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June 17, 1996

Mr. John Prall, R.G.
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Workplan for Soil and Water Investigation
Former Carnation Terminal Site, Berth 30
2700 7th Street
Oakland, California
(Work Order No. 202925)

Dear Mr. Prall:

Innovative Technical Solutions, Inc. (ITSI) is pleased to provide this Workplan for Soil and Water Investigation (Workplan) in the area of a former 15,000-gallon diesel underground storage tank (UST), at Berth 30, 2700 7th Street in Oakland, California. This Workplan was prepared in response to a March 19, 1996 letter from Mr. Dale Klettke, Hazardous Materials Specialist with Alameda County requesting a Soil and Water Investigation in the area of the former UST.

Figure 1 shows the approximate location of the site. The Port of Oakland tank identification number for the former UST is CF-31. The Alameda County Site Identification (STID) number for the site is 5801¹.

BACKGROUND

The UST was removed from the former Carnation Terminal in 1988 by Aqua Science Engineering (ASE). Two of four soil samples and a groundwater sample collected during removal of the UST were reported to contain petroleum hydrocarbons. The highest reported concentration was 3,800 mg/kg total petroleum hydrocarbons (TPH) as gasoline and 2,600 mg/kg unspecified petroleum hydrocarbons in soil sample TA-1 from the southern end of the former tank cavity. The results of the tank removal were documented in the *Project Report, Underground Storage Tank Removal Assessment*, by ASE, dated December 20, 1988.

Baseline Environmental Consulting (Baseline) was retained by the Port of Oakland to direct remediation activities at the site. Approximately 35 cubic yards of soil were excavated from the southern end of the former tank cavity in the area where soil sample TA-1 was collected. A confirmation soil sample collected following excavation was reported to contain 220 mg/kg of

¹ As indicated in the March 19, 1996 letter from Alameda County.

unspecified petroleum hydrocarbons. The excavation activities were documented in the *Report on Underground Tank Removal and Remedial Activities*, by Baseline, dated March 1989.

Subsequent to removal of the UST, the site and general area was redeveloped in 1992 through 1993. The former UST site is now located within the TransPacific Container Service Corporation Terminal, which is presently designated as Berth 30.

PROPOSED SCOPE OF WORK

As indicated above, redevelopment activities at Berth 30 has occurred since removal of the UST in 1988. The former UST site is now part of an active marine terminal, with its associated container offloading, handling and storage, trailer storage, and truck traffic. Due to redevelopment, the exact location of the former UST is not known. Therefore, initial activities are focused on locating and delineating the former tank cavity within the active terminal.

The proposed scope of work includes the following tasks:

- Preparation of a site-specific Health and Safety Plan signed by a Certified Industrial Hygienist (CIH).
- Locate former tank cavity, including review of plans and historical photographs, and a geophysical investigation using ground penetrating radar (GPR) and other techniques, if needed.
- Subsurface utility clearance of proposed drilling locations using independent utility locating contractors.
- Collection of soil and groundwater samples using a cuttingless sampling system for soil samples and HydroPunch® II sampler for groundwater samples.
- Preparation of draft and final SWI Report for submittal to the Port of Oakland and Alameda County.

A brief description of the proposed tasks are presented below.

Task 1 - Preparation of a Health and Safety Plan. A site-specific Health and Safety Plan will be prepared for the site and signed by a CIH. The Health and Safety Plan will be submitted to the Port of Oakland for review and approval prior to initiating field activities.

Task 2 - Locate former tank cavity. Based on a review of available redevelopment plans and historical aerial photographs of Berth 30, the general area of the former UST will be identified. A geophysical investigation of the former tank location will then be performed to attempt to locate and delineate the former tank cavity. The geophysical investigation will include pipe and cable location to try to identify remaining vent lines or power lines to the former UST, and to locate the 8-inch water line identified in the former tank cavity during the tank removal. A GPR investigation to identify potential contrast in backfill material in the former tank cavity from surrounding native material will also be performed.

However, locating the former tank cavity may be difficult depending on the nature of the backfill used during tank removal, and nature and thickness of new asphaltic concrete cover.

Task 3 - Subsurface utility clearance. Once the location of the former tank cavity is identified, and the boring locations marked, USA will be notified prior to initiating drilling activities. Also, an independent utility locating contractor experienced at Port of Oakland marine terminals will be utilized to clear the locations of the proposed borings, and to locate the utilities within a 200-foot by 200-foot area around the former tank cavity. Clearing the area around the former tank cavity will provide better protection of potential utilities and will also allow potential changes in boring locations in the field based on preliminary findings during drilling.

Task 4 - Collection of Soil and Groundwater Samples. Approximately four boring locations are proposed, based on a review of the historical sample results. Three borings would be located along the southern end of the former tank cavity, near the former pump island and near where confirmation samples TA-1 and SE were collected. These boring locations will be sampled for both soil and groundwater. A fourth boring would be located along the northwest side of the former tank cavity, between the former tank cavity and the outer harbor, to evaluate groundwater quality in the potential downgradient direction. This boring will be sampled for groundwater only.

Figure 2 shows the approximate location of the proposed soil borings in relation to the former tank cavity, as identified in the *Report on Underground Tank Removal and Remedial Activities* by Baseline Environmental Consulting, dated March 1989. The exact locations may change in the field based on the findings of the field screening of the soil borings and site access. Several alternate boring locations are shown in Figure 2. Soil borings may be placed at these alternate locations for collection of either soil and/or groundwater samples, depending on the results of initial field screening of one or more of the initial soil borings.

A direct push or cuttingless sampling system is proposed for collection of the soil and groundwater samples. This will minimize generating soil cuttings during the investigation. Also, by pushing the sampling system, the potential for tearing up encountered subsurface utilities is significantly reduced, if any subsurface utilities go undetected by the underground locators.

An estimated two soil samples will be collected per boring, at a depth of approximately four to five feet, and near the soil/water interface at a depth of approximately eight to ten feet. The soil samples will be collected in clean brass sleeves. The soil samples will then be capped with teflon tape and plastic friction caps, labeled, and placed in an iced cooler for transport to the laboratory.

The soil samples will be screened in the field using an organic vapor meter with photoionization detector (PID). A small portion of the soil will be placed in a container. The concentration of organic vapor in the headspace of the container will then be measured with the PID, and the concentration recorded on the boring log. A minimum of one soil sample per boring will be submitted for analysis. The soil samples will be analyzed for the following:

- TPH as gasoline by EPA Method 8015
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8020
- TPH as diesel by EPA Method 8015
- Total lead by EPA Method 6010

Groundwater samples will be collected using a HydroPunch® II sampler from each of the borings. A sample of groundwater will be collected for the purposes of measuring field parameters, including pH, electrical conductivity, and temperature. Field parameters will be recorded on the

sample collection log. Groundwater samples will then be collected and transferred into clean sample containers provided by the laboratory. The groundwater samples will then be sealed, labeled, and placed into an iced cooler for transport to the laboratory.

The groundwater samples will be analyzed for the following:

- TPH as gasoline by EPA Method 8015
- BTEX by EPA Method 602
- TPH as diesel by EPA Method 8015
- Total lead by EPA Method 6010
- Total dissolved solids (TDS) by EPA Method 160.1

Soil and groundwater samples will be sent for analysis under proper chain-of-custody procedures to Pace Analytical Services, Inc., a California-certified laboratory located in Petaluma, California. Silica-gel cleanup will be performed for samples for TPH analysis, when applicable. This should minimize potential interference from organic matter likely present in the soils beneath the site.

If groundwater sample collection is not successful with the HydroPunch® II sampler due to fine-grained soils and/or slow recovery, temporary wells may be constructed to allow collection of water samples after groundwater is allowed to recover and disturbed sediments are allowed to settle. Groundwater samples would then be collected using clean disposable bailers. Once samples are collected, the temporary wells will be removed and the borings grouted.

Appropriate quality assurance and quality control (QA/QC) procedures will be followed during the soil and groundwater investigation. QA/QC procedures will include:

- Non-disposable sampling equipment will be decontaminated prior to collecting each sample by high-temperature pressure washer or by washing with a non-phosphate detergent and double rinsing with distilled water.
- A minimum of one equipment decontamination sample per day will be collected following decontamination of the non-disposable sampling equipment, by pouring distilled water over a piece of cleaned equipment, and will be analyzed for the target compounds.
- A minimum of one field duplicate sample will be collected of groundwater, and will be analyzed for the target compounds.
- A trip blank will be included in each cooler along with the samples, and will be analyzed for volatile target compounds (e.g., TPH as gasoline and BTEX).

Rinse water from decontamination of sampling equipment and any soil cuttings generated during sampling will be placed in proper containers and labeled as to the source and date of accumulation. A sample of rinse water will be collected and analyzed for the target compounds indicated above. The soil sample results will be used to characterize the soil cuttings. Disposal of the rinse water and soil cuttings will be performed by the current Port of Oakland disposal contractor.

Task 5 - Prepare Soil and Water Investigation Report. Upon receipt of laboratory analyses for the soil and groundwater samples, a draft report will be prepared. This report will include tabulated sample results, a figure showing the former tank cavity and boring locations, copies of laboratory reports and chain-of-custodies for the soil and groundwater samples, and copies of the boring logs for the soil boring. The report will also include conclusions and recommendations based on the

findings of the investigation. Upon review and comment by the Port of Oakland, a final report will be prepared and provided to the Port of Oakland for submittal to Alameda County.

ESTIMATED SCHEDULE

The following schedule is anticipated for completion of the above tasks, starting from the approval of the Workplan by Alameda County:

Task	Weeks												
	1	2	3	4	5	6	7	8	9	10	11	12	
Health and Safety Plan	█												
Review of records and photographs	█	█	█										
Geophysical survey				█									
Utility clearance					█								
Soil and groundwater sampling					█								
Laboratory analysis						█	█	█					
Draft Soil and Water Investigation Report								█	█				
Review of Draft Report by Port of Oakland									█	█			
Final Soil and Water Investigation Report										█	█		

Considerations regarding the schedule include identifying the approximate area of the former tank cavity from historic records and photographs, clearing the area of metal objects such as containers and trailers, and delineating the former tank cavity using geophysical techniques.

CONCLUSIONS

The above scope of work should adequately evaluate the potential presence of soils containing petroleum hydrocarbons at the southern end of the former tank cavity. However, if the former tank cavity can't be located using the proposed geophysical techniques, the soil and groundwater sampling will not be conducted, and the requested scope of work will be re-evaluated.

Please give me a call if you have any questions or need additional information.

Sincerely,

Jeffrey D. Hess, R.G.
Project Director

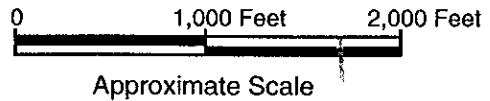
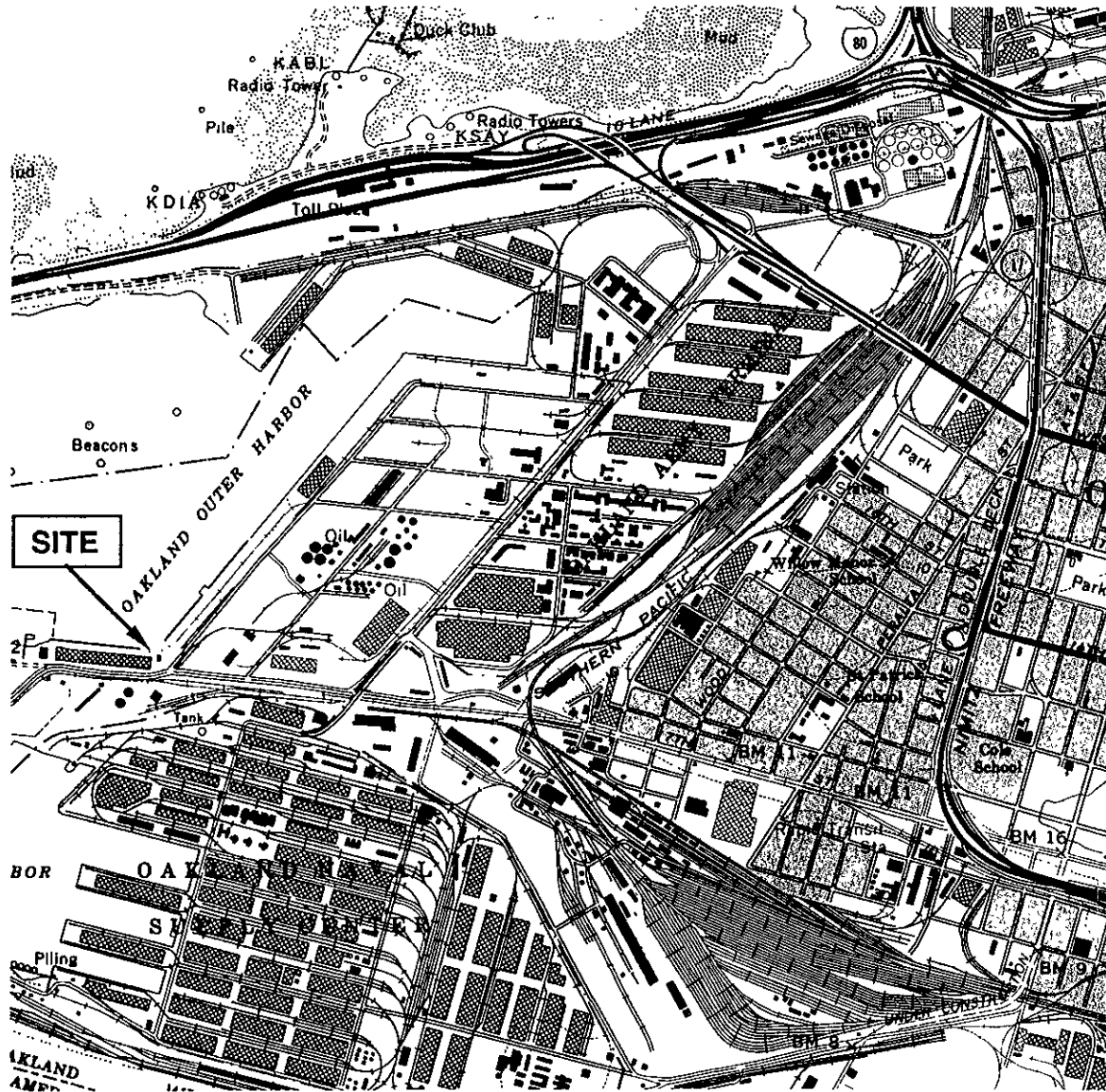


FIGURE 1
SITE LOCATION

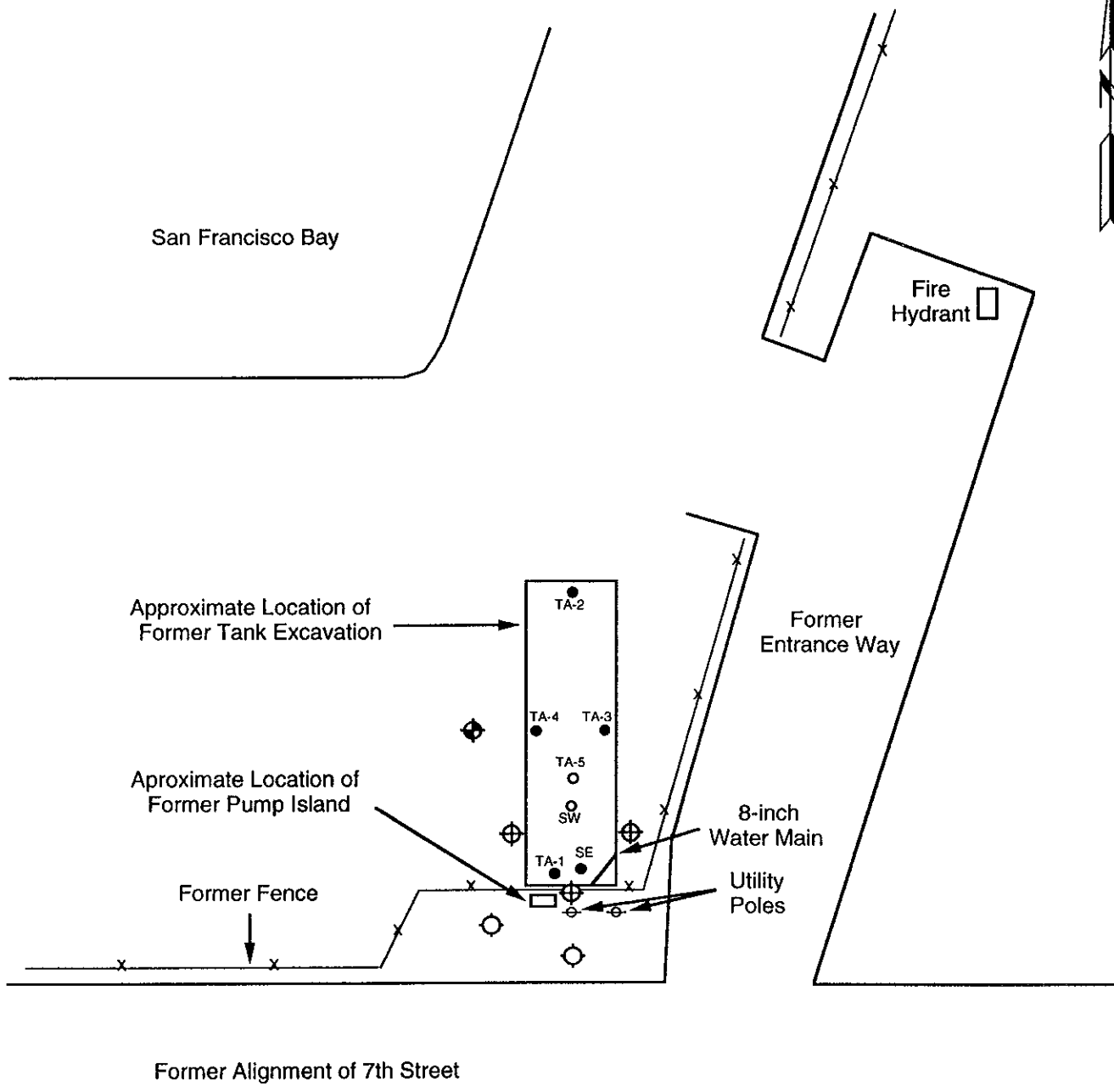
Former Carnation Terminal Site, Berth 30
2700 7th Street



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Source: Oakland West 7.5-minute U.S.G.S. Quadrangle,
dated 1959, and photorevised in 1980.



Legend

- Previous Soil Samples by Baseline and Aqua Science Engineers
- Previous Groundwater Samples by Baseline and Aqua Science Engineers
- ⊕ Proposed Boring Locations
- ⊕ Proposed Boring Locations (Groundwater Only)
- Alternate Boring Locations

Drawing Not To Scale

FIGURE 2
PROPOSED SOIL AND GROUNDWATER
SAMPLE LOCATIONS

Former Carnation Terminal Site, Berth 30
 2700 7th Street



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Source Adapted from Figure 2, Site Plan, from Report on Underground Tank Removal and Remedial Activities Baseline Environmental Consulting, March 1989