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29 March 2001
Project 2543.01

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Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Subject: *Remedial Investigation Work Plan*
Soil and Groundwater Investigation
2855 Mandela Parkway Property
Oakland, California

XJYI
D. Kleesattel

Dear Mr. Chan:

Treadwell & Rollo, Inc. is pleased to present this *Remedial Investigation Work Plan* to conduct an additional soil and groundwater investigation at the 2855 Mandela Parkway Property in Oakland, California. The purpose for this investigation is to collect additional site data to support an evaluation of the distribution of petroleum hydrocarbons and to monitor the stability of the gasoline free product previously detected beneath the property. The results of this evaluation will be used to formulate appropriate site management.

BACKGROUND

The existing building on the property is a 143,000 square foot, single-story industrial structure currently owned by 2855 Mandela Property. The building is currently occupied by a number of commercial tenants, mainly for warehousing and storage. The building was originally constructed in 1941 and operated until approximately 1983 by International Harvester as a truck service and sales facility. An underground gasoline storage tank was removed from property in 1991 by a previous owner, Cyprus Property.

Geologic conditions at the site consist of approximately two to eight feet of relatively sandy fill material underlain by Bay Mud to a depth of at least 24 feet below grade. The clayey Bay Mud appears to include heterogeneous zones of sandier soil and organic matter. The stabilized groundwater depth is approximately eight to ten feet and there are indications of a perched water zone at the interface between the fill and the Bay Mud.

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Environmental investigations have confirmed the presence of gasoline free product within the Bay Mud and potentially significant concentrations of the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) in groundwater beneath a portion of the property, including under the existing building. However, a soil vapor survey in 1998 indicated only relatively low benzene concentrations beneath the building's floor slab. A sample of perched water was collected in 1999 above an area of groundwater known to contain detectable concentrations of BTEX and the perched water samples did not contain detectable BTEX concentrations.

These previous investigation results suggest that gasoline vapors from the free product and those dissolved in the groundwater are retarded from upward migration into the fill zone beneath the building because of geologic conditions. These conditions might include the low-permeability clayey Bay Mud matrix and the presence of a perched water zone, as well as other factors. A study of the indoor ambient air quality completed in March 2001, concluded that gasoline vapors, specifically BTEX, are not migrating in significant concentrations from the groundwater surface into the building.

INVESTIGATION ACTIVITIES

Evaluating the distribution of petroleum hydrocarbons, including those in the soil vapors, will require collecting field data along multiple lines of evidence:

- Concentrations present in soil gas beneath the existing concrete floor slab
- The presence and chemical quality of a perched water layer at the fill/Bay Mud interface
- The vertical distribution of gasoline free product in the Bay Mud soil column.

The work scope to gather these data has been divided into the following tasks.

Task 1. Soil Vapor Sampling and Analysis

Ten soil vapor sampling locations are shown on the attached map. The locations were chosen to provide data to evaluate the potential for vapor migration into the occupied building space. Proposed locations A, B, and D were chosen because they are located immediately above the free product pool. Sampling locations C, E, F, G, and H were chosen because they are adjacent (laterally) to the free product plume or dissolved phase plume beneath occupied portions of the building. Sampling locations I and J were chosen to provide additional lateral definition of the soil vapor plume.

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Sampling and Analysis Procedures:

- To provide access for soil-vapor sampling, the concrete floor slab will be cored using a 2-inch diameter core. The base rock immediately below the core location may be removed to facilitate installing the soil vapor sampling probes.
- Dedicated vapor-sampling probes will be installed using a direct push technique. The dedicated soil vapor probe points (stainless steel) and Teflon sampling tubes will remain in place for subsequent and repeat sampling/monitoring. The sampling tubes will be grouted in place to provide a vapor seal between the slab and the underlying sand/fill. The Teflon soil vapor sampling tubes will remain accessible for repeat sampling if necessary.
- The shallow soil vapor probes will be set at approximately 2 to 3 feet below top of slab to correspond with the middle of the sand/fill interval. *Need for deeper samples also? probably will encounter GW.*
- Soil-vapor samples collected from each sampling location will be analyzed for BTEX (by EPA Method TO-14) by a California State-certified laboratory. *Need to analyze for TPHg? will add*

Task 2. Stratigraphic Soil Borings and Perched Water Monitoring Well

Two soil borings (2-inch diameter, direct-push probes with continuous soil collection) are planned to provide additional stratigraphic data (see attached map for locations).

what depth will SB-35 be advanced?
Proposed Soil Boring SB-35 is located between existing wells TR-4 and TR-6, both of which have collected free product. The purpose of this boring is: 1) to provide additional stratigraphic information regarding vertical distribution of free product within the Bay Mud; and 2) enable monitoring for the presence and chemical quality of the perched water zone, if present. A continuous core sample will be collected from this location. Soil boring SB-36 will be advanced approximately 20 feet below ground surface. The continuous core will be evaluated in the field for detailed stratigraphic characteristics and will be screened in the field for the potential presence of gasoline free product using a Photo-Ionization Detector (PID)-type organic vapor meter and by UV-fluorescence using a hand held lamp. The boring will then be backfilled with cement grout.

If evidence of free water (i.e., perched water) is noted at the fill/Bay Mud interface of Boring SB-35, an adjacent boring will be advanced to a depth of approximately six feet and will be completed as a perched water monitoring well.

Proposed Soil Boring SB-36 will be located within the boundary of the former UST excavation. The purpose of this boring is to: 1) evaluate whether free product has been collecting within the

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former tank excavation; and 2), similar to SB-35, to evaluate the stratigraphy of the Bay Mud and vertical distribution of free product within the soil column. If free product is present in the former tank excavation, it may make a relatively convenient product collection and removal sump if required. The boring will extend through the bottom of the former UST excavation, assumed to be approximately 6 to 7 feet below ground surface (excavation floor sample was collected from 6.5 feet below grade) and into the underlying Bay Mud to a maximum depth of approximately 20 feet. Continuous soil cores will be screened in the field using a PID and UV lamp for the potential presence of gasoline free product. The stratigraphic characteristics of the cores will also be recorded in detail.

Will samples be collected for chemical analysis?

Task 3. Install Free Product Monitoring Wells

Based on discussions with the Alameda County Department of Environmental Health (ACDEH), three additional monitoring wells are planned. These wells are designated as TR-7, TR-8, TR-9 on the attached site map. The purpose of these wells will be to monitor the stability (i.e., lateral extent) of the free product plume. The locations for these free-product plume monitoring wells were chosen based on the assumed extent of that plume. The intent is to place the wells beyond the lateral extent of the free product plume. Therefore, ~~if free product is observed during the installation of these wells, then the location of the wells will be changed.~~

construction? clam to 20'?

Additionally, because the purpose for these wells is to monitor whether the extent of the free product plume is stable, groundwater will not be extracted from these wells. Groundwater removal by purging or other activities could potentially cause localized disturbance and migration of the free product plume. Therefore, free product monitoring will be conducted using an electronic interface probe (IP). Initially, these wells will be monitored quarterly (every ~~3~~ *3?* months) for the first year. Subsequent monitoring will be conducted on an annual basis.

The free-product monitoring wells will be constructed of 2-inch diameter polyvinyl chloride (PVC) well casing. The screened intervals will be designed to permit free phase gasoline, if present, to enter and accumulate in the well casing.

Task 4. Reporting

Following the field investigation and receipt of the analytical data, Treadwell and Rollo will evaluate the results and prepare a technical report of our findings. A final report will be prepared and will be forwarded to ACDEH and RWQCB for review and comment.

SCHEDULE

Treadwell & Rollo is prepared to begin this investigation within two weeks upon authorization to proceed. We estimate that the installation of the soil vapor monitoring probes, soil borings, and

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free product monitoring wells will require approximately 5 days to perform, and that the laboratory data will be received two weeks after submittal. The investigation report will be submitted approximately 6 weeks after our receipt of the laboratory data.

We appreciate your review of this *Remedial Investigation Work Plan*, and look forward to your approval. If you have any questions or comments, please contact either of the undersigned.

Sincerely yours,
TREADWELL & ROLLO, INC.



Michael P. McGuire, P.E. XS27
Associate Engineer

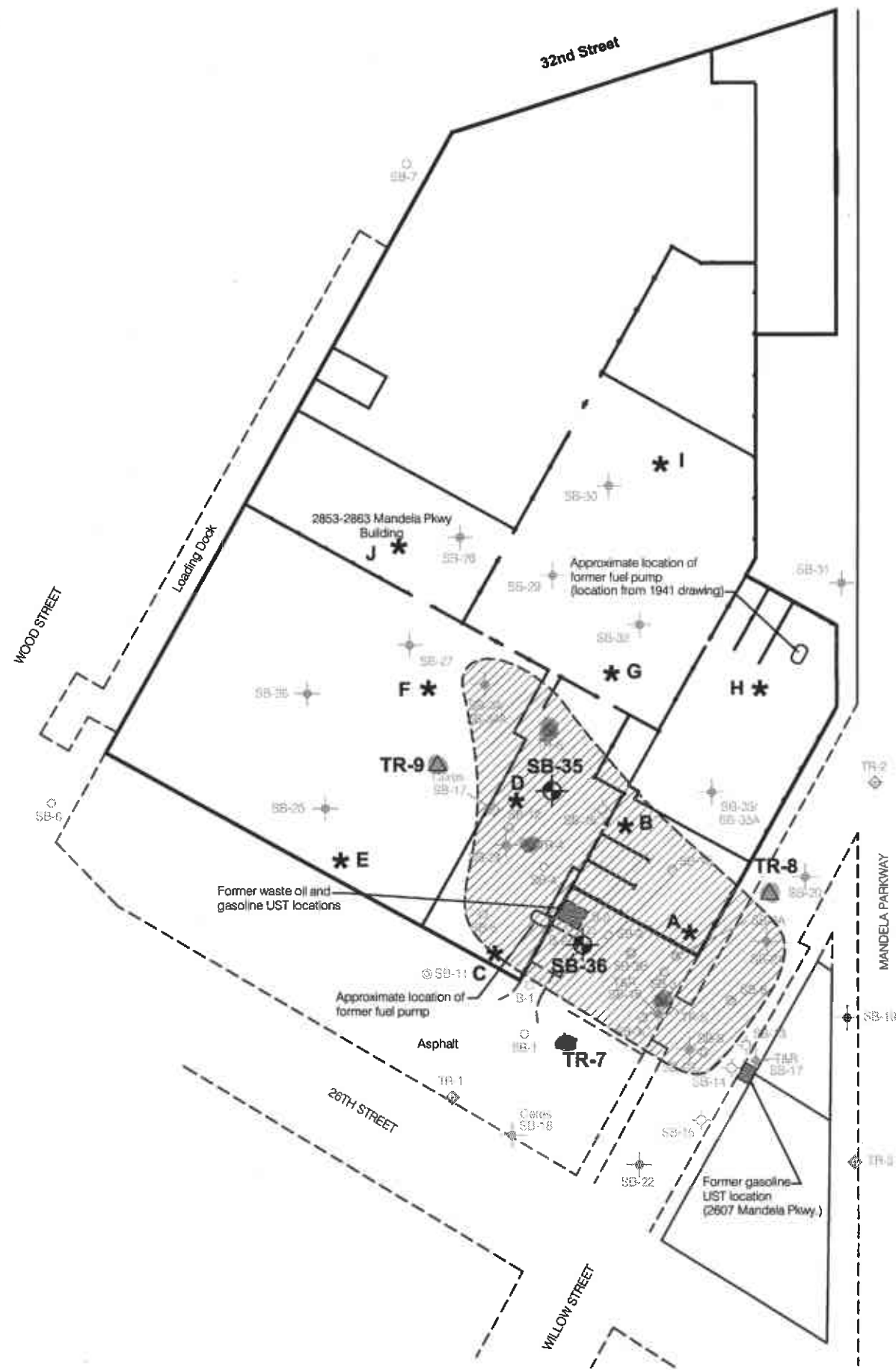


David R. Kleesattel, R.G. X541
Project Geologist

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cc: Faye Beverett – Page Street Properties, LLC
Rich Robbins – Wareham Development
Richards Jacobs – Howard, Rice, et. al.
Jeffery Allen – Graves and Allen
Glenn Leong – SOMA Corporation

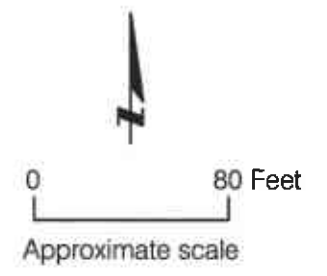
PLANNED SAMPLING LOCATIONS 254301.DWG



EXPLANATION

- Soil boring (06/92)
- Soil boring (08/98)
- Soil boring (10/98)
- Soil boring (11/98)
- Soil boring (1999)
- ◇ Piezometer (1999)
- ⊕ Monitoring well (1999)
- ▨ Free product extent based on:
1 - direct observation of product
2 - benzene >2000 µg/L
- G * Proposed soil - vapor collection point
- SB-35 ⊕ Proposed soil boring
- TR-7 △ Proposed groundwater well

Note:
Free product may not necessarily be present at all locations within the extent envelope indicated.



2855 MANDELA PARKWAY PROPERTY Oakland, California		
PLANNED SAMPLING LOCATIONS		
Date 03/23/01	Project No. 2543.01	Figure 1
Treadwell&Rollo		

References: Ceres Associates, 1998. Interactive Resources, 1999.