



# Subsurface Consultants, Inc.

R. William Rudolph, P.E.  
President

September 23, 1997

SCI 133.009

Mr. Jonathan Redding, Esq.  
Fitzgerald, Abbott & Beardsley, LLP  
1221 Broadway, 21st Floor  
Oakland, California 94612

**Work Plan**  
**Oil-Filled Manhole and Additional Investigation**  
**Ninth Avenue Terminal Study Area**  
**Port of Oakland**  
**Oakland, California**

Dear Mr. Redding:

Subsurface Consultants, Inc. (SCI) is pleased to present this work plan to conduct additional investigation at the Ninth Avenue Terminal Project for the Port of Oakland (Port). Based on findings presented in SCI's Third Interim Report of the subject site dated August 15, 1997, several areas have been identified that require additional investigation. This work plan presents SCI's recommended scope of work for several investigation tasks that are necessary to support current and future mediation and/or litigation goals of the Port and to comply with Alameda County Health Care Services Agency (ACHCSA) requirements presented in their letters dated August 2, 1996, December 2, 1996, January 14, 1997, and April 25, 1997. Based on our understanding, this work plan is required by ACHCSA pursuant to Water Code Section 13267(b) and Health and Safety Code Sections 25299.37 and 25299.78. Failure to submit this document may subject the Port to civil liability.

## SCOPE OF SERVICES

SCI's scope of services will comprise the following activities:

- Perform an evaluation of the oil-filled manhole and its associated in- and outflow pipes (i.e., Cannery Line),
- Additional subsurface investigation at Marine Terminals Corporation (MTC) Buildings H-317 (forklift repair shop) and H-309 (Ninth Avenue Terminal Transit Shed),
- Additional investigation of an area near former Building H-215 where chlorinated solvents and pesticides have been found in soil and groundwater,

These tasks are described below.

### **Oil-Filled Manhole Investigation**

The overall purpose of this investigation is to evaluate the various preferential pathways of existing subsurface utilities and their role in the current distribution of contaminants at the site. Specific concerns that will be evaluated in this investigation are related to the "oil-filled manhole" located west of former building H-217 and south of former building H-227. The diesel product identified in the manhole closely resembles the diesel product released at the KOT facility. Various pipes that feed and exit this manhole, however, are constantly submerged beneath the surface of the liquid, impeding visual observation of the pipes. Previous attempts to remove fluid from the manhole resulted in water flowing into the manhole from an external source failing to expose the pipes. SCI therefore believes that at least one outfall pipe exists flowing to the Bay. The number, location, size, construction, and configuration of this and other pipes is therefore essential to evaluate the source of product in the manhole. SCI will attempt to evaluate, at a minimum, all manhole connections and determine the integrity of the pipes and connections flowing into the manhole.

SCI proposes to block the suspected outfall pipe(s) using an appropriately sized inflatable device(s), thereby preventing inflow of Bay water into the manhole. SCI will then remove all liquid from the manhole and inflow pipes and store it temporarily on-site pending later disposal. A detailed visual reconnaissance of the manhole and pipes will allow appropriate utility locating techniques (e.g., probe and trace) to be performed providing information on the number, size, and orientation of the pipes. The pipes will be traced and located upstream to the maximum extent possible. The integrity of the connecting inflow pipes will be evaluated using a remote controlled video camera designed specifically for this type of study. The pipes will be cleaned and/or "jetted" as needed to allow access for the video camera. All connections, condition, misalignment, and leaks within pipe runs will be recorded to the maximum extent possible. The liquid generated from cleaning and/or jetting the pipes will be removed and stored on-site pending disposal.

The scope of work to evaluate the oil-filled manhole is a minimum scope based on a list of assumptions. The following additional scope items may be required to complete the investigation objective:

- Investigation of preferential pathways associated with the oil-filled manhole using a dye tracer,
- Trace the Cannery Line and determine its integrity from the upstream end (including additional test pits), and
- Chemical characterization of contaminants in sediment and backfill material along the Cannery Line.

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In addition, a *permanent* sealing-off or capping activity is proposed for appropriate utility pipes that discharge to the bay. This sealing operation for the oil-filled manhole will be performed only after investigation activities described herein have been completed. However, the inflatable devices positioned to seal off bay water to the manhole will be left in place to facilitate this effort, if performed at a later date.

### **Investigation at MTC Buildings H-317 and H-309**

Building H-317 is used by MTC to repair forklifts and other vehicles relevant to their business. In May 1997, SCI excavated test pits within a former UST area just west of the building (test pits SCITP-33A through SCITP-33E). A gasoline release from the UST reportedly leaked into San Francisco Bay in 1975. Soil and groundwater within the test pits were impacted with gasoline, diesel, and motor oil range petroleum hydrocarbons, polynuclear aromatic hydrocarbons (PAHs), and lead.

SCI will install two 2-inch diameter monitoring wells approximately 20 feet below the ground surface (bgs) down-gradient and/or cross-gradient of the former tank area to assess potential groundwater contamination and lateral extent of contamination. SCI will collect soil samples from the well borings, and we will develop and sample groundwater from the wells in accordance with the field procedures used for previous phases of investigation at the subject site.

SCI will also drill a total of four test borings up to 15 feet deep in the locations shown on the attached map using a cuttingless soil sampling technique known as Envirocore. A site reconnaissance conducted by SCI on September 11, 1997, provided information to locate the four borings. Two of the test borings will be located within and adjacent to Building H-317 near a discharge pipe for a suspected parts cleaning sink, and in the low-lying center of the building. The two other borings will be located adjacent to Building H-309 in an area of observed surface staining and in an unpaved location at the west end of the building where surface water runoff from the surrounding areas collects at a drain inlet.

SCI plans to submit 2 soil samples and one groundwater sample per boring for laboratory analysis. The samples will be tested for the following constituents: total volatile hydrocarbons (TVH), benzene, toluene, ethylbenzene, and total xylenes (BTEX), total extractable hydrocarbons (TEH), volatile organic compounds (VOCs), semi-volatile organic compounds including PAHs, pesticides/PCBs, lead, and total oil and grease (O&G).

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### Solvent Area Adjacent to Former Building H-215

*check this* (Elevated concentrations of chlorinated and nonchlorinated solvents and pesticides were discovered in soil and groundwater samples from this area over the past year. To evaluate the scope and costs of potential remediation activities in this area, additional investigation activities are necessary. To assess the vertical extent of solvents in the source area, SCI will drill 3 test borings to approximately 25 feet bgs. To evaluate the lateral and vertical extent of solvents in groundwater, SCI will install three 2-inch diameter monitoring wells, approximately 20 feet deep and one double-cased 2-inch diameter well, approximately 60 feet deep to assess whether solvents have impacted groundwater in the underlying aquifer. SCI will collect soil and groundwater samples in accordance with the field procedures used in previous phases of the investigation.

*I don't know w/ a deep GW well*  
SCI plans to construct the double-cased well with the screened interval placed between approximately 50 and 60 feet bgs, beneath the confining Bay Mud layer and within the underlying permeable sands of the San Antonio formation. Initially, an approximately 14-inch diameter boring will be drilled using hollow stem augers which will extend at least 10 feet into the confining Bay Mud layer (about 20 feet bgs). An 8-inch diameter steel pipe (conductor casing) will then be lowered into the boring, centered, and pushed into the clay 1 to 2 feet. The annular space will be sealed to the surface using a bentonite/cement mixture. The conductor casing will prevent any groundwater from the overlying aquifer to flow into and hence cross-contaminate the underlying aquifer. The remainder of the boring will be drilled using smaller 8-inch diameter augers and the well will be constructed in a similar manner to that of the shallower wells except only the lower 10 feet will be screened.

SCI plans to submit the following samples for laboratory analysis:

- 8 soil samples and one grab groundwater sample from each of the 3 test borings,
- 3 soil samples and one groundwater sample from each of the 3 shallow wells, and
- 12 soil samples and one groundwater sample from the deep monitoring well.

Selected samples will be analyzed for the following contaminants: TVH, BTEX, TEH, volatile organics compounds (VOCs), pesticides, and O&G.

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### **Tidal Influence Study**

A tidal influence study is necessary to evaluate the effect that the tides have on groundwater near Clinton Basin, to assess the effectiveness of the bulkhead wall in inhibiting the migration of contaminants in groundwater, and to evaluate tidal effects within utility pipes at the site. Initial review of electrical conductivity readings obtained from fluid in various manholes and catch basins located near the outfall end of several on-site drainage systems provided inconclusive information regarding tidal influence. SCI proposes to continuously record over a 48-hour period the groundwater elevations in 9 monitoring wells adjacent to Clinton Basin and the bulkhead wall (SCIMW-2, SCIMW-3, SCIMW-8, SCIMW-9, SCIMW-11, SCIMW-13, SCIMW-15, SCIMW-18, and SCIMW-24), while simultaneously recording tide elevations in the estuary. This will be accomplished by using 10 pressure transducer/data logging "troll" units. At the same time, water level measurements within at least seven storm drain manholes and catch basins near the estuary will be obtained at regular time intervals throughout the same study period by using an electric well sounder. Approximately six manholes and catch basins near the outfall end of the main storm drain systems along 8th and 10th Avenues will be monitored, along with the oil-filled manhole.

### **Preparation of Report**

SCI will prepare a report describing the scope, results, and findings of the above investigations.

SCI appreciates the opportunity to submit this work plan. If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Jeff Rubin  
Associate Environmental Scientist

Jeriann Alexander  
Associate Environmental Engineer

JD:JR:TJM:ly 133.009\addinv.wp

Attachments: Site Plan

TABLE A - ADDITIONAL RECOMMENDED INVESTIGATION

NINTH AVENUE TERMINAL  
 Port of Oakland, California  
 SCI 133.009  
 August 1997

ITEMS OF FURTHER STUDY	DATA COLLECTION														SAMPLE ANALYSES					BRIEF STATEMENT OF OBJECTIVES/RATIONALE/COMMENTS <sup>1,2</sup>
	Site Reconnaissance	Install Monitoring Wells	Drill Test Borings	Collect Soil Samples	Collect GW Sample	Utility Locating	Tidal Influence Study	Gas/BTEX EPA 8015	Extended Diesel - Oil Range EPA 8015	Volatile Organics EPA 8240	Semi-Volatile Organics EPA 8270	Chlorinated Pesticides PCB's EPA 8080	Heavy Metals EPA 6000/7000	Lead EPA 7240	Total Oil and Grease SMWW	Chromium 6+	pH, minerals	Cyanide		
1. Oil Filled Manhole Investigation						1													The diesel product identified in the manhole closely resembles the diesel product released at the KOT facility. Pipes that feed and exit this manhole are constantly submerged beneath the surface of the liquid, impeding visual observation of the pipes. The number, location, size, construction, and configuration of this and other pipes is therefore essential to evaluate the source of product in the manhole.	
2. Marine Terminals Corp. Building H-317: Install 2 wells and drill 2 test borings  Building H-309: Drill 2 test borings		2	4	12	6		18	18	18	18	18			12	18				The former UST area adjacent to Building H-317 reportedly had a spill in 1975. Investigation in April/May 1997 showed that this site has been impacted by petroleum hydrocarbons. Further study is necessary to determine the extent of contamination. During a recent site reconnaissance, SCI discovered additional potential source areas near Building H-317 and H-309: a central drainage area in H-317, a possible solvent sink drainage pipe, and excessive surface staining near an unpaved drainage area.	
3. Solvent Area at Former Building H-215 Install 3 shallow wells, 1 deep well and drill 3 test borings		4*	3	45	5	1	50	50	50		21				50				High concentrations of chlorinated solvents have been found in this area. The lateral and vertical extent of contamination to groundwater has not been fully characterized.	
4. Tidal Influence Study 6 wells and 7 manholes/catch basins																			A tidal influence study is necessary to evaluate the effect that the tides have on groundwater near Clinton Basin and to assess the effectiveness of the bulkhead wall in inhibiting the migration of contaminants in groundwater.	
5. Issue Report of Findings																			Includes data reduction and engineering analysis.	
Totals	0	2	7	57	11	1	68	68	68	18	39	0		12	68	0	0	0		

1. These should not be considered to be an exhaustive list of objectives, rationale, and comments.  
 2. Scope presented should not be considered comprehensive. Areas may be added, deleted, or relocated as additional information becomes available.  
 \* SCI proposes that one monitoring well will be double-cased and installed approximately 60' into a deeper confined aquifer.

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- Tidal influence study, and
- Preparation of a report describing the findings of the above.

These tasks are summarized on attached Table A and described in detail below.

### Oil-Filled Manhole Investigation

The overall purpose of this investigation is to evaluate the various preferential pathways of existing subsurface utilities and their role in the current distribution of contaminants at the site. Specific concerns that will be evaluated in this investigation are related to the "oil-filled manhole" located west of former building H-217 and south of former building H-227 (refer to attached Figure 1). The diesel product identified in the manhole closely resembles the diesel product released at the KOT facility. Various pipes that feed and exit this manhole, however, are constantly submerged beneath the surface of the liquid, impeding visual observation of the pipes. Previous attempts to remove fluid from the manhole resulted in water flowing into the manhole from an external source failing to expose the pipes. SCI therefore believes that at least one outfall pipe exists flowing to the Bay. The number, location, size, construction, and configuration of this and other pipes is therefore essential to evaluate the source of product in the manhole. SCI will attempt to evaluate, at a minimum, all manhole connections and determine the integrity of the pipes and connections flowing into the manhole.

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SCI 133.009  
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### Solvent Area Adjacent to Former Building H-215

*I Need to  
verify  
need..*

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### Preparation of Report

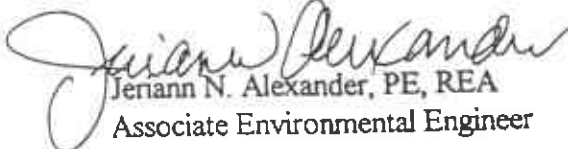
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SCI appreciates the opportunity to submit this work plan. If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

  
Jeffrey L. Rubin, CPSS, REA  
Associate Environmental Scientist

  
Jeriann N. Alexander, PE, REA  
Associate Environmental Engineer

JD:JLR:JNA:TJM:ly 133.009\addin.v.wp

Attachments: Table A, Figures 1 and 2

TABLE A - ADDITIONAL RECOMMENDED INVESTIGATION

NINTH AVENUE TERMINAL

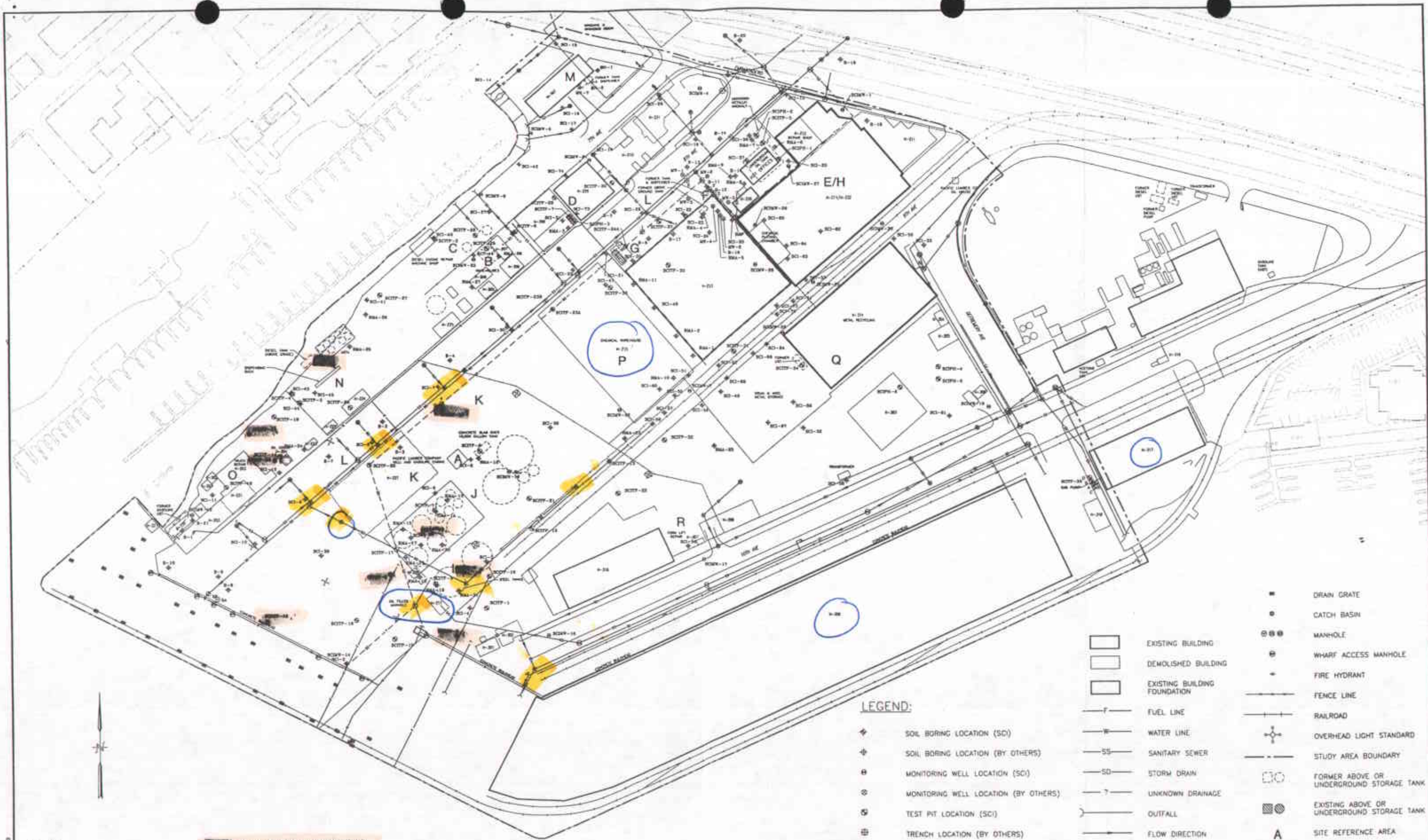
Port of Oakland, California

SCI 133.009

August 1997

ITEMS OF FURTHER STUDY	DATA COLLECTION														SAMPLE ANALYSES					BRIEF STATEMENT OF OBJECTIVES/RATIONALE/COMMENTS <sup>1,2</sup>
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2. Marine Terminals Corp. Building II-317: <u>Install 2 wells and drill 2 test borings</u>  Building II-309: Drill 2 test borings		2	4	12	6			18	18	18	18			12	18				The former UST area adjacent to Building II-317 reportedly had a spill in 1975. Investigation in April/May 1997 showed that this site has been impacted by petroleum hydrocarbons. Further study is necessary to determine the extent of contamination. During a recent site reconnaissance, SCI discovered additional potential source areas near Building II-317 and II-309: a central drainage area in II-317, a possible solvent sink drainage pipe, and excessive surface staining near an unpaved drainage area.	
3. Solvent Area at Former Building II-215 Install 3 shallow wells, 1 deep well and drill 3 test borings		4*	3	45	5	1		50	50	50		21			50				High concentrations of chlorinated solvents have been found in this area. The lateral and vertical extent of contamination to groundwater has not been fully characterized.	
4. Tidal Influence Study 6 wells and 7 manholes/catch basins							1												A tidal influence study is necessary to evaluate the effect that the tides have on groundwater near Clinton Basin and to assess the effectiveness of the bulkhead wall in inhibiting the migration of contaminants in groundwater. Includes data reduction and engineering analysis.	
5. Issue Report of Findings																				
Totals	0	2	7	57	11		1	68	68	68	18	39	0	12	68	0	0	0		

1. These should not be considered to be an exhaustive list of objectives, rationale, and comments.  
 2. Scope presented should not be considered comprehensive. Areas may be added, deleted, or relocated as additional information becomes available.  
 \* SCI proposes that one monitoring well will be double-cased and installed approximately 60' into a deeper confined aquifer.



**NOTES:**  
 1. UTILITY SURVEY WAS PREPARED BY:  
 AN WEST 5-22-96

**REFERENCE DRAWINGS:**  
 BASE MAP BY  
 PORT OF OAKLAND  
 DATED 2-22-96

**TIDAL INFLUENCE STUDY WELLS**  
**TIDAL INFLUENCE STUDY STORM DRAINS**



**LEGEND:**

- ◆ SOIL BORING LOCATION (SC)
- ◆ SOIL BORING LOCATION (BY OTHERS)
- ⊕ MONITORING WELL LOCATION (SC)
- ⊕ MONITORING WELL LOCATION (BY OTHERS)
- ⊕ TEST PIT LOCATION (SC)
- ⊕ TRENCH LOCATION (BY OTHERS)
- ▭ EXISTING BUILDING
- ▭ DEMOLISHED BUILDING
- ▭ EXISTING BUILDING FOUNDATION
- FUEL LINE
- WATER LINE
- SS SANITARY SEWER
- SD STORM DRAIN
- UNKNOWN DRAINAGE
- OUTFALL
- FLOW DIRECTION
- DRAIN GRATE
- CATCH BASIN
- ⊙ MANHOLE
- ⊙ WHARF ACCESS MANHOLE
- FIRE HYDRANT
- FENCE LINE
- RAILROAD
- ⊕ OVERHEAD LIGHT STANDARD
- ⊕ STUDY AREA BOUNDARY
- ⊕ FORMER ABOVE OR UNDERGROUND STORAGE TANK
- ⊕ EXISTING ABOVE OR UNDERGROUND STORAGE TANK
- A SITE REFERENCE AREA

DESIGNED BY  
 DRAWN BY RDP/DJP  
 CHECKED BY JD  
 APPROVED BY JD  
 DATE 9-11-97

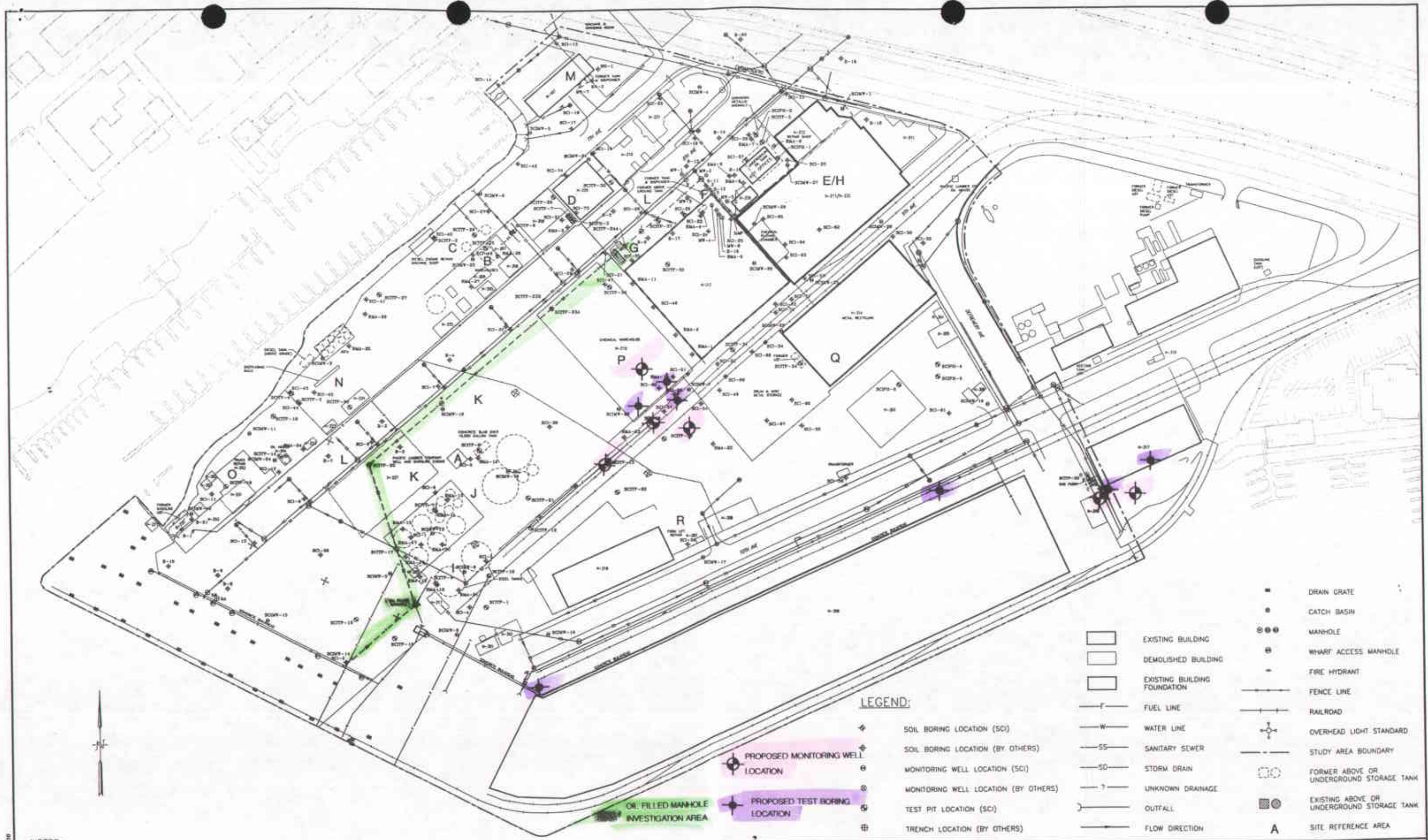


**Subsurface Consultants, Inc.**  
 Geotechnical & Environmental Engineers  
 171 12th Street - Suite 200  
 Oakland, California 94607  
 (510) 299-7960  
 FAX (510) 299-7970

NINTH AVENUE TERMINAL  
 PORT OF OAKLAND

**SITE PLAN**

SCALE AS SHOWN	
PROJECT NO. 133.005	
SHEET NO.	OF
—	—



**NOTES:**  
 1. UTILITY SURVEY WAS PREPARED BY  
 AN WEST 5-22-96

**REFERENCE DRAWINGS**  
 BASE MAP BY  
 PORT OF OAKLAND  
 DATED 2-22-96



DESIGNED BY	
DRAWN BY	RDP/DJP
CHECKED BY	JD
APPROVED BY	JD
DATE	9-11-97



**Subsurface Consultants, Inc.**  
 Geotechnical & Environmental Engineers  
 171 12th Street + Suite 200  
 Oakland, California 94607  
 (510) 299-7960  
 FAX (510) 299-7970

**NINTH AVENUE TERMINAL  
 PORT OF OAKLAND**  
**SITE PLAN**

SCALE	AS SHOWN
PROJECT NO	133.005
SHEET NO	1

- LEGEND:**
- [Symbol] EXISTING BUILDING
  - [Symbol] DEMOLISHED BUILDING
  - [Symbol] EXISTING BUILDING FOUNDATION
  - [Symbol] FUEL LINE
  - [Symbol] WATER LINE
  - [Symbol] SANITARY SEWER
  - [Symbol] STORM DRAIN
  - [Symbol] UNKNOWN DRAINAGE
  - [Symbol] OUTFALL
  - [Symbol] FLOW DIRECTION
  - [Symbol] DRAIN GRATE
  - [Symbol] CATCH BASIN
  - [Symbol] MANHOLE
  - [Symbol] WHARF ACCESS MANHOLE
  - [Symbol] FIRE HYDRANT
  - [Symbol] FENCE LINE
  - [Symbol] RAILROAD
  - [Symbol] OVERHEAD LIGHT STANDARD
  - [Symbol] STUDY AREA BOUNDARY
  - [Symbol] FORMER ABOVE OR UNDERGROUND STORAGE TANK
  - [Symbol] EXISTING ABOVE OR UNDERGROUND STORAGE TANK
  - [Symbol] A SITE REFERENCE AREA