October 22, 2015

RECEIVED
By Alameda County Environmental Health 9:30 am, Nov 02, 2015

Mr. Mark Detterman
Hazardous Materials Specialist
Alameda County Environmental Health Services
Environmental Protection, Local Oversight Program
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: **Letter of Transmittal For Site Conceptual Model and Site Management Plan**
500 Grand Avenue
Oakland, California 94611
ACEH Fuel Leak Case No. RO0003175
GeoTracker Global ID No. T10000007707

Dear Mr. Detterman:

As requested in your e-mail of September 30, 2015 and discussed at our meeting of September 25, 2015, regarding the above-referenced subject site, we submit this transmittal letter and accompanying Site Conceptual Model and Site Management Plan for the subject site.

I declare under penalty of perjury, that the information contained in the attached documents or reports is true and correct to the best of my knowledge.

Sincerely,

Patrick Ellwood

ELLWOOD COMMERCIAL REAL ESTATE
1345 GRAND AVENUE #101, PIEDMONT, CALIFORNIA 94610
510-238-9111
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AllWest

AllWest Environmental, Inc.

Specialists in Physical Due
Diligence and Remedial Services

2141 Mission Street, Suite 100
San Francisco, CA 94110
Tel 415.391.2510
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October 22, 2015

Mr. Mark Detterman
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

RE: Site Conceptual Model and Site Management Plan
500 Grand Avenue, Oakland, California 94611
ACEH Case No. RO0003175, Geotracker Global ID #T10000007707

Dear Mr. Detterman:

At your request, AllWest has prepared a Site Conceptual Model (SCM) and Site Management Plan (SMP) including Work Plan for the former service station/current parking lot located at 500 Grand Avenue in Oakland, California. The subject property originally was granted No Further Action status by the ACEH in September 2011 for use as a parking lot under ACEH Case No. RO000391. The proposed mixed-use redevelopment of the subject property is now being considered, and under this new land use scenario ACEH has opened a new case, ACEH Case No. RO0003175, to evaluate potential impacts of residual soil, ground water and soil vapor concentrations on construction workers and future commercial and residential occupants.

The purpose of the SCM is to summarize site conditions with respect to development and residual impact, identify potential receptors and potentially complete exposure pathways, and identify data gaps in the existing information on soil, ground water and soil vapor quality. Based on the identified data gaps, AllWest proposes additional subsurface characterization actions which are summarized in the SCM and further detailed in the Work Plan included in the Site Management Plan (SMP). The purpose of the SMP, in addition to presentation of the Work Plan, is to address potential risks to on-site construction workers and neighboring residents, workers and pedestrians, related to hazardous materials exposure during and after the proposed construction project on the site.

After our review of existing site data, AllWest submits the site meets the State Water Resources Control Board (SWRCB) criteria for closure as a low-threat leaking petroleum underground storage tank (UST) site under Resolution 2012-0016, or will meet the criteria following additional characterization proposed in the CSM and potential minimal additional remediation or building design modifications. A discussion of the criteria and the applicable characteristics of the site which meet the low threat criteria follows.

General Criteria a: The unauthorized release is located within the service area of a public water system.
Potable water to the subject property will be provided by the East Bay Municipal Utility District (EBMUD) once developed. There currently is no water service to the site, although a water distribution line is reported beneath Grand Avenue adjoining the property, which will facilitate future service.

General Criteria b: The unauthorized release consists only of petroleum.
Two releases have been documented on the site, both from historical petroleum USTs, one from a waste oil UST and another from three gasoline USTs. Although low concentrations of naphthalene, 2-methylnaphthalene, phthalate and trichloroethane were reported from a boring advanced adjoining one end of a clay sewer pipe in the vicinity of the former waste oil UST, these compounds were not detected in the UST excavations, the pipe trench, or elsewhere in site soils or ground water. The location where the non-petroleum compounds were detected was over-excavated and the soil removed from the site. Additional analyses of soil and ground water for the non-petroleum hydrocarbon contaminants historically detected is proposed in the SCM in the vicinity of the previous detection.

General Criteria c: The unauthorized ("primary") release from the UST system has been stopped.
All USTs formerly present on the site, including the waste oil and gasoline USTs, were removed in 1990 and 1991, as were the fuel dispenser islands and associated piping.

General Criteria d: Free product has been removed to the maximum extent practicable.
Free product initially was encountered in the waste oil and gasoline UST excavations. To remove it, approximately 31,300 gallons of ground water were pumped from both excavations. Free product has not since been encountered in the former monitoring wells installed and periodically sampled on the site.

General Criteria e: A conceptual site model that assess the nature, extent, and mobility of the release has been developed.
A Conceptual Site Model, ie: SCM has been prepared for the site and is attached to this letter.

General Criteria f: Secondary source removal has been removed to the extent practicable.
Significant excavation of the majority of site soils, to depths ranging from 4.5 to 10 feet, was conducted between 1992 and 1993. With the exception of an approximately 5-foot wide strip of residually-impacted soil unable to be excavated adjoining the retaining wall along the eastern property line and sidewalk adjoining the southern property line, all significantly impacted soil was removed. Potential remaining impacted soil is addressed in the SCM. In addition to over-excavation of impacted soil, approximately 41,300 gallons of ground water was pumped from the UST excavations, in addition to 5,000 gallons removed prior to the excavations, and enhanced bioremediation was facilitated through the use of ORC containing socks placed into monitoring wells. Residually impacted ground water potentially remaining along the eastern and southern perimeters of the site also is addressed in the SCM. Additional soil and ground water analyses for MTBE are addressed in the SCM.

General Criteria g: Soil or ground water has been tested for methyl tert-butyl ether (MTBE) and results reported in accordance with Health and Safety Code section 25296.15.
Subject property ground water has been tested for MTBE; results are included in the SCM. No soil sample analytical data for MTBE has been reviewed by AllWest.

General Criteria h: Nuisance as defined by Water Code section 13050 does not exist at the site.
Impacted ground water may be encountered by construction workers on site during future redevelopment activities. A discussion of the locations, residual concentrations present and potential exposure pathways is included in the SCM. A SMP has been developed for construction activities on the site, which will include measures to ensure appropriate worker safety and ground water management.

Media-Specific Criteria 1. Ground Water:
Ground water at the site meets the first two criteria for Class (1) of the ground-water specific criteria. The contaminant plume, during the most recent sampling event in 2009 was documented to be approximately 100 feet in length. No free product was encountered in ground water monitoring wells. Due to the presence of Lake Merritt approximately 190 feet south of the site however, the third Class (1) criteria is not met.

For this reason, Class (5) of the ground-water specific criteria is applicable to satisfy the media-specific criteria for ground water. The contaminant plume is stable and likely decreasing in areal extent. Only low concentrations of Total Petroleum Hydrocarbons as diesel (TPHd), benzene and MTBE were detected in monitoring wells approximately 90 feet down-gradient of the site in 2009. Ground water concentrations have decreased since initiation of monitoring in the 1990s and are expected to have further decreased through natural attenuation processes. Additionally, no public ground water supply wells are located within 2,000 feet of the site, no private water supply wells are located within 1,000 feet and Lake Merritt is tidally influenced and brackish and therefore not a potential drinking water source. Finally, additional ground water quality characterization proposed in the SCM is planned to document the contaminant plume does not pose a significant threat to future on-site occupants or propose further remedial or construction design measures to protect them.

Media-Specific Criteria 2. Petroleum Vapor Intrusion to Indoor Air:
Based on historic soil excavation and ground water removal activities, the most significant source areas for volatilization of petroleum hydrocarbons into indoor air have been removed. Residual petroleum hydrocarbon impact may remain along the eastern and southern property lines where excavation was previously infeasible. Since no free product (LNAPL) is currently present in soil or groundwater, Criteria 2, Scenarios 1 and 2 are not applicable, and therefore are satisfied. Although dissolved benzene concentrations are less than 100 micrograms per liter (µg/L), due to the lack of soil gas oxygen data and shallow depth of groundwater, there may be less than 5 feet of vertical separation between the dissolved phase benzene and potential future buildings as required by Criteria 2, Scenario 3. Since no soil gas oxygen data exists, and soil vapor analytical data collected in 2006 indicates benzene and ethylbenzene concentrations exceed their respective commercial levels of 280 milligrams per cubic meter ($\mu g/m^3$) and 3,600 $\mu g/m^3$, Criteria 2, Scenario 4 is not satisfied.

Additional soil, ground water and soil vapor quality investigation is proposed in these areas in the SCM. Through this sampling, data will be presented to demonstrate that site characterization is complete and that low-threat vapor-intrusion criteria are met, including Criteria 2 Scenarios 3 and 4. Alternatively, the new data will be used to facilitate additional excavation of impacted soil or design the proposed building foundation in such a way as to meet the low-threat vapor-intrusion criteria.

Media-Specific Criteria 3. Direct Contact and Outdoor Air Exposure:
As noted, a soil, groundwater and soil vapor quality investigation is proposed in the SCM, in areas where removal of significantly impacted soil was previously unable to be conducted. Current soil, groundwater and soil vapor quality data, in conjunction with existing data, will be used either to satisfy the maximum concentration criteria presented in Media-Specific Criteria 3, Table 1, for soil that will have no significant risk of adversely affecting human health, or will be used to facilitate additional excavation of impacted soil or appropriate design criteria to reduce exposure through direct contact or outdoor air exposure to acceptable levels. Current soil analytical data (through 2008) indicates that the Criteria 3, Table 1 levels for commercial/industrial and utility workers has been met. Construction/utility worker exposure to contaminated soil will be controlled through measures outlined in the SMP prepared for the site.

If you have any questions or concerns or would like additional information, please feel free to contact AllWest at 415-391-2510. We look forward to receiving your response and approval of the CSM and SMP, and future closure of the site as a low-threat leaking petroleum UST site.

Sincerely,

AllWest Environmental, Inc.

Leonard P. Niles

Leonard P. Niles, P.G., C.H.G.
Senior Project Manager

Cc: Mr. Patrick Ellwood, Ellwood Commercial Real Estate

TABLES

FIGURES

ATTACHMENTS

TABLES

Table 1. Residual Concentrations Reported in Soil (1988-2008)

(concentrations in mg/kg)

Sample ID (Year)	Depth (ft.)	Location on Site	TPHg	TPHd	B	T	E	X
B-5 (1989)	All to 16	Western Perimeter	<10	NA	<10	<0.1	<0.2	<0.1
B-10 (1990)	1.5	Western Perimeter	8.4	NA	0.28	ND	0.2	0.18
B-10 (1990)	2.5	Western Perimeter	ND	NA	0.09	ND	ND	ND
B-10 (1990)	5.5 & 8.5	Western Perimeter	ND	NA	ND	ND	ND	ND
S-1 (2006)	4	Southern Perimeter	390	15	<0.062	<0.12	0.9	1.9
ME-8E (1988)	5.5	Southern Perimeter (w/in excavation)	750	NA	***0.82***	6.5	***5.5***	26
S-2 (2006)	4	Southern Perimeter	***3,800***	***580***	0.41	17	***36***	170
SV-5 (2008)**	2	Southern Portion (w/in excavation)	<1.0	NA	<0.0005	<0.001	<0.001	<0.001
S-3 (2006)	4	Southern Perimeter	<1.0	11	<0.0005	<0.001	<0.001	<0.001
B-1 (1988)	6.5	Southern Perimeter	12	NA	<0.05	<0.1	<0.2	<0.1
MW-8D (1988)	1.3	Southeastern Corner	10	NA	<0.05	0.4	<0.2	0.5
SV-8 (2008)**	2	Eastern Perimeter	<1.0	NA	<0.0005	<0.001	<0.001	<0.001
SV-8 (2008)**	5	Eastern Perimeter	<1.0	NA	<0.0005	<0.001	<0.001	<0.001
B-6 (1989)	2	Eastern Perimeter	1	<100	<0.05	0.08	<0.05	<0.05
B-6 (1989)	4.5	Eastern Perimeter	<1.0	<10	<0.05	0.09	<0.05	<0.05
B-4 (1988)	3.5	Eastern Perimeter	510	NA	<0.05	1	3.5	13
SV-7 (2008)**	2	Eastern Perimeter	16	NA	0.001	<0.001	0.078	0.027
SV-7 (2008)**	5	Eastern Perimeter	***1,400***	NA	0.11	0.059	***15***	19
ESL*-Shallow Soil-Residential-Protection of Human Health			770	240	0.74	1,000	4.8	600
ESL*-Shallow Soil-Residential-GW is Not Potential DW Source			100	100	0.74	9.3	4.7	11

* ESL = San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for residential land use where groundwater is not a potential drinking water resource from Table B-1, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013.
**MTBE not detected
mg/kg = milligrams per kilogram
Concentrations exceeding ESL for protection of human health highlighted in ***bold*** font

Table 2. Residual Concentrations Reported in Ground Water (2008 & 2009)

(concentrations in µg/L)

Sample ID (Year)	Sample Type	Location on Site	TPHg	TPHd	B	T	E	X	MBTE
MW-8H (10/1/2009)	Well	Offsite to South	<50	640	<0.5	<0.5	<0.5	<0.5	1
MW-8I (10/1/2009)	Well	Offsite to South	53	92	2	<0.5	<0.5	<0.5	4
MW-8J (10/1/2009)	Well	Offsite to South	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
MW-8K (10/1/2009)	Well	Southern Perimeter	<50	<50	<0.5	<0.5	<0.5	<0.5	1
MW-8L (6/10/2009)	Well	Southern Perimeter	2,600	<50	<0.5	<0.5	<0.5	<0.5	<0.5
SV-4-W (2008)	Grab	Southern Portion (w/in excavation)	<50	NA	<0.5	<0.5	<0.5	<0.5	1
SV-5-W (2008)	Grab	Southern Portion (w/in excavation)	<50	NA	<0.5	<0.5	<0.5	<0.5	<0.5
SV-6-W (2008)	Grab	Southern Portion (w/in excavation)	<50	NA	<0.5	<0.5	<0.5	<0.5	<0.5
SV-7-W (2008)	Grab	Eastern Perimeter	6,200	NA	200	7	250	260	0.7
SV-8-W (2008)	Grab	Eastern Perimeter	<50	NA	<0.5	<0.5	<0.5	<0.5	2
ESL*-Commercial-Ground Water-Evaluation of Potential Vapor Intrusion			NV	NV	270	NV	3,100	NV	100,000
ESL*-Residential-Ground Water-Evaluation of Potential Vapor Intrusion			NV	NV	27	95,000	310	37,000	9,900
ESL**-Residential-Ground Water-Not Potential DW Source			500	640	27	130	43	100	1,800

* ESL = San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for Evaluation of Potential Vapor Intrusion, residential land use, from Table E-1, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013.

** ESL = RWQCB ESLs for residential land use where groundwater is not a potential drinking water resource from Table F-1b, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013

µg/L = micrograms per liter

Concentrations exceeding ESL indicating potential vapor intrusion concern for commercial use highlighted in **bold** font

NR-not reported; NV-no value, NA –not analyzed

Table 3. Residual Concentrations Reported in Soil Vapor (2006)

(concentrations in µg/m^3)

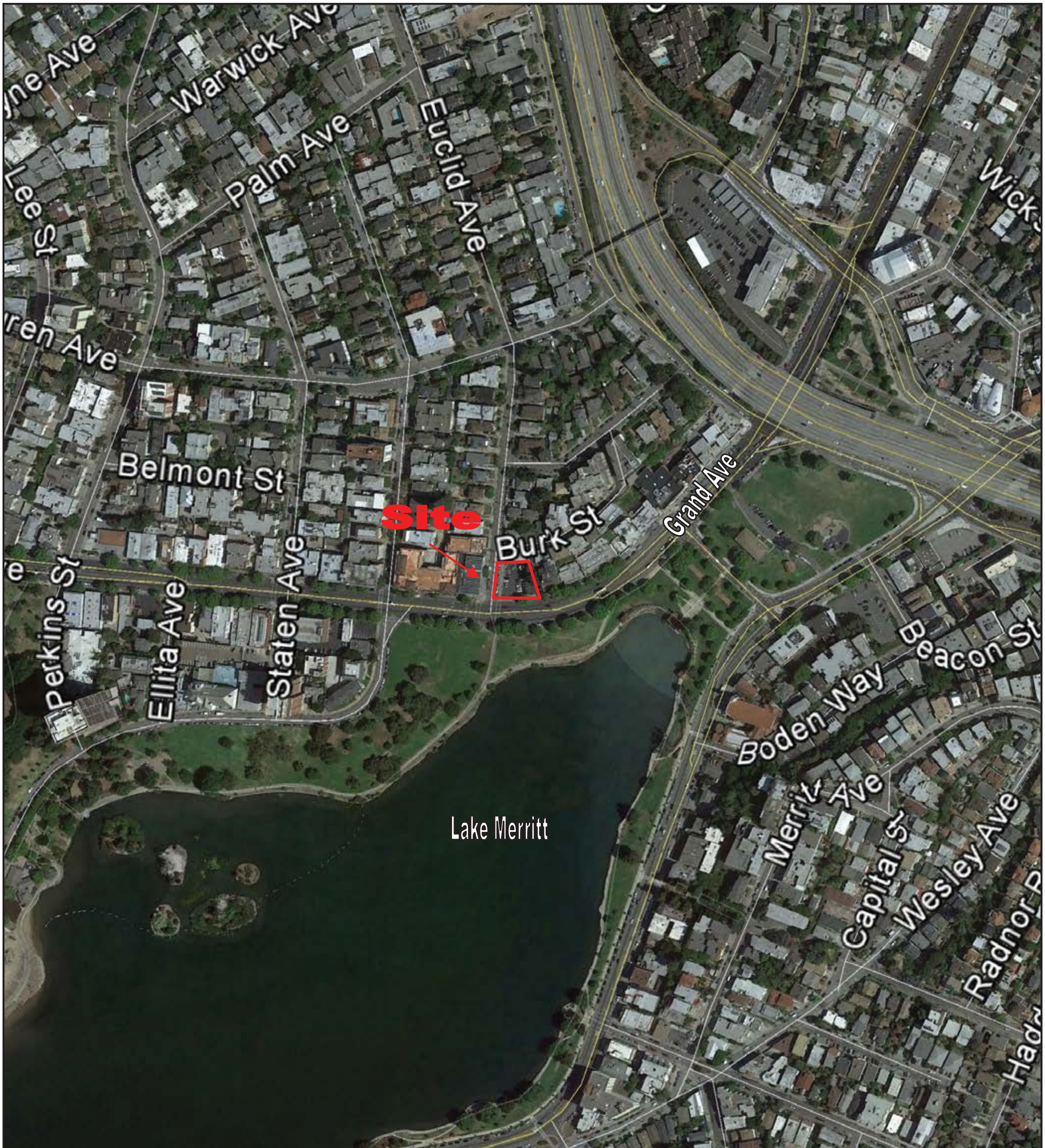
Sample ID (Year)	Sample Type	Location on Site	TPHg	TPHd	B	T	E	X	MBTE
SV-1 (11/20/2006)	Soil Vapor (4 ft bgs)	Southern Perimeter	60,000	NA	***3,400***	330	***2,600***	380	NA
SV-2 (11/20/2006)	Soil Vapor (4 ft bgs)	Southern Perimeter	2,000,000	NA	***34,000***	160,000	***64,000***	280,000	NA
SV-2 Duplicate (11/20/2006)	Soil Vapor (4 ft bgs)	Southern Perimeter	720,000	NA	***14,000***	69,000	***27,000***	110,000	NA
ESL*- Commercial - Soil Gas (Vapor Intrusion Concerns)			2,500,000	570,000	420	1,300,000	4,900	440,000	47,000
ESL*- Residential - Soil Gas (Vapor Intrusion Concerns)			300,000	68,000	42	160,000	490	52,000	4,700

* ESL = San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for indoor Air and Soil Gas (Vapor Intrusion Concerns), commercial/industrial and residential land use, from Summary Table E, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013.

µg/m^3 = micrograms per cubic meter

NR-not reported; NV-no value, NA –not analyzed

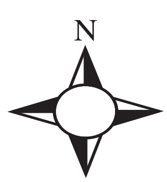
Concentrations exceeding ESL for commercial/industrial land use highlighted in ***bold*** font



N

NOT TO SCALE

AllWest	SITE LOCATION MAP
	FIGURE 1
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: GOOGLE EARTH
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/22/15



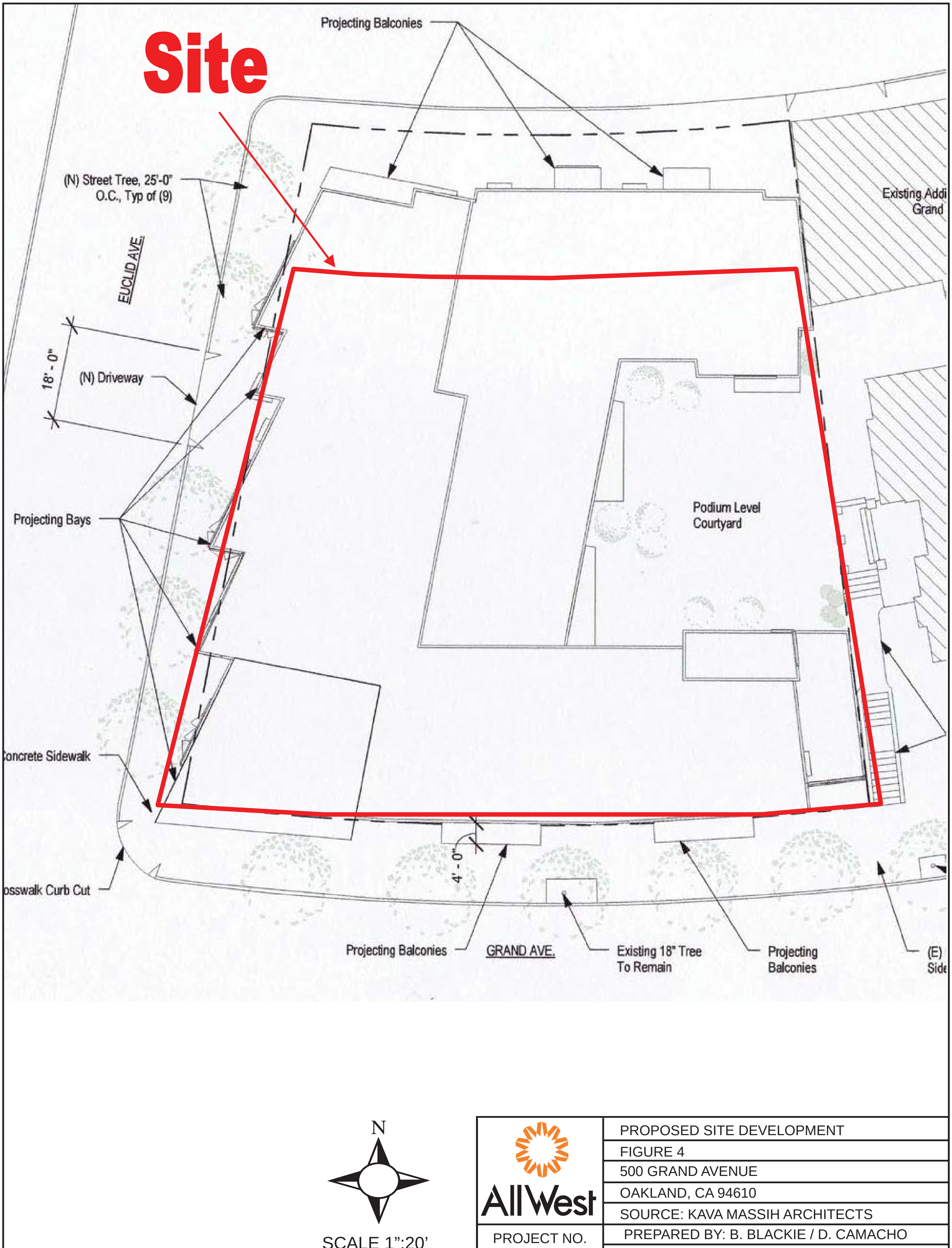
NOT TO SCALE

AllWest	CURRENT SITE CONFIGURATION
	FIGURE 2
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: GOOGLE EARTH
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/22/15

N

SCALE 1":30'

AllWest	HISTORICAL SITE DEVELOPMENT
	FIGURE 3
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: CAMBRIA
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/22/15



AllWest	PROPOSED SITE DEVELOPMENT
	FIGURE 4
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: KAVA MASSIH ARCHITECTS
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/22/15

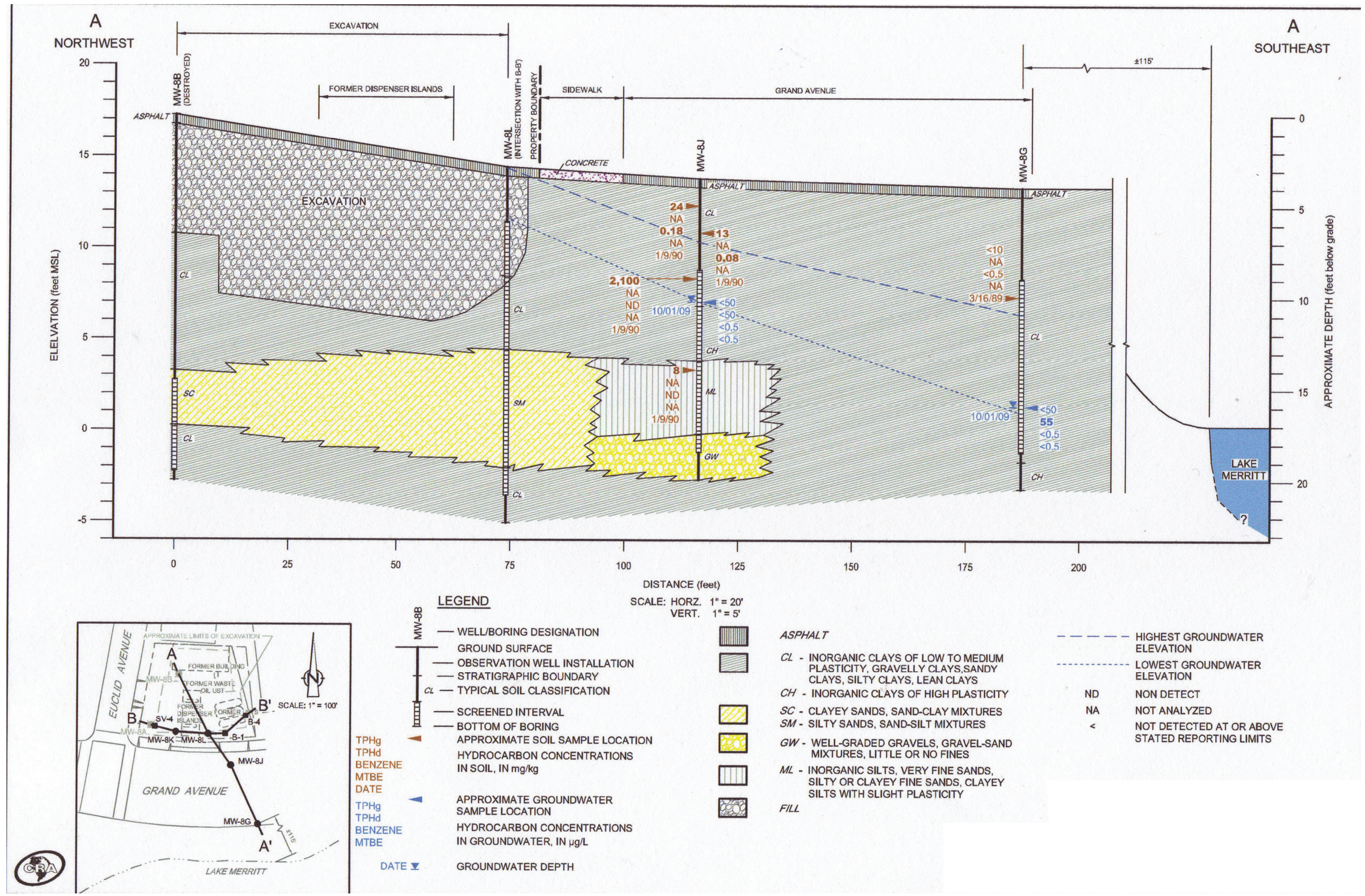


FIGURE 5.
GEOLOGIC CROSS SECTION A-A'

Date: 12/4/09
Photo ID No. CRA

N↑

AllWest

Site Name: 500 Grand Avenue
Oakland, California

Project Number: 15184.36

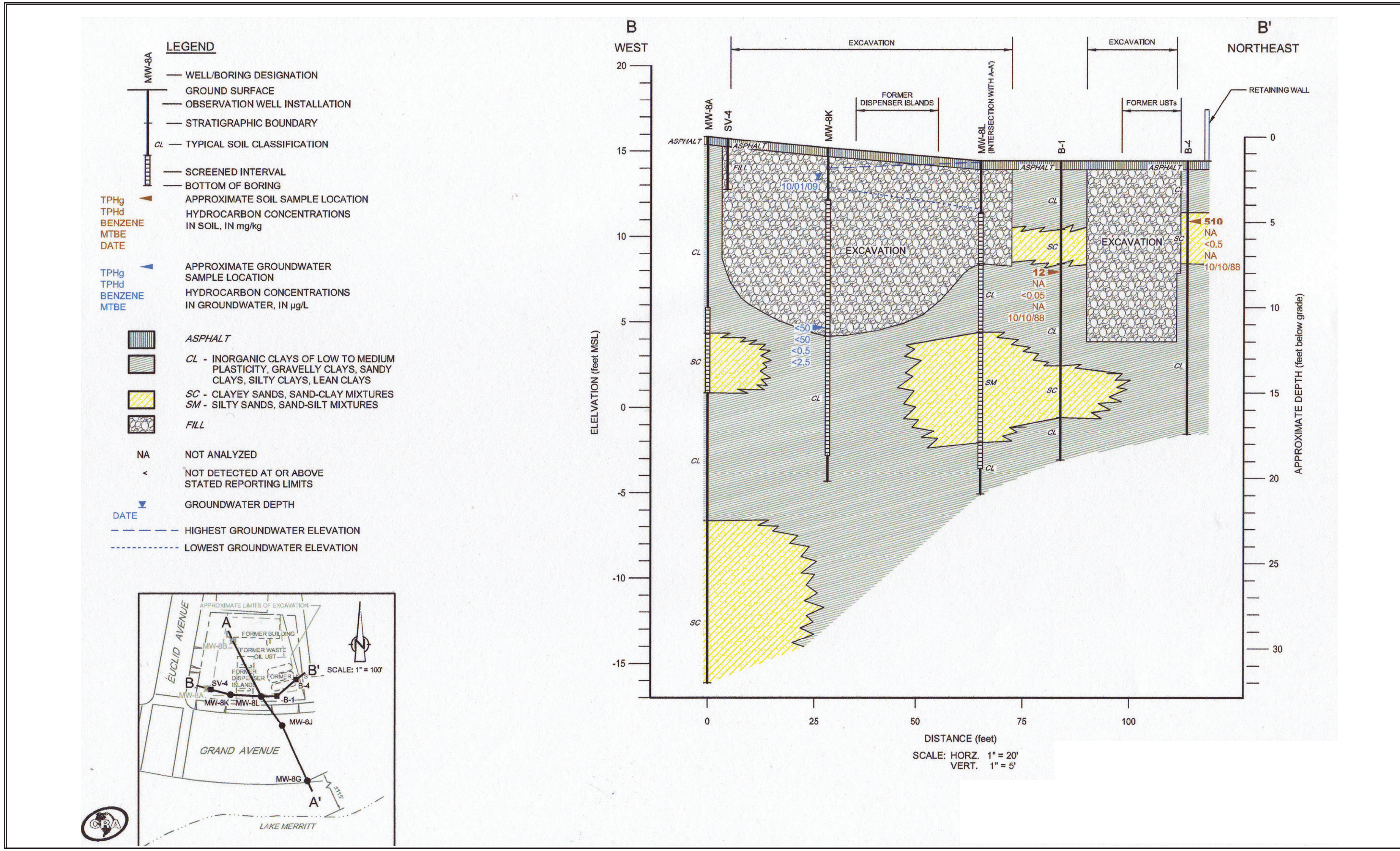


FIGURE 6. **GEOLOGIC CROSS SECTION B-B'**	**Date:** 12/4/09 **Photo ID No.** CRA **N↑**
AllWest	**Site Name:** 500 Grand Avenue, Oakland, California **Project Number:** 15184.36

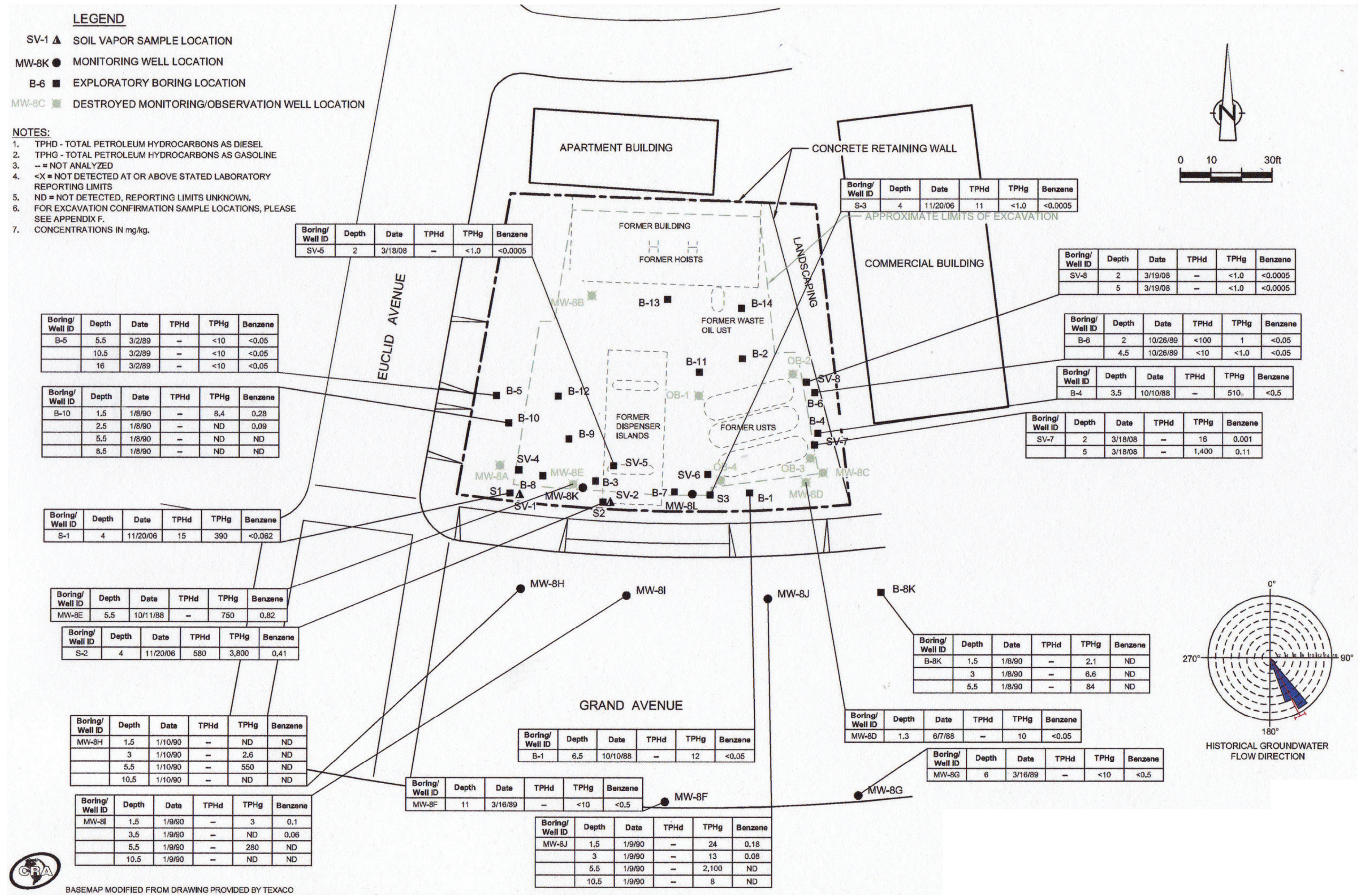


FIGURE 7.
RESIDUAL CONTAMINANT CONCENTRATIONS IN SOIL

Date: 12/4/09
Photo ID No. CRA

N

AllWest

Site Name: 500 Grand Avenue, Oakland, California

Project Number: 15184.36

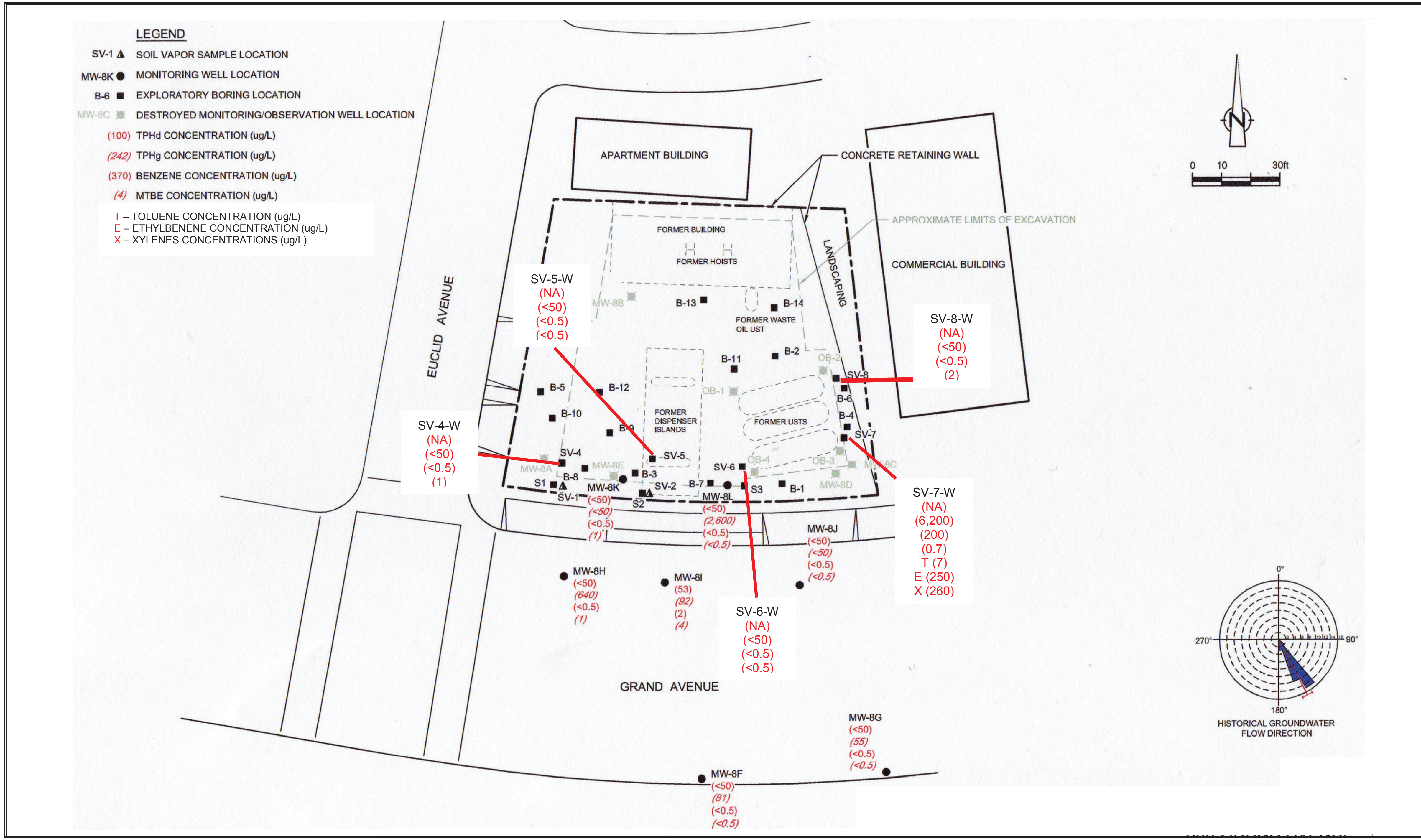
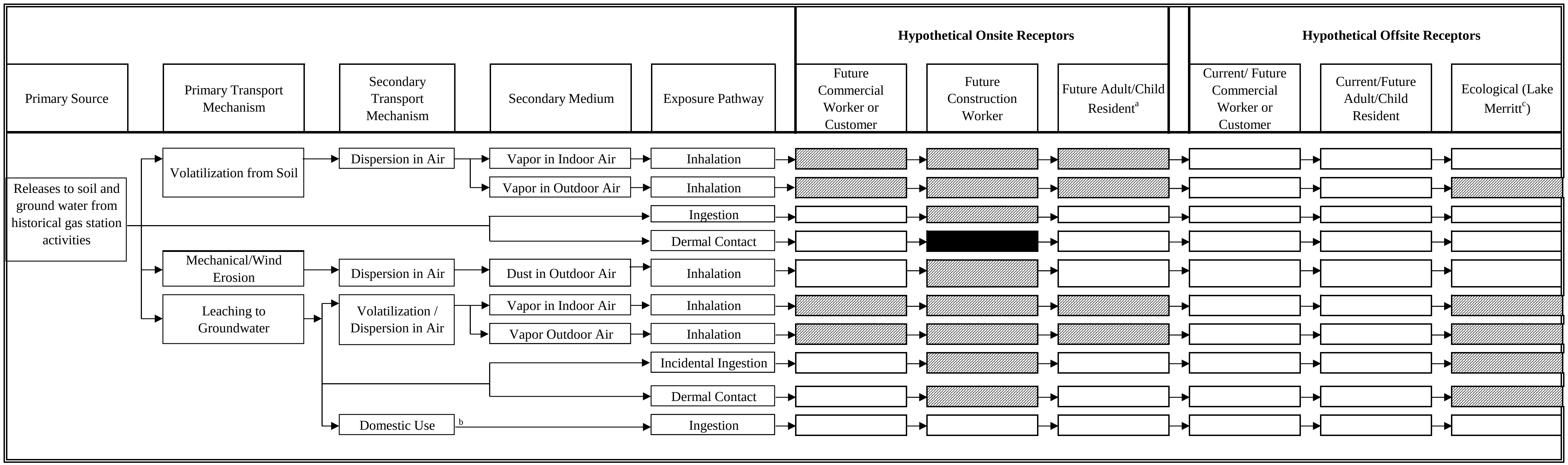


FIGURE 8. RESIDUAL CONTAMINANT CONCENTRATIONS IN GROUND WATER	Date: 12/4/09 Photo ID No. CRA N↑
AllWest	Site Name: 500 Grand Avenue Oakland, California Project Number: 15184.36

Figure 9. Potential Exposure Scenarios
500 Grand Avenue
Oakland, California
AllWest Project # 15184.23



Key:

Receptor likely to be exposed via this route, so exposure pathway is considered potentially complete and will be quantitatively evaluated in risk characterization step.

Receptor may be exposed via this route, so pathway is considered potentially complete. However, pathway likely insignificant and will be qualitatively evaluated only (Tier 1).

Pathway is incomplete; no further evaluation required.

Footnotes:

[a] Building footprint designed to cover entire site

[b] Domestic water is supplied by EBMUD from purchased imported sources and first encountered groundwater is not used as a domestic water supply at the Site or adjacent properties. Due to the lack of domestic and municipal water wells within 1/2 mile downgradient of the subject site, domestic use of groundwater is not considered a potentially complete pathway for current offsite residents.

[c] Lake Merritt is not a potable potential drinking water resource due to brackish/saline water quality.

ATTACHMENT A

Site Conceptual Model
500 Grand Avenue, Oakland, California
ACEH Case No. RO0003175
AllWest Project Number 15184.36

CSM Element	CSM Sub-Element	Description	Significant Data Gap(s)	How to Address
Site Location		The site is located on the northeastern corner of the termination of Euclid Avenue at Grand Avenue, addressed as 500 Grand Avenue in Oakland, Alameda County, California. A site location map is provided in Figure 1.	None	NA
Facility Structures, Physical Features and Surface Water Features	Current	There are no structures located on the site, which is developed with an asphalt-paved surface parking lot. Concrete retaining walls are located along the northern and eastern site perimeters, with the northern wall appearing located on or very near the property line and an irregularly-shaped narrow strip of landscaped (trees and bushes) and bare soil present between the eastern retaining wall and the property line. Topography of the site slopes very gently towards the south-southwest. The northeastern corner of the property is at an approximate elevation of 25 feet above mean sea level; the southern property line is at an approximate elevation of 17 feet above mean sea level. A sensitive receptor survey of the site vicinity was conducted by HLA in 1988 and KHM in 2001. The surveys identified no public water supply wells within 2,500 feet of the site and no private water supply wells within 1,000 feet of the site (CRA 2009). A utility study of the site and vicinity was conducted by HLA in 1991 and supplemented by CRA in 2009 through review of City utility maps and utilization of USA utility marking and a private utility locator. Gas, electric and communication lines were documented beneath the Grand Avenue sidewalk. An 8-inch water line, an electric line, two telephone lines, a communications line, an abandoned 8-inch diameter sewer line and an additional unknown metal utility line were documented beneath the Grand Avenue right-of-way adjoining the site. A 15-inch sewer line was documented on the south side of Grand Avenue down-gradient of the Site. Additional utility lines were documented beneath the site itself, but were reported to have been associated with the former service station and therefore likely removed during 1991 to 1993 demolition and over-excavation activities. Information on the depth of the utilities or the backfill materials was not available. CRA anticipated the utility lines beneath the sidewalk and the active sewer line beneath Grand Avenue to be shallow and the backfill for the older utility lines to be native soil. Additionally, the first occurrence of ground water (6 to 9 feet) was anticipated to be below the likely depth of the utility trenches. CRA did not expect the utility lines to act as preferential pathways for contaminant migration (CRA 2009). There is no surface vegetation on the site, with the exception of a street tree in the adjoining Grand Avenue sidewalk and trees/bushes beyond the eastern retaining wall. There are no surface water features on the site. Lake Merritt is located approximately 200 feet south and down-gradient, with no apparent connection or links to the site.	None	NA
	Historical	Historically, the site was developed with a service station from as early as 1946 until 1991. Facilities associated with the most recent station included a station building with three service bays. The service bays housed a sump and two hydraulic hoists. Additionally, three 10,000-gallon gasoline USTs, one 500-gallon waste oil UST, two fuel dispenser islands and associated product piping were present. The service station structures, likely including documented utility lines beneath the site reported to have been associated with the former service station facilities, were removed and the station demolished in 1992. Between 1992 and the mid-1990s when the current parking lot was paved, the site existed as a vacant lot (CRA 2009). No changes in topography were documented between development with the service station and the current parking lot. No other changes in physical or surface water features have been reported.	None	NA
	Proposed/Future	Redevelopment of the site and property adjoining north (403 Euclid Avenue) with a single, mixed-use building is proposed. The building footprint is designed to cover the entire surface of the site and adjoining property. Ground floor development is planned to include parking and retail space, as well as a space for building services and a lobby for the apartments above. An elevator shaft pit will be excavated to approximately 4 feet below grade. The second through partial sixth floors will be apartment units, with an open podium-level courtyard on the eastern side of the second floor.	None	NA
Site Operations/ Processes	Current	Site operations/processes are limited to vehicle parking. The current site configuration is shown on Figure 2.	None	NA
	Historical	The Site historically operated as a gasoline service station with fueling operations at two dispenser islands and automotive repair activities in three service bays. Gasoline was stored in three USTs and waste oil was stored in a single UST (CRA 2009). The historical site configuration is shown on Figure 3. Specific information on additional hazardous materials utilized at the service station is unavailable, but presumed to have included typical automotive repair/service materials such as oil, transmission fluid, coolant, etc., likely stored within the service station building.	None	NA
	Proposed/Future	Future site operations/processes are proposed to include parking, commercial and service space on the ground floor of a new building, with residential use on the upper floors. The proposed site development plan is included on Figure 4.	None	NA
Release & Remediation History		Elevated concentrations of petroleum hydrocarbons, VOCs and SVOCs were detected in soil, groundwater and soil gas samples during several subsurface investigations conducted in 1988-1990 by HLA. Approximately 5,000 gallons of ground water were removed from the gasoline UST pit as an interim remediation measure in 1989. During installation of spill containment devices on the waste oil UST at the Site in June 1990, free product was discovered in backfill surrounding the tank. The waste oil UST was removed in September 1990. Encountered during UST excavation activities, clay sewer pipes were subsequently removed from the western side of the former waste oil UST in January 1991. TPHg, TPHd, TOG and BTEX were detected in soil; HVOCs were not	None	NA

CSM Element	CSM Sub-Element	Description	Significant Data Gap(s)	How to Address
		detected. Free product was encountered in ground water within the tank excavation. TPHd, TPHg, TOG and BTEX were detected in the clay pipe trench samples. Naphthalene, 2-methylnaphthalene, phthalate and TCA were reported at low concentrations in one soil sample from a boring adjoining the western end of the pipes, but were not detected in soil samples collected from the trench; the location where the sample was collected subsequently was excavated (Cambria 2006; CRA 2009). The three 10,000-gallon gasoline USTs were removed from the Site in April 1992; the two dispenser islands and associated piping also were removed at this time and over-excavation of the former USTs location was conducted during May 1992 and January 1993. TPHg, TPHd and BTEX were detected in soil and ground water around the gasoline tanks following initial UST removals (CRA 2009). Over-excavation of the tank pit, area beneath the fuel islands, and the location of a former hydraulic hoist and sump initially was conducted. Between 1992 and 1993, approximately 2,400 cubic yards of soil were removed, to depths ranging from 4.5 to 10 feet bgs. The excavation extended to within 5 feet of the northern, southern and eastern property lines, where additional excavation was unable to be conducted due to the proximity of adjoining sidewalks/utilities and retaining walls; excavation on the western portion of the site was conducted to the limits of the detection of impacted soil. TPH-g and BTEX were not detected in confirmatory soil samples from the western, northern and eastern excavation sidewalls. Clean, imported crushed gravel and soil fill was used as backfill for the excavation pit (Cambria 2006; CRA 2009). 41,300 gallons of hydrocarbon-impacted ground water were removed from the gasoline and waste oil UST excavations following removal and during subsequent remedial activities. Additionally, between approximately 1996 and 2000, socks of ORC were periodically placed and replaced into site ground water monitoring wells to enhance naturally-occurring biodegradation. Free product was observed on the ground water within the UST excavations at the time of the tank removals, but subsequently was removed through ground water pumping. Free product was not reported in monitoring wells during any of the sampling events conducted on the site (CRA 2009). Several subsurface investigations including soil borings, groundwater monitoring well installations and monitoring events, and soil vapor sampling were conducted between 1993 and 2008 by Converse, Cambria and CRA. Based on the available data, there were two primary sources of petroleum hydrocarbon-impact to soil and ground water at the site, the former waste oil UST and clay sewer pipes and the former gasoline USTs. Source locations are shown on Figure 3. With the exception of narrow strips of soil adjoining the southern property line which could not be excavated without damaging the integrity of the Grand Avenue sidewalk and the adjoining the eastern property line which could not be excavated without damaging the integrity of the retaining wall (secondary contaminant sources), all significantly impacted soil has been removed from the site through excavation. Constituents of concern (COCs) remaining in soil and potentially soil vapor at the site are TPH-g and BTEX along the western, southern and eastern margins of the site, with TPH-d appearing to remain in soil only along the southern property line. COCs in ground water on the site are TPHg, BTEX and, to a lesser extent, MTBE.		
Geology and Hydrogeology	Regional	*Geology*: The site lies within the Coast Ranges geomorphic province. Rock types within this zone are intermingled due to the sliding action between the tectonic plates. The oldest well-documented bedrock in the East Bay is the Franciscan assemblage. The unconsolidated fluvial gravels, sands, silts and clays deposited in the major northwest-southeast trending valleys of the Coast Ranges are derived from younger rocks. The northern Coast Ranges are dominated by the irregular, knobby landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 600 miles long, extending from Point Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands. Geologically, the area of the subject property is underlain by Mesozoic era Eugeosynclinal Deposits. *Hydrogeology*: The site is located in the San Francisco Bay Hydrologic Region and lies in the Santa Clara Valley Groundwater Basin, East Bay Plain Subbasin located on the eastern shore of San Francisco Bay. The ground water basin consists of unconsolidated sediments of Quaternary age, including early-Pleistocene Santa Clara Formation, late-Pleistocene Alameda Formation, early-Holocene Temescal Formation and artificial fill. The average depth of the unconsolidated sediments is approximately 1,000 feet throughout the subbasin.	None	NA
	Local	*Geology*: The majority of the native site soils were over-excavated during previous contaminant removal activities and replaced with imported material, classified as clayey gravel in prior studies. Previous subsurface investigations on the site have documented underlying soils to include fine-grained materials such as clays and silts, along with varying amounts of coarser materials, including sands and gravels. A clayey-sand layer with a thickness of several feet has been documented approximately 10 to 15 feet bgs. Additional clayey-sand layers also were encountered at depths of approximately 5 feet bgs and 20 to 25 feet bgs in other on-site borings (CRA 2009). Copies of geologic cross-sections are included in Figures 5 and 6; excavated areas are depicted on Figure 7. *Hydrogeology*: Ground water underlying the site has been encountered at depths ranging from less than 1 foot to 16.5 feet bgs. During the period of on-site ground water monitoring, the depth to ground water reportedly has fluctuated between 1 to 12	None	NA; however additional subsurface geologic and hydrogeologic data will be logged during the proposed additional borings on the site and summarized in the report presented to the ACEH.

CSM Element	CSM Sub-Element	Description	Significant Data Gap(s)	How to Address
		feet beneath the top of the well casings. The ground water flow direction has consistently been measured towards the south-southeast, towards Lake Merritt (CRA 2009; Cambria 2006).		
Hydraulic Flow System		Only the shallow hydraulic flow system at the site is considered for the purposes of this SCM. The ground water flow direction, shown in the rose diagram on Figure 7, has been consistently towards the south-southeast with a horizontal gradient of approximately 0.075. Hydraulic conductivity has only been measured in the predominantly fine-grained native soils and not in the backfill which currently is present across the majority of the site. Hydraulic conductivity in native, predominantly fine-grained soils has been calculated at 0.03 foot/day in silty clay and 0.02 foot/day in sandy clay (CRA 2009).	None	NA
Contaminant Distribution/ Plume Dynamics	Soil	Due to extensive excavation conducted on the site in 1992 and 1993, significantly-impacted soil has been documented as remaining only along the southern and eastern property lines, where previous excavation was unable to be conducted. Highest residual TPH and BTEX concentrations present in these areas appear located nearest the former location of the gasoline USTs. Low concentrations of SVOCs, including naphthalene, 2-methylnaphthalene, phthalate, and VOCs including TCA were detected in boring B-13 near the former waste oil UST and clay pipes. This area was subsequently over-excavated. Based on the elapsed time since the most recent soil samples were analyzed (2008), residual contaminant concentrations are expected to have been further reduced due to natural attenuation. Table 1 summarizing applicable soil quality data is attached; a site plan showing the soil sampling data is included in Figure 7.	Only very limited data with regards to VOCs in the immediate vicinity of the former waste oil UST and clay pipes was available (8 soil samples total). Potential residual VOC concentrations in soil in this area of the site will be evaluated. Current data on residual soil contamination along the southern and southeastern property lines is needed to evaluate potential vapor intrusion concerns in the proposed building and potential direct contact impact to construction workers.	One direct push boring will be advanced in the general location of the former waste oil UST. Soil lithology will be logged and one soil sample from native material underlying the former UST location will be collected for VOC analysis. Two direct push borings will be advanced along the southern perimeter of the site, in the general locations of previous borings MW-8E and MW-8L. Two direct push borings also will be advanced along the southeastern perimeter of the site, in the general locations of previous borings SV-7 and MW-8C. Soil lithology will be logged and soil samples collected for TPHg, TPHd, BTEX and MTBE analyses.
	Ground Water	Ground water monitoring conducted on the site via monitoring wells generally demonstrated the highest concentrations of petroleum hydrocarbons and BTEX along the southern and southeastern perimeters. The most recently-available ground water monitoring data (2008 & 2009) indicates on-site ground water concentrations of TPHg, TPHd, BTEX and MTBE were beneath ESLs for evaluation of potential vapor intrusion concerns under a residential development scenario. Residential ground water ESLs for protection of human health were exceeded in two locations; ground water could be encountered by construction workers as it is shallow beneath the site. Due to the period of time that has elapsed since the most recent ground water sampling was conducted (2009), further reduction in ground water contaminant concentrations is expected due to natural attenuation. The remaining 7 site ground water monitoring wells were destroyed in August 2011. Table 2 summarizing the most recent ground water quality data is attached; a site plan showing the data also is included on Figure 8.	Current data on residual ground water contamination along the southern and southeastern property lines is needed to evaluate potential vapor intrusion concerns in the proposed building and potential direct contact impact to construction workers.	One ground water sample will be collected from the direct push boring advanced in the former waste oil UST location. The sample will be analyzed for VOCs. Four ground water samples will be collected from the direct push borings advanced along the southern and southeastern perimeters of the site. Ground water grab samples will be analyzed for TPHg, TPHd, BTEX and MTBE.
	Soil Vapor	Soil vapor sampling was conducted in 2006 by Cambria on the southern margin of the site following removal of the USTs and over-excavation. Analytical results of samples collected from two vapor probes SV-1 and SV-2 exceeded ESLs for TPH-g and BTEX; however, demonstrated significantly different results between two duplicate samples; also no leak tracer gas analysis was conducted. For these reasons, the validity of the soil vapor data is in question. No additional soil vapor sampling was conducted due to the shallow occurrence of ground water.	Current data on residual soil vapor impact of petroleum hydrocarbons along the southern and southeastern property lines and VOCs in the former waste oil UST vicinity is needed to evaluate potential vapor intrusion concerns in the proposed building and potential direct contact impact to construction workers. The potential explosion hazard from methane gas intrusion into the proposed building has not been evaluated.	Following collection of the ground water grab samples, the direct push borings will be converted into soil vapor probes if the depth to ground water (> 5 feet bgs) allows adequate sample collection. Five soil vapor samples will be collected from the direct push borings advanced along the southern and southeastern perimeters of the site, and in the former waste oil UST vicinity. Four soil vapor samples from the southern and southeastern site margin will be analyzed for TPHg, BTEX, MTBE, oxygen and methane. One soil vapor sample from the former waste oil UST vicinity will be additionally analyzed for VOCs.
Other Vicinity Release Sites		There are no up-gradient release sites in close proximity recorded on the SWRCB Geotracker and DTSC Envirostor databases. The nearest recorded sites are the closed Chevron facility at 460 Grand Avenue, approximately 250 feet west and cross-gradient, and the open Lakeside Park site at 468 Bellevue Avenue, approximately 450 feet southwest and cross-gradient. The nearest up-gradient site is a closed residential fuel oil release approximately 1/3 mile north-northwest, followed by another closed residential fuel oil release approximately ½ mile north-northwest.	None	NA
Land Use and Exposure Scenarios	On-Site	Currently, the site is an unmanned public parking lot with no sensitive receptors. Proposed development of the site is with a mixed use building, including residential units located above ground floor commercial space. Development plans indicate a building footprint designed to cover the entire surface of the site. Identified exposure scenarios associated with the proposed development include direct exposure to soil, ground water and soil vapor by construction workers, and soil vapor intrusion concerns, including both through the building foundation and elevator shaft, to future occupants with exposure via inhalation. Attached Figure 9 is a graphical depiction of potential exposure scenarios.	On-site exposure scenarios have not been evaluated for proposed mixed use (residential and commercial) redevelopment of the site.	Soil, soil vapor and ground water quality data collected will be compared to appropriate RWQCB ESLs to evaluate potential threats to sensitive on-site receptors.
	Adjacent	Surrounding land use includes sensitive receptors only in up- and cross-gradient locations, including those occupying residential and commercial developments to the north, west and east. The previous surveys by HLA and KHM identified no schools or water supply wells within 1000 feet of the site (CRA 2009). Ground water is not currently a drinking water source for Oakland, and based on the proximity to the San Francisco Bay and Lake Merritt, degraded water quality likely precludes future use of shallow ground water as a drinking water source. No sensitive receptors other than ecological have been identified down-gradient of the site; undeveloped park land and Lake Merritt are located south, southwest and southeast of the site. Available 2009 ground water monitoring data from wells in Grand Avenue down-gradient from the site indicated only low concentrations of TPHd approximately 150 feet up-gradient of the lake. Based on the low residual concentrations and presence of low-permeability soil, Lake Merritt is unlikely to be significantly impacted by petroleum hydrocarbons from the site.	None	NA

Site Conceptual Model
500 Grand Avenue, Oakland, California
ACEH Case No. RO0003175
AllWest Project Number 15184.36

Notes and Definitions:
HLA - Harding Lawson Associates; CRA – Conestoga Rovers Associates; KHM – KHM Environmental Management; Cambria - Cambria Environmental Technology, Inc.;
USA – Underground Service Alert; RWQCB – California Regional Water Quality Control Board; SWRCB – State Water Resources Control Board; DTSC - Department of Toxic Substances Control;
ESLs – Environmental Screening Levels; UST – Underground Storage Tank; TPHg - Total Petroleum Hydrocarbons as Gasoline; TPHd - Total Petroleum Hydrocarbons as Diesel; TOG - Total Oil & Grease;
BTEX - Benzene, Toluene Ethylbenzene and Xylenes; MTBE – methyl tertiary butyl ether; VOCs – volatile organic compounds; HVOC – chlorinated/halogenated volatile organic compounds; SVOCs – semivolatile organic compounds; TCE – trichloroethane; ORC - Oxygen Releasing Compound; bgs – beneath ground surface.

Cambria. *Work Plan for Additional Site Assessment, Former Texaco Service Station (Chevron 21-1173), 500 Grand Avenue, Oakland, California*. August 23, 2006.
Cambria. *Subsurface Investigation Report, Former Texaco Service Station (# 21-1173), 500 Grand Avenue, Oakland, California*. February 28, 2007.
CRA. *Site Conceptual Model and Case Closure Request, Former Texaco Station 21-1173 (Former Exxon No. 7-0237), 500 Grand Avenue, Oakland, California*. December 14, 2009.
Alameda County Health Care Services Agency, Environmental Health Department, *Remedial Action Completion Certificate, Fuel Leak Case No. RO0000391 (Global ID #T0600101355), Chevron #21-1137, 500 Grand, Oakland, CA 94611*. September 21, 2011

ATTACHMENT B

AllWest Environmental, Inc.

Specialists in Physical Due
Diligence and Remedial Services

2141 Mission Street, Suite 100
San Francisco, CA 94110

415.391.2510 AllWest1.com

SITE MANAGEMENT PLAN
AND SUBSURFACE INVESTIGATION WORK PLAN

500 Grand Avenue
Oakland, California 94610

ACEH Case Number RO0003175
Geotracker Global ID Number T0000007707

PREPARED FOR:

Ellwood Commercial Real Estate
1345 Grand Avenue
Piedmont, California 94610

ALLWEST PROJECT 15174.27
October 22, 2015

PREPARED BY:

Belinda P. Blackie, PE
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CERTIFIED HYDROGEOLOGIST
LEONARD P. NILES
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AllWest Environmental, Inc.

Specialists in Physical Due
Diligence and Remedial Services

2141 Mission Street, Suite 100
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SITE MANAGEMENT PLAN
AND SUBSURFACE INVESTIGATION WORK PLAN

403 Euclid Avenue &
500 Grand Avenue
Oakland, California 94610

ACEH Case Number RO0003175
Geotracker Global ID Number T0000007707

I. INTRODUCTION

AllWest Environmental, Inc. has prepared this Site Management Plan (SMP) to address potential risks to site construction workers and neighboring residents, workers and pedestrians, related to potential hazardous materials exposure during and after the proposed construction project at the subject property referenced above (Figure 1). The SMP includes a Subsurface Investigation Work Plan prepared to address data gaps in soil and ground water conditions as identified in the Site Conceptual Model (SCM) prepared for the subject property under separate cover. The SMP has been prepared in response to a request by the Alameda County Environmental Health Department (ACEH) under ACEH Case No. RO0003175.

The subject property, developed with a surface parking lot and an adjoining residential property at 403 Euclid Avenue, are proposed to be redeveloped with a single mixed-use commercial and residential building (Figures 2 and 4). Residual petroleum hydrocarbon impact remains present on the subject property from historical underground storage tank (UST) releases (Figures 3, 7 and 8). Based on the proposed land use change, additional characterization and this SMP are required by Alameda Department of Environmental Health. The Work Plan and SMP provide a framework to further evaluate current soil and ground water quality conditions and manage potentially hazardous materials in site soil and equipment in a manner consistent with the planned land use, while protecting human health and the environment.

For the purposes of this SMP and Work Plan, the term subject property and site will refer to the combined 500 Grand Avenue and 403 Euclid Avenue properties.

II. PROJECT DESCRIPTION

Redevelopment of the subject property with a single, mixed-use building is proposed. The building footprint will overlay the entire surface of the property. Ground floor development is planned to include parking and retail space, as well as a space for building services and a lobby for the apartments above. The second through partial sixth floors will be apartment units, with a podium-level open courtyard on the eastern side of the second floor. An elevator shaft is included in the design, but no additional subgrade structures are planned other than utilities. The retaining wall along the northern and eastern sides of the 500 Grand Avenue property will be removed to facilitate the redevelopment. The sidewalk adjoining Grand Avenue to the south will be replaced. The proposed site development plan is presented as Figure 4. Selected proposed building construction plans and elevations are included in Appendix A.

III. PROJECT BACKGROUND

A. Site Location and Description

The subject property is located on the northeastern corner of the termination of Euclid Avenue at Grand Avenue, addressed as 500 Grand Avenue and 403 Euclid Avenue in Oakland, Alameda County, California. The site consists of a roughly trapezoidal parcel of land, approximately 0.31 acre (13,500 square feet) in size, developed with an asphalt-paved, unmanned public parking lot (500 Grand Avenue) and two-story residential structure (403 Euclid Avenue). A retaining wall extends the length and width of the 500 Grand Avenue property, just inside the northern and eastern property boundaries.

Located on a gently sloping lot, approximately 30 feet above mean sea level (msl) on the northern boundary and 17 feet above msl on the southern boundary, the subject property is sited on the northern side of Grand Avenue, the eastern side of Euclid Avenue and the southern side of Burk Street. Beyond the adjoining streets, the property is bound by residential developments to the north, open space and Lake Merritt to the south, commercial and mixed use (commercial/residential) developments to the west, and residential and mixed use (commercial/residential) developments to the east.

Historically, the site was developed with a service station from as early as 1946 until 1991. Facilities associated with the most recent station included a station building with three service bays. The service bays housed a sump and two hydraulic hoists. Additionally, three 10,000-gallon gasoline USTs, one 500-gallon waste oil UST, two fuel dispenser islands and associated product piping were present. The service station structures, likely including documented utility lines beneath the site reported to have been associated with the former service station facilities, were removed and the station demolished in 1992. Between

1992 and the mid-1990s when the current parking lot was paved, the site existed as a vacant lot (CRA 2009).

A site location map and a current site configuration plan are presented on Figures 1 and 2, respectively. A historical site configuration plan is presented as Figure 3.

B. Site Geology and Hydrogeology

The subject property lies within the Coast Ranges geomorphic province. The northern Coast Ranges are dominated by the irregular, knobby landslide-topography of the Franciscan Complex. The eastern border is characterized by strike-ridges and valleys in Upper Mesozoic strata. In several areas, Franciscan rocks are overlain by volcanic cones and flows of the Quien Sabe, Sonoma and Clear Lake volcanic fields. The Coast Ranges are subparallel to the active San Andreas Fault. The San Andreas is more than 600 miles long, extending from Point Arena to the Gulf of California. West of the San Andreas is the Salinian Block, a granitic core extending from the southern extremity of the Coast Ranges to the north of the Farallon Islands. Geologically, the area of the subject property is underlain by Mesozoic era Eugeosynclinal Deposits. Rock types within this zone are intermingled due to the sliding action between the tectonic plates. The oldest well-documented bedrock in the East Bay is the Franciscan assemblage. The unconsolidated fluvial gravels, sands, silts and clays deposited in the major northwest-southeast trending valleys are derived from younger rocks.

The majority of the native soils on the 500 Grand Avenue property were over-excavated during previous contaminant removal activities and replaced with imported material classified as clayey gravel in prior studies. Previous subsurface investigations on the 500 Grand Avenue property have documented native soils to include fine-grained materials such as clays and silts, along with varying amounts of coarser materials, including sands and gravels. A clayey-sand layer with a thickness of several feet has been documented approximately 10 to 15 feet beneath ground surface (bgs). Additional clayey-sand layers also were encountered at depths of approximately 5 feet bgs and 20 to 25 feet bgs in other borings. Geologic cross-sections are shown as Figures 5 and 6.

The site is located in the San Francisco Bay Hydrologic Region and lies in the Santa Clara Valley Groundwater Basin, East Bay Plain Subbasin located on the eastern shore of San Francisco Bay. The ground water basin consists of unconsolidated sediments of Quaternary age, including early-Pleistocene Santa Clara Formation, late-Pleistocene Alameda Formation, early-Holocene Temescal Formation and artificial fill. The average depth of the unconsolidated sediments is approximately 1,000 feet throughout the subbasin. Ground water underlying the site has been encountered at depths ranging from less than 1 foot to 16.5 feet bgs. During the period of ground water monitoring on the 500 Grand Avenue property, the depth to ground water reportedly was documented as fluctuating between 1 to 12 feet beneath the top of the well casings. The ground water flow direction has consistently been measured towards the south-southeast, towards Lake Merritt.

C. Release and Remediation History – 500 Grand Avenue Property

Elevated concentrations of petroleum hydrocarbons, VOCs and SVOCs were detected in soil, groundwater and soil gas samples during several subsurface investigations conducted in 1988-1990 by HLA. Approximately 5,000 gallons of ground water were removed from the gasoline UST pit as an interim remediation measure in 1989.

During installation of spill containment devices on the waste oil UST at the 500 Grand Avenue service station facility in June 1990, free product was discovered in backfill surrounding the tank. The waste oil UST was removed in September 1990. Encountered during UST excavation activities, clay sewer pipes were subsequently removed from the western side of the former waste oil UST in January 1991. Total petroleum hydrocarbons as gasoline (TPHg), total petroleum hydrocarbons as diesel (TPHd), total oil and grease (TOG) and benzene, toluene, ethylbenzene and xylenes (BTEX) were detected in soil; chlorinated hydrocarbons were not detected. Free product was encountered in ground water within the tank excavation. TPHd, TPHg, TOG and BTEX were detected in the clay pipe trench samples. Naphthalene, 2-methylnaphthalene, phthalate and trichloroethane were reported at low concentrations in one soil sample from a boring adjoining the western end of the sewer pipes, but were not detected in soil samples collected from the trench; the location where the sample was collected subsequently was excavated (Cambria 2006; CRA 2009).

The three 10,000-gallon gasoline USTs were removed from the 500 Grand Avenue facility in April 1992; the two dispenser islands and associated piping also were removed at this time and over-excavation of the former USTs location was conducted during May 1992 and January 1993. TPHg, TPHd and BTEX were detected in soil and ground water around the gasoline tanks following initial UST removals (CRA 2009).

Over-excavation of the tank pits, area beneath the fuel islands, and the location of a former hydraulic hoist and sump was conducted. Between 1992 and 1993, approximately 2,400 cubic yards of soil were removed, to depths ranging from 4.5 to 10 feet bgs. The excavation extended to within 5 feet of the northern, southern and eastern property lines, where additional excavation was unable to be conducted due to the proximity of adjoining sidewalks/utilities and retaining walls; excavation on the western portion of the site was conducted to the limits of the detection of impacted soil. TPH-g and BTEX were not detected in confirmatory soil samples from the western, northern and eastern excavation sidewalls. Clean, imported crushed gravel and soil fill was used as backfill for the excavation pit (Cambria 2006; CRA 2009).

A total of 41,300 gallons of hydrocarbon-impacted ground water was removed from the gasoline and waste oil UST excavations following removal and during subsequent remedial activities. Additionally, between approximately 1996 and 2000 socks of oxygen releasing compound (ORC) were periodically placed and replaced into site ground water monitoring wells to enhance naturally-occurring biodegradation. Free product was observed on the ground water within the UST excavations during the tank removals, but subsequently was removed through ground water pumping. Free product was not reported in monitoring wells during any of the sampling events conducted on the site. Several subsurface investigations including soil borings, groundwater monitoring well installations and monitoring events, and soil vapor sampling were conducted between 1993 and 2008 by Converse, Cambria and CRA (CRA 2009).

Based on the available data, there were two primary sources of petroleum hydrocarbon-impact to soil and ground water at the 500 Grand Avenue property: 1) the former waste oil UST and clay pipes and, 2) the former gasoline USTs. With the exception of narrow strips of soil adjoining the southern property line which could not be excavated without damaging the integrity of the Grand Avenue sidewalk and adjoining the eastern property line which could not be excavated without damaging the integrity of the retaining wall, all significantly impacted soil was removed from the 500 Grand Avenue property via excavation. Constituents of concern (COCs) remaining in soil at the 500 Grand Avenue property are TPHg and BTEX along the western, southern and eastern margins of the site, with TPHd appearing to remain in soil only along the south and southeastern property line. COCs in ground water on the 500 Grand Avenue property are TPHg, BTEX and, to a lesser extent, MTBE. The most recent soil and ground water quality data for the 500 Grand Avenue property are summarized in Tables 1 and 2. The extent and concentrations of residual petroleum hydrocarbons in soil and groundwater at the subject site are shown in Figures 7 and 8.

D. Data Gaps Identified in SCM – 500 Grand Avenue Property

In the SCM prepared for the site, AllWest identified data gaps in the soil, ground water and soil vapor quality characterization conducted to date. As outlined in the SCM, current data on residual soil and ground water contamination by petroleum hydrocarbons along the southern and southeastern property lines is needed to evaluate potential vapor intrusion concerns in the proposed building and potential direct contact impact to construction workers. Current data on residual soil vapor impact along the southern and southeastern property lines also is needed to evaluate potential vapor intrusion concerns in the proposed building, as well as potential direct contact impact to construction workers. Data on oxygen content in soil vapor is also necessary to determine whether bio-attenuation of petroleum hydrocarbons is occurring, to comply with the State Water Resources Control Board (SWRCB) Low Threat Closure Policy (LTCP) Criteria 2, Scenarios 3 and 4.

Confirmation of the absence of volatile organic compounds (VOCs) in the immediate vicinity of the former waste oil UST and clay pipes also is needed. Additionally, the potential explosion hazard from methane gas intrusion into the proposed building has not been evaluated, and on-site exposure scenarios have not been evaluated for the proposed mixed use (residential and commercial) redevelopment of the site.

IV. WORK PLAN FOR PROPOSED INVESTIGATIVE ACTIVITIES

A. Permitting

Following approval of this Work Plan by the ACEH, AllWest will prepare and submit a drilling permit application and associated documentation to Alameda County Public Works Agency-Water Resources for their review and approval, if required.

B. Health and Safety Plan

AllWest will prepare a site specific health and safety plan (HSP) for the subsurface investigation prior to mobilizing to the site. A tailgate safety meeting will be conducted prior to commencing work. All site personnel will be required to review the HSP.

C. Underground Utility Locating

To avoid damage to underground utility installations during the course of the subsurface investigation, AllWest will contact Underground Service Alert (USA), an organization for public utility information, a minimum of 72 working hours in advance of the pending subsurface investigation. USA will then notify public and private entities that maintain underground utilities within the site vicinity to locate and mark their installations for field identification. A private underground utility locator will also be employed by AllWest to conduct a magnetometer sweep investigation to locate marked and unmarked underground utilities on the subject property and within the sidewalk areas adjacent to the property, in the vicinity of the proposed boring locations.

D. Geoprobe® DPT Boring Advancement

Five borings will be advanced at the site to further characterize soil, soil vapor and groundwater quality. Two borings will be located at the southern perimeter of the site, in the general vicinity of previous borings MW-8E and MW-8L. Two borings will be located at the southeastern perimeter of the site, in the general vicinity of previous borings SV-7 and MW-8C. One boring will be advanced in the general location of the former waste oil UST. The borings will be advanced by a C-57 licensed drilling contractor, using Geoprobe® direct push technology (DPT) continuous coring methods, to approximately 10 feet bgs. The proposed boring locations are shown in Figure 2.

Continuous core soil samples will be collected using a nominal 4-foot long, 2-inch outside diameter (OD) stainless steel core barrel drive probe and extension rods. The drive probe will be equipped with nominal 1-1/2 inch inside diameter (ID) clear PVC plastic tubes that line the interior of the probe. The probe and insert tubes will both be driven using a hydraulic percussion hammer to the specified depth of 10 feet bgs. After the specified drive interval, the drive probe and rods will be retrieved to the surface. The PVC tube containing subsurface soil will be removed. The drive probe will then be cleaned, equipped with a new PVC tube and reinserted into the outer drive casing with extension rods as required. The apparatus will then be driven, following the above procedure, until the desired depth is obtained. Geoprobe® DPT soil sampling procedures are included in Appendix A.

E. Soil Sampling

An AllWest environmental professional will oversee field work and drilling activities. The recovered soil samples will be inspected after each drive interval with lithologic and relevant drilling observations recorded. Soil samples will be screened for organic vapors using a photo-ionization detector (PID), or other appropriate device, by taking readings of headspace vapor concentrations of the soil inside a zip-lock plastic bag. PID readings, soil staining and other relevant observations will be recorded on the boring logs.

Continuous core soil samples will be collected for lithologic characterization and chemical analysis. Selected soil sample intervals of approximately 6 inches in length will be cut from the PVC tubes for analytical testing. The ends of the samples for possible analytical testing will be sealed using Teflon® squares and plastic end caps. The samples will be labeled and stored in an iced cooler. At least two soil samples from each of the perimeter borings and one from the former waste oil UST location will be submitted for laboratory analysis. For the perimeter locations, one sample from the fill material and one from underlying native soil will be collected; from the waste oil UST location, one sample from the native soil will be collected. Sample containers will be labeled and immediately placed on ice to preserve the chemical characteristics of their contents.

F. Groundwater Sampling

Based on the data obtained through previous subsurface investigations, groundwater is expected to be encountered at a shallow depth (approximately 1 to 10 feet bgs) beneath the subject property. Groundwater water levels in the borings will be measured and "grab" groundwater samples will be collected after the completion of soil coring to the designated depth. The rods and drive probe will be removed from the borehole, and new, temporary nominal 0.5 to 0.75-inch ID PVC solid well casing with a 5-foot slotted screened interval will be lowered into the borehole.

Prior to groundwater sampling, depth to water will be measured using an electronic water level probe through the temporary PVC casing. Groundwater samples will then be collected from the temporary PVC casing using disposable sample tubing fitted with a check ball valve device which recovers the groundwater sample by oscillation, a peristaltic pump fitted with disposable sample tubing, or a small-diameter polyethylene or Teflon® disposable bailer. Geoprobe® DPT groundwater sampling procedures are included in Appendix A.

Upon retrieval of the groundwater samples, the retained water will be transferred from the sampling device to appropriate sample bottles furnished by the analytical laboratory. Samples for TPHg, BTEX and VOC analyses will be collected in three 40-milliliter (ml) glass volatile organic analysis (VOA) vials preserved with hydrochloric acid (HCl), for each sample. Samples for TPHd analysis will be collected in one 1-liter (L) amber glass bottle preserved with HCl, for each sample. Sample bottles will be labeled and immediately placed on ice to preserve the chemical characteristics of their contents.

G. Soil Vapor Sampling

Following completion of soil and ground water sampling activities, if the depth to ground water is greater than five feet bgs, a soil vapor probe will installed into each of the four (4) DPT borings located at the property perimeter, and into the DPT boring in the vicinity of the former waste oil UST, for a total of five (5) soil vapor probe installations. Prior to vapor probe installations, the five (5) DPT borings will be backfilled to a depth of approximately 5 feet bgs with hydrated bentonite chips or pellets. Alternatively, depending on site conditions or the driller's preference, five (5) new boreholes may be driven using DPT methods to 5 feet bgs adjacent to the previous borings.

A plastic or stainless steel soil vapor probe, ½-inch diameter by 2-inches long and tipped with a porous plastic membrane, will be inserted to the bottom of each backfilled or new 2.25-inch diameter borehole at 5 feet bgs. The probe tip will be attached to a 7-foot length of 0.25-inch OD Teflon™ tubing extending to above the top of the pavement. A fine sand filter pack approximately 1-foot thick will be placed in the borehole annulus around the probe. A 1-foot layer of non-hydrated granular bentonite will then be used to fill the annular space above the filter pack, and hydrated granular bentonite will be used to fill the annular space above the non-hydrated bentonite to the top of the pavement. The bentonite will be allowed to hydrate and the borehole conditions to equalize for at least 2 hours prior to sampling activities, per DTSC vapor sampling guidelines. Temporary soil vapor probe installation procedures will be performed in general accordance with guidelines presented in the DTSC *Advisory – Active Soil Gas Investigations*, April, 2012.

Soil vapor sampling procedures will be in general accordance with State of California Department of Toxic Substances Control (DTSC) Final, Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance, October 2011 (DTSC, October 2011) and the DTSC Advisory, Active Soil Gas Investigations, April 2012 (DTSC, April 2012). Soil vapor sampling will not be performed if significant (greater than ½-inch) precipitation has occurred within the previous five days. AllWest will collect soil vapor samples in laboratory prepared 1-liter capacity SUMMA canisters. Prior to vapor purging and sample collection, a vacuum leak test of the flow-controller/gauge manifold assembly will be performed for a minimum of 5 minutes. Prior to sample collection, approximately 1 liter of soil vapor will be purged at a flow rate of approximately 200 milliliters per minute (ml/min) from each soil vapor probe using a dedicated 6-liter capacity SUMMA purge canister.

During vapor sample collection, a vacuum leak test of the flow-controller/gauge manifold assembly will be performed using helium as a leak tracer inside an airtight shroud. An ambient air sample will be collected using a SUMMA canister inside the leak detection shroud during at least one soil vapor probe sampling, to measure helium concentrations inside the shroud concurrent with soil vapor sample analysis. Flow rates of approximately 200 milliliters per minute (ml/min) will be used to fill the canisters. The canisters will be filled to approximately 80% of capacity. All pertinent field observations, pressure, times and readings will be recorded. Sample containers will be labeled, placed in a dark container and transported under chain-of-custody control to the analytical laboratory. Geoprobe® DPT soil vapor probe installation and sampling procedures and schematic diagrams are included in Appendix C.

H. Borehole Backfilling

At the completion of drilling and sampling activities and removal of all drive rods, sample probes, temporary PVC well casings and soil vapor probes, the borings will be backfilled level to the parking lot surface with a “neat” Portland

Type I or II cement grout slurry tremied into the borehole through a PVC pipe. The level of grout will be checked to ascertain if any settling has occurred and will be "topped off" if required.

I. Investigative Derived Waste Containment and Disposal

Investigative derived waste (IDW), including soil cores, purged groundwater and decontamination rinseate, will be contained on-site in 5-gallon pails pending analytical results, profiling and transport to an appropriate disposal facility.

J. Quality Assurance/Quality Control Program

To prevent the loss of constituents of interest, all soil and ground water samples will be preserved in an ice chest cooled to 4°C with crushed ice immediately after their collection and during transportation to the laboratory. Samples will be stored within the cooler in separate zip-lock plastic bags to avoid cross-contamination. Soil vapor samples will be transported within a dark container. Samples will be submitted to the analytical laboratory within 24 hours of collection.

All samples collected for this project will be transported under chain-of-custody protocol. The chain-of-custody program allows for the tracing of possession and handling of individual samples from the time of field collection through laboratory analysis. The document includes the signature of the collector, date and time of collection, sample number, number and type of sample containers including preservatives, parameters requested for analysis, signatures of persons and inclusive dates involved in the chain of possession. Upon delivery to the laboratory, the document will also include the name of the person receiving the samples and date and time the samples were received.

K. Analytical Methods

All samples selected for analysis will be analyzed by a State of California certified independent analytical laboratory. All samples are anticipated to be analyzed on 5-day standard turnaround time; however, rush turnaround times may be requested if necessary to expedite field activities.

Up to two (2) soil samples collected from each perimeter boring and one soil sample from the waste oil UST boring (9 soil samples total), and one (1) groundwater sample collected from each boring (5 groundwater samples total), will be analyzed for TPHd by EPA Method 8015B with silica gel cleanup and TPHg and VOCs (full scan, including BTEX and MTBE) by EPA method 8260B. Up to four (4) soil vapor samples collected from the perimeter probes will be analyzed for TPHg by EPA Method TO-3, BTEX and MTBE by EPA Method TO-15, and methane, oxygen and helium (leak detection gas) by ASTM D1946.

Up to one (1) soil vapor sample collected from the probe in the former waste oil UST vicinity will be analyzed for TPHg by EPA Method TO-3, full-scan VOCs including BTEX and MTBE by EPA Method TO-15, and methane, oxygen and helium (leak detection gas) by ASTM D1946.

L. Subsurface Investigation Report

A written report will be prepared for the proposed subsurface investigation, after the completion of all field work and receipt of analytical results. The report will be submitted to the ACEH. Included in the report will be soil boring logs, chain-of-custody documents and copies of the analytical laboratory reports, investigative findings, conclusions and recommendations. The report will be reviewed by a California Professional Geologist.

V. ENVIRONMENTAL MEASURES

Although widespread, significant concentrations of COCs were not encountered in subject property soil and ground water, localized elevated contaminant concentrations may pose soil and ground water management and potential health and safety issues which must be addressed during the proposed construction activities. In general, the soil and ground water management objective for the project includes minimization of construction worker, nearby resident, worker and pedestrian, and future property occupants' exposure to impacted soil and ground water.

A. Health and Safety Measures

The contractor for the project will be the party responsible for development and implementation of proper health and safety procedures, to minimize worker and public exposure to impacted soil during construction activities.

1. Health and Safety Plan

Potential health risks to workers and the public will be minimized through development and implementation of a comprehensive, site-specific HSP. The HSP will provide workers with an understanding of the contaminants present in site soils and ground water, as well as the potential chemical and physical hazards associated with the chemicals. The HSP will identify measures for protection of the public, procedures for entrance onto the project site during construction, general health and safety procedures and emergency response procedures, if needed. All personnel working on the subject property must read and understand the HSP, and strictly follow the outlined procedures. A copy of the HSP must be maintained on the subject property during construction, to be reviewed and updated as warranted.

The HSP also will describe health and safety training requirements for site personnel. Requirements include personnel training in accordance with Section 1910.120 of 29 Code of Federal Regulations (HazWoper training), in specific personal hygiene, and in the appropriate use of monitoring equipment which may be used during the project to protect and confirm the health and safety of workers and the public.

2. Health and Safety Officer

An on-site health and safety officer (HSO) for the project will be identified by the contractor. The HSO must be at the construction site at all times during excavation activities, to ensure compliance with the HSP is maintained. The HSO has the authority to direct and stop, if necessary, construction activities to ensure compliance with the HSP.

3. Measures for Protection of Public Health and Safety

The following health and safety measures will be implemented to protect the public from contamination in site soils.

- The site will be fenced to prevent access, and posted with the required Proposition 65 Toxic Enforcement Act and Safe Drinking Water Act warnings.
- Exposed soil will be watered at least twice a day, more if warranted, to prevent visible dust from migrating from the site.
- Soil being loaded onto trucks for off-haul, if any, will be watered to prevent visible dust.
- Soil being transported from the site in the back of trucks, if any, will be covered with a tarpaulin or similar cover.
- Wheels of vehicles leaving the subject property will be cleaned prior to entering city streets.
- If soil accumulates on city streets adjoining the site, sweeping will be performed.
- If winds at the subject property exceed 20 miles per hour, excavation and loading activities will be temporarily suspended.

B. Soil Management

Construction activities planned on the subject property that will involve disturbance to soil are limited to excavation activities for the new elevator shaft and foundation footings, as well as replacement of the sidewalks. Dust control measures will be implemented during all excavation tasks, to reduce potential exposure. Dust control measures may include moisture conditioning of soil with dust suppressants, watering and covering of exposed soil.

1. Soil Segregation

Based on soil quality data from the current investigation and that from previous investigations, soils identified as potentially requiring alternate disposal methods will be segregated from other soils on the site.

2. Soil Disposal

The contractor will select the appropriate Class I, Class II or Class III landfill to accept the generated soil, if any, as well as direct the off-haul schedule, and be responsible for coordination with the disposal facility. Confirmation of the off-haul, disposal and acceptance criteria for the soil at the selected disposal facility will be completed prior to initiation of excavation activities on the subject property. Trucks transporting soil will be appropriately lined and the soil securely covered.

The contractor, acting on behalf of the property owner, will be responsible for the regulatory paperwork and tracking activities associated with disposal of the soil. The contractor will be responsible for accurate completion of any required manifests; records of all soil shipped from the site will be maintained by the contractor and available for inspection on request. Disposal documentation will be included in the Site Closure Report (Section VI.A).

3. Soil Characterization

Additional soil quality analyses may be required of the excavated soil by landfills prior to acceptance. AllWest, at the request of the contractor, will be responsible for performance of required sampling. The contractor will be responsible for data submittal and acceptance verification from the facility. Establishment of post-excavation sampling and acceptance requirements will be conducted by the contractor prior to initiation of excavation.

C. Ground Water Management

Ground water is anticipated to be shallow on the subject property. Therefore, excavation activities may encounter ground water in quantities requiring removal. Based on ground water quality analyses conducted during the previous site investigations, COC concentrations in groundwater likely do not exceed East Bay Municipal Utility District (EBMUD) discharge limits. Discharge of water produced from construction dewatering to the sanitary sewer should be acceptable to EBMUD without treatment. Prior to discharge of ground water to the sanitary sewer system, the dewatering contractor will obtain a batch ground water discharge permit from EBMUD.

D. Confirmation Sampling

It is anticipated that confirmation sampling will not be conducted following completion of excavation activities, as excavations are minimal and significantly-impacted soil is not expected to be encountered beneath the bulk of the proposed building. Additionally, impacted soil remaining present on the subject property will be covered by the planned structure and imported backfill and not readily accessible to occupants and the general public. However, if staining, odors or elevated PID measurements are observed in soils below the excavation floors or along the sidewalls, confirmatory soil samples will be collected at these locations and analyzed for TPH-g, BTEX and MTBE by EPA method 8260B.

E. Dust Control Plan, Noise and Stormwater Control Measures, and Release Contingency Plan

1. Dust Control Plan

If construction activities in areas of impacted soil are to be conducted outside of the confining enclosure of a structure, a dust control plan is required. The contractor for the project will be the party responsible for development and implementation of the dust control plan and implementation of proper dust control procedures, to minimize worker and public exposure during construction activities.

2. Noise Control Measures

Noise generated by site construction activities will comply with City of Oakland noise ordinances. In general, noise generated by power equipment shall not exceed 80 decibels (dbA) at a distance of 100 feet from the equipment. Pavement breakers and jackhammers shall be equipped with noise attenuating shields or shrouds. All site personnel shall wear hearing protection when power equipment is in use.

3. Stormwater Control Measures

Prior to initiating construction activities, a Stormwater Pollution Prevention Plan (SWPPP) (prepared by the excavation contractor and specific to this project) will be implemented in accordance with the California State Water Resources Control Board (SWRCB) Order Number 2009-009-DWQ. Appropriate stormwater control measures will be established for the site by the contractor, to prevent runoff from reaching stormwater drains.

4. Release Contingency Plan

In the event of an encounter with unexpected contaminated soil, work will be temporarily suspended in the area and the construction contractor superintendant and AllWest will be notified. Containment, cleanup and disposal measures will be implemented. Observably impacted soil will be excavated to the extent practicable, and confirmatory soil samples collected. Excavated soil will be contained on-site, segregated from other excavated soil, prior to profiling, manifesting and transport to an appropriate offsite waste disposal facility.

In the event of a release of hazardous materials from equipment in use on the subject property, similar containment, cleanup and disposal measures will be implemented. Absorbent materials will be deployed to contain and clean up potential spills of hydraulic fluid. Soil contaminated by released hydraulic fluid will be excavated to the extent practicable, and confirmatory soil samples collected. Excavated soil will be contained on-site, segregated from other excavated soil; recovered hydraulic fluid and other contaminants will be contained onsite in 55-gallon waste drums, prior to profiling, manifesting and transport to an appropriate offsite waste disposal facility.

Historical subgrade structures, possibly including USTs, sumps or vaults, may be encountered during excavation activities on the subject property. If encountered, work also will be temporarily halted in that area and the construction contractor superintendant and AllWest notified. Appropriate measures, including permitting, removal, disposal and verification sampling by a licensed tank removal contractor if warranted, will be taken before proceeding with further excavation in the vicinity of the discovered structure.

V. REPORT PREPARATION

A. Closure Report

A closure report will be prepared by AllWest following completion of subsurface construction activities and disposal of generated soil and ground water. The report will include a timeline of construction activities, summary of analytical data (if any is generated), description of site mitigation and health and safety activities, and copies of manifests, bills of lading, certificates of treatment/disposal and other project-related documentation. The closure report also will include a certification statement that construction activities were performed in accordance with this SMP.

B. Post-Construction Risk Management

The post-construction element of the SMP contains measures to mitigate any long-term risks to human health after construction at the site is complete.

Any future construction that may disturb the building foundation to the extent that any of the underlying impacted soils may be exposed must be completed in a manner that is consistent with the SMP. Components of post-construction SMP provisions include prevention of exposure of site occupants or the public to impacted soils by capping the site with “clean” soil or the building’s proposed concrete foundations and establishing protocols for on-site workers engaged in subsurface excavation activities (e.g. utility repairs, work on building foundations, changes to paved areas).

VI. PROJECT STAFF AND SCHEDULE

Mr. Leonard P. Niles, P.G., C.H.G., a California Professional Geologist (PG 5774) and Certified Hydrogeologist (CHG 357), will provide technical oversight for this project and act as the project manager and regulatory liaison. Additionally, AllWest's staff of engineers, geologists, and technicians will be employed to perform the various tasks of the project. AllWest will inform the ACEH at least 10 days prior to the start of field activities, if warranted, and will inform the ACEH of any significant developments during the course of the investigations.

VII. LIMITATIONS

AllWest has prepared this SMP for the exclusive use of Ellwood Commercial Real Estate (Client) for this particular project and in accordance with generally accepted practices at the time of the work and with our written proposal. No other warranties, either expressed or implied are made as to the professional advice offered. This plan is not a specification for the proposed work and should not be used to bid out any of the proposed work found within. Reliance on this plan by any party other than the Client is at the user's sole risk.

VIII. REFERENCES

Cambria, *Work Plan for Additional Site Assessment, Former Texaco Service Station (Chevron 21-1173), 500 Grand Avenue, Oakland, California*, August 23, 2006.

CRA, *Site Conceptual Model and Case Closure Request, Former Texaco Station 21-1173 (Former Exxon No. 7-0237), 500 Grand Avenue, Oakland, California*, December 14, 2009.

AllWest, *Site Conceptual Model and Site Management Plan, 500 Grand Avenue, Oakland, California*, October 22, 2015.

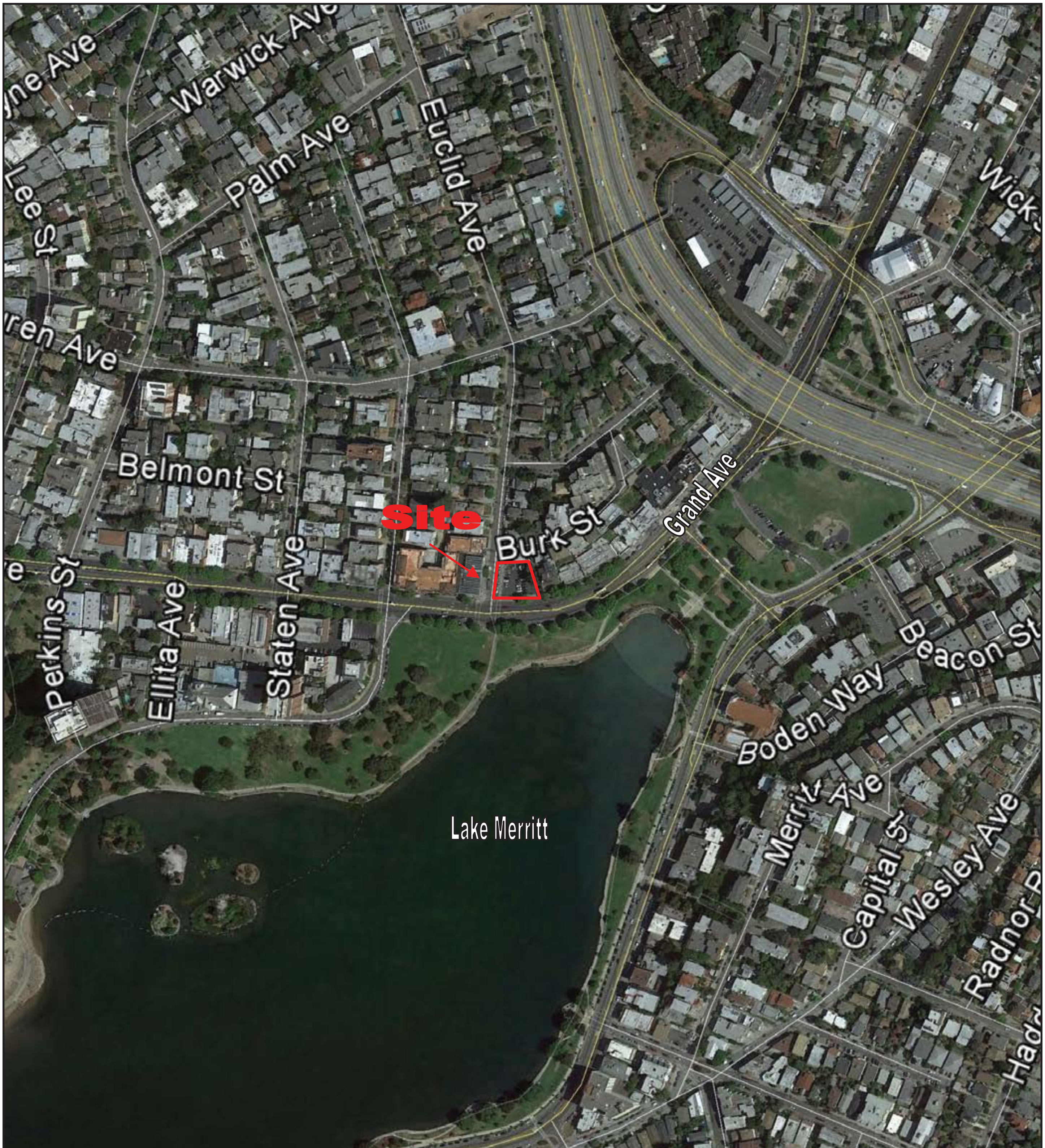
State of California Department of Toxics Substance Control (DTSC) and California Regional Water Quality Control Board, Los Angeles Region (LARWQCB), *Advisory – Active Soil Gas Investigations*, April, 2012.

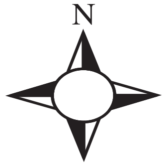
State of California Department of Water Resources (DWR), *California's Groundwater, Bulletin 118*, updated 2003.

State of California San Francisco Regional Water Quality Control Board (SFRWQCB), *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan),* June 29, 2013.

SFRWQCB, *User's Guide: Derivation and Application of Environmental Screening Levels,* Interim Final December 2013.

FIGURES





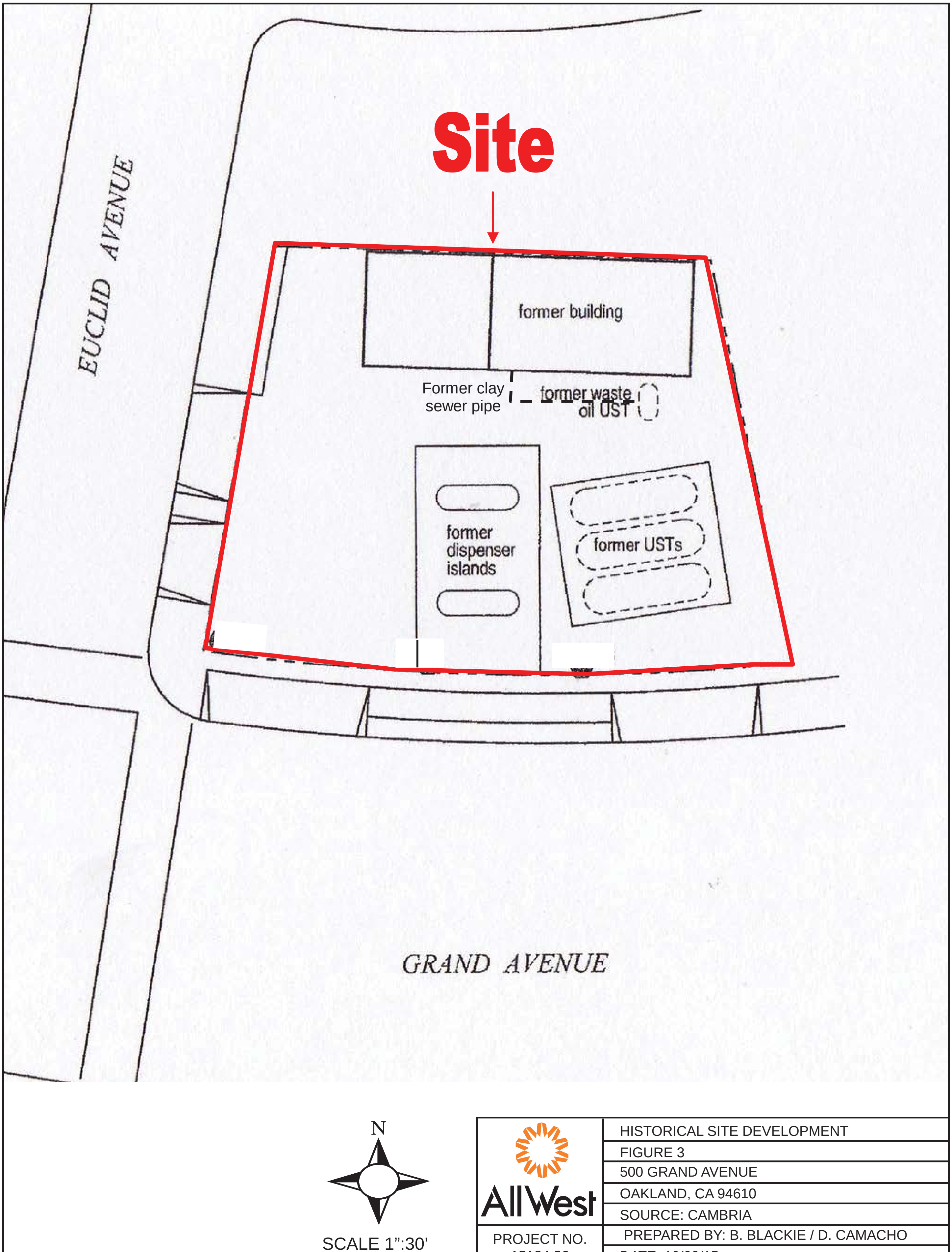
NOT TO SCALE

AllWest	SITE LOCATION MAP
	FIGURE 1
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: GOOGLE EARTH
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/22/15

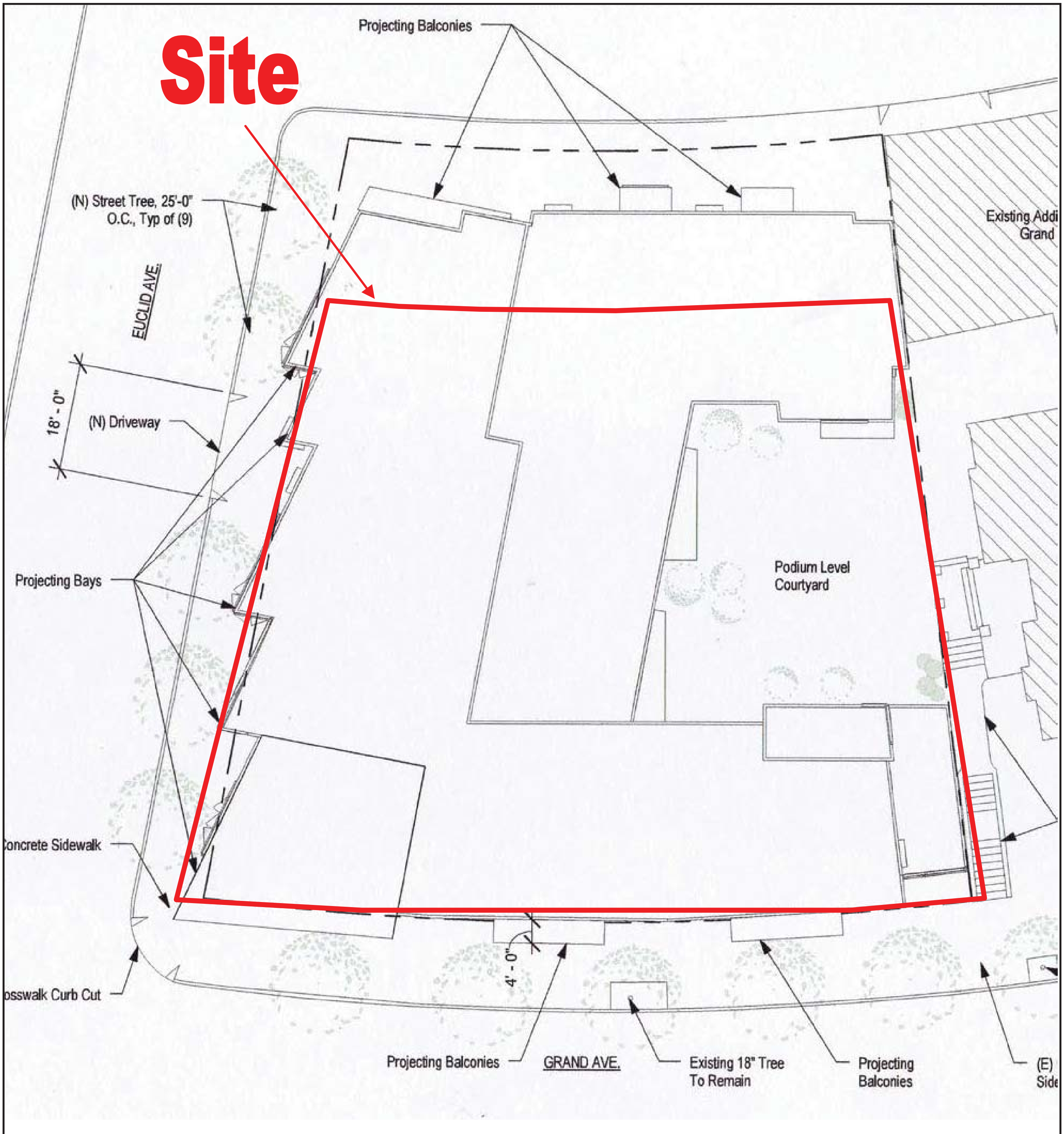
N

NOT TO SCALE

AllWest	CURRENT SITE CONFIGURATION
	FIGURE 2
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: GOOGLE EARTH
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/23/15



AllWest	HISTORICAL SITE DEVELOPMENT
	FIGURE 3
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: CAMBRIA
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/22/15



AllWest	PROPOSED SITE DEVELOPMENT
	FIGURE 4
	500 GRAND AVENUE
	OAKLAND, CA 94610
	SOURCE: KAVA MASSIH ARCHITECTS
PROJECT NO. 15184.36	PREPARED BY: B. BLACKIE / D. CAMACHO
	DATE: 10/22/15

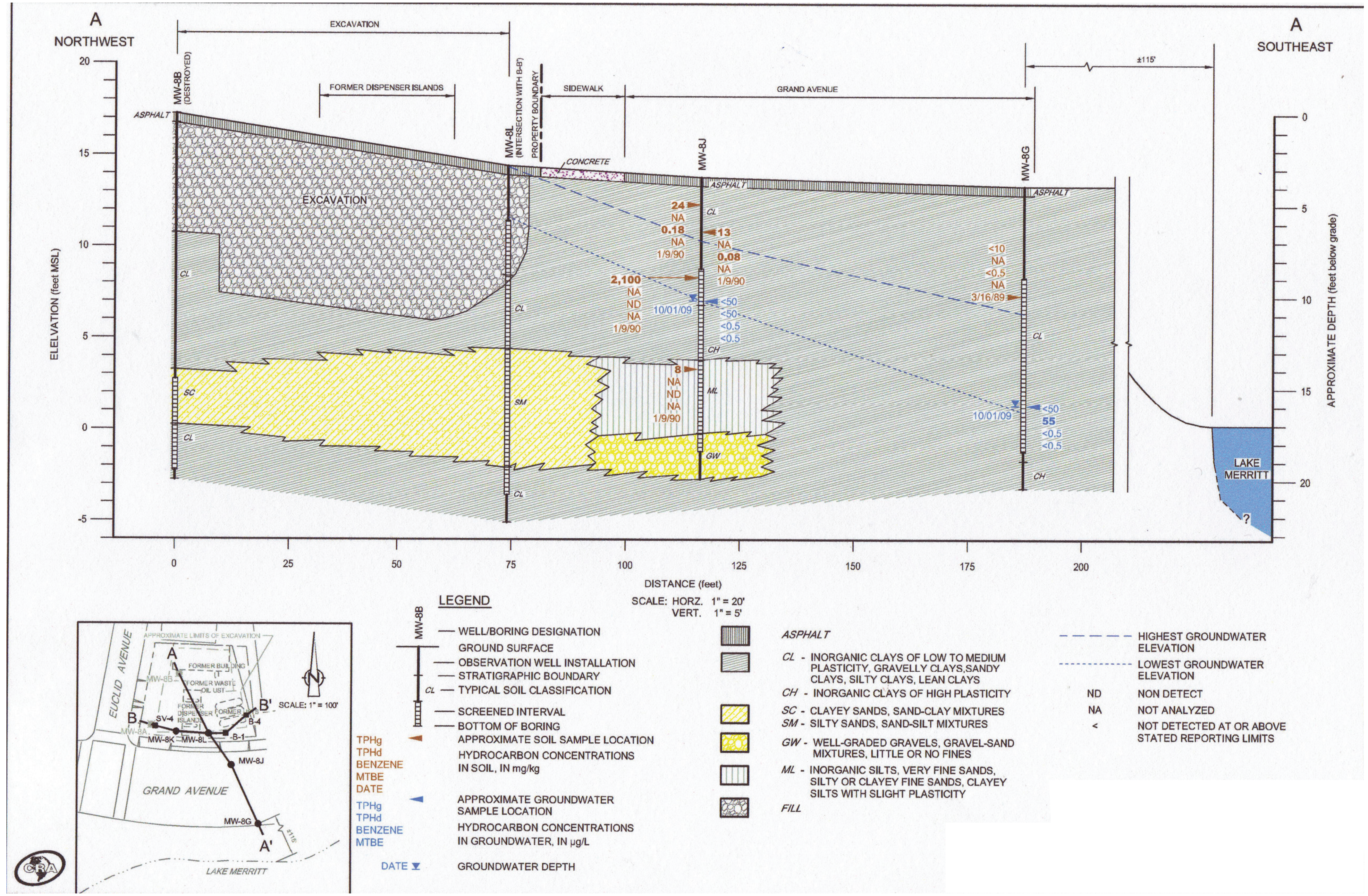


FIGURE 5.
GEOLOGIC CROSS SECTION A-A'

Date: 12/4/09
Photo ID No. CRA

N↑

AllWest

Site Name: 500 Grand Avenue
Oakland, California

Project Number: 15184.36

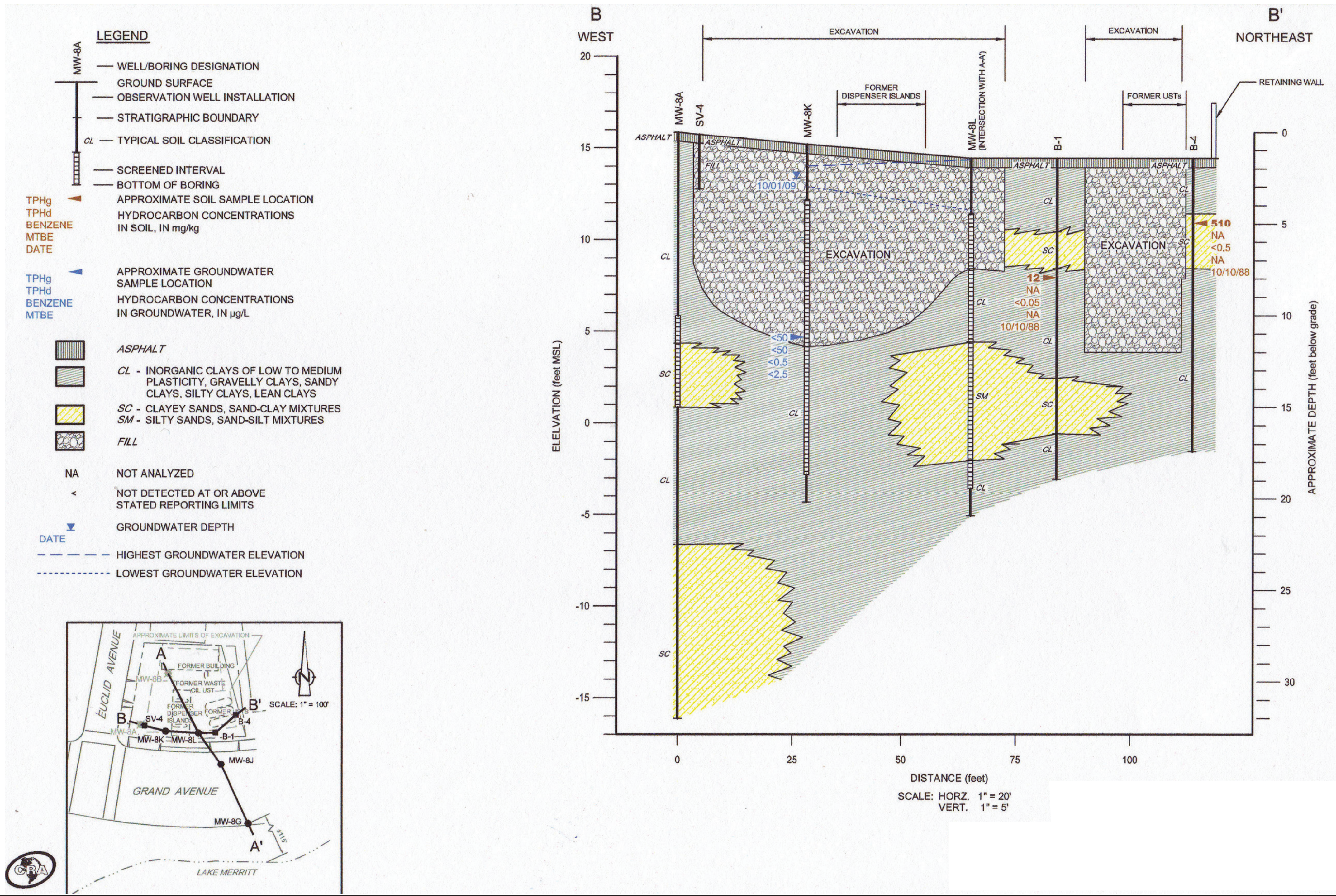
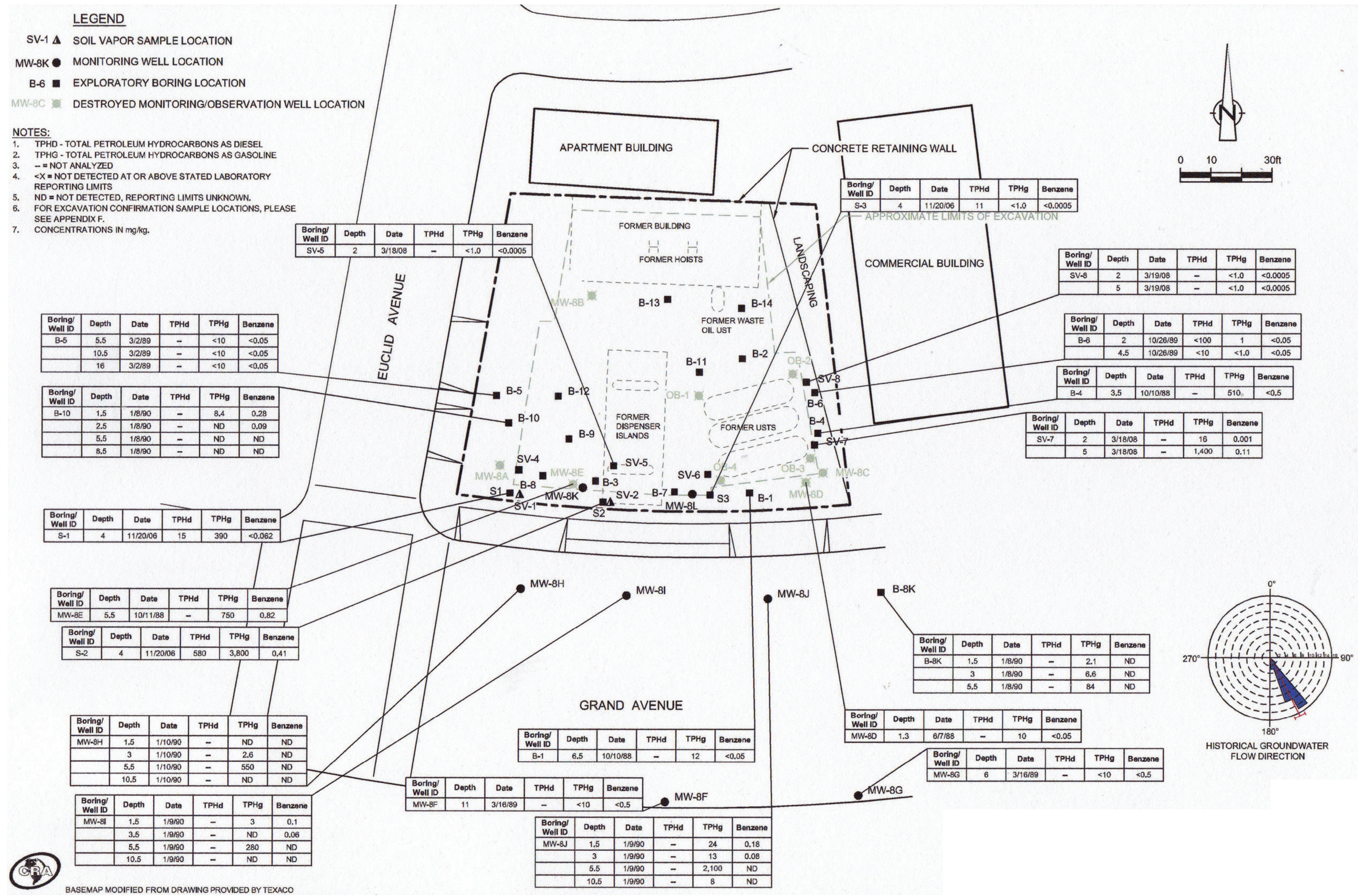


FIGURE 6. **GEOLOGIC CROSS SECTION B-B'**	**Date:** 12/4/09 **Photo ID No.** CRA **N↑**
AllWest	**Site Name:** 500 Grand Avenue Oakland, California **Project Number:** 15184.36



Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
SV-5	2	3/18/08	–	<1.0	<0.0005

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
S-3	4	11/20/06	11	<1.0	<0.0005

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
SV-8	2	3/19/08	–	<1.0	<0.0005
	5	3/19/08	–	<1.0	<0.0005

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
B-5	5.5	3/2/89	–	<10	<0.05
	10.5	3/2/89	–	<10	<0.05
	16	3/2/89	–	<10	<0.05

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
B-6	2	10/26/89	<100	1	<0.05
	4.5	10/26/89	<10	<1.0	<0.05

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
B-4	3.5	10/10/88	–	510	<0.5

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
B-10	1.5	1/8/90	–	8.4	0.28
	2.5	1/8/90	–	ND	0.09
	5.5	1/8/90	–	ND	ND
	8.5	1/8/90	–	ND	ND

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
SV-7	2	3/18/08	–	16	0.001
	5	3/18/08	–	1,400	0.11

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
S-1	4	11/20/06	15	390	<0.062

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
MW-8E	5.5	10/11/88	–	750	0.82

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
S-2	4	11/20/06	580	3,800	0.41

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
B-8K	1.5	1/8/90	–	2.1	ND
	3	1/8/90	–	6.6	ND
	5.5	1/8/90	–	84	ND

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
MW-8D	1.3	6/7/88	–	10	<0.05

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
B-1	6.5	10/10/88	–	12	<0.05

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
MW-8H	1.5	1/10/90	–	ND	ND
	3	1/10/90	–	2.6	ND
	5.5	1/10/90	–	550	ND
	10.5	1/10/90	–	ND	ND

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
MW-8G	6	3/16/89	–	<10	<0.5

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
MW-8F	11	3/16/89	–	<10	<0.5

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
MW-8I	1.5	1/9/90	–	3	0.1
	3.5	1/9/90	–	ND	0.06
	5.5	1/9/90	–	280	ND
	10.5	1/9/90	–	ND	ND

Boring/ Well ID	Depth	Date	TPHd	TPHg	Benzene
MW-8J	1.5	1/9/90	–	24	0.18
	3	1/9/90	–	13	0.08
	5.5	1/9/90	–	2,100	ND
	10.5	1/9/90	–	8	ND

FIGURE 7.
RESIDUAL CONTAMINANT CONCENTRATIONS IN SOIL

Date: 12/4/09
Photo ID No. CRA

N

AllWest

Site Name: 500 Grand Avenue
Oakland, California

Project Number: 15184.36

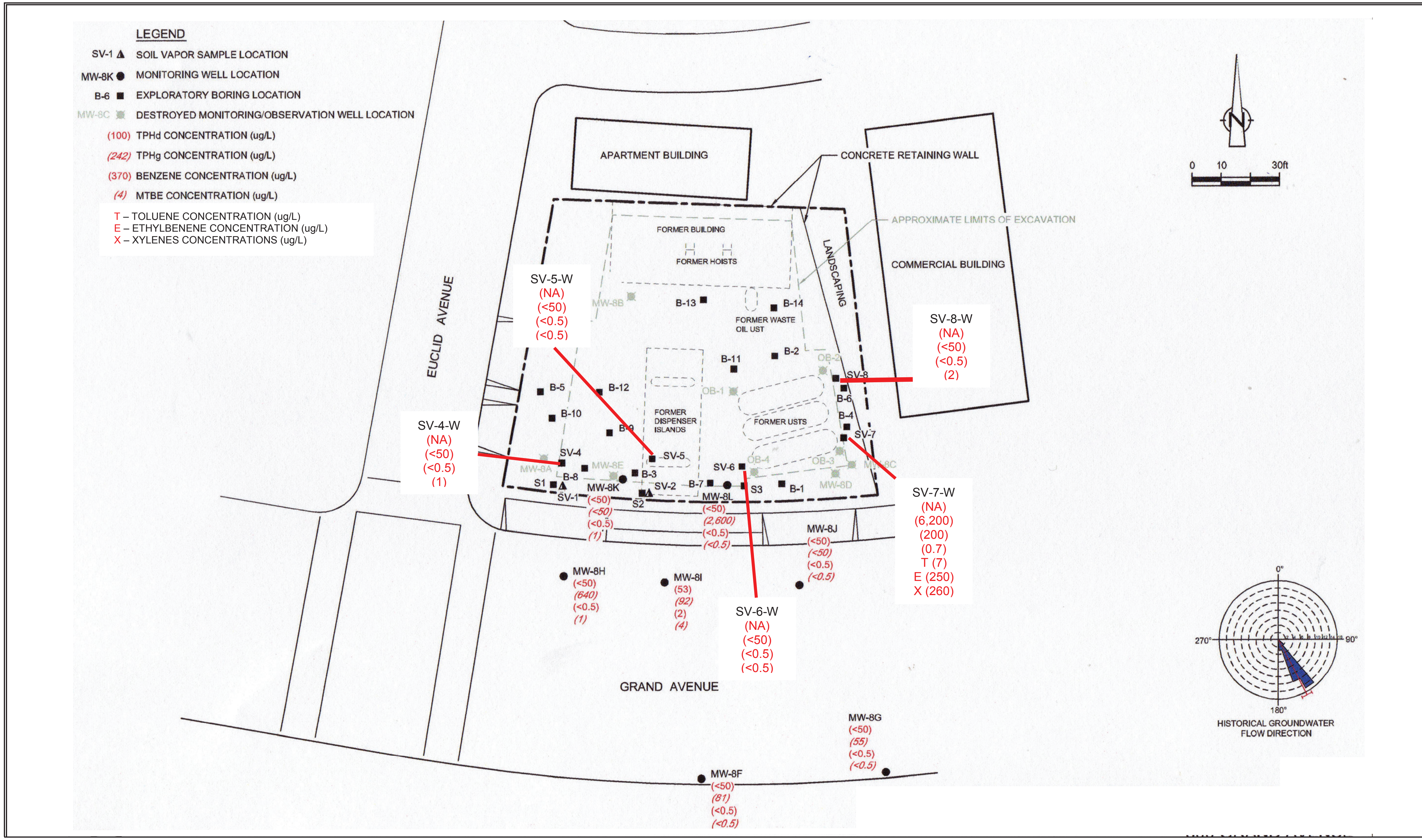


FIGURE 8.

RESIDUAL CONTAMINANT CONCENTRATIONS IN GROUND WATER

Date: 12/4/09

Photo ID No. CRA

N↑

AllWest

Site Name: 500 Grand Avenue, Oakland, California

Project Number: 15184.36

TABLES

Table 1. Residual Concentrations Reported in Soil (1988-2008)

(concentrations in mg/kg)

Sample ID (Year)	Depth (ft.)	Location on Site	TPHg	TPHd	B	T	E	X
B-5 (1989)	All to 16	Western Perimeter	<10	NA	<10	<0.1	<0.2	<0.1
B-10 (1990)	1.5	Western Perimeter	8.4	NA	0.28	ND	0.2	0.18
B-10 (1990)	2.5	Western Perimeter	ND	NA	0.09	ND	ND	ND
B-10 (1990)	5.5 & 8.5	Western Perimeter	ND	NA	ND	ND	ND	ND
S-1 (2006)	4	Southern Perimeter	390	15	<0.062	<0.12	0.9	1.9
ME-8E (1988)	5.5	Southern Perimeter (w/in excavation)	750	NA	***0.82***	6.5	***5.5***	26
S-2 (2006)	4	Southern Perimeter	***3,800***	***580***	0.41	17	***36***	170
SV-5 (2008)**	2	Southern Portion (w/in excavation)	<1.0	NA	<0.0005	<0.001	<0.001	<0.001
S-3 (2006)	4	Southern Perimeter	<1.0	11	<0.0005	<0.001	<0.001	<0.001
B-1 (1988)	6.5	Southern Perimeter	12	NA	<0.05	<0.1	<0.2	<0.1
MW-8D (1988)	1.3	Southeastern Corner	10	NA	<0.05	0.4	<0.2	0.5
SV-8 (2008)**	2	Eastern Perimeter	<1.0	NA	<0.0005	<0.001	<0.001	<0.001
SV-8 (2008)**	5	Eastern Perimeter	<1.0	NA	<0.0005	<0.001	<0.001	<0.001
B-6 (1989)	2	Eastern Perimeter	1	<100	<0.05	0.08	<0.05	<0.05
B-6 (1989)	4.5	Eastern Perimeter	<1.0	<10	<0.05	0.09	<0.05	<0.05
B-4 (1988)	3.5	Eastern Perimeter	510	NA	<0.05	1	3.5	13
SV-7 (2008)**	2	Eastern Perimeter	16	NA	0.001	<0.001	0.078	0.027
SV-7 (2008)**	5	Eastern Perimeter	***1,400***	NA	0.11	0.059	***15***	19
ESL*-Shallow Soil-Residential-Protection of Human Health			770	240	0.74	1,000	4.8	600
ESL*-Shallow Soil-Residential-GW is Not Potential DW Source			100	100	0.74	9.3	4.7	11

* ESL = San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for residential land use where groundwater is not a potential drinking water resource from Table B-1, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013.

**MTBE not detected

mg/kg = milligrams per kilogram

Concentrations exceeding ESL for protection of human health highlighted in ***bold*** font

Table 2. Residual Concentrations Reported in Ground Water (2008 & 2009)

(concentrations in µg/L)

Sample ID (Year)	Sample Type	Location on Site	TPHg	TPHd	B	T	E	X	MBTE
MW-8H (10/1/2009)	Well	Offsite to South	<50	640	<0.5	<0.5	<0.5	<0.5	1
MW-8I (10/1/2009)	Well	Offsite to South	53	92	2	<0.5	<0.5	<0.5	4
MW-8J (10/1/2009)	Well	Offsite to South	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5
MW-8K (10/1/2009)	Well	Southern Perimeter	<50	<50	<0.5	<0.5	<0.5	<0.5	1
MW-8L (6/10/2009)	Well	Southern Perimeter	2,600	<50	<0.5	<0.5	<0.5	<0.5	<0.5
SV-4-W (2008)	Grab	Southern Portion (w/in excavation)	<50	NA	<0.5	<0.5	<0.5	<0.5	1
SV-5-W (2008)	Grab	Southern Portion (w/in excavation)	<50	NA	<0.5	<0.5	<0.5	<0.5	<0.5
SV-6-W (2008)	Grab	Southern Portion (w/in excavation)	<50	NA	<0.5	<0.5	<0.5	<0.5	<0.5
SV-7-W (2008)	Grab	Eastern Perimeter	6,200	NA	200	7	250	260	0.7
SV-8-W (2008)	Grab	Eastern Perimeter	<50	NA	<0.5	<0.5	<0.5	<0.5	2
ESL*-Commercial-Ground Water-Evaluation of Potential Vapor Intrusion			NV	NV	270	NV	3,100	NV	100,000
ESL*-Residential-Ground Water-Evaluation of Potential Vapor Intrusion			NV	NV	27	95,000	310	37,000	9,900
ESL**-Residential-Ground Water-Not Potential DW Source			500	640	27	130	43	100	1,800

* ESL = San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for Evaluation of Potential Vapor Intrusion, residential land use, from Table E-1, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013.

** ESL = RWQCB ESLs for residential land use where groundwater is not a potential drinking water resource from Table F-1b, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013

µg/L = micrograms per liter

Concentrations exceeding ESL indicating potential vapor intrusion concern for commercial use highlighted in **bold** font

NR-not reported; NV-no value, NA –not analyzed

Table 3. Residual Concentrations Reported in Soil Vapor (2006)

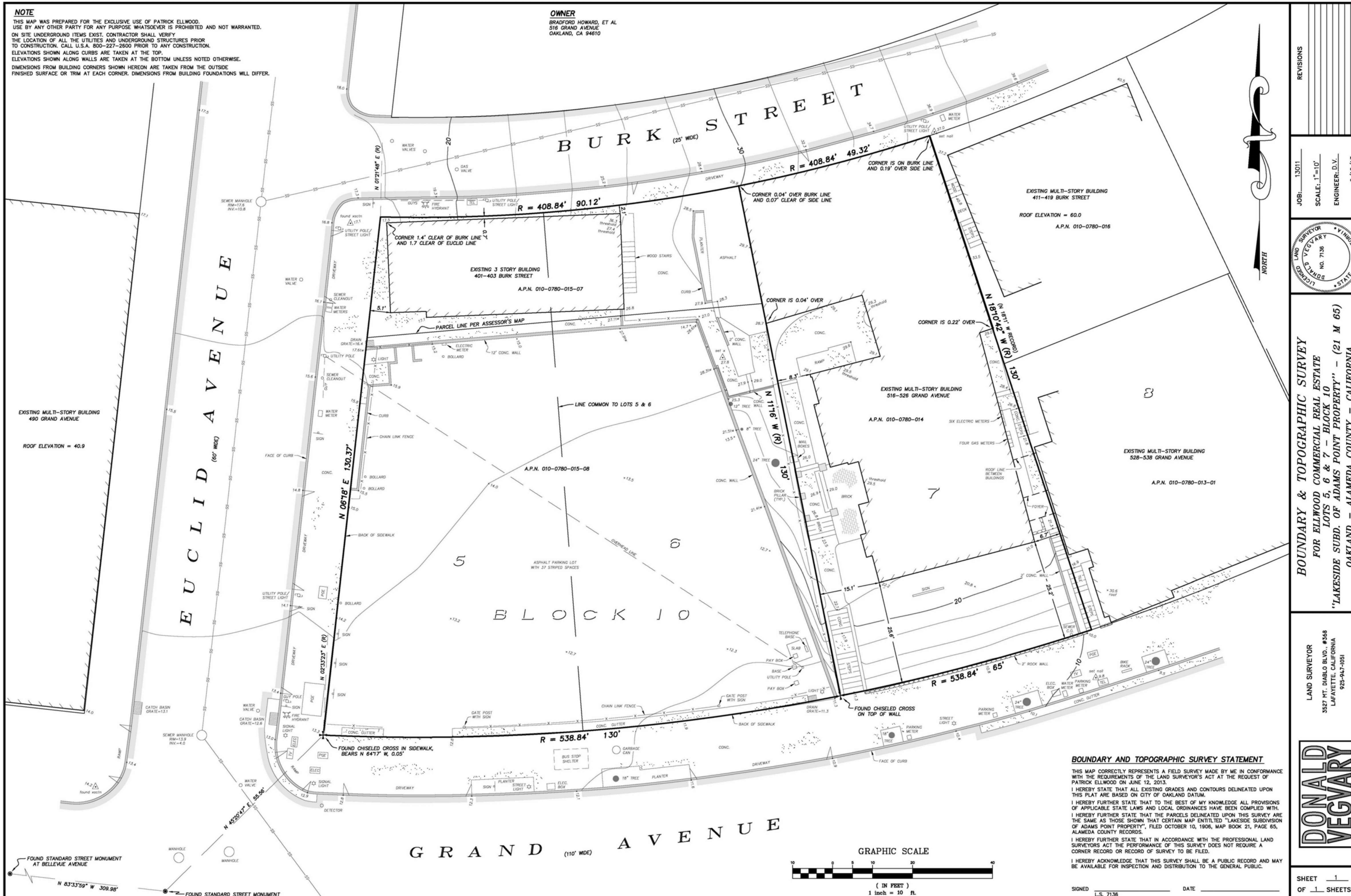
(concentrations in $\mu g/m^3$)

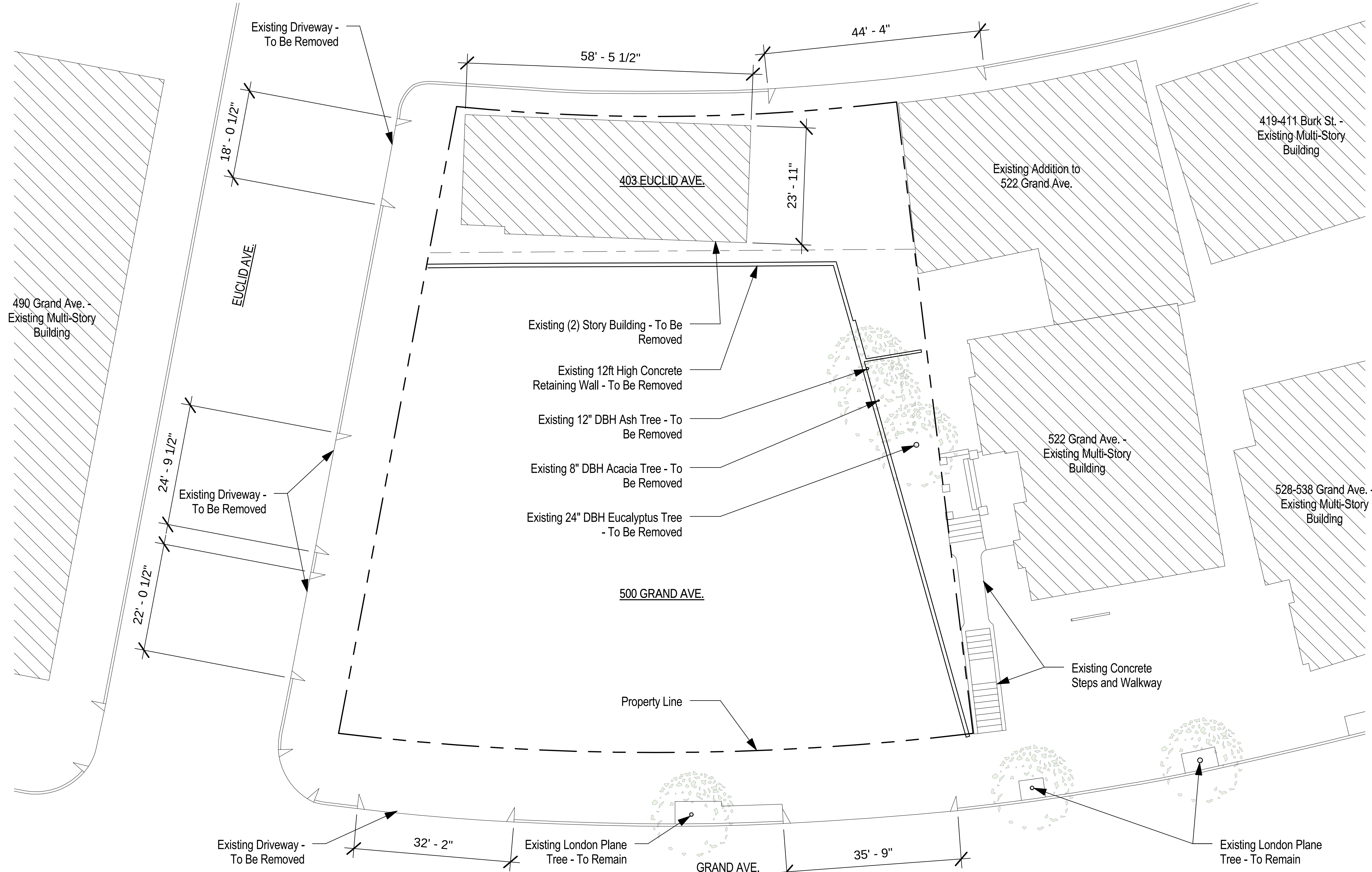
Sample ID (Year)	Sample Type	Location on Site	TPHg	TPHd	B	T	E	X	MBTE
SV-1 (11/20/2006)	Soil Vapor (4 ft bgs)	Southern Perimeter	60,000	NA	***3,400***	330	***2,600***	380	NA
SV-2 (11/20/2006)	Soil Vapor (4 ft bgs)	Southern Perimeter	2,000,000	NA	***34,000***	160,000	***64,000***	280,000	NA
SV-2 Duplicate (11/20/2006)	Soil Vapor (4 ft bgs)	Southern Perimeter	720,000	NA	***14,000***	69,000	***27,000***	110,000	NA
ESL*- Commercial - Soil Gas (Vapor Intrusion Concerns)			2,500,000	570,000	420	1,300,000	4,900	440,000	47,000
ESL*- Residential - Soil Gas (Vapor Intrusion Concerns)			300,000	68,000	42	160,000	490	52,000	4,700

* ESL = San Francisco Bay Regional Water Quality Control Board (RWQCB) Environmental Screening Levels (ESLs) for indoor Air and Soil Gas (Vapor Intrusion Concerns), commercial/industrial and residential land use, from Summary Table E, User's Guide: Derivation and Application of Environmental Screening Levels. RWQCB, Interim Final - December 2013.
$\mu g/m^3$ = micrograms per cubic meter
NR-not reported; NV-no value, NA –not analyzed
Concentrations exceeding ESL for commercial/industrial land use highlighted in ***bold*** font

APPENDIX A

PROPOSED BUILDING PLANS


NOTE
THIS MAP WAS PREPARED FOR THE EXCLUSIVE USE OF PATRICK ELLWOOD.
USE BY ANY OTHER PARTY FOR ANY PURPOSE WHATSOEVER IS PROHIBITED AND NOT WARRANTED.
ON SITE UNDERGROUND ITEMS EXIST. CONTRACTOR SHALL VERIFY THE LOCATION OF ALL THE UTILITIES AND UNDERGROUND STRUCTURES PRIOR TO CONSTRUCTION. CALL U.S.A. 800-227-2600 PRIOR TO ANY CONSTRUCTION.
ELEVATIONS SHOWN ALONG CURBS ARE TAKEN AT THE TOP.
ELEVATIONS SHOWN ALONG WALLS ARE TAKEN AT THE BOTTOM UNLESS NOTED OTHERWISE.
DIMENSIONS FROM BUILDING CORNERS SHOWN HEREON ARE TAKEN FROM THE OUTSIDE FINISHED SURFACE OR TRIM AT EACH CORNER. DIMENSIONS FROM BUILDING FOUNDATIONS WILL DIFFER.
OWNER
BRADFORD HOWARD, ET AL
516 GRAND AVENUE
OAKLAND, CA 94610
BURK STREET (25' WIDE)
EUCLID AVENUE (60' WIDE)
GRAND AVENUE (110' WIDE)
BLOCK 10
R = 408.84' 90.12'
R = 408.84' 49.32'
R = 538.84' 130'
R = 538.84' 65'
N 06°18' E 130.37'
N 11°16' W (R) 130'
N 18°10'42" W (R) 130'
N 01°21'48" E (R)
N 02°33'23" E (R)
N 45°20'47" E 55.56'
N 83°33'59" W 309.98'
EXISTING 3 STORY BUILDING
401-403 BURK STREET
A.P.N. 010-0780-015-07
CORNER 1.4' CLEAR OF BURK LINE AND 1.7 CLEAR OF EUCLID LINE
PARCEL LINE PER ASSESSOR'S MAP
LINE COMMON TO LOTS 5 & 6
A.P.N. 010-0780-015-08
ASPHALT PARKING LOT WITH 37 STRIPED SPACES
EXISTING MULTI-STORY BUILDING
411-419 BURK STREET
ROOF ELEVATION = 60.0
A.P.N. 010-0780-016
CORNER 0.04' OVER BURK LINE AND 0.07' CLEAR OF SIDE LINE
CORNER IS ON BURK LINE AND 0.19' OVER SIDE LINE
CORNER IS 0.04' OVER
CORNER IS 0.22' OVER
EXISTING MULTI-STORY BUILDING
516-526 GRAND AVENUE
A.P.N. 010-0780-014
EXISTING MULTI-STORY BUILDING
528-538 GRAND AVENUE
A.P.N. 010-0780-013-01
EXISTING MULTI-STORY BUILDING
490 GRAND AVENUE
ROOF ELEVATION = 40.9
FOUND CHISELED CROSS IN SIDEWALK, BEARS N 64°17' W, 0.05'
FOUND CHISELED CROSS ON TOP OF WALL
FOUND STANDARD STREET MONUMENT AT BELLEVUE AVENUE
FOUND STANDARD STREET MONUMENT
NORTH
GRAPHIC SCALE
(IN FEET)
1 inch = 10 ft.
BOUNDARY AND TOPOGRAPHIC SURVEY STATEMENT
THIS MAP CORRECTLY REPRESENTS A FIELD SURVEY MADE BY ME IN CONFORMANCE WITH THE REQUIREMENTS OF THE LAND SURVEYOR'S ACT AT THE REQUEST OF PATRICK ELLWOOD ON JUNE 12, 2013.
I HEREBY STATE THAT ALL EXISTING GRADES AND CONTOURS DELINEATED UPON THIS PLAT ARE BASED ON CITY OF OAKLAND DATUM.
I HEREBY FURTHER STATE THAT TO THE BEST OF MY KNOWLEDGE ALL PROVISIONS OF APPLICABLE STATE LAWS AND LOCAL ORDINANCES HAVE BEEN COMPLIED WITH.
I HEREBY FURTHER STATE THAT THE PARCELS DELINEATED UPON THIS SURVEY ARE THE SAME AS THOSE SHOWN THAT CERTAIN MAP ENTITLED "LAKESIDE SUBDIVISION OF ADAMS POINT PROPERTY", FILED OCTOBER 10, 1906, MAP BOOK 21, PAGE 65, ALAMEDA COUNTY RECORDS.
I HEREBY FURTHER STATE THAT IN ACCORDANCE WITH THE PROFESSIONAL LAND SURVEYORS ACT THE PERFORMANCE OF THIS SURVEY DOES NOT REQUIRE A CORNER RECORD OR RECORD OF SURVEY TO BE FILED.
I HEREBY ACKNOWLEDGE THAT THIS SURVEY SHALL BE A PUBLIC RECORD AND MAY BE AVAILABLE FOR INSPECTION AND DISTRIBUTION TO THE GENERAL PUBLIC.
SIGNED
L.S. 7136
DATE
REVISIONS
JOB: 13011
SCALE: 1"=10'
ENGINEER: D.V.
DATE: 6/12/13
DONALD VEGVARY
NO. 7136
BOUNDARY & TOPOGRAPHIC SURVEY
FOR ELLWOOD COMMERCIAL REAL ESTATE
LOTS 5, 6 & 7 - BLOCK 10
"LAKESIDE SUBD. OF ADAMS POINT PROPERTY" - (21 M 65)
OAKLAND - ALAMEDA COUNTY - CALIFORNIA
LAND SURVEYOR
3527 MT. DIABLO BLVD., #368
LAFAYETTE, CALIFORNIA
925-947-1051
DONALD VEGVARY
SHEET 1
OF 1 SHEETS
13011-ELLWOOD-6/20/13



Existing / Demolition Site Plan

1" = 20'-0"

04/29/2015

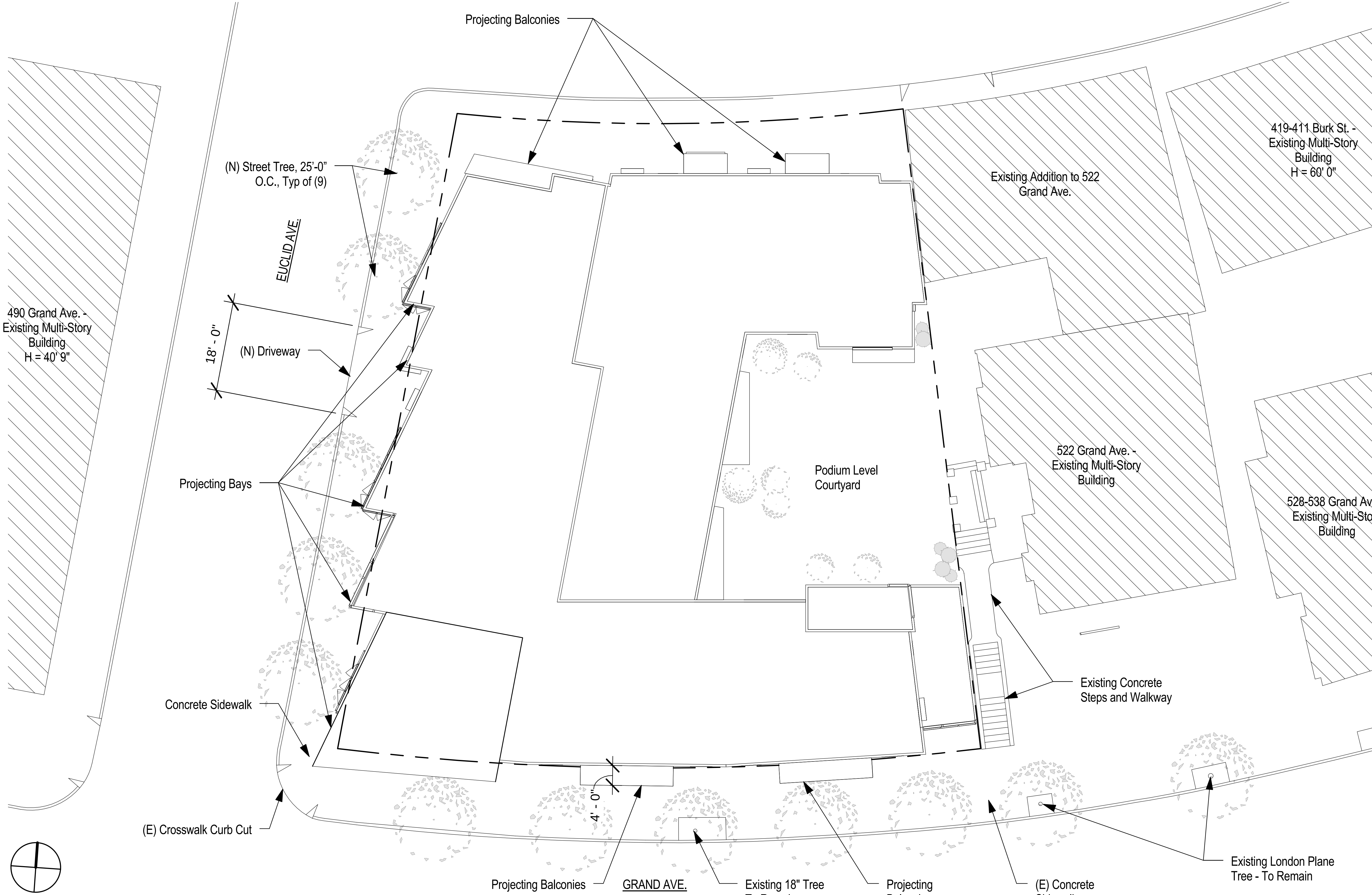
500 GRAND AVE. | OAKLAND, CA

A1.1

KAVA MASSIH ARCHITECTS

920 Grayson Street | Berkeley, CA 94710

KMA PROJECT NO. 1403



Site Plan

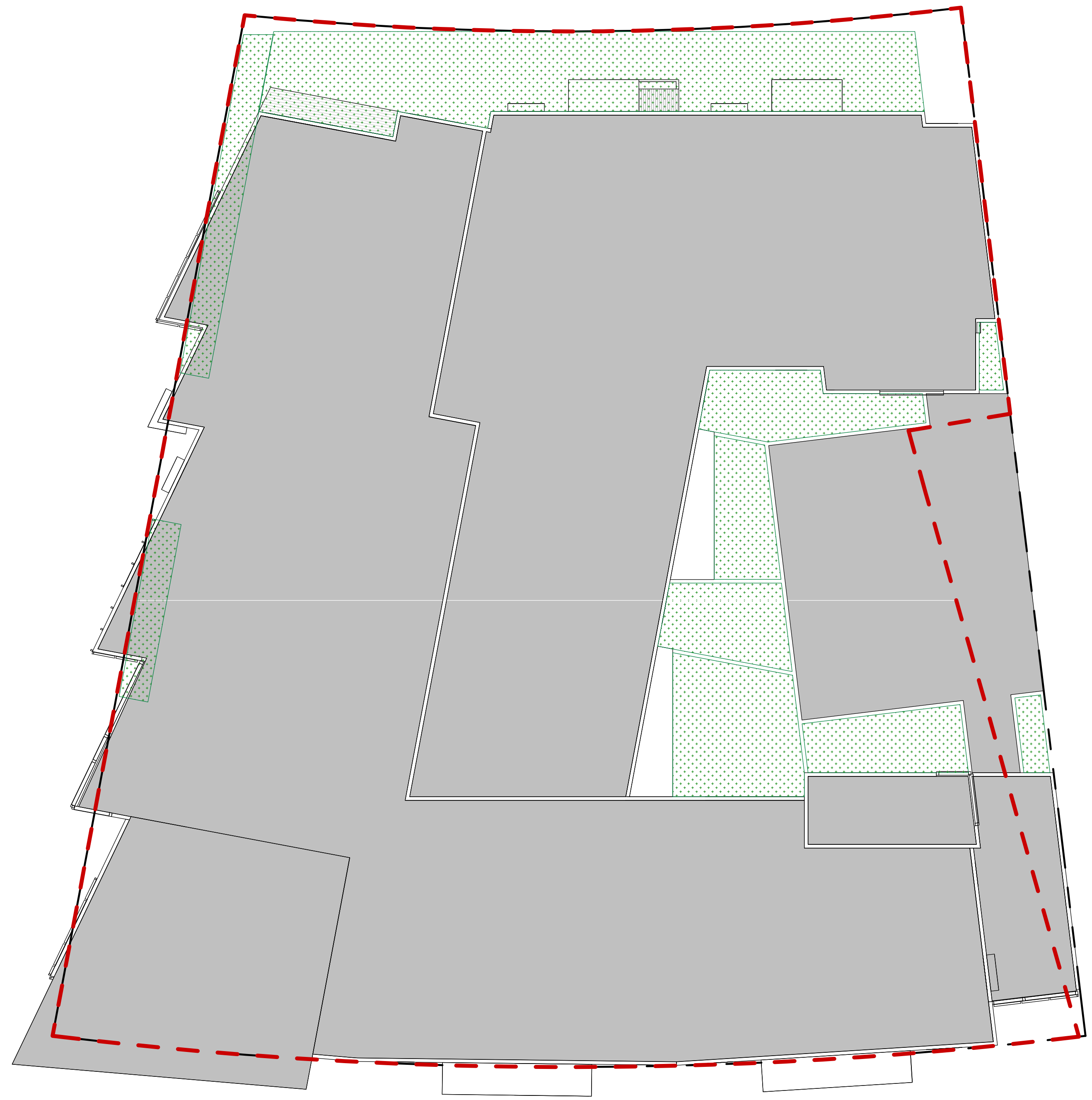
1" = 20'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A1.2

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403

Existing impervious surface	=	13,767 SF
Roof Area	=	10,207 SF
Planter Area	=	2,029 SF



Preliminary Post-Construction Stormwater Management Plan

1" = 20'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A1.3

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710

KMA PROJECT NO. 1403

Parking Schedule

Accessible Spaces	2
Lift Spaces	45

Total: 47

1st Floor Plan

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A2.1

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403

Unit Schedule

Unit Type	#	Typ. Area
1-Bed	18	795 SF
2-Bed	21	1,060 SF
Total	39	

2nd Floor Plan

1/16" = 1'-0"

04/29/2015

500 GRAND AVE. | OAKLAND, CA

A2.2

KAVA MASSIH ARCHITECTS

920 Grayson Street | Berkeley, CA 94710

KMA PROJECT NO. 1403

3rd Floor Plan

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A2.3

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710

KMA PROJECT NO. 1403

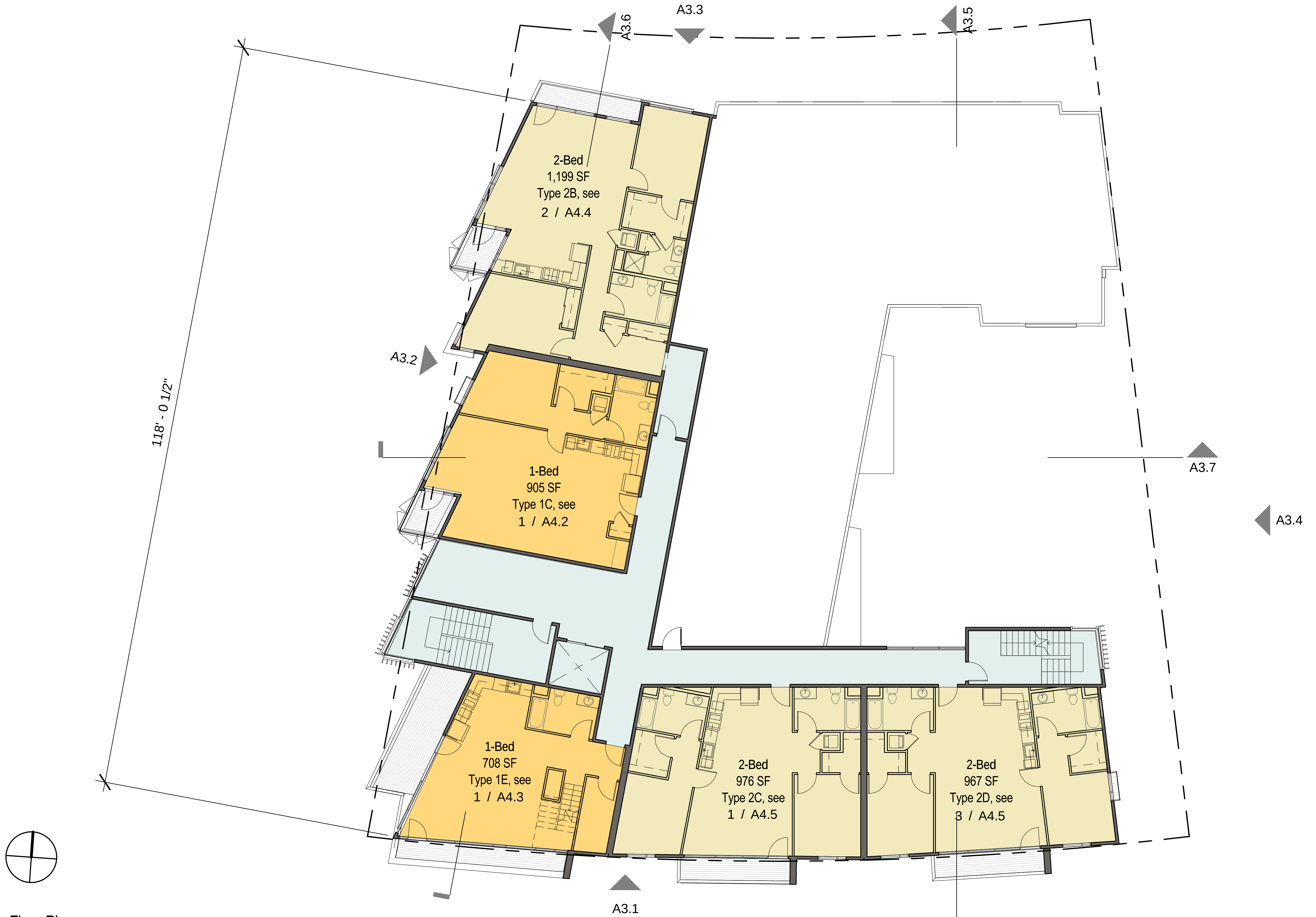
4th & 5th Floor Plans

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A2.4

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403



6th Floor Plan

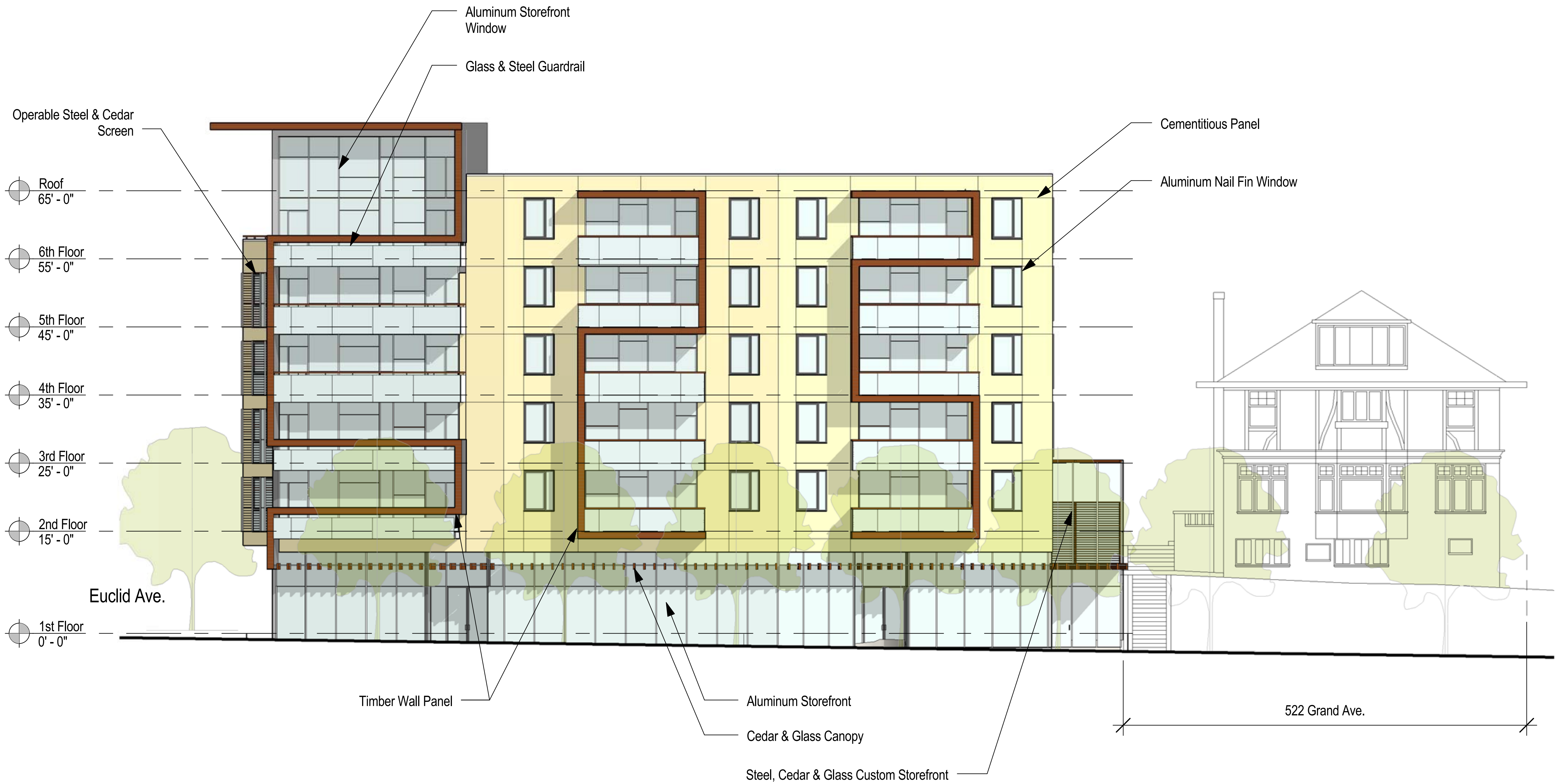
1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A2.6

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710

KMA PROJECT NO. 1403



South Elevation (Grand Ave.)

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A3.1

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403

West Elevation (Euclid Ave.)

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A3.2

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403

North Elevation (Burk St.)

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A3.3

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403

East Elevation

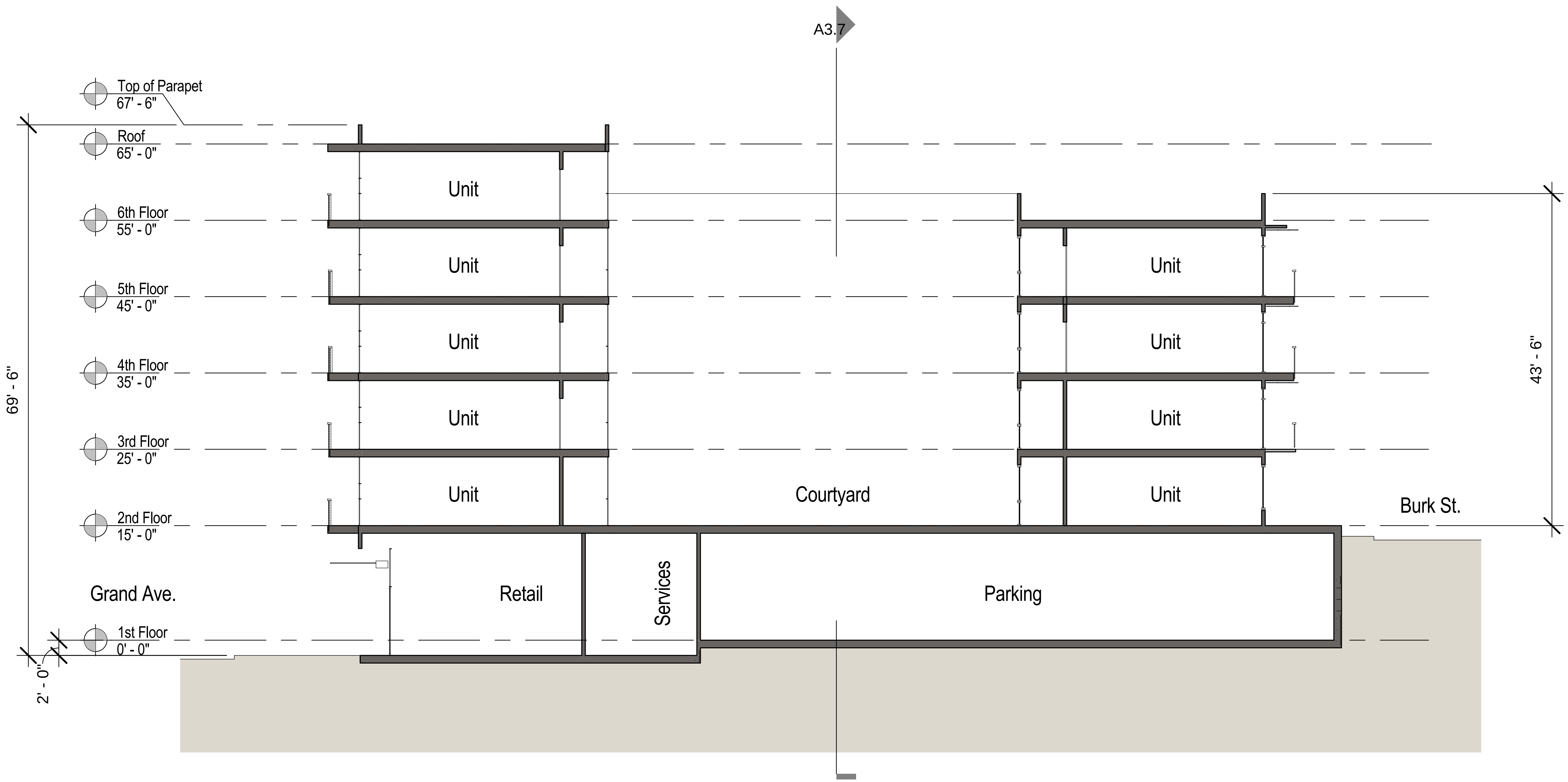
1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A3.4

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710

KMA PROJECT NO. 1403



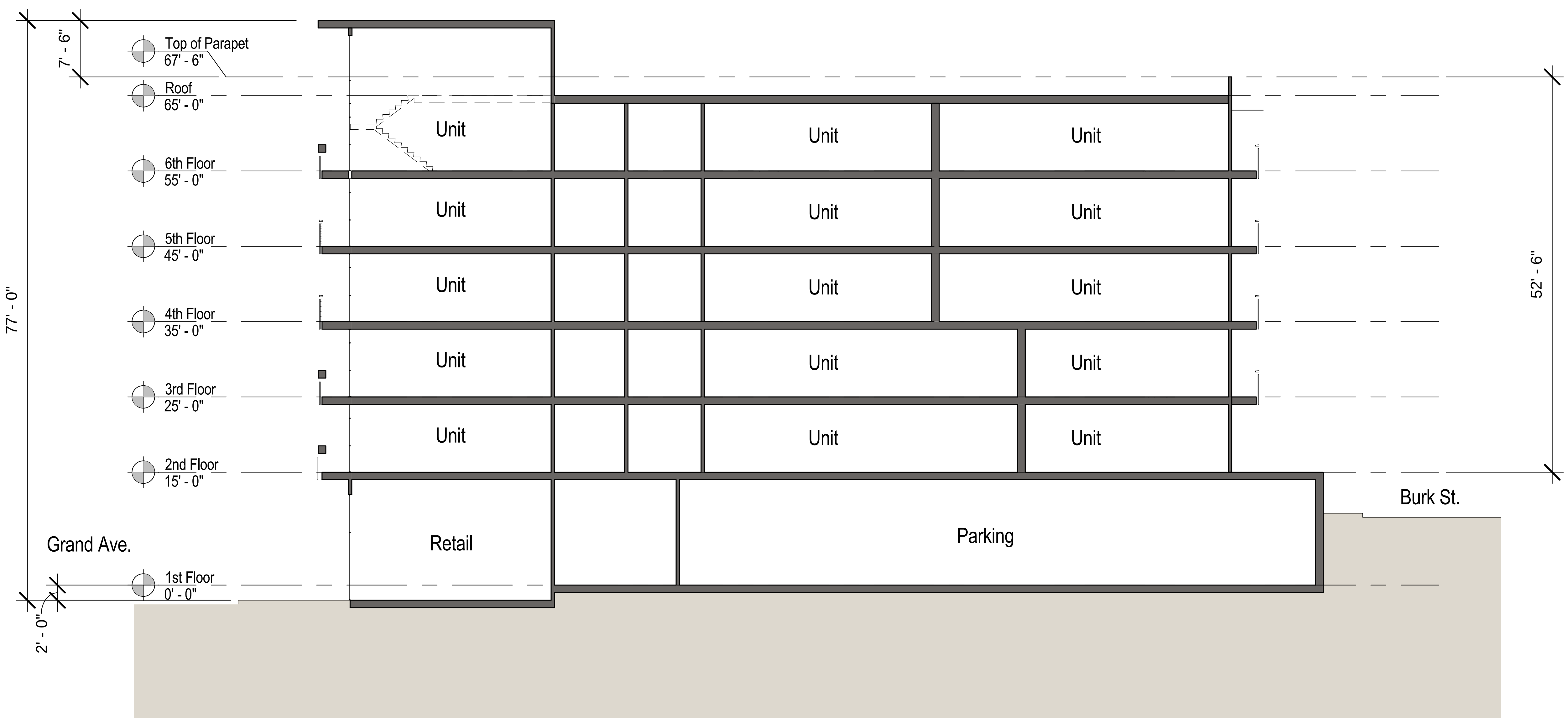
North-South Section At Courtyard

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A3.5

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403



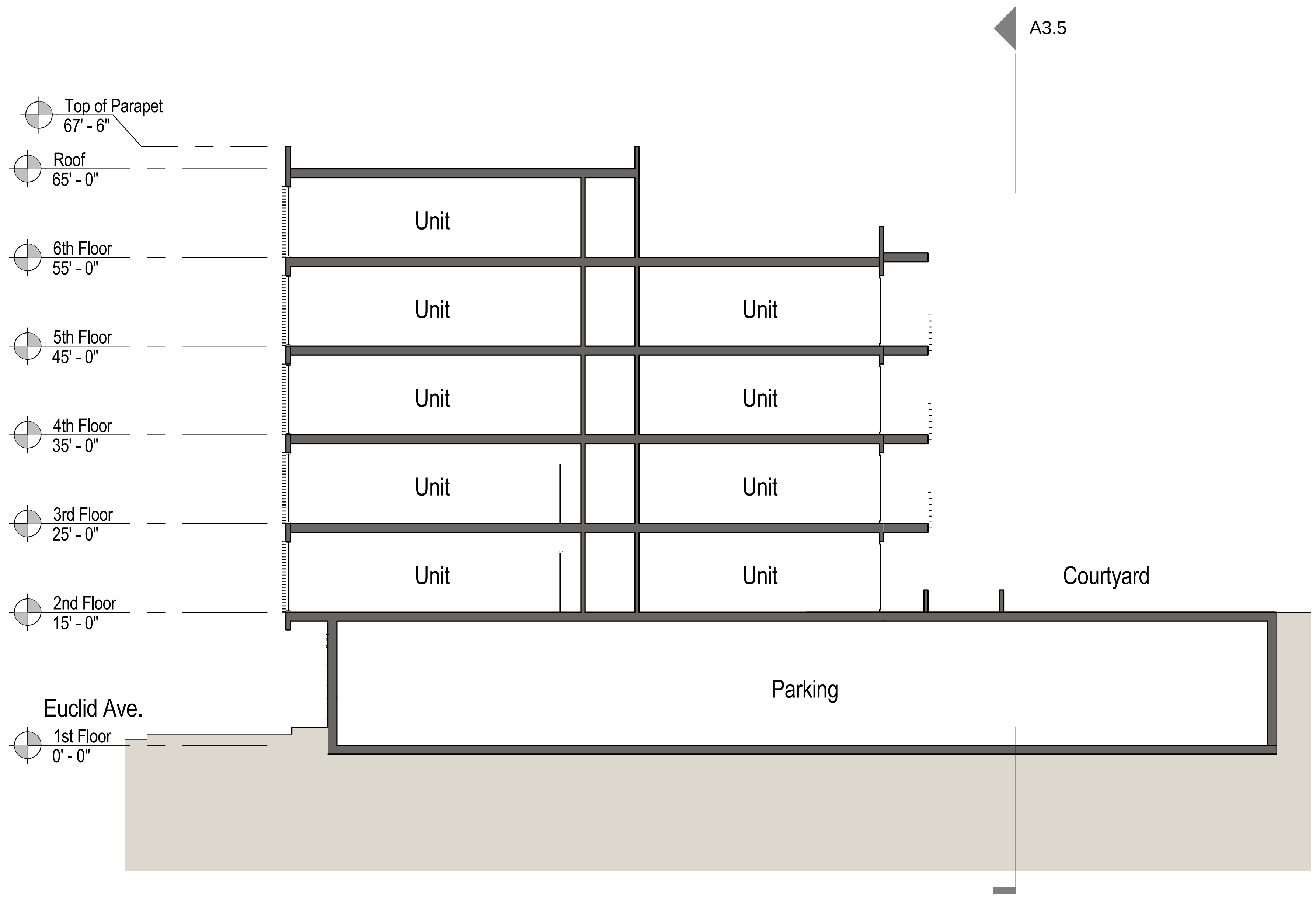
North-South Section

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A3.6

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403



East-West Section

1/16" = 1'-0"
04/29/2015

500 GRAND AVE. | OAKLAND, CA

A3.7

KAVA MASSIH ARCHITECTS
920 Grayson Street | Berkeley, CA 94710
KMA PROJECT NO. 1403

APPENDIX B

STANDARD GEOPROBE® DPT SOIL AND GROUNDWATER SAMPLING PROCEDURES

AllWest

STANDARD GEOPROBE™ DPT SAMPLING PROCEDURES

Soil Sampling

Direct push technology (DPT) soil core sampling using Geoprobe™ or similar methods is accomplished using a nominal 4-foot long, 2-inch diameter stainless steel steel drive probe and extension rods. The drive probe is equipped with nominal 1-1/2 inch diameter clear plastic poly tubes that line the interior of the probe. The probe and insert tubes are together pneumatically driven using a percussion hammer in 4-foot intervals. After each drive interval the drive probe and rods are retrieved to the surfaced. The poly tube containing subsurface soil is then removed. The drive probe is then cleaned, equipped with a new poly tube and reinserted into the boring with extension rods as required. The apparatus is then driven following the above procedure until the desired depth is obtained. The poly tubes and soil are inspected after each drive interval with lithologic and relevant drilling observations recorded. Soil samples are screened for organic vapors using an organic vapor meter (OVM), photo-ionization detector (PID) or other appropriate device. OVM/PID readings, soil staining and other relevant observations are recorded. Selected soil sample intervals can be cut from the 4-foot intervals for possible analytical or geotechnical testing or other purposes.

The soils contained in the sample liners are then classified according to the Uniform Soil Classification System and recorded on the soil boring logs.

Sample liners selected for laboratory analyses are sealed with Teflon sheets, plastic end caps, and silicon tape. The sealed sample liner is then labeled, sealed in a plastic bag, and placed in an ice chest cooled to 4°C with crushed ice for temporary field storage and transportation. The standard chain-of-custody protocol is maintained for all soil samples from the time of collection to arrival at the laboratory.

Groundwater Sampling

Groundwater sampling is performed after the completion of soil sampling and when the boring has reached its desired depth. The steel probe and rods are then removed from the boring and new, nominal 1-inch diameter PVC solid and perforated temporary casing is lowered into the borehole. Alternatively, a retractable screen sampling device such as a Hydropunch™ can be driven to the desired depth and pulled back to expose the screened interval. Depth to water is then measured using an electronic groundwater probe. Groundwater samples are collected using a stainless steel bailer, disposable Teflon™ bailer, or check valve or peristaltic pump with disposable Teflon™ or polyethylene sample tubing.

After the retrieval of the bailer, groundwater contained in the bailer (or discharged from sample tubing) is decanted into laboratory provided containers. The containers are then sealed with Teflon coated caps with no headspace, labeled, and placed in an ice chest for field storage and transportation to a state certified analytical laboratory. The standard chain-of-custody protocols are followed from sample collection to delivery to the laboratory. A new bailer (or sample tubing) is used for each groundwater sampling location to avoid cross contamination.

APPENDIX C

STANDARD GEOPROBE® DPT SOIL VAPOR PROBE INSTALLATION AND SAMPLING PROCEDURES

STANDARD GEOPROBE® AND SUB-SLAB PROBE SOIL VAPOR SAMPLING PROCEDURES

Geoprobe® DPT PRT Temporary Soil Vapor Probe Advancement

The Geoprobe® Direct Push Technology (DPT) Post Run Tubing (PRT) soil vapor sampling process involves driving into the subsurface a disposable Geoprobe® DPT sampling probe with expendable tip and a PRT adapter that are connected to 4-foot sections of Geoprobe® 1.25-inch inside diameter (ID) extension rods. The PRT adapter has a reverse-thread adapter at the upper end to allow the connection of flexible soil vapor sampling tubing with a PRT tubing adaptor after the installation (post-run) of the tip. The entire sampling assembly, the sampling tip, PRT adapter, and the Geoprobe® extension rods, is driven into the subsurface by a truck-mounted hydraulic percussion hammer. The sampler is driven to the desired depth as additional rods are connected. At the desired sampling depth, typically 5 feet below ground surface (bgs) a sufficient length of disposable flexible polyethylene or Teflon® sample tubing is first lowered through the center of the extension rod and connected to the PRT adapter. The extension rod is then retracted 3 to 4 inches to create a small void around the PRT adapter and the expendable sampling tip for extracting a soil vapor sample from that location. Bentonite chips will be used to fill the annular space between the probe and the subgrade material to the ground surface. The bentonite will then be hydrated with distilled water. The temporary Geoprobe® PRT soil vapor probe will be sampled at least 2 hours following driving of the probe, to allow vapor conditions to equalize in subsurface materials and the bentonite surface seal to hydrate in general accordance with guidelines presented in the CalEPA Department of Toxic Substance Control (DTSC) *Advisory – Active Soil Gas Investigations*, April, 2012..

Geoprobe® DPT Borehole Advancement and Temporary Soil Vapor Probe Installation

Alternatively, borings will be advanced using truck-mounted or limited access Geoprobe® DPT equipment, or a hand-operated slide hammer, to drive 1-inch outside diameter (OD) rods and probes with expendable steel tips to 5 feet bgs, without recovering soil cores. Or, borings will be advanced using Geoprobe® DPT continuous coring equipment using a nominal 4-foot or 5-foot long, 2-inch OD stainless steel core barrel drive sampler and extension rods. The drive probe will be equipped with nominal 1 ½-inch inside diameter (ID) clear PETG plastic tubes that line the interior of the probe. Continuous soil sample cores are recovered for potential lithologic characterization and laboratory analysis. After the probes or core barrels are advanced to the specified depth, typically 5 feet bgs, the probes and drive rods are removed, leaving the borehole open with the expendable probe tip (if used) at the bottom.

Plastic or stainless steel soil vapor probes, ½-inch diameter by 2-inches long and tipped with porous plastic membranes, are then inserted to the bottom of the 1-inch diameter boreholes at 5 feet bgs. The probe tips are attached to 7-foot lengths of 0.25-inch OD Teflon™ tubing extending to the top of the floor slab. A fine sand filter pack is placed in the borehole annulus around the probe. Hydrated bentonite chips are then used to fill the annular space above the filter pack to the top of the floor slab. The bentonite is allowed to hydrate and borehole conditions to equalize for 2 hours prior to sampling activities, per DTSC vapor sampling guidelines. Temporary soil vapor probe installation procedures will be performed in general accordance with guidelines presented in the DTSC *Advisory – Active Soil Gas Investigations*, April, 2012.

Sub Slab Soil Vapor Probe Installation

Semi-permanent sub-slab soil vapor probes are emplaced as follows: A 1-inch diameter hole is drilled through the concrete floor slab using a portable electric drill. The boreholes are advanced approximately

0.5 feet bgs into the subgrade material beneath the floor slab. Stainless steel or plastic vapor probes 2 inches long by 0.5 inches in diameter, tipped with porous plastic membranes, will be inserted to the bottom of each sub-slab borehole. The probe tips will be attached to lengths of 0.25-inch diameter Teflon™ or stainless steel tubing extending to approximately 1 inch below the top of the floor slab. The top of the Teflon™ or stainless steel tubing in each probe will be attached to a brass threaded male Swagelock™ fitting and cap recessed below the concrete floor. A fine sand filter pack approximately 2 to 4 inches thick will be placed in the borehole annulus around the probes. A Teflon™ sealing disk will be placed around the tubing above the filter pack.

Dry granular bentonite will be placed in the borehole annulus above the Teflon™ sealing disk to above the base of the concrete floor slab. Hydrated granulated bentonite will then be used to fill the annular space above the dry granular to approximately 2 inches above the bottom of the floor slab, and will be hydrated from the surface using deionized water. Quick-drying cement/bentonite grout will then be used to fill the remaining annular space to the Swagelock fitting approximately ¾ to 1 inch below the top of the slab. A watertight plastic cap or metal vault box will be installed flush with the top of the floor slab within a 2 to 4-inch diameter countersunk hole to protect the probe fitting. At least 2 hours will elapse prior to collecting vapor samples to allow the bentonite and cement grout seal to hydrate and borehole conditions to equalize, per DTSC sub-slab vapor sampling guidelines (DTSC, 2011).

<u>Soil Vapor Sampling via Summa Canister</u>

Soil vapor sampling procedures will be similar for Geoprobe® PRT and continuously cored temporary soil vapor probes, and semi-permanent sub-slab soil vapor probes, and will be in general accordance with *and DTSC Advisory – Active Soil Gas Investigations*, April 2012. Soil vapor sampling will not be performed if significant precipitation (greater than ½ inch in a 24 hour period) has occurred within the previous five days.

AllWest will collect soil vapor samples in laboratory prepared 1-liter capacity SUMMA canisters. Prior to vapor purging and sample collection, a vacuum leak shut-in test of the flow-controller/gauge manifold assembly we be performed for a minimum of 2 minutes. Prior to sample collection, approximately 3 sampling system volumes of soil vapor will be purged at a flow rate of approximately 150-200 milliliters per minute (ml/min) from each vapor probe using a dedicated 6-liter capacity SUMMA purge canister. Typical sampling system volumes are 4.5 ml/feet for ¼-inch OD/0.17-inch ID tubing, and 200 ml/feet for a 2-inch diameter borehole with sand filter pack (minus tubing volume). Assuming a 2-inch diameter borehole with a 0.5 feet sand filter pack interval, the typical system volume would be approximately 130 ml for a 5-feet bgs temporary probe, and 115 ml for a 1–feet bgs sub-slab probe, including 2-3 feet of tubing above grade. Therefore, 3 system volumes would typically be approximately 350 to 400 milliliters (ml) depending on tubing length and borehole diameter, depth and filter pack interval.

While sampling, a leak detection test is conducted using helium as a leak tracer inside an airtight plastic shroud covering the entire sampling apparatus, as recommended in the DTSC *Advisory – Active Soil Gas Investigations* (DTSC, 2012). The helium concentration within the shroud is monitored with a helium gas detection meter with a minimum precision of 0.1% to keep the concentration at approximately 10% (or two orders of magnitude above the minimum meter detection limit). The helium tracer gas will be infused into the shroud at the required concentration at least 5 minutes prior to sample collection. To verify helium detection meter accuracy, one (1) ambient air sample per day is collected using a 1-liter SUMMA canister inside the leak detection shroud during the sampling of one probe to measure helium concentrations inside the shroud. Depending upon helium availability, other leak detection gases such as isopropyl alcohol (IPA) or difluoroethane may be substituted.

Flow rates of approximately 150-200 ml/min are used to fill the sample canisters. The canisters are filled to approximate 80% of capacity (approximately 5 inches of mercury vacuum remaining). All pertinent field observations, pressure, times and readings are recorded. After filling and closing the sample valve, all SUMMA canisters are removed from the manifold, labeled with sampling information, including initial and final vacuum pressures, placed in a dark container and transported under chain-of-custody to the analytical laboratory. The analytical laboratory will record the final SUMMA canister vacuum upon receipt.

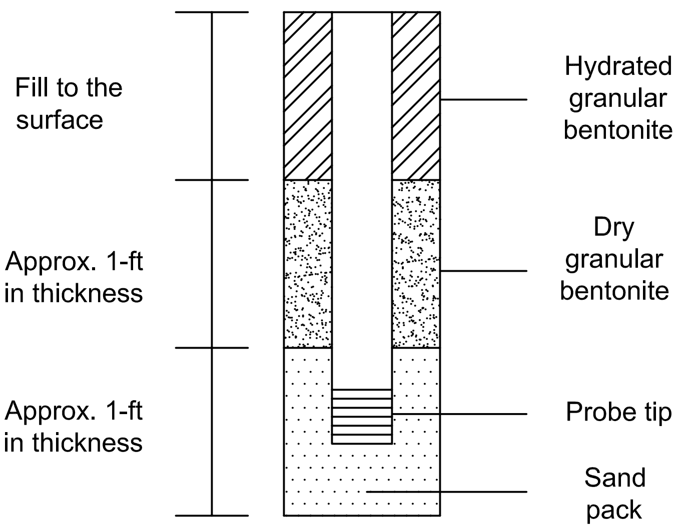
Soil Vapor Sampling via Tenax™ Sorbent Tubes

For collecting soil vapor samples in sorbent tubes for analysis by EPA Method TO-17, the sampling manifold setup, shut-in leak checks, system purging and leak detect shroud setup are similar to that using Summa canisters. However, instead of using Summa canisters for sample collection, samples are collected in stainless steel sample tubes filled with Tenax™ sorbent material. The sorbent tubes are attached with Swagelock™ fittings to the sample manifold downstream from the gauges, filters, flow restrictors, and purge canister or pump, and within the leak detection shroud. In areas of suspected high contaminant concentrations, two (2) Tenax™ sorbent tubes may be placed in series to prevent contaminant breakthrough. A vacuum pump, 100 ml syringe or SUMMA purge canister is attached outside of the leak detection shroud to the downstream end of the Tenax™ sorbent tubes, with the sample train tubing passing through the shroud wall. Helium detection meter concentration readings will be collected from the outflow port of the vacuum pump, if used. Alternatively, helium readings will be collected from the vapor filled syringe, or the SUMMA purge canister used for laboratory helium analysis. A schematic diagram of the sorbent tube soil vapor sampling manifold system and leak detection shroud is included in Appendix B.

Flow rates of approximately 50 to 100 ml/min are used to fill the sorbent tubes with a total sample volume of approximately 1 to 4 liters, depending on the desired laboratory detection limits. The sampling system vacuum should not exceed 100 inches of water (or 7.4 in Hg). All pertinent field observations, pressure, times and helium concentration readings are recorded. After the desired sample volume is withdrawn through the sorbent tubes, the tubes are removed from the manifold, capped with Swagelock™ caps, wrapped in aluminum foil, placed in a sealed plastic tube container, labeled with sampling information, placed in an ice chest cooled to 4°C with crushed ice, and transported under chain-of-custody to the analytical laboratory.

Soil Gas Probe Emplacement Methods

Figure 1
Permanent/Semi-permanent Gas Probe Construction



Temporary Gas Probe Method

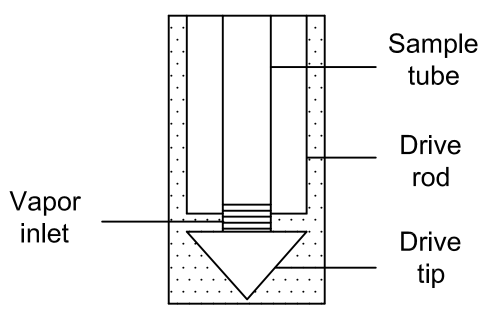
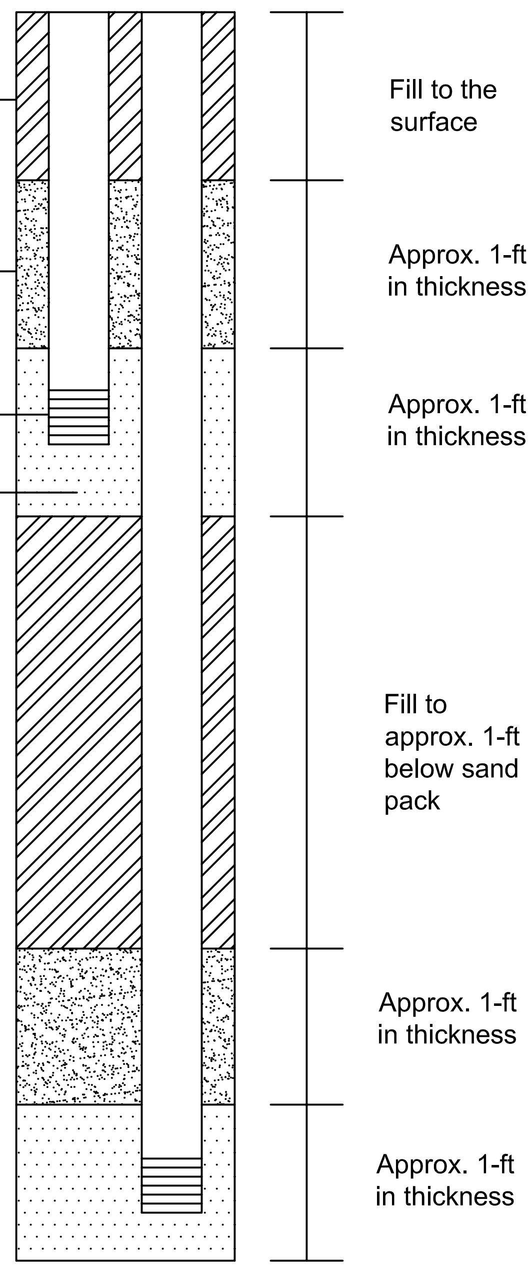


Figure 2
Multi-depth Gas Probe Construction



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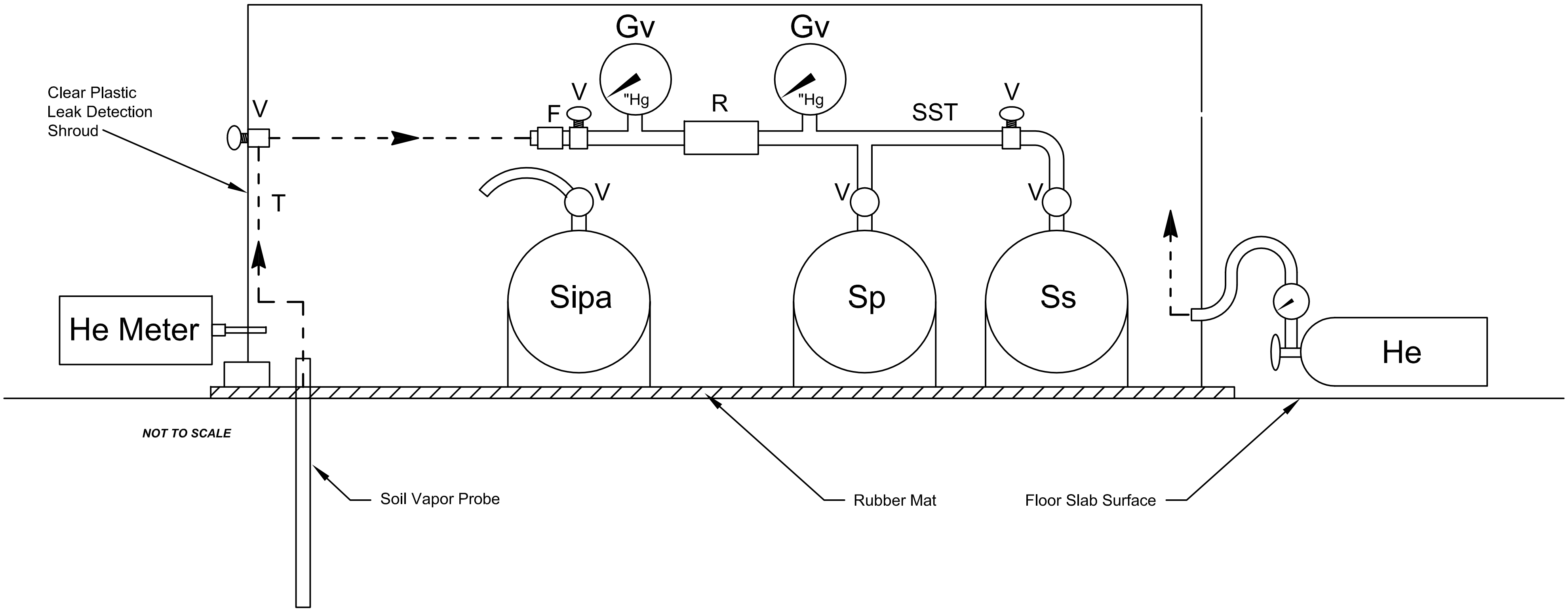
General Soil Gas Sampling Manifold Schematic
with Leak Detection Shroud



LEGEND

F	=	Filter
V	=	Valve
Gp	=	Pressure Gauge
R	=	Flow Regulator
Gv	=	Vacuum Gauge
Sp	=	Purge Summa Canister
Ss	=	Sample Summa Canister
Sipa	=	Ambient Air Helium Leak Detect Gas Summa Canister
He Meter	=	Helium detector for He concentration readings
T	=	Disposable Teflon or Polyethylene Tubing
SST	=	Stainless Steel Tubing and Fittings
He	=	Helium tank, leak detect gas, regulator and tubing

AllWest

STANDARD OPERATING PROCEDURE
SOIL VAPOR SAMPLING
HELIUM SHROUD
SOURCE: ALLWEST
PREPARED BY: C. RAMELB / C. MONAHAN