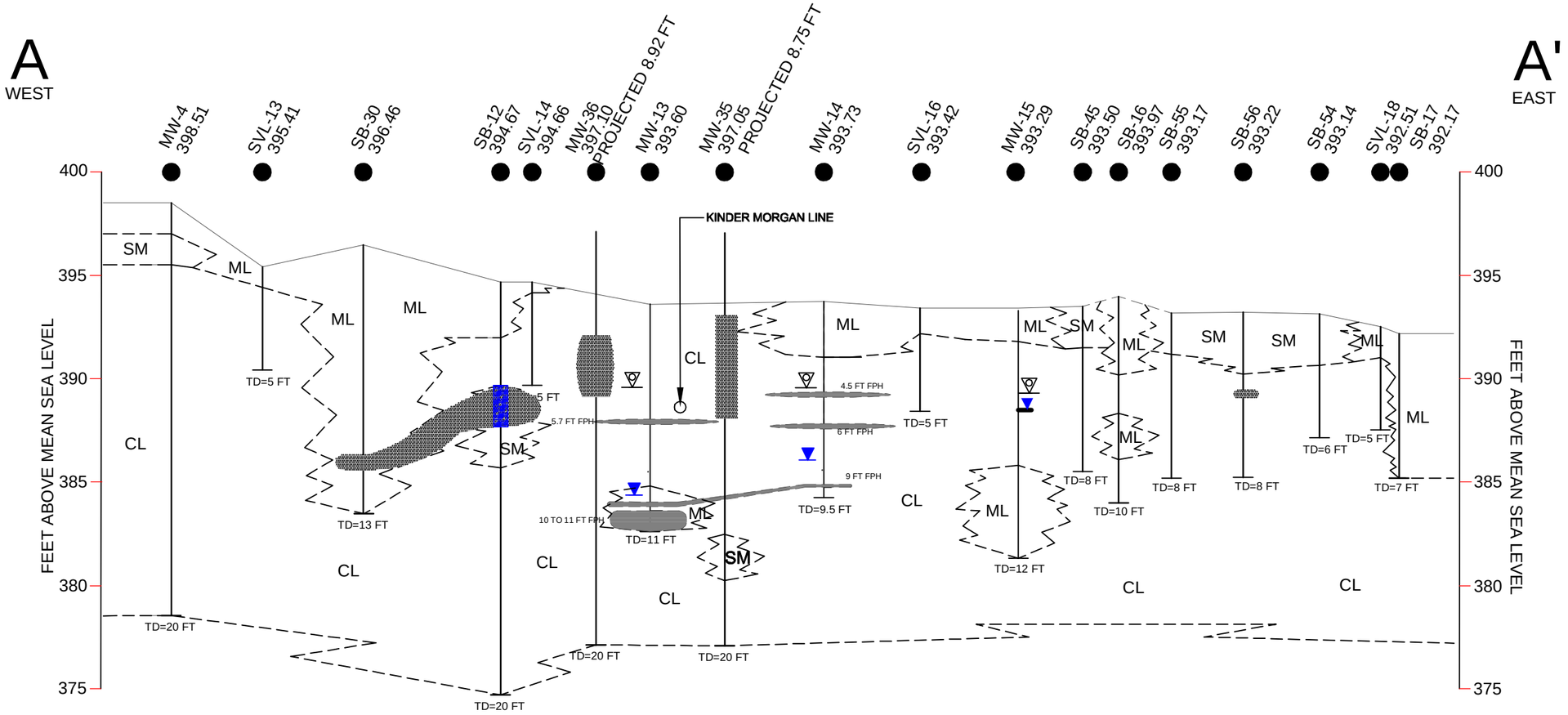
0 40 80 Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/23/2014

Total Petroleum Hydrocarbons as Gasoline in Groundwater
Isoconcentration Contours
September 2014

AECOM

Figure 13



LEGEND:

MW/SB/SVL — MONITORING WELL/BORING INDENTIFICATION

BORING INTERVAL

TD=9.5FT — TOTAL DEPTH

OBSERVED FPH IN WATER

IMPACTED WATER LEVEL

OBSERVED FPH IN SOIL

OIL STAINING AND DROPLETS

PERCHED WATER

FPH — FREE PHASE HYDROCARBONS

SOIL CONTACT

CL — LEAN CLAY, CLAY WITH SILT

ML — SILT, SILT WITH CLAY, SANDY SILT, GRAVELY SILT

SM — SILTY SAND, POORLY GRADED SAND WITH SILT

5
0
0 30
SCALE (FEET)

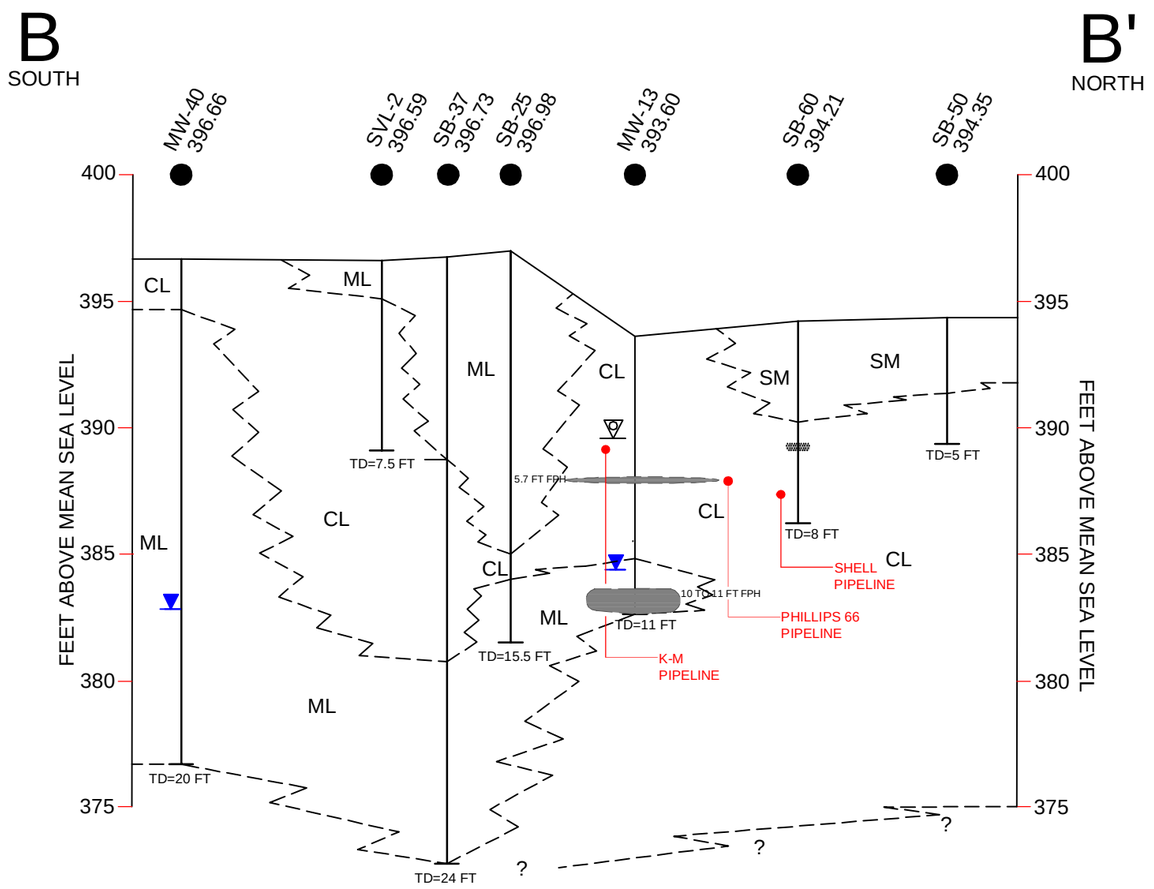
VERTICAL EXAGGERATION 5:1

Revised Excavation Interim Remedial Measures Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons
CONCORD, CALIFORNIA
Project No.: 60315106.5536 Date: 10/22/2014

Cross Section
A-A'

AECOM

Figure 14



LEGEND:

MW/SB/SVL — MONITORING WELL/BORING INDENTIFICATION

BORING INTERVAL

TD=9.5FT — TOTAL DEPTH

OBSERVED FPH IN WATER

INITIAL WATER LEVEL

OBSERVED FPH IN SOIL

OIL STAINING AND DROPLETS

FPH — FREE PHASE HYDROCARBONS

SOIL CONTACT

CL — LEAN CLAY, CLAY WITH SILT

ML — SILT, SILT WITH CLAY, SANDY SILT, GRAVELY SILT

SM — SILTY SAND, POORLY GRADED SAND WITH SILT, SILTY SAND WITH GRAVEL

5 / 0 — 0 / 30 SCALE (FEET)

VERTICAL EXAGGERATION 5:1

Revised Excavation Interim Remedial Measures Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons
CONCORD, CALIFORNIA
Project No.: 60315106.5536 Date: 10/22/2014

Cross Section
B-B'

AECOM

Figure 15

Path: P:\ENV\PHILLIPS 66\6.0 Projects\5536 Line 200 Program\5536_Concord NWS Line 200 Release\60214028.5536.Concord Line 200.ER\7.0 Deliverables\7.2_CADDProjects\Updated Figures\Revised EIRM\Figure 16 ORC Injection EIRM.mxd

Concord Naval Weapons Station

Release Area

Sub Panel and Motor Controller for the Well, and Booster Pump Motor

Shell Line

Phillips 66 Line

Kinder Morgan Line

EW-2

EW-3

Utility Box

Tank

EW-1

Electric Main Panel

Garage

Residence

IP-1
IP-2
IP-3
IP-4
IP-5
IP-6
IP-7
IP-8
IP-9
IP-10
IP-11
IP-12
IP-13
IP-14
IP-15
IP-16
IP-17
IP-18
IP-19
IP-20
IP-21
IP-22
IP-23
IP-24
IP-25
IP-26
IP-27
IP-28
IP-29
IP-30
IP-31
IP-32
IP-33
IP-34

Legend

- Extraction Well
- Injection Point
- Pipeline Location
- Fence Line
- Residential Property Boundary
- Restored Seasonal Wetland
- Underground Pipe/Conduit
- Aboveground Pipe/Conduit

N

0 30 60

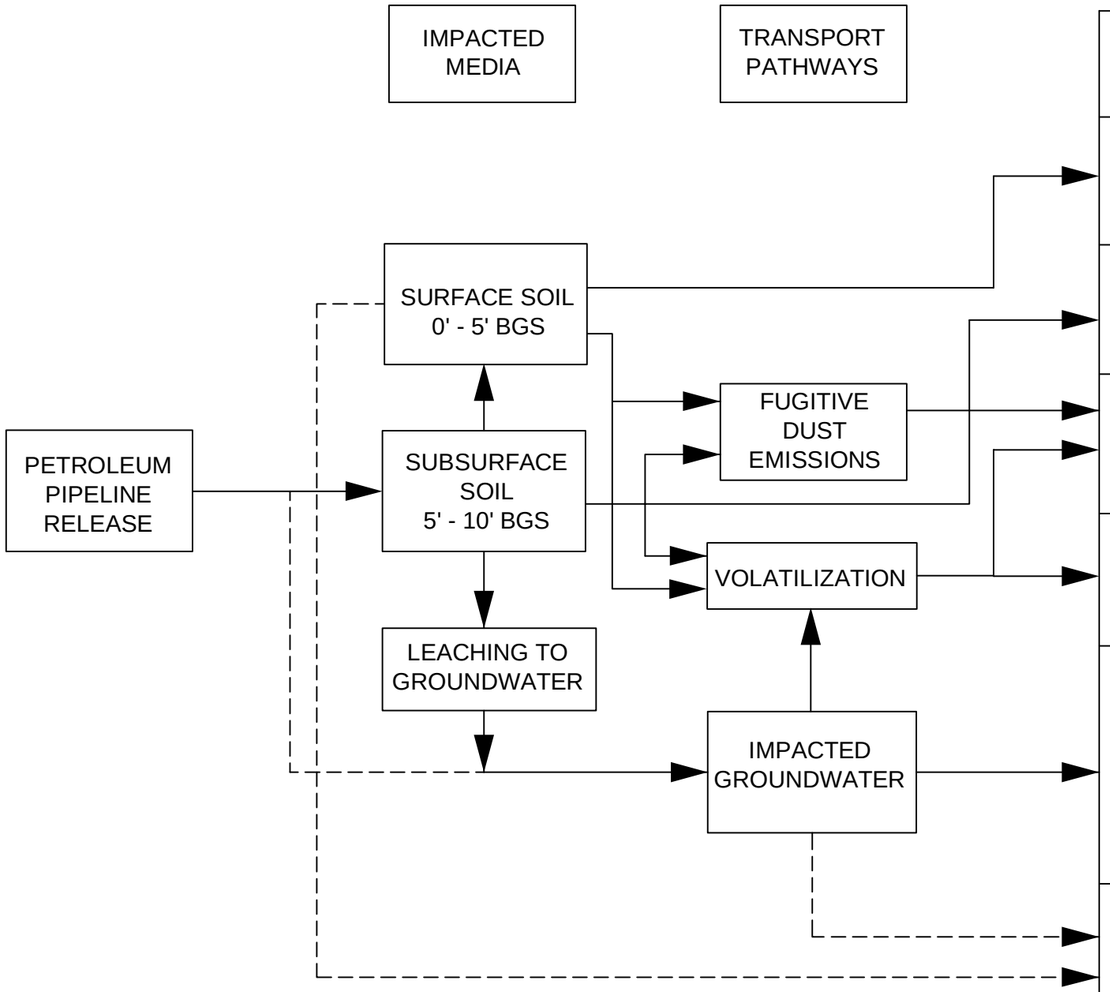
Feet

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California
Project No.:60315106.5536 Date:10/23/2014

IRM ORC Injection and Groundwater Treatment System Schematic

AECOM

Figure 16



EXPOSURE MEDIA	EXPOSURE ROUTE	RESIDENTIAL	POSSIBLE FUTURE COMMERCIAL	POSSIBLE FUTURE SURFACE CONSTRUCTION	POSSIBLE FUTURE TRENCH/ UTILITY CONSTRUCTION	ECOLOGICAL
SURFACE SOIL 0' - 5' BGS	INGESTION	P	X	P	P	P
	DERMAL CONTACT	P	P	P	P	P
SUBSURFACE SOIL 5' - 10' BGS	INGESTION	P[1]	X	P	P	P
	DERMAL CONTACT	P	X	P	P	P
OUTDOOR AIR	INHALATION	X	X	X	P	X
INDOOR AIR	INHALATION	P	P	X	X	X
GROUNDWATER	INGESTION OF DOMESTIC WATER	P	X	X	X	X
	INGESTION OF CROPS	P	X	X	X	P
	INHALATION FROM DOMESTIC WATER	P	X	X	X	X
	DERMAL CONTACT WITH DOMESTIC WATER	P	X	X	X	X
SURFACE WATER	INGESTION	P	X	X	X	P
	DERMAL CONTACT	P	X	X	X	P
	ECOTOXICITY					P

→ Confirmed complete transport pathway

⇢ Presently incomplete transport pathway

P Exposure pathway is potentially complete for this receptor

P[1] Exposure pathway is potentially complete for this receptor and will be evaluated, but is considered highly unlikely

X Exposure pathway is incomplete for this receptor

Soil exposure for future commercial receptors is limited to surface soil.
Dust emissions exposure is limited to naphthalene (i.e., volatile COCs do not apply).
Characterization indicates that MTBE is not a chemical of concern

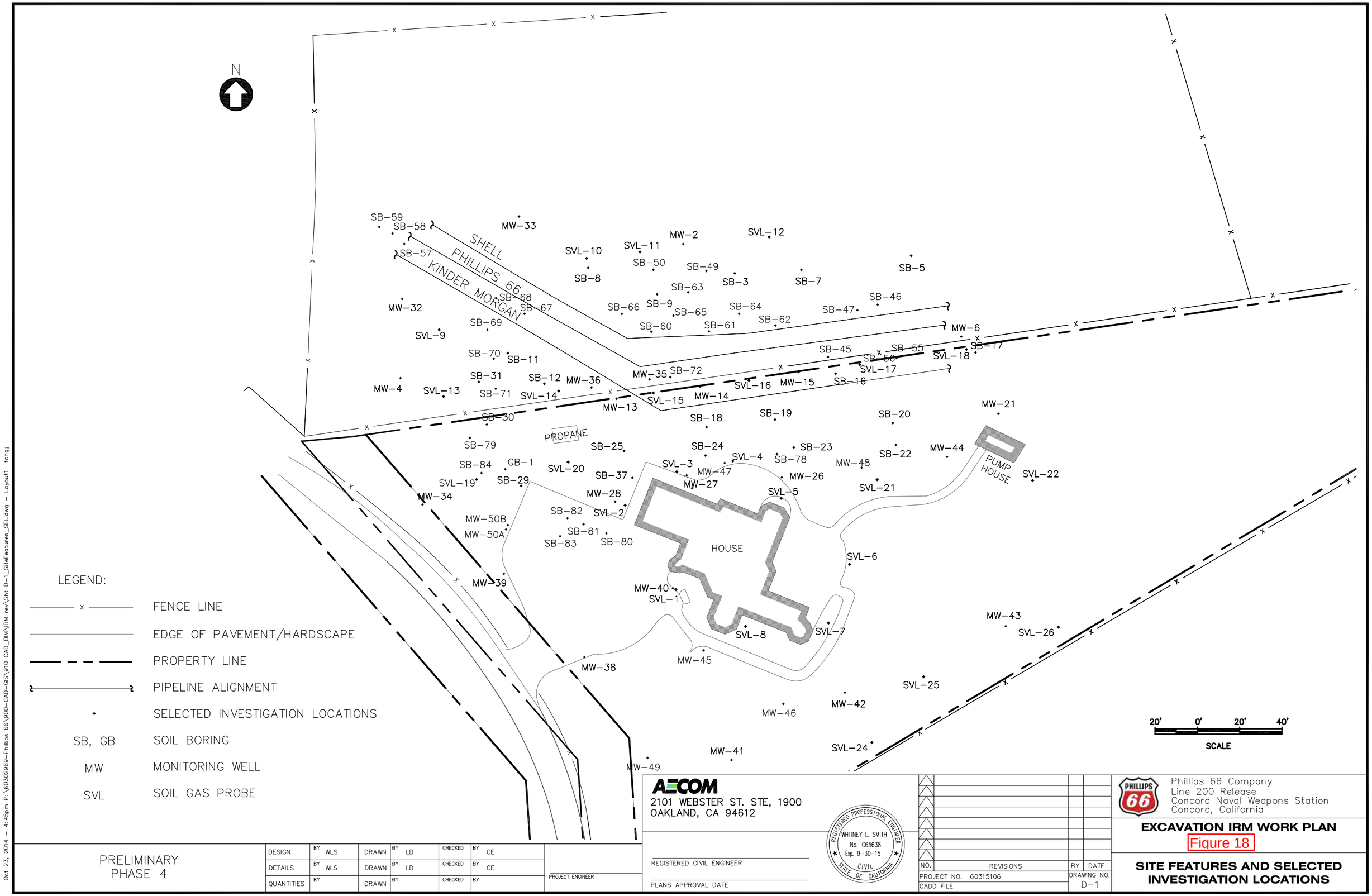
P:\ENVPHILLIPS 6816.0 Projects\5536 Line 200 Program\5536_Concord NWS Line 200 Release\60214028 5536 Concord Line 200 ERI\7.0 Deliv\Final CSM 10-22-2014.dwg Oct 22, 2014 - 9:31am Brownm6

Revised Excavation Interim Remedial Measure Work Plan
Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
CONCORD, CALIFORNIA
Project No.: 60315106.5536 Date: 10/22/2014

Conceptual Site Model Figure

AECOM

Figure 17



LEGEND:

x	FENCE LINE
	EDGE OF PAVEMENT/HARDSCAPE
	PROPERTY LINE
	PIPELINE ALIGNMENT
•	SELECTED INVESTIGATION LOCATIONS
SB, GB	SOIL BORING
MW	MONITORING WELL
SVL	SOIL GAS PROBE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE	
QUANTITIES	BY	DRAWN	BY	CHECKED	BY	

PROJECT ENGINEER

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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OAKLAND, CA 94612

REGISTERED PROFESSIONAL ENGINEER
WHITNEY L. SMITH
No. C65638
Exp. 9-30-15
CIVIL
STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

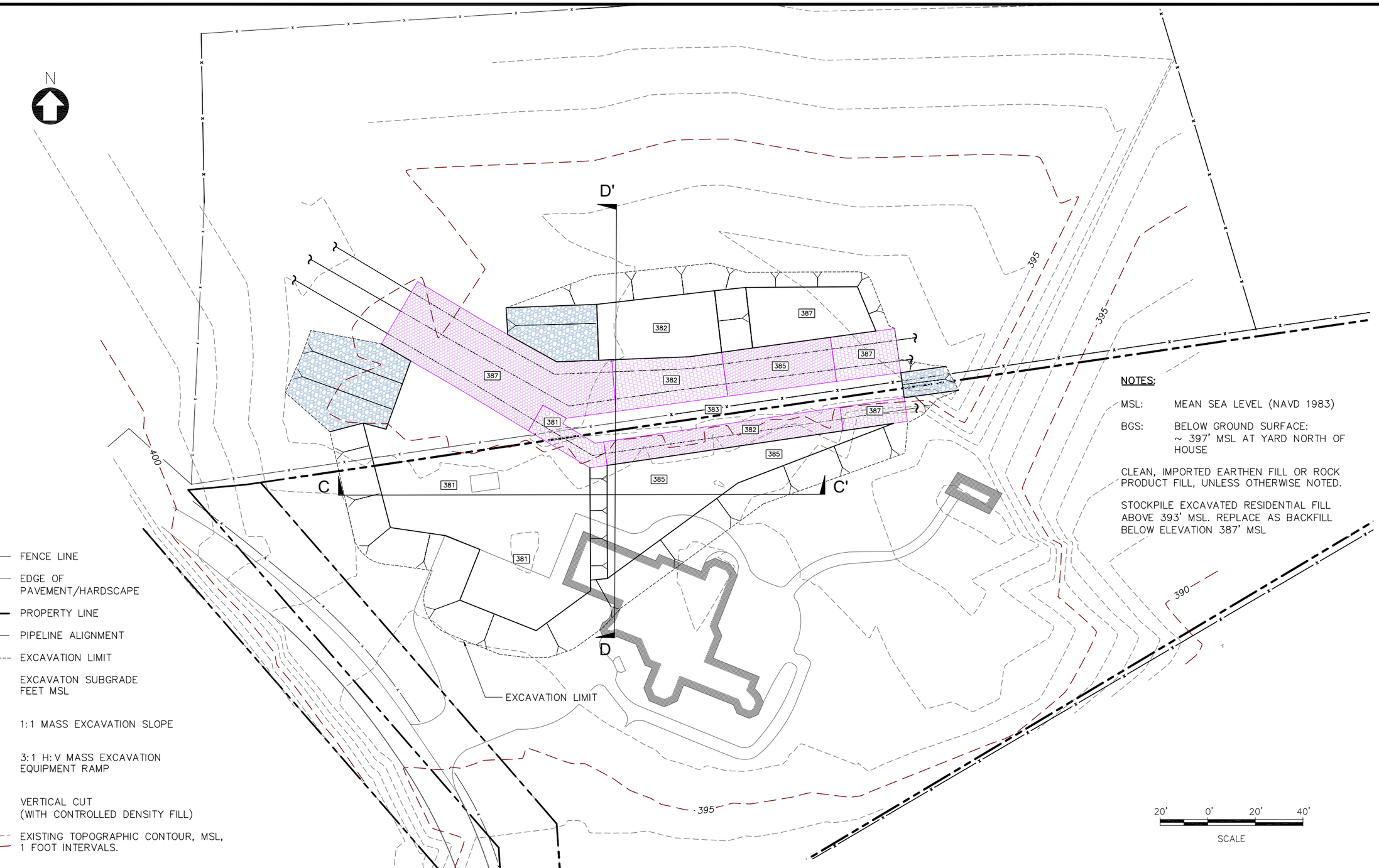
PROJECT NO. 60315106
CADD FILE
DRAWING NO. D-1

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 18

SITE FEATURES AND SELECTED INVESTIGATION LOCATIONS

Oct 23, 2014 - 4:45pm P:\60302969-Phillips 66\900-CAD-GIS\910 CAD_BIM\RM rev\Sht D-1_SiteFeatures_SEL.dwg - Layout1 tangj



LEGEND:

- FENCE LINE
- EDGE OF PAVEMENT/HARDSCAPE
- PROPERTY LINE
- PIPELINE ALIGNMENT
- EXCAVATION LIMIT
- 381 — EXCAVATON SUBGRADE FEET MSL
- 1:1 MASS EXCAVATION SLOPE
- 3:1 H:V MASS EXCAVATION EQUIPMENT RAMP
- VERTICAL CUT (WITH CONTROLLED DENSITY FILL)
- 395 — EXISTING TOPOGRAPHIC CONTOUR, MSL, 1 FOOT INTERVALS.
- CROSS SECTION ALIGNMENT

NOTES:

MSL: MEAN SEA LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE: ~ 397' MSL AT YARD NORTH OF HOUSE

CLEAN, IMPORTED EARTHEN FILL OR ROCK PRODUCT FILL, UNLESS OTHERWISE NOTED.

STOCKPILE EXCAVATED RESIDENTIAL FILL ABOVE 393' MSL. REPLACE AS BACKFILL BELOW ELEVATION 387' MSL

20' 0' 20' 40'

SCALE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	PROJECT ENGINEER	
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

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PROJECT NO. 60315106
CADD FILE
DRAWING NO. D-2

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 19

SITE TOPOGRAPHY EXCAVATION LIMITS & SECTIONS

May 28, 2015 – 11:56am P:\60302969-Phillips 66\900-CAD-GIS\910 CAD_BIM\RM rev\Sht D-2 Site Topo – 20150528.dwg – Sht D-2 diluntorum1

N

NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE:
~ 397' MSL AT YARD NORTH OF HOUSE

LEGEND:

- FENCE LINE
- EDGE OF PAVEMENT/HARDSCAPE
- PROPERTY LINE
- PIPELINE ALIGNMENT
- INVESTIGATION LOCATION
- BENZENE CLEANUP GOAL: ⩾ 0.6 MG/KG. APPLIES TO 0 TO 10 FEET BGS ONLY.
- BENZENE SOIL ISOCONCENTRATION CONTOURS, MG/KG
- TPH–TOTAL CLEANUP GOAL: ⩾ 2000 MG/KG
- TPH–TOTAL SOIL ISOCONCENTRATION, MG/KG
- EXCAVATION LIMIT
- SHORING

EXCAVATION LIMIT

20' 0' 20' 40'

SCALE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	PROJECT ENGINEER	
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

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NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
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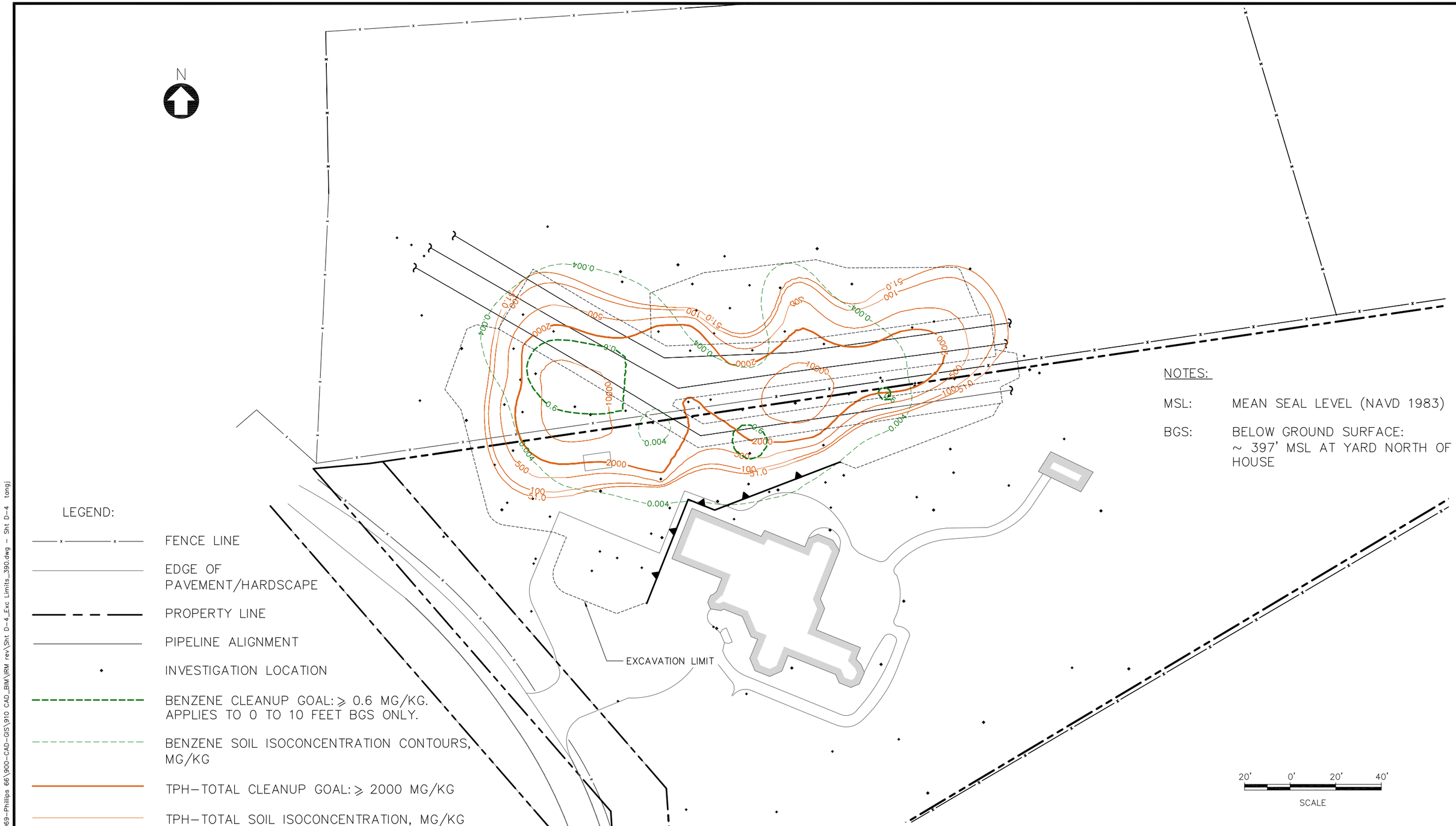
DRAWING NO. D–3

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 20

EXCAVATION LIMITS AT 392' MSL (~5' BGS)

Oct 23, 2014 – 5:40pm P:\60302969–Phillips 66\900–CAD–GIS\910 CAD_BIM\RM rev\Sht D–3 Exc Limits_392.dwg – Sht D–3 tangj



NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE: ~ 397' MSL AT YARD NORTH OF HOUSE

LEGEND:

- FENCE LINE
- EDGE OF PAVEMENT/HARDSCAPE
- PROPERTY LINE
- PIPELINE ALIGNMENT
- INVESTIGATION LOCATION
- BENZENE CLEANUP GOAL: ⩾ 0.6 MG/KG. APPLIES TO 0 TO 10 FEET BGS ONLY.
- BENZENE SOIL ISOCONCENTRATION CONTOURS, MG/KG
- TPH–TOTAL CLEANUP GOAL: ⩾ 2000 MG/KG
- TPH–TOTAL SOIL ISOCONCENTRATION, MG/KG
- EXCAVATION LIMIT
- SHORING

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	PROJECT ENGINEER
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE	
QUANTITIES	BY	DRAWN	BY	CHECKED	BY	

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STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
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Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN

Figure 21

EXCAVATION LIMITS AT 390' MSL (~7' BGS)

Oct 23, 2014 - 4:58pm P:\60302969-Phillips 66\900-CAD-GIS\910 CAD_BIM\RM rev\Sht D-4_Exc Limits_390.dwg - Sht D-4 tangj

NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE:
~ 397' MSL AT YARD NORTH OF HOUSE

LEGEND:

- FENCE LINE
- EDGE OF PAVEMENT/HARDSCAPE
- PROPERTY LINE
- PIPELINE ALIGNMENT
- INVESTIGATION LOCATION
- BENZENE CLEANUP GOAL: ⩾ 0.6 MG/KG. APPLIES TO 0 TO 10 FEET BGS ONLY.
- BENZENE SOIL ISOCONCENTRATION CONTOURS, MG/KG
- TPH–TOTAL CLEANUP GOAL: ⩾ 2000 MG/KG
- TPH–TOTAL SOIL ISOCONCENTRATION, MG/KG
- EXCAVATION LIMIT
- SHORING

20' 0' 20' 40'

SCALE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	PROJECT ENGINEER	
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

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Exp. 9-30-15
CIVIL
STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
CADD FILE
DRAWING NO. D–5

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN

Figure 22

EXCAVATION LIMITS AT 387' MSL (~ 10' BGS)

Oct 23, 2014 – 5:03pm P:\60302969–Phillips 66\900–CAD–GIS\910 CAD_BIM\RM rev\Sht D–5 Exc Limits_387.dwg – Sht D–5 tangj

N

NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE:
~ 397' MSL AT YARD NORTH OF HOUSE

LEGEND:

- FENCE LINE
- EDGE OF PAVEMENT/HARDSCAPE
- PROPERTY LINE
- PIPELINE ALIGNMENT
- INVESTIGATION LOCATION
- BENZENE CLEANUP GOAL: ⩾ 0.6 MG/KG. APPIES TO 0 TO 10 FEET BGS ONLY.
- BENZENE SOIL ISOCONCENTRATION CONTOURS, MG/KG
- TPH–TOTAL CLEANUP GOAL: ⩾ 2000 MG/KG
- TPH–TOTAL SOIL ISOCONCENTRATION, MG/KG
- EXCAVATION LIMIT
- SHORING

EXCAVATION LIMIT

20' 0' 20' 40'
SCALE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	PROJECT ENGINEER	
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

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Exp. 9-30-15
CIVIL
STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
CADD FILE
DRAWING NO. D–6

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 23

EXCAVATION LIMITS AT 384' MSL (~13' BGS)

Oct 23, 2014 – 5:08pm P:\60302969–Phillips 66\300–CAD–GIS\910 CAD_BIM\RM rev\Sht D–6 Exc Limits_384.dwg – Sht D–6 tangj

N

NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE:
~ 397' MSL AT YARD NORTH OF HOUSE

LEGEND:

- FENCE LINE
- EDGE OF PAVEMENT/HARDSCAPE
- PROPERTY LINE
- PIPELINE ALIGNMENT
- INVESTIGATION LOCATION
- BENZENE CLEANUP GOAL: ⩾ 0.6 MG/KG. APPLIES TO 0 TO 10 FEET BGS ONLY.
- BENZENE SOIL ISOCONCENTRATION CONTOURS, MG/KG
- TPH–TOTAL CLEANUP GOAL: ⩾ 2000 MG/KG
- TPH–TOTAL SOIL ISOCONCENTRATION, MG/KG
- EXCAVATION LIMIT
- SHORING

EXCAVATION LIMIT

20' 0' 20' 40'

SCALE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

PROJECT ENGINEER

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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No. C65638
Exp. 9-30-15
CIVIL
STATE OF CALIFORNIA

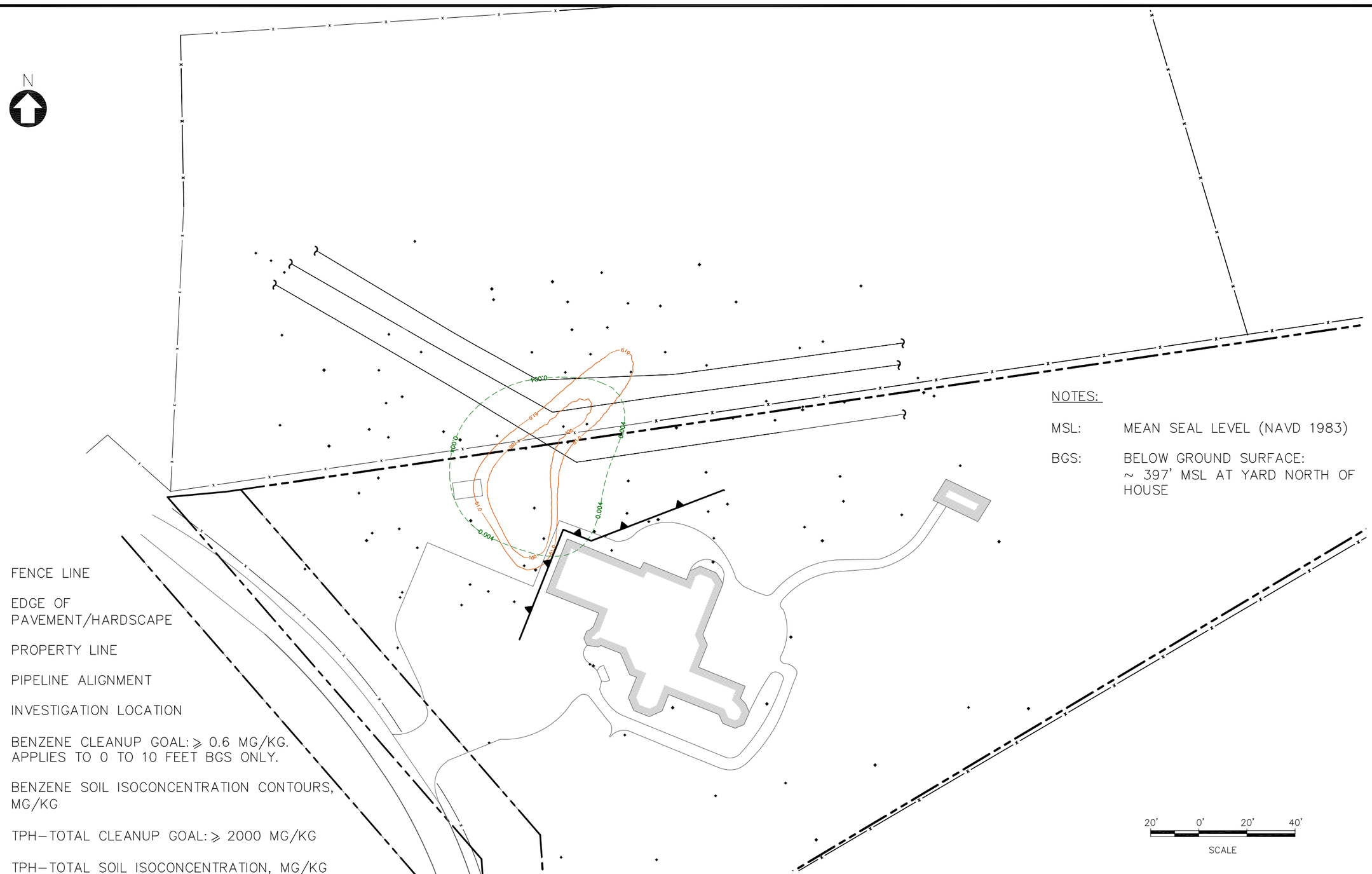
NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
CADD FILE
DRAWING NO. D–7

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 24

EXCAVATION LIMITS AT 381' MSL (~16' BGS)



NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE: ~ 397' MSL AT YARD NORTH OF HOUSE

20' 0' 20' 40'

SCALE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	PROJECT ENGINEER	
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

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PLANS APPROVAL DATE

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Exp. 9-30-15
CIVIL
STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
CADD FILE
DRAWING NO. D–8

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 25

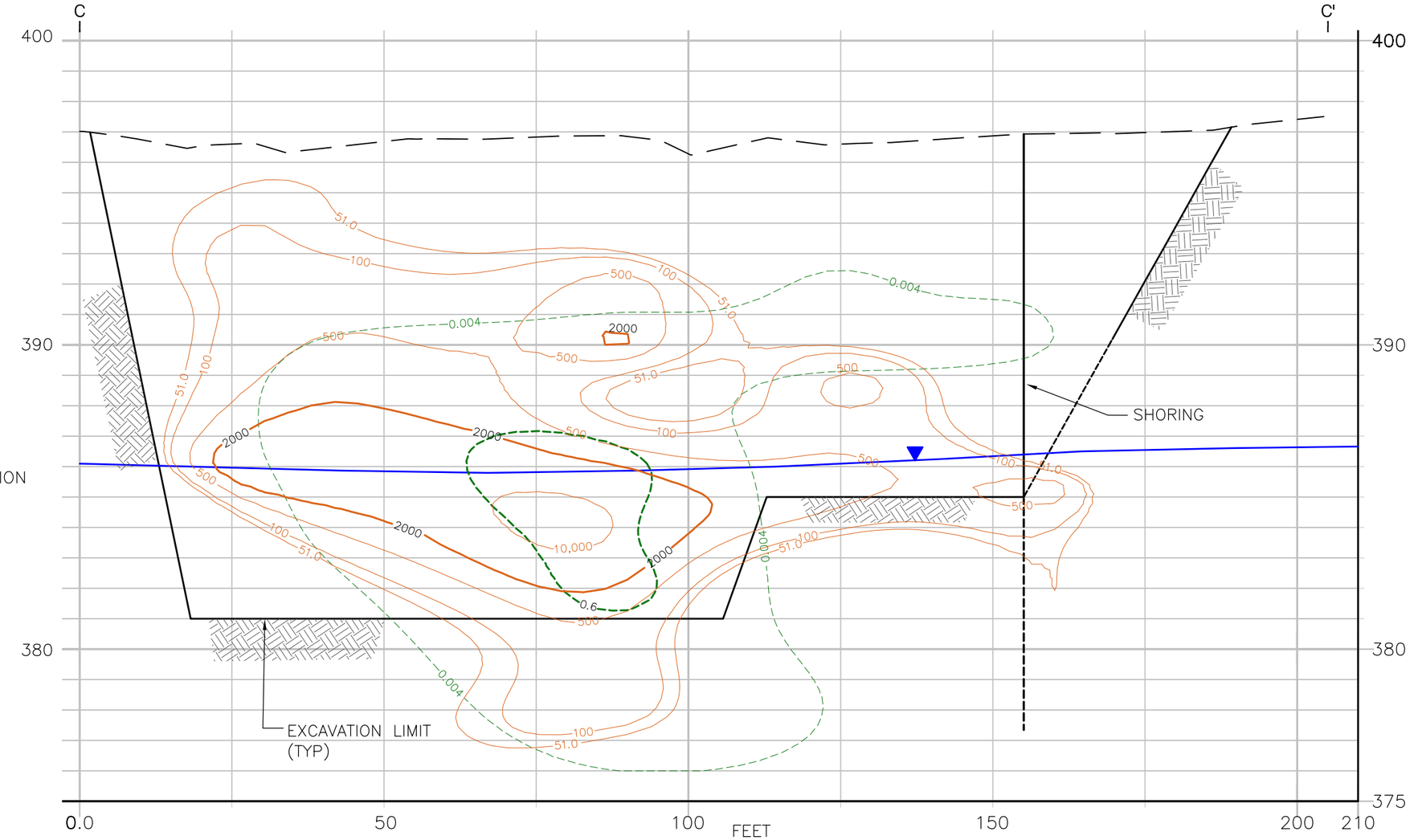
EXCAVATION LIMITS AT 380' MSL (~17' BGS)

Oct 23, 2014 – 5:16pm P:\60302969–Phillips 66\900–CAD–GIS\910 CAD_BIM\RM rev\Sht D–8 Exc Limits_380.dwg – Sht D–8 tongj

NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE:
~ 397' MSL AT YARD NORTH OF HOUSE



SECTION C - C'

LEGEND:

- GROUND SURFACE (Exist)
- BENZENE CLEANUP GOAL: ⩾ 0.6 MG/KG. APPLIES TO 0 TO 10 FEET BGS ONLY.
- BENZENE SOIL ISOCONCENTRATION CONTOURS, MG/KG
- TPH–TOTAL CLEANUP GOAL: ⩾ 2000 MG/KG
- TPH–TOTAL SOIL ISOCONCENTRATION, MG/KG
- GROUND WATER SURFACE (SEPT 2013)

2' 0' 2' 4' VERT. SCALE

10' 0' 10' 20' HORIZ. SCALE

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OAKLAND, CA 94612

REGISTERED PROFESSIONAL ENGINEER
WHITNEY L. SMITH
No. C65638
Exp. 9-30-15
CIVIL
STATE OF CALIFORNIA

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE	PROJECT ENGINEER	
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
CADD FILE
DRAWING NO. D–9

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 26

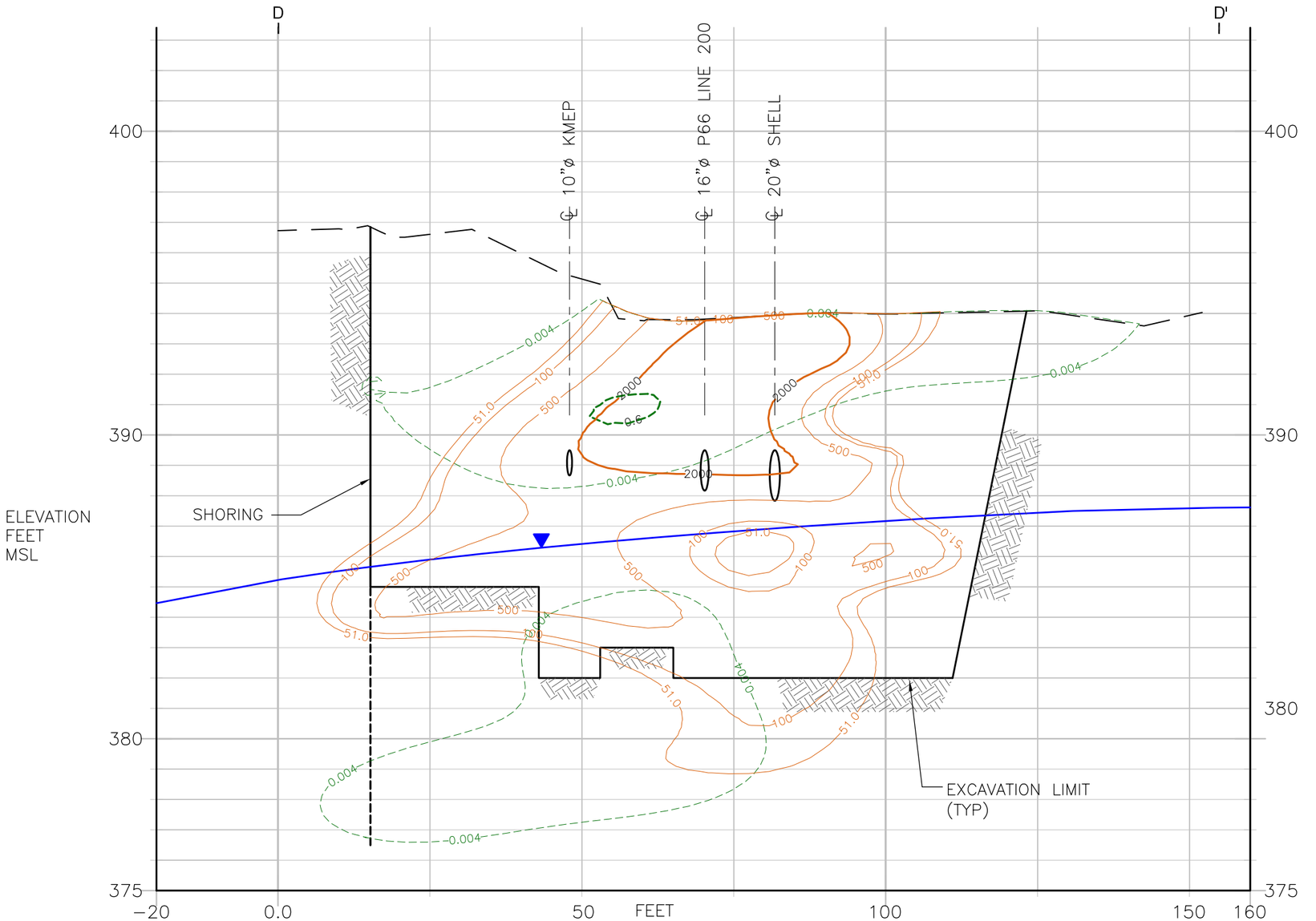
CROSS-SECTION C - C' WITH EXCAVATION LIMITS

Oct 23, 2014 – 5:43pm P:\60302969-Phillips 66\900-CAD-GIS\910 CAD_BIM\RM rev\Sht D-9_CROSS SECTION C-C'.dwg – Sht D-9 (tang)

NOTES:

MSL: MEAN SEAL LEVEL (NAVD 1983)

BGS: BELOW GROUND SURFACE:
~ 397' MSL AT YARD NORTH OF HOUSE



SECTION D - D'

LEGEND:

- GROUND SURFACE (Exist)
- BENZENE CLEANUP GOAL: ⩾ 0.6 MG/KG. APPLIES TO 0 TO 10 FEET BGS ONLY.
- BENZENE SOIL ISOCONCENTRATION CONTOURS, MG/KG
- TPH–TOTAL CLEANUP GOAL: ⩾ 2000 MG/KG
- TPH–TOTAL SOIL ISOCONCENTRATION, MG/KG
- GROUND WATER SURFACE (SEPT 2013)
- PETROLEUM TRANSMISSION PIPELINE (10 TO 20"ø), VERTICAL CONTROL ±1'.

2' 0' 2' 4' VERT. SCALE

10' 0' 10' 20' HORIZ. SCALE

PRELIMINARY
PHASE 4

DESIGN	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
DETAILS	BY WLS	DRAWN	BY LD	CHECKED	BY CE		
QUANTITIES	BY	DRAWN	BY	CHECKED	BY		

PROJECT ENGINEER

REGISTERED CIVIL ENGINEER

PLANS APPROVAL DATE

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CIVIL
STATE OF CALIFORNIA

NO.	REVISIONS	BY	DATE

PROJECT NO. 60315106
CADD FILE
DRAWING NO. D–10

Phillips 66 Company
Line 200 Release
Concord Naval Weapons Station
Concord, California

EXCAVATION IRM WORK PLAN
Figure 27

**CROSS-SECTION D - D'
WITH EXCAVATION LIMITS**

Oct 23, 2014 - 5:44pm P:\60302969-Phillips 66\900-CAD-GIS\910 CAD_BIM\RM rev\Sht 0-10_CROSS SECTION D-D'.dwg - Sht 0-10 tangj

Appendix T–1

Traffic Counts and Level of Service Calculations

Daily Traffic Volume Count

PHA Transportation Consultants
510-848-9233

Description 1: Concord
Description 2: Bailey Road North of Myrtle Dr (North of Railroad)
Description 3: 15-05-426

Site: 1
Date: 4/14/2015
Tuesday

24 Hour Volume

Begin	NB		SB		Combined		Begin	NB		SB		Combined	
10:00 AM	21	93	49	177	70	270	10:00 PM	32	94	14	59	46	153
10:15 AM	25		48		73		10:15 PM	28		21		49	
10:30 AM	27		37		64		10:30 PM	21		9		30	
10:45 AM	20		43		63		10:45 PM	13		15		28	
11:00 AM	32	133	38	170	70	303	11:00 PM	14	39	7	27	21	66
11:15 AM	31		50		81		11:15 PM	9		8		17	
11:30 AM	34		35		69		11:30 PM	13		7		20	
11:45 AM	36		47		83		11:45 PM	3		5		8	
12:00 PM	36	177	34	153	70	330	4/15/2015 12:00 AM	11	29	1	10	12	39
12:15 PM	41		45		86		12:15 AM	6		5		11	
12:30 PM	53		33		86		12:30 AM	7		1		8	
12:45 PM	47		41		88		12:45 AM	5		3		8	
1:00 PM	34	176	37	178	71	354	1:00 AM	6	11	2	8	8	19
1:15 PM	47		40		87		1:15 AM	3		2		5	
1:30 PM	53		41		94		1:30 AM	1		4		5	
1:45 PM	42		60		102		1:45 AM	1		0		1	
2:00 PM	51	208	50	253	101	461	2:00 AM	3	10	1	8	4	18
2:15 PM	54		63		117		2:15 AM	3		1		4	
2:30 PM	46		66		112		2:30 AM	2		0		2	
2:45 PM	57		74		131		2:45 AM	2		6		8	
3:00 PM	102	397	72	243	174	640	3:00 AM	5	9	0	16	5	25
3:15 PM	106		63		169		3:15 AM	2		3		5	
3:30 PM	93		57		150		3:30 AM	2		4		6	
3:45 PM	96		51		147		3:45 AM	0		9		9	
4:00 PM	80	385	53	229	133	614	4:00 AM	3	10	1	17	4	27
4:15 PM	113		65		178		4:15 AM	2		2		4	
4:30 PM	93		49		142		4:30 AM	3		3		6	
4:45 PM	99		62		161		4:45 AM	2		11		13	
5:00 PM	114	426	34	188	148	614	5:00 AM	2	22	12	78	14	100
5:15 PM	109		52		161		5:15 AM	3		18		21	
5:30 PM	101		45		146		5:30 AM	10		17		27	
5:45 PM	102		57		159		5:45 AM	7		31		38	
6:00 PM	108	411	42	179	150	590	6:00 AM	13	67	37	423	50	490
6:15 PM	109		44		153		6:15 AM	12		96		108	
6:30 PM	107		50		157		6:30 AM	18		109		127	
6:45 PM	87		43		130		6:45 AM	24		181		205	
7:00 PM	88	273	20	118	108	391	7:00 AM	59	261	118	754	177	1015
7:15 PM	58		34		92		7:15 AM	56		195		251	
7:30 PM	67		26		93		7:30 AM	61		266		327	
7:45 PM	60		38		98		7:45 AM	85		175		260	
8:00 PM	40	147	37	99	77	246	8:00 AM	72	251	158	426	230	677
8:15 PM	31		19		50		8:15 AM	82		85		167	
8:30 PM	40		23		63		8:30 AM	53		91		144	
8:45 PM	36		20		56		8:45 AM	44		92		136	
9:00 PM	40	128	15	73	55	201	9:00 AM	37	134	61	201	98	335
9:15 PM	26		17		43		9:15 AM	38		48		86	
9:30 PM	34		27		61		9:30 AM	29		48		77	
9:45 PM	28		14		42		9:45 AM	30		44		74	

		NB	SB	Combined
	24 Hour Volume	3891 (48.8%)	4087 (51.2%)	7978

	12:00 AM - 12:00 PM			12:00 PM - 12:00 AM		
	NB	SB	Combined	NB	SB	Combined
Count	1030	2288	3318	2861	1799	4660
	31.0 %	69.0 %		61.4 %	38.6 %	
Peak Hour	7:30 AM	7:15 AM	7:15 AM	5:00 PM	2:15 PM	3:00 PM
Volume	300	794	1068	426	275	640
Factor	0.88	0.75	0.82	0.93	0.93	0.92

PHA Transportation Consultants
510-848-9233

Description 1: Concord
Description 2: Bailey Road North of Myrtle Dr (North of Railroad)
Description 3: 15-05-426

Site: 1
Date: 4/15/2015
Wednesday

24 Hour Volume

Begin	NB		SB		Combined	
10:00 AM	35	121	44	157	79	278
10:15 AM	34		29		63	
10:30 AM	23		46		69	
10:45 AM	29		38		67	
11:00 AM	40	122	37	146	77	268
11:15 AM	21		34		55	
11:30 AM	36		29		65	
11:45 AM	25		46		71	
12:00 PM	42	176	30	180	72	356
12:15 PM	33		40		73	
12:30 PM	42		49		91	
12:45 PM	59		61		120	
1:00 PM	56	222	37	210	93	432
1:15 PM	53		59		112	
1:30 PM	57		53		110	
1:45 PM	56		61		117	
2:00 PM	66	302	71	222	137	524
2:15 PM	70		51		121	
2:30 PM	77		56		133	
2:45 PM	89		44		133	
3:00 PM	86	337	66	227	152	564
3:15 PM	74		52		126	
3:30 PM	90		49		139	
3:45 PM	87		60		147	
4:00 PM	84	390	46	153	130	543
4:15 PM	95		32		127	
4:30 PM	89		41		130	
4:45 PM	122		34		156	
5:00 PM	92	404	62	215	154	619
5:15 PM	105		60		165	
5:30 PM	106		42		148	
5:45 PM	101		51		152	
6:00 PM	96	366	44	174	140	540
6:15 PM	101		48		149	
6:30 PM	86		46		132	
6:45 PM	83		36		119	
7:00 PM	70	246	40	134	110	380
7:15 PM	69		32		101	
7:30 PM	71		33		104	
7:45 PM	36		29		65	
8:00 PM	51	184	23	95	74	279
8:15 PM	57		24		81	
8:30 PM	34		28		62	
8:45 PM	42		20		62	
9:00 PM	35	128	21	81	56	209
9:15 PM	39		14		53	
9:30 PM	32		28		60	
9:45 PM	22		18		40	

Begin	NB		SB		Combined	
10:00 PM	30	102	18	57	48	159
10:15 PM	32		14		46	
10:30 PM	19		16		35	
10:45 PM	21		9		30	
11:00 PM	15	57	8	33	23	90
11:15 PM	13		9		22	
11:30 PM	18		6		24	
11:45 PM	11		10		21	
4/16/2015 12:00 AM	8	29	5	14	13	43
12:15 AM	6		4		10	
12:30 AM	9		2		11	
12:45 AM	6		3		9	
1:00 AM	2	16	0	8	2	24
1:15 AM	7		2		9	
1:30 AM	4		5		9	
1:45 AM	3		1		4	
2:00 AM	0	8	2	9	2	17
2:15 AM	2		2		4	
2:30 AM	3		2		5	
2:45 AM	3		3		6	
3:00 AM	2	8	2	12	4	20
3:15 AM	2		3		5	
3:30 AM	1		5		6	
3:45 AM	3		2		5	
4:00 AM	2	17	5	28	7	45
4:15 AM	5		5		10	
4:30 AM	5		3		8	
4:45 AM	5		15		20	
5:00 AM	2	22	7	64	9	86
5:15 AM	4		14		18	
5:30 AM	10		24		34	
5:45 AM	6		19		25	
6:00 AM	12	58	39	431	51	489
6:15 AM	9		87		96	
6:30 AM	11		126		137	
6:45 AM	26		179		205	
7:00 AM	43	206	209	872	252	1078
7:15 AM	40		209		249	
7:30 AM	43		258		301	
7:45 AM	80		196		276	
8:00 AM	72	256	156	414	228	670
8:15 AM	90		102		192	
8:30 AM	52		80		132	
8:45 AM	42		76		118	
9:00 AM	31	134	59	200	90	334
9:15 AM	35		45		80	
9:30 AM	33		50		83	
9:45 AM	35		46		81	

		NB	SB	Combined
	24 Hour Volume	3911 (48.6%)	4136 (51.4%)	8047

	12:00 AM - 12:00 PM			12:00 PM - 12:00 AM		
	NB	SB	Combined	NB	SB	Combined
Count	997	2355	3352	2914	1781	4695
	29.7 %	70.3 %		62.1 %	37.9 %	
Peak Hour	7:45 AM	7:00 AM	7:00 AM	4:45 PM	1:15 PM	4:45 PM
Volume	294	872	1078	425	244	623
Factor	0.82	0.84	0.90	0.87	0.86	0.94

Vehicle Classification Count

PHA Transportation Consultants
510-848-9233

Description 1: Concord
Description 2: Bailey Road North of Myrtle Dr
Description 3: 15-05-426

Site: 1
Date: 4/14/2015
Tuesday

24 Hour Vehicle Classification
Combined Channels

Time	Total	Bike	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi
10:00 AM	270	0	85	152	5	28	0	0	0	0	0	0	0	0
11:00 AM	303	1	113	153	3	27	0	0	6	0	0	0	0	0
12:00 PM	330	0	161	140	2	23	0	0	4	0	0	0	0	0
1:00 PM	354	2	139	167	1	42	0	0	3	0	0	0	0	0
2:00 PM	461	1	160	227	11	52	2	0	7	0	0	1	0	0
3:00 PM	640	2	307	233	21	65	0	0	10	0	0	2	0	0
4:00 PM	614	5	308	223	19	52	0	0	6	0	0	1	0	0
5:00 PM	614	2	334	193	14	51	0	0	15	0	0	4	0	1
6:00 PM	590	4	356	168	15	38	0	0	4	0	0	5	0	0
7:00 PM	391	1	229	126	4	26	0	0	5	0	0	0	0	0
8:00 PM	246	3	125	96	2	18	0	0	2	0	0	0	0	0
9:00 PM	201	3	113	73	0	10	0	0	2	0	0	0	0	0
10:00 PM	153	1	83	60	1	8	0	0	0	0	0	0	0	0
11:00 PM	66	0	37	25	0	4	0	0	0	0	0	0	0	0
4/15/2015														
12:00 AM	39	0	25	12	0	2	0	0	0	0	0	0	0	0
1:00 AM	19	0	10	8	0	1	0	0	0	0	0	0	0	0
2:00 AM	18	0	10	6	0	2	0	0	0	0	0	0	0	0
3:00 AM	25	0	8	16	0	1	0	0	0	0	0	0	0	0
4:00 AM	27	0	8	15	0	3	0	0	1	0	0	0	0	0
5:00 AM	100	0	20	50	0	29	0	0	1	0	0	0	0	0
6:00 AM	490	2	66	315	6	92	0	0	4	0	0	4	0	1
7:00 AM	1015	2	201	607	28	123	0	0	31	2	0	14	1	6
8:00 AM	677	3	213	352	13	69	0	0	19	0	0	4	0	4
9:00 AM	335	0	106	184	5	36	0	0	3	0	0	1	0	0
Total	7978	32	3217	3601	150	802	2	0	123	2	0	36	1	12
%		0.4	40.3	45.1	1.9	10.1	0.0	0.0	1.5	0.0	0.0	0.5	0.0	0.2

PHA Transportation Consultants
510-848-9233

Description 1: Concord
Description 2: Bailey Road North of Myrtle Dr
Description 3: 15-05-426

Site: 1
Date: 4/15/2015
Wednesday

24 Hour Vehicle Classification
Combined Channels

Time	Total	Bike	Cars & Trailer	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi
10:00 AM	278	1	94	139	4	34	0	0	5	0	0	1	0	0
11:00 AM	268	1	103	125	4	27	0	0	6	0	0	2	0	0
12:00 PM	356	0	145	161	3	41	0	0	6	0	0	0	0	0
1:00 PM	432	3	171	199	7	47	1	0	4	0	0	0	0	0
2:00 PM	524	1	238	219	16	38	0	0	8	0	0	3	1	0
3:00 PM	564	4	270	217	7	60	0	0	6	0	0	0	0	0
4:00 PM	543	0	306	168	8	50	0	0	9	0	0	2	0	0
5:00 PM	619	3	323	208	12	52	0	0	14	0	0	6	0	1
6:00 PM	540	2	306	179	13	35	0	0	2	0	0	3	0	0
7:00 PM	380	2	207	135	7	24	0	0	3	0	0	2	0	0
8:00 PM	279	3	160	93	3	18	0	0	2	0	0	0	0	0
9:00 PM	209	0	116	72	4	16	0	0	1	0	0	0	0	0
10:00 PM	159	2	88	60	0	9	0	0	0	0	0	0	0	0
11:00 PM	90	1	51	33	0	5	0	0	0	0	0	0	0	0
4/16/2015														
12:00 AM	43	0	23	18	0	2	0	0	0	0	0	0	0	0
1:00 AM	24	0	17	5	0	2	0	0	0	0	0	0	0	0
2:00 AM	17	0	7	4	0	6	0	0	0	0	0	0	0	0
3:00 AM	20	0	6	12	0	1	0	0	0	1	0	0	0	0
4:00 AM	45	0	13	24	0	8	0	0	0	0	0	0	0	0
5:00 AM	86	0	17	53	0	16	0	0	0	0	0	0	0	0
6:00 AM	489	0	56	338	4	85	0	0	5	0	0	0	0	1
7:00 AM	1078	2	185	691	12	151	0	0	22	1	0	11	0	3
8:00 AM	670	3	199	357	18	72	0	0	14	0	0	5	0	2
9:00 AM	334	2	98	160	11	55	0	0	6	1	0	1	0	0
Total	8047	30	3199	3670	133	854	1	0	113	3	0	36	1	7
%		0.4	39.8	45.6	1.7	10.6	0.0	0.0	1.4	0.0	0.0	0.4	0.0	0.1

Vehicle Speed Count

PHA Transportation Consultants
510-848-9233

Description 1: Concord
Description 2: Bailey Road North of Myrtle Dr (North of Railroad)
Description 3: 15-05-426

Site: 1
Date: 4/14/2015
Tuesday

24 Hour Speed
Combined Channels

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
10:00 AM	270	8	2	1	1	4	15	41	43	71	37	29	11	7
11:00 AM	303	3	1	0	1	4	16	62	66	68	41	27	10	4
12:00 PM	330	4	0	0	1	2	27	56	88	77	40	23	10	2
1:00 PM	354	3	1	2	4	3	19	76	66	69	45	37	15	14
2:00 PM	461	27	2	0	1	6	24	74	95	89	64	56	20	3
3:00 PM	640	49	5	3	14	13	41	158	159	93	47	36	10	12
4:00 PM	614	31	2	1	1	2	17	148	152	88	56	66	32	18
5:00 PM	614	43	1	1	3	4	17	156	172	90	39	45	28	15
6:00 PM	590	30	4	1	1	3	15	122	188	112	53	35	14	12
7:00 PM	391	10	1	0	1	7	25	97	113	52	37	29	10	9
8:00 PM	246	5	2	1	0	2	15	55	62	50	28	19	7	0
9:00 PM	201	0	0	0	0	3	23	46	50	42	14	13	7	3
10:00 PM	153	1	0	1	0	2	19	29	42	36	11	8	3	1
11:00 PM	66	0	0	0	0	1	4	7	20	20	8	4	2	0
4/15/2015														
12:00 AM	39	0	0	0	1	0	3	10	12	7	1	4	1	0
1:00 AM	19	0	0	0	0	0	0	5	4	6	1	1	0	2
2:00 AM	18	0	0	0	0	0	2	2	6	2	1	4	0	1
3:00 AM	25	0	0	0	0	0	4	3	4	2	3	6	3	0
4:00 AM	27	0	0	0	0	0	1	6	8	4	4	1	2	1
5:00 AM	100	0	0	0	0	0	1	8	8	27	26	17	8	5
6:00 AM	490	20	1	3	2	2	7	27	56	84	124	111	45	8
7:00 AM	1015	82	14	8	20	21	21	85	198	290	176	87	12	1
8:00 AM	677	43	10	1	8	7	18	106	155	140	93	64	23	9
9:00 AM	335	12	1	5	0	4	10	53	65	79	56	33	11	6
Total	7978	371	47	28	59	90	344	1432	1832	1598	1005	755	284	133
%		4.7	0.6	0.4	0.7	1.1	4.3	17.9	23.0	20.0	12.6	9.5	3.6	1.7

Percentile Speeds	10 %	15 %	50 %	85 %	90 %
(mph)	38.7	41.5	49.2	59.3	61.8

10 mph Pace Speed	42.1 - 52.1	Average	48.7 mph
Number in Pace	3772 (47.3 %)	Minimum	5.0 mph
		Maximum	96.8 mph

Speeds Exceeded	45 mph	55 mph	65 mph
	70.3 %	27.3 %	5.2 %
Count	5607	2177	417

PHA Transportation Consultants
510-848-9233

Description 1: Concord
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Description 3: 15-05-426

Site: 1
Date: 4/15/2015
Wednesday

24 Hour Speed
Combined Channels

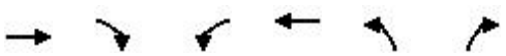
mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
10:00 AM	278	8	1	0	0	3	18	52	47	57	42	35	11	4
11:00 AM	268	14	3	3	1	0	10	52	52	52	50	19	5	7
12:00 PM	356	6	0	3	7	11	17	81	80	57	45	32	10	7
1:00 PM	432	7	2	1	3	2	22	72	109	76	50	57	21	10
2:00 PM	524	30	1	3	9	14	32	121	116	71	58	40	18	11
3:00 PM	564	22	3	1	7	3	18	117	150	90	65	52	27	9
4:00 PM	543	34	0	2	0	3	15	124	167	90	38	43	15	12
5:00 PM	619	38	3	0	2	0	23	105	192	105	57	51	36	7
6:00 PM	540	22	0	1	2	0	16	118	156	97	51	45	23	9
7:00 PM	380	12	2	0	0	2	27	91	86	74	43	20	16	7
8:00 PM	279	6	1	0	1	3	28	79	70	40	32	14	3	2
9:00 PM	209	9	0	0	1	2	23	45	46	33	25	14	7	4
10:00 PM	159	0	0	0	0	5	9	26	37	41	19	14	5	3
11:00 PM	90	0	0	0	0	0	2	14	30	23	10	7	2	2
4/16/2015														
12:00 AM	43	0	0	0	0	0	3	8	13	8	4	3	3	1
1:00 AM	24	0	0	0	0	1	1	6	5	3	8	0	0	0
2:00 AM	17	0	0	0	0	0	1	2	6	4	2	1	1	0
3:00 AM	20	0	0	0	0	2	4	4	2	3	0	3	0	2
4:00 AM	45	0	0	0	0	1	3	7	6	14	7	2	4	1
5:00 AM	86	0	0	0	0	0	3	4	15	21	23	14	5	1
6:00 AM	489	5	7	11	7	3	8	22	60	109	85	87	51	34
7:00 AM	1078	67	12	36	35	33	44	63	179	308	176	96	26	3
8:00 AM	670	43	7	2	2	6	17	107	152	137	80	70	31	16
9:00 AM	334	20	4	6	7	6	21	41	65	77	36	27	14	10
Total	8047	343	46	69	84	100	365	1361	1841	1590	1006	746	334	162
%		4.3	0.6	0.9	1.0	1.2	4.5	16.9	22.9	19.8	12.5	9.3	4.2	2.0

Percentile Speeds	10 %	15 %	50 %	85 %	90 %
(mph)	38.2	40.9	49.2	60.5	61.8

10 mph Pace Speed	42.1 - 52.1	Average	48.7 mph
Number in Pace	3708 (46.1 %)	Minimum	5.0 mph
		Maximum	90.8 mph

Speeds Exceeded	45 mph	55 mph	65 mph
	70.6 %	27.9 %	6.2 %
Count	5679	2248	496

Turning Movement Count
and
LOS Calculations



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	319	1	20	872	2	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	347	1	22	948	2	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			348		1338	347
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			97		98	93
cM capacity (veh/h)			821		103	521

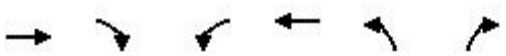
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	347	1	22	948	2	36
Volume Left	0	0	22	0	2	0
Volume Right	0	1	0	0	0	36
cSH	1700	1700	821	1700	103	521
Volume to Capacity	0.20	0.00	0.03	0.56	0.02	0.07
Queue Length (ft)	0	0	2	0	2	6
Control Delay (s)	0.0	0.0	9.5	0.0	40.6	12.4
Lane LOS			A		E	B
Approach Delay (s)	0.0		0.2		14.0	
Approach LOS					B	

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	62.7%	ICU Level of Service	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	320	0	0	874	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	348	0	0	950	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			348		1298	348
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			5.1		6.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		3.5	4.2
p0 queue free %			100		100	100
cM capacity (veh/h)			821		178	520

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	348	950	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	821	1700
Volume to Capacity	0.20	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.0		
Intersection Capacity Utilization	56.1%	ICU Level of Service	A



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	475	0	4	285	1	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	516	0	4	310	1	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			516		835	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			99		100	99
cM capacity (veh/h)			692		233	406

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	516	0	4	310	1	4
Volume Left	0	0	4	0	1	0
Volume Right	0	0	0	0	0	4
cSH	1700	1700	692	1700	233	406
Volume to Capacity	0.30	0.00	0.01	0.18	0.00	0.01
Queue Length (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	10.2	0.0	20.5	14.0
Lane LOS			B		C	B
Approach Delay (s)	0.0		0.1		15.3	
Approach LOS					C	

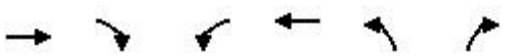
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	475	0	0	286	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	516	0	0	311	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			516		827	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			100		100	100
cM capacity (veh/h)			692		237	406

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	516	311	0
Volume Left	0	0	0
Volume Right	0	0	0
cSH	1700	692	1700
Volume to Capacity	0.30	0.00	0.00
Queue Length (ft)	0	0	0
Control Delay (s)	0.0	0.0	0.0
Lane LOS			A
Approach Delay (s)	0.0	0.0	0.0
Approach LOS			A

Intersection Summary			
Average Delay		0.0	
Intersection Capacity Utilization		30.5%	ICU Level of Service

A



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	319	1	20	895	2	33
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	347	1	22	973	2	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			348		1363	347
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			97		98	93
cM capacity (veh/h)			821		99	521

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	347	1	22	973	2	36
Volume Left	0	0	22	0	2	0
Volume Right	0	1	0	0	0	36
cSH	1700	1700	821	1700	99	521
Volume to Capacity	0.20	0.00	0.03	0.57	0.02	0.07
Queue Length (ft)	0	0	2	0	2	6
Control Delay (s)	0.0	0.0	9.5	0.0	42.1	12.4
Lane LOS			A		E	B
Approach Delay (s)	0.0		0.2		14.1	
Approach LOS					B	

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	64.0%	ICU Level of Service	B

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	320	23	23	875	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	348	25	25	951	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			373		1361	360
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	100
cM capacity (veh/h)			1186		160	684

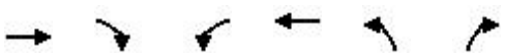
Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	373	976	0
Volume Left	0	25	0
Volume Right	25	0	0
cSH	1700	1186	1700
Volume to Capacity	0.22	0.02	0.00
Queue Length (ft)	0	2	0
Control Delay (s)	0.0	0.6	0.0
Lane LOS		A	A
Approach Delay (s)	0.0	0.6	0.0
Approach LOS			A

Intersection Summary			
Average Delay	0.4		
Intersection Capacity Utilization	81.9%	ICU Level of Service	D

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	498	0	4	285	1	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	541	0	4	310	1	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			541		860	541
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			99		100	99
cM capacity (veh/h)			675		224	392

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2
Volume Total	541	0	4	310	1	4
Volume Left	0	0	4	0	1	0
Volume Right	0	0	0	0	0	4
cSH	1700	1700	675	1700	224	392
Volume to Capacity	0.32	0.00	0.01	0.18	0.00	0.01
Queue Length (ft)	0	0	0	0	0	1
Control Delay (s)	0.0	0.0	10.4	0.0	21.1	14.3
Lane LOS			B		C	B
Approach Delay (s)	0.0		0.1		15.7	
Approach LOS					C	

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Volume (veh/h)	475	0	0	286	23	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	516	0	0	311	25	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type					None	
Median storage veh)						
vC, conflicting volume			516		827	516
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
tC, single (s)			5.1		7.4	7.2
tC, 2 stage (s)						
tF (s)			3.1		4.4	4.2
p0 queue free %			100		89	94
cM capacity (veh/h)			692		237	406

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	516	311	50
Volume Left	0	0	25
Volume Right	0	0	25
cSH	1700	692	300
Volume to Capacity	0.30	0.00	0.17
Queue Length (ft)	0	0	15
Control Delay (s)	0.0	0.0	19.4
Lane LOS			C
Approach Delay (s)	0.0	0.0	19.4
Approach LOS			C

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	37.2%	ICU Level of Service	A