Alameda-Contra Costa Transit District

September 21, 2006

Mr. Stephen Plunkett
Alameda County Health Division
Division of Environmental Protection
Department of Environmental Health
1131 Harbor Bay Parkway, Second Floor
Alameda, CA 94502

Dear Mr. Plunkett:

Subject: Workplan for Downgradient Subsurface Investigation – Case #RO402
AC Transit, 1177 47th Street, Emeryville

AC Transit hereby submits the enclosed Workplan for Downgradient Subsurface Investigation for the AC Transit facility located at 1177 47th Street in Emeryville. Our consultant, Cameron-Cole, prepared this report, in response to your August 23, 2006, letter.

Per our phone conversation on September 18, 2006, you agreed that a detailed description of a chosen remedial method did not have to be included in this workplan. Instead, a recommended remedial action alternative for free product removal and downgradient migration control of dissolved product will be presented after additional subsurface characterization of the off-site conditions is performed. Also, you agreed to extend the due date of the Soil and Groundwater Investigation Report an additional 60-days to allow for access agreements to be executed between AC Transit and off-site property owners.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

If you have any questions or comments regarding the enclosed workplan, please call Brad Wright of Cameron-Cole at (510) 769-3563 or me at (510) 577-8869.

Sincerely,

Suzanne Chaewsky

Suzanne Chaewsky, P.E.
Environmental Engineer
enclosure

10626 International Boulevard • Oakland, CA 94603 • TEL (510) 891-4777 • www.actransit.org

WORKPLAN
FOR DOWNGRADIENT SUBSURFACE INVESTIGATION
AT THE AC TRANSIT 1177 47TH STREET FACILITY
EMERYVILLE CALIFORNIA

Prepared For:

10626 E. 14th Street
Oakland, California 94603

Prepared By:

CAMERON-COLE

101 West Atlantic Blvd.
Alameda, California 94501

September 2006

WORKPLAN
FOR DOWNGRADIENT SUBSURFACE INVESTIGATION
AT THE AC TRANSIT 1177 47TH STREET FACILITY
EMERYVILLE CALIFORNIA

Prepared For:
Ms. Suzanne Chaewsky
AC Transit-Environmental
10626 E. 14th Street
Oakland, California 94603

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101 West Atlantic Blvd.
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September 2006

Brad Wright, RG, CHG
Principal Hydrogeologist
West Coast Regional Manager

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FIGURES

1. INTRODUCTION

On behalf of AC Transit, Cameron-Cole LLC has prepared this workplan to further define the lateral extent of groundwater contaminants downgradient of the AC Transit facility located at 1177 47th Street in Emeryville, California (the site), Alameda County Environmental Health Services (ACEHS) fuel leak case No. RO0000402. A site location map is presented as Figure 1 and the site facility layout is presented as Figure 2. The results of the most recent subsurface investigations (conducted in February 2003 and October 2003) were reported to ACEHS in the *Subsurface Investigation Report*, May 2003 and the *Groundwater Monitoring and Subsurface Investigation Report*, December 2003. In an August 23, 2006 letter to AC Transit, ACEHS requested the submittal of a Workplan for Soil and Groundwater Investigation, with Site Conceptual Model and Well Survey, which presents a plan to better define the extent of total petroleum hydrocarbons (TPH) in soil and groundwater downgradient of the site. This workplan has been prepared to satisfy the submittal requirements outlined in the August 23, 2006 letter. In addition, this workplan presents the current site conceptual model, which identifies the sources, nature distribution and transport of the contamination.

2. SITE CONCEPTUAL MODEL

Total petroleum hydrocarbon impacts to soil and groundwater observed at the site are associated with the underground storage tanks (USTs), one documented surface diesel spill and a leaking hydraulic lift. Concentrations of chemicals above State of California Maximum Contaminant Levels (MCLs) or Environmental Screening Levels (ESLs) are only observed in groundwater. The extent of the groundwater plume is presented in Figure 3 and is limited to the shallow aquifer presented in cross-section on Figure 4. As shown on Figure 3, concentrations of dissolved TPH and related compounds are transported in groundwater, which flows to the west onsite at an average gradient of 0.023 feet/foot and to the northwest offsite. Groundwater potentiometric surface maps with flow directions and gradients have been submitted to ACEHS in monitoring reports since the resumption

of groundwater monitoring in 1999. A review of the historic subsurface investigations conducted onsite used to develop the site conceptual transport model is presented in the following section.

2.1. Previous Site Investigations

Prior to 1999, several subsurface soil and groundwater investigation associated with USTs and one surface diesel spill were conducted at the Site. During these historic investigations, several soil borings and 14 groundwater monitor wells (MW-1 through MW-10 and W-1 through W-4) were installed at the site (Figure 2). In 1999, it was determined that the casing in monitor well W-2 was bent at a depth of three feet below grade, preventing the lowering of a bailer for sample collection. Monitor well W-2 was subsequently abandoned. In December 1999, six USTs located in Tank Farm No. 2 (Figure 2) were excavated and removed under oversight from the ACHCS.

Additional subsurface investigation work conducted in 2001 included the installation of soil borings SB-1a through SB-4a installed in the vicinity of former Tank Farm No. 2 and the installation of soil borings SB-5a through SB-8a located along the downgradient property boundary. After reviewing the results from samples collected from soil borings SB-1a through SB-8a, three additional monitor wells (MW-11 through MW-13) were installed at the site. Figure 2 shows the location of the monitor wells and soil borings. Figure 2 also displays the location of facility buildings, former and existing UST locations and subsurface utilities.

During third quarter 2002 groundwater monitoring conducted at the site, an approximate seven-foot free phase product layer was measured in monitor well MW-13. This was the first measurable product layer recorded in this monitor well. Subsequent testing conducted by AC Transit on the hydraulic lift system located in the Tire Shop located near monitor well MW-13, confirmed that one of the hydraulic hoists had leaked. The lift was immediately taken out of service. ACHCS was notified of the release by AC Transit in a letter dated November 6, 2002. On November 13, 2002, removal of the free phase product from monitor well MW-13 was initiated. Product layer removal

consisted of pumping the free phase layer from the well on a daily basis. By November 20, 2002 the layer had been reduced to a sheen (< 0.01 feet).

On February 18, 2003, five soil borings (SB-1b through SB-5b) were installed in the vicinity of the Tire Building to assess the extent of the impact of hydraulic oil (Figure 2). At the request of ACHCS a sixth boring (SB-6b) was located downgradient of a 1,000-gallon UST used by the facility's emergency generator. The review of analytical results from samples collected from soil borings SB-1b through SB-5b, resulted in a second investigation focused along Doyle Street, located downgradient of the site. Soil borings SB-7b through SB-12b were installed within Doyle Street to better define the extent of TPH downgradient of the site. At the request of ACHCS, two additional borings SB-13b and SB-14b were installed onsite to sufficient depths to define a sand layer encountered in monitor wells W-1, W-2 and MW-13.

2.2. Well Survey

To assess the potential for impacts to sensitive receptors through groundwater, a Well Completion Report Release Agreement was filed with the County of Alameda Public Works Agency. The well completion report was submitted to ACHCS in the document *Summary of Soil and Groundwater Activities*, dated May 2006. The well completion report provided a listing of all the wells installed within a 1/2-mile radius of the Site. The well completion report found a total of 338 wells, none of which are used for domestic or municipal supply.

Based on the current known extent of the groundwater plume, location of facility buildings, property boundaries and absence of domestic or municipal supply wells, there are no likely exposure pathways to sensitive receptors. Additionally, access to the Site is restricted to authorized personnel making exposure of the general public unlikely.

3. SCOPE OF WORK

Figure 2 shows the location of seven soil borings and four monitor wells proposed to further define the extent of TPH downgradient of the site. As these proposed soil borings and monitor wells are all located on property not owned by AC Transit, the final locations might need to be changed if required by the property owners. If the proposed soil borings or monitor wells require relocation, ACEHS will be notified prior to mobilizing drilling equipment to the site. Drilling, sampling and laboratory analytical methods are described in detail in the following sections.

Prior to mobilizing drilling equipment to the site, the following activities will be performed:

- The site specific Health and Safety Plan will be updated in accordance with California Occupational Health and Safety Administration requirements;
- AC Transit will negotiate an access agreement with the owners of the Emeryville Business Center located at 4701 Doyle Street;
- An encroachment permit will be obtained from the City of Emeryville for those soil borings and monitor wells located with Doyle Street;
- Underground Service Alert (USA) will be notified of impending activities. Additionally, a professional underground utility locator will clear each boring location;
- Schedule drilling contractors; and
- Drilling permits will be obtained from Alameda County Public Works Agency (ACPWA).

3.1. Soil Borings and Grab Groundwater Sampling

Soil borings will be installed using direct push drilling equipment. Each soil boring will be continuously cored within new polyethylene sleeves and described onsite by an experienced geologist in accordance with the Unified Soil Classification System. This includes a description of the soil type, texture, grain size, moisture content and Munsel color. Additional soil descriptions recorded in the field include evidence of chemical contamination including staining, discoloration and

odor. A representative sample from each soil horizon will be screened with a photoionization detector (PID) to determine if volatile constituents are present in the soil core.

If evidence of soil contamination is recorded in the field, the identified soil interval will be selected for laboratory analysis. Laboratory soil sample preparation includes cutting the polyethylene sleeve for the interval to be submitted, capping each end of the sleeve with Teflon tape and tight fitting caps, assigned the sample interval a unique identification number, placing the sample in plastic bags and an ice filled color. The sample ID number, depth, time and date of collection and requested analysis will be entered onto chain-of-custody documentation.

Grab groundwater samples will be collected from the water table aquifer through PVC casing installed in the borings. Grab groundwater samples will be collected with bailers or by pumping to the surface through small diameter tubing. The grab groundwater samples will be placed in laboratory supplied containers, assigned unique identification numbers, sealed in plastic bags and placed in an ice filled cooler. The sample ID number, depth, time and date of collection and requested analysis will be entered onto chain-of-custody documentation. If a second saturated horizon is encountered during soil boring installation a second soil boring will be installed immediately adjacent to the first and a second grab groundwater sample may be collected.

Based on the lithologic logs recorded during previous site investigations, it is assumed that the water table aquifer will be encountered at depths of approximately 20 though 23 feet below groundsurface. Once the total depth of the soil boring has been reached and all samples have been collected, the boring will be backfilled with neat cement pumped into the borehole from the bottom up.

Drill cuttings and fluids generated during soil boring installation will be contained in appropriate labeled containers, transported to the site's waste storage facility and disposed of in accordance with all regulatory requirements.

3.2. Monitor Wells

Based on the laboratory analytical results from grab groundwater samples collected from the proposed soil borings, up to four monitor wells will be installed. The proposed monitor wells will be installed using eight-inch outside diameter hollow-stem auger drilling equipment. During drilling, a continuous core of the lithology will be collected and described by an onsite geologist in accordance with the Unified Soil Classification System. This includes a description of the soil type, texture, grain size, moisture content and Munsel color. Additional soil descriptions recorded in the field include evidence of chemical contamination including staining, discoloration and odor. A representative sample from each soil horizon will be screened with a photoionization detector (PID) to determine if volatile constituents are present in the soil core.

The wells will be constructed with two-inch diameter PVC casing. The monitor wells will be screened in the permeable zones with screen lengths that match the stratigraphic sequence. The screen interval may also extend approximately two feet above first encountered groundwater to allow for potential floating hydrocarbon interception. The sand filter-pack will be installed through the hollow stem augers from the bottom up and will extend approximately 1.5 feet above the screened interval. A one-foot thick bentonite bridge will be established on top of the filter-pack and the remaining annular space will be sealed with 95-pound Portland Type I/II cement mixed with five gallons of clean water with not more than 5% added bentonite. The wells will be protected with a traffic rated vault box set to grade and locking cap. The location and top of casing elevation of each well will be surveyed relative the North America Data (NAD) 83 system.

After the sanitary seal has cured, the new monitor wells will be developed by surging the screened interval to promote flow through the filterpack and purging of approximately ten casing volumes of groundwater. Physical parameters including, temperature, pH, electric conductance and turbidity will be recorded during well development. Groundwater samples will be collected from the new monitor wells following wells development. The wells will be sampled in accordance with the methodology used during semiannual monitoring events.

Drill cuttings and fluids generated during monitor well installation will be contained in appropriate labeled containers, transported to the site's waste storage facility and disposed of in accordance with all regulatory requirements.

3.3. Laboratory Analysis

Soil and groundwater samples collected during the investigation will be analyzed for TPH by USEPA Method 8015 modified using a silica gel cleanup and for benzene, toluene, ethylbenzene, xylene and fuel oxygenates by USEPA Method 8021B and 8260. Groundwater samples submitted for 8015 modified analyses will be placed in one liter amber containers, groundwater samples submitted for 8021B and 8260 analysis will be placed in 40-milliliter (ml) vials.

4. REPORTING

Data collected during the downgradient subsurface investigation will be presented in a report to be submitted to ACHES. The report will include soil boring logs, monitor well logs, monitor well survey data, an updated site wide groundwater potentiometric surface may and laboratory analytical results. The report will include a description of the field activities, a site map displaying the soil boring and monitor well locations and summary table of laboratory analytical results. The results of the investigation will present the known extent of the TPH in soil and groundwater. If warranted, recommendations for additional data collection or remedial options will be proposed. Copies of laboratory analytical reports and soil boring logs will be provided as an appendix. The report will be reviewed and stamped by a California registered geologist.

N

0 2000

FEET

SITE

CALIFORNIA

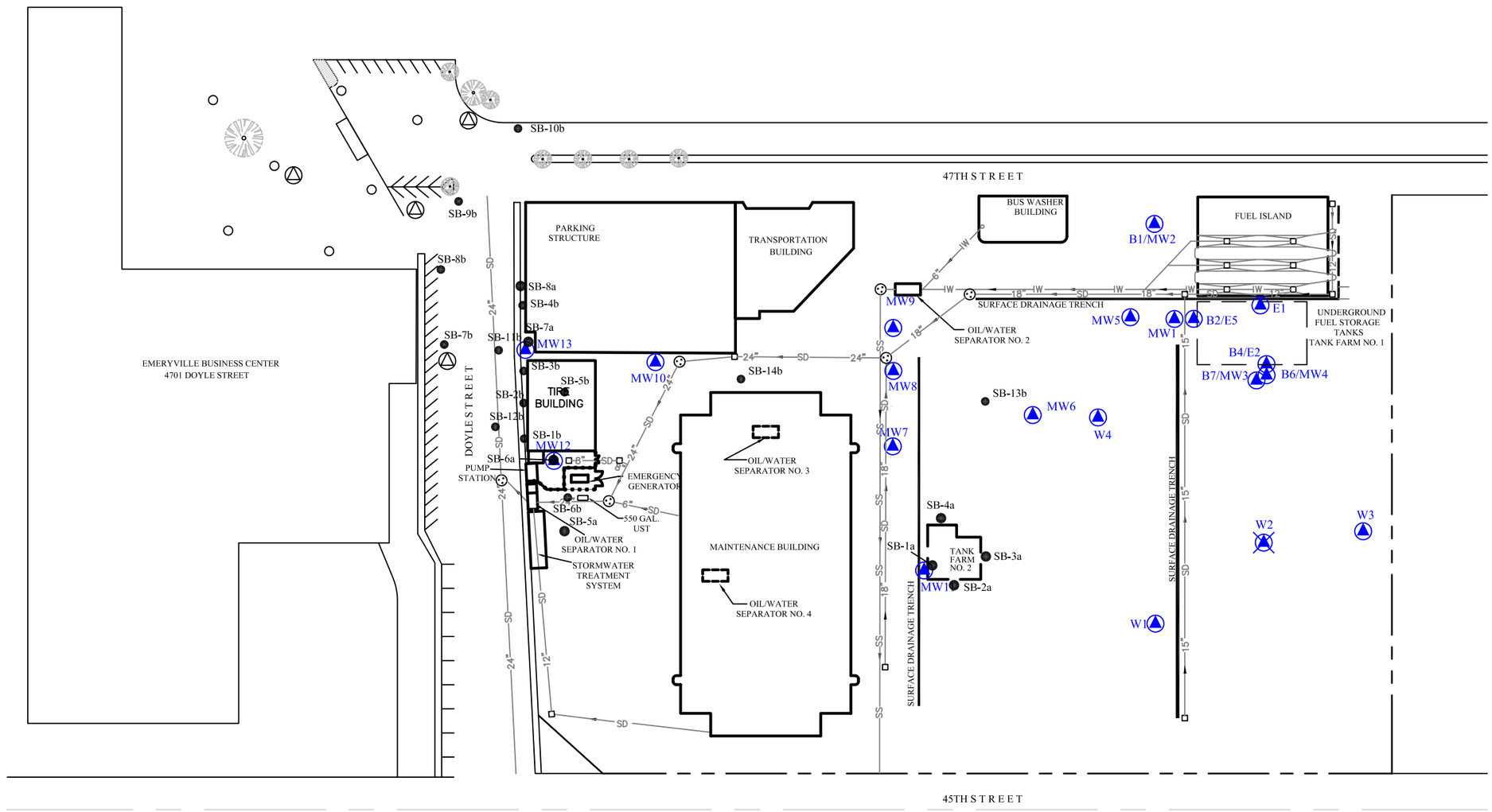
ADAPTED FROM U.S.G.S. 7.5' QUADRANGLE
OAKLAND WEST, CALIFORNIA

CAMERON-COLE

FIGURE 1

SITE LOCATION MAP
AC TRANSIT 1177 47th STREET
EMERYVILLE, CALIFORNIA

SCALE:	DATE:	DWG NO.
1" = 2000'	4/24/03	2015-LOCMAP



LEGEND

- MANHOLE
- CATCH BASIN
- MONITOR WELL
- ABANDONED MONITOR WELL
- PROPOSED MONITOR WELL
- SOIL BORING
- PROPOSED SOIL BORING
- SD — STORM DRAIN PIPELINE
- SS — SANITARY SEWER PIPELINE
- IW — INDUSTRIAL WASTE PIPELINE
- CHAIN LINK FENCE

0 100
FEET

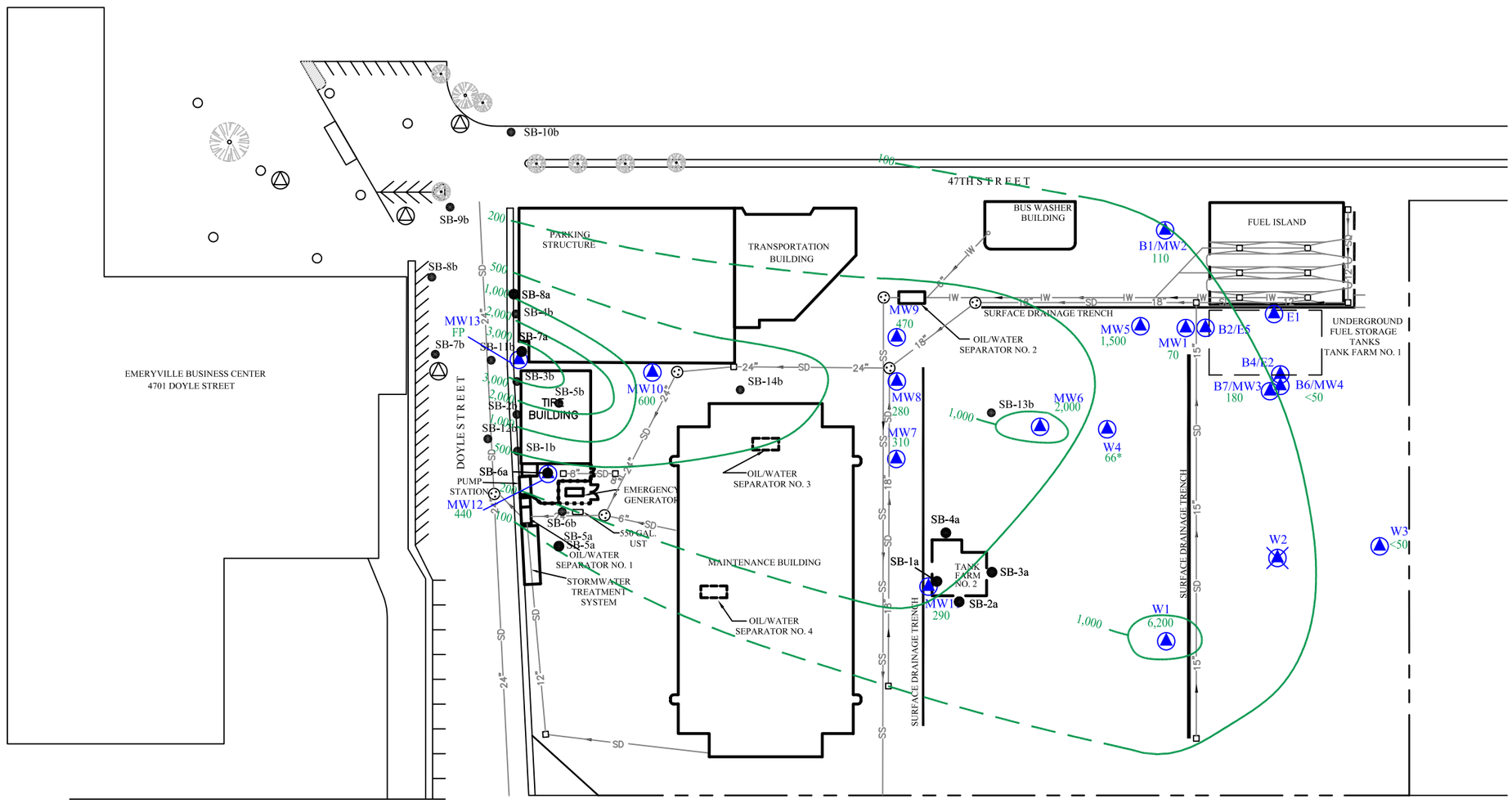
	BY	DATE
DRAWN	SPS	9/14/06
CHECKED		
APPROVED		
APPROVED		
APPROVED		

CAMERON-COLE

FIGURE 2
SOIL BORING AND MONITOR WELL LOCATIONS
AC TRANSIT, EMERYVILLE FACILITY - OAKLAND, CA

SCALE: 1" = 100'

DWG. NO.: 2017-20



LEGEND

MANHOLE	440	TPH CONCENTRATION
CATCH BASIN	66*	NOT USED IN CONTOURING
MONITORING WELL	FP	FREE PRODUCT
ABANDONED MONITORING WELL	———	TPH ISOCONCENTRATION CONTOUR
PROPOSED MONITOR WELL	——SD——	STORM DRAIN PIPELINE
SOIL BORING	——SS——	SANITARY SEWER PIPELINE
PROPOSED SOIL BORING	——IW——	INDUSTRIAL WASTE PIPELINE
		CHAIN LINK FENCE

	BY	DATE
DRAWN	SPS	9/18/06
CHECKED		
APPROVED		
APPROVED		
APPROVED		

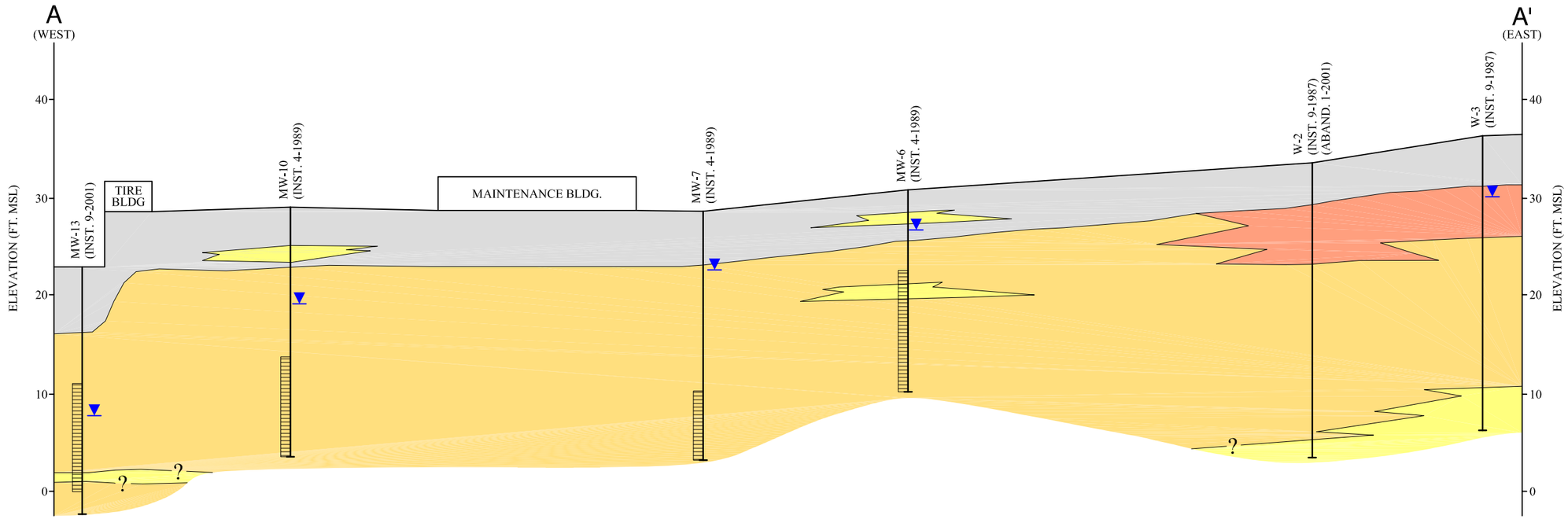
CAMERON-COLE

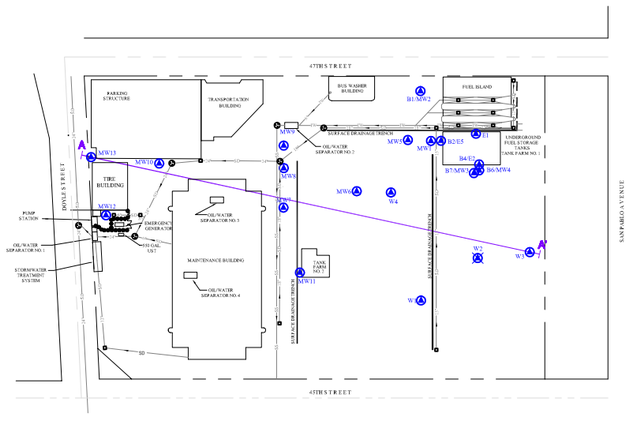
FIGURE 3

TPH ISOCONCENTRATION CONTOUR MAP
AC TRANSIT - NOVEMBER 3, 2005
EMERYVILLE FACILITY - OAKLAND, CA

SCALE: 1" = 100'

DWG. NO.: 2017-21





SECTION LOCATION KEY

LEGEND

- FILL
- CLAY - CL/CH
- SILT - ML
- SAND/GRAVEL - SM, SP, SW, GM, GP
- GROUNDWATER LEVEL (10/20/02)
- MONITORING WELL SCREEN INTERVAL

0 60
FEET

	BY	DATE
DRAWN	CJJ	3-27-03
CHECKED		
APPROVED		
APPROVED		
APPROVED		

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FIGURE 4

GEOLOGIC CROSS SECTION A - A'
AC TRANSIT, 1177 47th STREET - EMERYVILLE, CA

SCALE: AS NOTED

DWG. NO.: 2015-11