CITY OF CONCORD
CLAYTON ROAD/ TREAT BOULEVARD/DENKINGER ROAD INTERSECTION CAPACITY IMPROVEMENTS
DRAFT INITIAL STUDY/ MITIGATED NEGATIVE DECLARATION

Submitted to:
City of Concord
Planning Division
1950 Parkside Drive
Concord, CA 94519

Prepared by:
Nichols Consulting Engineers
December 2012

Adopted by:

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1.0 Background

1. Project Title:	Clayton Road/ Treat Boulevard/ Denkinger Road Intersection Capacity Improvements Project
2. Lead Agency Name and Address:	City of Concord Planning Division 1950 Parkside Dr., MS/53 Concord, CA 94519
3. Contact Person & Phone Number:	G. Ryan Lenhardt, Senior Planner (925) 671-3162
4. Project Location:	The intersection of Clayton Road, Treat Boulevard and Denkinger Road in Concord, California
5. Project Sponsor's Name and Address:	City of Concord Engineering Services Department 1950 Parkside Dr Concord, CA 94519
6. General Plan Designations:	NC, Neighborhood Commercial and CMX, Commercial Mixed Use
7. Zoning:	NC, Neighborhood Commercial and CMX, Commercial Mixed Use
8. Description of Project:	Upgrade the traffic signal phasing at the intersection of Clayton Rd/ Treat Blvd/ Denkinger Rd and widen northbound Treat Blvd approach to include two exclusive left-turn lanes, two through lanes, and one right-turn lane.
9. Surrounding Land Uses and Setting:	Commercial.

10. Other Agencies Whose Approval Is Required:

2.0 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	Aesthetics		Agricultural and Forestry Resources		Air Quality
	Biological Resources		Cultural Resources		Geology/Soils
	Hazards and Hazardous Materials		Hydrology/ Water Quality		Land Use/ Planning
	Mineral Resources		Noise		Population/ Housing
	Public Services		Recreation		Transportation/ Traffic
	Utilities/Service Systems		Greenhouse Gas Emissions		Mandatory Findings of Significance

3.0 Determination

On the basis of this initial evaluation:

__ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

X I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

__ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

__ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

__ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

G. Ryan Lenhardt, Senior Planner Date

4.0 Project Summary

4.1 PROJECT LOCATION

Clayton Road/ Treat Boulevard/ Denkinger Road Intersection Capacity Improvement Project (Project) is located in the south-central portion of the City of Concord, CA. The intersection improvements will extend approximately 440 feet northeast on Treat Blvd, cross Clayton Road and extend approximately 150 feet northeast on Denkinger Road. Surrounding land uses include Neighborhood Commercial and Commercial Mixed Use. The project is located adjacent to the following Assessor's Parcel Numbers:

Property Owner	**Assessor's Parcel Number**
Bel Air Development Co C/O Zimmerman MNGT 1330 Broadway #1050 Oakland, CA 94612	133-150-122
Bel Air Development Co C/O Zimmerman MNGT 1330 Broadway #1050 Oakland, CA 94612	133-150-009
Dianda Family LLC C/O George Baldocchi 1615 Farm Bureau Rd Concord, CA 94519	115-561-002
Dianda Family LLC C/O George Baldocchi 1615 Farm Bureau Rd Concord, CA 94519	115-560-009
Dianda Family LLC C/O George Baldocchi 1615 Farm Bureau Rd Concord, CA 94519	115-560-010
Janet Davies Trust C/O Larry Dahl/ Oil Stop 403 S Adams St Arlington, VA 22204	132-160-004
Monroe J Wingate Trust C/O Gallagher & Miersch 1390 Willow Pass Rd #220 Concord, CA 94520	132-160-010

4.2 PROJECT BACKGROUND

On July 18, 2012, the City of Concord was awarded $432,600 from the Contra Costa Transportation Authority via the Major Streets: Traffic Flow, Safety and Capacity Improvements funding category of the Cooperative Agreement NO. 24C.01. The funds are specified for the Clayton Road/ Treat Boulevard/ Denkinger Road Intersection Capacity Improvement Project (Project). The Clayton Road/ Treat Boulevard corridor is designated in the Central Contra Costa Action Plan as a Route of Regional Significance, which carries heavy volumes of regional traffic on a daily basis, connecting to I-680. The intersection is located at a critical junction point along this vital regional route.

A traffic analysis report was conducted by Kimley-Horn and Associates (Appendix A) to determine the need of the improvement project and the level to which the proposed improvements would improve traffic conditions within the project area. The traffic analysis assigns a Level of Service (LOS) for an intersection or roadways peak flows based on the Transportation Research Board's *Highway Capacity Manual 2000.* Level of Service is a qualitative term that describes congestion at an intersection, on the basis of ratings from A to F. LOS A describes a completely uncongested operating condition where motorists encounter virtually no delay. LOS B and LOS C describe increasing levels of congestion compared to LOS A. LOS D is what one would observe on a typical busy urban intersection during peak periods of traffic. Some motorists may need to wait for more than one red signal cycle to get through an intersection. LOS E represents congested conditions, where a majority of motorists may need to wait for multiple red signal cycles to get through an intersection. LOS F describes severe congestion, where long queues and delays develop. The traffic analysis concluded that the Clayton Rd/Treat Blvd intersection currently operates at LOS D and E during peak hours in the morning and evening respectively. If left unimproved, the LOS will decrease to LOS F by 2030 (Kimley-Horn and Associates, 2011).

The proposed improvements will increase the capacity of this intersection to accommodate the heavy traffic flows on Clayton Road during peak commute periods. It will allow the opposing left-turn movements from Treat Blvd and from Denkinger Rd to be serviced simultaneously, hence enabling the City to shorten the signal cycle length at this intersection and improve the system-wide signal coordination along Clayton Rd during the peak periods. These improvements will increase the LOS of the intersection to LOS C for the morning peak flows and LOS D during the evening peak flows.

4.3 PROJECT DESCRIPTION

The intersection improvement project will require widening of the roadway on the southwest side of the intersection to accommodate an additional traffic lane in Treat Blvd. The additional traffic lane will allow for the northbound Treat Blvd intersection to have two (2) left-hand turn lanes, two (2) northbound thru-traffic lanes, and one (1) right-hand turn lane. In addition, minor widening north of the intersection on the east side to transition the northbound through lanes to the existing alignment. A Right-of-Way take of 7,551.0 square feet (sf), or 0.17 acres, is

proposed on APNs 133-150-122 and 133-150-009, which will result in the loss of 24 parking spaces on the CVS parking lot and the relocation of five (5) monitoring wells on the Gas Station parcel. A 10' wide sidewalk is proposed on Treat Blvd and pedestrian improvements are proposed at all crosswalks in the project area to comply with current American Disability Act (ADA) regulations. Curb and gutter will be installed along Treat Blvd. Utility vaults will be relocated to accommodate for the additional traffic lane, but all utilities will remain within the proposed Right-of-Way.

The following summarizes a number of adjustments required with the widening of Treat Blvd and the resulting intersection improvements:

- The gas station driveway on Clayton Road closest to Treat Blvd will need to be relocated and narrowed in size.

- Five (5) existing observation and monitoring wells at the gas station will need to be relocated.

- 24 parking spaces will need to be removed within the adjacent shopping center to accommodate the road widening (Appendix H of Traffic Impact Analysis).

- Various utilities will need to be relocated.

- Existing overhead poles will need to be relocated or undergrounded.

- Existing street lighting and street furniture will need to be relocated.

- Two street trees will be removed from Treat Boulevard and eight street trees will be removed from two (2) private parcels (APN 133-150-009-08 and APN 133-150-122-09). Four trees will be replanted in the proposed Treat Boulevard right of way upon completion of the improvements.

These improvements will require excavation, demolition, well drilling, paving, and construction. These activities will generate noise, dust, vehicle exhaust, and vibration. It is anticipated that the overall project will take 7 months to complete and will be constructed during 2013 and 2014.

Figure 1

Concord	Concord Treat Clayton Intersection Improvement Project Vicinity Map City of Concord			Nichols Consulting Engineers, Chtd.
	0 440 Feet	Data Sources: Cal Atlas, CC Co.	Date: Nov. 2012 Drawn by: KK	Figure: 1

Figure 2

Legend
Project Boundary
Roads
Concord Treat Clayton Intersection Improvement
Project Location Map
City of Concord
Concord
0 0.45 0.9 1.8 Miles
Data Sources:
Cal Atlas, CC Co.
Date: Nov. 2012
Drawn by: KK
Figure: 1
Nichols Consulting Engineers, Chtd.

5.0 Site Photographs

The following photographs depict the Treat Blvd and Clayton Road intersection from various aspects. Photograph 1 depicts the southeast corner of Treat Blvd and Clayton Road adjacent to the BP gas station. Photograph 2 shows a portion of the proposed ROW take along Treat Blvd adjacent to the existing BP gas station.

Photograph 1 : Northeast view of Treat Blvd and Clayton Rd Intersection

Courtesy of Nichols Consulting Engineers, Ltd,

Photograph 2: Northeast view of Treat Blvd ROW take.

Courtesy of Nichols Consulting Engineers, Ltd.

6.0 Environmental Checklist

The following Environmental Checklist form is used to describe the impacts of the proposed project, as detailed in the Project Description. Potential environmental impacts are described as follows:

Potentially Significant Impact: An environmental impact that could be significant and for which no feasible mitigation is known. If any potentially significant impacts are identified in this Checklist, an Environmental Impact Report (EIR) must be prepared.

Potentially Significant Unless Mitigated: An environmental impact that requires the incorporation of mitigation measures to reduce that impact to less-than-significant level.

Less- Than- Significant- Impact: An environmental impact may occur, however, the impact would not be considered significant based on CEQA environmental standards.

No Impact: No environmental impacts would result from implementation of the project.

INITIAL STUDY CHECKLIST

I. AESTHETICS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect on a scenic vista?				X
b. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings, within a state scenic highway?				X
c. Substantially degrade the existing visual character or quality of the site and its surroundings?		X		
d. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?				X

Item I-a.
Discussion
The Treat/Clayton Intersection is located in a neighborhood dominated by commercial uses. There are no designated national, regional, state, or local scenic vistas in proximity to the project site. Examples of scenic resources include areas of wildlife or open space, parks, trails, landmarks, rock outcroppings, etc. The City relies on the General Plan and Zoning Ordinance to initiate design standards that affect the scenic vistas within the City.

No Impact. The Intersection Improvement Project includes the addition of one vehicular traffic lane in Treat Blvd in a neighborhood with no existing scenic vistas or resources. No mitigation measures are proposed as there are no impacts to scenic vistas as a result of this project.

Item I-b.
Discussion. According to Caltrans's *Guidelines for the Official Designation of Scenic Highways,* a Scenic Corridor is an area of land generally adjacent to and visible from the highway. Although major highways run through the city, the City of Concord has no designated California scenic highways or corridors.

No Impact. The Intersection Improvement project is not located within a state scenic highway or near scenic resources, therefore, the proposed project has no impact on these resources and therefore no mitigation measures are required.

Item I-c.
Discussion. Although the proposed Intersection Improvement project is not located near any designated scenic vistas, existing street trees provide a scenic screening between the right-of-way (ROW) traffic and the commercial establishments located adjacent to the proposed project.

Less than Significant Impact with Mitigation.
A total of ten (10) existing ornamental street trees on Treat Blvd are proposed to be removed to accommodate the additional traffic lane. Two (2) trees will be removed from the existing Treat Blvd ROW and eight (8) trees are proposed to be removed from APNs 133-150-009-08 and 133-150-122-09. Removal of the street trees may result in a loss of screening between the vehicular traffic within the ROW and the adjacent commercial establishments. With appropriate mitigation measures, the impact will be reduced to less than significant.

Mitigation Measure I-c.
In order to reduce the potential visual screening impact to less than significant, four (4) Trident Maple trees with a minimum size of 15 gallons will be replanted within the new ROW of Treat Blvd. These trees will be strategically placed to provide the most screening benefits to the adjacent properties. Property owner permission will be required to remove the trees and the terms of replanting the eight (8) trees on private property will be negotiated between the City and private property owner.

Item I-d.
Discussion. The Intersection Improvement project proposal does not include additional lighting sources as an element of the design and will not create substantial light or glare to the surrounding areas.

No Impact. Because the project does not result in additional sources of light or glare, there is no impact to aesthetic resources proposed and therefore no mitigation measures required.

II. AGRICULTURAL AND FORESTRY RESOURCES – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?				X
d. Result in the loss of forest land or conversion of forest land to non-forest use?				X
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland (including livestock grazing) to non-agricultural use?				X

Item II-a.

Discussion. There is no Prime Farmland, Farmland of Statewide Importance, or Unique Farmland located in the project area. The attached Contra Costa County Important Farmland Map of 2008 (Figure 3) indicates that the farmland of regional or state importance is located in the eastern regions of Contra Costa County. The proposed project site is located in an urbanized area.

No Impact. The nature of the proposed Intersection Improvement project has no impact on land development and is proposed to improve existing urban traffic conditions only. There will be no impact on potential farmland development as a result of the improvements. Therefore, no mitigation measures are proposed.

Item II-b.

Discussion. The Williamson Act was enacted in 1965 and allows local governments to enter into contracts with private landowners that restrict the private land from use other than farmland or related open space. The private landowner receives a tax

incentive and the land is thus preserved as farmland and not developed. There are no Williamson Act contracts in the project vicinity, nor are there any agricultural zoning designations in the project area.

No Impact. As indicated, there are no agricultural land uses or zoning designations in the project vicinity. The nature of the proposed intersection improvements has no impact on land development and is proposed for vehicle capacity improvements only. There will be no potential for farmland development as a result of the intersection improvements. Therefore, no mitigation measures are proposed.

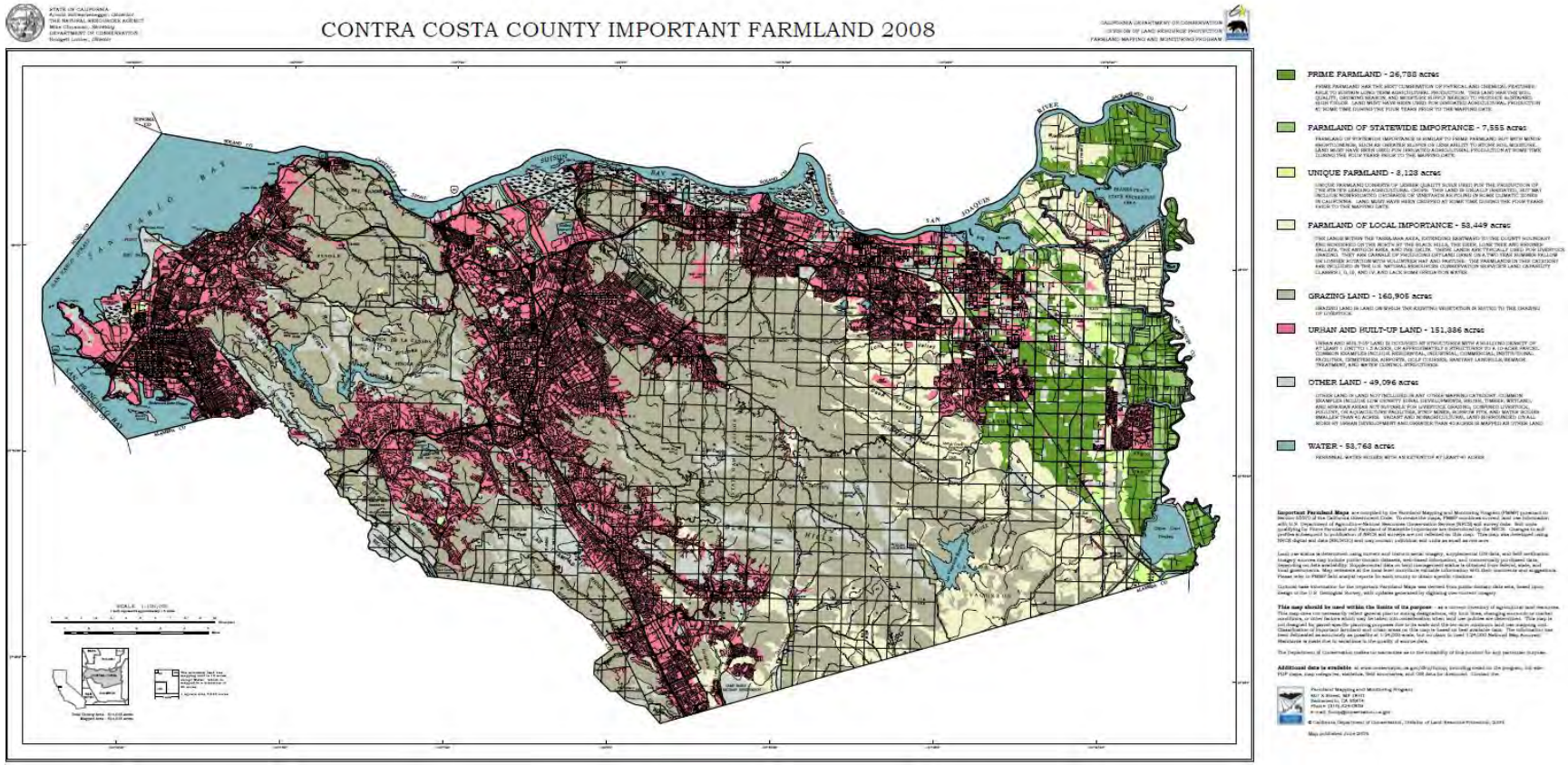
Item II-c.
Discussion. According to California Public Resource Code Sections 4526, 12220(g), and 51104 (g), the project area is not located within a designated forest land, timberland, or Timberland Production zone. The City of Concord has also not designated the project area as a significant forestland or timberland resource.

No Impact. As indicated, there are no forestland or timberland land uses or zoning designations in the project vicinity. The nature of the proposed intersection improvements have no impact on land development and are proposed for vehicle capacity improvements only. There will be no potential for forestland development as a result of the culvert replacement. Therefore, no mitigation measures are proposed.

Item II-d.
Discussion. Per *Item II-c* above, there are no impacts to forest resources and therefore no mitigation measures proposed.

Item II-e.
Discussion. Per *Item II-a* above, there are no impacts to farmland resources and therefore no mitigation measures proposed.

Figure 3: Contra Costa County Important Farmland Map



III. Air Quality – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Conflict with or obstruct implementation of the applicable air quality plan?		X		
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?		X		
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?			X	
d. Expose sensitive receptors to substantial pollutant concentrations?			X	
e. Create objectionable odors affecting a substantial number of people?				X

Item III-a.

Discussion. The *City of Concord 2030 Urban Area General Plan* does not have specific policies referencing Air Quality regulations or standards. The City relies on Federal, State, and Regional regulations to protect air quality during construction projects. Regionally, the project is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which is entrusted with regulating the stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma Counties. Figure 4 presents the most current significance thresholds including annual emissions for operational emissions and daily standards for short-term construction related emissions. Reactive Organic Gases, Nitrogen Oxides, and Particulate Matter (PM2.5) are allowed an emissions level of 54 lbs/day during construction related projects. Particulate Matter (PM10) emissions are to be limited to 84 lbs/day during Construction related activities. Ozone levels are not regulated during construction activities and are not included in the threshold table. The BAAQMD does not have threshold standards for increased traffic capacity for projects involving road and intersection expansion.

Less Than Significant Impact with Mitigation. Construction of the intersection improvements will require the use of heavy equipment during construction, which

would create some level of temporary emissions. Air pollutants would be emitted by construction equipment and worker vehicles. Fugitive dust and particulate matter would be generated during demolition and grading of the project site.

Mitigation Measure III-a. In order to address particulate matter originating from dust emissions related to construction, the City of Concord will comply with all BAAQMD policies and shall include in the improvement plans the requirement that the Contractor, during the period of soil excavation (1) water the active grading area at least one time per day or more as necessary to prevent visible dust plumes from leaving the project site and (2) water the excavated soil to prevent visible dust plumes when loading soil into trucks for export from the site.

Item III-b.
Discussion. The California Air Resources Board (CARB) is part of the California EPA and is responsible for the coordination and administration of both the federal and state air pollution control programs in California. CARB sets the California Ambient Air Quality Standards (CAAQS), oversees the Toxic Air Contaminants Program (TACs), and the Hotspots Program. TACs were intended to reduce exposure to air toxins such as asbestos, benzene, and chloroform. The Hotspots Program was designed to report and notify the public of the types and quantities of air toxins routinely released in the air at specific locations. There are no TACs or designated Hotspots in the project area.

Regionally, the project is under the jurisdiction of the Bay Area Air Quality Management District (BAAQMD), which is entrusted with regulating the stationary sources of air pollution in the nine counties that surround San Francisco Bay: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, southwestern Solano, and southern Sonoma Counties. BAAQMD establishes permitting requirements for stationary sources; inspects emission sources; and enforces such measures when necessary. The BAAQMD has established significance thresholds to assess the regional and localized impacts of project related air pollutant emissions generated from construction equipment. Figure 4 presents the most current significance thresholds including annual emissions for operational emissions and daily standards for short-term construction related emissions. A project with daily emission rates below these thresholds is considered to have a less than significant effect on air quality. The BAAQMD does not have threshold standards for increased traffic capacity for projects involving road and intersection expansion.

Less than Significant with Mitigation.
Per the discussion and Mitigation Measure III-a, the potential impacts to air quality will be reduced to less than significant levels.

Figure 4: Bay Area Air Quality Management District Thresholds of Significance

Adopted Air Quality CEQA Thresholds of Significance* - June 2, 2010			
Pollutant	**Construction-Related**	**Operational-Related**	
Project-Level			
Criteria Air Pollutants and Precursors (Regional)	**Average Daily Emissions (lb/day)**	**Average Daily Emissions (lb/day)**	**Maximum Annual Emissions (tpy)**
ROG	54	54	10
NO_X	54	54	10
PM_{10}	82 (exhaust only)	82	15
$PM_{2.5}$	54 (exhaust only)	54	10
$PM_{10}/PM_{2.5}$ (fugitive dust)	Best Management Practices	None	
Local CO	None	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)	
GHGs **Projects other than Stationary Sources**	None	Compliance with Qualified Greenhouse Gas Reduction Strategy OR 1,100 MT of CO_2e/yr OR 4.6 MT CO_2e/SP/yr (residents + employees)	
GHGs **Stationary Sources**	None	10,000 MT/yr	
Risk and Hazards – New Source (Individual Project)	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient $PM_{2.5}$ increase: > 0.3 $\mu g/m^3$ annual average Zone of Influence: 1,000-foot radius from fence line of source or receptor	
Risk and Hazards – New Receptor (Individual Project) ***Note: Threshold Effective Date May 1, 2011***	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient $PM_{2.5}$ increase: > 0.3 $\mu g/m^3$ annual average Zone of Influence: 1,000-foot radius from fence line of source or receptor	

Adopted Air Quality CEQA Thresholds of Significance* - June 2, 2010		
Pollutant	**Construction-Related**	**Operational-Related**
Risk and Hazards – New Source (Cumulative Thresholds)	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) $PM_{2.5}$: > 0.8 $\mu g/m^3$ annual average (from all local sources) Zone of Influence: 1,000-foot radius from fence line of source or receptor
Risk and Hazards – New Receptor (Cumulative Thresholds) ***Note: Threshold Effective Date May 1, 2011***	Same as Operational Thresholds**	Compliance with Qualified Community Risk Reduction Plan OR Cancer: > 100 in a million (from all local sources) Non-cancer: > 10.0 Hazard Index (from all local sources) (Chronic) $PM_{2.5}$: > 0.8 $\mu g/m^3$ annual average (from all local sources) Zone of Influence: 1,000-foot radius from fence line of source or receptor
Accidental Release of Acutely Hazardous Air Pollutants	None	Storage or use of acutely hazardous materials locating near receptors or receptors locating near stored or used acutely hazardous materials considered significant
Odors	None	Complaint History—5 confirmed complaints per year averaged over three years
Plan-Level		
Criteria Air Pollutants and Precursors	None	1. Consistency with Current Air Quality Plan control measures 2. Projected VMT or vehicle trip increase is less than or equal to projected population increase
GHGs	None	Compliance with Qualified Greenhouse Gas Reduction Strategy (or similar criteria included in a General Plan) OR 6.6 MT CO2e/ SP/yr (residents + employees)
Risks and Hazards	None	1. Overlay zones around existing and planned sources of TACs (including adopted Risk Reduction Plan areas) 2. Overlay zones of at least 500 feet (or Air District-approved modeled distance) from all freeways and high volume roadways
Odors	None	Identify locations of odor sources in general plan
Accidental Release of Acutely Hazardous Air Pollutants	None	None
Regional Plans (Transportation and Air Quality Plans)		
GHGs, Criteria Air Pollutants and Precursors, and Toxic Air Contaminants	None	No net increase in emissions
CO = carbon monoxide; CO_2e = carbon dioxide equivalent; GHGs = greenhouse gases; lb/day = pounds per day; MT = metric tons; NO_X = oxides of nitrogen; $PM_{2.5}$= fine particulate matter with an aerodynamic resistance diameter of 2.5 micrometers or less; PM_{10} = respirable particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; ppm = parts per million; ROG = reactive organic gases; SP = service population; tpy = tons per year; yr= year.		

www.baaqmd.gov

Item III-c.

Discussion. Air quality is regulated by Federal, State, Regional, and Local standards. Per the Clean Air Act, the United States Environmental Protection Agency (USEPA) is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. There are seven criteria air pollutants: nitrogen dioxide (NOx), ozone (O_3), particulate matter (including both PM10 and PM2.5), carbon

monoxide (CO), sulfur dioxide (SOx), and lead. The project area is located in a Federal and State designated non-attainment area for ozone (8 hour) and particulate matter PM2.5, however the project area is in attainment for all other criteria air pollutants. Figure 5 depicts the California 8-hour Ozone Non-attainment Areas Map and Figure 6 depicts the California PM 2.5 Non-attainment Areas Map.

Ozone is a secondary criteria pollutant, meaning that it is not directly emitted. The EPA reports that ozone is a gas that is formed when volatile organic compounds (VOCs) and nitrogen dioxide undergo photochemical reactions that occur in the presence of sunlight. Ground-level ozone is the primary constituent of smog and the associated health affects of smog. The primary source of VOC emissions is unburned hydrocarbons in motor vehicle exhaust.

Particulate matter typically occurs in the form of fugitive dust generated from vehicle exhaust, grading, demolition, and disturbed areas of soil. PM2.5 are fine dust particles that are less than 2.5 micrometers in size. PM10 particles are referred to as coarse particles and are more visible to the naked eye. The project area is in non-attainment to the USEPA particulate matter PM2.5 standards as depicted in Figure 5.

Carbon monoxide is a colorless, odorless gas, which in urban areas is associated with the incomplete combustion of fossil fuels in motor vehicles. High levels of CO are commonly found near freeways and major intersections; however, the project area is in attainment to the USEPA carbon monoxide standards.

Nitrogen dioxide is a criteria air pollutant that is generated from the combustion of materials such as fossil fuels, wood, and coal. It is an irritant to the mucous membranes due to its ability to form nitric acid when combined with the water of the eyes, nose, and lungs. The project area is in attainment to the USEPA nitrogen dioxide levels.

Sulfur dioxide's major pollution source comes from the burning of fossil fuels at power generation plants. It is similar to Nitrogen Dioxide in how it reacts to the human body. The project area is in attainment to the USEPA sulfur dioxide levels.

Lead is a metal that can be found in very small quantities in the atmosphere. The major sources of lead pollution was historically exhaust from leaded-gasoline. Since the USEPA's adoption of lead in gasoline standards in 1978, there have been minimal ambient lead concentrations in the atmosphere. The project area is in attainment to the USEPA lead levels.

Less Than Significant Impact. Based on the short-term nature of the project, the intersection improvements will not result in all other criteria air pollutants, including ozone and particulate matter to exceed BAAQMD thresholds or State Standards. During construction, there will be an increase in ozone emissions. However, the increase is less

than cumulatively considerable. BAAQMD Standards will be followed during grading and construction and therefore, the impact is less than significant.

Item III-d

Discussion. According to the Bay Area Air Quality Management District CEQA Guidelines, sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly and people with illnesses. Examples include schools, hospitals and residential areas.

Less Than Significant Impact with Mitigation Measures. There are no sensitive receptors within the project area, however, persons with sensitivities to air quality may frequent the surrounding commercial establishments. Based on the short-term nature of the project, the intersection improvements will not result in all other criteria air pollutants, including ozone to exceed BAAQMD thresholds or State Standards. BAAQMD Standards will be followed during grading and construction activities.

Mitigation Measure III-d. As a result of *Mitigation Measure III-a* stated above, there will be a less than significant impact on air quality in relation to sensitive receptors.

Item III-e.

Discussion. Objectionable odors are defined as nuisance odors that impact communities or businesses. The intersection improvements will not result in objectionable odors during and after construction.

No Impact. The proposed project will not result in objectionable odors and therefore will have no impact. No mitigation measures are proposed.

Figure 5

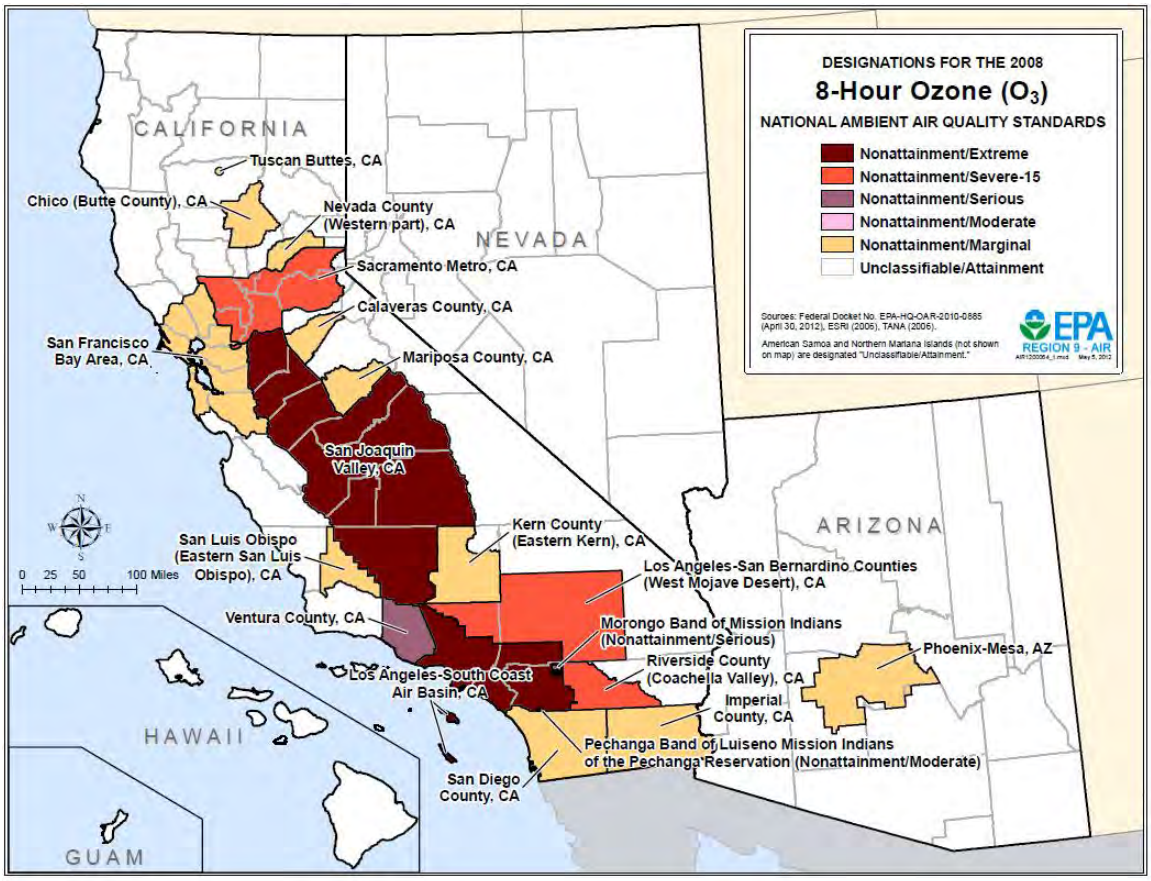


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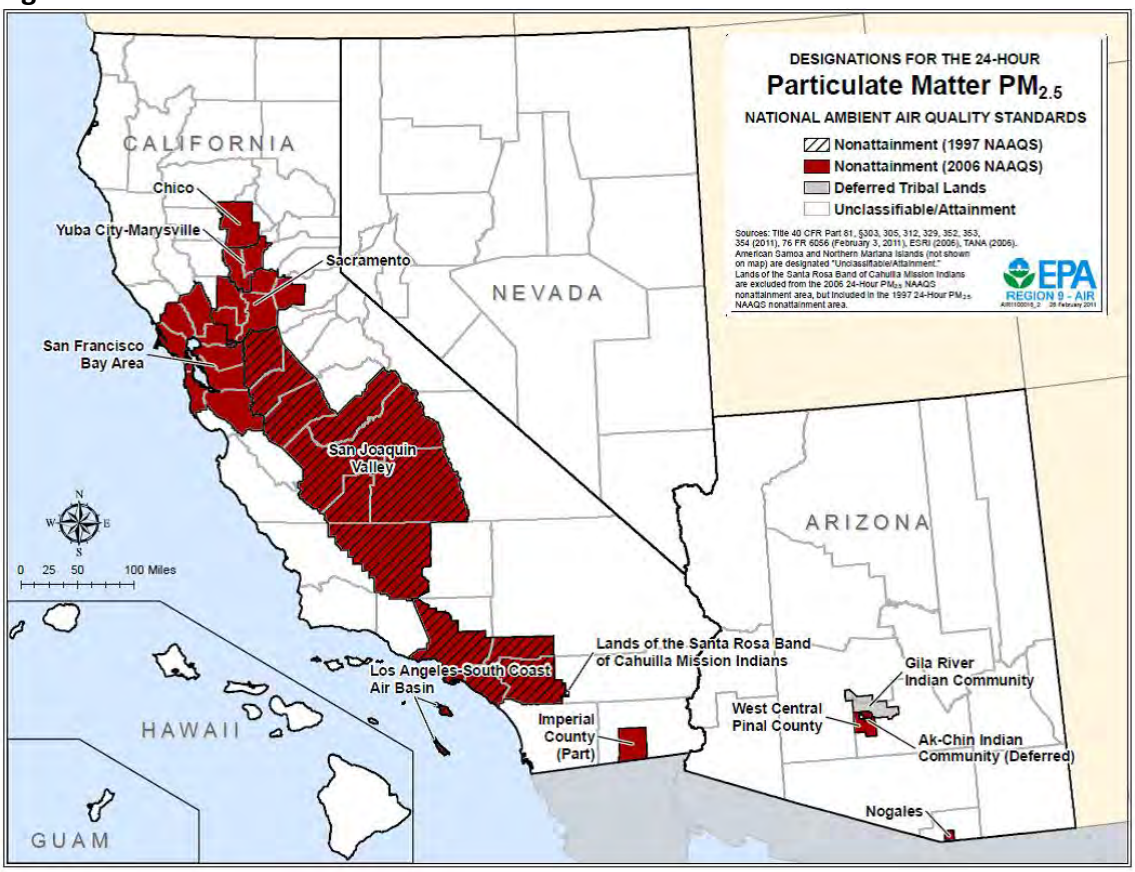
Figure 6



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IV. BIOLOGICAL RESOURCES – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish & Game or U.S. Fish & Wildlife Service?		X		

b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations or by the California Department of Fish & Game or U.S. Fish & Wildlife Service?				X
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?				X
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?		X		
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?				X

Items IV-a.
Discussion.
State and federal "endangered species" legislation has provided the California Department of Fish and Game (CDFG) and the United States Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal endangered species acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as "species of special status."

Permits may be required from both the CDFG and USFWS if activities associated with a proposed project will result in the "take" of a listed species. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Game Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFG and the USFWS are

Responsible agencies under CEQA. Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation. Although no stick nests were observed in trees on the site, a conclusive investigation of nesting birds was not conducted. Trees in the project vicinity may provide suitable nesting habitat for migratory birds. If a migratory bird, regardless of its federal or state status, were to nest in trees near the site prior to or during proposed construction activities, such activities could result in the abandonment of active nests or direct mortality to these birds. Construction activities that adversely affect the nesting success of special-status or non-special-status migratory birds, including tree-nesting raptors, or result in mortality of individual birds constitute a violation of state and federal laws.

The *City of Concord 2030 Urban Area General Plan* has a list of goals and policies that pertain to protection of special status species within the City. The City is committed to preserving the habitat of the special status species listed within the General Plan. Policy POS-3.4.2 of the plan sets forth the requirements to protect rare, threatened, or endangered species and their habitat through the City's environmental review process. Specifically, the policy calls for sustainable development practices, wetland protection, creek corridor and riparian area restoration, and mitigating any impact on sensitive species. Policy POS-3.4.6 specifically targets construction related activities during breeding and nesting seasons for special status species. Project related activities within sensitive habitat of special status species will generally not be allowed during the breeding season. If the project activities cannot avoid these seasons, the applicant will have to arrange for surveys of any special status species within 500 feet of the project area.

Item IV-a.
Discussion. Substantially interfering with native wildlife movement or with their use of nursery sites could constitute a potentially significant impact and would require consultation with the US Fish and Wildlife Service.

Less Than Significant Impact with Mitigation.
Due to the urban nature of the project area, it is unlikely that native wildlife utilizes the project area for migration or nursery sites. The removal of 10 trees on Treat Blvd may have the potential to interfere with nesting bird activity, but with adequate mitigation can be reduced to less than significant.

Mitigation Measure IV-a
Prior to construction and tree removal, a professional Biologist will survey the trees for potential nesting activity. If nests are located within the project site, construction will halt until fledging activity has ended. Four (4) trees will be replaced within the new Treat Blvd ROW upon completion of the construction project to mitigate loss of potential habitat.

Item IV-b, c.

Discussion. The United States Army Corps of Engineers regulates the filling or grading of all waters of the U.S. under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by "ordinary high water marks" (OHWM) on opposing channel banks. All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE.

Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the Regional Water Quality Control Board (RWQCB) issues a certification (Section 401) that the proposed activity will meet state water quality standards. The filling of isolated wetlands is regulated by the RWQCB. It is unlawful to fill isolated wetlands without filing a Notice of Intent with the RWQCB. The RWQCB is also responsible for enforcing National Pollution Discharge Elimination System (NPDES) permits, including the Construction General Permit.

The California Department of Fish and Game has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1601 and 1602 of the California Fish and Game Code. Activities that would disturb these drainages are regulated by the CDFG via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question.

No impact. There are no state or federally regulated waters within the project area, therefore there is no impact and no mitigation measures are proposed.

Item IV-d.

Discussion. Migration patterns are defined as the movement of fish and wildlife within natural habitat. Construction projects that create segmented wildlife habitat can impact migration patterns.

No Impact. The urban nature of the intersection improvement project is not conducive to wildlife migration patterns. The construction project will have no impact to wildlife migration, therefore no mitigation is proposed.

Item IV-e.

Discussion. The intersection improvement project will require the City of Concord to conduct an environmental review, which will include a review of all studies conducted in compliance with CEQA, and the creation and adoption of appropriate mitigation measures as set forth in this document. The project complies with all applicable elements of the City's adopted *2030 Urban Area General Plan* and the 2012 Development Code Update that protects sensitive and natural resources.

Policy POS-3.4.3 of the 2030 Urban Area General Plan sets forth the requirement to retain significant vegetation, including native vegetation and heritage trees where feasible. The policy provides that replacement plantings are required as appropriate for mitigation measures.

A protected tree is defined as 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 (Q. douglasii), Coast live oak (Q. agrifolia), California bay (Umbellaria californica), California buckeye (Aesculus californica), and California sycamore (Platanus racemosa). Protected trees also include 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 non-native tree where the sum of all stem diameters is 24 inches or more as measured 54 inches above the ground.

Less Than Significant Impact with Mitigation. As mentioned in *Item IV-a Discussion,* there is minimal potential to affect unique plants and wildlife and heritage trees. However, the project proposal includes the removal of ten (10) non-heritage trees from the project area and replanting four (4) trees once construction is complete. With mitigation measures in place, the impacts will be less than significant.

Mitigation Measure IV-e. Avoidance and minimization of direct impact to heritage trees, significant trees, and other native trees will be included during final project design. These trees and shrubs will be protected prior to construction with construction fencing and any loss of these resources will be compensated by replanting after construction is complete.

Item IV-f.
Discussion. There are no known Habitat Conservation Plans or Natural Community Conservation plans that apply to the area that includes the project location. No impacts are anticipated and no mitigation measures are proposed.

Figure 7: City of Concord Vegetation and Habitat Map

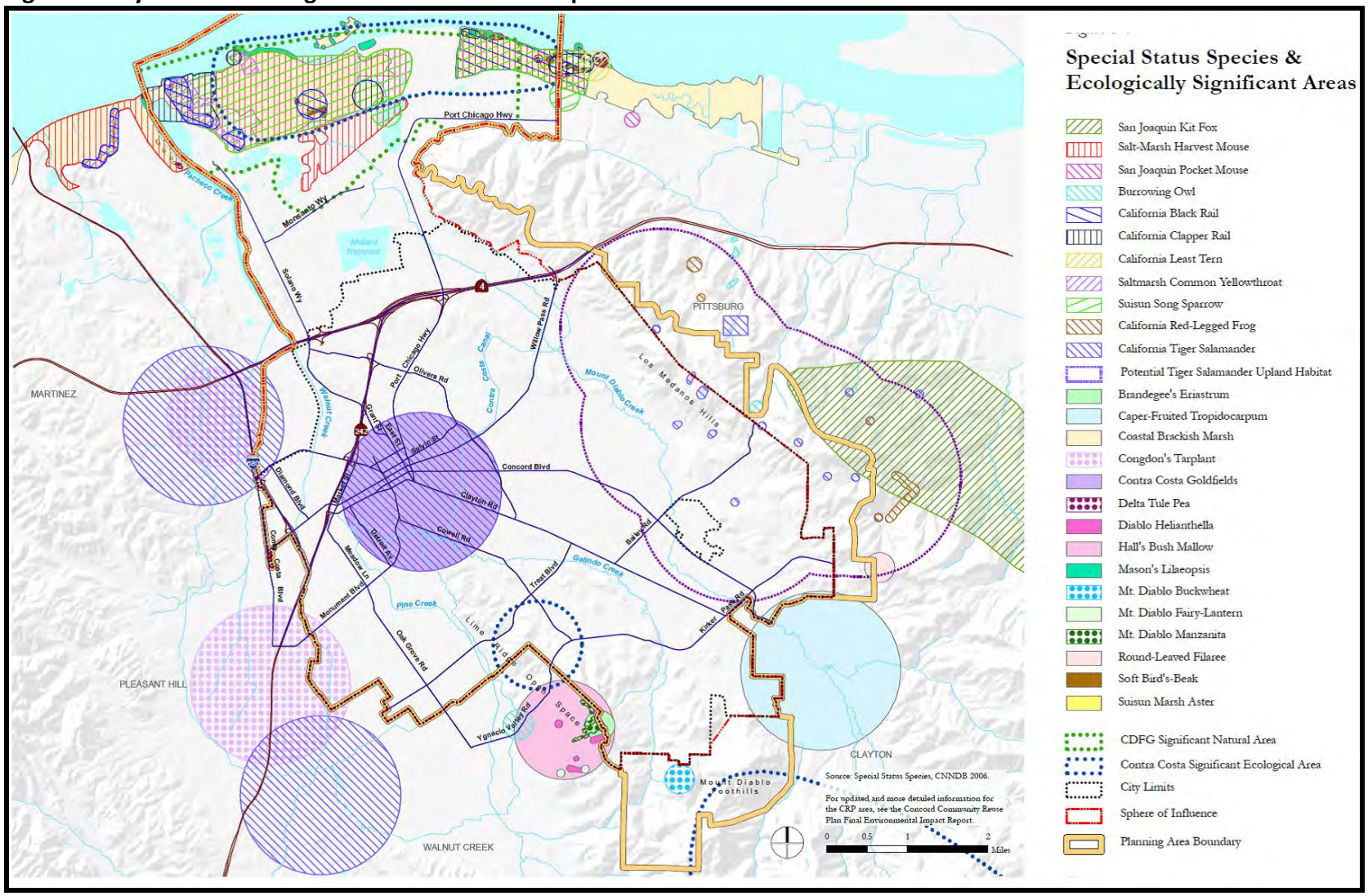
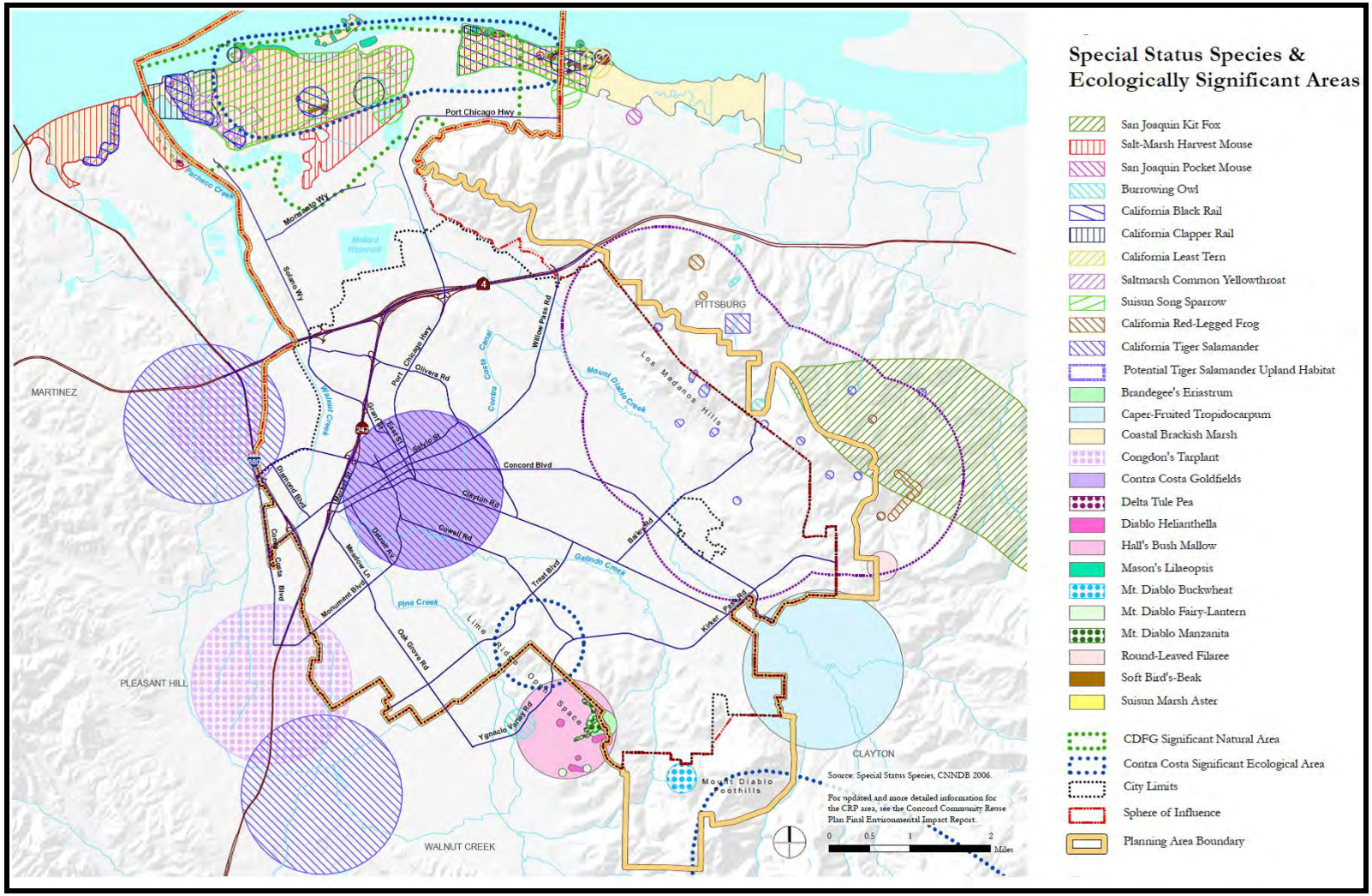


Figure 8. City of Concord Special Status Species Habitat Map



V. CULTURAL RESOURCES – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?				X
b. Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5?				X
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d. Disturb any human remains, including these interred outside of formal cemeteries?				X

Items V-a, b, c

Discussion. Cultural resources are protected under the National Historic Preservation Act the State of California's Public Resource Code and are detailed below.

National Historic Preservation Act:

The National Historic Preservation Act (NHPA) was enacted by Congress in 1966 to establish national policy for historic preservation in the United States. The NHPA establishes the role and responsibilities of the federal government in historic preservation. The NHPA directs agencies to identify and manage historic properties under their control; to undertake actions that will advance the Act's provisions, and avoid actions contrary to its purposes; to consult with others while carrying out historic preservation activities; and to consider the effects of their actions on historic properties.

California Register of Historical Resources:

The California Register of Historical Resources (California Register) is a guide to cultural resources that must be considered when a government agency undertakes a discretionary action subject to CEQA. The California Register helps government agencies identify and evaluate California's historical resources (California Office of Historic Preservation 2001b:1), and indicates which properties are to be protected, to the extent prudent and feasible, from substantial adverse change (PRC §5024.1(a)). Any resource listed in, or eligible

for listing in, the California Register is to be taken into consideration during the CEQA process.

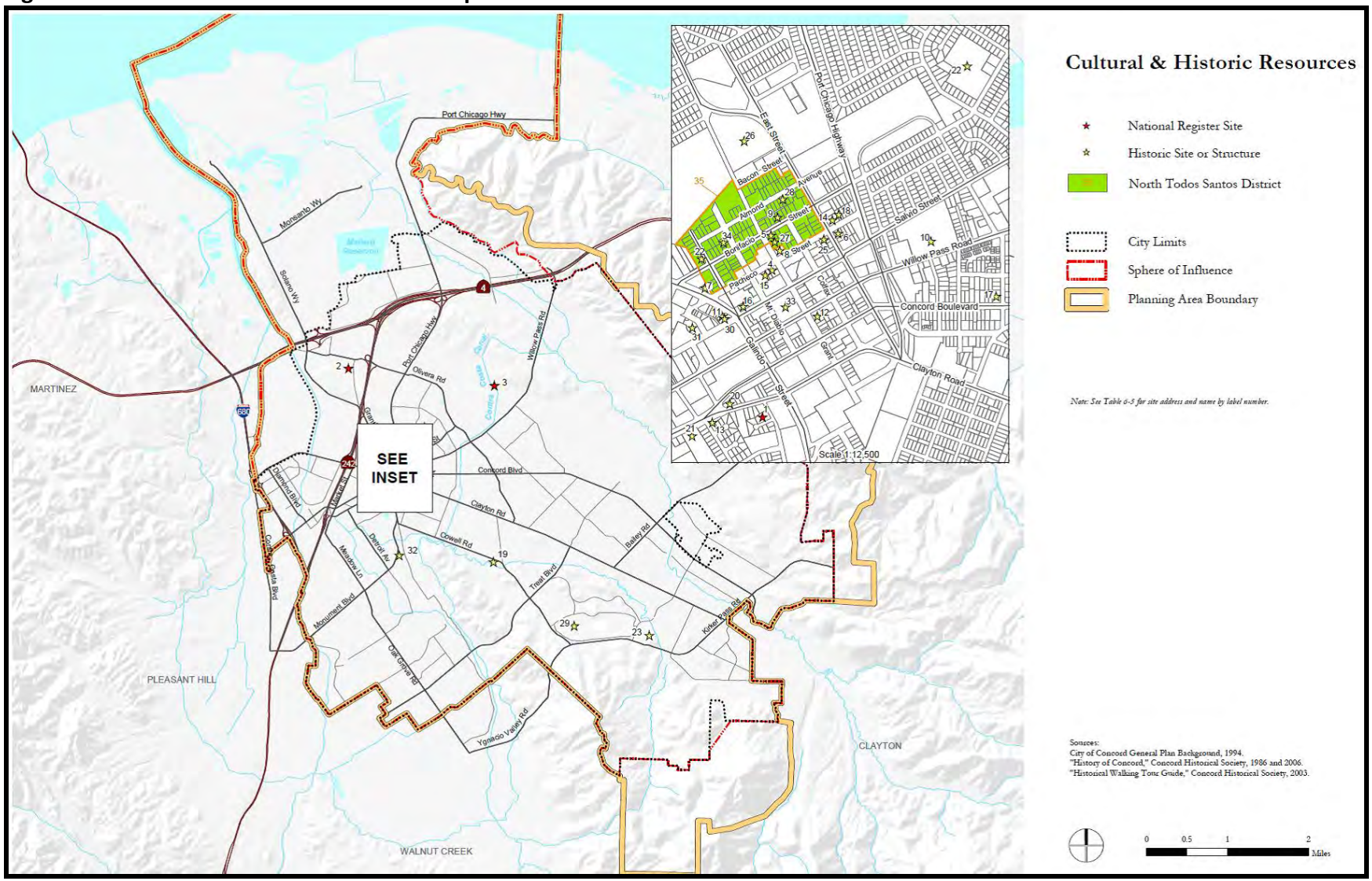
Public Resources Code §5097.5:
California Public Resources Code §5097.5 prohibits excavation or removal of any "vertebrate paleontological site…or any other archaeological, paleontological or historical feature, situated on public lands, except with express permission of the public agency having jurisdiction over such lands." Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Section 5097.5 states that any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands is a misdemeanor.

No Impact. The *City of Concord 2030 Urban Area General Plan* provides discussion on the archeological and historic resources located within the City limits. Of the 35 designated historic sites and structures located within the City limits, none are located within the project area. There are no known cultural resources located within the project area. As such, the proposed project has no known impact on cultural resources and no mitigation is proposed.

Item V-d.
Discussion. Section 7050.5 of the California Health and Safety Code states that in the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the remains are discovered has determined whether or not the remains are subject to the coroner's authority. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated cultural materials.

No Impact. According to the *City of Concord 2030 Urban Area General Plan*, no cultural resources were identified within the project area. As such, the proposed project has no impact on cultural resources and no mitigation is proposed.

Figure 9. Cultural and Historic Resources Map



VI. GEOLOGY & SOILS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Expose people or structures to potential substantial adverse effects, including risk of loss, injury, or death involving:				X
i.) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii.) Strong seismic ground shaking?				X
iii.) Seismic-related ground failure, including liquefaction?				X
iv.) Landslides?				X
b. Result in substantial soil erosion or the loss of topsoil?			X	
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X	
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

Items VI-a.i-iv.
Discussion. The proposed project is a intersection capacity improvement project that will assist in improving traffic conditions within the vicinity of Treat Blvd and Clayton Rd. There is no proposed change to seismic conditions in the project area.

No Impact. There will be no impact to the Earthquake Fault Zone as referenced in Division of Mines and Geology Special Publication 42. The intersection improvements will not result in strong seismic-ground shaking, liquefaction, or landslides. Because there is no impact to seismic related activities, there are no mitigation measures proposed.

Items VI-b, c.
Discussion. During the construction phase of the project, portions of the site will have exposed soil areas that during rain or high wind events could cause minor erosion. Once the construction of the project is complete, the ROW will be repaved to prevent extensive soil erosion. With the implementation of the proposed mitigation measures, the proposed project will have a less than significant impact on geology and soils.

Less Than Significant Impact. During construction and grading activities, there is a potential for soil movement and erosion. During construction, stockpiles of material will be located within the project area. Once the final construction is complete, these stockpiles will be removed and the site will be restored and repaved. A typical construction Temporary BMP Plan will include design and specifications that clearly detail the required temporary construction BMPs that shall be installed prior to and during construction to prevent any erosion that may occur during rain or wind events. With all temporary BMPs installed, the impacts are less than significant.

Items VI-d, e.
Discussion. The project area for the proposed intersection improvements is not located on expansive soil and no septic tanks or waste water disposal systems are proposed as a part of this project. Mitigation measures are unnecessary.

VII. GREENHOUSE GAS EMISSIONS: Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?		X		
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				X

Item VII-a.
Discussion. Projects that contribute to the increase of green house gas (GHG) emissions are associated with global climate change. Estimated GHG emissions attributed to projects are primarily associated with increases of carbon dioxide (CO2) from mobile sources during construction activities.

The Bay Area Air Quality Management District (BAAQMD) offers guidance for addressing the GHG emissions associated with individual development projects and standards for GHG emissions are documented in the *Adopted Air Quality CEQA Thresholds of Significance.* However, BAAQMD does not have an adopted Threshold of Significance for construction-related GHG emissions. The District has also prepared an emission inventory of pollutants contributing to climate change, or greenhouse gases (GHG). The Greenhouse Gas Source Inventory estimates direct and indirect emissions from sources within the District's jurisdiction for the following gases: carbon dioxide, methane, nitrous oxides, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Due to the nature of the proposed project, significant impacts associated with generation of greenhouse gas (GHG) emissions are not anticipated with the proposed mitigation measures.

Less Than Significant Impact with Mitigation. Greenhouse Gas emissions will temporarily increase during construction practices and the use of heavy machinery. The BAAQMD regulates construction practices involving air quality measures, but does not have a standard for construction related green house emissions. Regardless, the project proponent proposes mitigation measures to reduce emission levels during construction.

Mitigation Measure VII-a. Use of heavy machinery will be minimized to the fullest extent possible during the construction process. Vehicles will be turned off when not in

use rather than remaining in an idling state. Trips will be augmented to reduce emissions and increase fuel efficiency.

Item VII-b

Discussion. In June 2005, former Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The Executive Order established the following goals for the State of California: GHG emissions should be reduced to 2000 levels by 2010; GHG emissions should be reduced to 1990 levels by 2020; and GHG emissions should be reduced to 80 percent below 1990 levels by 2050. The Air Resources Board is responsible for the implementation of AB 32 Scoping Plan, which identifies action items that work to reach the GHG emissions reductions goals.

No Impact. The proposed intersection improvement is a land use based project and would not conflict with the State goal of reducing GHG emissions and would not conflict with the AB 32 Scoping Plan or the action measures. Construction and grading activities would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing greenhouse gas emissions.

VIII. HAZARDS & HAZARDOUS MATERIALS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?)				X
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?			X	

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?				X
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing in the project area?				X
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X

Items VIII-a, b.
Discussion
The Environmental Protection Agency (EPA, Federal and State) determines whether a chemical, either in its liquid, gas, or solid form could be a hazardous material. This determination is based on its potential to pose a hazard to human health, safety, or the environment. A material may also be considered hazardous if it is listed on any Federal, State, or Local Hazardous Materials List; and may be considered hazardous based on its concentration or quantity. Transport of hazardous materials is regulated by the EPA and by the Department of Transportation (DOT) under Title 49.

The California State Water Resources Control Board is responsible for implementing the Underground Storage Tank (UST) Program. The program is designed to regulate existing USTs and ensure that hazardous materials contained within the USTs do not leak and contaminate groundwater, soils, or drinking wells. All known leaky underground storage tanks (LUSTs) are queried on the Water Resource Control Board's Geotracker. The Geotracker lists LUSTs that have been closed and mediated, as well as LUSTs requiring mitigation for the potential soil and water contamination. Properties with known LUSTs must come into compliance with Chapter 6.7 of the California State Water Resource Control Board's Health and Safety Code.

Less Than Significant Impact. The intersection improvement project will not utilize hazardous materials on site. The construction vehicles which are operated on diesel fuel will be maintained regularly to ensure that diesel fuel does not leak onto the project site or adjacent properties. However, the adjacent parcel (APN 133-150-009) is registered with the California State Water Resources Control Board as having an existing LUST on site that requires mitigation. The property is a former gasoline fueling station with three (3) underground storage tanks on site. The property owner and Closure Solutions, Inc are currently working to remove the storage tanks. Closure Solutions developed a Conceptual Site Model (Appendix A) that depicts the extent of the leakage, the types of pollutants, and groundwater depths and provided this report to the CA State Water Resources Board on June 29, 2012. The contaminants sited within the report include total petroleum hydrocarbons (TPHg), benzene, and methyl tert-butyl ether (MTBE), which can all be grouped into a chemical family called separate phase hydrocarbons (SPH). The SPH soil and groundwater contamination is located 24-38 feet below ground surface (bgs).

Although a portion of the ROW take is on a list LUST site, the proposed intersection improvements will not create a hazardous materials exposure risk. The improvements will require grading activities to a maximum of 8 feet bgs. According to the Conceptual Site Model report, soil and groundwater contamination occurs at 24-38 feet bgs, which is far below the area of impact for the intersection improvements. Because there will be no exposure to hazardous materials, there is a less than significant impact.

Item VIII-c.
Discussion. The proposed project is not located within one quarter mile of a licensed daycare facility or school. No mitigation measures are proposed due to the fact that no schools or daycare facilities are located within ¼ mile of the project area.

Item VIII-d.
Discussion. See discussion VIII-a,b above.

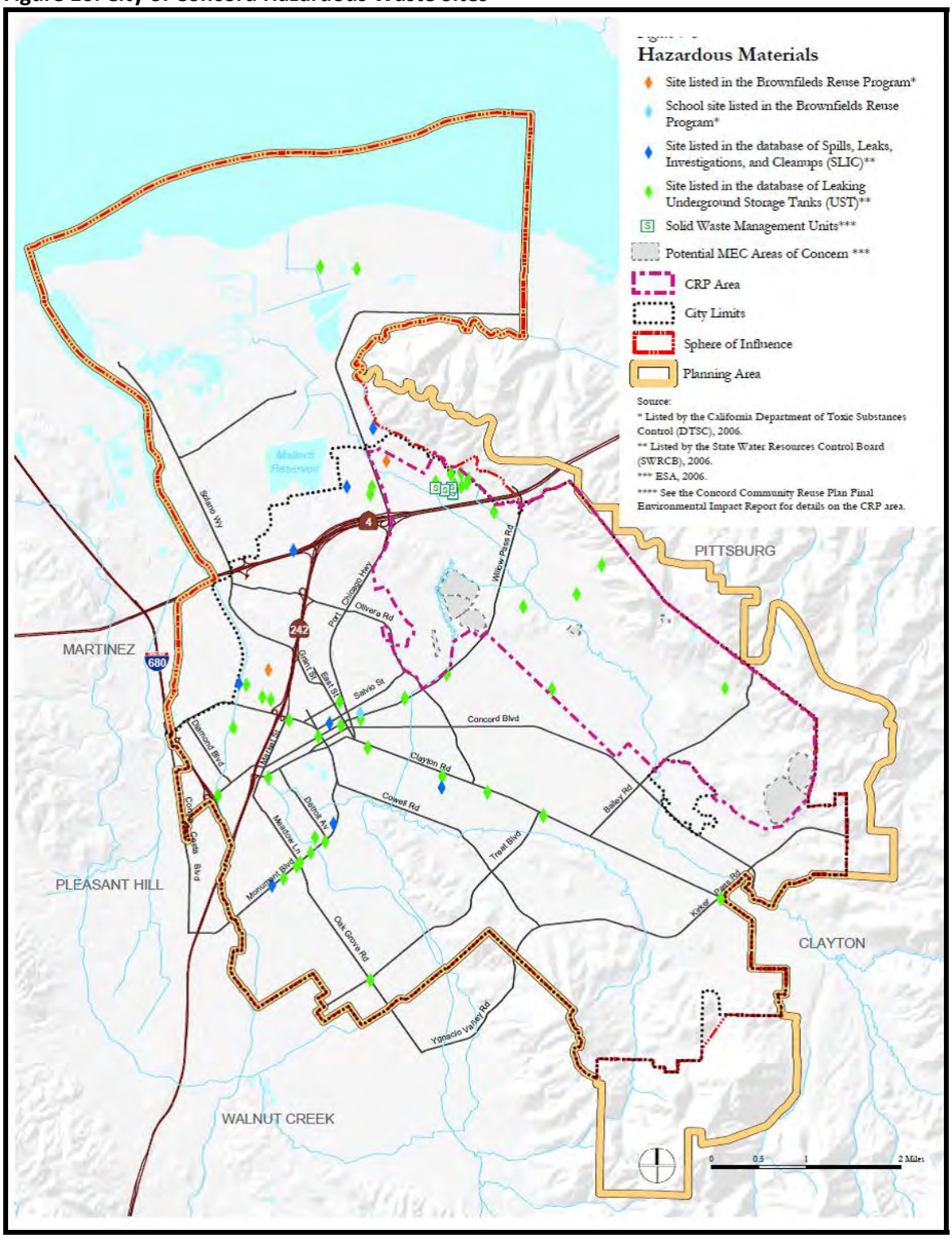
Items VIII-e, f.
Discussion. The proposed project is not located within an airport land use plan or within two miles of a public or private airstrip. Thus, no impacts result from the proposed intersection improvements and no mitigation measures are necessary.

Item VIII-g.
Discussion. The proposed project will not impair implementation of an emergency response or excavation plan. During construction, all excavation routes will be maintained. Because there is no impact, mitigation measures are not required.

Item VIII-h.

Discussion. The intersection improvement project is located in a predominately urban area with minimal risk to wildfires. The project will not increase wildfire risk and therefore has no impact or required mitigation measures.

Figure 10. City of Concord Hazardous Waste Sites



IX. HYDROLOGY & WATER QUALITY – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Violate any water quality standards?				X
b.) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of local groundwater supplies (i.e. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c.)Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
d.) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in flooding on- or off-site?				X
e.) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
f.) Otherwise substantially degrade water quality?				X
g.) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other				X

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Flood Hazard Delineation Map or other flood hazard delineation map?				
h.) Place within a 100-year flood hazard area improvements which would impede or redirect flood flows?				X
i.) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
j.) Inundation by seiche, tsunami, or mudflow?				X

Item IX-a.
Discussion
As noted above, the proposed intersection improvement project is not located near Waters of the US or other water bodies. The area is predominately urban with no potential for construction runoff to enter or impact any surrounding water bodies. Therefore, mitigation is unnecessary.

Item IX-b.
Discussion. The proposed project will have no impact on groundwater supplies and will not interfere with groundwater recharge rates as the intersection improvements constitute as a redevelopment project. No new disturbance is proposed to impact groundwater recharge rates. Because there will be no impact to groundwater, no mitigation measures are proposed.

Items IX-c, d.
Discussion. The proposed project will result in no permanent or long-term changes to the drainage pattern of the project area. Due to the highly urbanized character of the project area, complex stormwater systems serve as the areas drainage patterns. All runoff is directed to the stormwater system. The project will have no impact on these drainage patterns and therefore no mitigation measures are proposed.

Item IX-e.
Discussion. The existing project area is completely disturbed and paved with asphalt and concrete. The additional traffic lane proposed on Treat Blvd will be located in an area that is disturbed and already contributing runoff into the stormwater system. The

proposed improvements will result in no change in the volume of runoff entering the stormwater system, therefore no mitigation is proposed.

Item IX-f.
Discussion. As discussed in *Item IX-a* above, there will be minimal impact to water quality. Construction is not proposed near Waters of the US, Waters of the State, or other water bodies. There will be no impacts to water quality, therefore no mitigation is proposed.

Item IX-g, h.
Discussion. No housing is proposed as a part of this project. Also, the proposed intersection improvements will not change the location of the 100-year floodplain boundary. Therefore, there is no impact to the Flood Hazard Boundary of Flood Insurance Rate Maps. No mitigation is proposed.

Item IX-i.
Discussion. The nature of this proposed project is to provide traffic congestion alleviation for the Treat Blvd and Clayton Rd intersection. The improvements will not affect any levees or dams. No mitigation measures are proposed.

Item IX-j.
Discussion. Due to the location of the proposed project, there will be no additional risk of inundation by seiche, tsunami, or mudflow as a part of this project. No mitigation measures are required.

X. LAND USE & PLANNING – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Physically divide an established community?				X
b.) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X

c.) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Item X-a.
Discussion. The physical division of an established community typically refers to the construction of a physical feature (such as an interstate highway or railroad tracks) or removal of a mean of access (such as a local road or bridge) that would impair mobility within an existing community, or between a community and outlying areas.

No Impact. The proposed project is an intersection improvement project with a goal of improving access of the commuting vehicles to their local destinations. Improving the intersection will not physically divide the already established community. No mitigation measures are proposed.

Item X-b.
Discussion. The City of Concord land use designations for the project area include Neighborhood Commercial and Commercial Mixed Use. Surrounding land uses include neighborhood grocery stores and gas stations that serve multiple surrounding neighborhoods and commuters who use Treat Blvd and Clayton Rd as a major thoroughfare.

No Impact. The proposed intersection improvement will not alter the land use of the area. The implementation of the proposed project would not result in conflict with any applicable land use or conservation plans.

Item X-c.
Discussion. The *City of Concord 2030 Urban Area General Plan* identifies goals and policies for the protection of parks, open space, and conservation of natural habitat and wildlife. Goals include protecting existing parks and increasing park land throughout the City limits, preserving open space areas and protecting water resources, and protecting existing special status species.

No Impact. The proposed project area is in a highly urbanized area within the City of Concord. The proposed project will not impact park land, open space, special status species or any conservation plan relevant to the project area. No mitigation is proposed.

Figure 11: Existing General Plan Land Use Map

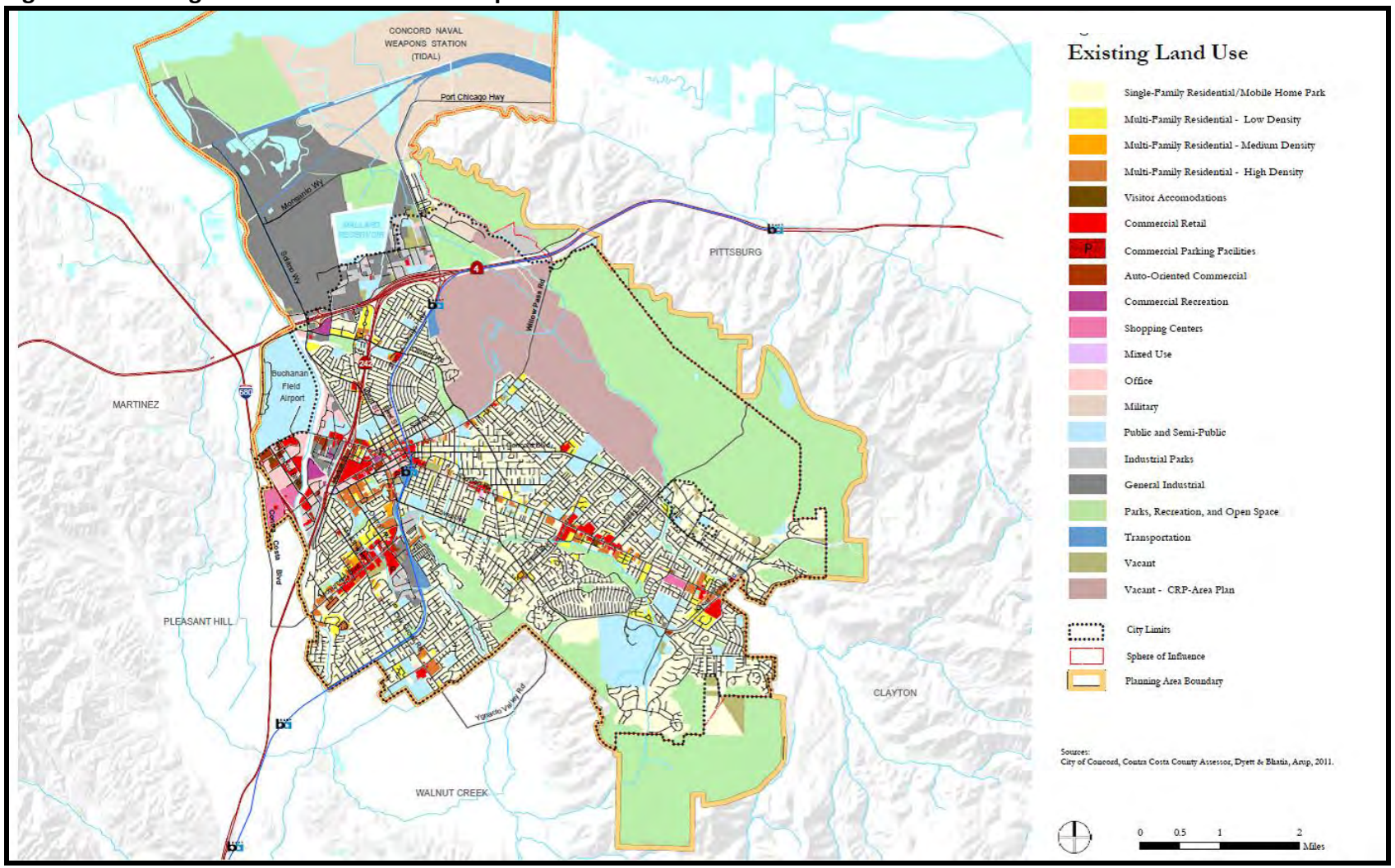
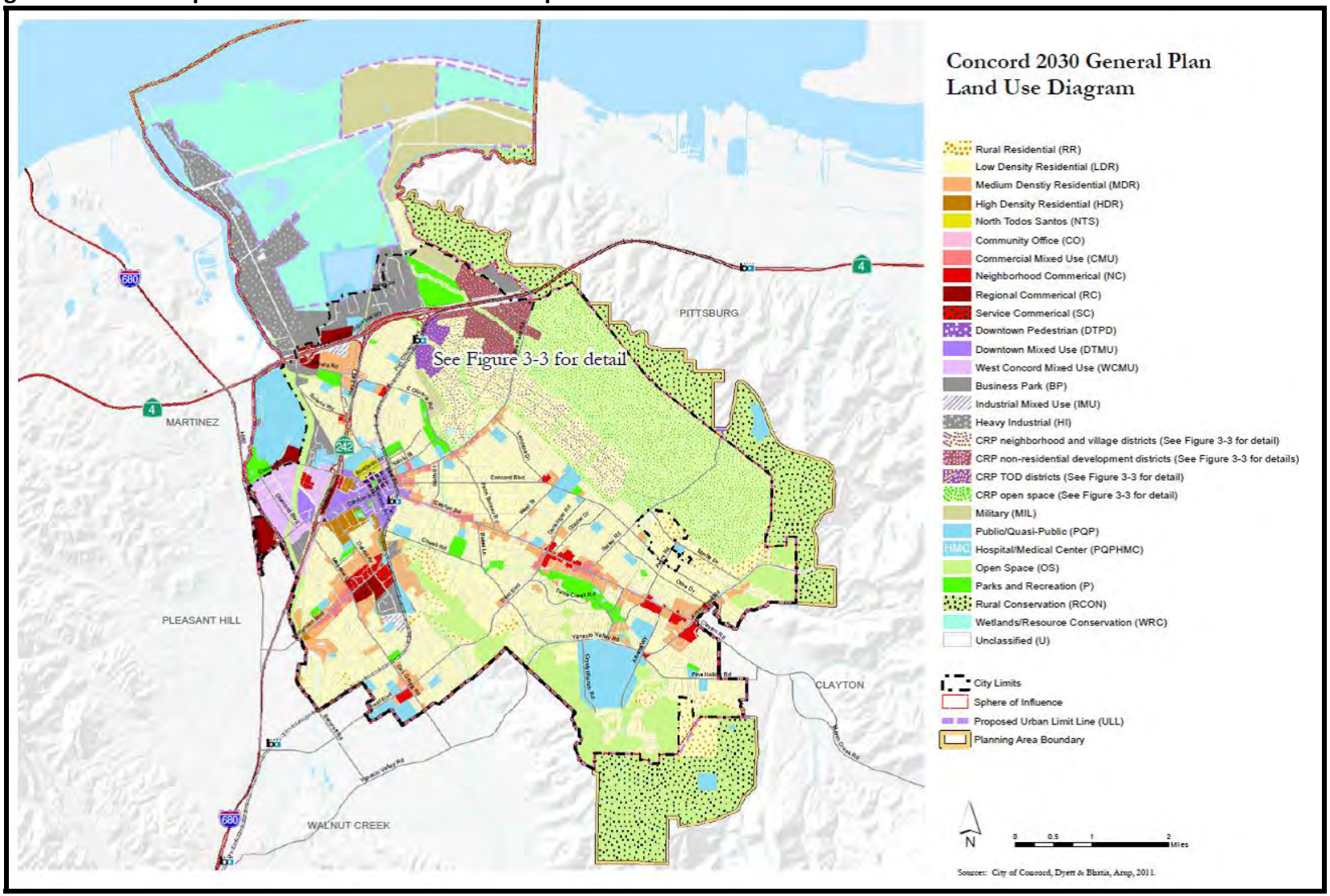


Figure 12: 2030 Proposed General Plan Land Use Map



XI. MINERAL RESOURCES – Would the project result in:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) The loss of availability of a known mineral resource that would be of value to the region and the residents of the state?				X
b.) The loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?				X

Items XI-a, b.
Discussion: No known mineral resources or recovery sites are located in or near the project area. Therefore, the proposed project will have no impact on mineral resources.

No Impact. There would be no impact as the project site is not located in a mineral resource recovery site.

XII. NOISE – Would the project result in:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Exposure of persons to or generation of noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies?		X		
b.) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?			X	
c.) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X

d.) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?		X		
e.) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?				X
f.) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?				X

Item XII-a.
Discussion
Sensitive noise receptors are defined as populations and land uses where the presence of unwanted sound could affect the use of the land. Examples include residences, schools, nursing homes, and concert halls. Sensitive noise receptors in the area include the surrounding commercial establishments and the individuals who may frequent them. The maximum noise levels allowed in Commercial Zoning Districts is 75 dBA. According to the City of Concord Municipal Code, construction equipment noise is exempt from the Noise Ordinance regulations on approved projects.

Less Than Significant Impact with Mitigation. Construction related activities will generate a short term increase of existing ambient noise levels. With the implementation of the mitigation measures outlined below in *Item XII-a Mitigation Measures,* the proposed project may result in a temporary or periodic exposure to or generation of noise levels in excess of standards established in the local General Plan, Community Plan, or Noise Ordinance, but it will be temporary and is allowable under local ordinances. Therefore, the project will have a less than significant impact on noise.

Mitigation Measure XII-a. In order to mitigate the impacts of increased ambient noise levels, construction noise emanating from all construction activities shall only occur between the hours of 7:30 am and 6:00 pm Monday through Friday per City of Concord Municipal Code, unless other hours and over night construction operations are approved by the City. All construction equipment will be fitted with the factory installed muffling devices and will be maintained in good working order. The City will advise potentially affected residents of the proposed construction activities including duration, schedule of activities, and contacts for filing noise complaints. The City or its contractor will attempt to respond to all noise complaints received and resolve issues as soon as possible.

Item XII-b.
Discussion. Vibration is described in terms of frequency and amplitude. Unlike sound, there is no standard way of measuring and reporting amplitude. Construction activities will result in temporary and intermittent vibration impacts to the surrounding area. Construction vibration is generally associated with pile driving and rock blasting. Occasionally, large bulldozers and loaded trucks can cause perceptible vibration levels at close proximity. The intersection improvement project will generate ground borne vibration from soil compaction, jack hammers, and grading-related activities.

Less Than Significant Impact. Construction activities will result in intermittent exposure of ground borne vibration to the surrounding areas. However, this impact would be temporary and temporary impacts resulting from construction would be exempt during the hours of 7:30 am to 6:00 pm Monday through Friday under the City of Concord Noise Ordinance. Therefore, impacts in this regard are considered less than significant and no mitigation measures are proposed.

Item XII-c.
Discussion. The proposed project is an intersection improvement project. There will not be a permanent increase in noise levels. No mitigation measures are required.

Item XII-d.
Discussion. Refer to the information stated in *Item XII-a Discussion* above.

Less Than Significant Impact with Mitigation. With the implementation of the mitigation measures outlined in *Item XII-a Mitigation Measures,* the proposed project may result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project, but it will be temporary and is allowable under local ordinances. Therefore, the project will have a less than significant impact on noise.

Item XII-e, f.
Discussion. The project area is not located in an airport land use plan or within the vicinity of a private airstrip. Therefore, there is no impact and no mitigation proposed.

XIII. POPULATION & HOUSING – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Induce substantial population growth in an area, either directly (i.e. by proposing new homes and businesses) or indirectly (i.e. through				X

extension of roads or other infrastructure)?				
b.) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c.) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Items XIII-a, b, c.
Discussion. The proposed project includes no residential component and therefore no impact on housing and population would occur.

No Impact. There will be no change to the availability of housing or population growth, as a result of the intersection improvement project. No mitigation measures are required.

XIV. PUBLIC SERVICES –

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental services and/or facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services?				X
Fire Protection?				X
Police Protection?				X
Schools?				X
Parks?				X

Other Public Facilities?				X

Item XIV- a.
Discussion. The proposed intersection improvements will improve the vehicle traffic capacity at Treat Blvd and Clayton Rd. There are no changes proposed that will require additional maintenance or public services**.** No additional public services will be required as a result of the intersection improvements. No mitigation measures are required.

XV. RECREATION – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b.) Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

Items XV-a,b.
Discussion. The proposed project will not increase or decrease the use of existing neighborhood or regional parks, or other recreational facilities. No new facilities will be required to be built as a result of this project, nor will there be an increase of usage of existing recreation facilities. No mitigation measures are required.

XVI. TRANSPORTATION & TRAFFIC – Would the project result in:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transits and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?		X		
b.) Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?		X		
c.) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d.) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		X		
e.) Result in inadequate emergency access?			X	
f.) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or			X	

pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				

Items XVI-a.
Discussion. The City of Concord and Contra Costa County have regulatory authority of roads and traffic in the project vicinity. The goal of the intersection improvement project is to increase the vehicular capacity level of Treat Blvd and Clayton Rd to the transportation goals listed in the *City of Concord 2030 Urban Area General Plan*. Construction may take place during the day Monday through Friday and the Contractor may not close more than one lane in any direction at a time during the day limited to the hours between 9:00 AM and 3:30 PM. The Contractor's day work operations including off-street staging of vehicles and equipment shall be limited to the hours of 7:30 AM and 6:00 PM and weekend work is prohibited unless authorized by the City. This will be a temporary inconvenience to motorists and public transit users in the local community,

Less Than Significant Impact With Mitigation Measures. The proposed project will improve the traffic element and bring the area up to the standards stated in the *City of Concord 2030 Urban Area General Plan.* There will be a temporary increase of traffic volumes during construction as a result of construction vehicles mobilizing to and from the project site and the temporary lane closure. Once construction is complete, the proposed project will not result in a permanent increase in traffic; therefore, the project will have a less than significant impact on transportation and traffic with mitigation measures applied to the temporary increase of traffic during construction.

Mitigation Measure XVI-a. To mitigate the potential impacts to traffic safety and congestion, the Contractor shall be required to work with area residents and businesses to develop a Transportation Management Plan (TMP). The TMP shall address alternative traffic routes and detour plans. The Detour plan will utilize the TMP to devise alternative travel routes that will result in a less than significant impact on traffic.

Item XVI-b.
Discussion. As discussed in Item XVI-a above, the intersection improvement project may result in temporary impacts to traffic congestion. However, with implementation of *Mitigation Measure XVI-a* listed above, the impacts will be less than significant.

Item XVI-c.
Discussion. The intersection improvement project will not result in a change in air traffic patterns. No impacts or mitigation measures are proposed.

Item XVI-d.
Discussion. The intersection improvement project will eliminate current traffic congestion via an improved design to the existing turn lanes at the Treat Blvd and

Clayton Rd intersection. The design will be reviewed by City and County transportation engineers to ensure there are no dangerous design features. While there are no new dangerous design features proposed, circulation will be impacted at the existing gas station and parking removed at the adjacent shopping center, therefore mitigation measures are necessary.

Less than Significant with Mitigation.
Circulation:
The widening of the northbound approach on Treat Boulevard will require ROW acquisition from the gas station which will be negotiated between the property owner and the City of Concord. Currently, fuel delivery trucks traveling eastbound on Clayton Road access the gas station parcel by entering the second driveway past the Clayton Road/Treat Boulevard-Denkinger Road intersections, traveling around the gas station building, and stopping parallel to Treat Boulevard to refuel the tanks. This path will require site modifications as described in the Mitigation Measure XVI-d(1) to reduce the impacts to less than significant.

Parking Demand:
The existing Shopping Center on the corner of Treat Blvd and Clayton Blvd measures approximately 103,400 sq. ft. in commercial space and contains 388 parking spaces. The shopping center is legally non-conforming with respect to the parking ordinance that requires 414 parking spaces or a ratio of 1:250 gross sq. ft. The proposed project requires right-of-way to accommodate the widening that will remove 24 parking spaces on the west side of the parking lot for the adjacent Bel Air Shopping Center. The removal of the additional 24 spaces exacerbates the non-conformity. During the project planning phase of this project, City staff conducted a multi-day parking demand survey during peak parking demand days of the year including the day after Thanksgiving. At no time were all existing 388 parking spaces being utilized. Based on the analysis and field observations, it was concluded that the proposed removal would not create a parking shortage. (Appendix A) Incorporation of Mitigation Measure XVI-d(2) will reduce the impacts to less than significant.

Mitigation Measure XVI-d(1).
In order to maintain fuel delivery truck access, modifications will need to be made to the gas station parcel. Removal of the existing bollards and modification of the existing curb return (island) on the southwest corner of the gas station building to facilitate tanker truck fuel deliveries will reduce the impacts to less than significant.

Mitigation Measure XVI-d(2).
The reduction of parking spaces at the Bel Air Shopping Center increases the level of non-compliance the area is in with the City's parking standards. However, the Parking Demand Survey indicates that there will be no impact to parking demand with the parking space reduction. Therefore, the City shall approve a variance to memorialize the parking demand analysis findings and reduce the impacts to less than significant.

Item XVI-e.
Discussion. Please refer to *Item XVI-a Discussion*.

Less Than Significant Impact. During construction and the temporary lane closures, it will be necessary for Emergency Vehicles to utilize the Traffic Management Plan and Detour Plan mentioned above. The Contra Costa County Fire Protection District 11 serves the project vicinity and will require access for emergency fire vehicles. Emergency access vehicles will see no change in access to the project vicinity as the intersection will remain open during construction for vehicular traffic. Once construction of the intersection improvements are complete, the proposed project will not result in inadequate emergency access or access to nearby uses; therefore, the project will have a less than significant impact on transportation and traffic.

Item XVI-f
Discussion: Please refer to *XVI-a Discussion* above.

Less Than Significant Impact. The proposed project may cause a short term impact to pedestrians and bicyclists during construction and road closure. Pedestrians and bikers will be accommodated in the Traffic Management and Detour Plan to ensure avoidance of the project area. Once construction is complete, the proposed project will not result in permanent hazards or barriers for pedestrians or bicyclists; therefore, the project will have a less than significant impact on transportation and traffic.

XVI. UTILITIES & SERVICE SYSTEMS – Would the project:

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b.) Require or result in the construction of new water or wastewater delivery, collection or treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c.) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d.) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e.) Result in a determination by wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f.) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
g.) Comply with federal, state, and local statues and regulations related to solid waste?				X

Items XVII-a, b, c.

Discussion. The RWQCB is responsible for enforcing storm water treatment standards during construction practices for projects that impact one (1) acre of land or more. The

proposed project, including staging areas, impacts less than one (1) acre of land. With proper temporary BMPs installed during construction to prevent potential runoff during construction activities, there will be no impact to existing stormwater facilities. The proposed intersection improvement project will require no new stormwater facilities or wastewater treatment facilities. Construction will not generate substantial solid waste that would require sewer service or landfill accommodations. The proposed design will utilize Best Management Practices for stormwater treatment. Due to the fact that no new facilities are proposed, there is no impact to stormwater facilities and no mitigation measures proposed.

Item XVII-d.
Discussion. The intersection improvement project does not require additional water supplies or entitlements. No impact to water supply is proposed and no mitigation measures are required.

Item XVII-e.
Discussion. The intersection improvement project does not require additional wastewater treatment facilities as it is a transportation project. No mitigation measures are proposed.

Item XVII-f.
Discussion. The intersection improvement project will not produce excess waste and will not require additional landfill facilities. No mitigation measures are proposed.

Item XVII-g.
Discussion. The intersection improvement project will be compliant with all applicable federal, state, and regional solid waste regulations. No mitigation measures are proposed.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a.) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or		X		

Environmental Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?				
b.) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, or the effects of probable future projects.)			X	
c.) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?				X

Item XVIII-a.
Discussion. As revealed by the previous discussions for each environmental category, the proposed project could degrade the quality of the environment; however, implementation of Mitigation Measures I-c, III-a, IV-a, IV-e, VI-b, VII-a, XII-a, XVI-a would ensure that potential impacts related to aesthetics, air quality, biological resources, geology and soils, greenhouse gases, noise, and traffic would be reduced to less-than-significant levels. No long-term significant impacts are associated with the project.

Item XVIII-b.
Discussion. The impacts of the proposed project would generally be individually limited and not cumulatively considerable. Most impacts would result from construction-period activities, and would be temporary. All environmental impacts as a result of implementation of the project would be reduced to less-than-significant levels through implementation of the mitigation measures recommended in this document.

XVIII-c.

Discussion. Based on the analysis of all the above questions, it has been determined that the project would not result in environmental effects that would cause substantial direct or indirect adverse effects on human beings.

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FINAL REPORT

TRAFFIC ANALYSIS FOR
CLAYTON ROAD/TREAT BOULEVARD INTERSECTION
CAPACITY IMPROVEMENTS PROJECT (PJ #2144)

March 3, 2011

Prepared by: Kimley-Horn and Associates, Inc.

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1.0 INTRODUCTION

The City of Concord retained Kimley-Horn and Associates, Inc. (Kimley-Horn) to provide engineering services to complete a before and after conditions study for the Clayton Road at Treat Boulevard-Denkinger Road Intersection Improvements Project in the City of Concord. Proposed improvements at the intersection include widening the northbound approach of Treat Boulevard at Clayton Road to provide two exclusive left turn lanes, two through lanes, and one exclusive right turn lane, and to modify the intersection to 8-phase traffic signal operation. These improvements are expected to improve the intersection operating efficiency and to reduce the size of vehicle queues experienced on the eastbound Clayton Road approach during the PM peak period.

The purpose of this study is to review the traffic operations with and without the proposed improvements, estimate project benefits, and develop a conceptual design plan for the proposed improvements. Because Clayton Road and Mendocino Drive-Rosal Lane intersection is occasionally affected by traffic backed up from the Treat Boulevard-Denkinger Road intersection, it was also included in elements of this evaluation.

This report summarizes the data collection effort, traffic analyses, and conceptual plan development. The following are the project steps as described in the report:

1. Collect existing pedestrian, bicycle, and traffic volumes
2. Conduct Level of Service (LOS) analysis to review the impacts of the proposed improvements to intersection delay and level of service.
3. Conduct traffic operations analysis using traffic simulation to review queuing at the intersection with the proposed improvements during the PM peak hour.
4. Estimate project benefits
5. Prepare conceptual plans and ROW layouts for the proposed improvements.
6. Summarize study conclusions

1.1 Project Area

Clayton Road is a six (6) lane arterial inside the study area that serves as one of the major east-west commute corridors in the City of Concord. Clayton Road extends from Marsh Creek Road to the east, through the City of Concord Downtown, and to SR 242 to the west. The corridor carries a high volume of regional and local commuter traffic, especially during the morning and afternoon peak periods to and from Downtown Concord. Treat Boulevard is a major north-south/east-west arterial that crosses Clayton Road at its northern end, where it changes to Denkinger Road, and extends through the City of Concord to the City of Walnut Creek and provides connection to I-680 at its southern end. Similar to Clayton Road, Treat Boulevard carries a significant amount of local and regional commuter traffic during the morning and afternoon peak periods. As a result of the heavy volumes both on Clayton Road and Treat Boulevard, there is significant congestion at the Clayton Road and Treat Boulevard-Denkinger Road intersection during the peak periods. This intersection is located along a Route of Regional Significance as specified in the Central Contra Costa County Action Plan.

The peak direction of travel for Clayton Road is westbound in the AM peak period and eastbound in the PM peak period. The peak direction of Treat Boulevard is southbound in the AM peak period and northbound during the PM peak period. During the evening peak hour, eastbound queues on Clayton Road at Treat Boulevard-Denkinger Road occasionally extend to the Clayton Road/Mendocino Drive intersection, resulting in queues not clearing every signal cycle with some traffic having to wait over one cycle. Similarly, northbound queues on Treat Boulevard are sometimes unable to fully clear during a single cycle of the traffic signal. There is existing signal synchronization (coordination) along Clayton Road during the AM, midday, and PM peak periods to progress traffic through the corridor to minimize travel time, delay, and stopping. The Clayton Road/Treat Boulevard-Denkinger Road is connected in signal coordination with the traffic signals on Clayton Road between Coventry Road-6th Street and Alberta Way-Terry Lynn Drive. As the intersection with the heaviest volumes and highest congestion, the Clayton Road/Treat Boulevard-Denkinger Road traffic signal controls the signal cycle length that is required for coordination within this group of traffic signals. The existing cycle lengths are currently fairly high, 140 seconds in both the AM and PM peak periods, primarily due to the intersection operations at Clayton Road/Treat Boulevard-Denkinger Road, where the latter streets are split phased due to the existing lane configurations on Treat Boulevard-Denkinger Road. To improve the overall traffic operations along Clayton Road and at the intersection, geometric and signal phasing improvements being considered at the intersection of Clayton Road/Treat Boulevard-Denkinger Road were evaluated.

Figure 1 illustrates the study area.

Figure 1: Study Area Map

2.0 DATA COLLECTION

Existing and future conditions information was collected to develop traffic models, to evaluate the traffic conditions and operations of the proposed improvements. Data collection included obtaining available data from the City of Concord, collecting turning movement volumes, queuing data, and conducting a field review of the project area.

Traffic data that was obtained from the City for the analysis included:

- Existing traffic signal timing for signalized intersections.
- Electronic base plans of the intersections in AutoCAD format.
- Year 2030 traffic forecasts for the Clayton Road/Treat Boulevard-Denkinger Road intersection obtained from the Concord Community Reuse Plan EIR dated January 2010.

Turning movement counts, including vehicular, pedestrian, and bicycle counts, were collected at Clayton Road/Treat Boulevard-Denkinger Road during the AM and PM peak period. In addition, turning movement counts, including vehicular, pedestrian, and bicycle counts, were collected at Clayton Road at Mendocino Drive-Rosal Lane during the PM peak period. Turning movement counts were collected on May 13, 2010 during the following time periods:

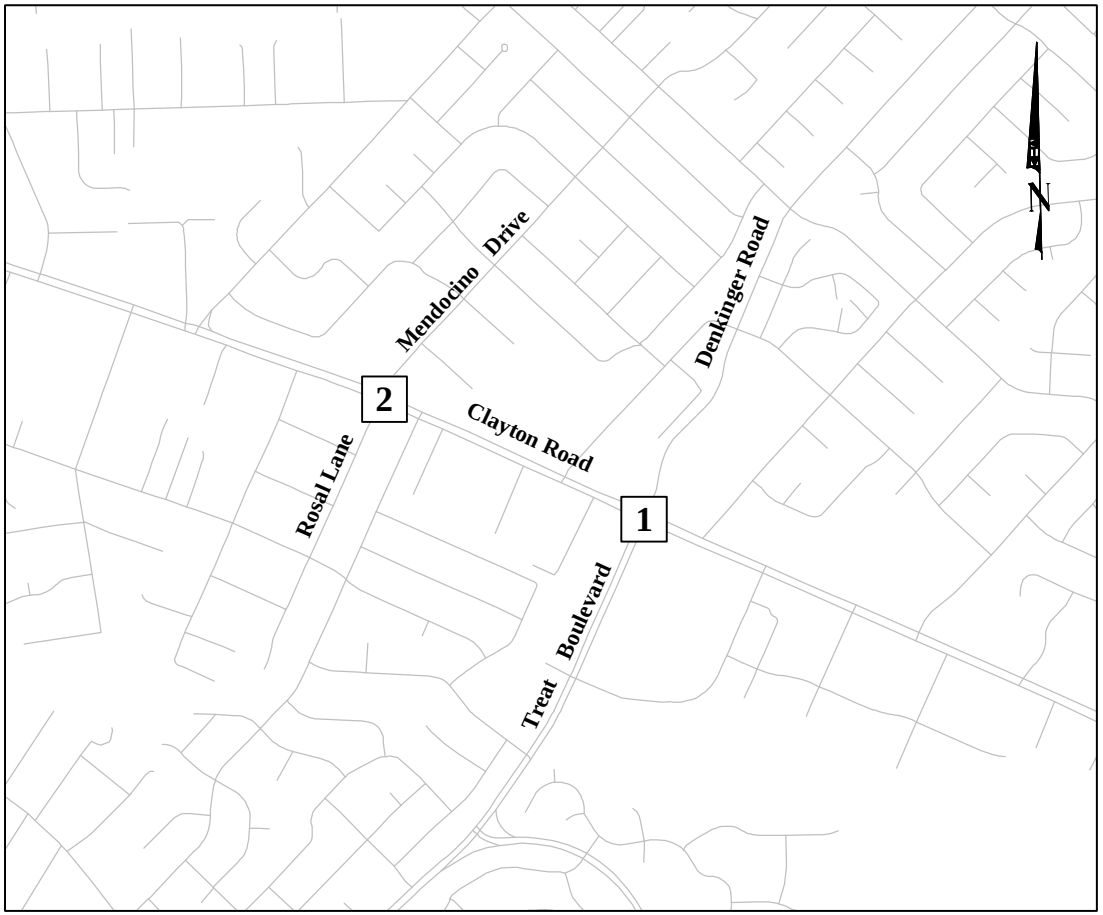
- AM Peak 7:00 AM to 9:00 AM
- PM Peak 4:00 PM to 6:30 PM

The peak hour traffic volumes for each intersection are summarized in **Figure 2.** The peak hour is defined as the highest four (4) consecutive 15-minute periods selected from the data collected during each peak period. Detailed turning movements counts are included in **Appendix A.**

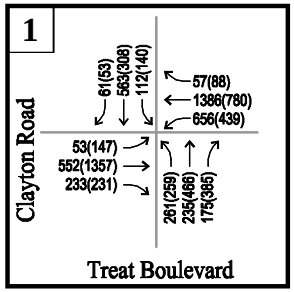
2.1 Field Review

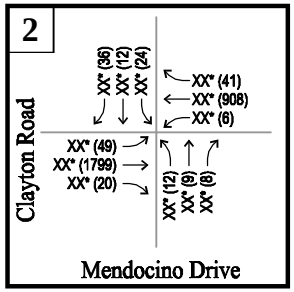
A field review of the project area was conducted during the PM peak period to observe existing traffic conditions including intersection operations, queuing, and any other traffic related issues. Key observations during the field review included the following:

- Existing geometrics
- Traffic operations including signal operations, vehicular movements, and traffic congestion
- Queuing on Clayton Road and Treat Boulevard

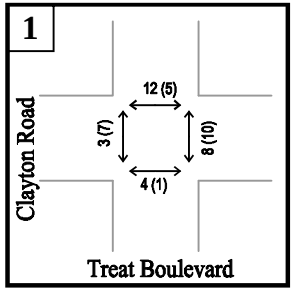


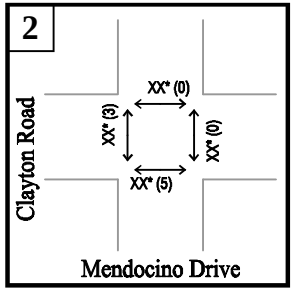
Vehicular Volume



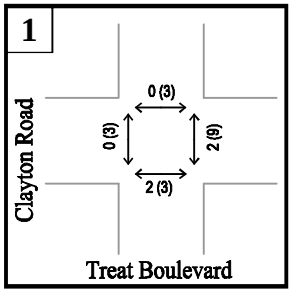


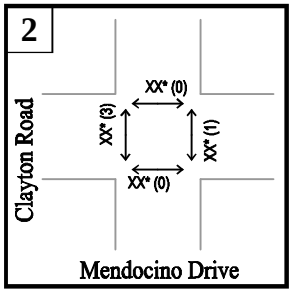
Pedestrian Volume





Bicycle Volume





LEGEND

X	Study Area Intersections
XX (YY)	AM (PM) Peak Hour Volumes
XX*	AM volume was not collected for Clayton Road-Mendocino Drive

City of Concord
Clayton-Treat Intersection Improvement Project

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Figure 2
Existing Peak Hour Traffic Volumes

3.0 TRAFFIC ANALYSIS

A traffic analysis was conducted to review the proposed intersection improvements at Clayton Road/Treat Boulevard-Denkinger Road. The proposed improvements include widening the northbound approach of Treat Boulevard-Denkinger Road at Clayton Road to provide two exclusive left turn lanes, two through lanes, and one exclusive right turn lane. In addition, modification of the northbound approach will allow changing the signal phasing from the existing 6-phase operation, with northbound/southbound split phasing, to 8-phase operation, with northbound/southbound protected left turn phasing.

The traffic evaluation included delay, level of service, and queuing analyses, with details as follows:

- Delay and Level of Service Analysis - Conducted intersection analysis with "Before" and "After" conditions for existing and 2030 traffic volumes during both the AM and PM peak periods, to understand the impact the proposed improvements will have on intersection delay and level of service.
- Queuing Analysis - Completed for the "Before" and "After" conditions using a traffic simulation model to review the impact the proposed improvements will have on intersection queuing.

"Before" conditions refers to existing intersection geometrics and signal phasing, while "After" conditions refers to proposed geometric and signal phasing improvements.

In addition, supplemental queuing and delay analyses were conducted using manual spreadsheet methods to verify simulation results and to estimate additional maximum delay data. The analysis was conducted for the critical eastbound Clayton Road approach with existing and 2030 traffic volumes during the PM peak period, which is the heaviest period of queuing.

3.1 Traffic Model Development and Calibration

The initial step in the traffic analysis was the development and calibration of the traffic models. Traffic models were developed in the *Synchro 7* traffic operations software and the *SimTraffic* 7 simulation software and used for the traffic analysis. The *Synchro 7* software is used as the base and input model for the *SimTraffic* simulation software and was developed first. Traffic data collected including traffic volumes, geometric data, traffic signal timing, and other operational data were input into the *Synchro* model and then used for development of the *SimTraffic* simulations.

The traffic models were developed for the following scenarios:

1. Existing AM peak period under "Before" conditions
2. Existing PM peak period under "Before" conditions
3. Existing AM peak period under "After" conditions
4. Existing PM peak period under "After" conditions

5. 2030 AM peak period under "Before" conditions
6. 2030 PM peak period under "Before" conditions
7. 2030 AM peak period under "After" conditions
8. 2030 PM peak period under "After" conditions

The traffic models were developed initially for the PM peak period, which is currently the most critical period of the day, under the "Before" conditions to calibrate the model. For the PM peak period, the traffic volumes for the eastbound approach were adjusted to take into account that under current conditions, traffic demand is greater than the traffic volume that is able to be served at the intersection, or counted through the intersection, during the peak conditions. During the PM peak hour, eastbound queues will occasionally extend back to Clayton Road/Mendocino Drive. During that time, a portion of the eastbound traffic at Clayton Road/Treat Boulevard-Denkinger Road does not clear the intersection since it is not possible to provide sufficient green time to clear the queue during oversaturated periods. Therefore, traffic volume that does not clear the intersection is not counted as through vehicles and the traffic demand is greater than the turning movement counts. To capture the true eastbound traffic volume approaching Clayton Road/Treat Boulevard-Denkinger Road for the analysis, counts were collected at the upstream intersection of Clayton Road/Mendocino Drive, which is past the queue from Clayton Road/Treat Boulevard-Denkinger Road, to determine the traffic demand for the eastbound movement. Therefore, the PM peak hour volumes for the eastbound direction at Clayton Road/Treat Boulevard-Denkinger Road were adjusted based on the peak 15-minute volume at Clayton Road/Mendocino Drive and used as the demand volume for the Clayton Road/Treat Boulevard-Denkinger Road intersection eastbound volume to reflect actual conditions.

Once the models were developed, the model results for PM peak "Before" conditions were reviewed in comparison to the field observations to determine if the model reasonably matched the observed conditions. The queuing results from the simulation model were obtained and reviewed against the field conditions to verify model calibration. **Table 1**, on the following page, summarizes the comparison of the field observed queues and the model queues for the PM peak hour. Based on the comparison, it was determined that the model reasonably matched the field conditions. Detailed queuing analysis reports are included in **Appendix B.**

Using the calibrated "Before" conditions model with existing PM peak traffic volumes, traffic models were developed for the remaining scenarios. Existing traffic counts were used in conjunction with traffic forecasts from the Concord Community Reuse Plan EIR to estimate the 2030 traffic conditions. For the 2030 "Before" model, the cycle length was optimized at 160 seconds for the PM peak hour. For the Existing and 2030 PM peak hour "After" models, the cycle lengths were optimized at 130 seconds and 140 seconds, respectively.

Table 1: Average Queue Lengths Comparison for PM Peak Hour

Directions	Movements	Field Observed Conditions	*SimTraffic* Model
		Maximum Observed Queue (Per Lane)	95th Percentile Queue (Per Lane)
Eastbound	Left	200	190
	Through1	800	815
	Through2	850	850
	Through-Right	825	895
Westbound	Left1	250	245
	Left2	275	210
	Through1	1100	1375
	Through2	1000	1110
	Through-Right	350	420
Northbound	Left	150	210
	Through-Left	450	405
	Through	400	370
	Right	275	300
Southbound	Left	150	190
	Through	200	295
	Through-Right	200	245

3.2 Delay and Level of Service Analysis

A Level of Service (LOS) analysis was conducted at Clayton Road/Treat Boulevard-Denkinger Road during the AM and PM peak periods to determine the impact of the proposed improvements with existing and 2030 traffic volumes. The *Synchro 7* software was used for the LOS analysis of the "Before" and "After" conditions.

LOS is a qualitative term that describes congestion at an intersection, on the basis of ratings from A to F. LOS A describes a completely uncongested operating condition where motorists encounter virtually no delay. LOS B and LOS C describe increasing levels of congestion compared to LOS A. LOS D is what one would observe at a typical busy urban intersection during peak periods of traffic. With LOS D, some motorists may need to wait for more than one red signal cycle to get through an intersection. LOS E represents congested conditions, where a majority of motorists may need to wait for more than one red signal cycle to get through an intersection. LOS F describes severe congestion, where long queues develop and motorists encounter long delays.

For this analysis, the LOS at Clayton Road/Treat Boulevard-Denkinger Road was measured using the methodology contained in the *Highway Capacity Manual (HCM)*, 2000 Edition. The 2000 HCM methodology utilizes average delay per vehicle based upon peak hourly traffic volumes, peak hour factors, number of lanes, etc., in the LOS calculation.

The qualitative A through F LOS scale is measured quantitatively using measures of effectiveness. The measure used depends on the type of facility being assessed. **Table 2** relates the operational characteristics associated with each LOS category for signalized intersections.

Table 2: Signalized Intersection Level of Service Definitions

Level of Service	Description	Avg. control delay per vehicle (sec/veh)
A	Free flow with no delays. Users are virtually unaffected by others in the traffic stream	≤ 10
B	Stable traffic. Traffic flows smoothly with few delays.	> 10 – 20
C	Stable flow but the operation of individual users becomes affected by other vehicles. Modest delays.	> 20 – 35
D	Approaching unstable flow. Operation of individual users becomes significantly affected by other vehicles. Delays may be more than one cycle during peak hours.	> 35 – 55
E	Unstable flow with operating conditions at or near the capacity level. Long delays and vehicle queuing.	> 55 – 80
F	Forced or breakdown flow that causes reduced capacity. Stop and go traffic conditions. Excessive long delays and vehicle queuing.	> 80

Source: Transportation Research Board, *Highway Capacity Manual 2000*, National Research Council, 2000.

The performance measures and intersection LOS calculated for all analysis scenarios are summarized in **Table 3**. Detailed LOS model reports are included in **Appendix C.**

Table 3: Level of Service Summary for Clayton Road/Treat Boulevard-Denkinger Road

Direction	Approach Delay (secs./veh.)	Approach LOS	Overall Intersection Delay (secs./veh.)	Overall Intersection LOS	Approach Delay (secs./veh.)	Approach LOS	Overall Intersection Delay (secs./veh.)	Overall Intersection LOS
AM Peak								
	Existing - "Before"				**Existing - "After"**			
EB	40.2	D	37.9	D	31.8	C	32.8	C
WB	26.0	C			22.9	C		
NB	50.1	E			41.8	D		
SB	60.2	E			55.9	E		
	2030 – "Before"				**2030 – "After"**			
EB	44.9	D	44.3	D	33.0	C	34.8	C
WB	31.2	C			25.4	C		
NB	57.4	E			41.0	D		
SB	63.4	E			56.2	E		

Note: Delays are based on HCM Signalized Intersection Analysis

Table 3, continued: Level of Service Summary for Clayton Road/ Treat Boulevard-Denkinger Road

Direction	Approach Delay (secs./veh.)	Approach LOS	Overall Intersection Delay (secs./veh.)	Overall Intersection LOS	Approach Delay (secs./veh.)	Approach LOS	Overall Intersection Delay (secs./veh.)	Overall Intersection LOS
PM Peak								
	Existing - "Before"				**Existing - "After"**			
EB	86.4	F	57.8	E	42.0	D	41.0	D
WB	40.0	D			39.5	D		
NB	36.8	D			36.6	D		
SB	57.6	E			51.4	D		
	2030 - "Before"				**2030 - "After"**			
EB	97.5	F	87.1	F	52.2	D	59.1	E
WB	82.9	F			60.3	E		
NB	78.4	E			61.9	E		
SB	77.0	E			74.9	E		

Note: Delays are based on HCM Signalized Intersection Analysis

As expected, there is a reduction in delay with the proposed improvements under both Existing and 2030 traffic conditions during the AM and PM peak hours. In general, the approach delay for eastbound Clayton Road and northbound Treat Boulevard was significantly reduced in the "After" conditions compared to the "Before" conditions. The following summarizes the results of the analysis:

- During the AM peak hour under Existing traffic conditions, the overall intersection LOS was improved to C from D with the "After" conditions (proposed improvements) as compared to the "Before" conditions, with the most significant reduction in delay occurring on the northbound and eastbound approaches.
- During the PM peak hour under Existing traffic conditions, the overall intersection LOS was improved to D from E with the "After" conditions (proposed improvements) as compared to the "Before" conditions, with the most significant reduction in delay occurring on the eastbound approach, where the approach LOS improved from F to D.
- During the AM peak hour under 2030 traffic conditions, the overall intersection LOS was improved to C from D with the "After" conditions (proposed improvements) as compared to the "Before" conditions, with the most significant reduction in delay occurring on the northbound and eastbound approaches.
- During the PM peak hour under 2030 traffic conditions, the overall intersection LOS was improved to E from F with the "After" conditions (proposed improvements) as compared to the "Before" conditions, with the most significant reduction in delay occurring on the eastbound approach, where the approach LOS improved from F to D.

To capture an overall understanding of the impact of the improvements, average reduction in delay was calculated for the intersection under Existing and 2030 traffic conditions, and is as follows:

- Existing Traffic Conditions: Reduction in overall intersection delay during both the AM and PM peak hours – 23%
- 2030 Traffic Conditions: Reduction in overall intersection delay during both the AM and PM peak hours – 28%

As a result of this significant decrease in delay and improvement in LOS, additional benefits will be achieved from installing the proposed improvements, including potential reduction in collisions, reductions in vehicle emissions, shorter cycle lengths, improved signal coordination, and reduction in number of stops.

3.3 Queuing Analysis

A queuing analysis was conducted at Clayton Road/Treat Boulevard-Denkinger Road to review the impact of the proposed improvements with existing and 2030 traffic volumes. Since the most significant queuing at the intersection occurs during the PM peak period, queuing was only reviewed during that time period and was not reviewed during the AM peak period. The *SimTraffic* simulation software, which allows for the queuing to be estimated over the full peak hour, was used for the queuing analysis of the "Before" and "After" conditions.

Queuing was reviewed for the critical movements at the intersection for each condition. During the PM peak, all eastbound and northbound movements and the westbound left turn movement have the longest queues for this intersection and therefore were considered to be the critical movements. The queue data was obtained by both a visual review of the simulation itself and from the queue data report from the model. **Table 4** summarizes the queuing results, including the average queues and estimated maximum queues (95th percentile queues) for the critical movements during the PM peak hour with Existing and 2030 "Before" and "After" conditions.

Table 4: Queue Lengths for Critical Movements During the PM Peak Hour

Traffic Volume Conditions	Directions	Turning Movements	"Before" Conditions			"After" Conditions		
			Storage Length Per Lane (ft)	Average Queue Per Lane (ft)	95th Percentile Queue Per Lane (ft)	Storage Length Per Lane (ft)	Average Queue Per Lane (ft)	95th Percentile Queue Per Lane (ft)
Existing	Eastbound	Left	160	140	190	160	110	185
		Through1	570[2]	630	815	570[2]	440	600
		Through2		645	850		435	575
		Through-Right		675	895		495	660
	Westbound	Left1	215	220	245	215	195	235
		Left2		240	245		210	265
	Northbound	Left1	165	145	210	165	130	185
		Left2	-	-	-		150	210
		Through1[1]	1000[2]	265	405	1000[2]	175	280
		Through2		260	370		185	255
		Right	170	145	300	375	130	280

Table 4, continued: Queue Lengths for Critical Movements During the PM Peak Hour

Traffic Volume Conditions	Directions	Turning Movements	"Before" Conditions			"After" Conditions		
			Storage Length Per Lane (ft)	Average Queue Per Lane (ft)	95th Percentile Queue Per Lane (ft)	Storage Length Per Lane (ft)	Average Queue Per Lane (ft)	95th Percentile Queue Per Lane (ft)
2030	Eastbound	Left	160	140	225	160	120	190
		Through1[1]	570[2]	1145	1725	570[2]	875	1325
		Through2		1175	1745		875	1385
		Through-Right		1230	1750		990	1445
	Westbound	Left1	215	260	275	215	260	275
		Left2		310	335		310	325
	Northbound	Left1	165	145	235	165	145	190
		Left2	-	-	-		185	205
		Through1	1000[2]	1000	1285	1000[2]	520	790
		Through2		1000	1290		540	850
		Right	170	465	730	375	320	485

Note: 1 – Through-Left in "Before" conditions
2 – The storage is considered the distance measured to the adjacent intersection

From the Existing traffic conditions simulation analysis, the following benefits are noted as a result of the proposed improvements:

- Under the "Before" conditions, the average queues for the eastbound approach extend past the adjacent intersection to the west at Denkinger Court, whereas under the "After" conditions, the simulation showed the average queues were shorter and did not extend to the upstream intersection. The 95th percentile queues showed a spillback past Denkinger Court under both conditions; however, the queue lengths under "After" conditions were shorter than "Before" conditions.
- Under the "Before" conditions, the queues for the northbound left turn movement frequently exceed the storage length and stack in the northbound shared through-left turn lane causing delays and additional queues for the northbound through movements. Under the 'After" conditions, both the average and 95th percentile queues were observed to exceed the storage slightly for the northbound left turn movement; however, the left turn had minimal effect on delays and queues for the northbound through movement.
- Under the "Before" conditions, the 95th percentile queue for the northbound right turn movement exceeds the existing available storage length, whereas under the "After" conditions, the 95th percentile queue for this movement does not exceed the proposed storage length.

From the 2030 traffic conditions simulation analysis, the following benefits are noted as a result of the proposed improvements:

- The simulation models showed that both the average and 95th percentile queues spill back and extend past the adjacent intersection to the west at Denkinger Court in the eastbound direction under both conditions; however, the queue lengths under "After" conditions were significantly shorter than "Before" conditions.
- Under the "Before" conditions, the queues for the northbound left turn movement were frequently observed to exceed the storage length, and extended queues were stacked in the northbound shared through-left turn lane in the simulation, causing delays and additional queues for the northbound through movement. Under the "Before" conditions, both the average and 95th percentile northbound queues were observed to extend towards the upstream intersection to the south at Bel Air Drive. Under the "After" conditions, both the average and 95th percentile queues were observed to exceed the storage slightly for the northbound left turn movement; however, the left turn had a minimal effect on delays and queues for the northbound through movement.
- Under the "Before" conditions, both the average and 95th percentile queues for the northbound right turn movement exceed the existing storage length, whereas under the "After" conditions, the average queue for this movement does not exceed the proposed storage length. The 95th percentile queue exceeds the proposed storage length under the "After" conditions; however, the queue length under "After" conditions is significantly shorter than that under "Before" conditions.

3.4 Supplemental Analysis

Additional queuing and delay analyses were performed by City staff to verify and supplement the model results and to more accurately estimate the maximum delay in the queue that eastbound traffic experiences by not being served in one cycle. Analysis was conducted using manual methods to determine the average and maximum queues per lane and delays associated with the queuing for "Before" and "After" conditions under both Existing and 2030 traffic volumes. The queuing analysis was conducted based on basic queuing theory, looking at 15-minute demand volumes versus 15-minute service volumes, per lane, and estimating queue formation from cumulative demand where vehicles are not served through the intersection in one cycle due to inadequate service capacity. Based on the queues and the time it would take for traffic to be serviced by the traffic signal, the estimated average delay and maximum delay in the queue were calculated. **Table 5** shows the results from the supplemental analysis. Detailed supplemental queuing analyses are included in **Appendix D.**

Table 5: Supplemental PM Peak Hour Queuing Analysis for Eastbound Clayton Road

Scenario	Average Queue per Lane (vehicles)	Reduction in Average Queue	Maximum Queue per Lane (vehicles)	Reduction in Maximum Queue	Average Delay in Queue (seconds)	Reduction in Average Delay in Queue	Maximum Delay in Queue (seconds)	Reduction in Maximum Delay in Queue	Total Delay (vehicle hours)	Reduction in Total Delay (vehicle hours)
Existing "Before"	22	-	37	-	138	-	228	-	28	-
Existing "After"	18	18%	27	27%	106	23%	163	29%	13.5	52%
2030 "Before"	47	-	73	-	226	-	348	-	66.5	-
2030 "After"	35	26%	57	22%	168	26%	267	23%	47	29%

Note: – Prepared by City Staff

As shown in the results, there is a substantial reduction in average and maximum queue lengths under the "After" conditions as compared to the "Before" conditions. The corresponding average, maximum, and total delays were reduced consistent with the reduction in queuing for the "After" conditions. Under the Existing "After" conditions with the improvements, the results show a reduction of maximum queues of 27% and total delay of 52%, and under the 2030 "After" conditions, results indicate a reduction of maximum queues of 22% and total delay of 29%. The results from this supplemental queuing analysis show similar results as obtained from the *SimTraffic* simulation analyses and summarized in **Table 4**.

3.5 Benefit Analysis

To understand the overall non-monetary and monetary benefits of installing the proposed improvements, a benefits analysis was conducted based on the traffic analysis results. With a reduction in queuing and delay, there are corresponding benefits such as time savings for people traveling through the intersection and along the corridor, fuel savings, and emission reductions. These benefits have corresponding monetary savings due to cost of time, cost of fuel, and health costs associated with the emission reductions.

Based on the traffic analysis results, the total benefits were calculated for the current year based on the total yearly travel time savings, and resultant time, fuel, and emission reductions. Based on the total benefits, total dollar savings was calculated based on methods developed and used by the Metropolitan Transportation Commission (MTC) for traffic operations projects. **Table 6** summarizes the total project benefits. The table also summarizes the assumptions and methods for calculating the project benefits and costs. The benefits are based on the savings with Existing and 2030 "After" conditions for AM and PM peak periods only. Additional benefits can be achieved during the off-peak hours and weekends.

Table 6: Clayton Road/Treat Boulevard-Denkinger Road AM/PM Peak Benefits Summary

Benefits				
	Existing		2030	
Savings	**Savings**	**Monetary Savings**	**Savings**	**Monetary Savings**
Travel Time Savings	9,340 hrs	$167,999	20,000 hrs	$357,600
Fuel Consumption Saving	6,700 gals	$20,033	17,500 gals	$52,325
NOx Emissions Reduction	0.10 ton	$1,720	0.25 ton	$4,281
CO Emissions Reduction	0.50 ton	$37	1.25 ton	$93
VOC Emissions Reduction	0.12 ton	$140	0.29 ton	$349
Total Benefits (in 2010 dollars)		$189,929		$414,648
Total Benefits for 20 years (in 2010 dollars)				$6,035,770

Notes:

- General methodology, fuel consumption factors, and health costs of motor vehicle emissions based on California Department of Transportation, Office of Transportation Economics. California Life-Cycle Benefit/Cost Analysis Model and Technical Supplement to the User's Guide, 2009.
- Benefits claimed include travel time savings, fuel consumption savings, and health cost savings associated with emissions reductions for weekday peak periods (2 hours each in AM and PM peak) only. Yearly savings calculated based on 250 days of workday in a year.
- Value of time assumed to be 50 percent of the wage rate for off-the-clock travel or $17.88 in 2010 constant dollars. Bay Area average wage rate is $20.82 per hour in 1990 constant dollars, based on Travel Demand Models for the San Francisco Bay Area [BAYCAST-90] Technical Summary, Table 4, p. 28, June 1997. Adjusted for inflation using CPI, from US Dept of Labor, Bureau of Labor Statistics, CPI - All Urban Consumers, San Francisco-Oakland-San Jose, CA area, All Items, Not Seasonally Adjusted (Series Id:CUURA422SA0). Vehicle fleet assumed to be 100 percent automobiles. Average vehicle occupancy assumed to be one.
- Fuel cost assumed to be $2.99 per gallon, from US Dept of Labor Bureau of Labor Statistics, CPI - Average Price Data, San Francisco-Oakland-San Jose, CA area, Gasoline unleaded regular per gallon. Average of monthly prices in the Bay Area from July 2009 – June 2010.
- Health cost of NOx Emissions ($17,298 per ton), CO Emissions ($74 per ton), and VOC Emissions ($1,210 per ton) are based on the California Department of Transportation, Office of Transportation Economics from Exhibit III-41, p. III-64 of the year 2007. The 2010 costs are calculated with a standard assumption of 2% increase per year from the 2007 costs.
- Total benefits for 20 years were calculated by straight line average between 2010 and 2030.

4.0 CONCEPTUAL PLAN, ROW LAYOUT, ESTIMATE

A conceptual design plan was developed at Clayton Road/Treat Boulevard-Denkinger Road for the proposed improvements. A detailed ground topographic survey was conducted at the intersection based on the City's horizontal and vertical control for establishing the existing conditions. In addition, a field review of the existing infrastructure was completed. Based on the topographic survey mapping and field review, base plans of the Existing conditions and a conceptual plan of the proposed improvements were developed. The conceptual plan is included in **Appendix E**. The conceptual plan includes the proposed layout of the civil improvements, signing and striping improvements, and existing and proposed signal equipment.

The intersection improvements will require widening of the roadway on the southeast side of the intersection to accommodate the additional lane. In addition, it will require minor widening north of the intersection on the east side to transition the northbound through lanes to the existing alignment. The length of the widening on the southeast side of the intersection is dependent upon the required storage for the northbound movements, with it primarily dependent upon the length of the right turn pocket. The lengths of the northbound left and right turn storage bays were reviewed based on the queuing analysis. Based on this analysis, the length of the proposed left turn pockets will provide adequate storage. For the northbound right turn movement, the pocket should be extended from its current length and as far back as feasible from the intersection to accommodate maximum queuing in the year 2030 (485'). Therefore, the right turn pocket was laid out to extend to the main driveway for the adjacent Bel Air Shopping Center south of the intersection, which would increase the right turn storage from its existing length of 170' to a required minimum of 375'. The proposed improvement would provide additional storage for right turn vehicles, although this length may still be exceeded under the highest peak conditions based on the 2030 queuing analysis.

The widening of the roadway would require obtaining Right-of-Way (ROW) on the southeast side of the intersection. In addition, the widening will have an impact on the street lighting, landscaping, circulation, etc., and may affect the parking and driveways of the adjacent properties, as shown in the Conceptual Plan. The following summarizes a number of impacts and adjustments required with the widening of Treat Boulevard on the east side south of the intersection:

- The driveways at the gas station on the southeast corner of the intersection will be affected and coordination with the property owner regarding preferred circulation is recommended. In particular, the driveway on Clayton Road closest to Treat Boulevard will need to be relocated and narrowed in size. This improvement will also require relocation of an existing storm drain inlet.
- The gas station drive aisle along the Treat Boulevard side of the main gas station building will be narrowed and can accommodate one-way traffic.
- The gas station pricing sign will need to be relocated.
- Two existing observation and monitoring wells at the gas station will need to be relocated.
- 24 parking spaces will need to be removed within the adjacent shopping center to accommodate the widening. This impact is discussed in more detail in Section 5.0.

- Various utilities will need to be relocated.
- Existing overhead poles will need to be relocated or undergrounded.

The addition of a lane on the south leg of the intersection will result in a shift of the northbound through lanes to the east through the intersection. As a result, the existing "pork-chop" island on the northeast corner will need to be removed to accommodate the new alignment, and minor roadway widening on the east side of the roadway north of the intersection will be required to provide a transition of the northbound through lanes to the existing lane alignment. The widening of the roadway on the northeast corner can be accommodated within the existing ROW, although the widening will require the relocation of a PG&E vault and removal/replacement of a storm drain inlet.

To estimate the impact on the adjacent properties and the ROW acquisition that would be required for the improvements, a layout of the existing and proposed ROW was developed. A ROW diagram is included in **Appendix F**. As shown, an estimated 8,415 sq. ft. of total ROW would be required for the improvements.

Based on the Conceptual Plan, a preliminary cost estimate totaling $2.59 million was developed (see **Appendix G)**. This cost estimate includes the undergrounding of existing overhead utilities which will be impacted as a result of the proposed widening on Treat Boulevard.

5.0 SUMMARY OF FINDINGS

Kimley-Horn reviewed "Before" and "After" scenarios for both Existing and 2030 traffic conditions including overall intersection operations, congestion, and queuing. The findings of the analyses are summarized as follows:

- In the Existing "Before" conditions, the intersection operates with an unacceptable level of service (LOS E) during the PM peak hour; whereas it operates with an acceptable level of service (LOS D) in the "After" conditions.
- Both in the 2030 "Before" and "After" conditions, the intersection operates with an unacceptable level of service during the PM peak hour, but the "After" conditions operate with reduced delay (with LOS E) as compared to the "Before" conditions (LOS F).
- Both in the Existing and 2030 "After" conditions, the intersection operates with reduced delay and improved LOS C during the AM peak hour compared to Existing and 2030 "Before" conditions (LOS D), respectively.
- As shown in Table 5, during the PM peak hour, average delay, maximum delay, and total delay in queue for eastbound Clayton Road were substantially reduced in "After" conditions as compared to "Before" conditions both under Existing and 2030 traffic volumes.
- The proposed improvements will substantially reduce the size of the queue for eastbound Clayton Road during the PM peak hour under both Existing and 2030 traffic conditions.
- During the PM peak hour, for both Existing and 2030 "Before" conditions, the average queues exceed the storage lengths for northbound left and right turn movements, whereas for both Existing and 2030 "After" conditions, the recommended northbound left and right turn storage lengths will accommodate the average queues. In the 2030 "After" conditions, the northbound right turn 95th percentile queue might extend past the 375' minimum storage lane recommended in this study. However, the 95th percentile queue may only occur during a short period of the PM peak hour and the queue could be cleared quickly.
- Since the Clayton Road/Treat Boulevard-Denkinger Road intersection controls the cycle length for signal coordination along the corridor, the improvements will allow for the cycle length to be shortened not only for this intersection but also for other intersections along the corridor during the peak periods. As a result, additional reduction in delay and benefits for the entire corridor can be realized that are not reflected in this analysis.
- The proposed improvements will require widening the northbound Treat Boulevard approach and acquiring an estimated 8,415 sq. ft. of additional right-of-way to accommodate the widening and the minimum lane storage requirement for the northbound right turn movement. Additionally, 24 parking spaces will need to be removed on the west side of the parking lot for the adjacent Bel Air Shopping Center, to accommodate the widening. These spaces are located between the shopping center main driveway along Treat Boulevard and the gas station located on the southeast corner of the Clayton Road/Treat Boulevard-Denkinger Road intersection. City Staff conducted a multi-day parking demand survey within the shopping center between November 21 and December 5, 2010 (for a total of 15 individual surveys) to determine if the removal of these spaces would create a parking shortage within the shopping center. The survey

consisted of counting the number of occupied parking spaces during high demand periods and comparing this number to on-site parking supply. The survey was performed on several weekdays and weekends, including post Thanksgiving Day, in order to capture holiday season parking demand. Survey results are listed in **Appendix H**.

The Bel Air Shopping Center consists of approximately 103,400 square feet of gross floor area (excluding the gas station building) occupied by two main stores (CVS/pharmacy and Staples), U.S. Postal Office, RadioShack, Citibank, and other small businesses. A small portion of this floor area (approximately 10,500 square feet) appeared to be vacant when the parking demand survey was conducted. This vacant floor space is generally located in the middle part of the shopping center and south of the east-west drive-aisle that connects the parking lot directly to the main access driveway off of Treat Boulevard.

There are 388 marked parking spaces within the Bel Air Shopping Center, including 218 spaces on the south side of the main access drive aisle (south lot), and 170 spaces on the north side parking where 24 spaces are proposed to be eliminated (north lot). A maximum occupancy of 146 spaces was observed from the survey, or 38% of total parking supply. This occupancy included 98 spaces (or 45% occupancy rate) within the south lot, and 48 spaces (or 28% occupancy rate) within the north lot. Removal of 24 spaces would only increase the maximum occupancy rate to 40% for the entire shopping center and to 33% for the north lot, thus continuing to maintain a parking surplus. Additionally, none of the spaces proposed to be eliminated were ever found to be occupied when individual surveys were taken, mainly because of the remote location of these spaces and availability of other parking spaces located much closer to the shopping center buildings.

Additionally, parking demand data obtained from the survey were extrapolated linearly to estimate parking conditions for a fully occupied shopping center (i.e., vacant floor space was assumed to be backfilled with new businesses), coupled with the removal of 24 parking spaces from the north lot as proposed. Under this scenario, it was found that the maximum parking occupancy rate would increase to 45% for the entire shopping center and to 34% for the north lot. For the south lot, the maximum parking occupancy rate would increase to 52% as a result of filling up the vacant floor space with new businesses. Therefore, a fully occupied Bel Air Shopping Center would still operate with a parking surplus despite the 24 parking spaces being eliminated as proposed.

Based on this analysis, it was concluded that the proposed removal of 24 parking spaces would not create a parking shortage within the shopping center. The center would continue to have an adequate supply of on-site parking, even with the elimination of 24 spaces to accommodate the proposed project.

- The widening of the northbound approach on Treat Boulevard and the required ROW acquisition from the gas station is not expected to impact the operations of the refueling trucks for the gas station. A conceptual plan showing the path and circulation of the refueling trucks with the proposed improvements is included in **Appendix I**. The

refueling tanks for the gas station are located just west of the gas pump drive aisles (outside the widening limits). Currently, refueling trucks traveling northbound on Treat Boulevard enter the gas station at the northern most driveway adjacent to the Clayton Road/Treat Boulevard-Denkinger Road intersection and park between the gas pump drive aisles to refuel the tanks. It does not appear that this path of entering and exiting the gas station and method of filling the gas tanks will be impacted by the improvements, as shown in the refueling truck circulation plan. Refueling trucks traveling on eastbound Clayton Road currently enter the gas station at the second driveway past the Clayton Road/Treat Boulevard-Denkinger Road intersection, travel around the gas station building, and stop parallel to Treat Boulevard to refuel the tanks. Similarly, it does not appear this path for entering and exiting the gas station and method of filling the gas tanks will be impacted by the improvements, as shown in the refueling truck circulation plan. However, this path will require removal of the existing bollards and modification of the existing curb return (island) on the southwest corner of the gas station building. The area contained within the bollards used to house a propane tank and is now no longer in use.

6.0 CONCLUSION

The Clayton Road/Treat Boulevard-Denkinger Road intersection is identified in the Central Contra Costa County Action Plan as a Route of Regional Significance. This intersection is highly congested during the evening commute period due to its central location in the City of Concord, serving both work and non-work related vehicle trips. Most importantly, the Clayton Road eastbound approach experiences oversaturated conditions as a result of heavy traffic demand and limited intersection capacity during this period, resulting in bottleneck conditions and excessive delays to clear the intersection in the eastbound direction. These conditions are expected to worsen to more intolerable levels by 2030 unless intersection capacity is expanded.

The proposed intersection improvements will improve its geometric design and upgrade the existing traffic signal to a more efficient 8-phase operation, thus expanding intersection capacity to improve level of service, reduce stopped delay, and relieve queuing conditions during the PM peak period. Current vehicle delays and traffic backups along the Clayton Road eastbound approach will be substantially mitigated with the implementation of this project. Additionally, the proposed improvements will significantly reduce the severity of impacts anticipated at buildout as a result of increased traffic volumes.

APPENDICES

A. Traffic Counts

B. Queuing Analysis Reports

C. LOS Analysis Reports

D. Supplemental Analysis

E. Conceptual Plan

F. ROW Layout

G. Preliminary Project Cost Estimate

H. Parking Demand Survey

I. Gas Station – Refueling Truck Circulation

Appendix A
Traffic Counts

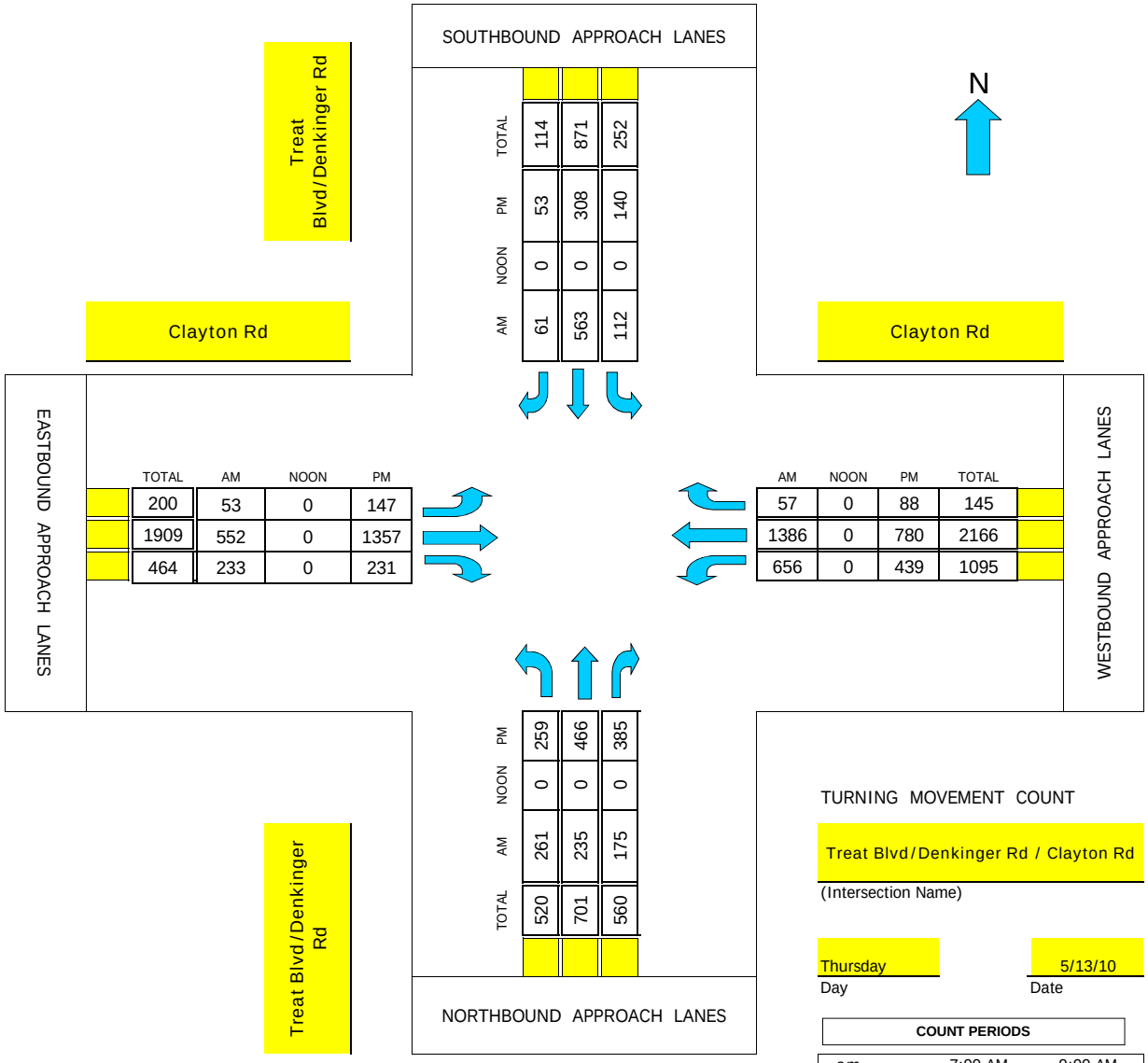
Intersection Turning Movement

Prepared by:

National Data & Surveying Services

TMC Summary of Treat Blvd/Denkinger Rd/Clayton Rd

Project #: 10-7182-001



	TOTAL	PM	NOON	AM
	114	53	0	61
	871	308	0	563
	252	140	0	112

TOTAL	AM	NOON	PM
200	53	0	147
1909	552	0	1357
464	233	0	231

AM	NOON	PM	TOTAL
57	0	88	145
1386	0	780	2166
656	0	439	1095

	PM	NOON	AM	TOTAL
	259	0	261	520
	466	0	235	701
	385	0	175	560

TURNING MOVEMENT COUNT

Treat Blvd/Denkinger Rd / Clayton Rd

(Intersection Name)

Thursday — Day

5/13/10 — Date

COUNT PERIODS			
am	7:00 AM	-	9:00 AM
noon		-	
pm	4:00 PM	-	6:30 PM

AM PEAK HOUR	730 AM
NOON PEAK HOUR	0 AM
PM PEAK HOUR	530 PM

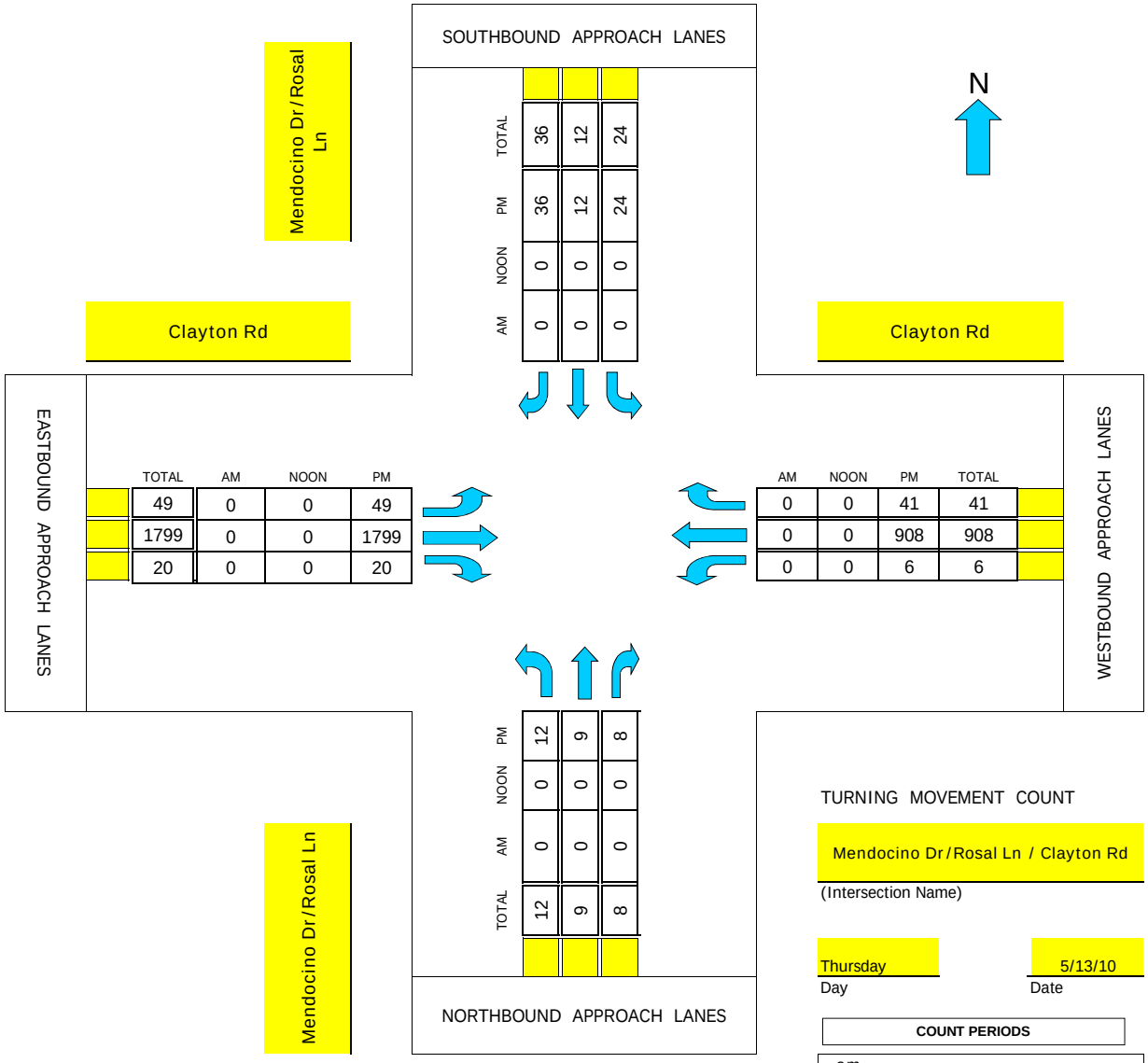
Intersection Turning Movement

Prepared by:

National Data & Surveying Services

TMC Summary of Mendocino Dr/Rosal Ln/Clayton Rd

Project #: 10-7182-002



	AM	NOON	PM	TOTAL
	0	0	36	36
	0	0	12	12
	0	0	24	24

	TOTAL	AM	NOON	PM
	49	0	0	49
	1799	0	0	1799
	20	0	0	20

	AM	NOON	PM	TOTAL
	0	0	41	41
	0	0	908	908
	0	0	6	6

	AM	NOON	PM	TOTAL
	0	0	12	12
	0	0	9	9
	0	0	8	8

TURNING MOVEMENT COUNT

Mendocino Dr/Rosal Ln / Clayton Rd

(Intersection Name)

Thursday — Day

5/13/10 — Date

COUNT PERIODS			
am		-	
noon		-	
pm	4:00 PM	-	6:30 PM

AM PEAK HOUR	0 AM
NOON PEAK HOUR	0 AM
PM PEAK HOUR	515 PM

Appendix B
Queuing Analysis Reports

Intersection: 170: Clayton Road & Denkinger Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	TR	L	L	T	T	TR	L	LT	T
Maximum Queue (ft)	185	821	812	936	227	240	1254	1018	484	189	431	450
Average Queue (ft)	140	628	645	674	221	239	1029	532	246	146	264	258
95th Queue (ft)	189	815	849	896	245	241	1373	1108	419	210	405	370
Link Distance (ft)		1838	1838	1838			1794	1794	1794		651	651
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160				215	215				165		
Storage Blk Time (%)	8	57			64	75	1			2	16	0
Queuing Penalty (veh)	37	89			196	228	5			10	27	0

Intersection: 170: Clayton Road & Denkinger Road

Movement	NB	SB	SB	SB
Directions Served	R	L	T	TR
Maximum Queue (ft)	375	169	241	235
Average Queue (ft)	144	150	163	171
95th Queue (ft)	301	193	250	237
Link Distance (ft)			1009	1009
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)	350	145		
Storage Blk Time (%)	1	11	9	
Queuing Penalty (veh)	2	19	15	

Intersection: 170: Clayton Road & Denkinger Road, All Intervals

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	TR	L	L	T	T	TR	L	L	T
Maximum Queue (ft)	184	617	598	668	226	239	474	475	368	177	189	294
Average Queue (ft)	110	438	435	493	195	210	221	206	218	129	148	176
95th Queue (ft)	184	602	577	662	236	264	441	374	348	183	211	278
Link Distance (ft)		1832	1832	1832			1787	1787	1787			651
Upstream Blk Time (%)												
Queuing Penalty (veh)												
Storage Bay Dist (ft)	160				215	215				165	165	
Storage Blk Time (%)	9	38			4	5	0			5	9	3
Queuing Penalty (veh)	47	67			12	15	0			17	29	11

Intersection: 170: Clayton Road & Denkinger Road, All Intervals

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	TR
Maximum Queue (ft)	256	334	169	296	232
Average Queue (ft)	186	128	132	136	156
95th Queue (ft)	257	279	192	260	238
Link Distance (ft)	651			1008	1008
Upstream Blk Time (%)					
Queuing Penalty (veh)					
Storage Bay Dist (ft)		350	145		
Storage Blk Time (%)		0	11	7	
Queuing Penalty (veh)		0	22	14	

Intersection: 170: Clayton Road & Denkinger Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	TR	L	L	T	T	TR	L	LT	T
Maximum Queue (ft)	185	1700	1746	1787	265	315	1815	1824	1796	190	1071	1070
Average Queue (ft)	140	1145	1175	1232	257	311	1369	732	559	145	1000	996
95th Queue (ft)	223	1729	1743	1751	275	336	2250	1786	1610	235	1286	1291
Link Distance (ft)		2500	2500	2500			1788	1788	1788		1000	1000
Upstream Blk Time (%)							31	1	0		53	53
Queuing Penalty (veh)							125	5	1		0	0
Storage Bay Dist (ft)	160				215	215				165		
Storage Blk Time (%)	14	50			74	79	1			7	74	57
Queuing Penalty (veh)	84	73			173	184	4			32	104	292

Intersection: 170: Clayton Road & Denkinger Road

Movement	NB	B300	B300	SB	SB	SB
Directions Served	R	T	T	L	T	TR
Maximum Queue (ft)	575	683	683	170	1023	1023
Average Queue (ft)	463	543	553	141	656	636
95th Queue (ft)	730	954	971	207	1012	980
Link Distance (ft)		668	668		1009	1009
Upstream Blk Time (%)		29	47		2	1
Queuing Penalty (veh)		0	0		0	0
Storage Bay Dist (ft)	550			145		
Storage Blk Time (%)	3			26	64	
Queuing Penalty (veh)	9			62	114	

Intersection: 170: Clayton Road & Denkinger Road

Movement	EB	EB	EB	EB	WB	WB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	TR	L	L	T	T	TR	L	L	T
Maximum Queue (ft)	185	1443	1461	1568	265	314	1820	1624	1610	177	189	996
Average Queue (ft)	121	874	935	988	261	310	1118	546	352	167	185	519
95th Queue (ft)	192	1324	1384	1443	274	325	2110	1382	1128	188	204	788
Link Distance (ft)		2494	2494	2494			1783	1783	1783			1004
Upstream Blk Time (%)							9					0
Queuing Penalty (veh)							37					0
Storage Bay Dist (ft)	160				215	215				165	165	
Storage Blk Time (%)	9	45			69	72				23	46	28
Queuing Penalty (veh)	53	65			161	167				79	158	80

Intersection: 170: Clayton Road & Denkinger Road

Movement	NB	NB	SB	SB	SB
Directions Served	T	R	L	T	TR
Maximum Queue (ft)	1056	400	170	852	826
Average Queue (ft)	538	321	163	517	486
95th Queue (ft)	851	484	199	800	789
Link Distance (ft)	1004			1006	1006
Upstream Blk Time (%)	0				
Queuing Penalty (veh)	0				
Storage Bay Dist (ft)		375	145		
Storage Blk Time (%)	20	4	79	16	
Queuing Penalty (veh)	101	12	189	29	

Appendix C
LOS Analysis Reports

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	552	233	656	1386	57	261	235	175	112	563	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.91	0.91	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4829		3433	5048		1610	3341	1568	1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4829		3433	5048		1610	3341	1568	1770	3482	
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	62	649	274	737	1557	64	272	245	182	119	599	65
RTOR Reduction (vph)	0	49	0	0	3	0	0	0	107	0	6	0
Lane Group Flow (vph)	62	874	0	737	1618	0	169	348	75	119	658	0
Confl. Peds. (#/hr)	12		4	4		12	3		8	8		3
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot			Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases									3			
Actuated Green, G (s)	7.8	37.8		33.7	63.7		20.0	20.0	53.7	28.5	28.5	
Effective Green, g (s)	9.8	39.8		35.7	65.7		22.0	22.0	57.7	30.5	30.5	
Actuated g/C Ratio	0.07	0.28		0.26	0.47		0.16	0.16	0.41	0.22	0.22	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	124	1373		875	2369		253	525	680	386	759	
v/s Ratio Prot	0.04	0.18		c0.21	c0.32		c0.10	0.10	0.03	0.07	c0.19	
v/s Ratio Perm									0.02			
v/c Ratio	0.50	0.64		0.84	0.68		0.67	0.66	0.11	0.31	0.87	
Uniform Delay, d1	62.7	43.8		49.5	29.0		55.6	55.5	25.3	45.9	52.8	
Progression Factor	1.00	0.83		0.82	0.54		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	2.3		5.6	1.2		5.1	2.4	0.0	0.2	9.9	
Delay (s)	63.9	38.6		46.1	16.9		60.7	58.0	25.4	46.1	62.7	
Level of Service	E	D		D	B		E	E	C	D	E	
Approach Delay (s)		40.2			26.0			50.1			60.2	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	37.9	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	53	552	233	656	1386	57	261	235	175	112	563	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	0.99		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4829		3433	5048		3433	3539	1565	1770	3482	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4829		3433	5048		3433	3539	1565	1770	3482	
Peak-hour factor, PHF	0.85	0.85	0.85	0.89	0.89	0.89	0.96	0.96	0.96	0.94	0.94	0.94
Adj. Flow (vph)	62	649	274	737	1557	64	272	245	182	119	599	65
RTOR Reduction (vph)	0	55	0	0	3	0	0	0	61	0	6	0
Lane Group Flow (vph)	62	868	0	737	1618	0	272	245	121	119	658	0
Confl. Peds. (#/hr)	12		4	4		12	3		8	8		3
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases									8			
Actuated Green, G (s)	6.8	37.8		31.6	62.6		13.1	28.7	60.3	11.9	27.5	
Effective Green, g (s)	8.8	39.8		33.6	64.6		15.1	30.7	64.3	13.9	29.5	
Actuated g/C Ratio	0.07	0.31		0.26	0.50		0.12	0.24	0.49	0.11	0.23	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	120	1478		887	2508		399	836	810	189	790	
v/s Ratio Prot	0.04	0.18		c0.21	c0.32		c0.08	0.07	0.04	0.07	c0.19	
v/s Ratio Perm									0.04			
v/c Ratio	0.52	0.59		0.83	0.65		0.68	0.29	0.15	0.63	0.83	
Uniform Delay, d1	58.5	38.2		45.5	24.2		55.1	40.7	17.9	55.6	47.9	
Progression Factor	0.94	0.74		0.78	0.58		0.97	1.12	0.75	1.00	1.00	
Incremental Delay, d2	1.5	1.7		4.9	1.0		3.6	0.1	0.0	4.7	7.2	
Delay (s)	56.6	30.1		40.4	15.0		57.4	45.6	13.5	60.2	55.1	
Level of Service	E	C		D	B		E	D	B	E	E	
Approach Delay (s)		31.8			22.9			41.8			55.9	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	75.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	1545	266	439	780	88	259	466	385	140	308	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.91	0.91	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4962		3433	4996		1610	3381	1556	1770	3447	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4962		3433	4996		1610	3381	1556	1770	3447	
Peak-hour factor, PHF	1.00	1.00	1.00	0.85	0.85	0.85	0.80	0.80	0.80	0.86	0.86	0.86
Adj. Flow (vph)	169	1545	266	516	918	104	324	582	481	163	358	62
RTOR Reduction (vph)	0	17	0	0	9	0	0	0	101	0	11	0
Lane Group Flow (vph)	169	1794	0	516	1013	0	292	614	380	163	409	0
Confl. Peds. (#/hr)	5		1	1		5	7		10	10		7
Confl. Bikes (#/hr)			3			3			9			3
Turn Type	Prot			Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases									3			
Actuated Green, G (s)	16.4	44.6		24.6	52.8		29.5	29.5	54.1	21.3	21.3	
Effective Green, g (s)	18.4	46.6		26.6	54.8		31.5	31.5	58.1	23.3	23.3	
Actuated g/C Ratio	0.13	0.33		0.19	0.39		0.22	0.22	0.42	0.17	0.17	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	233	1652		652	1956		362	761	679	295	574	
v/s Ratio Prot	0.10	c0.36		c0.15	0.20		0.18	c0.18	0.11	0.09	c0.12	
v/s Ratio Perm									0.14			
v/c Ratio	0.73	1.09		0.79	0.52		0.81	0.81	0.56	0.55	0.71	
Uniform Delay, d1	58.4	46.7		54.1	32.5		51.4	51.4	31.2	53.6	55.2	
Progression Factor	1.24	0.83		0.84	1.03		0.75	0.76	0.66	1.00	1.00	
Incremental Delay, d2	7.9	48.2		6.0	1.0		9.8	4.9	0.5	1.3	3.5	
Delay (s)	80.2	87.0		51.3	34.4		48.4	43.8	20.9	54.8	58.7	
Level of Service	F	F		D	C		D	D	C	D	E	
Approach Delay (s)		86.4			40.0			36.8			57.6	
Approach LOS		F			D			D			E	

Intersection Summary			
HCM Average Control Delay	57.8	HCM Level of Service	E
HCM Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.0%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	169	1545	266	439	780	88	259	466	385	140	308	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.98		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4962		3433	4996		3433	3539	1556	1770	3448	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4962		3433	4996		3433	3539	1556	1770	3448	
Peak-hour factor, PHF	1.00	1.00	1.00	0.85	0.85	0.85	0.80	0.80	0.80	0.86	0.86	0.86
Adj. Flow (vph)	169	1545	266	516	918	104	324	582	481	163	358	62
RTOR Reduction (vph)	0	17	0	0	10	0	0	0	113	0	11	0
Lane Group Flow (vph)	169	1794	0	516	1012	0	324	582	368	163	409	0
Confl. Peds. (#/hr)	5		1	1		5	7		10	10		7
Confl. Bikes (#/hr)			3			3			9			3
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases									8			
Actuated Green, G (s)	14.6	50.1		19.0	54.5		16.6	25.7	44.7	15.2	24.3	
Effective Green, g (s)	16.6	52.1		21.0	56.5		18.6	27.7	48.7	17.2	26.3	
Actuated g/C Ratio	0.13	0.40		0.16	0.43		0.14	0.21	0.37	0.13	0.20	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	226	1989		555	2171		491	754	619	234	698	
v/s Ratio Prot	0.10	c0.36		c0.15	0.20		0.09	c0.16	0.10	c0.09	0.12	
v/s Ratio Perm									0.14			
v/c Ratio	0.75	0.90		0.93	0.47		0.66	0.77	0.60	0.70	0.59	
Uniform Delay, d1	54.7	36.6		53.8	26.1		52.7	48.2	32.7	53.9	46.9	
Progression Factor	1.30	0.88		0.86	0.94		1.05	0.70	0.64	1.00	1.00	
Incremental Delay, d2	9.8	6.3		21.5	0.7		2.0	3.7	0.8	7.1	0.8	
Delay (s)	80.8	38.4		67.9	25.2		57.6	37.4	21.6	61.0	47.7	
Level of Service	F	D		E	C		E	D	C	E	D	
Approach Delay (s)		42.0			39.5			36.6			51.4	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	41.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	85.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	624	271	718	1513	27	381	506	257	91	588	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.91	0.91	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4823		3433	5069		1610	3364	1565	1770	3486	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	0.99	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4823		3433	5069		1610	3364	1565	1770	3486	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	98	624	271	718	1513	27	381	506	257	91	588	58
RTOR Reduction (vph)	0	54	0	0	1	0	0	0	142	0	6	0
Lane Group Flow (vph)	98	841	0	718	1539	0	286	601	115	91	640	0
Confl. Peds. (#/hr)	12		4	4		12	3		8	8		3
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot			Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases									3			
Actuated Green, G (s)	9.5	34.1		32.0	56.6		26.8	26.8	58.8	27.1	27.1	
Effective Green, g (s)	11.5	36.1		34.0	58.6		28.8	28.8	62.8	29.1	29.1	
Actuated g/C Ratio	0.08	0.26		0.24	0.42		0.21	0.21	0.45	0.21	0.21	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	145	1244		834	2122		331	692	736	368	725	
v/s Ratio Prot	0.06	0.17		c0.21	c0.30		0.18	c0.18	0.04	0.05	c0.18	
v/s Ratio Perm									0.04			
v/c Ratio	0.68	0.68		0.86	0.73		0.86	0.87	0.16	0.25	0.88	
Uniform Delay, d1	62.4	46.7		50.7	34.0		53.7	53.8	22.9	46.3	53.8	
Progression Factor	0.98	0.84		0.77	0.65		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.2	2.9		7.5	1.9		19.6	10.9	0.0	0.1	12.0	
Delay (s)	70.4	42.1		46.5	24.0		73.3	64.6	22.9	46.4	65.8	
Level of Service	E	D		D	C		E	E	C	D	E	
Approach Delay (s)		44.9			31.2			57.4			63.4	
Approach LOS		D			C			E			E	

Intersection Summary			
HCM Average Control Delay	44.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	98	624	271	718	1513	27	381	506	257	91	588	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.99	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.95		1.00	1.00		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4824		3433	5069		3433	3539	1564	1770	3487	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4824		3433	5069		3433	3539	1564	1770	3487	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	98	624	271	718	1513	27	381	506	257	91	588	58
RTOR Reduction (vph)	0	57	0	0	1	0	0	0	53	0	5	0
Lane Group Flow (vph)	98	838	0	718	1539	0	381	506	204	91	641	0
Confl. Peds. (#/hr)	12		4	4		12	3		8	8		3
Confl. Bikes (#/hr)			2						2			
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases									8			
Actuated Green, G (s)	10.4	35.0		30.9	55.5		17.4	34.4	65.3	9.7	26.7	
Effective Green, g (s)	12.4	37.0		32.9	57.5		19.4	36.4	69.3	11.7	28.7	
Actuated g/C Ratio	0.10	0.28		0.25	0.44		0.15	0.28	0.53	0.09	0.22	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	169	1373		869	2242		512	991	870	159	770	
v/s Ratio Prot	0.06	0.17		c0.21	c0.30		c0.11	0.14	0.06	0.05	c0.18	
v/s Ratio Perm									0.07			
v/c Ratio	0.58	0.61		0.83	0.69		0.74	0.51	0.23	0.57	0.83	
Uniform Delay, d1	56.3	40.3		45.9	29.0		52.9	39.3	16.2	56.7	48.3	
Progression Factor	1.10	0.68		0.77	0.58		0.97	1.10	0.84	1.00	1.00	
Incremental Delay, d2	2.9	2.0		5.2	1.4		4.9	0.2	0.0	3.1	7.3	
Delay (s)	65.0	29.5		40.5	18.4		56.4	43.3	13.6	59.8	55.7	
Level of Service	E	C		D	B		E	D	B	E	E	
Approach Delay (s)		33.0			25.4			41.0			56.2	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM Average Control Delay	34.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	81.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
170: Clayton Road & Denkinger Road

PM Peak
2030 "Before" Conditions

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	1769	416	471	701	41	281	687	514	179	480	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		*0.95	*0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4925		3433	5036		1681	3532	1549	1770	3440	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4925		3433	5036		1681	3532	1549	1770	3440	
Peak-hour factor, PHF	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	1882	443	471	701	41	281	687	514	179	480	90
RTOR Reduction (vph)	0	24	0	0	4	0	0	0	115	0	10	0
Lane Group Flow (vph)	155	2301	0	471	738	0	253	715	399	179	560	0
Confl. Peds. (#/hr)	5		1	1		5	7		10	10		7
Confl. Bikes (#/hr)			3			3			9			3
Turn Type	Prot			Prot			Split		pm+ov	Split		
Protected Phases	5	2		1	6		3	3	1	4	4	
Permitted Phases									3			
Actuated Green, G (s)	17.1	66.0		17.0	65.9		30.4	30.4	47.4	26.6	26.6	
Effective Green, g (s)	19.1	68.0		19.0	67.9		32.4	32.4	51.4	28.6	28.6	
Actuated g/C Ratio	0.12	0.42		0.12	0.42		0.20	0.20	0.32	0.18	0.18	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	211	2093		408	2137		340	715	527	316	615	
v/s Ratio Prot	0.09	c0.47		c0.14	0.15		0.15	c0.20	0.09	0.10	c0.16	
v/s Ratio Perm									0.17			
v/c Ratio	0.73	1.10		1.15	0.35		0.74	1.00	0.76	0.57	0.91	
Uniform Delay, d1	68.0	46.0		70.5	31.1		59.9	63.8	48.7	60.0	64.4	
Progression Factor	1.00	1.00		0.93	1.11		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.8	52.8		93.0	0.4		13.8	33.7	5.5	1.4	17.5	
Delay (s)	78.8	98.8		158.2	35.0		73.7	97.5	54.1	61.4	81.9	
Level of Service	E	F		F	D		E	F	D	E	F	
Approach Delay (s)		97.5			82.9			78.4			77.0	
Approach LOS		F			F			E			E	

Intersection Summary			
HCM Average Control Delay	87.1	HCM Level of Service	F
HCM Volume to Capacity ratio	1.03		
Actuated Cycle Length (s)	160.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	111.3%	ICU Level of Service	H
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	1769	416	471	701	41	281	687	514	179	480	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Util. Factor	1.00	0.91		0.97	0.91		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	4926		3433	5037		3433	3539	1551	1770	3441	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	4926		3433	5037		3433	3539	1551	1770	3441	
Peak-hour factor, PHF	0.94	0.94	0.94	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	155	1882	443	471	701	41	281	687	514	179	480	90
RTOR Reduction (vph)	0	28	0	0	4	0	0	0	112	0	11	0
Lane Group Flow (vph)	155	2297	0	471	738	0	281	687	402	179	559	0
Confl. Peds. (#/hr)	5		1	1		5	7		10	10		7
Confl. Bikes (#/hr)			3			3			9			3
Turn Type	Prot			Prot			Prot		pm+ov	Prot		
Protected Phases	5	2		1	6		3	8	1	7	4	
Permitted Phases									8			
Actuated Green, G (s)	15.8	64.4		16.0	64.6		12.0	27.6	43.6	12.0	27.6	
Effective Green, g (s)	17.8	66.4		18.0	66.6		14.0	29.6	47.6	14.0	29.6	
Actuated g/C Ratio	0.13	0.47		0.13	0.48		0.10	0.21	0.34	0.10	0.21	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	225	2336		441	2396		343	748	561	177	728	
v/s Ratio Prot	0.09	c0.47		c0.14	0.15		0.08	c0.19	0.09	c0.10	0.16	
v/s Ratio Perm									0.17			
v/c Ratio	0.69	0.98		1.07	0.31		0.82	0.92	0.72	1.01	0.77	
Uniform Delay, d1	58.5	36.3		61.0	22.5		61.8	54.0	40.3	63.0	52.0	
Progression Factor	1.00	1.00		0.90	1.08		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.8	15.1		61.2	0.3		13.4	15.9	3.6	70.6	4.4	
Delay (s)	65.3	51.4		116.3	24.7		75.2	69.9	43.9	133.6	56.4	
Level of Service	E	D		F	C		E	E	D	F	E	
Approach Delay (s)		52.2			60.3			61.9			74.8	
Approach LOS		D			E			E			E	

Intersection Summary			
HCM Average Control Delay	59.1	HCM Level of Service	E
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	100.4%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

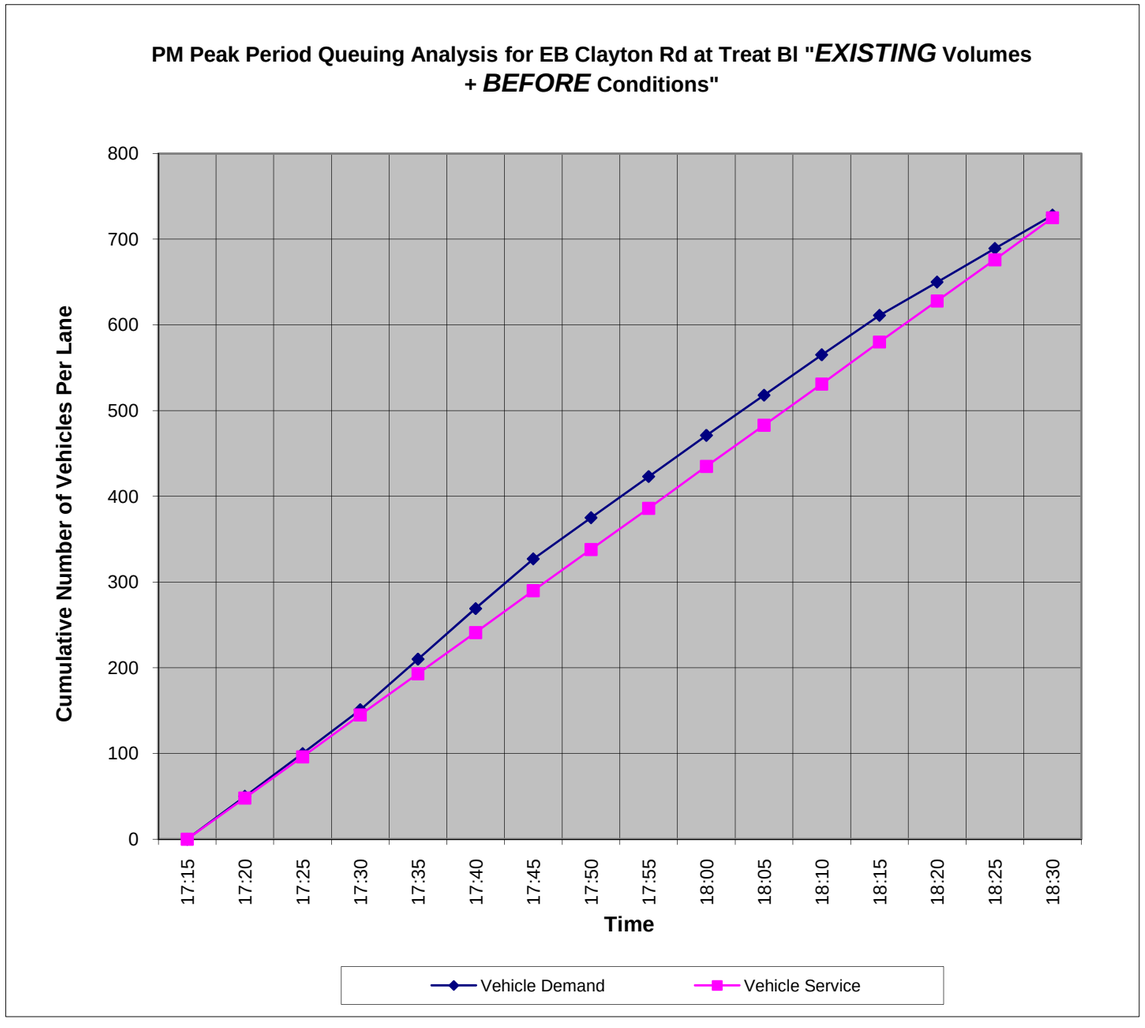
Appendix D
Supplemental Analysis

QUEUING ANALYSIS - EXISTING BEFORE CONDITIONS

Start Time	15-min Demand Volume	End Time	Cum Demand Volume Per lane	Cum Service Volume Per Lane	**Queue (vehicles)**	**Total 15-Minute Delay (vehicle seconds)**
16:00	109					
16:15	130					
16:30	109					
16:45	111					
17:00	138					
17:15	151	17:15	0	0	0	
17:30	176	17:20	50	48	2	
17:45	144	17:25	100	96	4	2,700
18:00	140	17:30	151	145	6	
18:15	117	17:35	210	193	17	
		17:40	269	241	28	19,350
		17:45	327	290	37	
		17:50	375	338	37	
		17:55	423	386	37	32,850
		18:00	471	435	36	
		18:05	518	483	35	
		18:10	565	531	34	30,150
		18:15	611	580	31	
		18:20	650	628	22	
		18:25	689	676	13	15,300
		18:30	728	725	3	

Total Delay (vehicle seconds)		**100,350**	
Total Delay (vehicle hours)		**28**	
Average Queue (vehicles)	**22**		
Maximum Queue	**37**		
Average Delay in Queue (seconds)		**138**	**(1.0 cycle)**
Maximum Delay in Queue		**228**	**(1.6 cycle)**

Cycle Length = 140 seconds
EB Split = 47 seconds
EB effective green = 43 seconds
Saturation Flow = 1,900 vehicles per lane per hour

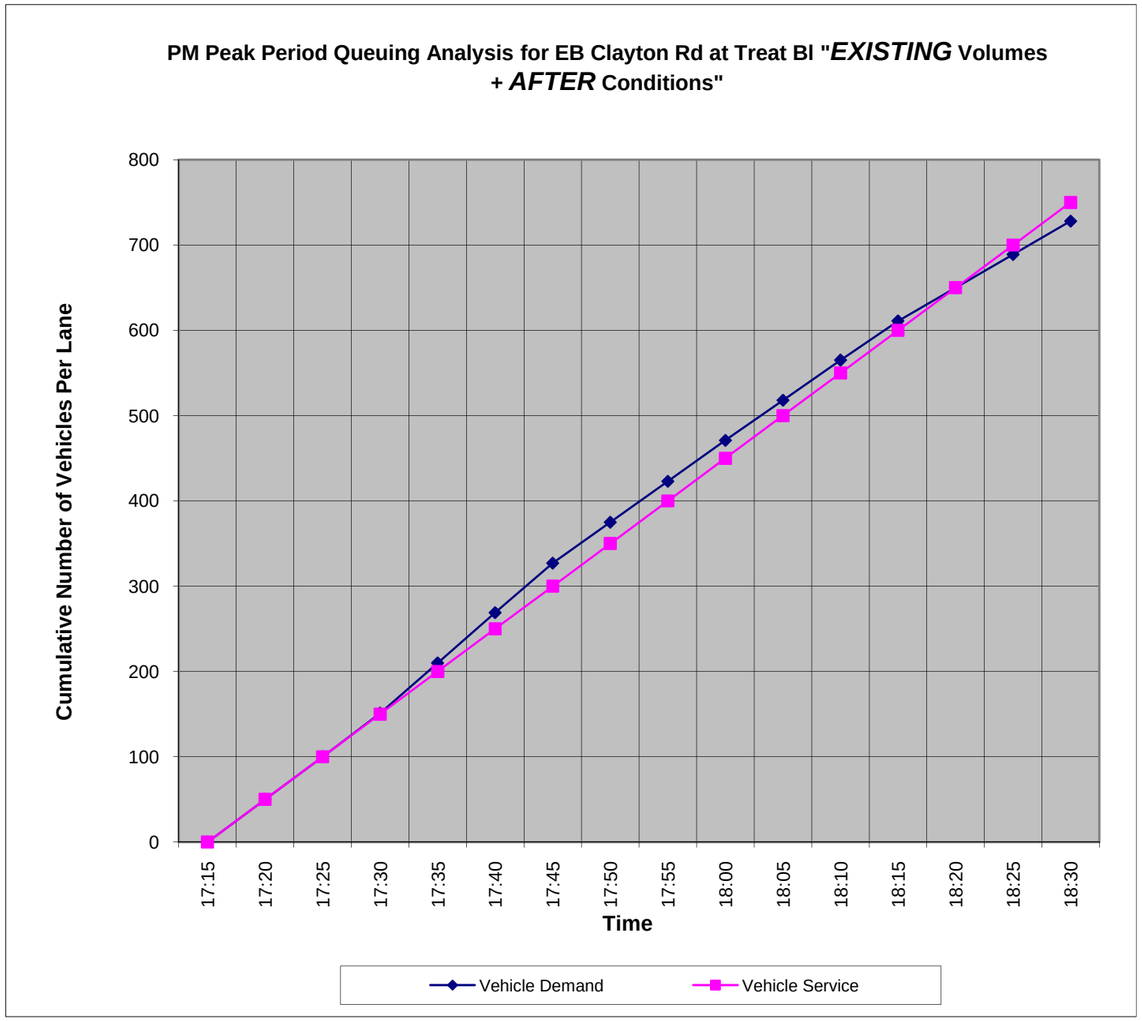


QUEUING ANALYSIS - EXISTING AFTER CONDITIONS

Start Time	15-min Demand Volume	End Time	Cum Demand Volume Per lane	Cum Service Volume Per Lane	**Queue (vehicles)**	**Total 15-Minute Delay (vehicle seconds)**
16:00	109					
16:15	130					
16:30	109					
16:45	111					
17:00	138					
17:15	151	17:15	0	0		
17:30	176	17:20	50	50		
17:45	144	17:25	100	100		
18:00	140	17:30	151	150	1	
18:15	117	17:35	210	200	10	
		17:40	269	250	19	12,600
		17:45	327	300	27	
		17:50	375	350	25	
		17:55	423	400	23	21,600
		18:00	471	450	21	
		18:05	518	500	18	
		18:10	565	550	15	14,400
		18:15	611	600	11	
		18:20	650	650	0	
		18:25	689	700		
		18:30	728	750		

Total Delay (vehicle seconds)		**48,600**	
Total Delay (vehicle hours)		**13.5**	
Average Queue (vehicles)	**18**		
Maximum Queue	**27**		
Average Delay in Queue (seconds)		**106**	**(0.8 cycle)**
Maximum Delay in Queue		**163**	**(1.25 cycle)**

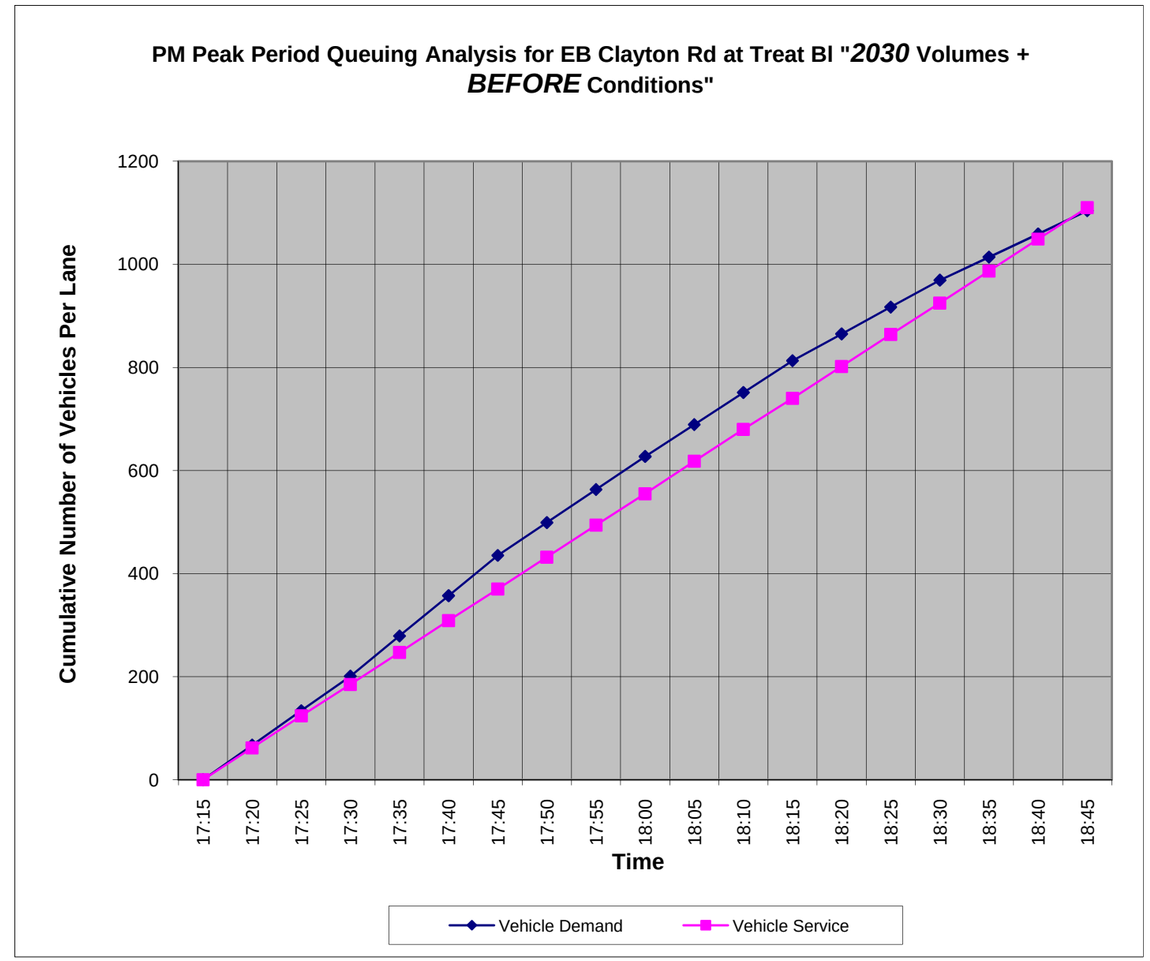
Cycle Length = 130 seconds
EB Split = 46 seconds
EB effective green = 42 seconds
Saturation Flow = 1,900 vehicles per lane per hour



QUEUING ANALYSIS - 2030 BEFORE CONDITIONS

Start Time	15-min Demand Volume	End Time	Cum Demand Volume Per lane	Cum Service Volume Per Lane	**Queue (vehicles)**	**Total 10- to 15-Minute Delay (vehicle seconds)**
16:00	145					
16:15	173					
16:30	145					
16:45	148					
17:00	184					
17:15	201	17:15	0	0	0	
17:30	234	17:20	67	62	5	
17:45	192	17:25	134	124	10	7,200
18:00	186	17:30	201	185	16	
18:15	156	17:35	279	247	32	
		17:40	357	309	48	36,450
		17:45	435	370	65	
		17:50	499	432	67	
		17:55	563	494	69	61,650
		18:00	627	555	72	
		18:05	689	618	71	
		18:10	751	680	71	65,250
		18:15	813	740	73	
		18:20	865	802	63	
		18:25	917	864	53	52,650
		18:30	969	925	44	
		18:35	1014	987	27	16,200
		18:40	1059	1049	10	
		18:45	1104	1110	-6	

Total Delay (vehicle seconds)	**239,400**	
Total Delay (vehicle hours)	**66.5**	
Average Queue (vehicles)	**47**	
Maximum Queue	**73**	
Average Delay in Queue (seconds)	**226**	**(1.5 cycle)**
Maximum Delay in Queue	**348**	**(2.3 cycle)**

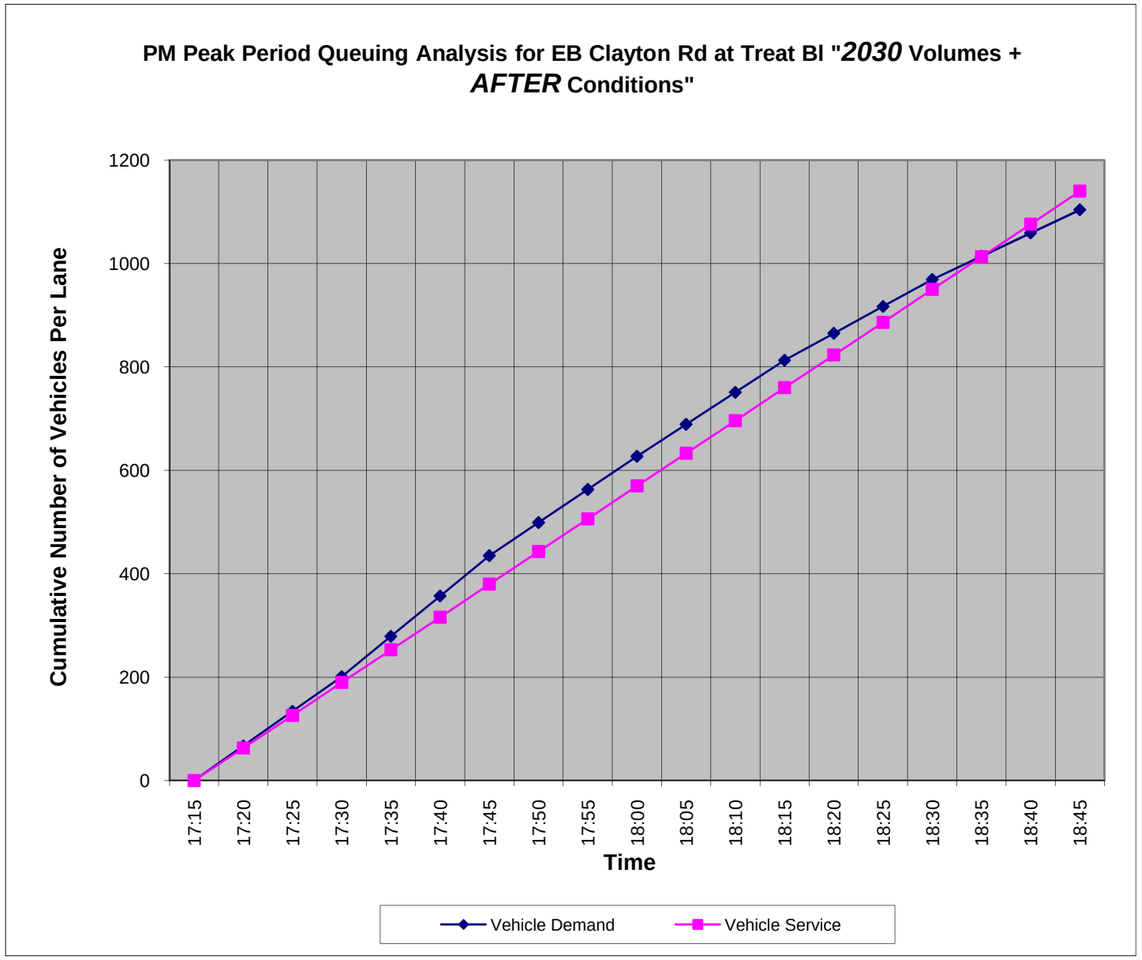


Cycle Length = 150 seconds
EB Split = 62 seconds
EB effective green = 58 seconds
Saturation Flow = 1,900 vehicles per lane per hour

QUEUING ANALYSIS - 2030 AFTER CONDITIONS

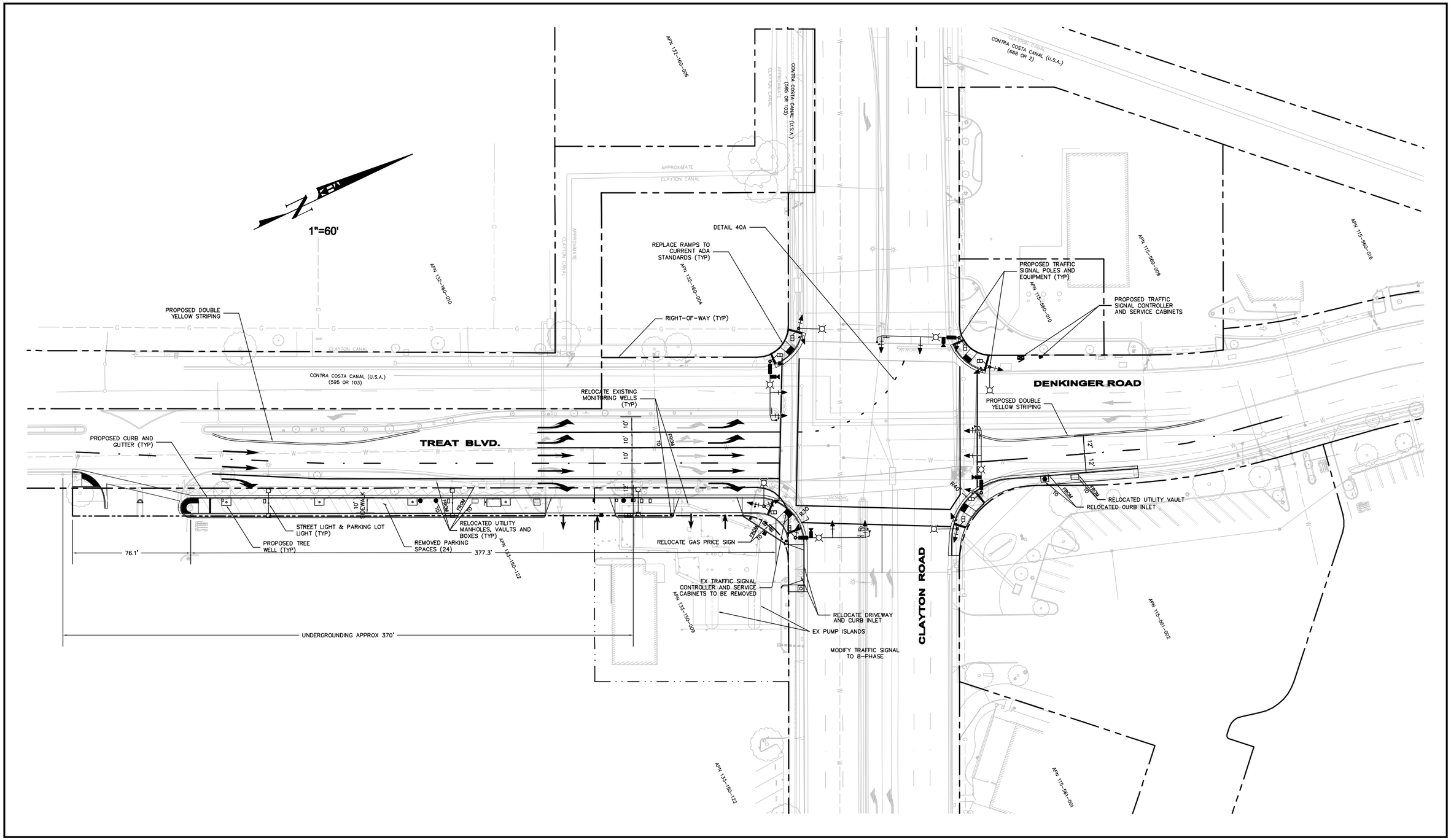
Start Time	15-min Demand Volume	End Time	Cum Demand Volume Per lane	Cum Service Volume Per Lane	**Queue (vehicles)**	**Total 5- to 15-Minute Delay (vehicle seconds)**
16:00	145					
16:15	173					
16:30	145					
16:45	148					
17:00	184					
17:15	201	17:15	0	0	0	
17:30	234	17:20	67	63	4	
17:45	192	17:25	134	126	8	4,950
18:00	186	17:30	201	190	11	
18:15	156	17:35	279	253	26	
		17:40	357	316	41	29,700
		17:45	435	380	55	
		17:50	499	443	56	
		17:55	563	506	57	50,400
		18:00	627	570	57	
		18:05	689	633	56	
		18:10	751	696	55	49,500
		18:15	813	760	53	
		18:20	865	823	42	
		18:25	917	886	31	32,400
		18:30	969	950	19	
		18:35	1014	1013	1	3,000
		18:40	1059	1076	-17	
		18:45	1104	1140		

Total Delay (vehicle seconds)	**169,950**	
Total Delay (vehicle hours)	**47**	
Average Queue (vehicles)	**35**	
Maximum Queue	**57**	
Average Delay in Queue (seconds)	**168**	**(1.2 cycle)**
Maximum Delay in Queue	**267**	**(1.9 cycle)**



Cycle Length = 140 seconds
EB Split = 60 seconds
EB effective green = 56 seconds
Saturation Flow = 1,900 vehicles per lane per hour

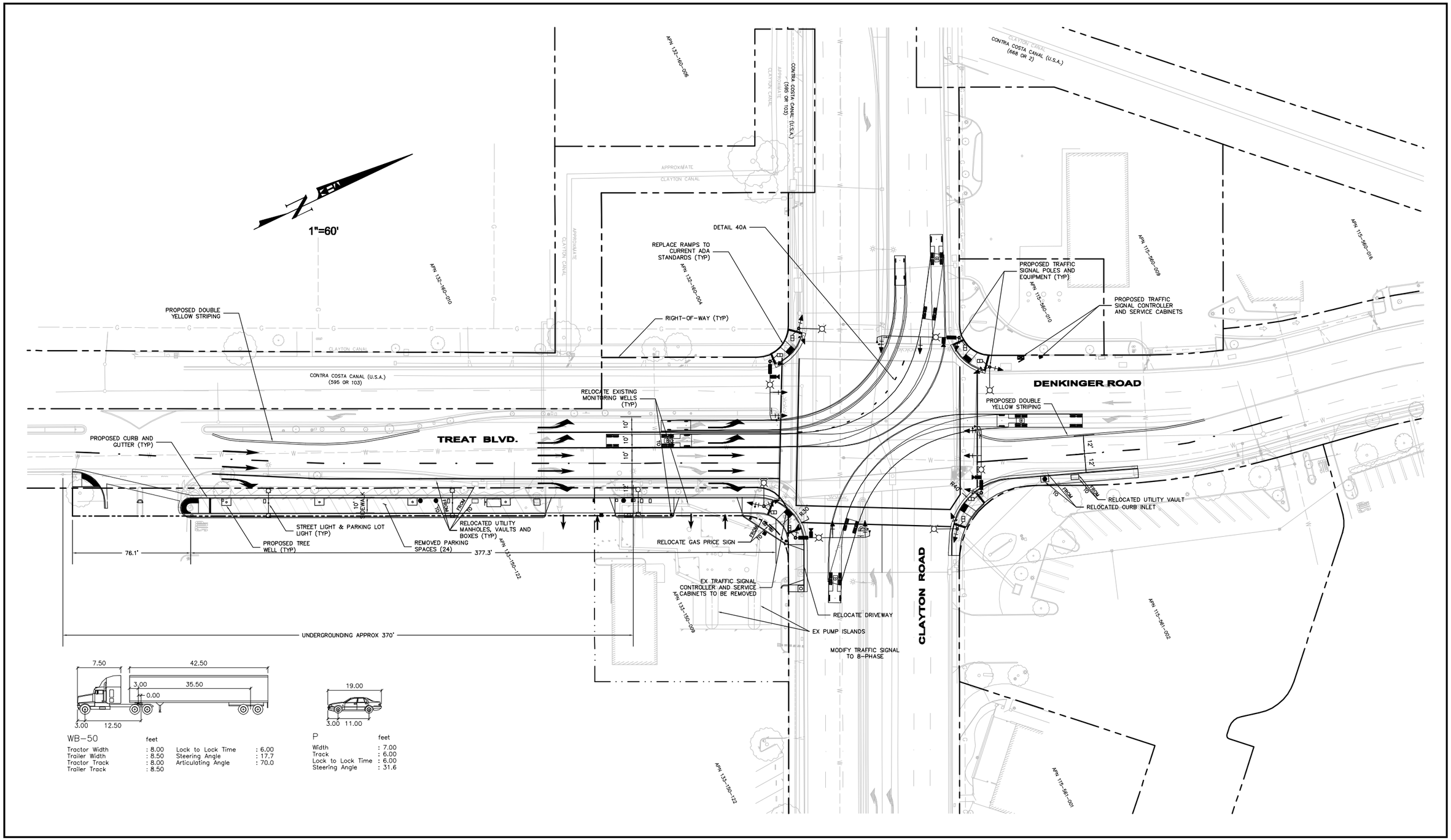
Appendix E
Conceptual Plan



CITY OF CONCORD
Treat Boulevard and Clayton Road
March 3, 2011

Conceptual Plan
Parking Loss 24 Spaces

Kimley-Horn and Associates, Inc.

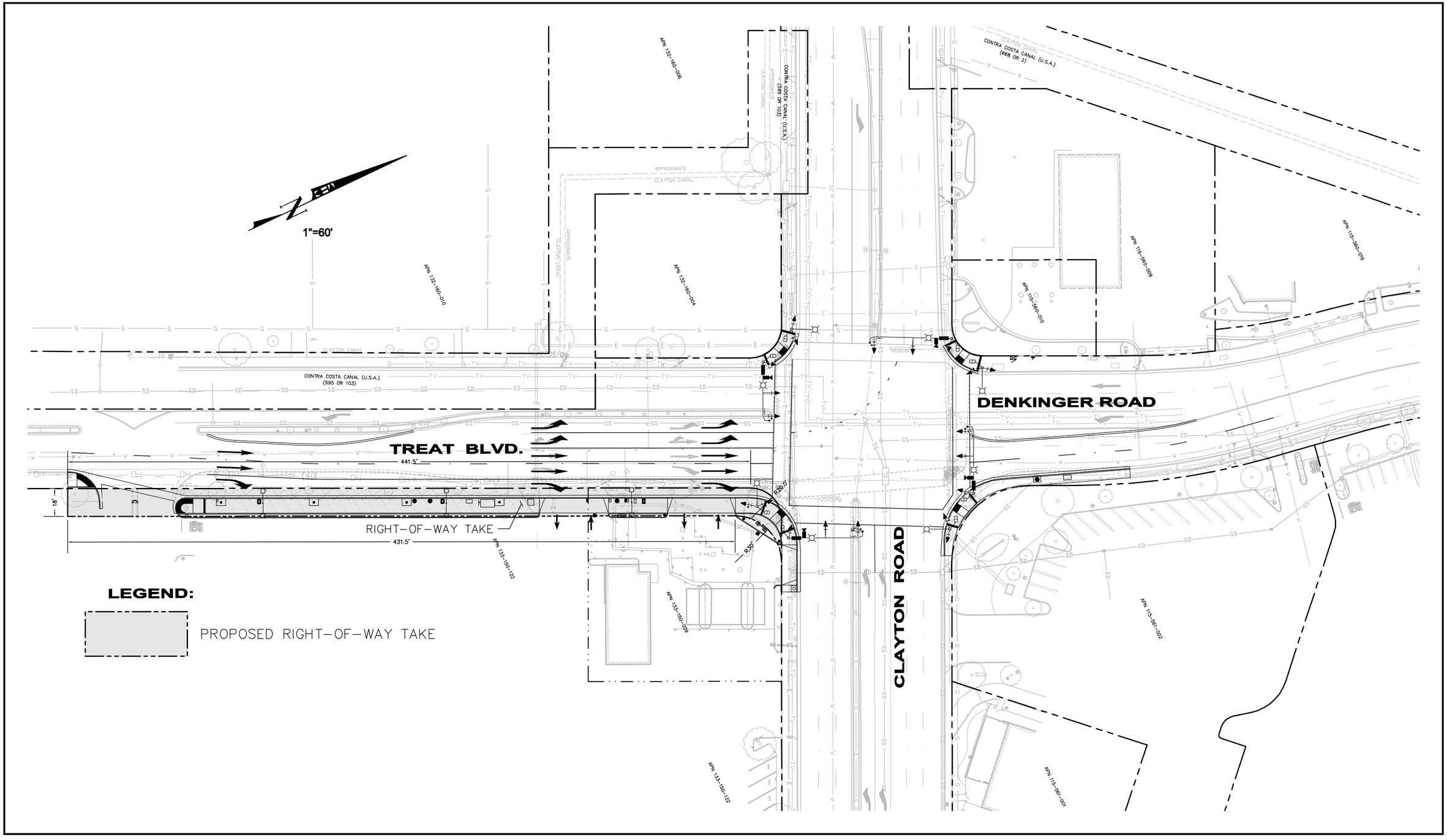


CITY OF CONCORD
Treat Boulevard and Clayton Road
March 3, 2011

Conceptual Plan with Truck Turning
Parking Loss 24 Spaces

Kimley-Horn and Associates, Inc.

Appendix F
ROW Layout



CITY OF CONCORD
Treat Boulevard and Clayton Road
March 3, 2011

ROW Layout
TAKE = 8414.5 SF (0.19 ACRES)
Parking Loss 24 Spaces

Kimley-Horn and Associates, Inc.

Appendix G
Preliminary Project Cost Estimate

Client:	**City of Concord, California**	**Date:**	**2/28/2011**
Project:	**Clayton Road/Treat Boulevard Intersection, PJ 2144**	**Prepared By:**	**LBF**

Preliminary Cost Estimate - *Engineering/Environmental/ROW*

Kimley-Horn and Associates, Inc.

Items

Item	Description	Quantity	Unit	Unit Cost	Cost
	General				
1	Admin (10% of Construction)	1	LS	$117,240	$117,240
2	Cost Recovery (150% of Admin)	1	LS	$175,860	$175,860
3	Environmental Studies	1	LS	$35,172	$35,172
4	Design Engineering (conceptual completed)*	1	LS	$140,688	$140,688
5	Design Services During Construction	1	LS	$17,586	$17,586
6	Construction Staking	1	LS	$29,310	$29,310
7	Construction Management	1	LS	$152,412	$152,412
8	Land Costs + Contingency	1	LS	$500,000	$500,000
9	Acquisition Services (25%)	1	LS	$125,000	$125,000
10	Right-of-Way Engineering	1	LS	$5,000	$5,000
11	Utility Relocations (pre-construction, undergrounding)	1	LS	$116,600	$116,600
				General Sub-Total =	**$1,415,000**

Preliminary Cost Estimate - *Construction*

Base Bid Items

Item	Description	Quantity	Unit	Unit Cost	Cost
	General				
1	Mobilization (10%)	1	LS	$78,800	$78,800
2	NPDES	1	LS	$23,640	$23,640
3	Traffic Control System	1	LS	$78,800	$78,800
4	Construction Area Signs	1	LS	$8,000	$8,000
				General Sub-Total =	**$189,000**

	Construction Items				
1	Clearing and Grubbing (Incl sm tree removal)	1,690	SF	$5.00	$8,450
2	Tree Removal	10	EA	$1,000.00	$10,000
3	Demolition of Existing Curb and/or Curb and Gutter	1,030	LF	$10.00	$10,300
4	Demolition of Existing Sidewalks and Misc. Concrete	5,610	SF	$5.00	$28,050
5	Demolition of Existing Asphalt Concrete	7,410	SF	$2.00	$14,820
6	Demolition of Curb Inlet	1	EA	$1,000.00	$1,000
7	Roadway Excavation (F)	800	CY	$34.00	$27,200
8	Sawcutting	1,300	LF	$2.00	$2,600
9	Aggregate Base (Assume 12")	300	CY	$50.00	$15,000
10	Hot Mix Asphalt Concrete (Assume 12")	600	TON	$90.00	$54,000
11	Valley Gutter	310	SF	$15.00	$4,650
12	Sidewalk and Walkways	3,600	SF	$7	$25,200
13	Commercial Driveway Approach	635	SF	$10	$6,350
14	Vertical Curb and Gutter	690	LF	$25	$17,250
15	Traffic Island Curb	720	LF	$25	$18,000
16	Curb Ramp Case CM	2	EA	$3,000	$6,000
17	Curb Ramp Case C	4	EA	$3,000	$12,000
18	Thermoplastic Striping Det. 10	650	LF	$2.00	$1,300
19	Thermoplastic Striping Det. 22	290	LF	$1.50	$435
20	Thermoplastic Striping Det. 38	665	LF	$1.40	$931
21	Thermoplastic Striping 12" White	560	LF	$1.50	$840
22	Thermoplastic Pavement Legends	550	SF	$4	$2,200
23	Remove Conflicting Striping	1	LS	$10,000	$10,000
24	Traffic Sign	2	EA	$150	$300

25	Remove Traffic Signs	2	LS	$3,000	$6,000
26	Traffic Signal Modification	1	LS	$340,567	$340,567
27	Dual Arm Street Lighting, Including Pullbox, Conduit & Wire	3	EA	$8,000	$24,000
28	Trees	4	EA	$1,500	$6,000
29	Landscaping	750	SF	$4	$3,000
30	18" Class III RCP	4	LF	$65	$300
31	Curb Opening Catch Basin	1	EA	$2,000	$2,000
32	Relocate Water Meter	3	EA	$4,000	$12,000
33	Relocate Gas Station Lights	3	EA	$800	$2,400
34	Relocate Gas Station Sign	1	EA	$2,000	$2,000
35	Area Drains and sidewalk pipes	2	EA	$1,500	$3,000
36	Relocate Monitoring Wells	2	EA	$5,000	$10,000
37	Misc. Gas Station Improvements (Grading, pavement, etc.)	1	LS	$100,000	$100,000
				Construction Items Sub-Total =	**$788,000**

Sub-Total=	$977,000
Contingency @ 20% =	$195,400
CONSTRUCTION TOTAL =	**$1,172,400**

GRAND TOTAL= $2,587,400

Assumptions

1 The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

2 Estimate is based on topographic mapping, field reconnaissance, aerial photography, traffic signal record drawings. All measurements are approximate.

3 Assumes new sidewalk to be 10' wide along the gas station frontage.

4 Cost of undergrounding utilities included in work by others. Assumes other costs associated with relocating facilities owned by franchise utilities will be at the utility company's expense. Assumes the relocation of 1 CB and 2 water services only.

5 "Pork-Chop" island on northeast corner of the intersection will be removed. Curb return and approximately 100 LF of curb, gutter and sidewalk along Denkinger Rd. will be replaced to improve northbound lane alignment through intersection. New curb return radius = 40' (existing radius = 60').

6 Traffic Signal controller cabinet will be relocated to west side of Denkinger Rd. due to lack of space on southeast corner.

7 Interconnect cable to adjacent intersections to the east, west, and south will be replaced.

8 Price of right-of-way is assumed to be $30.00 per square foot based on similar projects and knowledge of the project area.

9 No right-of-way acquisition required on the northeast corner of the intersection.

Appendix H
Parking Demand Survey

BEL AIR SHOPPING CENTER PARKING DEMAND SURVEY

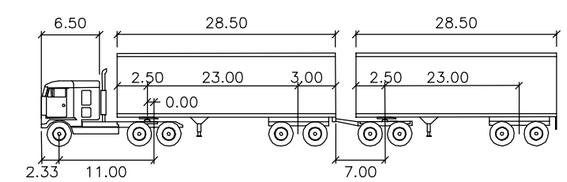
Date	Day	Time	North of Main Driveway				South of Main Driveway			Entire Shopping Center			
			Total Spaces	Occupied Spaces	Surplus	Surplus w/o 24 Spaces	Total Spaces	Occupied Spaces	Surplus	Total Spaces	Occupied Spaces	Surplus	Surplus w/o 24 Spaces
11/21/10	Sunday	10:45 AM	170	16	154	130	218	54	164	388	70	318	294
11/21/10	Sunday	2:00 PM	170	18	152	128	218	65	153	388	83	305	281
11/23/10	Tuesday	2:00 PM	170	50	120	96	218	74	144	388	124	264	240
11/24/10	Wednesday	1:20 PM	170	39	131	107	218	86	132	388	125	263	239
11/26/10	Friday	4:15 PM	170	36	134	110	218	78	140	388	114	274	250
11/27/10	Saturday	3:20 PM	170	24	146	122	218	82	136	388	106	282	258
11/28/10	Sunday	3:00 PM	170	17	153	129	218	72	146	388	89	299	275
11/29/10	Monday	3:40 PM	170	48	122	98	218	90	128	388	138	250	226
11/30/10	Tuesday	5:30 PM	170	18	152	128	218	80	138	388	98	290	266
12/01/10	Wednesday	12:15 PM	170	44	126	102	218	70	148	388	114	274	250
12/01/10	Wednesday	4:30 PM	170	40	130	106	218	69	149	388	109	279	255
12/02/10	Thursday	12:15 PM	170	37	133	109	218	94	124	388	131	257	233
12/03/10	Friday	4:00 PM	170	**48**	**122**	**98**	218	**98**	**120**	388	**146**	**242**	**218**
12/04/10	Saturday	2:30 PM	170	35	135	111	218	92	126	388	127	261	237
12/05/10	Sunday	2:20 PM	170	22	148	124	218	80	138	388	102	286	262

Source: City of Concord

Appendix I
Gas Station – Refueling Truck Circulation

Existing Treat Boulevard Refueling Truck Circulation

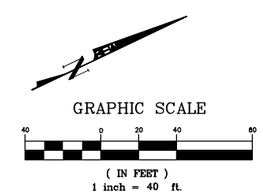
Future Treat Boulevard Refueling Truck Circulation



WB–67D feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.00
Trailer Width	: 8.50	Steering Angle	: 15.6
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

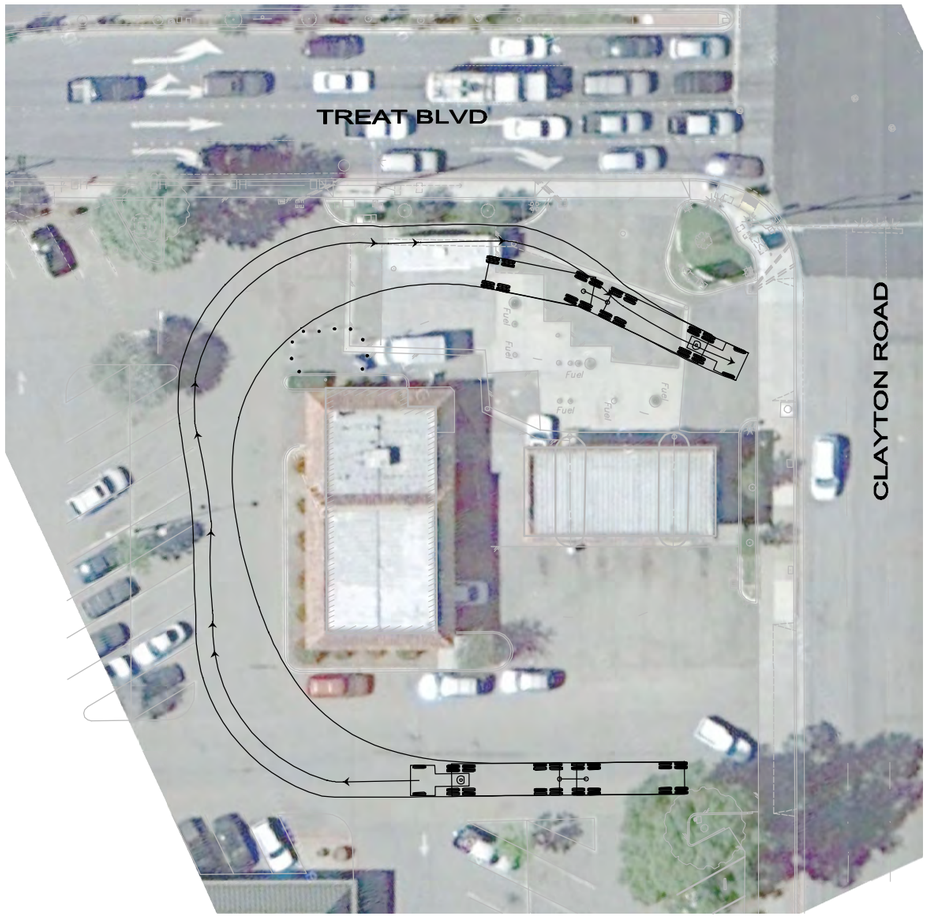
Refueling Truck Profile



CITY OF CONCORD
Treat Boulevard and Clayton Road
March 3, 2011

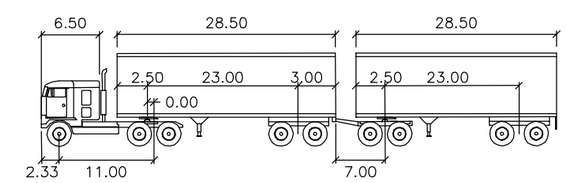
Gas Station - Refueling Truck Circulation
Treat Boulevard Circulation

Kimley-Horn and Associates, Inc.



Existing Clayton Road Refueling Truck Circulation

Future Clayton Road Refueling Truck Circulation



WB–67D feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.00
Trailer Width	: 8.50	Steering Angle	: 15.6
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Refueling Truck Profile

GRAPHIC SCALE

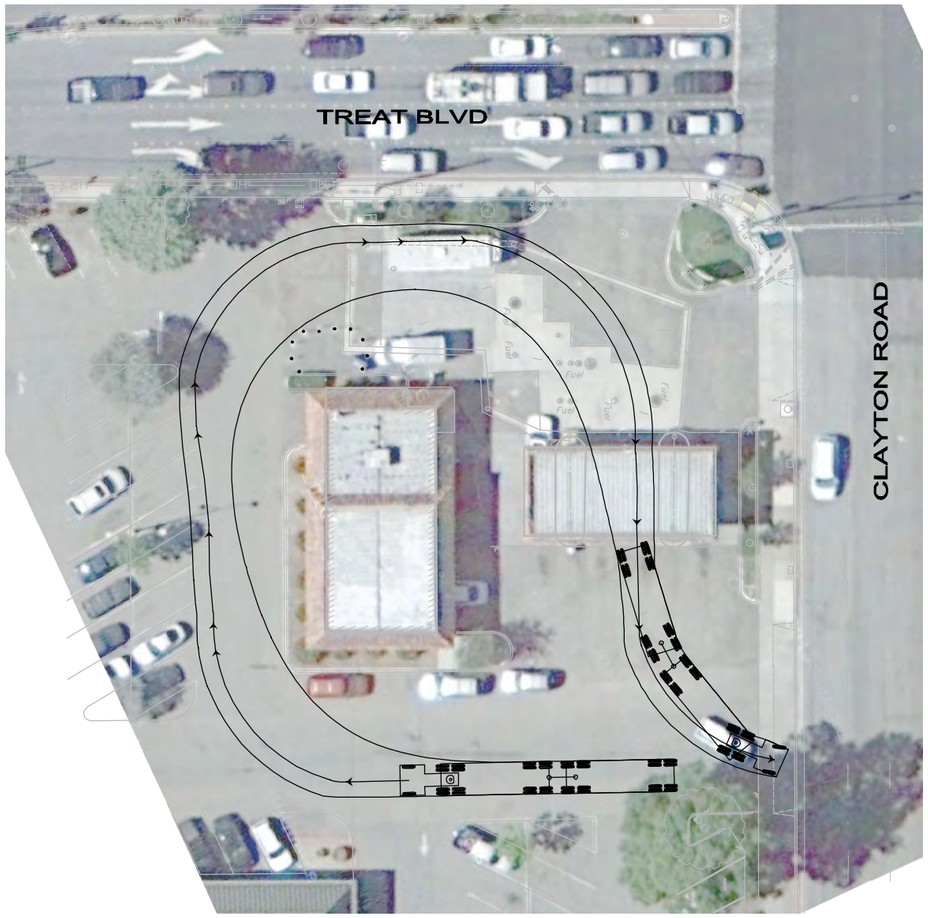
40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

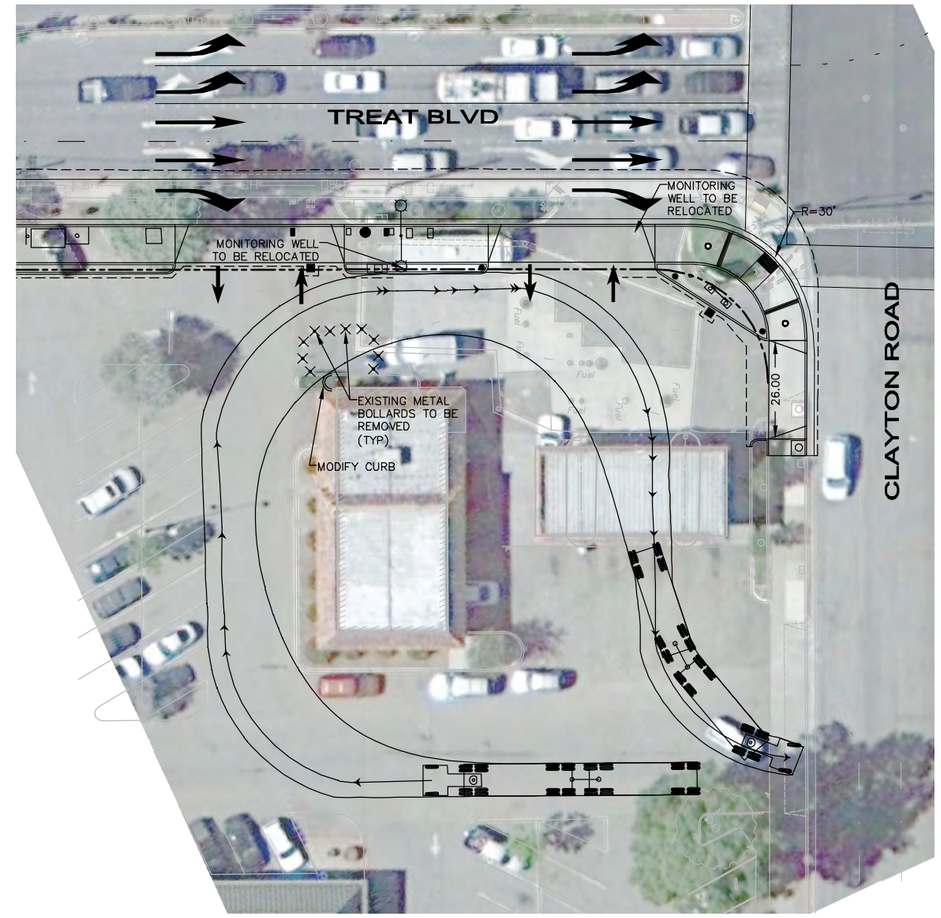
CITY OF CONCORD
Treat Boulevard and Clayton Road
March 3, 2011

Gas Station - Refueling Truck Circulation
Clayton Road Circulation

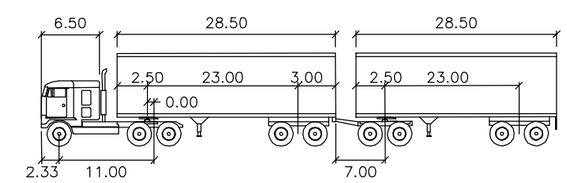
Kimley-Horn and Associates, Inc.



Existing Clayton Road Refueling Truck Circulation



Future Clayton Road Refueling Truck Circulation



WB–67D feet

Tractor Width	: 8.00	Lock to Lock Time	: 6.00
Trailer Width	: 8.50	Steering Angle	: 15.6
Tractor Track	: 8.00	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Refueling Truck Profile

GRAPHIC SCALE

40 0 20 40 80

(IN FEET)
1 inch = 40 ft.

CITY OF CONCORD
Treat Boulevard and Clayton Road
March 3, 2011

Gas Station - Refueling Truck Circulation
Clayton Road Through Circulation

Kimley-Horn and Associates, Inc.

CLOSURE SOLUTIONS, INC.

June 29, 2012

Mr. Kevin Brown
Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

RE: CONCEPTUAL SITE MODEL
Falcon Gas Station
4300 Clayton Road
Concord, California
Case No. 07-0892

Dear Mr. Brown:

On behalf of Bel Air Development Company, Closure Solutions, Incorporated (Closure Solutions) is submitting this *Conceptual Site Model* (CSM) for the Falcon Gas Station, located at 4300 Clayton Road in Concord, California (the Site, Figure 1). In a letter dated April 11, 2012 (Attachment A), the San Francisco Regional Water Quality Control Board (SFRWQCB) requested preparation of the CSM following assessment of separate-phase hydrocarbons (SPH) discovered in Site monitoring wells in early 2011 and the vertical and lateral extent of SPH and dissolved-phase hydrocarbons beneath the Site.

1.0 INTRODUCTION

1.1 Location and Setting

The Site is located on the south corner of the intersection of Clayton Road and Treat Boulevard in Concord California (Figure 2). The elevation of the Site is approximately 190 feet above mean sea level with relatively flat topography (USGS, Walnut Creek Quadrangle, California). The majority of the Site is covered by the station building, asphalt, and concrete. Land use in the surrounding area is primarily commercial, ringed by residential properties. The Assessor's Parcel Number is 133-150-009.

1.2 Current Use

The Site is an inactive retail gasoline station and currently maintains three gasoline underground storage tanks (USTs), one inactive used oil UST, and associated product lines and dispensers (Figure 2).

At this time, no motor fuels are being dispensed at the Site. The USTs were temporarily closed on December 20, 2011 for a period of one year under a permit issued by the Contra Costa

County Health Services Department – Hazardous Materials Division. An automotive smog testing facility currently operates out of the station building.

1.3 Regional Hydrogeology

The Site is located within the Clayton Valley Groundwater Basin[1]. The basin is bounded by Suisun Bay to the north, Mt. Diablo Creek to the east, the Concord Fault to the west, and the foothills of Mt. Diablo to the south. The area is generally underlain by thick alluvial deposits which cover a faulted and folded complex of consolidated Cretaceous and Tertiary rocks. Water-bearing units can be found in recent and older alluvium valley fill deposits.

1.4 Local Hydrogeology

The Site is located about 1,100 feet north of basin-bounding Eocene formations[2] on Pleistocene and Pliocene alluvial and fluvial sediments[3] (Figures 5, 6, and 7 in Attachment C). These sediments are differentiated into two units, Plio-Pleistocene undifferentiated poorly sorted gravel, sand, silt, and clay - QTu, and Pleistocene alluvial fan and fluvial deposits - Qpaf[4]. At the Site, the Qpaf is typically unsaturated and acts as an aquitard, creating confining conditions for groundwater in the underlying QTu sediments. Groundwater at the Site is generally encountered at or near the QTu/Qpaf contact at 30 to 45 feet below ground surface (bgs). Recharge to the QTu at the Site is primarily via subsurface inflow of water derived from stream flow in Golinda Creek located to the south at the basin boundary and to a lesser extent from flows in the partially lined storm water channel located about 350 feet to the west; discharge is via subsurface out flow with eventual discharge to Suisun Bay and vertical leakage into the overlying Qpaf and eventual discharge via evapotranspiration.

Groundwater flow direction is primarily to the north, but has ranged from west-northwest to northeast. The gradient has ranged from 0.02 to 0.15 feet per foot. Recent and historical groundwater data are presented in Attachment B.

1.5 Lithology

The Site is underlain by Pleistocene and Pliocene alluvial and fluvial sediments. These sediments are differentiated into two units, Plio-Pleistocene undifferentiated poorly sorted gravel, sand, silt, and clay - QTu, and Pleistocene alluvial fan and fluvial deposits - Qpaf. Based on previous investigations, the occurrence of the QTu in the basin (as near as 1,900 feet west), and the

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[1] California's Groundwater Bulletin 118, San Francisco Bay Hydrologic Region, Clayton Valley Groundwater Basin.
[2] Preliminary Geologic Map Emphasizing Bedrock Formations in Contra Costa County, California: A digital database. Compiled by R.W Graymer, D.L. Jones, and E.E. Brabb. U.S. Geological Survey Open-file Report 94-622.
[3] Quaternary Geology Of Contra Costa County, and Surrounding Parts of Alameda, Marin, Sonoma, Solano, Sacramento, and San Joaquin Counties, California: A Digital Database. U.S. Geological Survey Open File Report 97-98 By E.J. Helley and R.W. Graymer.
[4] Ibid.

textural maturity of the gravel factions reported in logs of borings drilled at and near the Site, the Qpaf is about 23 feet thick in the eastern part of the Site and about 45 feet thick in the western part and consists primarily of a fining up sequence of predominately coarse grained silt with gravel grading up to clayey silt at approximately 16 to 20 feet bgs. The QTu at the Site consists of generally saturated, angular coarse-grained gravel in a clayey, silty, and sandy matrix. The contact between the Qpaf and the QTu may be inferred to be an erosional unconformity. Generalized geologic cross-sections and boring logs are presented in Attachment C.

1.6 Sensitive Receptors

As reported in the *Corrective Action Plan* (CAP) submitted by ARCADIS on May 30, 2010, a sensitive receptor survey was conducted in 1992. The survey consisted of reviewing the files of the California Department of Water Resources to identify water wells within a 2,000-foot radius of the Site. No permitted water supply wells were identified within the search radius. The closest water supply well identified was located more than 1 mile west (cross-gradient) of the Site.

The nearest surface water body identified was Galindo Creek, located approximately 1,100 feet south (up-gradient) of the Site.

2.0 SUMMARY OF PREVIOUS INVESTIGATIONS

Based on the presence of SPH in Site wells and the results of UST compliance testing subsequently performed on the premium-grade UST, an Unauthorized Release Report was submitted by Closure Solutions on April 26, 2011. In December 2011, the RWQCB opened a new environmental case for the Site in addition to the previously existing environmental case no. 07-200, associated with operation of Former BP Service Station No. 11145 on the premises.

Based on various environmental documents prepared by current and former consultants, Closure Solutions has prepared the following summary of previous environmental corrective actions for both environmental cases at the Site. While Closure Solutions does not have reason to believe that the information is incorrect, Closure Solutions has not independently verified this information for accuracy. It is our understanding that:

Former BP 11145 (Case #07-0200, Global ID #T0601300187)

- In October 1992, four soil borings were advanced. Elevated soil concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene were reported from the vicinity of the USTs, the used oil UST, and the dispenser islands.

- In September 1993, three monitoring wells were installed on-Site. Maximum concentrations of TPHg and benzene were reported in soil samples from MW-2 at 29.5 feet bgs.

- In April 1995, two monitoring wells, one on-Site and one off-Site, and one on-Site vapor extraction well were installed. Maximum concentrations of TPHg and benzene were reported in soil samples from VW-1. A five day soil vapor extraction (SVE) test was also completed.

- In November 1995, five on-Site vapor extraction wells were installed. A SVE system operated at the Site from February through December 1996, removing approximately 510 pounds of TPHg and 7.4 pounds of benzene.

- In December 2001, a dual phase extraction test was completed. Detailed information on the test was not available however, based on the limited extent of hydrocarbons and methyl tertiary butyl ether (MTBE) in the subsurface, DPE was not recommended as a remedial technology at the Site.

- In March 2009, a corrective action plan (CAP) was submitted to address the elevated hydrocarbon concentrations in the vicinity of well MW-1. The CAP recommended monitored natural attenuation, with additional vapor sampling to confirm that residual contamination was not a threat to human health or the environment. The CAP was never approved.

- In May 2010, another CAP was submitted that proposed air sparge and SVE. The CAP was approved in December 2010, but has not been implemented due to the new release at the Site.

Falcon Gas Station (Case #07-0892, Global ID #T10000003419)

- On February 4, 2011, ARCADIS, the consultant for Former BP #11145, detected SPH in groundwater monitoring wells during a regularly-scheduled groundwater monitoring and sampling event. SPH thicknesses of 4.14 feet in well MW-2, 2.60 feet in well MW-5 and 0.08 feet in well MW-3 were recorded. Wells MW-1 and MW-4 did not contain SPH. It was noted at the time that many of the dispenser pumps were not working. ARCADIS noted the potential new release appeared to be from the current station operator, and reported the potential release to the SFRWQCB. Based on information obtained during UST compliance testing activities reportedly conducted shortly after discovery of the new release, the source of SPH appeared to be the 6,000-gallon premium-grade UST.

- On April 1, 2011, Closure Solutions performed a vacuum extraction event at the Site from wells MW-2 and MW-5. Prior to the event, SPH thicknesses in the wells were 4.21 feet and 0.85 feet, respectively. The vacuum extraction event recovered the equivalent of approximately 600 gallons of SPH and groundwater. At the end of the vacuum event, SPH was not measurable in either well. Monthly gauging has been performed since the vacuum event, with limited SPH detected in the wells measuring up to 0.98 feet in June 2012.

- The USTs were temporarily closed on December 20, 2011 for a period of one year under a permit issued by the Contra Costa County Health Service Department – Hazardous Materials Division.

- In May 2012, Closure Solutions advanced three off-Site and three on-Site soil borings for the collection of soil and grab groundwater samples and installed two on-Site groundwater monitoring wells to delineate the vertical and lateral extent of hydrocarbon impact onsite and the lateral extent of hydrocarbon impact offsite in the down-gradient direction. In addition, three on-Site soil vapor probes were installed. Based on results from soil and grab groundwater samples, the greatest hydrocarbon impacts appear to be in the vicinity of the premium-grade UST. Soil gas concentrations above environmental screening levels (ESLs) were only detected in sample VP-2-15, within the immediate vicinity of the base of the premium grade UST. Soil gas concentrations attenuated with depth, decreasing to below ESLs in the soil vapor sample taken at 5 feet. Soil vapor constituents were not detected above ESLs for residential or commercial/industrial land use in the soil gas samples collected closest to the on-Site building, therefore, vapor intrusion is not expected to be a concern at the Site.

3.0 ENVIRONMENTAL CONDITIONS

3.1 Extent of Groundwater Impact

Prior to the recent release discovered at the Site in February 2011, dissolved-phase gasoline constituent concentrations detected in Site groundwater monitoring wells were elevated. Based on the results of the third quarter 2010 groundwater monitoring event (the last event conducted before discovery of the new release), down-gradient wells MW-2 and MW-5 had reported low to non-detect concentrations, demonstrating that the impacts to groundwater were primarily on-Site. Maximum concentrations of TPHg, benzene and MTBE have historically been detected in well MW-1, with concentrations decreasing since the third quarter 2004. Historically, SPH was never detected in any of the Site wells prior to February 2011.

Measureable thicknesses of SPH have been detected in wells MW-2, MW-3 and MW-5 since the vacuum extraction event was performed in April 2011, with thicknesses of up to 0.98 feet in off-Site well MW-5. The grab groundwater samples obtained from borings B-5, B-7, B-8, and B-10 in May 2012 and analyses of groundwater samples from newly installed monitor wells MW-6 and MW-7 in June 2012 suggest that SPH is currently limited to the vicinity of boring B-10 and monitor wells MW-2 and MW-5. Based on the observed occurrence of SPH in Site monitor wells and groundwater sample analyses, the SPH is present in the depth interval of about 30 to 34 feet bgs. Groundwater affected by the release is inferred to extend beneath Treat Blvd. and Clayton Road from the vicinity of the USTs and wells MW-1 and

MW-3. A Groundwater Elevation Contour and Analyses Map for the First Quarter 2012 is included as Figure 2 in Attachment B. Recent and historical groundwater monitoring data is also presented in Attachment B.

3.2 Extent of Soil Impact

Based on Site assessments completed for the former BP release, all historical soil analytical data was collected prior to the SVE system start up in 1996. The maximum concentrations of TPHg and benzene were reported from well VW-1 at 29 feet bgs at 4,000 milligrams per kilogram (mg/kg) and 67 mg/kg, respectively. For MTBE, the maximum concentration was 3.6 mg/kg from well VW-2 at 26 feet bgs. Soil affected by this old release is confined to the Qpaf stratigraphic unit and attenuate to low or non-detect concentrations in the QTu stratigraphic unit.

Analytical data obtained during the May 2012 field work indicate impacts at the Site associated with the new release are limited to the immediate vicinity of the USTs within the vadose zone, and extend laterally to the north and west in the depth interval of about 24 to 38 feet bgs. Recent and historical soil analytical data is presented in Attachment D. Soil sample locations are presented on Figure 2.

4.0 EXPOSURE PATHWAY EVALUATION

Closure Solutions has prepared the following table to outline the potential human health exposure pathways, and evaluate whether such pathways are complete or significant.

Potential Exposure Medium	Potential Exposure Pathway	Pathway Evaluation
Groundwater	Ingestion	***Pathway Incomplete:*** No water wells identified within 2,000-foot radius of the Site. Impacted groundwater is not reasonably expected to impact any existing drinking water wells.
	Dermal Contact	
Subsurface Soil	Ingestion	***Pathway Incomplete:*** Site is currently paved and current land use is not expected to change in foreseeable future.
	Dermal Contact	
Soil Vapor	Intrusion into Indoor Air	***Comparatively Insignificant:*** Potential exposure to soil vapor likely insignificant when compared with exposure associated with current Site use as a retail gasoline service station and/or smog shop.

4.1 Groundwater

The groundwater exposure pathway is considered incomplete. No water wells have been identified within 2,000-foot radius of the Site. Dermal contact with affected groundwater is unlikely given that the depth to groundwater is typically greater than 30 feet bgs and the Site and vicinity are paved.

Though the SPH has caused dissolved-phase concentrations of gasoline constituents to exceed Water Quality Objectives in a limited volume of groundwater, when viewed in the context of Site stratigraphy, hydrology, and reported soil concentrations, the lateral extent of affected groundwater can reasonably be expected to naturally attenuate over a short distance (a few hundred feet) and not pose a significant threat to current or future potential beneficial groundwater uses.

4.2 Subsurface Soil

The subsurface soil exposure pathway is considered incomplete based on soil concentrations, Site use, and the presence of asphalt or concrete covering the affected area. Hydrocarbon impacts in soil have been reported at depths from 5 to 45 feet bgs in the vicinity of the USTs and western portion of the Site. Based on limited soil sample data, no shallow soil samples (0 to 10 feet bgs) have been reported with concentrations above the San Francisco Regional Water Quality Control Board Environmental Screening Levels (Regional Board ESLs) for Direct Exposure for commercial/industrial workers (Table K-2) or for construction workers (Table K-3). Although there is limited shallow soil data, the land use is not expected to change in the foreseeable future and dermal contact with affected soil is unlikely given the Site and vicinity are paved. Additionally, any current or future workers who perform construction related activities on gasoline service stations are required to have appropriate hazardous materials training, therefore appropriate protective measures would be in place prior to performing work. The Regional Water Board's ESL tables are included as Attachment E.

4.3 Soil Vapor

Benzene was reported during the third quarter 2011 groundwater monitoring event at a concentration of 6,400 micrograms per liter (ug/L) in well MW-1. This pathway is considered insignificant when evaluated against the depth to groundwater (greater than 30 feet bgs). Exposures to petroleum vapors associated with historical fuel system releases are considered comparatively insignificant relative to exposures from small surface spills and fugitive vapor releases that typically occur at active fueling facilities. Additionally, the benzene plume is laterally limited with concentrations decreasing rapidly away from well MW-1 and does not extend under Site structures. Soil vapor sample analyses obtained during the May 2012 field

work indicate that high vapor concentrations are limited to the immediate vicinity of the USTs at depths greater than 5 feet bgs. However, soil gas concentrations in the samples collected from the vapor probe closest to the on-Site building indicate vapor intrusion is not expected to be a concern at the Site. Tabulated groundwater and soil vapor analytical data are included in Attachment B and D, respectively. The Regional Board's ESL tables are included in Attachment E.

5.0 OBSERVATIONS AND CONTENTIONS

Based on analytical data from Site investigations, groundwater monitoring and other environmental corrective actions performed at the Site to date, several key observations and contentions may be supported. The observations and contentions are presented below, along with the justification supporting each observation or contention.

Considering the geology, hydrology, and land use at and in the vicinity of the Site, the residual gasoline constituents remaining in fine-grained soil and groundwater do not appear to threaten human health, safety, or environmental receptors. The Site is paved with asphalt and concrete which isolates contaminated soil from potential receptors. The land use is not expected to significantly change in the foreseeable future and there is no current or anticipated beneficial use of the affected groundwater. Constituent concentrations are expected to naturally attenuate to acceptable levels in a reasonable period of time.

The Site has been adequately characterized for the purpose of evaluating threats to human health and environmental receptors. Based on soil and groundwater sample analytical results collected to date, Site conditions do not pose an unreasonable threat to potential receptors. Shallow soil impacts are limited to the immediate vicinity of the USTs and shallow affected groundwater at 30 to 40 feet bgs is not used nor anticipated to be used as a source of drinking water or other beneficial use.

Water Quality Objectives will be achieved in a reasonable period of time. Although groundwater in the immediate vicinity of the Site may exceed Regional Board Basin Plan Water Quality Objectives, given the nature of the release and the Site's geology and hydrology, Water Quality Objectives will be achieved in a reasonable period of time. The release has been stopped, a significant mass of the release has been recovered, and SPH and residual gasoline constituents remaining in soil and groundwater will naturally attenuate in time.

6.0 LIMITATIONS

This report is based on Site conditions, data, and other information available as of the date of the report, and the conclusions and recommendations herein are applicable only to the time frame in which the report was prepared. Background information used to prepare this report including, but not limited to, previous field measurements, analytical results, Site plans and other data have been furnished to Closure Solutions by Bel Air Development Company, and as available on the GeoTracker website. Closure Solutions has relied on this information as furnished, and is neither responsible for nor has confirmed the accuracy of this information

If you have any questions regarding this submission, please contact the undersigned at (916) 760-9048 (dparfitt@closuresolutions.com) or Mr. Brian Busch at (925) 566-8403 (bbusch@closuresolutions.com).

Sincerely,
Closure Solutions, Inc.

Dennis Parfitt, CEG 1223
Principal Geologist

Attachments:

Figure 1	Site Location Map
Figure 2	Site Plan
Attachment A	SFRWQCB Correspondence
Attachment B	Recent and Historical Groundwater Monitoring Data
Attachment C	Generalized Geologic Cross-Sections and Soil Boring Logs
Attachment D	Recent and Historical Soil and Soil Vapor Data
Attachment E	Regional Board ESLs

cc: Robert Frates, Bel Air Development Company
Paul Andrews, Contra Costa County Health Services Department
Hollis E. Phillips, ARCADIS U.S., Inc.

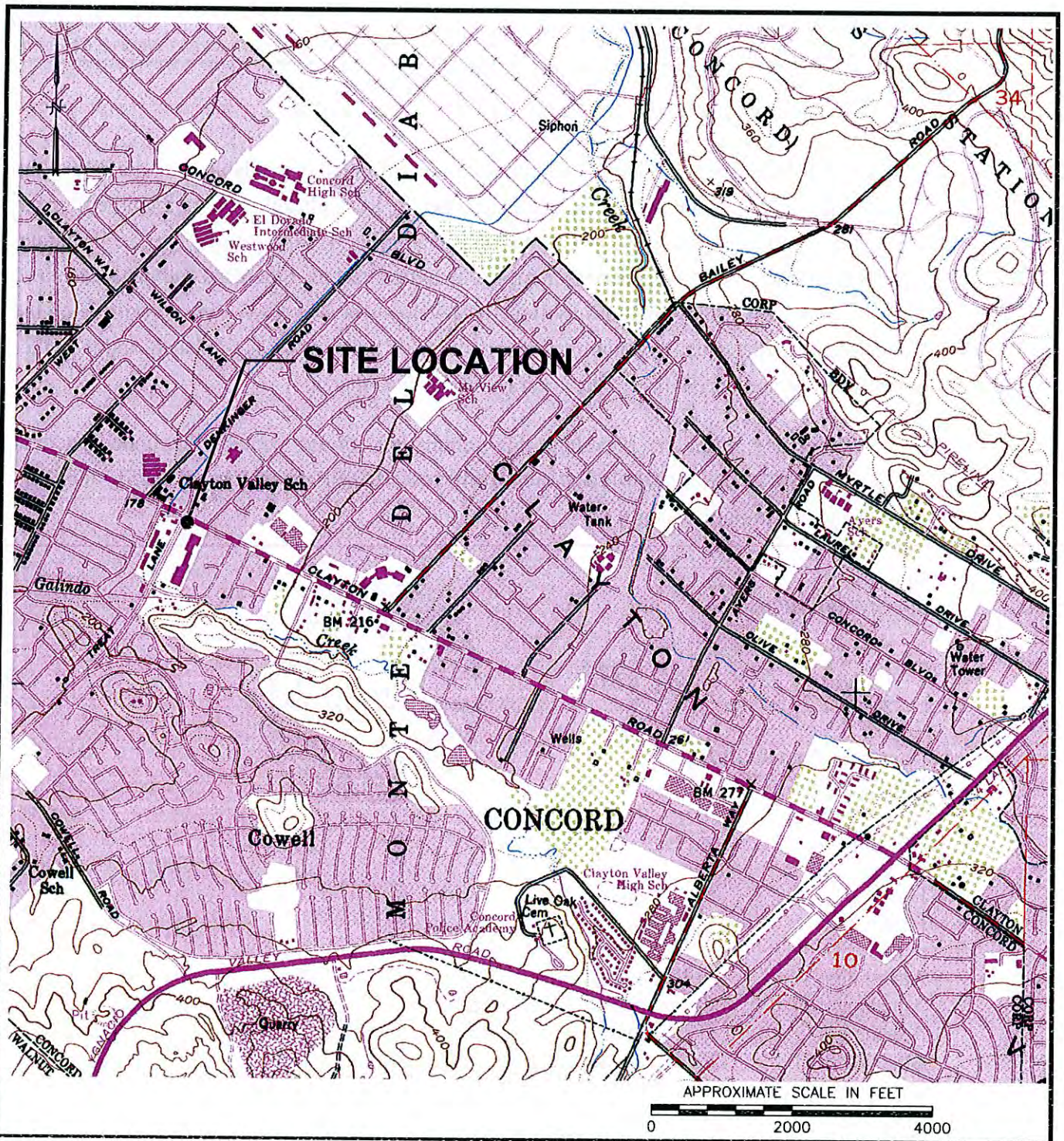


FIGURE 1

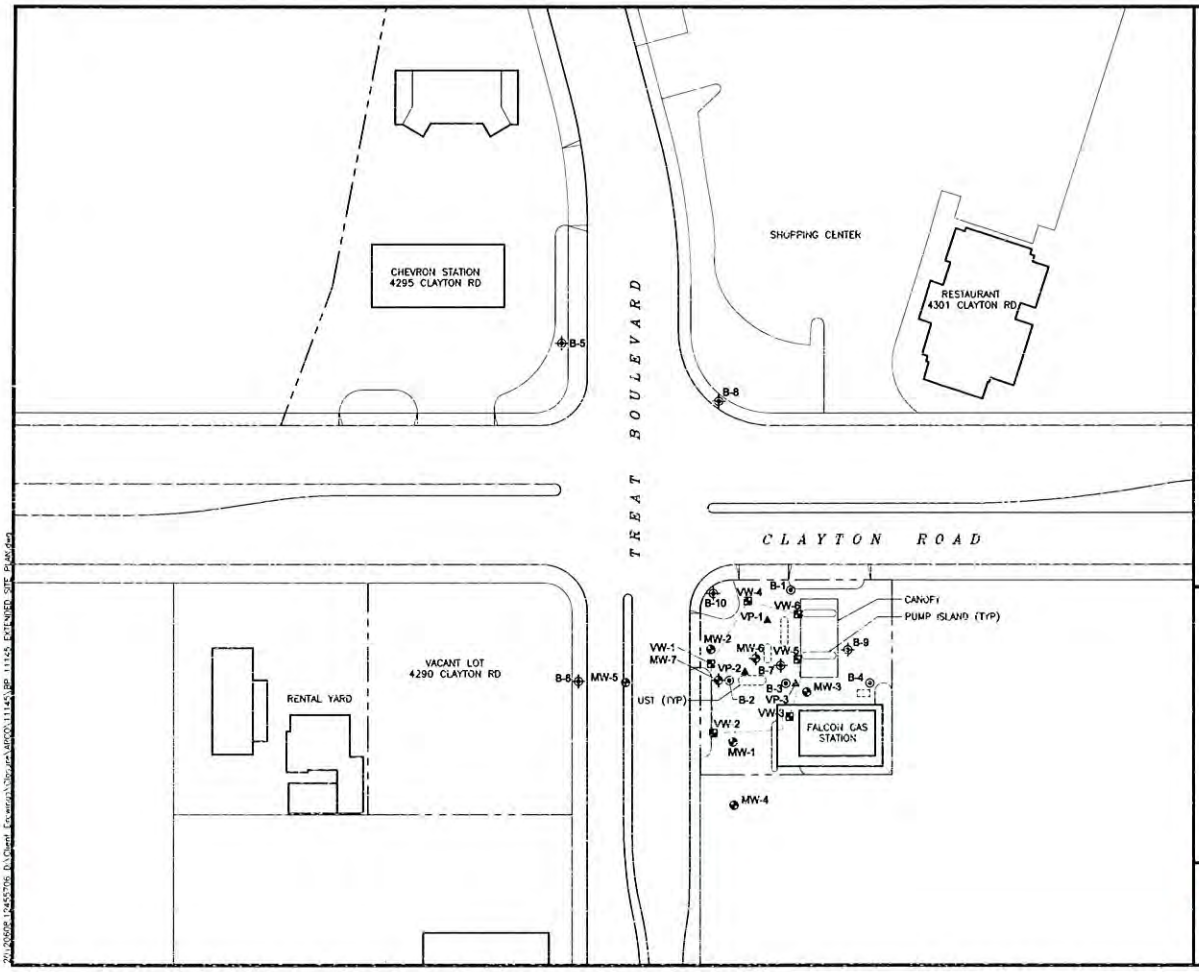
SITE LOCATION MAP

FALCON GAS STATION
4300 CLAYTON ROAD
CONCORD, CALIFORNIA

CLOSURE SOLUTIONS, INC.
2300 Clayton Road •Suite 1435
Concord • California • 94520
Phone: (800) 988-7880

REFERENCE:
USGS 7.5 MIN QUAD MAP TITLED: CLAYTON, CALIFORNIA DATED: 1953 REVISED 1994

20120608.09443184 D:\Client Drawings\Closure\ARCO\11145\BP11145 VICINITY MAP.dwg



SCALE
0 50 100 FEET

LEGEND:

- MAY 2012 GROUNDWATER MONITORING WELL LOCATION
- GROUNDWATER MONITORING WELL LOCATION
- VAPOR EXTRACTION WELL LOCATION
- MAY 2012 SOIL BORING LOCATION
- SOIL BORING LOCATION
- MAY 2012 SOIL SOIL VAPOR PROBE LOCATION
- SVE PIPING

NOTES:

BASEMAP ADAPED FROM ARCADIS ENVIRONMENTAL AND GOOGLE EARTH

FIGURE 2

EXTENDED SITE PLAN WITH MONITORING WELL AND SOIL BORING LOCATIONS

FALCON GAS STATION
4300 CLAYTON ROAD
CONCORD, CALIFORNIA

CLOSURE SOLUTIONS, INC.
2300 Clayton Road • Suite 1435
Concord • California • 94520
Phone: (800) 988-7880

ATTACHMENT A

SFRWQCB Correspondence

CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

MATTHEW RODRIQUEZ
SECRETARY FOR
ENVIRONMENTAL PROTECTION

San Francisco Bay Regional Water Quality Control Board

April 11, 2012
File No. 07-0892 (KEB)

Bel Air Development Company
Attn.: Robert A. Frates; rfrates@zimmermaninvestments.com
1330 Broadway Avenue, Suite 1050
Oakland, CA 94612

SUBJECT: **Approval of Work Plan and Requirement to Submit a Technical Report** - Falcon Gas Station, 4300 Clayton Road, Concord, Contra Costa County

Dear Mr. Frates:

This letter approves your March 9, 2012, *Investigation Work Plan and Preliminary Conceptual Site Model* with the conditions noted below, and requires you to submit a technical report of the findings of the investigation.

Background
The site is a non-operational gasoline service facility improved with an automobile service building/smog testing operation, three underground storage tanks (USTs), and two product dispenser islands. In 1989 BP acquired the property from the Mobil Corporation and later sold the facility in 1994.

The February 14, 2011, groundwater monitoring report indicated that over four feet of separate-phase hydrocarbons (SPH or "free product") was measured in on-site well MW-2 on February 4, 2011. In addition, approximately 2.6 feet of SPH was measured in off-site, downgradient well MW-5, and SPH was further detected in on-site well MW-3. During an October 31, 2011, groundwater monitoring event free product was again measured in MW-2 and MW-5 at 0.38 feet and 0.52 feet, respectively.

A single-walled, 1,000-gallon fiberglass fuel UST installed in 1984 is reportedly the source of the free product. The timing and volume of the release are unknown. On April 1, 2011, a vacuum extraction test on MW-2 and MW-5 resulted in the removal of approximately 600 gallons of SPH and groundwater.

The Regional Water Board's December 23, 2011, letter required the submittal of a work plan by January 31, 2012, to identify the source of the SPH beneath and downgradient of the site, and define the vertical and lateral extent of soil and groundwater contamination associated with the fuel release. The first iteration of the work plan, dated January 31, 2012, did not adequately describe the site's environmental setting, nor did it propose an appropriate soil testing program or justify the design and location of new

groundwater monitoring wells. A time extension was granted to submit a revised and acceptable work plan to the Regional Water Board by March 6, 2012. We also required you to submit the UST integrity and leak detection reports prepared over the past five years. As of the date of this letter, no such reports have been submitted to our agency.

Proposed Scope of Work

The work plan proposes:

- Advancing four off-site and three on-site soil borings with a direct-push drill rig to approximately 45 feet below the ground surface;
- Advancing two on-site borings with a hollow-stem auger drill rig and installing two groundwater monitoring wells (each well will consist of 4-inch diameter PVC piping, with a screened interval set at 27 to 45 feet, a slot size of 0.010, and a #2/12 Monterey sand pack);
- Continuous lithologic logging and field screening of the soil conditions encountered in the nine borings, soil and groundwater sampling, and laboratory analysis for various petroleum hydrocarbons and related compounds utilizing EPA Method 8260B;
- Monitoring well development and the surveying of the well locations per the GeoTracker requirements, and;
- Submitting a technical report of the results of the investigation.

Conditional Approval of Work Plan

The work plan is generally acceptable. However, additional work is necessary to adequately characterize the unsaturated (vadose) zone beneath and downgradient of the site. For example, an insufficient number of samples are proposed to define the vertical and lateral extent of on-site soil contamination caused by the fuel release. Also, there are six on-site soil vapor extraction (SVE) wells that could potentially be sampled. An assessment of petroleum hydrocarbons in soil vapor may also be appropriate to better define the extent of on-site soil contamination before a final remedial cleanup approach is chosen. A good soil vapor study can also aid in the evaluation of the risk to human health posed by petroleum vapors via the vapor intrusion/inhalation pathway. Therefore, the work plan is approved with the following conditions:

- A minimum of three soil samples per each on-site borehole shall be submitted for laboratory analysis, and
- Multi-level soil vapor probes shall be installed and sampled at the site in accordance with DTSC's March 2010 *Advisory – Active Soil Gas Investigation* technical document (the locations and depths of the probes, and suggested sample methodology and laboratory analysis, shall be discussed with the Regional Water Board caseworker prior to the start of the project).
- An evaluation shall be made to determine the feasibility of sampling the six SVE wells for petroleum vapors.

You are hereby required to a technical report by June 22, 2012, that discusses the completion and findings from the above investigation activities. The report should include a work plan and proposed schedule to conduct interim active remediation to remove free product, along with an updated Conceptual Site Model.

The Regional Water Board caseworker shall be notified no less than 72 hours in advance of all field activities, so that site visits can be scheduled. Any problems with obtaining on- or off-site access or the necessary permits shall be brought to the early attention of the Water Board caseworker.

This requirement for a report is made pursuant to Water Code Section 13267, which allows the Regional Water Board to require technical or monitoring program reports from any person who has discharged, discharges, proposes to discharge, or is suspected of discharging waste that could affect water quality. The attachment provides additional information about Section 13267 requirements. Any extension to the above deadline must be confirmed in writing by Regional Water Board staff.

In addition to paper submittals, please submit all documents in electronic format to the State Water Resources Control Board's GeoTracker database. Guidance for electronic information submittal is available at:

http://www.waterboards.ca.gov/cwphome/ust/cleanup/electronic_reporting/index.html

All reports should have the Regional Water Board file number 07-0892 on the first page of the report. Copies of all submittals should also be sent to the Contra Costa County Health Services Department (CCCHSD) in Martinez.

If you have any questions, please contact Kevin Brown of my staff at (510) 622-2358 or via e-mail at kebrown@waterboards.ca.gov.

Sincerely,

Bruce H. Wolfe
Executive Officer

Enclosure: Fact Sheet – Requirements for Submitting Technical Reports Under Section 13267 of the California Water Code

cc:

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CALIFORNIA
Water Boards

EDMUND G. BROWN JR.
GOVERNOR

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SECRETARY FOR
ENVIRONMENTAL PROTECTION

San Francisco Bay Regional Water Quality Control Board

Fact Sheet – Requirements For Submitting Technical Reports Under Section 13267 of the California Water Code

What does it mean when the Regional Water Board requires a technical report?
Section 13267[1] of the California Water Code provides that "...the regional board may require that any person who has discharged, discharges, or who is suspected of having discharged or discharging, or who proposes to discharge waste...that could affect the quality of waters...shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires."

This requirement for a technical report seems to mean that I am guilty of something, or at least responsible for cleaning something up. What if that is not so?
The requirement for a technical report is a tool the Regional Water Board uses to investigate water quality issues or problems. The information provided can be used by the Regional Water Board to clarify whether a given party has responsibility.

Are there limits to what the Regional Water Board can ask for?
Yes. The information required must relate to an actual or suspected or proposed discharge of waste (including discharges of waste where the initial discharge occurred many years ago), and the burden of compliance must bear a reasonable relationship to the need for the report and the benefits obtained. The Regional Water Board is required to explain the reasons for its request.

What if I can provide the information, but not by the date specified?
A time extension may be given for good cause. Your request should be promptly submitted in writing, giving reasons.

Are there penalties if I don't comply?
Depending on the situation, the Regional Water Board can impose a fine of up to $5,000 per day, and a court can impose fines of up to $25,000 per day as well as criminal penalties. A person who submits false information or fails to comply with a requirement to submit a technical report may be found guilty of a misdemeanor. For some reports, submission of false information may be a felony.

Do I have to use a consultant or attorney to comply?
There is no legal requirement for this, but as a practical matter, in most cases the specialized nature of the information required makes use of a consultant and/or attorney advisable.

What if I disagree with the 13267 requirements and the Regional Water Board staff will not change the requirement and/or date to comply?
You may ask that the Regional Water Board reconsider the requirement, and/or submit a petition to the State Water Resources Control Board. See California Water Code sections 13320 and 13321 for details. A request for reconsideration to the Regional Water Board does not affect the 30-day deadline within which to file a petition to the State Water Resources Control Board.

If I have more questions, whom do I ask?
Requirements for technical reports include the name, telephone number, and email address of the Regional Water Board staff contact.

Revised March 2012

[1] All code sections referenced herein can be found by going to www.leginfo.ca.gov.

ATTACHMENT B

Recent and Historical Groundwater Monitoring Data

Table 1
Separate-Phase Hydrocarbon Measurements
and Groundwater Analytical Data

Falcon Gas Station
4300 Clayton Road
Concord, California

Well Number	Date	Depth to Product (Feet)	Depth to Water (Feet)	Groundwater Elevation (Feet)	SPH Thickness (Feet)	GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)
MW-1	4/11/2011	---	32.29		0.00	--	--	--	--	--	--
184.18	4/27/2011	---	32.01		0.00	---	---	---	---	---	---
	6/3/2011	---	29.20		0.00	---	---	---	---	---	---
	7/13/2011	---	31.89		0.00	---	---	---	---	---	---
	7/28/11*	---	30.75	153.43	0.00	12,000	6,400	440	240	970	84
	8/16/2011	---	31.02		0.00	---	---	---	---	---	---
	9/22/2011	---	31.38		0.00	---	---	---	---	---	---
	10/31/2011	---	33.41		0.00	---	---	---	---	---	---
	11/28/2011	---	34.06		0.00	---	---	---	---	---	---
	12/20/2011	---	34.71		0.00	---	---	---	---	---	---
	1/24/2012	---	35.91		0.00	---	---	---	---	---	---
	1/31/12*	---	35.34	148.84	0.00	7,200	4,300	180	160	470	50
	2/28/2012	---	36.42		0.00	---	---	---	---	---	---
	3/21/2012	---	33.41		0.00	---	---	---	---	---	---
	4/26/2012	---	35.77		0.00	---	---	---	---	---	---
	5/24/2012	---	35.41		0.00	---	---	---	---	---	---
	6/21/2012	---	**35.53**	**148.65**	**0.00**	---	---	---	---	---	---
MW-2	4/11/2011	---	32.73		0.00	---	---	---	---	---	---
186.98	4/27/2011	32.28	32.30		0.02	---	---	---	---	---	---
	6/3/2011	31.19	31.20		0.01	---	---	---	---	---	---
	7/13/2011	30.84	31.31		0.47	---	---	---	---	---	---
	7/28/11*	---	31.37	153.45	0.20	---	---	---	---	---	---
	8/16/2011	31.20	31.60		0.40	---	---	---	---	---	---
	9/22/2011	31.65	31.97		0.32	---	---	---	---	---	---
	10/31/2011	33.30	33.68		0.38	---	---	---	---	---	---
	11/28/2011	34.11	34.33		0.22	---	---	---	---	---	---
	12/20/2011	34.74	34.83		0.09	---	---	---	---	---	---
	1/24/2012	35.76	36.06		0.30	---	---	---	---	---	---
	1/31/12*	---	35.86	148.90	0.00	---	---	---	---	---	---
	2/28/2012	---	36.22		0.00	---	---	---	---	---	---

Table 1
Separate-Phase Hydrocarbon Measurements
and Groundwater Analytical Data

Falcon Gas Station
4300 Clayton Road
Concord, California

Well Number	Date	Depth to Product (Feet)	Depth to Water (Feet)	Groundwater Elevation (Feet)	SPH Thickness (Feet)	GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)
MW-2	3/21/2012	33.30	33.68		0.38	---	---	---	---	---	---
(cont'd)	4/26/2012	35.61	35.78		0.17	---	---	---	---	---	---
	5/24/2012	35.35	35.43		0.08	---	---	---	---	---	---
	6/21/2012	**35.90**	**36.04**		**0.14**	---	---	---	---	---	---
MW-3	4/11/2011	32.94	32.95		0.01	---	---	---	---	---	---
188.45	4/27/2011	32.92	32.93		0.01	---	---	---	---	---	---
	6/3/2011	31.67	31.68		0.01	---	---	---	---	---	---
	7/13/2011	31.12	31.13		0.01	---	---	---	---	---	---
	7/28/11*	---	31.16	155.09	0.00	9,700	73	1,400	170	1,500	ND<0.50
	8/16/2011	---	31.67		0.00	---	---	---	---	---	---
	9/22/2011	---	32.06		0.00	---	---	---	---	---	---
	10/31/2011	---	33.78		0.00	---	---	---	---	---	---
	11/28/2011	---	34.62		0.00	---	---	---	---	---	---
	12/20/2011	---	35.24		0.00	---	---	---	---	---	---
	1/24/2012	36.40	36.41		0.01	---	---	---	---	---	---
	1/31/12*	---	36.52	149.73	0.00	---	---	---	---	---	---
	2/28/2012	---	36.70		0.00	---	---	---	---	---	---
	3/21/2012	---	33.78		0.00	---	---	---	---	---	---
	4/26/2012	---	35.81		0.00	---	---	---	---	---	---
	5/24/2012	---	35.79		0.00	---	---	---	---	---	---
	6/21/2012	---	**36.11**	**152.34**	**0.00**	**3,500**	**13**	**340**	**220**	**1,300**	**ND<1.0**
MW-4	4/27/2011	---	29.66		0.00	---	---	---	---	---	---
184.20	6/3/2011	---	28.74		0.00	---	---	---	---	---	---
	7/13/2011	---	31.89		0.00	---	---	---	---	---	---
	7/28/11*	---	28.42	155.78	0.00	53	ND<0.50	2.2	1.1	8.1	ND<0.50
	8/16/2011	---	27.77		0.00	---	---	---	---	---	---
	9/22/2011	---	28.93		0.00	---	---	---	---	---	---
	10/31/2011	---	31.69		0.00	---	---	---	---	---	---
	11/28/2011	---	32.26		0.00	---	---	---	---	---	---

Table 1
Separate-Phase Hydrocarbon Measurements
and Groundwater Analytical Data

Falcon Gas Station
4300 Clayton Road
Concord, California

Well Number	Date	Depth to Product (Feet)	Depth to Water (Feet)	Groundwater Elevation (Feet)	SPH Thickness (Feet)	GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)
MW-4	12/20/2011	---	NM		0.00	---	---	---	---	---	---
(cont'd)	1/24/2012	---	NM		0.00	---	---	---	---	---	---
	1/31/12*	---	32.44	151.76	0.00	---	---	---	---	---	---
	2/28/2012	---	33.26		0.00	---	---	---	---	---	---
	3/21/2012	---	31.69		0.00	---	---	---	---	---	---
	4/26/2012	---	31.99		0.00	---	---	---	---	---	---
	5/24/2012	---	31.89		0.00	---	---	---	---	---	---
	6/21/2012	**---**	**32.70**	**151.50**	**0.00**	**---**	**---**	**---**	**---**	**---**	**---**
MW-5	4/11/2011	32.47	32.48		0.01	---	---	---	---	---	---
184.47	4/27/2011	---	32.03		0.00	---	---	---	---	---	---
	6/3/2011	---	31.03		0.00	---	---	---	---	---	---
	7/13/2011	---	31.30		0.00	---	---	---	---	---	---
	7/28/11*	---	30.79	153.69	0.01	---	---	---	---	---	---
	8/16/2011	31.08	31.10		0.02	---	---	---	---	---	---
	9/22/2011	32.03	32.06		0.03	---	---	---	---	---	---
	10/31/2011	32.98	33.50		0.52	---	---	---	---	---	---
	11/28/2011	33.81	34.10		0.29	---	---	---	---	---	---
	12/20/2011	NM	NM		---	---	---	---	---	---	---
	1/24/2012	35.40	35.95		0.55	---	---	---	---	---	---
	1/31/12*	---	35.85	149.04	0.56	---	---	---	---	---	---
	2/28/2012	35.80	36.62		0.82	---	---	---	---	---	---
	3/21/2012	32.98	33.50		0.52	---	---	---	---	---	---
	4/26/2012	35.03	35.81		0.78	---	---	---	---	---	---
	5/24/2012	34.68	35.55		0.87	---	---	---	---	---	---
	6/21/2012	**35.22**	**36.20**		**0.98**	**---**	**---**	**---**	**---**	**---**	**---**

Table 1
Separate-Phase Hydrocarbon Measurements
and Groundwater Analytical Data

Falcon Gas Station
4300 Clayton Road
Concord, California

Well Number	Date	Depth to Product (Feet)	Depth to Water (Feet)	Groundwater Elevation (Feet)	SPH Thickness (Feet)	GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)
MW-6	5/24/2012	---	34.98		0.00	---	---	---	---	---	---
187.10	**6/21/2012**	**---**	**35.66**	**151.44**	**0.00**	**11,000**	**960**	**6,400**	**750**	**5,400**	**ND<1.0**
MW-7	5/24/2012	---	34.82		0.00	---	---	---	---	---	---
186.67	**6/21/2012**	**---**	**35.41**	**151.26**	**0.00**	**5,600**	**260**	**2,100**	**160**	**920**	**ND<1.0**

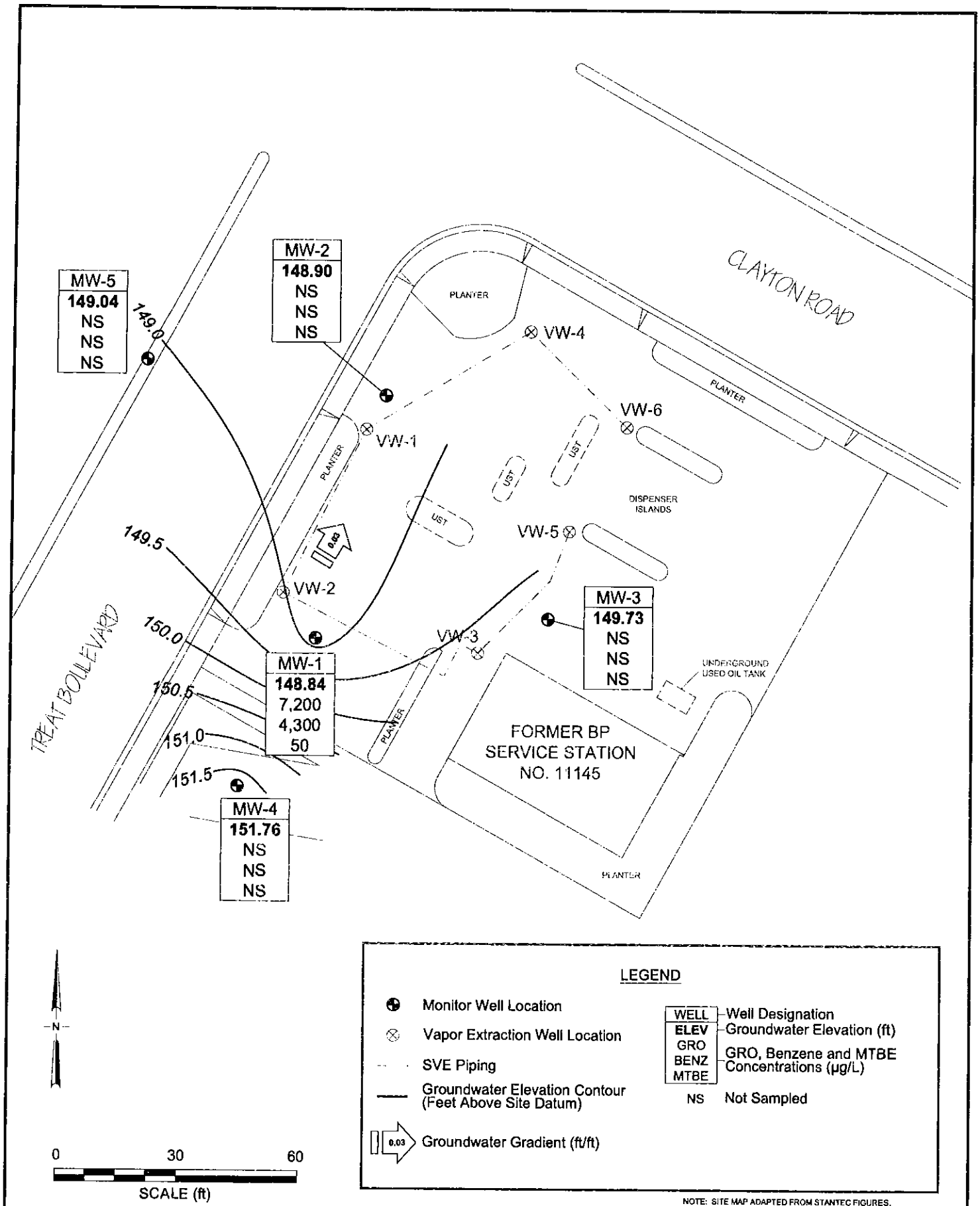
Table 2
Grab Groundwater Analytical Data

Former Falcon Gas
4300 Clayton Road
Concord, California

Sample ID	Date Sampled	GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)
B-5-W	5/14/2012	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.5	ND<1.0
B-7-W	5/15/2012	**1,200**	**27**	**86**	**3.8**	**12.5**	ND<1.0
B-8-W	5/16/2012	ND<50	ND<0.50	ND<0.50	ND<0.50	ND<1.5	ND<1.0
B-10-W	5/17/2012	**150,000**	**6,400**	**51,000**	**3,900**	**21,200**	ND<100

ABBREVIATIONS:

Bold	=	Detection above laboratory reporting limits
GRO	=	Gasoline Range Organics (C6-C12)
B	=	Benzene
T	=	Toluene
E	=	Ethylbenzene
X	=	Total xylenes
MTBE	=	Methyl tertiary butyl ether by EPA Method 8020/8260
(µg/L)	=	Micrograms per liter (parts per billion [ppb])
ND<	=	Not detected at or above specified laboratory reporting limit



NOTE: SITE MAP ADAPTED FROM STANTEC FIGURES.
SITE DIMESIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT & ASSOCIATES, INC. ENGINEERING, WATER RESOURCES & ENVIRONMENTAL 1324 Mangrove Ave. Suite 212, Chico, California 95926 Project No.: 09-88-666 Date: 02/24/11	Former BP Service Station #11145 4300 Clayton Road Concord, California	Groundwater Elevation Contour and Analytical Summary Map January 31, 2012	Drawing 2

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-1														
10/18/1993	--	184.18	36.67	0.00	147.51	20,000	5,000	2,500	260	1,400	--	--	--	
2/7/1994	--	[illegible]	37.92	0.00	146.19	45,000	9,100	4,000	500	2,500	--	--	--	
5/19/1994	--		38.26	0.00	145.92	30,000	9,300	4,300	340	1,600	--	4.4	--	
8/15/1994	--		39.38	0.00	144.80	43,000	17,000	6,400	600	2,000	--	--	--	DUP
10/31/1994	--		40.85	0.00	143.33	35,000	11,000	3,700	280	1,900	--	--	--	DUP
2/8/1995	--		37.58	0.00	146.60	55,000	9,400	3,800	280	3,500	--	--	--	DUP
4/11/1995	--		33.61	0.00	150.57	22,000	8,600	2,800	130	1,300	--	3.9	--	
8/7/1995	--		31.32	0.00	152.86	1,000	150	43	1.6	160	--	--	--	DUP
2/6/1996	--		32.55	0.00	151.63	--	--	--	--	--	--	--	--	MD
4/16/1996	--		32.96	0.00	151.22	7,500	4,800	260	<25	360	670	5.9	--	
7/9/1996	--		29.12	0.00	155.06	--	--	--	--	--	--	--	--	MD
7/10/1996	--		--	--	--	80	8.3	3.0	<1.0	1.1	22	--	--	DUP
10/25/1996	--		31.23	0.00	152.95	18,000	9,000	720	<50	900	1,500	5.7	--	
1/8/1997	--		31.02	0.00	153.16	7,600	3,000	1,200	<10	<10	440	2.9	--	
4/23/1997	--		29.75	0.00	154.43	22,000	9,900	1,200	120	1,000	1,700	--	--	DUP
7/22/1997	--		30.42	0.00	153.76	48,000	16,000	4,000	290	1,800	2,200	--	--	DUP
10/7/1997	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-1 Cont.														
10/3/1997	--	184.18	32.95	0.00	151.23	1,800	450	48	2.5	130	250	--	--	DUP
1/8/1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5/8/1998	--		23.72	0.00	160.46	110,000	24,000	7,700	1,000	5,000	2,300	--	--	DUP
11/5/1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12/15/2000	--		35.09	0.00	149.09	13,000	4,800	1,600	250	770	390	--	--	
1/16/2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6/7/2001	--		37.35	0.00	146.83	20,000	6,200	2,500	290	1,100	400	--	--	
7/20/2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11/14/2001	--		38.40	0.00	145.78	74,000	18,000	7,900	620	2,900	1,100	--	--	
1/4/2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/5/2002	--		34.60	0.00	149.58	110,000	19,000	11,000	740	4,700	800	--	--	
8/15/2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/31/2002	--		37.00	0.00	147.18	38,000	14,000	6,100	370	2,300	<620	--	--	
1/28/2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/9/2003	--		35.50	0.00	148.68	4,400	1,600	460	66	270	110	--	--	
7/16/2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/23/2003	--		34.41	0.00	149.77	49,000	16,000	7,300	650	3,700	<1,200	--	--	
1/22/2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/9/2004	--		33.78	0.00	150.40	54,000	15,000	6,900	600	3,300	<2,500	--	--	
7/16/2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/7/2004	--		36.59	0.00	147.59	38,000	16,000	6,600	640	3,500	<1,200	--	--	
1/18/2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/15/2005	--		31.27	0.00	152.91	<50,000	9,800	3,300	<500	1,900	<2,500	--	--	
7/22/2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/24/2005	--		31.22	0.00	152.96	<50,000	13,000	4,900	520	2,600	<2,500	--	--	
1/24/2006	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/7/2006	--		27.44	0.00	156.74	<50,000	4,700	1,400	<500	1,400	<2,500	--	--	
8/1/2006	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11/29/2006	--		29.40	0.00	154.78	5,700	2,300	690	110	620	76	1.6	--	
1/29/2007	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-1 Cont.														
4/27/2007	--	184.18	31.73	0.00	152.45	12,000	4,200	940	210	1,000	63	2.0	--	
7/11/2007	[illegible]	[illegible]	33.04	0.00	151.14	41,000	21,000	24,000	560	2,800	140	2.0	[illegible]	[illegible]
10/25/2007	--		35.44	0.00	148.74	620	350	57	22	75	<5.0	1.4	--	
2/1/2008	[illegible]	[illegible]	34.76	0.00	149.42	43,000	24,000	3,400	710	2,200	120	1.5	[illegible]	[illegible]
5/14/2008	--		33.94	0.00	150.24	32,000	16,000	3,500	580	3,100	220	1.0	--	
7/15/2008	[illegible]	[illegible]	34.11	0.00	149.07	2,400	4,600	390	98	480	33	2.2	[illegible]	[illegible]
10/9/2008	--		36.95	0.00	147.23	8,200	6,100	1,500	290	1,500	120	4.5	--	
1/7/2009	[illegible]	[illegible]	34.50	0.00	149.68	59,000	27,000	5,800	2,000	420	200	3.3	[illegible]	[illegible]
4/15/2009	--		36.08	0.00	148.10	26,000	12,000	1,800	430	1,900	170	4.7	--	
7/20/2009	[illegible]	[illegible]	31.52	0.00	146.66	32,000	16,000	2,700	750	980	140	3.3	[illegible]	[illegible]
10/27/2009	--		39.70	0.00	144.48	16,000	6,100	260	230	700	170	3.1	--	
1/8/2010	[illegible]	[illegible]	37.83	0.00	146.35	8,800	2,800	220	230	140	220	3.5	7.01	
5/12/2010	P		35.46	0.00	148.72	510	280	16	7.7	29	5.4	1.36	6.98	Sample data from 6/10/2010
7/17/2010	[illegible]	[illegible]	35.13	0.00	149.05	31,000	9,500	2,300	670	1,900	92	1.72	7.21	[illegible]
10/19/2010	P		36.51	0.00	147.67	21,000	8,900	1,100	340	1,600	110	1.33	7.10	
1/7/2011	[illegible]	[illegible]	36.72	0.00	147.46	20,000	11,000	2,300	720	1,100	61	1.15	6.97	[illegible]
7/28/2011	P		30.75	0.00	153.43	12,000	6,400	440	240	970	84	1.63	7.10	
1/30/2012	[illegible]	[illegible]	34.41	0.00	149.77	9,900	4,300	410	160	870	50	1.51	7.77	[illegible]
MW-2														
10/18/1993	--	184.81	36.89	0.00	147.92	4,400	810	110	47	740	--	--	--	
5/19/1994	[illegible]	[illegible]	38.61	0.00	146.20	280	3.1	2.0	4.0	22	--	4.5	--	
8/15/1994	--		39.58	0.00	145.23	1,800	740	15	11	46	--	3.3	--	
11/11/1994	[illegible]	[illegible]	38.10	0.00	146.71	240	10	0.51	1.9	2.93	--	1.3	--	[illegible]
2/8/1995	--		38.15	0.00	146.66	230	44	6.6	4.9	17	--	--	--	
4/11/1995	[illegible]	[illegible]	35.87	0.00	148.94	49,000	1,900	5.1	5.7	73	--	[illegible]	[illegible]	[illegible]
8/7/1995	--		31.54	0.00	153.27	63	3.6	<0.50	<0.50	<1.0	--	3.2	--	
10/27/1995	[illegible]	[illegible]	32.42	0.00	152.39	30	1.1	<0.50	<0.50	<1.0	12	[illegible]	[illegible]	
2/6/1996	--		32.76	0.00	152.05	--	--	--	--	--	--	--	--	MD

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-2 Cont.														
2/7/1996	--	184.11	[illegible]	0.00	[illegible]	<50	<0.50	<1.0	<1.0	<1.0	<10	6.6	[illegible]	[illegible]
4/16/1996	--		33.17	0.00	151.64	<50	<0.50	<1.0	<1.0	<1.0	<10	6.0	--	
7/15/1996	--	[illegible]	[illegible]	0.00	[illegible]	<50	<0.50	<1.0	<1.0	<1.0	<10	5.6	[illegible]	[illegible]
10/25/1996	--		31.66	0.00	153.15	3,700	810	54	140	240	420	5.7	--	
1/15/1997	[illegible]	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/23/1997	--		28.71	0.00	156.10	1,400	350	27	32	140	490	1.9	--	
7/22/1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/3/1997	--		33.45	0.00	151.36	<50	18	<1.0	<1.0	<1.0	<10	3.2	--	
1/8/1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5/8/1998	--		24.15	0.00	160.66	200	0.75	<1.0	<1.0	<1.0	<10	2.8	--	
12/15/2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1/16/2001	--		35.33	0.00	149.34	5,800	170	8.8	730	510	77	--	--	
4/17/2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/20/2001	--		34.43	0.00	150.24	2,300	79	<2.5	12	97	48	--	--	
10/29/2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1/4/2002	--		35.78	0.00	148.89	340	10	<0.50	20	5.4	88	--	--	
4/4/2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
8/1/2002	--		35.39	0.00	149.28	2,500	67	1.0	380	220	77	--	--	
10/31/2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1/28/2003	--		35.85	0.00	148.82	54	1.9	<0.50	0.59	<0.50	8.0	--	--	
4/30/2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/16/2003	--		31.74	0.00	152.93	4,000	270	7.9	490	180	18	--	--	
10/29/2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1/22/2004	--		35.55	0.00	149.12	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
4/29/2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/14/2004	--		34.87	0.00	149.80	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
10/28/2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1/26/2005	--		34.65	0.00	150.02	670	50	<2.5	84	40	60	--	--	
4/15/2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/22/2005	--		30.00	0.00	154.67	<50	<0.50	<0.50	<0.50	<0.50	4.3	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-2 Cont.														
10/24/2005	--	184.61	32.91	0.00	151.70	<50	<0.50	<0.50	0.71	0.81	<2.5	--	--	
1/24/2006	--		30.60	0.00	154.07	200	6.3	<0.50	3.5	<0.50	25	--	--	
4/7/2006	--	184.67	30.60	0.00	154.07	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
8/1/2006	--		25.60	0.00	159.07	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
11/22/2006	--	184.67	28.12	0.00	156.55	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	--	
1/26/2007	--		31.31	0.00	153.36	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	--	
4/27/2007	--	184.67	30.73	0.00	153.94	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	--	
7/13/2007	--		33.64	0.00	151.03	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.4	--	
10/25/2007	--	184.67	35.11	0.00	149.56	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	--	
2/4/2008	--		34.75	0.00	149.92	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.0	--	
4/17/2008	--	184.67	34.71	0.00	149.96	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.3	--	
7/15/2008	--		35.71	0.00	148.96	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.3	--	
10/9/2008	--	184.67	37.83	0.00	146.84	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	--	
1/7/2009	--		38.86	0.00	145.81	65	<0.50	<0.50	<0.50	<0.50	<0.50	6.0	--	
4/14/2009	--	184.67	37.71	0.00	146.96	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	--	
7/20/2009	--		37.71	0.00	146.96	<50	2.6	<0.50	<0.50	<0.50	<0.50	3.5	--	
10/27/2009	--	184.67	38.06	0.00	146.61	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.2	--	
3/8/2010	P		38.37	0.00	146.30	740	13	<0.50	10	<1.0	<0.50	1.54	6.97	
5/12/2010	--	184.67	36.19	0.00	148.48	<50	<0.50	<0.50	<0.50	<1.0	<0.50	2.2	--	
8/17/2010	P		35.10	0.00	149.57	<50	<0.50	<0.50	<0.50	<1.0	<0.50	--	7.21	
10/19/2010	--	184.67	34.87	0.00	149.80	<50	<0.50	<0.50	<0.50	<1.0	<0.50	2.2	--	
2/4/2011	--		39.56	4.14	148.22	--	--	--	--	--	--	--	--	b
7/25/2011	--	184.67	36.22	0.00	148.45	<50	<0.50	<0.50	<0.50	<1.0	<0.50	2.2	--	
1/31/2012	--		**35.86**	**0.12**	**148.90**	--	--	--	--	--	--	--	--	**b**
MW-3														
10/18/1993	--	186.25	37.39	0.00	148.86	<50	4.3	0.60	<0.50	0.60	--	--	--	
10/18/1993	--	186.25	37.39	0.00	148.86	<50	4.3	0.60	<0.50	0.60	--	--	--	DUP
3/8/1994	--		38.76	0.00	147.49	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	
3/8/1994	--	186.25	38.76	0.00	147.49	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	DUP
5/19/1994	--		39.05	0.00	147.20	<50	<0.50	<0.50	<0.50	<0.50	--	5.7	--	

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MW-3 Cont.														
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/31/1994	--		41.71	0.00	144.54	<50	<0.50	<0.50	<0.50	0.80	--	5.7	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/11/1995	--		34.73	0.00	151.52	<50	<0.50	<0.50	<0.50	<1.0	--	5.4	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/2/1995	--		32.84	0.00	153.41	<50	<0.50	<0.50	<0.50	<1.0	<5.0	7.5	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2/7/1996	--		--	--	--	<50	<0.50	<1.0	<1.0	<1.0	<10	7.8	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/16/1996	--		33.73	0.00	152.52	<50	<0.50	<1.0	<1.0	<1.0	<10	6.1	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/25/1996	--		32.22	0.00	154.03	<50	<0.50	<1.0	<1.0	<1.0	<10	5.3	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/23/1997	--		31.17	0.00	155.08	<50	1.8	<1.0	<1.0	1.2	<10	3.0	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/3/1997	--		34.21	0.00	152.04	<50	<0.50	<1.0	<1.0	<1.0	<10	3.4	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1/8/1998	--		35.61	0.00	150.64	5,200	1,400	670	42	270	150	--	--	DUP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12/15/2000	--		35.75	0.00	150.50	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
6/7/2001	--		34.31	0.00	151.94	56	<0.50	<0.50	0.58	<1.5	<0.50	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11/14/2001	--		37.13	0.00	149.12	<50	<0.50	<0.50	<0.50	<1.5	<0.50	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/5/2002	--		35.14	0.00	151.11	54	<0.50	<0.50	<0.50	<1.0	<0.50	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/31/2002	--		37.65	0.00	148.60	<50	<0.50	<0.50	<0.50	0.57	<2.5	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/9/2003	--		34.85	0.00	151.40	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	

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MW-3 Cont.														
7/17/2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/23/2003	--		35.32	0.00	150.93	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
1/22/2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/9/2004	--		34.29	0.00	151.96	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
7/30/2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/7/2004	--		37.10	0.00	149.15	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
1/25/2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/15/2005	--		31.90	0.00	154.35	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
7/22/2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/24/2005	--		32.30	0.00	153.95	<50	0.74	0.88	1.3	1.7	<2.5	--	--	
1/24/2006	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/7/2006	--		27.45	0.00	158.80	--	--	--	--	--	--	--	--	NSP
7/31/2006	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11/29/2006	--		29.99	0.00	156.26	--	--	--	--	--	--	--	--	NSP
1/29/2007	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/27/2007	--		32.40	0.00	153.85	--	--	--	--	--	--	--	--	NSP
7/30/2007	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/25/2007	--		30.18	0.00	156.07	--	--	--	--	--	--	--	--	NSP
2/4/2008	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5/14/2008	--		34.58	0.00	151.67	--	--	--	--	--	--	--	--	NSP
8/15/2008	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/9/2008	--		37.51	0.00	148.74	--	--	--	--	--	--	--	--	NSP
1/27/2009	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/15/2009	--		36.69	0.00	149.56	--	--	--	--	--	--	--	--	NSP
7/20/2009	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/27/2009	--		43.30	0.00	142.95	--	--	--	--	--	--	--	--	NSP
2/12/2010	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5/12/2010	--		36.00	0.00	150.25	--	--	--	--	--	--	--	--	NSP
8/17/2010	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/19/2010	--		37.07	0.00	149.18	--	--	--	--	--	--	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-3 Cont.														
2/4/2011	S	186.21	30.70	0.00	155.51	--	--	--	--	--	--	--	--	
7/28/2011	P		31.16	Sheen	155.09	9,700	73	1,400	170	1,500	<0.50	1.31	7.18	
11/30/2011	P		30.92	0.00	155.35	--	--	--	--	--	--	--	--	
MW-4														
8/7/1995	--	184.20	28.70	0.00	155.50	<50	<0.50	<0.50	<0.50	<1.0	--	4.5	--	
10/2/1995	--	184.20	29.31	0.00	154.89	<50	<0.50	<0.50	<0.50	<1.0	<5.0	7.4	--	
2/6/1996	--		29.80	0.00	154.40	--	--	--	--	--	--	--	--	MD
2/7/1996	--	184.20	29.80	0.00	154.40	<50	<0.50	<1.0	<1.0	<1.0	<10	6.0	--	
4/16/1996	--		30.22	0.00	153.98	<50	<0.50	<1.0	<1.0	<1.0	<10	6.2	--	
7/9/1996	--	184.20	30.70	0.00	153.50	<50	<0.50	<1.0	<1.0	<1.0	<10	5.6	--	
10/25/1996	--		28.81	0.00	155.39	<50	<0.50	<1.0	<1.0	<1.0	<10	5.8	--	
2/6/1997	--	184.20	29.01	0.00	155.19	<50	<0.50	<1.0	<1.0	<1.0	<10	2.9	--	
4/23/1997	--		28.24	0.00	155.96	<50	<0.50	<1.0	<1.0	<1.0	<10	2.0	--	
7/22/1997	--	184.20	33.33	0.00	150.87	<50	<0.50	<1.0	<1.0	<1.0	<10	3.2	--	
10/3/1997	--		33.27	0.00	150.93	<50	<0.50	<1.0	<1.0	<1.0	<10	3.1	--	
2/6/1998	--	184.20	24.01	0.00	160.19	<50	<0.50	<1.0	<1.0	<1.0	<10	--	--	
5/8/1998	--		23.97	0.00	160.23	--	--	--	--	--	--	--	--	NS
11/10/1998	--	184.20	25.72	0.00	158.48	--	--	--	--	--	--	--	--	NS
1/20/1999	--		25.48	0.00	158.72	<50	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	
7/8/1999	--	184.20	28.12	0.00	156.08	--	--	--	--	--	--	--	--	NS
1/4/2000	--		28.20	0.00	156.00	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	
7/21/2000	--	184.20	29.60	0.00	154.60	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	
10/31/2000	--		29.90	0.00	154.30	--	--	--	--	--	--	--	--	NS
2/13/2000	--	184.20	30.77	0.00	153.43	--	--	--	--	--	--	--	--	NS
1/16/2001	--		31.46	0.00	152.74	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	
5/7/2001	--	184.20	30.62	0.00	153.58	--	--	--	--	--	--	--	--	NS
7/20/2001	--		31.15	0.00	153.05	67	<0.50	<0.50	<0.50	<1.5	<0.50	--	--	
11/19/2001	--	184.20	31.41	0.00	152.79	--	--	--	--	--	--	--	--	NS
1/4/2002	--		28.34	0.00	155.86	110	0.52	<0.50	<0.50	<1.0	<0.50	--	--	
4/5/2002	--	184.20	31.18	0.00	153.02	--	--	--	--	--	--	--	--	NS

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-4 Cont.														
8/1/2002	--	184.20	32.04	0.00	152.16	<50	<0.50	<0.50	<0.50	<1.0	<0.50	--	--	
10/31/2002	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
1/28/2003	--		31.80	0.00	152.40	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
4/8/2003	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
7/16/2003	--		28.38	0.00	155.82	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	
10/28/2003	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
1/22/2004	--		31.81	0.00	152.39	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
4/9/2004	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
7/14/2004	--		31.52	0.00	152.68	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
10/7/2004	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
1/26/2005	--		30.66	0.00	153.54	<50	0.85	1.5	<0.50	2.5	<2.5	--	--	
4/11/2005	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
7/22/2005	--		26.48	0.00	157.72	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
10/24/2005	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
1/24/2006	--		25.90	0.00	158.30	59	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
4/7/2006	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
8/1/2006	--		21.25	0.00	162.95	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	
11/28/2006	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
1/26/2007	--		27.84	0.00	156.36	--	--	--	--	--	--	--	--	NSP
4/27/2007	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
7/13/2007	--		30.46	0.00	153.74	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	--	
10/25/2007	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
2/4/2008	--		30.14	0.00	154.06	--	--	--	--	--	--	--	--	NSP
4/14/2008	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
7/15/2008	--		32.50	0.00	151.70	<50	0.58	<0.50	<0.50	<0.50	<0.50	4.8	--	
10/9/2008	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
1/7/2009	--		35.95	0.00	148.25	--	--	--	--	--	--	--	--	NSP
4/15/2009	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
7/20/2009	--		35.09	0.00	149.11	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.1	--	
10/27/2009	--	[illegible]	[illegible]	0.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-4 Cont.														
3/8/2010	--	184.20	34.80	0.00	149.40	--	--	--	--	--	--	--	--	
6/22/2010	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSR
8/17/2010	P		32.75	0.00	151.45	<50	<0.50	<0.50	<0.50	<1.0	<0.50	0.78	7.21	
10/19/2010	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
2/4/2011	--		35.71	0.00	148.49	--	--	--	--	--	--	--	--	
7/21/2011	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1/31/2012	**--**		**32.44**	**0.00**	**151.76**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	
MW-5														
8/7/1995	--	184.47	31.05	0.00	153.42	610	2.2	0.88	0.87	2.2	--	3.7	--	
10/27/1995	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
2/6/1996	--		32.34	0.00	152.13	--	--	--	--	--	--	--	--	MD
3/27/1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
4/16/1996	--		32.76	0.00	151.71	<50	<0.50	<1.0	<1.0	<1.0	<10	6.4	--	
7/9/1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	MD
7/10/1996	--		--	--	--	<50	<0.50	<1.0	<1.0	<1.0	<10	5.9	--	
10/23/1996	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1/8/1997	--		31.16	0.00	153.31	<250	<2.5	<5	<5	<5	<50	2.9	--	
4/22/1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
7/22/1997	--		27.01	0.00	157.46	80	1.2	<1.0	<1.0	<1.0	<10	2.3	--	
10/21/1997	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
1/8/1998	--		34.38	0.00	150.09	<50	<0.50	<1.0	<1.0	<1.0	<10	2.6	--	
5/7/1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
11/30/1998	--		30.25	0.00	154.22	--	--	--	--	--	--	--	--	NS
2/26/1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
7/8/1999	--		30.64	0.00	153.83	--	--	--	--	--	--	--	--	NS
1/4/2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
7/21/2000	--		31.30	0.00	153.17	120	<0.50	0.51	1.1	<0.50	2.1	--	--	
10/31/2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
12/15/2000	--		34.84	0.00	149.63	--	--	--	--	--	--	--	--	NS
1/16/2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS

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Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-5 Cont.														
6/7/2001	--	184.47	33.17	0.00	151.30	--	--	--	--	--	--	--	--	NS
7/20/2001	[illegible]	[illegible]	34.08	0.00	150.39	58	0.37	<0.50	<0.50	<1.0	<0.50	[illegible]	[illegible]	[illegible]
11/14/2001	--		--	--	--	--	--	--	--	--	--	--	--	INA
1/4/2002	[illegible]	[illegible]	34.05	0.00	150.42	<50	<0.50	<0.50	<0.50	<1.0	<0.50	[illegible]	[illegible]	[illegible]
4/5/2002	--		34.39	0.00	150.08	--	--	--	--	--	--	--	--	NS
7/17/2002	[illegible]	[illegible]	35.98	0.00	148.51	[illegible]	0.24	<0.50	<0.50	<1.0	<0.50	[illegible]	[illegible]	[illegible]
10/31/2002	--		36.86	0.00	147.61	--	--	--	--	--	--	--	--	NS
1/29/2003	[illegible]	[illegible]	36.75	0.00	147.72	<50	<0.50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]
4/9/2003	--		34.24	0.00	150.23	--	--	--	--	--	--	--	--	NS
7/16/2003	[illegible]	[illegible]	34.55	0.00	149.92	61	<0.50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]
10/23/2003	--		34.55	0.00	149.92	--	--	--	--	--	--	--	--	NS
1/27/2004	[illegible]	[illegible]	34.30	0.00	150.17	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/9/2004	--		33.82	0.00	150.65	--	--	--	--	--	--	--	--	NSP
7/14/2004	[illegible]	[illegible]	33.44	0.00	151.03	<50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]	[illegible]
10/7/2004	--		33.52	0.00	150.95	--	--	--	--	--	--	--	--	NSP
1/26/2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	INA
4/15/2005	--		31.43	0.00	153.04	--	--	--	--	--	--	--	--	NSP
7/27/2005	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	INA
10/24/2005	--		31.37	0.00	153.10	--	--	--	--	--	--	--	--	NSP
1/24/2006	[illegible]	[illegible]	30.75	0.00	153.72	130	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]	[illegible]
4/7/2006	--		27.39	0.00	157.08	--	--	--	--	--	--	--	--	NSP
7/17/2006	[illegible]	[illegible]	29.25	0.00	155.22	<50	<0.50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]
11/29/2006	--		29.59	0.00	154.88	--	--	--	--	--	--	--	--	NSP
1/16/2007	[illegible]	[illegible]	31.01	0.00	153.46	<50	<0.50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]
4/27/2007	--		31.83	0.00	152.64	--	--	--	--	--	--	--	--	NSP
7/13/2007	[illegible]	[illegible]	32.63	0.00	151.84	<50	<0.50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]
10/25/2007	--		35.72	0.00	148.75	--	--	--	--	--	--	--	--	NSP
2/4/2008	[illegible]	[illegible]	35.08	0.00	149.39	66	<0.50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]
5/14/2008	--		34.12	0.00	150.35	--	--	--	--	--	--	--	--	NSP
7/15/2008	[illegible]	[illegible]	33.38	0.00	151.09	<50	<0.50	<0.50	<0.50	<0.50	<0.50	[illegible]	[illegible]	[illegible]

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
MW-5 Cont.														
10/9/2008	--	184.47	37.06	0.00	147.41	--	--	--	--	--	--	--	--	NSP
1/7/2009	--	184.47	36.45	0.00	148.02	--	--	--	--	--	--	--	--	NSP
4/15/2009	--		36.18	0.00	148.29	--	--	--	--	--	--	--	--	NSP
7/20/2009	--	184.47	37.35	0.00	147.12	<5	<0.50	<0.50	<0.50	<0.50	<0.50	0.18	6.96	
10/27/2009	--		39.72	0.00	144.75	--	--	--	--	--	--	--	--	NSP
3/8/2010	--	184.47	38.17	0.00	146.31	--	--	--	--	--	--	--	--	
5/12/2010	--		35.45	0.00	149.02	--	--	--	--	--	--	--	--	NSP
8/17/2010	--	184.47	37.46	0.00	147.01	<50	<0.50	<0.50	<0.50	<1.0	<0.50	0.38	6.70	
10/19/2010	--		36.39	0.00	148.08	--	--	--	--	--	--	--	--	
2/4/2011	--	184.47	30.86	0.00	153.61	--	--	--	--	--	--	--	--	
7/28/2011	--		30.79	0.01	153.69	--	--	--	--	--	--	0.68	6.84	b
9/13/2011	--	184.47	30.78	0.00	153.69	--	--	--	--	--	--	--	--	
QC-2														
10/18/1993	--	184.47	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	
2/8/1994	--	184.47	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	
5/19/1994	--		--	--	--	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	
8/11/1994	--	184.47	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	
10/31/1994	--		--	--	--	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	
2/6/1995	--	184.47	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	--	--	--	
4/11/1995	--		--	--	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	
8/7/1995	--	184.47	--	--	--	<50	<0.50	<0.50	<0.50	<1.0	--	--	--	
10/2/1995	--		--	--	--	<50	<0.50	<0.50	<0.50	<1.0	<5.0	--	--	
2/7/1996	--	184.47	--	--	--	<50	<0.50	<1.0	<1.0	<1.0	<10	--	--	
4/16/1996	--		--	--	--	<50	<0.50	<1.0	<1.0	<1.0	<10	--	--	
7/9/1996	--	184.47	--	--	--	<50	<1.0	<1.0	<1.0	<1.0	<10	--	--	
VW-1														
11/30/1998	--	NS	30.58	0.00	--	--	--	--	--	--	--	--	--	NS
12/3/1998	--		31.79	0.00	--	89,500	25,000	410	3,800	4,100	5,800	--	--	
7/8/1999	--		28.66	0.00	--	<50	<1.0	<1.0	<1.0	<1.0	<1.0	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	P/NP	TOC Elevation (feet)	Depth to Water (feet)	LNAPL Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	DO (mg/L)	pH	Footnote
VW-1 Cont.														
1/4/2000	--	NS	28.70	0.00	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	--	
4/11/2000	--		21.35	0.00	--	81,000	29,000	570	4,100	2,300	3,800	--	--	
7/21/2000	--		31.67	0.00	--	76,000	20,000	450	3,700	1,400	4,700	--	--	
10/31/2000	--		34.29	0.00	--	--	--	--	--	--	--	--	--	NS
VW-2														
11/30/1998	--	NS	28.40	0.00	--	11,000	3,900	130	140	220	<10	--	--	
1/20/1999	--		29.63	0.00	--	19,000	9,800	330	330	500	<10	--	--	
7/8/1999	--		31.12	0.00	--	81,000	27,000	530	3,000	2,900	6,300	--	--	
1/4/2000	--		31.19	0.00	--	3,600	1,000	22	20	11	770	--	--	
4/11/2000	--		25.93	0.00	--	4,100	15	11	24	35	17	--	--	
7/21/2000	--		27.84	0.00	--	5,500	92	55	70	32	10	--	--	
10/31/2000	--		31.62	0.00	--	--	--	--	--	--	--	--	--	NS
VW-3														
11/30/1998	--	NS	31.20	0.00	--	--	--	--	--	--	--	--	--	NS
1/20/1999	--		30.36	0.00	--	8	72	10	3.4	13	14	--	--	
7/8/1999	--		31.11	0.00	--	390	35	<1.0	1.6	<1.0	210	--	--	
1/4/2000	--		34.32	0.00	--	68	4	[illegible]	[illegible]	[illegible]	8.2	--	--	NS
4/11/2000	--		31.19	0.00	--	700	8.6	2.8	1.3	1.9	340	--	--	
7/21/2000	--		31.33	0.00	--	360	18	0.97	0.75	3.3	250	--	--	
10/31/2000	--		33.83	0.00	--	--	--	--	--	--	--	--	--	NS

Symbols & Abbreviations:
--/- - = Not analyzed/applicable/sampled/measured
< = Not detected at or above specified laboratory reporting limit
DO = Dissolved oxygen
DTW = Depth to water in ft bgs
GRO = Gasoline range organics, range C4-C12
GWE = Groundwater elevation in ft
g/L = Micrograms per liter
mg/L = Milligrams per liter
MTBE = Methyl tert-butyl ether
NP = Not purged before sampling
P = Purged before sampling
LNAPL = Light non-aqueous phase liquid
TPHg = Total petroleum hydrocarbons as gasoline
TOC = Top of casing elevation in ft
NP = Not Purged
NS = Well not sampled

Footnotes:
a = The Gasoline Range Organics (GRO) concentration reported is due to the presence of discrete peaks
b = Well not sampled due to presense of LNAPL
NSP = Well not sampled this event, in accordance with groundwater sampling schedule
DRY = Well dry during gauging: not sampled
DUP = Duplicate sample
INA = Well inaccessible

Notes
Water level elevation in wells containing LNAPL were adjusted assuming a specific gravity of 0.75 for LNAPL

Beginning in the first quarter 2008, the carbon range for GRO was changed from C4-C12 to C6-C12

The data within this table collected prior to October 2009 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information.

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1									
8/15/1994	--	--	--	--	--	--	--	--	DUP
8/15/1994	--	--	--	--	--	--	--	--	DUP
10/31/1994	--	--	--	--	--	--	--	--	DUP
10/31/1994	--	--	--	--	--	--	--	--	DUP
2/8/1995	--	--	--	--	--	--	--	--	DUP
2/8/1995	--	--	--	--	--	--	--	--	DUP
4/11/1995	--	--	--	--	--	--	--	--	DUP
4/11/1995	--	--	--	--	--	--	--	--	DUP
8/7/1995	--	--	--	--	--	--	--	--	DUP
8/7/1995	--	--	--	--	--	--	--	--	DUP
10/2/1995	--	--	610	--	--	--	--	--	
2/7/1996	--	--	1,100	--	--	--	--	--	
2/7/1996	--	--	1,100	--	--	--	--	--	DUP
4/16/1996	--	--	690	--	--	--	--	--	DUP
4/16/1996	--	--	690	--	--	--	--	--	DUP
7/10/1996	--	--	24	--	--	--	--	--	
7/10/1996	--	--	24	--	--	--	--	--	DUP
10/25/1996	--	--	1,300	--	--	--	--	--	DUP
10/25/1996	--	--	1,300	--	--	--	--	--	DUP
1/8/1997	--	--	320	--	--	--	--	--	DUP
1/8/1997	--	--	320	--	--	--	--	--	DUP
4/23/1997	--	--	1,700	--	--	--	--	--	DUP
4/23/1997	--	--	1,700	--	--	--	--	--	DUP
7/22/1997	--	--	2,100	--	--	--	--	--	
7/22/1997	--	--	2,100	--	--	--	--	--	DUP
10/3/1997	--	--	290	--	--	--	--	--	
10/3/1997	--	--	290	--	--	--	--	--	DUP
1/8/1998	--	--	<10	--	--	--	--	--	
5/8/1998	--	--	2,300	--	--	--	--	--	DUP
5/8/1998	--	--	2,300	--	--	--	--	--	DUP
12/17/1999	--	--	90	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1 Cont.									
1/16/2001	--	--	79	--	--	--	--	--	
4/7/2001	--	--	400	--	--	--	--	--	
7/20/2001	--	--	1,100	--	--	--	--	--	
11/14/2001	--	--	1,100	--	--	--	--	--	
1/4/2002	--	--	300	--	--	--	--	--	
4/17/2002	--	--	800	--	--	--	--	--	
8/1/2002	--	--	530	--	--	--	--	--	
10/21/2002	--	--	410	--	--	--	--	--	
1/28/2003	--	--	<500	--	--	--	--	--	
4/9/2003	--	--	110	--	--	--	--	--	
7/16/2003	--	--	380	--	--	--	--	--	
10/23/2003	--	--	1,200	--	--	--	--	--	
1/22/2004	--	--	<2,500	--	--	--	--	--	
4/29/2004	--	--	110	--	--	--	--	--	
7/14/2004	--	--	<1,200	--	--	--	--	--	
10/27/2004	--	--	1,400	--	--	--	--	--	
1/26/2005	--	--	<2,500	--	--	--	--	--	
4/27/2005	--	--	1,500	--	--	--	--	--	
7/22/2005	--	--	<2,500	--	--	--	--	--	
10/24/2005	--	--	850	--	--	--	--	--	
1/24/2006	--	--	<2,500	--	--	--	--	--	
4/10/2006	--	--	1,300	--	--	--	--	--	
8/1/2006	--	--	420	--	--	--	--	--	
11/15/2006	<15,000	<1,000	76	<25	<25	<25	<25	<25	
1/26/2007	<15,000	<1,000	<25	<25	<25	<25	<25	<25	
4/27/2007	<15,000	<1,000	140	<50	<50	<50	<50	<50	
7/13/2007	--	--	140	--	--	--	--	--	
10/23/2007	--	--	210	--	--	--	--	--	
2/4/2008	--	--	120	--	--	--	--	--	
4/17/2008	--	--	220	--	--	--	--	--	
7/15/2008	--	--	33	--	--	--	--	--	
10/7/2008	--	--	120	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1 Cont.									
1/7/2009	--	--	<100	--	--	--	--	--	
4/15/2009	--	--	170	--	--	--	--	--	
7/20/2009	--	--	140	--	--	--	--	--	
10/27/2009	--	--	170	--	--	--	--	--	
3/8/2010	--	--	150	--	--	--	--	--	
6/10/2010	--	--	34	--	--	--	--	--	Re-sample well on 6/10/2010
8/17/2010	--	--	35	--	--	--	--	--	
10/19/2010	--	--	110	--	--	--	--	--	
2/4/2011	--	--	15	--	--	--	--	--	
7/28/2011	--	--	84	--	--	--	--	--	
1/31/2012	--	--	**50**	--	--	--	--	--	
MW-2									
5/19/1994	--	--	--	--	--	--	--	--	DUP
5/19/1994	--	--	--	--	--	--	--	--	DUP
10/2/1995	--	--	5.2	--	--	--	--	--	
2/7/1996	--	--	56	--	--	--	--	--	MD
4/10/1996	--	--	70	--	--	--	--	--	
7/9/1996	--	--	<10	--	--	--	--	--	
10/7/1996	--	--	1,400	--	--	--	--	--	
1/8/1997	--	--	1,500	--	--	--	--	--	
4/3/1997	--	--	400	--	--	--	--	--	
7/22/1997	--	--	700	--	--	--	--	--	
10/7/1997	--	--	510	--	--	--	--	--	
1/8/1998	--	--	15	--	--	--	--	--	
4/8/1998	--	--	210	--	--	--	--	--	
12/15/2000	--	--	91	--	--	--	--	--	
3/16/2001	--	--	77	--	--	--	--	--	
6/7/2001	--	--	55	--	--	--	--	--	
9/20/2001	--	--	16	--	--	--	--	--	
11/14/2001	--	--	25	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/l.								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-2 Cont.									
1/4/2002	--	--	88	--	--	--	--	--	
4/5/2002	--	--	88	--	--	--	--	--	
7/17/2002	--	--	77	--	--	--	--	--	
10/31/2002	--	--	33	--	--	--	--	--	
1/24/2003	--	--	44	--	--	--	--	--	
4/9/2003	--	--	<2.5	--	--	--	--	--	
7/10/2003	--	--	18	--	--	--	--	--	
10/28/2003	--	--	--	--	--	--	--	--	NS
1/22/2004	--	--	34	--	--	--	--	--	
4/9/2004	--	--	<2.5	--	--	--	--	--	
7/12/2004	--	--	3.3	--	--	--	--	--	
10/7/2004	--	--	<2.5	--	--	--	--	--	
7/25/2005	--	--	2.8	--	--	--	--	--	
4/15/2005	--	--	<2.5	--	--	--	--	--	
7/25/2005	--	--	2.5	--	--	--	--	--	
10/24/2005	--	--	<2.5	--	--	--	--	--	
7/10/2006	--	--	2.5	--	--	--	--	--	
4/7/2006	--	--	<2.5	--	--	--	--	--	
8/17/2006	--	--	2.5	--	--	--	--	--	
11/29/2006	<300	<20	31	<0.50	<0.50	<0.50	<0.50	<0.50	
1/26/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
4/27/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/17/2007	--	--	<0.50	--	--	--	--	--	
10/25/2007	--	--	<0.50	--	--	--	--	--	
2/4/2008	--	--	<0.50	--	--	--	--	--	
5/14/2008	--	--	<0.50	--	--	--	--	--	
7/15/2008	--	--	<0.50	--	--	--	--	--	
10/9/2008	--	--	<0.50	--	--	--	--	--	
1/7/2009	--	--	<0.50	--	--	--	--	--	
4/15/2009	--	--	--	--	--	--	--	--	NSP
7/20/2009	--	--	<0.50	--	--	--	--	--	
10/27/2009	--	--	--	--	--	--	--	--	NSP

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-2 Cont.									
3/8/2010	--	--	<0.50	--	--	--	--	--	
5/12/2010	--	--	--	--	--	--	--	--	NSP
6/17/2010	--	--	<0.50	--	--	--	--	--	
MW-3									
10/18/1993	--	--	--	--	--	--	--	--	DUP
10/18/1993	--	--	--	--	--	--	--	--	DUP
3/8/1994	--	--	--	--	--	--	--	--	DUP
3/8/1994	--	--	--	--	--	--	--	--	DUP
10/2/1995	--	--	<5.0	--	--	--	--	--	
2/8/1996	--	--	<10	--	--	--	--	--	DUP
2/7/1996	--	--	<10	--	--	--	--	--	DUP
4/16/1996	--	--	<10	--	--	--	--	--	
10/1/1996	--	--	<10	--	--	--	--	--	
10/23/1996	--	--	<10	--	--	--	--	--	
4/23/1997	--	--	<10	--	--	--	--	--	
10/3/1997	--	--	<10	--	--	--	--	--	
1/8/1998	--	--	160	--	--	--	--	--	
1/8/1998	--	--	150	--	--	--	--	--	DUP
12/15/2000	--	--	<0.50	--	--	--	--	--	NSP
6/7/2001	--	--	<0.50	--	--	--	--	--	
11/14/2001	--	--	<0.50	--	--	--	--	--	
4/5/2002	--	--	<0.50	--	--	--	--	--	
10/31/2002	--	--	<2.5	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-3 Cont.									
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/9/2003	--	--	<2.5	--	--	--	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/23/2003	--	--	<2.5	--	--	--	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/9/2004	--	--	<2.5	--	--	--	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/7/2004	--	--	<2.5	--	--	--	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/15/2005	--	--	<2.5	--	--	--	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/24/2005	--	--	<2.5	--	--	--	--	--	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/7/2006	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
11/29/2006	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/27/2007	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/25/2007	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5/14/2008	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/9/2008	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4/15/2009	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
10/27/2009	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5/12/2010	--	--	--	--	--	--	--	--	NSP
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
7/23/2011	--	--	<0.50	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-4									
10/2/1995	--	--	<5.0	--	--	--	--	--	
2/6/1996			<5.0						NS
2/7/1996	--	--	<10	--	--	--	--	--	
7/8/1996			<10						
7/9/1996	--	--	<10	--	--	--	--	--	
10/28/1996			<10						
1/8/1997	--	--	<10	--	--	--	--	--	
4/7/1997			<10						
7/22/1997	--	--	<10	--	--	--	--	--	
10/7/1997			<10						
1/8/1998	--	--	<10	--	--	--	--	--	
4/8/1998			--						
11/30/1998	--	--	--	--	--	--	--	--	NS
7/20/1999			<10						
7/8/1999	--	--	--	--	--	--	--	--	NS
4/4/2000			2.0						
7/21/2000	--	--	3.1	--	--	--	--	--	
10/17/2000			--						NS
12/15/2000	--	--	--	--	--	--	--	--	NS
3/16/2001			<0.50						
6/7/2001	--	--	--	--	--	--	--	--	NS
9/20/2001			<0.50						
11/14/2001	--	--	--	--	--	--	--	--	NS
2/4/2002			<0.50						
4/5/2002	--	--	--	--	--	--	--	--	NS
7/16/2002			<0.50						
10/31/2002	--	--	--	--	--	--	--	--	NS
1/22/2003			<0.50				1.2		
4/9/2003	--	--	--	--	--	--	--	--	NSP
7/16/2003			<0.50						
10/28/2003	--	--	--	--	--	--	--	--	NSP
1/22/2004			<0.5						

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-4 Cont.									
4/9/2004	--	--	--	--	--	--	--	--	NSP
7/14/2004									
10/7/2004	--	--	--	--	--	--	--	--	NSP
1/18/2005									
4/15/2005	--	--	--	--	--	--	--	--	NSP
7/12/2005									
10/24/2005	--	--	--	--	--	--	--	--	NSP
1/24/2006									
4/7/2006	--	--	--	--	--	--	--	--	NSP
8/17/2006									
11/29/2006	--	--	--	--	--	--	--	--	NSP
1/30/2007									
4/27/2007	--	--	--	--	--	--	--	--	NSP
7/17/2007									
10/25/2007	--	--	--	--	--	--	--	--	NSP
2/7/2008									
5/14/2008	--	--	--	--	--	--	--	--	NSP
8/11/2008									
10/9/2008	--	--	--	--	--	--	--	--	NSP
1/7/2009									
4/15/2009	--	--	--	--	--	--	--	--	NSP
7/20/2009			<0.50						
10/27/2009	--	--	--	--	--	--	--	--	NSP
2/8/2010									
5/12/2010	--	--	--	--	--	--	--	--	NSP
10/2/2010			<0.50						
7/28/2011	--	--	<0.50	--	--	--	--	--	
MW-5									
10/2/1995	--	--	33	--	--	--	--	--	
2/2/1996									MD
2/7/1996	--	--	<10	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-5 Cont.									
4/16/1996	[illegible]	[illegible]	<10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
7/9/1996	--	--	--	--	--	--	--	--	MD
7/10/1996	[illegible]	[illegible]	<10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
10/25/1996	--	--	<10	--	--	--	--	--	
1/[illegible]/1997	[illegible]	[illegible]	<10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
4/23/1997	--	--	<50	--	--	--	--	--	
7/22/1997	[illegible]	[illegible]	<10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
10/3/1997	--	--	<10	--	--	--	--	--	
1/[illegible]/1998	[illegible]	[illegible]	<10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
5/8/1998	--	--	<10	--	--	--	--	--	
11/30/1998	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
1/20/1999	--	--	<1.0	--	--	--	--	--	
7/8/1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
1/4/2000	--	--	<0.50	--	--	--	--	--	
7/31/2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
10/31/2000	--	--	--	--	--	--	--	--	
1/11/2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
1/16/2001	-	--	<0.50	--	--	--	--	--	
6/7/2001	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
7/20/2001	--	--	<0.50	--	--	--	--	--	
1/10/2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
1/4/2002	--	--	<0.50	--	--	--	--	--	
4/8/2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
8/1/2002	--	--	<0.50	--	--	--	--	--	
10/31/2002	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
1/28/2003	--	--	<2.5	--	--	--	--	--	
4/2/2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
7/16/2003	--	--	<0.50	--	--	--	--	--	
10/21/2003	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NS
1/22/2004	--	--	--	--	--	--	--	--	NS
4/5/2004	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	NSP
7/14/2004	--	--	<2.5	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-5 Cont.									
10/7/2004	--	--	--	--	--	--	--	--	NSP
1/26/2005	--	--	--	--	--	--	--	--	INA
4/15/2005	--	--	--	--	--	--	--	--	NSP
7/22/2005	--	--	--	--	--	--	--	--	INA
10/24/2005	--	--	--	--	--	--	--	--	NSP
1/24/2006	--	--	<2.5	--	--	--	--	--	
4/7/2006	--	--	--	--	--	--	--	--	NSP
8/1/2006	--	--	<2.5	--	--	--	--	--	
11/29/2006	--	--	--	--	--	--	--	--	NSP
1/26/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
5/21/2007	--	--	--	--	--	--	--	--	NSP
7/13/2007	--	--	<0.50	--	--	--	--	--	
10/25/2007	--	--	--	--	--	--	--	--	NSP
2/4/2008	--	--	<0.50	--	--	--	--	--	
5/1/2008	--	--	--	--	--	--	--	--	NSP
7/15/2008	--	--	<0.50	--	--	--	--	--	
10/9/2008	--	--	--	--	--	--	--	--	NSP
1/7/2009	--	--	--	--	--	--	--	--	NSP
4/15/2009	--	--	--	--	--	--	--	--	NSP
7/20/2009	--	--	<0.50	--	--	--	--	--	
11/9/2010	--	--	--	--	--	--	--	--	NSP
5/12/2010	--	--	--	--	--	--	--	--	NSP
8/7/2010	--	--	--	--	--	--	--	--	NSP
QC-2									
10/2/1995	--	--	<5.0	--	--	--	--	--	
2/7/1996	--	--	<10	--	--	--	--	--	
4/16/1996	--	--	<10	--	--	--	--	--	
7/9/1996	--	--	<10	--	--	--	--	--	
VW-1									
11/30/1998	--	--	--	--	--	--	--	--	NS

Table 2. Summary of Fuel Additives Analytical Data

Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
VW-1 Cont.									
1/20/1999	--	--	6,900	--	--	--	--	--	
7/8/1999	--	--	<1.0	--	--	--	--	--	
1/4/2000	--	--	<0.50	--	--	--	--	--	
4/11/2000	--	--	3,800	--	--	--	--	--	
7/31/2000	--	--	4,700	--	--	--	--	--	
10/31/2000	--	--	--	--	--	--	--	--	NS
VW-2									
11/30/1998	--	--	<10	--	--	--	--	--	
1/20/1999	--	--	410	--	--	--	--	--	
7/8/1999	--	--	6,300	--	--	--	--	--	
1/4/2000	--	--	1,770	--	--	--	--	--	
4/11/2000	--	--	17	--	--	--	--	--	
7/31/2000	--	--	18	--	--	--	--	--	
10/31/2000	--	--	--	--	--	--	--	--	NS
VW-3									
11/30/1998	--	--	--	--	--	--	--	--	NS
1/20/1999	--	--	14	--	--	--	--	--	
7/8/1999	--	--	210	--	--	--	--	--	
1/4/2000	--	--	5.5	--	--	--	--	--	NS
4/11/2000	--	--	340	--	--	--	--	--	
7/31/2000	--	--	850	--	--	--	--	--	
10/31/2000	--	--	--	--	--	--	--	--	NS

Symbols & Abbreviations:
-- = Not analyzed/sampled
< = Not detected at or above specified laboratory reporting limit
1,2-DCA = 1,2-Dichloroethane
DIPE = Diisopropyl ether
EDB = 1,2-Dibromoethane
ETBE = Ethyl tert-butyl ether
MTBE = Methyl tert-butyl ether
µg/L = Micrograms per liter
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol
DUP = Duplicate sample
INA = Well inaccessible
NP = Not Purged
NS = Well not sampled
NSP = Well not sampled this event, in accordance with groundwater sampling schedule

Notes:
The data within this table collected prior to October 2009 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

Table 3. Historical Groundwater Gradient - Direction and Magnitude

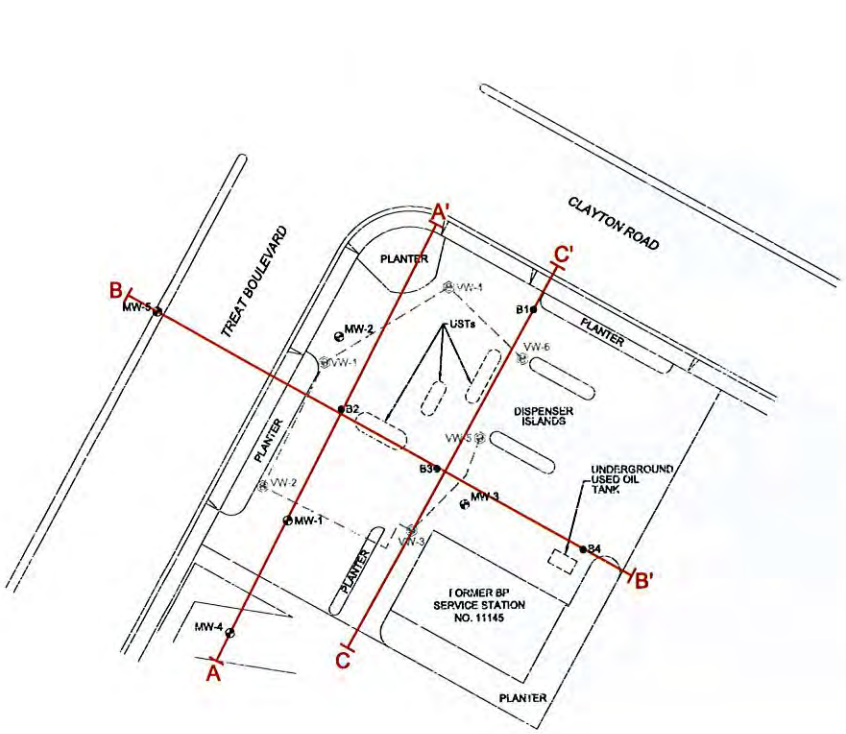
Former BP Service Station #11145, 4300 Clayton Road, Concord, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
1/22/2004	North-Northeast	0.023
4/8/2004	North-Northeast	0.02
7/14/2004	North	0.067
10/7/2004	Northeast	0.067
1/26/2005	Northwest	0.15
4/13/2005	North-Northeast	0.08
7/22/2005	Northwest	0.1
10/24/2005	North	0.07
1/24/2006	North-Northeast	0.13
4/7/2006	North-Northeast	0.04
8/1/2006	North-Northwest	0.09
11/29/2006	North-Northwest	0.045
1/26/2007	North	0.025
4/27/2007	North	0.028
7/13/2007	North-Northwest	0.031
10/25/2007	North-Northwest	0.073
2/4/2008	North-Northwest	0.072
4/14/2008	North-Northwest	0.04
7/15/2008	North-Northwest	0.043
10/22/2008	North-Northwest	0.04
1/7/2009	North-Northwest	0.075
4/15/2009	North-Northwest	0.054
7/20/2009	North-Northwest	0.047
10/27/2009	Northeast	0.04
3/8/2010	North	0.03
5/12/2010	North	0.02
8/17/2010	North	0.02
10/19/2010	North-Northeast	0.05
2/4/2011	West-Northwest	0.03
7/28/2011	North	0.02
1/31/2012	**Northeast**	**0.03**

Notes:
The data within this table collected prior to October 2009 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

ATTACHMENT C

Generalized Geologic Cross-Sections and Soil Boring Logs



LEGEND

MW-1 GROUNDWATER MONITORING WELL

VW-1 VAPOR EXTRACTION WELL

B1 SOIL BORING LOCATION

SOIL VAPOR EXTRACTION (SVE) PIPING

CROSS-SECTION LOCATION

NOTE:

BASE MAP PROVIDED BY STANTEC, DATED 8/11/2009, AT A SCALE OF 1"=30'.

0 30' 60'

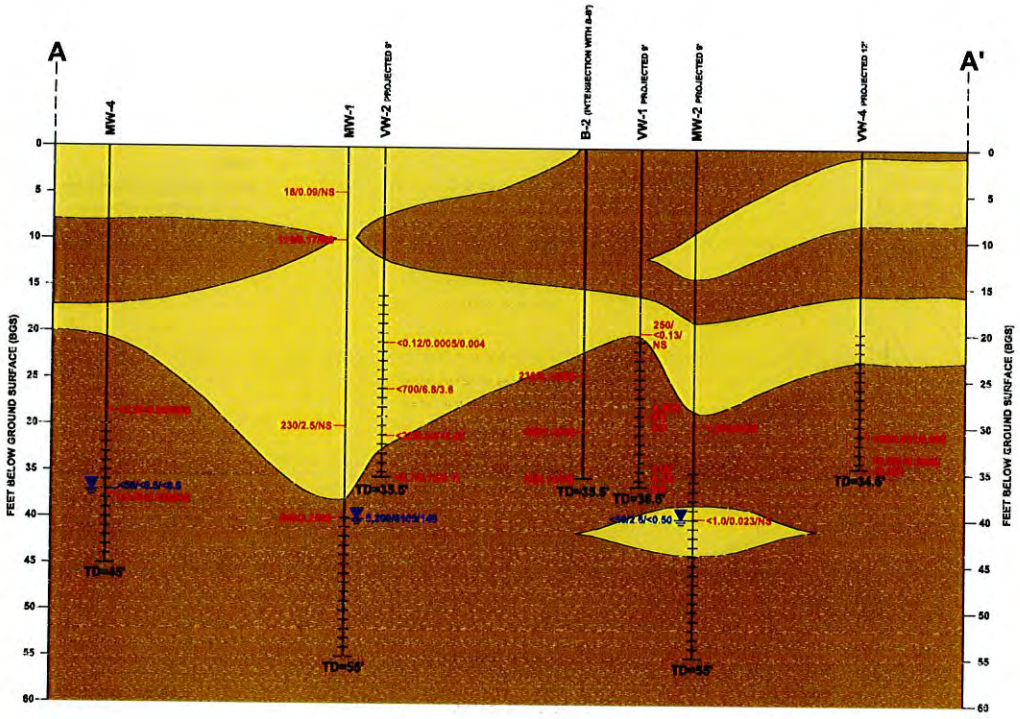
GRAPHIC SCALE

FORMER BP SERVICE STATION #11145
4300 CLAYTON ROAD
CONCORD, CALIFORNIA

CROSS-SECTION LOCATION MAP

ARCADIS

FIGURE 4



LEGEND:

MW-1 — LOCATION ID

WELL BORING

SCREENED INTERVAL FOR MONITORING WELLS

BOTTOM OF BORING

8,200/6,100/140 — GROUNDWATER SAMPLE CONCENTRATIONS FOR TPH-g/BENZENE/MTBE IN µg/L, JULY 2009

260/2.2/NS — SOIL SAMPLE CONCENTRATIONS FOR TPH-g/BENZENE/MTBE IN mg/kg

DEPTH TO WATER, JULY 2009

FINE GRAIN SOIL

COARSE GRAIN SOIL

TPH-g — TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

MTBE — METHYL-TERTIARY-BUTYL ETHER

NS — NOT SAMPLED

TD — TOTAL DEPTH OF WELL OR BORING (IN FEET BELOW GROUND SURFACE)

mg/kg — MILLIGRAMS PER KILOGRAM

µg/L — MICROGRAMS PER LITER

0 15' 30'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

NOTES:

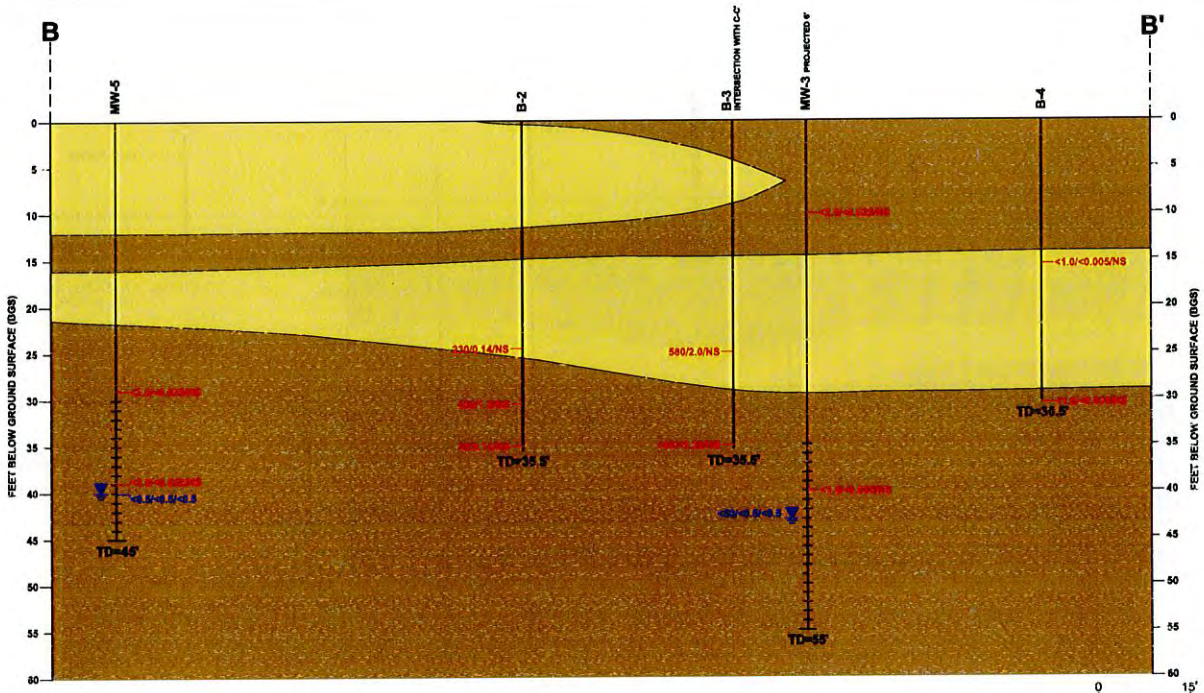
1. B-2 NOT USED IN STRATIGRAPHICAL LAYOUT; FOR ANALYTICAL PURPOSES ONLY.
2. GROUNDWATER DATA REPRESENTS LAST EVENT ALL MONITORING WELLS WERE SAMPLED, JULY 2009.

FORMER BP SERVICE STATION #11145
4300 CLAYTON ROAD
CONCORD, CALIFORNIA

CROSS-SECTION A-A'

ARCADIS

FIGURE 5



LEGEND:

MW-5 — LOCATION ID

WELL BORING

SCREENED INTERVAL FOR MONITORING WELLS

BOTTOM OF BORING

<0.5/<0.5/<0.5 GROUNDWATER SAMPLE CONCENTRATIONS FOR TPH-g/BENZENE/MTBE IN µg/L, JULY 2009

<2.5/<0.025/NS SOIL SAMPLE CONCENTRATIONS FOR TPH-g/BENZENE/MTBE IN mg/kg

DEPTH TO WATER, JULY 2009

FINE GRAIN SOIL

COARSE GRAIN SOIL

mg/kg MILLIGRAMS PER KILOGRAM

µg/L MICROGRAMS PER LITER

TPH-g TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

MTBE METHYL-TERTIARY-BUTYL ETHER

NS NOT SAMPLED

TD TOTAL DEPTH OF WELL OR BORING (IN FEET BELOW GROUND SURFACE)

NOTES:

1. B-2, B-3 AND B-4 NOT USED IN STRATIGRAPHICAL LAYOUT; FOR ANALYTICAL PURPOSES ONLY.
2. GROUNDWATER DATA REPRESENTS LAST EVENT ALL MONITORING WELLS WERE SAMPLED, JULY 2009.

0 15' 30'
HORIZONTAL SCALE

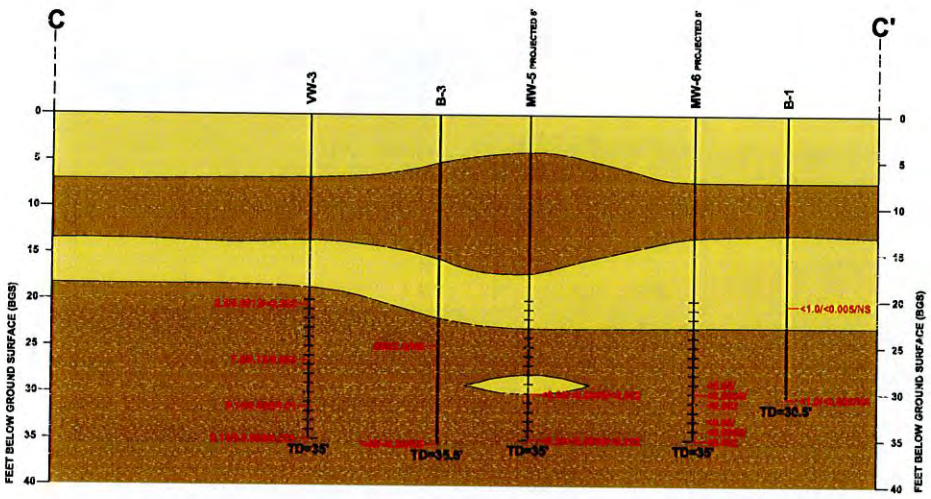
0 10' 20'
VERTICAL SCALE

FORMER BP SERVICE STATION #11145
4300 CLAYTON ROAD
CONCORD, CALIFORNIA

CROSS-SECTION B-B'

ARCADIS

FIGURE 6



LEGEND:

VW-3 — LOCATION ID

WELL BORING

SCREENED INTERVAL FOR MONITORING WELLS

BOTTOM OF BORING

7.4/0.13/0.006 SOIL SAMPLE CONCENTRATIONS FOR TPH-g/BENZENE/MTBE IN mg/kg

FINE GRAIN SOIL

COARSE GRAIN SOIL

TPH-g TOTAL PETROLEUM HYDROCARBONS AS GASOLINE

MTBE METHYL-TERTIARY-BUTYL ETHER

NS NOT SAMPLED

TD TOTAL DEPTH OF WELL OR BORING (IN FEET BELOW GROUND SURFACE)

mg/kg MILLIGRAMS PER KILOGRAM

0 15' 30'
HORIZONTAL SCALE

0 10' 20'
VERTICAL SCALE

NOTE:

1. B-1 AND B-3 NOT USED IN STRATIGRAPHICAL LAYOUT; FOR ANALYTICAL PURPOSES ONLY.

FORMER BP SERVICE STATION #11145
1300 CLAYTON ROAD
CONCORD, CALIFORNIA

CROSS-SECTION C-C'

ARCADIS

FIGURE 7

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

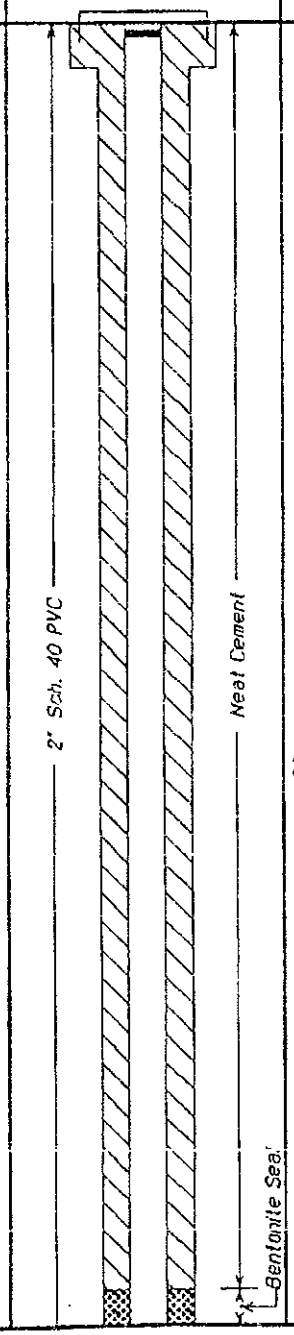
LOG OF BORING MW-1

SEE SITE PLAN

ALISTO PROJECT NO: 10-064-02 DATE DRILLED: 09/23/93
CLIENT: BP Oil Company
LOCATION: 4300 Clayton Road, Concord, California
DRILLING METHOD: Hollow-Stem Auger (8")
DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 184.18 '
LOGGED BY: Ted Moise APPROVED BY: Al Seville

BLOWS/6 IN.	PID VALUES	DEPTH feet	SOIL CLASS	GEOLOGIC DESCRIPTION
				6" Concrete.
			CL	gravelly CLAY: brown, damp, stiff, gravel to 1" diameter; minor silt.
5,7,8	25	5		sandy CLAY: gray/brown, minor angular gravel to 1/2", fine- to medium-grained sand.
3,4,3	52	10		Same.
11,12,18	145	15		silty CLAY: tan, damp, very stiff, minor very fine- to fine-grained sand.
10,15,21	144	20		Same.
			ML	sandy SILT: tan/gray, damp, hard, very fine- to fine-grained sand; minor clay.
20,22,24	265	25		
			CL	gravelly CLAY: brown, damp, hard, very fine- to medium-grained sand; rounded gravel to 1/2".
24,38, 50 (4")	385	30		
75 (8")	NR			No recovery.

WELL DIAGRAM



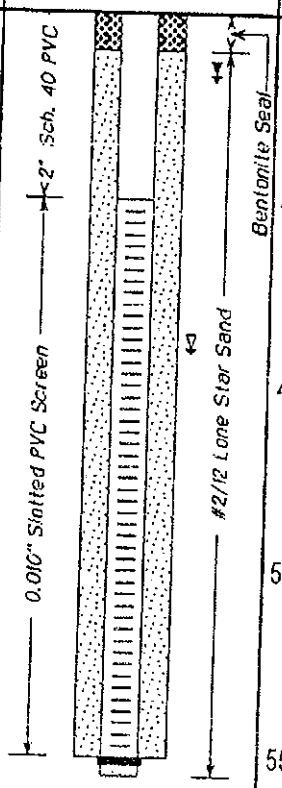
ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-1

SEE SITE PLAN

ALISTO PROJECT NO: 10-064-02 DATE DRILLED: 09/23/93
CLIENT: BP Oil Company
LOCATION: 4300 Clayton Road, Concord, California
DRILLING METHOD: Hollow-Stem Auger (8")
DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 164.16 '
LOGGED BY: Ted Moise APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						CL	No recovery.
17,28,40	118		40			SC	clayey SAND: brown/red, moist, very dense; very fine- to medium-grained sand; abundant fines.
39,50 (3")			45			GC	clayey GRAVEL: brown, wet, very dense; angular gravel to 1".
60 (6")			50				Same.
18,38, 50 (5")			55			SM	Same.
							silty SAND: tan, wet, very dense; very fine- to fine-grained sand.
			60				
			65				



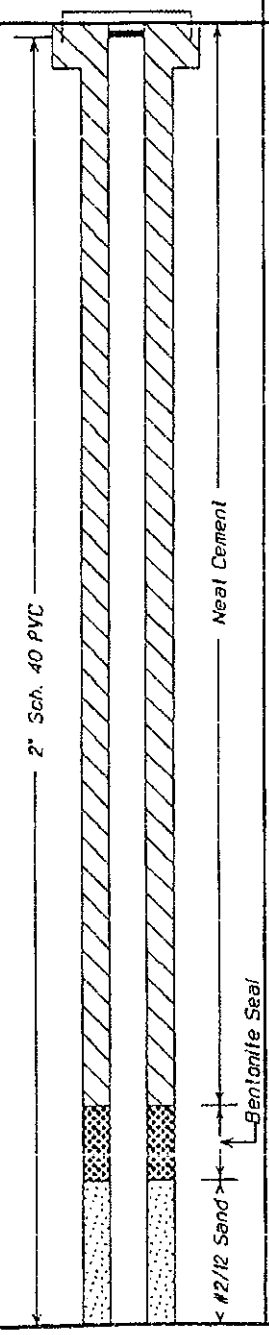
ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-2

SEE SITE PLAN

ALISTO PROJECT NO: 10-064-02 DATE DRILLED: 09/24/93
CLIENT: BP Oil Company
LOCATION: 4300 Clayton Road, Concord, California
DRILLING METHOD: Hollow-Stem Auger (8")
DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 184.81'
LOGGED BY: Ted Moise APPROVED BY: Al Seville

BLOWS/6 IN.	PID VALUES	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						4" Asphalt.
					CL	gravelly CLAY: black, damp, very stiff; rounded gravel to 1" diameter.
7,11,13	73	5	■			Same: red/brown, rouned gravel to 1/2" diameter.
16,32,22	5	10	■			sandy CLAY: red/brown, damp, hard; very fine- to fine-grained sand, minor gravel to 1/4" diameter.
28,23,10	3	15	■			gravelly CLAY: brown, damp, very stiff; abundant rounded gravel to 1" diameter.
18,34,38	4	20	■			sandy CLAY: tan, damp, hard; very fine- to fine-grained sand.
40,50 (6")	--	25				No recovery.
30,50 (6")	250	30	■			gravelly CLAY: brown, damp, hard; rounded gravel to 1/2" diameter.
21,30,50	40					Same: brown/gray.



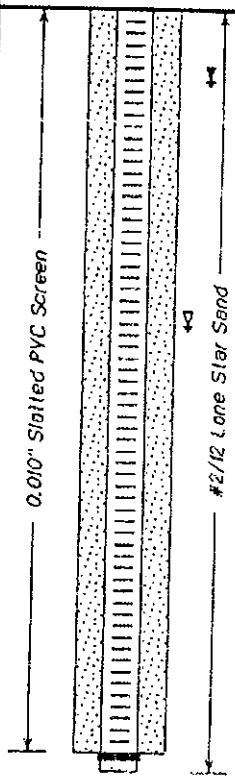
ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-2

SEE SITE PLAN

ALISTO PROJECT NO: 10-064-02 DATE DRILLED: 09/24/93
CLIENT: BP Oil Company
LOCATION: 4300 Clayton Road, Concord, California
DRILLING METHOD: Hollow-Stem Auger (8")
DRILLING COMPANY: Great Sierra Exploration CASING ELEVATION: 184.81'
LOGGED BY: Ted Moise APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						CL	gravelly CLAY: brown/gray, damp, hard; rounded gravel to 1/2" diameter.
6,10,14	76		40				silty CLAY: gray/brown, moist, very stiff; minor very fine- to fine-grained sand; no gravel.
24,50 (5")			45				gravelly CLAY: brown, wet, hard; angular gravel to 1/2" diameter.
19,27,35			50				Same.
50 (4")			55				Same.
			60				
			65				



ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-3

SEE SITE PLAN

ALISTO PROJECT NO: *10-064-02* DATE DRILLED: *09/24/93*

CLIENT: *BP Oil Company*

LOCATION: *4300 Clayton Road, Concord, California*

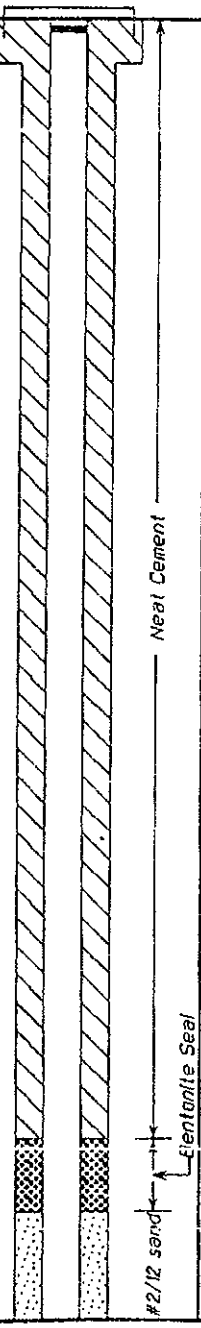
DRILLING METHOD: *Hollow-Stem Auger (8")*

DRILLING COMPANY: *Great Sierra Exploration* CASING ELEVATION: *186.25 '*

LOGGED BY: *Ted Moise* APPROVED BY: *Al Sevilla*

BLOWS/6 IN.	PID VALUES	DEPTH feet	SAMPLES	SOIL CLASS	GEOLOGIC DESCRIPTION
					6" Concrete.
				CL	gravelly CLAY: black, damp, very stiff; angular gravel to 1" diameter.
8,11,21	2.9	5	■		
21,17,18	130	10	■		Same: brown, damp.
11,13,16	139	15	■		sandy CLAY: gray, damp, very stiff; very fine- to medium-grained sand, minor rounded gravel to 1/2" diameter; Insufficient recovery-took O.V.M..
12,19,26	81	20	■		silty CLAY: gray, damp, hard; minor very fine- to fine-grained sand.
9,12,18	178	25	■		Same: blue/gray, very stiff.
16,19,20	3	30	■		gravelly CLAY: gray/brown, damp, very stiff; minor very fine-grained sand; angular gravel to 1/2" diameter.
					Same.

WELL DIAGRAM



ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-3

SEE SITE PLAN

ALISTO PROJECT NO: *10-064-02* DATE DRILLED: *09/24/93*

CLIENT: *BP Oil Company*

LOCATION: *4300 Clayton Road, Concord, California*

DRILLING METHOD: *Hollow-Stem Auger (8")*

DRILLING COMPANY: *Great Sierra Exploration* CASING ELEVATION: *186.25 '*

LOGGED BY: *Ted Moise* *APPROVED BY: Al Sevilla*

BLOWS/6 IN	PID VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
22,24,30	2	0.010" Slotted PVC Screen; #2/12 Lone Star Sand				CL	gravelly CLAY: gray/brown, damp, hard; minor very fine-grained sand; angular gravel to 1/2" diameter.
18,24, 50 (4")	2		40				Same.
50 (2")	--		45				No recovery; hard drilling.
27,40,50			50				gravelly CLAY: red/brown, wet, hard; angular gravel to 1" diameter, abundant fine- to medium-grained sand.
18,36,41			55			SM	silty SAND: tan, wet, very dense; fine- to coarse-grained sand.
			60				
			65				

Boring Number: MW-4
Job Number: 5104.01
Location: 4300 Clayton Road, Concord
Date Drilled: 04/06/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 8-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 2" I.D./0.020" slot/Monterey #3 sand

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
		0		Asphalt (6 inches).	
		1	ML	Sandy silt with gravel, brown, damp, low plasticity; no product odor.	
		2			
		3			
		4		(Hand dug to 5 feet)	
	0 ppm	5			
		6			
	0 ppm	7		Grades to fine gravel at 7 feet.	
	0 ppm	8			
		9	SM	Silty sand, brown, damp; no product odor, root fibers.	
		10	GW	Sandy gravel with silt, brown, damp; no odor; angular to subrounded metaconglomerate gravels 1/2 to 3 inches in diameter.	
		11			
	0 ppm	12			
		13			
	0 ppm	14			
		15			
	0 ppm	16			
	0 ppm	17	ML	Grades to moist at 17 feet. Sandy silt with clay, brown, damp, low plasticity; small, well-rounded gravel at GW-ML interface.	
	0 ppm	18			
	0 ppm 0 ppm	19			
		20		Silty sand, brown, moist; no product odor. (Section continues)	

Boring Number: MW-4
Job Number: 5104.01
Location: 4300 Clayton Road, Concord
Date Drilled: 04/06/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 8-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 2" I.D./0.020" slot/Monterey #3 sand

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
		20	SM	Silty sand, brown, moist; no product odor.	
	0 ppm	21			
	0 ppm	22			
	0 ppm	23		Grades to slightly clayey at 23 feet.	
		24			
	0 ppm	25	SW	Silty sand with gravel, brown, moist.	
	0 ppm	26	GW	Sandy gravel with clay, brown with olive mottling, moist; no product odor.	
		27			
	0 ppm	28	SM	Silty sand, brown, moist.	
	0 ppm	29	GW	Sandy gravel with clay, brown, moist; no odor.	
		30			
	0 ppm	31			
	0 ppm	32			
	0 ppm	33			
		34			
	0 ppm	35	SM	Silty sand with clay, reddish brown, moist; no product odor, rootholes.	
	0 ppm	36		Grades to coarser sand at 36.5 feet.	
	0 ppm	37		Water at 37.5 feet (04/06/95).	
	0 ppm	38	GW	Sandy gravel with clay, brown, saturated; no product odor.	
		39			
	0 ppm	40			

(Section continues)

Boring Number: MW-4
Job Number: 5104.01
Location: 4300 Clayton Road, Concord
Date Drilled: 04/06/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 8-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 2" I.D./0.020" slot/Monterey #3 sand

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
	0 ppm	40	GM	Sandy gravel with clay, brown, saturated, no product odor.	
	0 ppm	41			
	0 ppm	42			
		43			
	0 ppm	44			
	0 ppm			Sandy silt, brown, saturated, low plasticity; no product odor.	
		45	ML	Boring terminated at 45 feet.	
		46			
		47			
		48			
		49			
		50			
		51			
		52			
		53			
		54			
		55			
		56			
		57			
		58			
		59			
		60			

Boring Number: MW-5
Job Number: 5104.01
Location: 4300 Clayton Road, Concord
Date Drilled: 04/06/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 8-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 2" I.D./0.020" slot/Monterey #3 sand

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
		0		Loam (2 inches) over asphalt (12 inches).	
		1	ML	Clayey silt with sand, brown, damp, low plasticity.	
		2			
		3			
		4		(Hand dug to 5 feet)	
	0 ppm	5	ML	Gravelly silt with clay, brown, damp, low plasticity, no odor.	
		6			
	0 ppm	7			
		8			
	0 ppm	9			
		10		No recovery from 9-1/2 to 11 feet due to gravel.	
		11			
	0 ppm	12		Grades to more gravel at 12 feet.	
		13	GM	Silty gravel with sand, poorly sorted, brown, moist, no product odor.	
	0 ppm	14			
		15			
	0 ppm	16	ML	Sandy silt with clay, brown, damp, low plasticity; no product odor.	
	0 ppm	17			
		18			
	0 ppm	19			
		20		(Section continues)	

Boring Number: MW-5
Job Number: 5104.01
Location: 4300 Clayton Road, Concord
Date Drilled: 04/06/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 8-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 2" I.D./0.020" slot/Monterey #3 sand

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
		20	ML	Sandy silt with clay, brown, damp, low plasticity; no product odor.	
		21			
	0 ppm	22	SM	Silty fine sand, brown, damp; no product odor.	
		23			
		24		Grading to medium sand at 24 feet.	
		25		Silty sand with gravel, brown with olive mottling, damp; no product odor.	
	0 ppm	26		Color grades to olive at 26 feet.	
		27			
		28			
	0 ppm	29			
		30	SW	Gravelly sand with silt, olive, moist, no product odor.	
	0 ppm	31	GW	Sandy gravel with clay, olive, moist; no product odor.	
	0 ppm	32			
		33			
		34			
		35			
	0 ppm	36			
		37			
		38			
	0 ppm	39		Water at 39 feet (04/06/95).	
		40			

(Section continues)

Boring Number: MW-5
Job Number: 5104.01
Location: 4300 Clayton Road, Concord
Date Drilled: 04/06/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 8-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 2" I.D./0.020" slot/Monterey #3 sand

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
		40	GW	Sandy gravel with clay, olive, moist; no product odor.	
	0 ppm	41			
		42			
	0 ppm	43			
	0 ppm	44			
	0 ppm	45		Boring terminated at 45 feet.	
		46			
		47			
		48			
		49			
		50			
		51			
		52			
		53			
		54			
		55			
		56			
		57			
		58			
		59			
		60			

Boring Number: VW- 1
Job Number: 5104.01
Location: 4300 Clayton Road, Concord
Date Drilled: 04/07/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
		0	GM	Asphalt (2 inches).	
		1		Silty gravel with sand, gray with olive mottling, damp; no product odor, rootholes.	
		2			
		3			
	0 ppm	4		(Hand explored to 5 feet.)	
		5		Silty gravel with sand, gray with olive mottling, damp; no product odor, rootholes.	
	0 ppm	6		No recovery from 6.5 to 8 feet	
		7			
	0 ppm	8			
	0 ppm	9		Old concrete debris at 9 feet. No recovery from 8.5 to 11 feet.	
		10			
	0 ppm	11		Silty gravel with clayey sand, brown, damp; no product odor.	
		12			
	0 ppm	13			
	0 ppm	14			
		15			
	0 ppm	16	ML	Clayey silt with sand, brown with gray mottling, damp, low plasticity; no product odor.	
	0 ppm	17			
	0 ppm	18		Grades more fine sand at 18 feet.	
		19			
	4.5 LEL	20	GM	Silty gravel with sand, brown with olive mottling, moist, product odor. (Section continues)	

Boring Number: VW-1
Job Number: 5104.01
Location: 4300 Cloyton Road, Concord
Date Drilled: 04/07/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Note: No blowcounts due to Mobile Overshoot Sampling System (MOSS).

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
	4.5 LEL	20	GM	Silty gravel with sand, brown with olive mottling, moist; product odor.	
	4.0 LEL	21			
	4.1 LEL	22			
		23	SM	Silty sand with gravel, brown with olive mottling, moist; product odor.	
	4.0 LEL	24	GM	Silty gravel with sand, brown with olive mottling, moist; product odor.	
	8.0 LEL	25	SM	Silty sand with clay, brown with olive mottling, moist; strong product odor.	
		26			
	6 LEL	27			
		28			
	20 LEL	29			
	19 LEL	30			
		31	GM	Silty gravel with clay, brown with olive mottling, moist; strong product odor.	
	9 LEL	32			
	5 LEL	33			
		34	SM	Silty sand with gravel, brown with olive mottling; slight product odor.	
	3 LEL	35			
	4 LEL	36		Very moist – capillary fringe at 36.5 feet.	
		37		Boring terminated at 36-1/2 feet.	
		38			
		39			
		40			

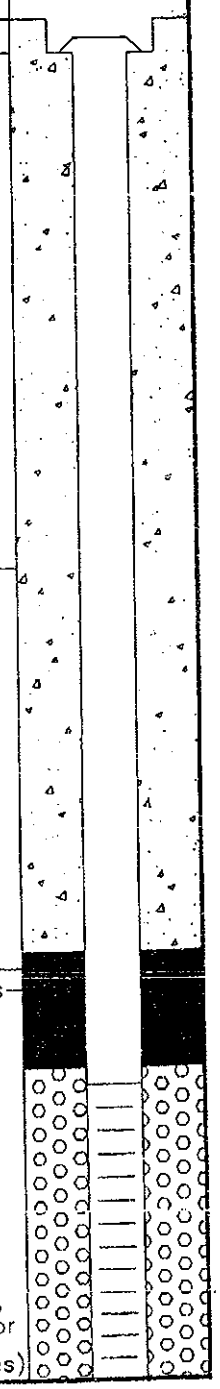
Boring Number: VW-2
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/01/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description
		0	ML	Asphalt (2 inches). Clayey silt with gravel, brown, damp, low plasticity, very stiff.
		1		
		2		
		3		
	0 ppm	4		
8 10		5		Grass and rootholes at 4.5 to 5 feet.
12	0 ppm	6		
		7		Grades to increasing gravel and decreasing silt at 8 feet.
		8	GM	Sandy gravel with silt, grayish brown, damp, very dense.
		9		
21 32		10		
40	0 ppm	11		
		12		
		13		Grades to increasing silt and decreasing gravel at 13 feet.
		14	ML	Clayey silt, brown with red mottling, damp, low plasticity, very stiff.
8 10	0 ppm	15		
15	0 ppm	16		
		17		
		18		
		19		Sandy silt with clay, brown with olive gray mottling, damp, low plasticity, very stiff; hydrocarbon odor only from olive gray mottling. (Section continues)
9 10		20		

Well Const.



Boring Number: VW-2
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/01/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
9 10		20	ML	Sandy silt with clay, brown with olive-gray mottling, damp, low plasticity, very stiff; hydrocarbon odor from olive-gray mottling only.	
14	60 ppm	21			
		22			
		23			
	690 ppm	24			
6 7		25		Silty sand, brown, moist, medium dense; strong hydrocarbon odor (hydrocarbon may be new since soil is not reduced [green]).	
9	1,200 ppm	26			
		27			
	5,400 ppm	28			
		29			
12 20	360 ppm	30			
24	485 ppm	31			
		32		Grades to increasing gravel at 32 feet.	
		33	GM	Sandy gravel with silt, brown, very moist to wet, medium dense; strong hydrocarbon odor.	
		34			
19 15	620 ppm 1,120 ppm	35			
12	9,120 ppm	36	ML	Sandy silt with gravel, brown, very moist, low plasticity; very strong hydrocarbon odor.	
		37		Boring terminated at 36 feet.	
		38			
		39			
		40			

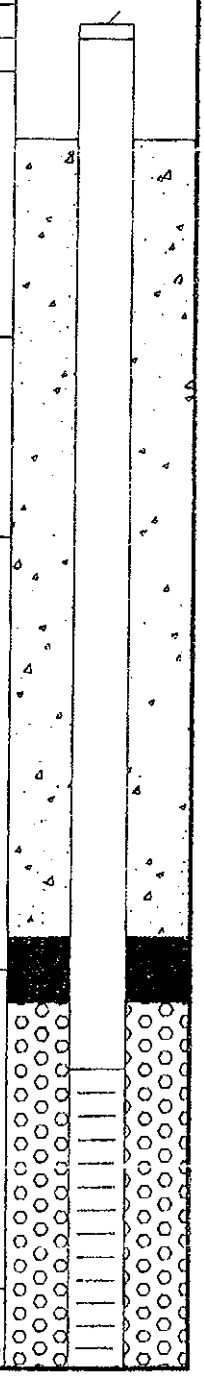
Boring Number: VW-3
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/01/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description
		0		Asphalt (2 inches).
				Fill.
		1	ML	Clayey silt with gravel, brown, damp, low plasticity, very stiff.
		2		
		3		
		4		
8		5		
10				
14	0 ppm	6		
		7		Grades to increasing gravel at 7 feet.
		8	GM	Sandy gravel with silt, brown, damp, medium dense.
	0 ppm	9		
13		10		
14				
15	0 ppm	11		
		12		
		13		
	0 ppm	14		Grades to increasing silt, decreasing gravel at 14 feet.
5		15	ML	Clayey silt, brown with reddish blue mottling, damp, very stiff, low plasticity.
8	0 ppm			
10	0 ppm	16		
		17		
		18		
		19	GM	Sandy gravel with silt, brown, damp, medium dense; slight hydrocarbon odor.
9		20		(Section continues)

Well Const.



Boring Number: VW-3
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/01/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

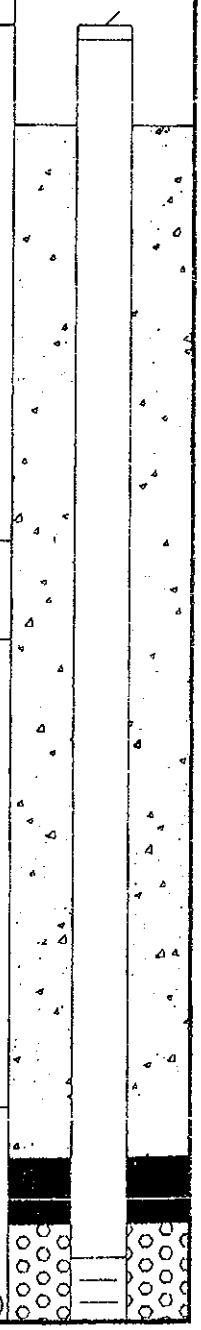
Blows (per 5 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
9		20	GM	Sandy gravel with silt, brown, damp, medium dense; slight hydrocarbon odor.	
11 13	37 ppm	21			
		22			
		23			
	1,600 ppm	24			
15		25			
21 29	2,800 ppm	26		Grades to increasing medium sand at 26 feet.	
		27			
	1,675 ppm	28			
	1,100 ppm	29			
19	37 ppm	30			
28 35	54 ppm	31			
		32			
		33			
		34			
13	23 ppm	35			
18 28	140 ppm 110 ppm	36			
		37		Boring terminated at 36.5 feet.	
		38			
		39			
		40			

Boring Number: VW-4
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/02/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Blows (per 6 in.)	Field V.O.C Concen.	Depth (in feet)	USCS Abbrv	Soil Description
		0	GM	Asphalt (2 inches).
				Sandy gravel with silt, brown, damp, medium dense.
		1	ML	Clayey silt, brown, damp, very stiff, low plasticity.
		2		
		3		
		4		
8 10	0 ppm	5		
12	0 ppm	6		
		7		
		8		Change in drilling speed at 8 feet.
		9	SM	Sand with silt, brown, damp, medium dense.
10 12	0 ppm	10		
15	0 ppm	11	GM	Sandy gravel with silt, brown, damp, medium dense.
		12		
		13		
		14		
22 16	0 ppm	15		
12	0 ppm	16		
		17	ML	Clayey silt, brown with dark brown mottling, damp, low plasticity, very stiff.
		18		
		19		
12 14	0 ppm 0 ppm	20		



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Boring Number: VW-4
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/02/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbr.	Soil Description	Well Const.
12	0 ppm	20	ML	Clayey silt, brown with dark brown mottling, damp, low plasticity, very stiff.	
14	0 ppm				
16	0 ppm	21			
		22			
		23			
		24	GM	Sandy gravel with silt, brown with green mottling, damp to moist, dense.	
13	0 ppm	25			
15	0 ppm				
17	0 ppm	26			
		27			
		28			
		29		Grades to decreasing sand, increasing silt at 29 feet	
19	53 ppm	30			
29	283 ppm				
34		31			
		32			
		33		Grades to increasing medium sand at 33 feet.	
		34			
15	0 ppm	35			
25	0 ppm				
30	0 ppm	36		Boring terminated at 36 feet.	
		37			
		38			
		39			
		40			

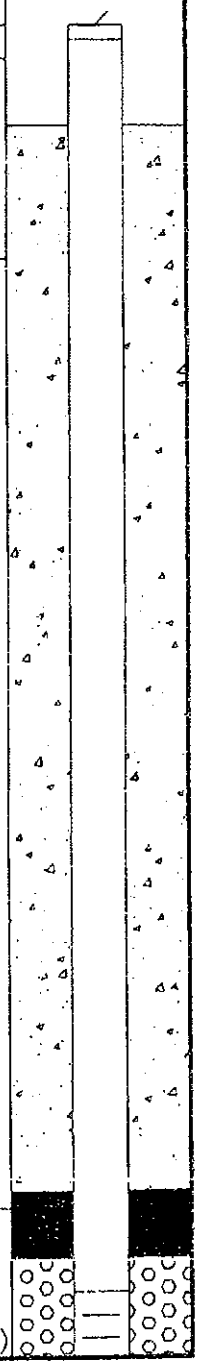
Boring Number: VW-5
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/02/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description
		0		Concrete (6 inches).
		1	GM	Silty gravel wth sand, brown, damp, medium dense.
			ML	Clayey silt, brown, damp, very stiff, low plasticity.
		2		
		3		
		4	GM	Sandy gravel with silt, brown, damp, medium dense.
6	0 ppm	5		
8	0 ppm			
10	0 ppm	6		
		7		
		8		
		9		
18		10		
30	0 ppm			
42	0 ppm	11		
		12		
		13		
		14		Grades to olive in color.
22	0 ppm	15		
16				
12	0 ppm	16		
		17		
		18		
		19	ML	Clayey silt, brown with green mottling around root-holes, damp, hard, low plasticity.
8	0 ppm	20		
10	0 ppm			

Well Const.



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Boring Number: VW-5
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/02/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

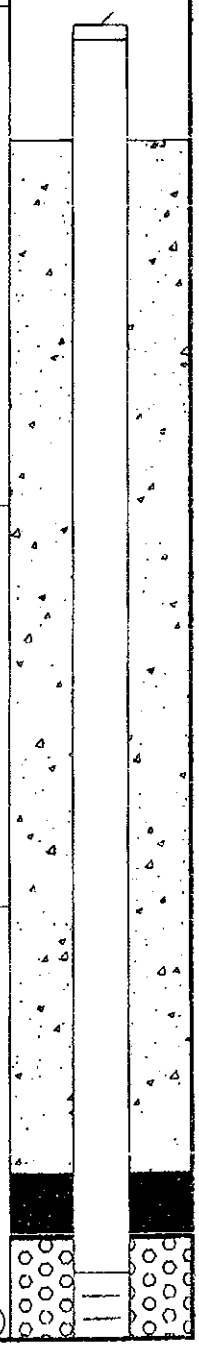
Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbr.	Soil Description	Well Const.
8	0 ppm	20	ML	Clayey silt, brown with green mottling around root-holes, damp, hard, low plasticity.	
10	0 ppm				
12	0 ppm	21			
	0 ppm	22			
	0 ppm	23			
		24	SM	Silty sand, brown, moist, medium dense.	
12	0 ppm	25			
14	0 ppm				
16	0 ppm	26			
	0 ppm	27			
		28	ML	Clayey silt, brown, damp to moist, low plasticity, hard.	
		29			
19	0 ppm	30	GM	Silty gravel with sand, brown with green mottling between gravel grains, moist, very dense.	
28	0 ppm				
32	0 ppm	31			
		32			
	0 ppm	33			
		34			
12	0 ppm	35			
14	0 ppm				
18	0 ppm	36		Grades to very moist to saturated at 36 feet.	
				Boring terminated at 36 feet.	
		37			
		38			
		39			
		40			

Boring Number: VW-6
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/02/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem ouger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" peo gravel

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
		0		Concrete (6 inches).	
		1	ML	Clayey silt with gravel, brown, damp, low plasticity, stiff.	
		2			
		3			
		4			
8 8	0 ppm	5			
10	0 ppm	6			
		7			
		8	GM	Silty gravel with sand, brown, damp, very dense.	
		9			
16 21	0 ppm	10			
32	0 ppm	11			
		12			
		13			
		14		Grades to increasing silt at 13.5 feet.	
5 6	0 ppm	15	ML	Clayey silt, brown, moist, low plasticity, stiff.	
5	0 ppm	16			
		17			
		18			
		19			
5 7	0 ppm	20			



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Boring Number: VW-6
Job Number: 5104.02
Location: 4300 Clayton Road, Concord
Date Drilled: 11/02/95
Logged By: Robert Campbell
Client: BP Oil Company
Drilling Company: Exploration Geoservices

CEECON
CALIFORNIA ENVIRONMENTAL ENGINEERS & CONTRACTORS

Drilling Method: 10.25-inch hollow-stem auger
Sampling Method: 2.5-inch split spoon
Well Casing: 4" I.D./0.100" slot/3/8" pea gravel

Blows (per 6 in.)	Field V.O.C. Concen.	Depth (in feet)	USCS Abbrv.	Soil Description	Well Const.
5 7	0 ppm	20	ML	Clayey silt, brown with dark brown mottling, damp, low plasticity, very stiff.	
12	0 ppm	21			
		22			
		23		Grades to increasing gravel at 23 feet.	
		24	GM	Sandy gravel with silt, brown, damp to moist, dense.	
14 15	0 ppm	25			
17	0 ppm	26			
		27			
		28			
		29			
15 25	0 ppm	30		Grades to moist and very dense at 30 feet.	
30	0 ppm	31			
		32			
		33			
		34		Silty gravel with sand, brown with green mottling, very moist, dense.	
8 12	0 ppm	35			
14	0 ppm	36		Boring terminated at 36 feet.	
		37			
		38			
		39			
		40			

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road**
Concord, CA

Boring No: **B-5**
Date Drilled: **05/14/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **NA**
Well Depth: **NA**
Casing Type: **NA**
Slot Size: **NA**
Sand Pack: **NA**

Screen Interval: **NA**
Hole Diameter: **2"**
Hole Depth: **45'**
First Water Depth: **43'**

▽ = First Water
▼ = Static Groundwater

Elevation	Northing	Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
				Hand Augured	1				**Grass**
					2				**GC** Gravelly Clay (GC), dark brown, moist, approximately 70% fines, medium plasticity, approximately 30% gravel up to 2 1/2" in diameter, subround. (FILL)
					3				
					4				
					5				
					6				
					7				**GM** Silty Gravel (GM), yellowish brown, moist, approximately 60% gravel up to 1" in diameter, subround to subangular, up to 40% fines, non-plastic.
					8				
Neat Cement					9				
					10				
					11				
					12				**ML** Silt (ML), dark yellowish brown, moist, approximately 95% fines, non-plastic, approximately 5% sand, fine grain.
					13				
					14				
					15				
					16				
					17				As above.
					18				
					19				**CL** Lean Clay with Sand (CL), dark brown, moist, approximately 85% fines, low to medium plasticity, approximately 15% sand, fine grain.
					20				
					21				
					22				**SM**

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Boring No: **B-5**
Date Drilled: **05/14/2012**

Well Completion (Backfill, Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample: Recovery	Sample: Interval	Soil Type	LITHOLOGY / DESCRIPTION
					23				**SM** Silty Sand with Gravel (SM), dark yellowish brown, moist, approximately 60% sand, fine to coarse grain, approximately 25% fines, no to low plasticity, approximately 15% gravel up to 1" in diameter, subangular.
					24				
					25				
					26				
					27				
					28				
					29				As above, except approximately 70% sand, approximately 20% fines, non-plastic, approximately 10% gravel.
Neat Cement					30				
					31				
					32				
					33				**SP** Gravelly Sand with Silt (SP), grayish brown, moist, approximately 60% sand, fine to coarse grain, approximately 30% gravel up to 3/4" in diameter, angular to subangular, approximately 10% fines.
					34				
					35				**CL** Lean Clay (CL), dark yellowish brown, approximately 90% fines, medium plasticity, approximately 10% sand, fine to coarse grain, trace gravel up to 1/2" in diameter, subangular.
					36				
					37				
					38				
					39				
					40				**SM** Silty Sand (SM), greenish gray, moist, approximately 70% sand, fine to coarse grain, approximately 30% fines, no to low plasticity, trace gravel up to 1/2" in diameter, subangular.
					41				
					42				
	▽				43				
					44				As above, except wet.
					45				Bottom of boring 45'
					46				
					47				
					48				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road**
Concord, CA

Boring No: **B-6**
Date Drilled: **05/15/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **NA**
Well Depth: **NA**
Casing Type: **NA**
Slot Size: **NA**
Sand Pack: **NA**

Screen Interval: **NA**
Hole Diameter: **2"**
Hole Depth: **45'**
First Water Depth: **NA**

▽ = First Water
▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
									Concrete/Base Rock
				Hand Augured	1				
					2				**CL** Lean Clay (CL), dark brown, moist, approximately 95% fines, medium plasticity, approximately 5% sand, fine to coarse grain.
					3				
					4				
					5				
					6				
					7				
			2.0		8				
Neat Cement					9				
					10				**SP** Gravelly Sand (SP), gray, dry, approximately 40% gravel up to 3/4" in diameter, subangular, approximately 60% sand, fine to coarse grain.
					11				
			1.9		12				Poor recovery.
					13				
					14				Soft.
					15				
			3.2		16				
					17				**CL** Sandy Clay (CL), yellowish brown, moist, approximately 70% fines, medium plasticity, approximately 30% sand, fine to medium grain.
					18				
					19				
			1.6		20				
					21				**SM** Silty Sand (SM), dark yellowish brown, dry to moist, approximately 70% sand, fine to coarse grain, approximately 30% fines, non-plastic.
					22				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Boring No: **B-6**
Date Drilled: **05/15/2012**

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
					23				
			2.5		24				
					25				
					26				As above, except trace gravel from 26 to 28 feet approximately 1/2" in diameter, subround.
					27				
			2.8		28				As above.
					29				
Neat Cement					30				
					31				GC Gravelly Clay (GC), greenish brown, moist, approximately 70% fines, medium plasticity, approximately 30% gravel up to 1/2" in diameter, trace sand, fine to coarse grain.
			2.1		32				
					33				
					34				
					35				
			3.9		36				As above, except green, petroleum odor, gravel up to 1" in diameter, subangular.
					37				
					38				
					39				SC Sandy Clay (SC), green, moist, approximately 60% fines, low to medium plasticity, approximately 40% sand, fine to medium grain, trace gravel up to 1/2" in diameter, strong petroleum odor
			389.9		40				
					41				
					42				
					43				As above, except trace gravel up to 1" in diameter, petroleum odor but it smells weathered.
					44				
			68.6		45				Bottom of boring 45'
					46				
					47				
					48				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road**
Concord, CA

Boring No: **B-7**
Date Drilled: **05/15/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **NA**
Well Depth: **NA**
Casing Type: **NA**
Slot Size: **NA**
Sand Pack: **NA**

Screen Interval: **NA**
Hole Diameter: **2"**
Hole Depth: **47'**
First Water Depth: **45'**

▽ = First Water
▼ = Static Groundwater

Elevation	Northing	Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
				Hand Augured	1				**Asphalt**
					1				**CL** Lean Clay (CL), dark brown, moist, approximately 95% fines, medium plasticity, approximately 5% sand, fine grain.
					2				
					3				
					4				
					5				
					6				
					7				As above, except yellowish brown, approximately 10% sand, fine grain, trace gravel up to 3/8" in diameter, subround.
			1.8		8				
Neat Cement					9				**SC** Clayey Sand with Gravel (SC), yellowish brown, moist, approximately 60% sand, fine to coarse grain, approximately 30% fines, low to medium plasticity, approximately 10% gravel up to 1" in diameter, angular.
					10				
					11				
			2.0		12				
					13				
					14				
					15				As above.
			1.8		16				**CL** Lean Clay with Sand (CL), yellowish brown, moist, approximately 85% fines, medium plasticity, approximately 15% sand, fine grain, faint hydrocarbon odor.
					17				
					18				
					19				
			3.4		20				As above.
					21				
					22				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Boring No: **B-7**
Date Drilled: **05/15/2012**

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
					23				
			46.8		24				**CL** Lean Clay (CL) yellowish brown, green petroleum staining, medium to high plasticity, trace sand, fine grain, slight petroleum odor.
					25				
					26				
					27				
			4.2		28				**SC** Clayey Sand with Gravel (SC), brown, moist, approximately 70% sand, fine to coarse grain, approximately 20% fines, low to medium plasticity, approximately 10% gravel up to 3/4" in diameter, subangular.
					29				
					30				
Neat Cement					31				
					32				**CL** Lean Clay (CL), yellowish brown, moist, medium plasticity, trace sand, fine grain.
					33				Acetate sleeve jammed in macro core. No sample collected.
					34				**SC** Clayey Sand with Gravel (SC), dark yellowish brown, moist, approximately 60% sand, fine to coarse grain, approximately 20% gravel up to 1/2" in diameter, angular, approximately 20% fines, medium plasticity.
					35				
			2.139		36				
					37				
					38				
					39				
					40				No recovery. Acrylic wrinkled in macro core.
					41				Hydropunch to 47'.
					42				
					43				
					44				
	▽				45				
					46				
					47				
									Bottom of boring 47'
					48				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road**
Concord, CA

Boring No: **B-8**
Date Drilled: **05/16/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **NA**
Well Depth: **NA**
Casing Type: **NA**
Slot Size: **NA**
Sand Pack: **NA**

Screen Interval: **NA**
Hole Diameter: **2"**
Hole Depth: **45'**
First Water Depth: **44'**

▽ = First Water
▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
									Concrete
					1				**Base Rock**
				Hand Augured	2				CL Sandy Clay (CL), dark brown, moist, approximately 70% fines, medium plasticity, approximately 30% sand, fine to coarse grain, trace gravel up to 2" in diameter, subround. (FILL)
					3				
					4				
					5				
					6				
					7				GP Sandy Gravel with Clay (GP), dark brown, moist, approximately 60% gravel up to 1" in diameter, subangular, approximately 20% sand, fine to coarse grain, approximately 20% fines, medium plasticity.
					8				
Neat Cement			1.0		9				
					10				
					11				
					12				
					13				
					14				
					15				CL Lean Clay with Sand (CL), yellowish brown, moist, approximately 90% fines, medium plasticity, approximately 10% sand, fine grain.
			1.3		16				
					17				As above.
					18				
					19				
			2.5		20				
					21				
					22				CL

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Boring No: **B-8**
Date Drilled: **05/16/2012**

Well Completion (Backfill, Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
					23				**CL** Sandy Clay (CL), dark brown, moist, approximately 60% fines, medium plasticity, approximately 40% sand, fine to medium grain.
			2.2		24				
					25				
					26				
					27				As above, except approximately 75% fines, approximately 25% fine sand.
			2.3		28				
					29				
Neat Cement					30				
					31				As above, except approximately 60% fines, approximately 40% sand, fine to coarse grain.
			3.2		32				**CL** Lean Clay (CL), dark yellowish brown, moist, approximately 90% fines, medium plasticity, approximately 10% sand, fine to medium grain.
					33				
					34				
					35				
			2.2		36				At 35-36', sand stringers approximately 1" thick, wet.
					37				Trace gravel up to approximately 1/2" subround.
					38				
					39				
			0.7		40				**ML** Silty Sand with Gravel (ML), yellowish brown, moist to wet, approximately 70% sand, fine to coarse grain, approximately 20% fines, low plasticity, approximately 10% gravel up to 3/4" in diameter, subangular.
					41				
			0.5		42				Wet from approximately 41-41.5'.
					43				
	▽				44				Saturated at 44'.
					45				Bottom of boring 45'
					46				
					47				
					48				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road**
Concord, CA

Boring No: **B-9**
Date Drilled: **05/16/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **NA**
Well Depth: **NA**
Casing Type: **NA**
Slot Size: **NA**
Sand Pack: **NA**

Screen Interval: **NA**
Hole Diameter: **2"**
Hole Depth: **47'**
First Water Depth: **NA**

▽ = First Water
▼ = Static Groundwater

Elevation	Northing	Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
				Hand Augured	1				**Asphalt**
					1				**CL** Sandy Clay (CL), dark brown, moist, approximately 70% fines, medium plasticity, approximately 30% sand, fine to medium grain.
					2				
					3				
					4				
					5				
					6				
					7				
					8				As above.
Neat Cement			0.5		9				
					10				
					11				
					12				**GC** Clayey Gravel (GC), brownish gray, moist, approximately 70% gravel up to 3/4" in diameter, angular, approximately 30% fines, medium plasticity.
			1.0		13				
					14				
					15				
					16				As above.
			0.9		17				
					18				
					19				**SM** Silty Sand with Gravel (SM), brownish gray, approximately 20% sand, fine to coarse grain, approximately 30% fines, non-plastic, approximately 10% gravel up to 1/2" in diameter, subangular.
					20				
			0.7		21				
					22				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Boring No: **B-9**
Date Drilled: **05/16/2012**

Well Completion (Backfill, Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
					23				**GC** Clayey Gravel (GC), dark yellowish brown, moist, approximately 80% gravel up to 3/4" in diameter, angular, approximately 20% fines, medium plasticity.
					24				
			0.01		25				
					26				
					27				
					28				**CL** Lean Clay with Sand (CL), yellowish brown, moist, approximately 85% fines, medium plasticity, approximately 15% sand, fine grain.
					29				
Neat Cement					30				
			0.05		31				
					32				
					33				**CL** Sandy Clay (CL), yellowish brown, moist, approximately 60% fines, medium plasticity, approximately 40% sand, fine to coarse grain.
					34				
			1.4		35				
					36				
					37				**SC** Clayey sand with Gravel (SC), yellowish brown, moist, approximately 70% sand, fine to coarse grain, approximately 20% fines, medium plasticity, approximately 10% gravel up to 3/4" in diameter, angular.
					38				
			0.8		39				
					40				
					41				**GC** Clayey Gravel with Sand (GC), yellowish brown, moist, approximately 70% gravel up to 1" in diameter, angular, approximately 20% fines, medium plasticity, approximately 10% sand, fine to coarse grain.
					42				
			0.6		43				
					44				
					45				
					46				
			1.2		47				Bottom of boring 47'
					48				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road Concord, CA**

Boring No: **B-10**
Date Drilled: **05/17/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **NA**
Well Depth: **NA**
Casing Type: **NA**
Slot Size: **NA**
Sand Pack: **NA**

Screen Interval: **NA**
Hole Diameter: **2"**
Hole Depth: **46'**
First Water Depth: **45'**

▽ = First Water
▼ = Static Groundwater

Elevation	Northing	Easting

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
									Grass
				Hand Augured	1				**CL** Sandy Clay (CL), dark brown, approximately 75% fines, medium plasticity, approximately 25% sand, fine grain.
					2				
					3				
					4				
					5				
					6				
					7				
					8				No recovery.
Neat Cement					9				
					10				
					11				As above.
			10.2		12				
					13				**CL** Gravelly Clay with Sand (CL), dark yellowish brown, moist, approximately 60% fines, medium plasticity, approximately 25% gravel up to 1/2" in diameter, subangular, approximately 15% sand, fine to coarse grain.
					14				
					15				
			0.4		16				
					17				
					18				
					19				**CL** Lean Clay (CL), yellowish brown, moist, approximately 95% fines, medium to high plasticity, approximately 5% sand, fine grain, trace gravel up to 3/8" in diameter, subround.
			0.7		20				
					21				
					22				**CL**

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Boring No: **B-10**
Date Drilled: **05/17/2012**

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample (Recovery / Interval)	Soil Type	LITHOLOGY / DESCRIPTION
					23			**CL** Sandy Clay (CL), yellowish brown, moist, approximately 70% fines, medium plasticity, approximately 30% sand, fine grain, trace gravel up to 1/2" in diameter, subround.
			0.4		24			
					25			
					26			As above, except green petroleum staining and slight odor.
			0.9		27			
					28			**SC** Clayey Sand (SC), greenish brown, moist, approximately 70% sand, fine to coarse grain, approximately 30% fines, medium plasticity, trace gravel up to 3/8" in diameter, subround.
					29			
			9		30			
Neat Cement					31			**SP** Poorly Graded Sand with Clay (SP), green, approximately 80% sand, fine grain, approximately 20% fines, low to medium plasticity, slight petroleum odor.
					32			
					33			**GC** Clayey Gravel (GC), greenish brown, moist, approximately 70% gravel up to 1" in diameter, angular, approximately 30% fines, medium plasticity, petroleum odor but it smells weathered.
					34			
					35			
					36			**SC** Clayey Sand (SC), greenish brown, moist, approximately 70% sand, fine grain, approximately 30% fines, medium plasticity, petroleum staining and odor.
					37			
					38			
					39			As above.
			94.7		40			
					41			**SC** Clayey Sand with Gravel (SC), yellowish brown, moist, approximately 60% sand, fine to coarse grain, approximately 25% fines, medium plasticity, approximately 15% gravel up to 1" in diameter, angular.
					42			
			385		43			
					44			No recovery - liner wrinkled.
	▽				45			
					46			Bottom of boring 46'
					47			
					48			

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road**
Concord, CA

Well No: **MW-6**
Date Drilled: **05/17/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **4"**
Well Depth: **45'**
Casing Type: **PVC**
Slot Size: **0.010"**
Sand Pack: **#2/12**

Screen Interval: **27-45'**
Hole Diameter: **10"**
Hole Depth: **45'**
First Water Depth: **NA**

▽ = First Water
▼ = Static Groundwater

Elevation | Northing | Easting

Well Completion (Backfill, Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Well Box									**Asphalt**
				Hand Augured	1–5				**GC** Clayey Gravel with Sand (GC), dark brown, moist, approximately 60% gravel up to approximately 2" in diameter, junk concrete pieces, approximately 20% fines, medium plasticity, 20% sand, fine to coarse grain. (FILL)
			6.0		6–8				**SC** Clayey Sand (SC), yellowish brown, moist, approximately 60% sand, fine grain, approximately 40% fines, medium plasticity.
Neat Cement			4.4		10–12				As above, except approximately 70% sand, fine to coarse grain, approximately 30% fines, medium plasticity, trace gravel up to approximately 1/2" in diameter, subround.
			64.8		14–16				As above, except grayish-brown, approximately 80% sand, fine to coarse, approximately 20% fines, low to medium plasticity, trace gravel, angular.
					16–19				**CL** Sandy Clay (CL), yellowish brown, moist, approximately 80% fines, medium to high plasticity, approximately 20% sand, fine to coarse grain, slight petroleum odor.
			54.0		20–22				**SC** Clayey Sand (SC), yellowish brown, moist, approximately 70% sand, fine to medium grain, approximately 30% fines, medium plasticity, stronger petroleum odor.

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Well No: **MW-6**
Date Drilled: **05/17/2012**

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample (Recovery / Interval)	Soil Type	LITHOLOGY / DESCRIPTION
					23			
			2,671		24			
Bentonite					25			
					26			
					27			**SC** As above, except greenish brown, approximately 70% sand, fine to coarse grain, approximately 20% fines, medium plasticity, up to approximately 10% gravel, approximately 3/4" in diameter, subangular, strong petroleum odor.
			1,435		28			
					29			
					30			**CL** Sandy Clay with Gravel (CL), greenish brown, moist, approximately 60% sand, fine to coarse grain, approximately 20% gravel up to approximately 3/4" in diameter, subangular, approximately 20% fines, medium plasticity, strong petroleum odor.
			1,593		31			
					32			
					33			
#2/12 Sand Filter			1,717		34			**SC** Clayey Sand with Gravel (SC), greenish brown, moist, approximately 70% sand, fine to coarse grain, approximately 20% fines, medium plasticity, approximately 10% gravel up to 3/4" in diameter, subround, strong petroleum odor and staining.
0.010" screen					35			
					36			
					37			
			597.1		38			
					39			
					40			**CL** Sandy Clay (CL), yellowish brown, moist, approximately 60% fines, medium plasticity, approximately 40% sand, fine to medium grain, slight petroleum odor.
					41			
			343		42			**GC** Clayey Gravel with Sand (GC), greenish brown, moist, approximately 60% gravel up to approximately 1" in diameter, angular, 20% sand, fine to coarse grain, approximately 20% fines, medium plasticity, slight petroleum odor.
					43			
					44			
			39.3		45			Bottom of boring 45'
End Cap					46			
					47			
					48			

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **4300 Clayton Road**
Concord, CA

Well No: **MW-7**
Date Drilled: **05/17/2012**

Project No: **4201.02.03**
Logged By: **Matthew Farris**
Driller: **Gregg Drilling**
Drilling Method: **GeoProbe Direct Push**
Sampling Method: **Continuous Core**

Well Diameter: **4"**
Well Depth: **45'**
Casing Type: **PVC**
Slot Size: **0.010"**
Sand Pack: **#2/12**

Screen Interval: **27-45'**
Hole Diameter: **10"**
Hole Depth: **45'**
First Water Depth: **NA**

▽ = First Water
▼ = Static Groundwater

Elevation | Northing | Easting

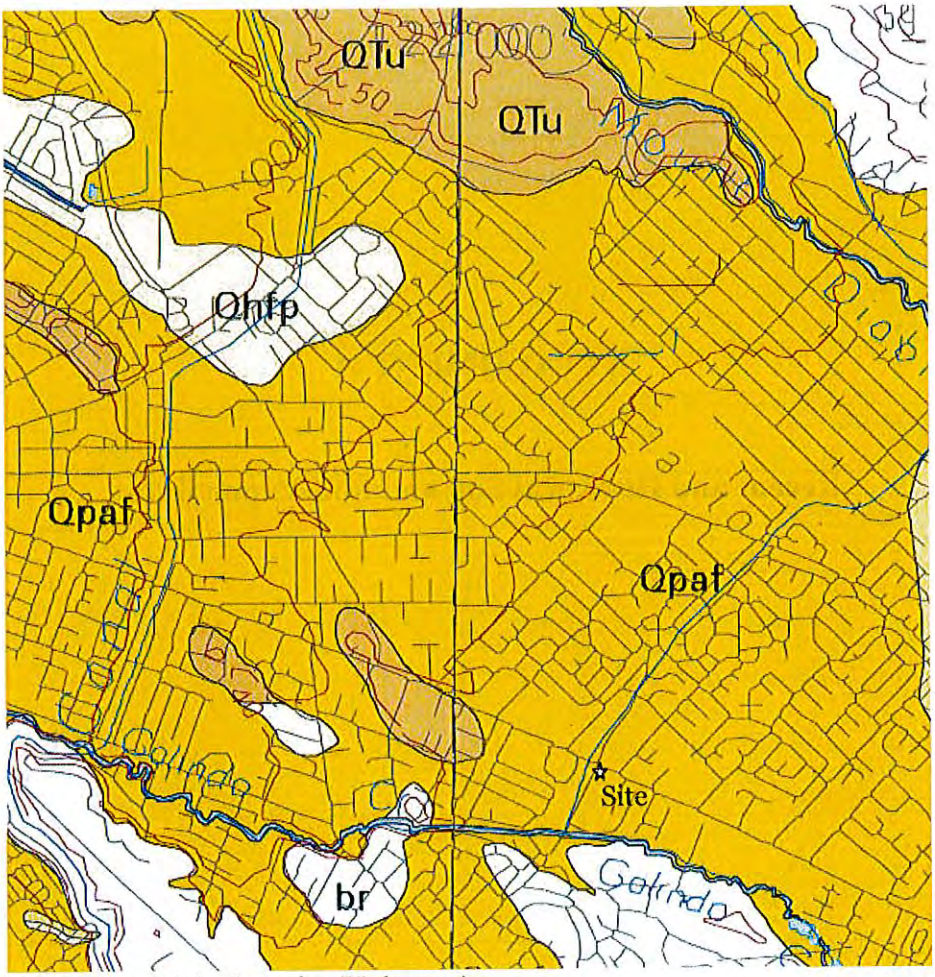
Well Completion (Backfill, Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
Well Box									**Asphalt**
				Hand Augured	1				**FILL** Fill material (FILL), asphalt, brick, concrete, clay.
					2				
					3				
					4				
					5				
					6				
					7				
					8				Same as above. Poor recovery.
					9				
					10				
					11				
Neat Cement					12				
					13				No recovery.
					14				
					15				
					16				**CL** Lean Clay (CL), yellowish brown, moist, approximately 95% fines, medium to high plasticity, approximately 5% sand, fine grain.
					17				
					18				
					19				
			2.7		20				**CL** Lean Clay with Sand (CL), yellowish brown, moist, approximately 80% fines, meduim to high plasticity, approximately 20% sand, fine to coarse grain.
					21				
					22				

CLOSURE SOLUTIONS, INC.

Client: **Bel Air Development**
Location: **Concord, CA**

Well No: **MW-7**
Date Drilled: **05/17/2012**

Well Completion (Backfill / Casing)	Static Water Level	Moisture Content	PID Reading (ppm)	Blow Counts	Depth (feet)	Sample Recovery	Sample Interval	Soil Type	LITHOLOGY / DESCRIPTION
					23				**CL** Sandy Clay (CL), yellowish brown with green staining, moist, approximately 60% fines, medium plasticity, approximately 30% sand, fine to coarse grain, approximately 10% gravel up to 3/4" in diameter, subround.
			19.5		24				
Bentonite					25				
					26				
					27				
			13.2		28				**GC** Gravelly Clay with Sand (GC), yellowish brown, moist, approximately 60% clay, medium plasticity, approximately 25% gravel up to approximately 1/2" in diameter, subangular, approximately 15% sand, fine to coarse grain.
					29				
					30				
					31				**SC** Clayey Sand with Gravel (SC), green, moist, approximately 60% sand, fine to medium grain, approximately 30% fines, medium plasticity, approximately 10% gravel up to 1/2" in diameter, subround, strong petroleum odor and staining.
			309.2		32				
					33				
#2/12 Sand Filter					34				As above, except approximately 75% sand, fine to coarse grain, approximately 15% fines, medium plasticity, up to approximately 10% gravel approximately 3/4" in diameter, subround, strong petroleum odor and staining.
0.010" screen					35				
			2,614		36				
					37				From 37' to 38' Clay (CL) stringers.
					38				
			100.2		39				As above, except gravel up to approximately 1" in diameter, subangular.
					40				
					41				**SC** Clayey Sand (SC), brownish green, moist, approximately 70% sand, fine to coarse grain, approximately 30% fines, medium plasticity, trace gravel up to 3/4" in diameter, subangular, petroleum odor and staining.
			342.5		42				
					43				
					44				**CL** Sandy Clay (CL), greenish brown, wet, approximately 60% fines, medium plasticity, up to approximately 40% sand, fine grain, petroleum staining and some odor.
			23.2		45				Bottom of boring 45'
End Cap					46				
					47				
					48				



Qhfp Floodplain deposits (Holocene)
Qpaf Alluvial Fans and Fluvial Deposits (Pleistocene)
Qtu Undifferentiated Continental Gravels (Plio-Pleistocene)
br Bedrock (Eocene)

Quaternary Geology Of Contra Costa County, and Surrounding Parts of Alameda, Marin, Sonoma, Solano, Sacramento, and San Joaquin Counties, California: A Digital Database. U.S. Geological Survey Open File Report 97-98
By E.J. Helley and R.W. Graymer

ATTACHMENT D

Recent and Historical Soil and Soil Vapor Data

Table 1
Soil Analytical Data

Former Falcon Gas
4300 Clayton Road
Concord, California

Sample ID	Date Sampled	Depth (feet bgs)	GRO (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)
B-5-42	5/14/2012	42	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-5-45	5/14/2012	45	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-6-32	5/15/2012	32	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-6-36	5/15/2012	36	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-6-40	5/15/2012	40	**3.3**	**0.0094**	**0.45**	**0.10**	**0.77**	ND<0.020
B-6-45	5/15/2012	45	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	**0.0058**	ND<0.020
B-7-24	5/15/2012	24	**5.1**	**0.024**	ND<0.0050	**0.26**	**0.012**	ND<0.020
B-7-28	5/15/2012	28	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-7-36	5/15/2012	36	**3.8**	ND<0.0050	**0.25**	**0.17**	**1.25**	ND<0.020
B-8-28	5/16/2012	28	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-8-36	5/16/2012	36	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-8-42	5/16/2012	42	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-9-35	5/16/2012	35	ND<0.50	**0.015**	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-9-39	5/16/2012	39	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-9-47	5/16/2012	47	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-10-30	5/17/2012	30	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	**0.0054**	ND<0.020
B-10-33	5/17/2012	33	**0.51**	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
B-10-36	5/17/2012	36	**2.5**	ND<0.0050	**0.044**	**0.026**	**0.116**	ND<0.020
B-10-40	5/17/2012	40	**46**	**0.10**	**1.8**	**1.2**	**3.7**	ND<0.020
B-10-43	5/17/2012	43	ND<0.50	**0.41**	**5.8**	**2.4**	**12.4**	ND<0.020
MW-6-20	5/17/2012	20	**1.3**	**0.21**	ND<0.0050	**0.016**	ND<0.010	ND<0.020
MW-6-24	5/17/2012	24	**700**	**0.55**	**22**	**7.5**	**28**	ND<0.020
MW-6-31	5/17/2012	31	**590**	**0.53**	**6.8**	**4.9**	**26.9**	ND<0.020
MW-6-38	5/17/2012	38	**12**	**0.019**	**0.51**	**0.38**	**1.79**	ND<0.020
MW-6-45	5/17/2012	45	ND<0.50	ND<0.0050	**0.0056**	ND<0.0050	ND<0.010	ND<0.020
MW-7-28	5/17/2012	28	**0.77**	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020
MW-7-36	5/17/2012	36	**700**	**0.14**	**0.33**	**4.3**	**18.34**	ND<0.020
MW-7-42	5/17/2012	42	**37**	**0.19**	**0.76**	**2.3**	**6.55**	ND<0.020
MW-7-45	5/17/2012	45	ND<0.50	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	ND<0.020

Table 1
Soil Analytical Data

Former Falcon Gas
4300 Clayton Road
Concord, California

Sample ID	Date Sampled	Depth (feet bgs)	GRO (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)

ABBREVIATIONS:

Bold	=	Detection above laboratory reporting limits
GRO	=	Gasoline Range Organics (C6-C12)
B	=	Benzene
T	=	Toluene
E	=	Ethylbenzene
X	=	Total xylenes
MTBE	=	Methyl tertiary butyl ether by EPA Method 8020/8260
feet bgs	=	Feet below ground surface
mg/kg	=	Milligrams per kilogram (parts per million [ppm])
ND<	=	Not detected at or above specified laboratory reporting limit

Table 3
Soil Vapor Analytical Data

Former Falcon Gas
4300 Clayton Road
Concord, California

Sample ID	Date Sampled	GRO ($\mu g/m^3$)	B ($\mu g/m^3$)	T ($\mu g/m^3$)	E ($\mu g/m^3$)	X ($\mu g/m^3$)	Methane (ppm(v))
VP-1-5	5/21/2012	ND<7,200	**8.3**	**21**	**8.2**	**45**	**730**
VP-1-15	5/21/2012	ND<7,200	ND<3.3	**4.5**	**5.1**	**26.4**	ND<5.0
VP-2-5	5/21/2012	ND<7,200	**30**	**45**	**27**	**164**	ND<5.0
VP-2-15	5/21/2012	**1,000,000**	**1,300**	**220**	**480**	**4,210**	**1,000**
VP-3-5	5/21/2012	ND<7,200	**6.0**	**33**	**27**	**90**	ND<5.0
VP-3-15	5/21/2012	ND<7,200	**8.4**	**6.7**	**14**	**78**	ND<5.0
ESLs		29,000	280	180,000	3,300	58,000	NA

ABBREVIATIONS:

Bold	=	Detection above laboratory reporting limits
GRO	=	Gasoline Range Organics (C6-C12)
B	=	Benzene
T	=	Toluene
E	=	Ethylbenzene
X	=	Total xylenes
($\mu g/m^3$)	=	Micrograms per cubic meter
(ppm(v))	=	Parts per million by volume
ND<	=	Not detected at or above specified laboratory reporting limit
ESLs	=	Environmental screening levels for shallow soil gas for evaluation of potential vapor intrusion concerns - Commercial/Industrial land use as established by the California Regional Water Quality Control Board - San Francisco Bay Region, Table E.

Table 1
Historical Soil Sample Analytical Data
Former BP Service Station No. 11145
4300 Clayton Road
Concord, California

Soil Borings											
B-1	10/23/92	20.5	<1.0	--	<0.005	<0.005	<0.005	<0.005	--	--	--
		30.5	<1.0	--	<0.005	<0.005	<0.005	<0.005	--	--	--
B-2	10/26/92	24.5	**230**	--	**0.14**	**1.10**	**1.60**	**4.90**	--	--	--
		30.5	**480**	--	**1.30**	**4.00**	**5.30**	**23.0**	--	--	--
		35.5	**35**	--	**0.14**	**0.35**	**0.31**	**1.2**	--	--	--
B-3	10/26/92	25	**580**	--	**2.00**	**12.00**	**4.80**	**23.00**	--	--	--
		35.5	<40	--	<0.20	**0.22**	<0.20	<0.20	--	--	--
B-4	10/27/92	15.5	<1.0	<5.0	<0.005	<0.005	<0.005	<0.005	--	<50	--
		30.5	<1.0	<5.0	<0.005	<0.005	<0.005	<0.005	--	<50	--
Monitoring Wells											
MW-1	09/23/93	5	**18**	--	**0.09**	**0.5**	**0.33**	**1**	--	--	--
		10	**110**	--	**0.17**	**0.18**	**4.7**	**0.41**	--	--	--
		30	**230**	--	**2.5**	**8.4**	**4**	**18**	--	--	--
		40	**260**	--	**2.2**	**2.8**	**2.1**	**11**	--	--	--
MW-2	09/24/93	29.5	**1,000**	--	**6**	**48**	**25**	**100**	--	--	--
		40	<1.0	--	**0.023**	**0.023**	**0.0021**	**0.015**	--	--	--
MW-3	09/24/93	10	**16**	--	**0.028**	**0.088**	**0.038**	**0.16**	-	--	--
		40	<1	--	<0.005	<0.005	<0.005	<0.005	--	--	--
MW-4	04/06/95	28.5	<2.5	--	<0.025	<0.025	<0.025	<0.050	--	--	--
		37.5	<2.5	--	<0.025	<0.025	<0.025	<0.050	--	--	--
MW-5	04/06/95	29	<2.5	--	<0.025	<0.025	<0.025	<0.050	--	--	--
		39	<2.5	--	<0.025	<0.025	<0.025	<0.050	--	--	--
Vapor Extraction Wells											
VW-1	04/07/95	20	**250**	--	<0.13	<0.13	**2.6**	**3.3**	--	--	--
		29	**4,000**	--	**67**	**150**	**84**	**350**	--	--	--
		36.5	**16**	--	**0.58**	**0.091**	**0.28**	**1.0**	--	--	--
VW-2	11/01/95	21	**0.12**	--	**0.0005**	<0.0005	**0.0028**	**0.001**	**0.004**	--	--
		26	**700**	--	**6.8**	**12**	**9.3**	**22**	**3.6**	--	--
		31	**22**	--	**0.34**	**0.21**	**0.13**	**0.53**	<0.020	--	--
		36	**5.7**	--	**0.73**	**0.055**	**0.0098**	**0.021**	**0.11**	--	--
VW-3	11/01/95	21.5	**2.3**	--	**0.0013**	**0.16**	**0.0054**	**0.010**	<0.002	--	--
		26.5	**7.4**	--	**0.13**	**0.28**	**0.29**	**0.92**	**0.006**	--	--
		31.5	**0.14**	--	**0.036**	**0.0062**	**0.0033**	**0.013**	**0.010**	--	--
		36.5	**0.13**	--	**0.098**	**0.0009**	<0.0005	<0.001	**0.023**	--	--
VW-4	11/02/95	31	**4.9**	--	**0.0010**	**0.23**	**0.020**	**0.043**	**0.005**	--	--
		36	<0.050	--	<0.0005	<0.0005	<0.0005	<0.001	<0.002	--	--

Table 1
Historical Soil Sample Analytical Data
Former BP Service Station No. 11145
4300 Clayton Road
Concord, California

Vapor Extraction Wells (Continued)											
VW-5	11/02/95	31	<0.050	--	<0.0005	**0.0013**	<0.0005	<0.001	<0.002	--	--
		36	<0.050	--	<0.0005	<0.0005	<0.0005	<0.001	**0.002**	--	--
VW-6	11/02/95	31	<0.050	--	<0.0005	<0.0005	<0.0005	<0.001	<0.002	--	--
		36	<0.050	--	<0.0005	<0.0005	<0.0005	<0.001	<0.002	--	--

Notes:
mg/kg = milligrams per kilogram
-- = not available/not analyzed
MtBE = Methyl tert-butyl ether
GRO = Gasoline Range Organics
TPHg = Total petroleum hydrocarbons as gasoline
DRO = Diesel Range Organics
TOG = Total Oil and Grease

ATTACHMENT E

Regional Board ESLs

Table K-2. Direct Exposure Soil Screening Levels
Commerical/Industrial Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Acenaphthene	3.1E+03	noncarcinogenic effects	-	3.1E+03	1.6E+04	N/A
Acenaphthylene	3.3E+03	noncarcinogenic effects	-	3.3E+03	1.7E+04	N/A
Acetone	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	1.0E+05
Aldrin	1.3E-01	carcinogenic effects	1.3E-01	4.6E+00	2.3E+01	N/A
Anthracene	2.6E+04	noncarcinogenic effects	-	2.6E+04	1.3E+05	N/A
Antimony	8.2E+01	noncarcinogenic effects	-	8.2E+01	4.1E+02	N/A
Arsenic	1.6E+00	carcinogenic effects	1.6E+00	5.1E+01	2.6E+02	N/A
Barium	3.4E+04	noncarcinogenic effects	-	3.4E+04	1.7E+05	N/A
Benzene	2.7E-01	carcinogenic effects	2.7E-01	1.6E+01	8.2E+01	8.7E+02
Benzo(a)anthracene	1.3E+00	carcinogenic effects	1.3E+00	3.3E+03	1.7E+04	N/A
Benzo(b)fluoranthene	1.3E+00	carcinogenic effects	1.3E+00	3.3E+03	1.7E+04	N/A
Benzo(k)fluoranthene	1.3E+00	carcinogenic effects	1.3E+00	3.3E+03	1.7E+04	N/A
Benzo(g,h,i)perylene	3.3E+03	noncarcinogenic effects	-	3.3E+03	1.7E+04	N/A
Benzo(a)pyrene	1.3E-01	carcinogenic effects	1.3E-01	3.3E+03	1.7E+04	N/A
Beryllium	3.9E+02	noncarcinogenic effects	2.2E+03	3.9E+02	1.9E+03	N/A
1,1-Biphenyl	6.2E+03	noncarcinogenic effects	-	6.2E+03	3.1E+04	N/A
Bis(2-chloroethyl) ether	3.8E-01	carcinogenic effects	3.8E-01	-	-	9.6E+03
Bis(2-chloroisopropyl) ether	7.7E-02	carcinogenic effects	7.7E-02	5.5E+02	2.7E+03	7.9E+02
Bis(2-ethylhexyl) phthalate	1.2E+02	carcinogenic effects	1.2E+02	2.5E+03	1.2E+04	N/A
Boron	4.1E+04	noncarcinogenic effects	-	4.1E+04	2.0E+05	N/A
Bromodichloromethane	1.3E+00	carcinogenic effects	1.3E+00	1.1E+02	5.6E+02	3.0E+03
Bromoform (Tribromomethane)	3.6E+02	carcinogenic effects	3.6E+02	4.1E+03	2.0E+04	N/A
Bromomethane	2.3E+00	noncarcinogenic effects	-	2.3E+00	1.2E+01	3.1E+03
Cadmium	7.4E+00	carcinogenic effects	7.4E+00	1.0E+02	5.1E+02	N/A
Carbon tetrachloride	4.4E-02	carcinogenic effects	4.4E-02	1.5E+01	7.3E+01	1.1E+03
Chlordane	1.7E+00	carcinogenic effects	1.7E+00	8.1E+01	4.0E+02	N/A
p-Chloroaniline	8.2E+02	noncarcinogenic effects	-	8.2E+02	4.1E+03	N/A
Chlorobenzene	6.8E+02	saturation limit	-	8.5E+02	4.3E+03	6.8E+02
Chloroethane	3.4E+01	noncarcinogenic effects	9.9E+02	3.4E+01	1.7E+02	1.6E+03
Chloroform	1.5E+00	carcinogenic effects	1.5E+00	1.6E+02	7.8E+02	2.9E+03
Chloromethane	2.5E+01	noncarcinogenic effects	-	2.5E+01	1.3E+02	4.1E+03
2-Chlorophenol	2.7E+01	noncarcinogenic effects	-	2.7E+01	1.3E+02	5.5E+04
Chromium (total)	-	-	-	-	-	N/A

Table K-2. Direct Exposure Soil Screening Levels
Commerical/Industrial Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Chromium III	3.1E+05	noncarcinogenic effects	-	3.1E+05	1.5E+06	N/A
Chromium VI	3.6E+01	carcinogenic effects	3.6E+01	3.6E+01	1.8E+02	N/A
Chrysene	2.1E+02	carcinogenic effects	2.1E+02	3.3E+03	1.7E+04	N/A
Cobalt	1.9E+03	carcinogenic effects	1.9E+03	2.7E+03	1.3E+04	N/A
Copper	8.2E+04	noncarcinogenic effects	-	8.2E+04	4.1E+05	N/A
Cyanide	1.2E+02	noncarcinogenic effects	-	1.2E+02	6.1E+02	N/A
Dibenz(a,h)anthracene	2.1E-01	carcinogenic effects	2.1E-01	3.3E+03	1.7E+04	N/A
Dibromochloromethane	3.4E+01	carcinogenic effects	3.4E+01	4.1E+03	2.0E+04	N/A
1,2-dibromo-3-chloropropane	4.1E-01	carcinogenic effects	4.1E-01	7.7E+04	3.8E+05	N/A
1,2-Dibromoethane	4.4E-02	carcinogenic effects	4.4E-02	1.8E+01	8.9E+01	N/A
1,2-Dichlorobenzene	4.6E+02	noncarcinogenic effects	-	4.6E+02	2.3E+03	6.0E+02
1,3-Dichlorobenzene	2.4E+02	noncarcinogenic effects	-	2.4E+02	1.2E+03	6.0E+02
1,4-Dichlorobenzene	2.6E+00	carcinogenic effects	2.6E+00	1.3E+03	6.6E+03	N/A
3,3-Dichlorobenzidine	2.4E+00	carcinogenic effects	2.4E+00	-	-	N/A
Dichlorodiphenyldichloroethane (DDD)	1.0E+01	carcinogenic effects	1.0E+01	8.5E+01	4.3E+02	N/A
Dichlorodiphenyldichloroethene (DDE)	7.0E+00	carcinogenic effects	7.0E+00	8.5E+01	4.3E+02	N/A
Dichlorodiphenyltrichloroethane (DDT)	7.0E+00	carcinogenic effects	7.0E+00	8.5E+01	4.3E+02	N/A
1,1-Dichloroethane	4.7E+00	carcinogenic effects	4.7E+00	2.7E+02	1.3E+03	1.7E+03
1,2-Dichloroethane	4.8E-01	carcinogenic effects	4.8E-01	4.5E+00	2.2E+01	1.8E+03
1,1-Dichloroethene	6.5E+01	noncarcinogenic effects	-	6.5E+01	3.2E+02	1.5E+03
cis-1,2-Dichloroethene	2.2E+01	noncarcinogenic effects	-	2.2E+01	1.1E+02	1.2E+03
trans-1,2-Dichloroethene	3.4E+01	noncarcinogenic effects	-	3.4E+01	1.7E+02	3.1E+03
2,4-Dichlorophenol	6.1E+02	noncarcinogenic effects	-	6.1E+02	3.1E+03	N/A
1,2-Dichloropropane	1.0E+00	carcinogenic effects	1.0E+00	3.0E+00	1.5E+01	1.1E+03
1,3-Dichloropropene	3.6E-01	carcinogenic effects	3.6E-01	8.4E+00	4.2E+01	1.4E+03
Dieldrin	1.3E-01	carcinogenic effects	1.3E-01	7.7E+00	3.8E+01	N/A
Diethyl phthalate	9.8E+04	noncarcinogenic effects	-	9.8E+04	4.9E+05	N/A
Dimethyl phthalate	1.2E+06	noncarcinogenic effects	-	1.2E+06	6.2E+06	N/A
2,4-Dimethylphenol	4.1E+03	noncarcinogenic effects	-	4.1E+03	2.0E+04	N/A
2,4-Dinitrophenol	4.1E+03	noncarcinogenic effects	-	4.1E+03	2.0E+04	N/A
2,4-Dinitrotoluene	4.2E+00	carcinogenic effects	4.2E+00	4.1E+02	2.0E+03	N/A
1,4-Dioxane	1.1E+02	carcinogenic effects	1.1E+02	1.2E+09	5.8E+09	N/A
Dioxin (2,3,7,8-TCDD)	1.8E-05	carcinogenic effects	1.8E-05	-	-	N/A

Table K-2. Direct Exposure Soil Screening Levels
Commerical/Industrial Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Endosulfan	9.2E+02	noncarcinogenic effects	-	9.2E+02	4.6E+03	N/A
Endrin	4.6E+01	noncarcinogenic effects	-	4.6E+01	2.3E+02	N/A
Ethylbenzene	5.0E+00	carcinogenic effects	5.0E+00	8.7E+02	4.3E+03	4.0E+02
Fluoranthene	4.4E+03	noncarcinogenic effects	-	4.4E+03	2.2E+04	N/A
Fluorene	2.8E+03	noncarcinogenic effects	-	2.8E+03	1.4E+04	N/A
Heptachlor	4.8E-01	carcinogenic effects	4.8E-01	7.7E+01	3.8E+02	N/A
Heptachlor epoxide	2.4E-01	carcinogenic effects	2.4E-01	2.0E+00	1.0E+01	N/A
Hexachlorobenzene	1.3E+00	carcinogenic effects	1.3E+00	1.2E+02	6.1E+02	N/A
Hexachlorobutadiene	3.7E+01	carcinogenic effects	3.7E+01	4.1E+01	2.0E+02	N/A
γ-Hexachlorocyclohexane (Lindane)	4.6E+01	noncarcinogenic effects	-	4.6E+01	2.3E+02	N/A
Hexachloroethane	4.4E+01	carcinogenic effects	4.4E+01	1.2E+02	6.2E+02	N/A
Indeno(1,2,3-c,d)pyrene	2.1E+00	carcinogenic effects	2.1E+00	3.3E+03	1.7E+04	N/A
Lead	7.5E+02	noncarcinogenic effects	-	7.5E+02	7.5E+02	N/A
Mercury (elemental)	1.8E+01	noncarcinogenic effects	-	1.8E+01	8.8E+01	N/A
Methoxychlor	-	-	-	-	-	N/A
Methylene chloride	1.7E+01	carcinogenic effects	1.7E+01	2.4E+02	1.2E+03	2.4E+03
Methyl ethyl ketone	2.1E+04	noncarcinogenic effects	-	2.1E+04	1.1E+05	3.4E+04
Methyl isobutyl ketone	1.2E+04	noncarcinogenic effects	-	1.2E+04	6.1E+04	1.7E+04
Methyl mercury	1.2E+01	noncarcinogenic effects	-	1.2E+01	6.2E+01	N/A
2-Methylnaphthalene	4.4E+02	noncarcinogenic effects	-	4.4E+02	2.2E+03	N/A
tert-Butyl methyl ether	6.5E+01	carcinogenic effects	6.5E+01	3.7E+03	1.8E+04	2.1E+04
Molybdenum	1.0E+03	noncarcinogenic effects	-	1.0E+03	5.1E+03	N/A
Naphthalene	2.8E+00	carcinogenic effects	2.8E+00	2.0E+01	1.0E+02	N/A
Nickel	3.4E+03	noncarcinogenic effects	-	3.4E+03	1.7E+04	N/A
Pentachlorophenol	9.0E+00	carcinogenic effects	9.0E+00	2.3E+02	1.2E+03	N/A
Perchlorate	1.4E+02	noncarcinogenic effects	-	1.4E+02	7.2E+02	N/A
Phenanthrene	3.3E+03	noncarcinogenic effects	-	3.3E+03	1.7E+04	N/A
Phenol	6.1E+04	noncarcinogenic effects	-	6.1E+04	3.1E+05	N/A
Polychlorinated biphenyls (PCBs)	7.4E-01	carcinogenic effects	7.4E-01	2.1E+00	1.1E+01	N/A
Pyrene	6.6E+03	noncarcinogenic effects	-	6.6E+03	3.3E+04	N/A
Selenium	1.0E+03	noncarcinogenic effects	-	1.0E+03	5.1E+03	N/A
Silver	1.0E+03	noncarcinogenic effects	-	1.0E+03	5.1E+03	N/A
Styrene	1.5E+03	saturation limit	-	1.8E+03	9.2E+03	1.5E+03

Table K-2. Direct Exposure Soil Screening Levels
Commerical/Industrial Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens (HQ = 0.2) (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
tert-Butyl alcohol	3.2E+05	saturation limit	-	-	-	3.2E+05
1,1,1,2-Tetrachloroethane	4.5E+00	carcinogenic effects	4.5E+00	6.1E+03	3.1E+04	2.0E+03
1,1,2,2-Tetrachloroethane	6.0E-01	carcinogenic effects	6.0E-01	5.2E+02	2.6E+03	2.0E+03
Tetrachloroethene	9.5E-01	carcinogenic effects	9.5E-01	1.8E+02	8.9E+02	2.3E+02
Thallium	1.6E+01	noncarcinogenic effects	-	1.6E+01	8.2E+01	N/A
Toluene	2.1E+02	noncarcinogenic effects	-	2.1E+02	1.1E+03	6.5E+02
Toxaphene	1.8E+00	carcinogenic effects	1.8E+00	-	-	N/A
TPH (gasolines)	4.5E+02	noncarcinogenic effects	-	4.5E+02	2.2E+03	4.5E+03
TPH (middle distillates)	4.5E+02	noncarcinogenic effects	-	4.5E+02	2.2E+03	N/A
TPH (residual fuels)	3.7E+03	noncarcinogenic effects	-	3.7E+03	1.8E+04	N/A
1,2,4-Trichlorobenzene	2.7E+01	noncarcinogenic effects	7.9E+02	2.7E+01	1.3E+02	N/A
1,1,1-Trichloroethane	9.5E+02	noncarcinogenic effects	-	9.5E+02	4.8E+03	1.2E+03
1,1,2-Trichloroethane	1.1E+00	carcinogenic effects	1.1E+00	1.8E+01	8.8E+01	1.8E+03
Trichloroethene	4.1E+00	carcinogenic effects	4.1E+00	5.2E+01	2.6E+02	1.3E+03
2,4,5-Trichlorophenol	1.6E+03	noncarcinogenic effects	-	1.6E+03	6.0E+03	N/A
2,4,6-Trichlorophenol	2.0E+01	noncarcinogenic effects	2.6E+02	2.0E+01	1.0E+02	N/A
Vanadium	2.0E+02	noncarcinogenic effects	-	2.0E+02	1.0E+03	N/A
Vinyl chloride	4.7E-02	carcinogenic effects	4.7E-02	2.6E+01	1.3E+02	1.2E+03
Xylenes	1.0E+02	noncarcinogenic effects	-	1.0E+02	5.1E+02	4.2E+02
Zinc	6.1E+04	noncarcinogenic effects	-	6.1E+04	3.1E+05	N/A

Primary source: USEPA Region 9 Preliminary Remediation Goals (PRGs, USEPA 2004), modified as noted below. See text for discussion.

Notes:

See text for equations and assumptions used in models.

Final screening level is lowest of individual screening levels for carcinogenic effects and noncarcinogenic effects (based on HQ=0.2)

Saturation limit used as upper limit for volatile organic compounds that are liquid at ambient conditions (see text).

Carcinogens: Based on target cancer risk of 10^{-6}; modified with respect to CalEPA/OEHHA slope factors when available (marked by "*"). Screening levels for PCBs based on updated USEPA slope factors as presented in USEPA Region IX Preliminary Remediation Goals document (USEPA 2004).

Noncarcinogens: Adjusted to target hazard quotient of 0.2 for use in tables for all chemicals. Screening levels based on hazard quotient of 1.0 provided for reference.

Saturation: Theoretical soil saturation level in the absence of free product; calculated for volatile organic compounds that are liquids under ambient conditions (refer to Table J).

TPH:Total Petroleum Hydrocarbons.

Direct-exposure screening level for lead from USEPA Region 9 Preliminary Remediation Goals document (USEPA 2004).

Table K-3. Direct Exposure Soil Screening Levels
Construction/Trench Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Acenaphthene	1.7E+04	noncarcinogenic effects	-	1.7E+04	8.3E+04	N/A
Acenaphthylene	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	N/A
Acetone	1.0E+05	saturation limit	-	1.2E+05	5.9E+05	1.0E+05
Aldrin	1.5E+00	carcinogenic effects	1.5E+00	1.6E+01	7.8E+01	N/A
Anthracene	1.0E+05	noncarcinogenic effects	-	1.0E+05	5.0E+05	N/A
Antimony	3.1E+02	noncarcinogenic effects	-	3.1E+02	1.5E+03	N/A
Arsenic	1.5E+01	carcinogenic effects	1.5E+01	1.8E+02	9.2E+02	N/A
Barium	2.6E+03	noncarcinogenic effects	-	2.6E+03	1.3E+04	N/A
Benzene	1.2E+01	carcinogenic effects	1.2E+01	1.9E+02	9.7E+02	8.7E+02
Benzo(a)anthracene	1.5E+01	carcinogenic effects	1.5E+01	1.1E+04	5.3E+04	N/A
Benzo(b)fluoranthene	1.5E+01	carcinogenic effects	1.5E+01	1.1E+04	5.3E+04	N/A
Benzo(k)fluoranthene	1.5E+01	carcinogenic effects	1.5E+01	1.1E+04	5.3E+04	N/A
Benzo(g,h,i)perylene	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	N/A
Benzo(a)pyrene	1.5E+00	carcinogenic effects	1.5E+00	1.1E+04	5.3E+04	N/A
Beryllium	9.8E+01	noncarcinogenic effects	1.1E+02	9.8E+01	4.9E+02	N/A
1,1-Biphenyl	2.0E+04	noncarcinogenic effects	-	2.0E+04	1.0E+05	N/A
Bis(2-chloroethyl) ether	1.3E+01	carcinogenic effects	1.3E+01	-	-	9.6E+03
Bis(2-chloroisopropyl) ether	3.0E+00	carcinogenic effects	3.0E+00	6.0E+03	3.0E+04	7.9E+02
Bis(2-ethylhexyl) phthalate	1.4E+03	carcinogenic effects	1.4E+03	8.0E+03	4.0E+04	N/A
Boron	6.3E+04	noncarcinogenic effects	-	6.3E+04	3.1E+05	N/A
Bromodichloromethane	5.3E+01	carcinogenic effects	5.3E+01	1.3E+03	6.5E+03	3.0E+03
Bromoform (Tribromomethane)	4.8E+03	carcinogenic effects	4.8E+03	1.5E+04	7.4E+04	N/A
Bromomethane	2.9E+01	noncarcinogenic effects	-	2.9E+01	1.4E+02	3.1E+03
Cadmium	3.9E+01	carcinogenic effects	3.9E+01	3.8E+02	1.9E+03	N/A
Carbon tetrachloride	1.9E+00	carcinogenic effects	1.9E+00	1.5E+02	7.4E+02	1.1E+03
Chlordane	2.1E+01	carcinogenic effects	2.1E+01	2.6E+02	1.3E+03	N/A
p-Chloroaniline	3.1E+03	noncarcinogenic effects	-	3.1E+03	1.5E+04	N/A
Chlorobenzene	6.8E+02	saturation limit	-	7.2E+03	3.6E+04	6.8E+02
Chloroethane	4.2E+02	noncarcinogenic effects	1.3E+04	4.2E+02	2.1E+03	1.6E+03
Chloroform	6.3E+01	carcinogenic effects	6.3E+01	1.7E+03	8.3E+03	2.9E+03
Chloromethane	3.1E+02	noncarcinogenic effects	-	3.1E+02	1.6E+03	4.1E+03
2-Chlorophenol	3.2E+02	noncarcinogenic effects	-	3.2E+02	1.6E+03	5.5E+04
Chromium (total)	-	-	-	-	-	N/A

Table K-3. Direct Exposure Soil Screening Levels
Construction/Trench Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Chromium III	1.2E+06	noncarcinogenic effects	-	1.2E+06	5.8E+06	N/A
Chromium VI	5.3E-01	noncarcinogenic effects	1.9E+00	5.3E-01	2.6E+00	N/A
Chrysene	2.4E+03	carcinogenic effects	2.4E+03	1.1E+04	5.3E+04	N/A
Cobalt	9.4E+01	carcinogenic effects	9.4E+01	1.0E+02	5.2E+02	N/A
Copper	3.1E+05	noncarcinogenic effects	-	3.1E+05	1.5E+06	N/A
Cyanide	1.3E+03	noncarcinogenic effects	-	1.3E+03	6.7E+03	N/A
Dibenz(a,h)anthracene	2.4E+00	carcinogenic effects	2.4E+00	1.1E+04	5.3E+04	N/A
Dibromochloromethane	4.6E+02	carcinogenic effects	4.6E+02	1.5E+04	7.7E+04	N/A
1,2-dibromo-3-chloropropane	5.3E+00	carcinogenic effects	5.3E+00	1.1E+03	5.3E+03	N/A
1,2-Dibromoethane	1.7E+00	carcinogenic effects	1.7E+00	2.2E+02	1.1E+03	N/A
1,2-Dichlorobenzene	6.0E+02	saturation limit	-	5.4E+03	2.7E+04	6.0E+02
1,3-Dichlorobenzene	6.0E+02	saturation limit	-	2.7E+03	1.4E+04	6.0E+02
1,4-Dichlorobenzene	1.1E+02	carcinogenic effects	1.1E+02	1.1E+04	5.5E+04	N/A
3,3-Dichlorobenzidine	3.1E+01	carcinogenic effects	3.1E+01	-	-	N/A
Dichlorodiphenyldichloroethane (DDD)	1.2E+02	carcinogenic effects	1.2E+02	3.0E+02	1.5E+03	N/A
Dichlorodiphenyldichloroethene (DDE)	8.7E+01	carcinogenic effects	8.7E+01	3.0E+02	1.5E+03	N/A
Dichlorodiphenyltrichloroethane (DDT)	8.7E+01	carcinogenic effects	8.7E+01	3.0E+02	1.5E+03	N/A
1,1-Dichloroethane	2.0E+02	carcinogenic effects	2.0E+02	3.2E+03	1.6E+04	1.7E+03
1,2-Dichloroethane	2.1E+01	carcinogenic effects	2.1E+01	5.6E+01	2.8E+02	1.8E+03
1,1-Dichloroethene	8.0E+02	noncarcinogenic effects	-	8.0E+02	4.0E+03	1.5E+03
cis-1,2-Dichloroethene	2.7E+02	noncarcinogenic effects	-	2.7E+02	1.3E+03	1.2E+03
trans-1,2-Dichloroethene	4.2E+02	noncarcinogenic effects	-	4.2E+02	2.1E+03	3.1E+03
2,4-Dichlorophenol	2.2E+03	noncarcinogenic effects	-	2.2E+03	1.1E+04	N/A
1,2-Dichloropropane	3.7E+01	noncarcinogenic effects	4.3E+01	3.7E+01	1.9E+02	1.1E+03
1,3-Dichloropropene	1.6E+01	carcinogenic effects	1.6E+01	1.0E+02	5.2E+02	1.4E+03
Dieldrin	1.6E+00	carcinogenic effects	1.6E+00	2.6E+01	1.3E+02	N/A
Diethyl phthalate	3.2E+05	noncarcinogenic effects	-	3.2E+05	1.6E+06	N/A
Dimethyl phthalate	4.0E+06	noncarcinogenic effects	-	4.0E+06	2.0E+07	N/A
2,4-Dimethylphenol	1.5E+04	noncarcinogenic effects	-	1.5E+04	7.7E+04	N/A
2,4-Dinitrophenol	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.4E+04	N/A
2,4-Dinitrotoluene	5.6E+01	carcinogenic effects	5.6E+01	1.5E+03	7.4E+03	N/A
1,4-Dioxane	1.4E+03	carcinogenic effects	1.4E+03	1.6E+07	7.9E+07	N/A
Dioxin (2,3,7,8-TCDD)	2.3E-04	carcinogenic effects	2.3E-04	-	-	N/A

Table K-3. Direct Exposure Soil Screening Levels
Construction/Trench Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
Endosulfan	3.1E+03	noncarcinogenic effects	-	3.1E+03	1.6E+04	N/A
Endrin	1.6E+02	noncarcinogenic effects	-	1.6E+02	7.8E+02	N/A
Ethylbenzene	2.1E+02	carcinogenic effects	2.1E+02	9.9E+03	4.9E+04	4.0E+02
Fluoranthene	1.4E+04	noncarcinogenic effects	-	1.4E+04	7.0E+04	N/A
Fluorene	1.2E+04	noncarcinogenic effects	-	1.2E+04	6.2E+04	N/A
Heptachlor	5.8E+00	carcinogenic effects	5.8E+00	2.6E+02	1.3E+03	N/A
Heptachlor epoxide	2.9E+00	carcinogenic effects	2.9E+00	6.8E+00	3.4E+01	N/A
Hexachlorobenzene	1.6E+01	carcinogenic effects	1.6E+01	4.2E+02	2.1E+03	N/A
Hexachlorobutadiene	1.5E+02	noncarcinogenic effects	4.8E+02	1.5E+02	7.4E+02	N/A
γ-Hexachlorocyclohexane (Lindane)	1.6E+02	noncarcinogenic effects	-	1.6E+02	8.0E+02	N/A
Hexachloroethane	4.0E+02	noncarcinogenic effects	5.1E+02	4.0E+02	2.0E+03	N/A
Indeno(1,2,3-c,d)pyrene	2.4E+01	carcinogenic effects	2.4E+01	1.1E+04	5.3E+04	N/A
Lead	7.5E+02	noncarcinogenic effects	-	7.5E+02	7.5E+02	N/A
Mercury (elemental)	5.8E+01	noncarcinogenic effects	-	5.8E+01	2.9E+02	N/A
Methoxychlor	-	-	-	-	-	N/A
Methylene chloride	6.3E+02	carcinogenic effects	6.3E+02	2.9E+03	1.4E+04	2.4E+03
Methyl ethyl ketone	3.4E+04	saturation limit	-	1.9E+05	9.5E+05	3.4E+04
Methyl isobutyl ketone	1.7E+04	saturation limit	-	1.3E+05	6.6E+05	1.7E+04
Methyl mercury	4.1E+01	noncarcinogenic effects	-	4.1E+01	2.0E+02	N/A
2-Methylnaphthalene	1.4E+03	noncarcinogenic effects	-	1.4E+03	7.2E+03	N/A
tert-Butyl methyl ether	2.8E+03	carcinogenic effects	2.8E+03	4.8E+04	2.3E+05	2.1E+04
Molybdenum	3.9E+03	noncarcinogenic effects	-	3.9E+03	1.9E+04	N/A
Naphthalene	1.3E+02	carcinogenic effects	1.3E+02	2.5E+02	1.2E+03	N/A
Nickel	2.6E+02	noncarcinogenic effects	-	2.6E+02	1.3E+03	N/A
Pentachlorophenol	9.9E+01	carcinogenic effects	9.9E+01	7.2E+02	3.6E+03	N/A
Perchlorate	5.4E+02	noncarcinogenic effects	-	5.4E+02	2.7E+03	N/A
Phenanthrene	1.1E+04	noncarcinogenic effects	-	1.1E+04	5.3E+04	N/A
Phenol	2.3E+05	noncarcinogenic effects	-	2.3E+05	1.2E+06	N/A
Polychlorinated biphenyls (PCBs)	6.7E+00	noncarcinogenic effects	8.4E+00	6.7E+00	3.4E+01	N/A
Pyrene	2.1E+04	noncarcinogenic effects	-	2.1E+04	1.0E+05	N/A
Selenium	3.9E+03	noncarcinogenic effects	-	3.9E+03	1.9E+04	N/A
Silver	3.9E+03	noncarcinogenic effects	-	3.9E+03	1.9E+04	N/A
Styrene	1.5E+03	saturation limit	-	2.1E+04	1.0E+05	1.5E+03

Table K-3. Direct Exposure Soil Screening Levels
Construction/Trench Worker Exposure Scenario

Chemical	Final Screening Level (mg/kg)	Basis	Carcinogens (Risk = 10^{-6}) (mg/kg)	Noncarcinogens HQ = 0.2 (mg/kg)	Noncarcinogens (HQ = 1.0) (mg/kg)	Saturation (mg/kg)
tert-Butyl alcohol	3.2E+05	saturation limit	-	-	-	3.2E+05
1,1,1,2-Tetrachloroethane	1.9E+02	carcinogenic effects	1.9E+02	2.3E+04	1.2E+05	2.0E+03
1,1,2,2-Tetrachloroethane	2.4E+01	carcinogenic effects	2.4E+01	5.9E+03	3.0E+04	2.0E+03
Tetrachloroethene	3.0E+01	carcinogenic effects	3.0E+01	1.8E+03	9.2E+03	2.3E+02
Thallium	6.2E+01	noncarcinogenic effects	-	6.2E+01	3.1E+02	N/A
Toluene	6.5E+02	saturation limit	-	2.6E+03	1.3E+04	6.5E+02
Toxaphene	2.2E+01	carcinogenic effects	2.2E+01	-	-	N/A
TPH (gasolines)	4.2E+03	noncarcinogenic effects	-	4.2E+03	2.1E+04	4.5E+03
TPH (middle distillates)	4.2E+03	noncarcinogenic effects	-	4.2E+03	2.1E+04	N/A
TPH (residual fuels)	1.2E+04	noncarcinogenic effects	-	1.2E+04	5.8E+04	N/A
1,2,4-Trichlorobenzene	3.2E+02	noncarcinogenic effects	1.1E+04	3.2E+02	1.6E+03	N/A
1,1,1-Trichloroethane	1.2E+03	saturation limit	-	1.1E+04	5.7E+04	1.2E+03
1,1,2-Trichloroethane	4.6E+01	carcinogenic effects	4.6E+01	2.1E+02	1.1E+03	1.8E+03
Trichloroethene	1.7E+02	carcinogenic effects	1.7E+02	2.2E+02	1.1E+03	1.3E+03
2,4,5-Trichlorophenol	1.7E+04	noncarcinogenic effects	-	1.7E+04	8.5E+04	N/A
2,4,6-Trichlorophenol	7.7E+01	noncarcinogenic effects	3.4E+03	7.7E+01	3.9E+02	N/A
Vanadium	7.7E+02	noncarcinogenic effects	-	7.7E+02	3.9E+03	N/A
Vinyl chloride	2.0E+00	carcinogenic effects	2.0E+00	3.0E+02	1.5E+03	1.2E+03
Xylenes	4.2E+02	saturation limit	-	1.3E+03	6.3E+03	4.2E+02
Zinc	2.3E+05	noncarcinogenic effects	-	2.3E+05	1.2E+06	N/A

Primary source: USEPA Region 9 Preliminary Remediation Goals (PRGs, USEPA 2004), modified as noted below. See text for discussion.

Notes:

See text for equations and assumptions used in models.

Final screening level is lowest of individual screening levels for carcinogenic effects and noncarcinogenic effects (based on HQ=0.2) or screening level for construction/trench workers if lower (see Table K-3). Saturation limit used as upper limit for volatile organic compounds that are liquid at ambient conditions (see text).

Carcinogens: Based on target cancer risk of 10^{-6}; modified with respct to CalEPA/OEHHA slope factors when available (marked by "*"). Screening levels for PCBs based on updated USEPA slope factors as presented in USEPA Region 9 Preliminary Remediation Goals document (USEPA 2004).

Noncarcinogens: Adjusted to target hazard quotient of 0.2 for use in tables for all chemicals. Screening levels based on hazard quotient of 1.0 provided for reference

Saturation: Theoretical soil saturation level in the absence of free product; calculated for volatile organic compounds that are liquids under ambient conditions (refer to Table J).

TPH:Total Petroleum Hydrocarbons. See text for discussion of different TPH catogories.

APPENDIX C

Mitigation Monitoring and Reporting Program

Mitigation Measures	Implemented By	When Implemented	Monitored By	Monitoring Action and Frequency	Verification By/Date
I. AESTHETICS					
Mitigation Measure AES: I-c: Consistent with guidance from the *City of Concord 2030 Urban Area General Plan*, the following mitigation measures will reduce the potential impact of removing ten (10) street trees from the visual screen to less than significant: • Replant four (4) Trident Maple trees (minimum size of 15 gallons) within the new ROW of Treat Blvd. • Obtain property owner permission to remove eight (8) trees on private property. Terms of replanting will be negotiated between the property owner and the City. • Monitor survival success of street trees on a monthly basis for one year after construction activities. • Obtain property owner permission to remove eight (8) trees on private property. Terms of replanting will be negotiated between the property owner and the City.	Contractor	Prior to Council Acceptance	Contractor	Once per month for one year after construction activities.	Monthly reports will be included in the project file.
II. AGRICULTURE AND FORESTRY RESOURCES					
There are no significant impacts related to agriculture and forestry resources.					
III. AIR QUALITY					
Mitigation Measure AIR-III-a: The City of Concord must comply with all policies and regulations of the Bay Area Air Quality Management District and the California Air Resources Board. In addition, the City of Concord will employ the following mitigation measures: • Include in the improvement plan the requirement that the Contractor water the active grading area at least one	Contractor	During construction activities.	City of Concord Department of Community and Economic Development	On a daily basis during grading activities.	Daily construction reports will be included in the project file.

time per day for dust control and, • Water the excavated soil to prevent visible dust plumes when loading soil into trucks for export from the site.					
IV. BIOLOGICAL RESOURCES					
Mitigation Measure BIO-IV-A: If construction activities are initiated during the nesting season (February 1st through September 30th) the removal of ten (10) trees on Treat Blvd has the potential to interfere with nesting bird activity. With the implementation of the following mitigation measures, potentially significant impacts will be avoided. • A Professional Biologist will survey the trees for potential nesting activities. If active nests are located within the immediate vicinity of the project site, construction activities will halt until the young have fledged. • The California Department of Fish and Wildlife will be contacted prior to tree removal if active nests are found within the trees to be removed.	City of Concord Department of Community and Economic Development and Project Biologist	Prior to initiation of construction activities	City of Concord Planning Division/Biologist	10 days prior to tree removal.	Biological survey reports will be included in project file.
Mitigation Measure BIO-IV-e: A protected tree is defined as 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 (*Q. douglasii*), Coast live oak (*Q. agrifolia*), California bay (*Umbellaria californica*), California buckeye (*Aesculus californica*), and California sycamore (*Platanus racemosa*). Protected trees also include 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 non-native tree where the sum of all stem diameters is 24 inches or more as measured 54 inches above the ground. • Protected trees will be avoided during the construction project and protected with construction fencing. Any loss of these resources will be compensated by replanting after construction is complete.	Project Contractor	Prior to construction activities.	City of Concord Department of Public Works	Prior to construction activities and through the duration of the project.	Daily construction monitoring reports will be included within the project file.

V. CULTURAL RESOURCES					
There are no significant impacts related to cultural resources.					
VI. GEOLOGY AND SOILS					
There are no significant impacts related to geology and soils.					
VII. GREENHOUSE GAS EMISSIONS					
Mitigation Measure GHG: VII-a: The proposed project will temporarily increase greenhouse gas emissions during construction activities. The following mitigation measures reduce the impact to less than significant. • Use of heavy machinery will be minimized to the fullest extent possible during construction activities. • Vehicles will be turned off when not in use for more than 5 minutes rather than remain in an idling state. • Trips will be augmented to reduce emissions and increase fuel efficiency.	Project Contractor	During construction activities.	City of Concord Department of Community and Economic Development	Through the duration of the project.	Daily construction log will be included in the project file.
VIII. HAZARDS AND HAZARDOUS MATERIALS					
There are no potentially significant impacts related to hazards or hazardous materials.					
IX. HYDROLOGY AND WATER QUALITY					
There are no potentially significant impacts related to hydrology and water quality.					
X. LAND USE AND PLANNING					
There are no potentially significant impacts related to land use and planning.					
XI. MINERAL RESOURCES					
There are no potentially significant impacts related to mineral resources.					
XII. NOISE					
Mitigation Measure NOISE-XII-a: Construction activities shall be limited to weekday hours between 7:30 a.m. and 6 p.m. consistent with the City of Concord Noise Ordinance. All equipment shall be maintained in proper working order, including proper muffling.	Project Contractor	During construction activities	City of Concord Department of Community and Economic Development	Review and verification, continuous during construction	Daily construction reports will be included in the project file.
XIII. POPULATION AND HOUSING					
There are no potentially significant impacts related to population and housing.					
XIV. PUBLIC SERVICES					
There are no potentially significant impacts related to public services.					
XV. RECREATION					
There are no significant impacts related to recreation.					
XVI. TRANSPORATION/TRAFFIC					
Mitigation Measure TRANS XVI-a: The City will review	Contractor	Prior to and during	City of Concord	Plan review and	Daily construction

a Traffic Management Plan prepared by a registered Traffic Engineer for work on the Treat/Clayton Blvd intersection. The Traffic Control Plan shall define the detour routes, warning signs, lights, barricades, cones, etc. according to standard guidelines required by the City. Further the contractor shall maintain the work site, including traffic control, in a safe condition at all times, even outside of normal work hours.		construction activities	Planning Division and Department of Community and Economic Development	continuous during construction	reports and the TMP will be included in the project file.
Mitigation Measure TRANS XVI-d(1): The widening of the northbound approach on Treat Blvd will require a ROW acquisition from the gas station, which will change the access route fuel delivery trucks will use to access the fuel storage areas. In order for delivery trucks to maintain access, the following modifications will be required to reduce the impact to less than significant: • Removal of existing bollards on the southwest corner of the gas station. • Modification of the existing curb return (island) on the southwest corner of the gas station building.	Project Contractor	Incorporated into project design and maintain after construction.	City Concord Department of Community and Economic Development	Plan review and maintained after construction.	Final design approval will be included in project file.
Mitigation Measure TRANS XVI-d(2): The existing shopping center on the corner of Treat Blvd and Clayton Blvd is legally non-conforming in regards to the City of Concord's parking ordinance. The proposed project requires a ROW take that will remove 24 parking spaces. The Parking Demand Survey conducted for the area indicated that there will be no impact to parking with the removal of 24 spaces. Therefore, the City will approve a variance to memorialize the Parking Demand Survey findings.	City of Concord Planning Department	Prior to construction activities.	City of Concord Planning Department	City Council hearing.	Approved variance shall be included in the project file.
XVII. UTILITIES AND SERVICE SYSTEMS					
There are no potentially significant impacts to utilities and service systems.					