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TANK EXCAVATION WORK PLAN
SOUTHERN PACIFIC TRANSPORTATION COMPANY
OAKLAND, CALIFORNIA

Canonie Environmental

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

LIST OF TABLES

LIST OF FIGURES

TANK EXCAVATION WORK PLAN
SOUTHERN PACIFIC TRANSPORTATION COMPANY
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1.0 INTRODUCTION

This work plan describes the procedures for the removal of two underground storage tanks at the Southern Pacific Transportation Company (SPTCo.) facility located in Oakland, California. See Figures 1 and 2 for site and tank locations. Table 1 lists the tank capacities and products. Included in this work plan is a description of site preparation and excavation, site closure and restoration, contingencies for investigation and mitigation of contamination (if detected), waste disposal, record keeping and certifications, health and safety measures, and project quality assurance procedures.

The removal of the tanks will be in accord with the California Code of Regulations Title 23, Waters; Chapter 3, Water Resources Control Board; Subchapter 16, California Underground Storage Tank Regulations and in accord with local, county, and city regulations, as required. Canonie Environmental Services Corp. (Canonie), a licensed California State contractor (No. 510801 A), will coordinate and perform the removal activities. All local officials responsible for underground tank programs will be contacted at least 72 hours before mobilization.

2.0 REMOVAL PROCEDURES

2.1 Site Preparation

Before beginning operations at the Oakland site, Canonie will provide or complete the following items:

1. File and obtain approval of all permits.

2. Contact local officials and regulatory personnel and inform them of the removal.

3. Secure the site as needed to prevent unauthorized personnel from entering the work area (ie, using barricades and construction tape).

4. Saw-cut asphalt and concrete surfaces where necessary.

5. Review health and safety requirements and locate nearby emergency medical facilities.

SPTCo. will be responsible for locating all aboveground and underground utilities. They will also be responsible for removing all product from the underground storage tanks and product lines. After product removal, excavation operations will begin.

2.2 Rendering the Tank Inert

The tank(s) will be rendered inert with dry ice. The fill neck or manway cover on the tank will be removed and crushed dry ice will be placed in the tank. A minimum of 2.0 pounds of dry ice per 100 gallons of tank volume will be added. The procedure will continue until organic vapors are less than 10 percent of the lower explosive limit of methane. An explosimeter

will be used by a qualified worker to confirm that the vapors have been purged to this limit. A local fire marshal or a representative of another regulatory agency will be on the site to verify that the tank is safe for removal.

2.3 Excavation and Removal

The steps for completing excavation and removal are as follows:

1. Excavate existing surface materials and soils to expose the top surface of the tank and manway entrance. This will also include excavation of the product supply lines and vents connected to the tank. All soils will be segregated by field observations (ie, visible contamination and odor) so that clean and contaminated materials can be stockpiled separately.

2. Remove manway cover or fill neck and confirm that product has been removed. If for some reason the product has not been removed, contact SPTCo. for removal. Once empty, the tank should then be rendered inert by decreasing vapors to acceptable levels with dry ice as described in Section 2.2.

3. Continue excavation operations until the tank is free and clear for removal. As mentioned in Step 1, contaminated soils (if present) and clean soils will be segregated. If contaminated soils are present, they will be either put in drums or stockpiled for off-site disposal on plastic film bermed with earth. The decision of whether to drum or stockpile soils will be based on soil volume and site access.

4. Use cable rigging fastened to the tank to lift the tank from the excavation. A backhoe or crane will be used to remove the tank from the excavation.

5. After removal of the tank from the excavation, the soils below the tank will be inspected for the presence of product. If contamination is evident, additional excavation will be performed until clean soil is encountered or until further excavation is no longer feasible. As mentioned in Step 3, any contaminated soil encountered will be either put in drums or stockpiled on plastic film. Samples will be analyzed within two weeks for the constituents described in Section 2.4. The decision for additional excavation will depend on the results of the chemical analyses.

6. The excavated tanks will be manifested and transported as California Regulated Waste. This will be accomplished by:

   Erickson Trucking Inc.
   255 Parr Boulevard
   Richmond, CA 94801
   (415) 235-1393
   United States Environmental Protection Agency
   (EPA) No. CAD009466392
   California Department of Health Services (DHS) No. 019

7. After excavation and sampling operations have been completed, the pit will be backfilled and the site restored to its original condition. Closure and restoration will be in accord with the procedures outlined in Section 2.5.

2.4 Collection and Analyses of Soil Samples

After excavation and tank removal operations, the on-site engineer or geologist will obtain two soil samples from between one to two feet below the backfill material, and approximately one-third of the way in from each end of the tank. In addition, a soil sample shall be taken at the base of the pipe excavation trench for every 20 lineal feet of pipe. The soil will

Once the excavation has been determined to be adequate, it will be backfilled. The fill and compaction methods are outlined in Section 2.5.1.

2.5 Closure and Restoration

2.5.1 Soils

The results of the soil sample analysis will determine whether additional excavation will be required. The excavation will be backfilled with clean soil. Backfill material will be compacted to a relative compaction of 90 percent to within one foot of surrounding grade. The final surface will be completed with the same material that was in place before excavation.

If chemical levels above regulatory cleanup standards are detected in the soil samples, a proposal for excavation will be submitted to SPTCo. Any need for implementation of alternative remedial actions for contaminated soils will also be included in the proposal.

2.5.2 Ground Water

From the site visit and review of local geology and hydrogeology, ground water is not now expected to be encountered during excavation. If, however, ground water is encountered; a water sample will be collected and analyzed for the appropriate constituents given the tank contents listed in Section 2.4. As stated earlier, the removal of the tanks will be in accord with the California Code of Regulations Title 23, Waters; Chapter 3, Water Resources Control Board; Subchapter 16, California Underground Storage Tank Regulations. These regulations explain the necessary procedures when ground water is encountered. Samples will be collected using laboratory prepared glass sample bottles equipped with Teflon™-lined lids.

If chemicals are detected, a proposal for ground water remediation will be developed and submitted to SPTCo. A typical remediation might consist of first installing three monitoring wells to assess the nature and extent of

ground water contamination and to provide information on ground water gradients. The need for additional wells and subsequent ground water remediation will depend on the results of the initial installation, sampling, and testing program.

2.5.3 Site Cleanup

On completion of all site activities, the area will be restored to its original condition. All equipment will be decontaminated before removal from the site. Removal of the tanks, contaminated soils, or other waste materials generated during site operations will be in accord with the waste disposal plan discussed below.

2.6 Waste Disposal Plan

The types of material potentially requiring disposal include the following:

1. Remaining product;
2. Tank and product supply lines;
3. Contaminated soil.

The procedures for disposal of each of these materials follow:

1. Remaining Product: SPTCo. will empty the tank before Canonie mobilizes. If a tank has not been emptied, a licensed removal and transportation contractor will be called to the site for removal of the tank contents. The contents will be recycled or manifested as hazardous waste for disposal at an approved disposal facility.

2. Tank and Product Supply Lines: The tanks and lines will be manifested as California Regulated Waste and transported by Erickson Trucking Inc., to Erickson Inc's facility in Richmond,

3.3 Analysis of Job Hazards

This section presents an analysis of the job hazards of the field activities. The primary hazards are divided into two areas:

1. Chemical hazards from remaining product or vapors in the tank(s) and from contaminated soils and ground water;

2. Physical hazards from working around heavy machinery such as excavation equipment.

3.3.1 Hazards of Chemical Exposure

The tanks located at the Oakland facility contained regular gasoline and diesel fuel. The most hazardous chemical constituents pertaining to fuel products are benzene, toluene, xylene, and lead. Benzene is considered carcinogenic to humans. The volatility of fuel products presents a potential exposure by inhalation. Possible direct contact with contaminated soils or product residues in the tanks are a potential skin exposure route. The risks from these materials and the measures to be undertaken to minimize these risks are discussed in Section 3.4.

3.3.2 Physical Hazards

The primary physical hazards posed by the field programs are from working near heavy construction equipment (eg, excavation equipment, etc). Hard hats, ear plugs, and steel-toed boots will be required for all personnel working around such equipment. In addition, heat from high ambient temperatures, protective clothing, a heavy physical workload, and/or a

4. Health and Safety Officer: This worker will be responsible for performing the appropriate monitoring activities and maintaining appropriate personal protective equipment for all individuals.

5. Truck Drivers: These workers will transport waste materials to an appropriate disposal facility.

3.4.1 Risks of Exposure by Direct Contact

Direct contact with the skin could potentially occur through various activities of the work including the following:

1. Removal and handling of contaminated soil during excavation by the backhoe operator and laborers;

2. Soil sampling.

The exposure potential by direct contact is considered low for the following reasons:

1. Backhoe operators will use equipment to handle waste materials, soils, samples, etc, and will probably not come in direct contact with waste materials.

2. To reduce the possibility of skin contact with contaminants, workers will wear protective clothing including, but not limited to, boots, gloves, and additional protective clothing, as necessary.

3. Operations do not involve splashing or uncontrolled release of waste materials, soils, or ground water.

4. Workers are skilled in techniques for excavating and sampling, including material loading, sample handling, decontamination, sample packaging and transport, and waste loading and transport.

3.4.2 Risks of Exposure by Inhalation

The following activities could cause a potential exposure by inhalation:

1. Volatilization from contaminated soil during removal, excavation, and handling;

2. Volatilization from removal of product and wash water during tank purging and cleaning.

The exposure potential of volatile compounds by inhalation is considered low for the following reasons:

1. SPTCo. will remove tank contents before Canonie mobilizes personnel at the site.

2. Tanks are closed containers and do not allow significant volatilization to occur.

3. Half-face respirators will be maintained on-site to protect against inhalation exposure, if necessary.

4. Air monitoring will be performed as a precaution during all on-site operations and, if necessary, respiratory protection procedures will be implemented.

3.4.3 Risks From Physical Hazards

The physical hazards of working with heavy machinery and the potential for heat stress are not considered any different from those of standard construction operations. Risks will be minimized by using properly trained and experienced personnel and by using personal protective equipment (hard hats, steel-toed boots, earplugs) and rest periods.

3.5 Plan for Air Monitoring

During waste excavation, waste loading, and tank purging and cleaning operations; an organic vapor analyzer (OVA) or equivalent will be available to measure airborne levels of organic vapors. Readings will be taken above the excavation and the tank to monitor the presence of vapors. If sustained readings of total organic vapors of 20 parts per million (ppm) above background levels are detected in the workers' breathing zone for five minutes, work will be stopped and respirators will be donned by all personnel in the active zone. If levels of volatile organics above background exceed the 20-ppm range, the site safety officer in consultation with the corporate industrial hygienist will determine whether safety measures need to be upgraded. Examples of possible upgrade measures include the following:

1. Full-shift personnel air monitoring using personal sampling pumps and charcoal sorbent tubes;

2. Additional personal protective clothing and upgraded respiratory protection;

3. Additional on-site training and safety meetings.

Air monitoring will be performed by the site safety officer and will be performed during tank removal.

3.6 Personal Protective Equipment

Personal protective equipment will be worn by all personnel in the active area. Personal protective equipment designed to prevent contact with contaminated materials is described in the next four sections.

3.6.1 Coveralls

When appropriate from potential for skin contact, all personnel will wear a one-piece, front-zippered, Tyvek™ or Polytyvek™ suit to protect against skin exposure. These coveralls are expected to provide adequate protection to personnel and will be replaced after each use and when torn or otherwise damaged.

3.6.2 Steel-Toed Boots

Boots with steel toes will be worn at all times.

3.6.3 Gloves

Latex gloves will be worn by personnel sampling and handling soil.

3.6.4 Hard Hats

Hard hats will be worn by all personnel working near heavy machinery.

3.7 Work Zone and Security Measures

Only authorized personnel will be allowed in the active working zones. Active work zones will be marked with temporary barriers and plastic tape and will be posted as construction zones. Throughout the various field activities, all personnel entering an active zone will have the full complement of protective clothing previously described. The site safety officer will be responsible to see that all personnel are properly

equipped. "NO SMOKING" signs will be displayed around the work area. Fire extinguishers conforming to the local fire prevention standards will be maintained in the work area.

3.8 Decontamination Procedures

All excavation and sampling equipment, as well as all nondisposable protective gear coming in contact with potentially contaminated soils or ground water at the site, will be decontaminated before being removed from the site or being reused. The excavation equipment will be cleaned thoroughly with a high-pressure steam cleaner. Sampling equipment and neoprene gloves will be washed thoroughly with soapy water and rinsed with clean water. Disposable protective gear will be placed in plastic bags for future disposal.

If personnel have direct skin contact with contaminated soils or ground water, the following procedures will be used:

1. Remove necessary protective clothing.
2. Wash the affected area with soapy water.
3. Rinse with clean water.
4. Wash and rinse nondisposable protective equipment.
5. Don new protective clothing and clean equipment, as appropriate.

3.9 General Safe Work Practices

Direct contact with ground water and soils during excavation activities will be avoided; but, if such contact with protective clothing occurs, the

employee will immediately follow the procedure outlined in Section 3.8. No food, drink, or smoking will be allowed in areas where work is being performed.

The following standard operating procedures will be observed:

1. All work will be planned well in advance of the site work.

2. No eating, drinking, or smoking will be allowed before removal of protective clothing and decontamination.

3. Restricted areas will not be entered without proper protective clothing.

4. Utility lines will not be tampered with.

5. All personnel must know the location of the first aid kit.

6. Lift with leg muscles and not with your back.

7. All injuries must be reported to the health and safety officer.

8. No horseplay, scuffling, or other acts which may increase the risk of an accident will be allowed.

9. All personnel will wash thoroughly at the end of the work day before leaving the site.

3.10 Emergency Response Plan

Before starting work, an emergency response network will be established. Information containing the name(s), address(es), telephone number(s), and individual contact(s) of the nearest health, fire, and police facilities will be assembled. This information will be reproduced, displayed, and

posted in strategic locations around the jobsite. All personnel will be made aware of this information and of its location for use in an emergency. Provisions will be made to allow for on-site decontamination of personnel who come in direct contact with contaminated soil or gas vapors. The site safety officer will have training in cardiopulmonary resuscitation and first aid.

3.11 Documentation

Documentation of air monitoring will be included in the record of the tank removal log. Medical surveillance and injury records required by the Occupational Safety and Health Administration are maintained in the Canonie corporate office. The corporate record-keeping requirements and formats are established in the corporate health and safety manual which is available upon request.

4.0 QUALITY ASSURANCE AND QUALITY CONTROL

Quality assurance (QA) is defined as the integrated program designed for assuring reliability of monitoring and measurement data. Quality control (QC) is defined as the routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process. The overall QA objectives are to develop and implement standardized procedures for obtaining and evaluating data that can be used to assess site hazards and develop and evaluate alternative remedial actions.

The QA/QC plan presented herein is designed to implement the procedures necessary to maintain a consistent quality of technical products and will be employed by Canonie in fulfilling the requirements of this work plan. This consistency is accomplished through the standardization and documentation of field techniques and activities. All field activities will be planned in advance and reviewed by the technical project personnel. Laboratory activities will be performed by properly trained and qualified personnel and will conform to the specific procedures outlined in the subsequent sections.

Project deliverables resulting from these activities will be submitted and reviewed for completeness, reliability, accuracy, and conformance with specified procedures. Each deliverable will be reviewed by a project manager and a senior technical professional (vice-president level) before issuance to SPTCo. and the regulatory agencies. Senior reviewers will evaluate project deliverables on the basis of professional standards of practice, Canonie standards of quality, and established regulatory performance criteria. Because project deliverables could be used in litigation, it is extremely important that all work meet these standards of quality. After the internal review performed by Canonie, deliverables will

be submitted to SPTCo. SPTCo. will review the documents and all comments generated will be addressed and incorporated into the document for submittal to the regulatory agency.

4.1 Sampling Techniques

As described in Section 2.0, soil samples will be collected after excavation activities. After reaching the desired excavation depth, a clean, decontaminated brass sampling tube two-inches in diameter will be driven into the soil. The ends will be sealed with Teflon™ or aluminum foil, capped, and placed in sealed ziplock bags.

Water samples will be collected if water is encountered in the excavation. Samples will be collected in laboratory cleaned glass jars equipped with Teflon™-lined lids.

4.2 Sample Handling and Chain of Custody

The brass tubes and glass jars will be labeled using a waterproof marker to designate the location, date, sample I.D., and depth at which the sample was taken. All samples will then be placed on ice in an insulated ice chest and shipped to the analytical laboratory within 48 hours for analysis.

A separate chain-of-custody form will be included with each ice chest and will be placed in a sealed plastic bag. When transferring samples, the individuals relinquishing and receiving will sign, date, and note the time on the chain-of-custody form. A designated sample custodian will accept the shipped samples at the laboratory and will verify that the sample identification numbers match those on the chain-of-custody record.

The custodian will enter the sample identification number data into a log-book which is arranged by project code and station number. The laboratory custodian will use the sample identification number or assign a unique

laboratory number for each sample and will see that all samples are either transferred to the proper analyst or are stored in the appropriate secure area. The custodian will distribute samples to the appropriate analysts. Laboratory personnel are responsible for the care and custody of samples from the time they are received until the sample is exhausted or returned to the custodian.

When sample analyses and necessary QA checks have been completed in the laboratory, the unused portion of the sample will be disposed of properly. All data sheets and laboratory records are retained as part of the permanent documentation.

4.3 Field Observations and Documentation

General observations of climate, site conditions, and any factors affecting the sample will be recorded in the field notebook. The field notebook will be maintained by the field team leader to provide a daily record of significant events, observations, personnel present, site conditions, excavation procedures, sampling procedures, and calibration records.

4.4 Decontamination Procedures

Sampling equipment will be washed in detergent water, rinsed in clean water, rinsed in distilled water, and dried in air. The backhoe used for excavation will be steam cleaned as needed before leaving the site.

4.5 Analytical Procedures and Data Requirements

In general, the laboratory will adhere to the recommendations promulgated in Code of Federal Regulations Title 21, Part 58, "Good Laboratory Practices," and the criteria described in the U.S. EPA's Test Methods for Evaluating Solid Wastes, SW-846. Laboratory prepared clean glassware will

be used for organic analyses. Plasticware will not be used because other organic compounds may be extracted by solvents and produce interfering peaks on the chromatograph.

4.6 Laboratory Quality Assurance

Laboratory QA procedures for this study will consist of blank, recovery, and duplicate determinations. The specific routines to be followed are outlined in the next four sections. All samples with apparent chemical levels exceeding the limit of detection will be confirmed by an appropriate technique.

4.6.1 Blanks

Blank determinations will be method blanks to check for solvent interferences. Between each sample vial, a rinse vial containing the injection solvent will be inserted to see that there is no carryover. Method blanks will be carried throughout the entire analytical program.

4.6.2 Recoveries

A soil and water sample free from chemicals will be prepared by the laboratory. These samples will be used to demonstrate recovery of constituents being tested. The recoveries will be run at a level of 5 to 10 times the limit of detection noted for a particular compound.

4.6.3 Duplicates

As a check on the precision of the methods employed, approximately 10 percent of the samples will be analyzed in duplicate.

4.6.4 Confirmation

All samples that show levels of chemicals in excess of the limits of detection will be appropriately confirmed.

Respectfully submitted,

Lance D. Geselbracht, P.E.
Project Manager

LDG/as

TABLE 1

OAKLAND FACILITY
TANK PARTICULARS

Tank Identification	Tank Construction	Tank Capacity (gal)	Former Product
Tank 1	Steel	10,000	Regular Gasoline
Tank 2	Steel	10,000	Diesel Fuel

SCALE

2,000 0 2,000 FEET

QUADRANGLE LOCATION

REFERENCE:

USGS TOPOGRAPHIC MAP
TITLED: OAKLAND WEST, CA.
DATED 1959 (REV. 1980)

SITE LOCATION PLAN
OAKLAND, CALIFORNIA

PREPARED FOR

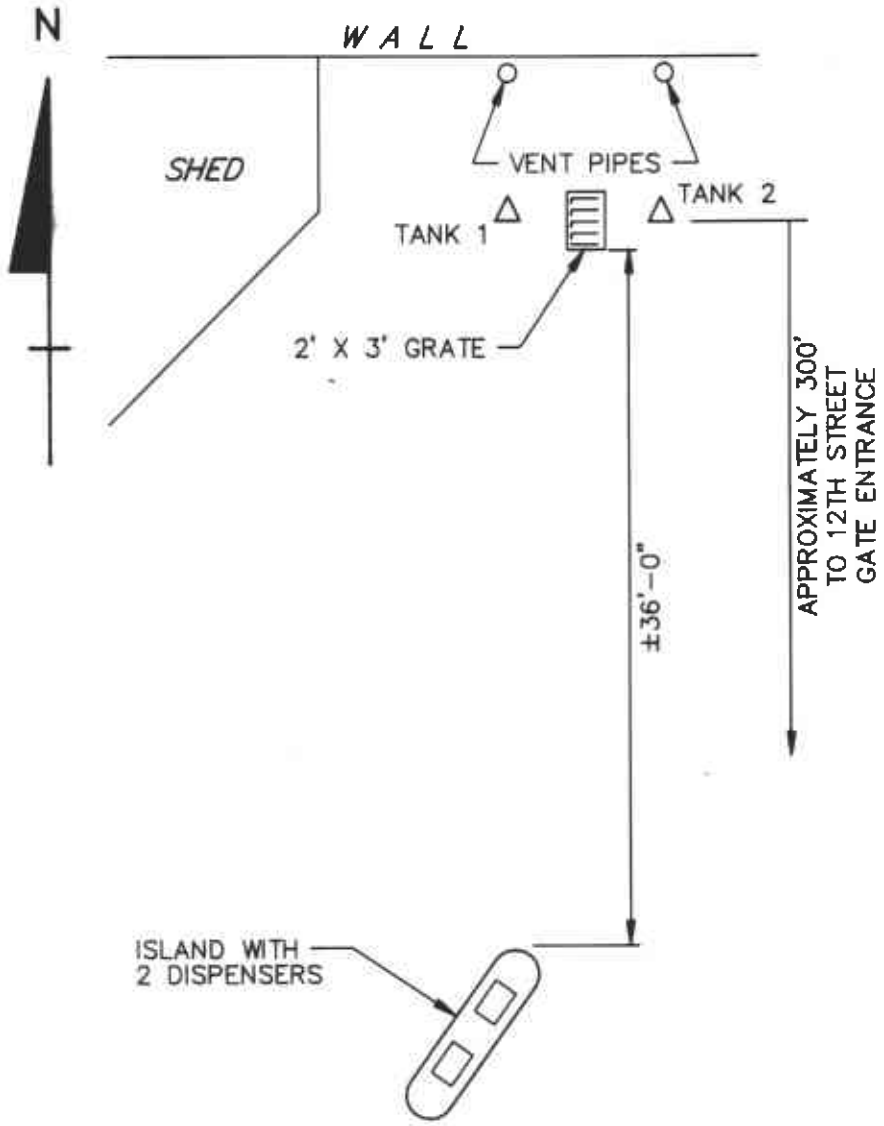
SOUTHERN PACIFIC
TRANSPORTATION COMPANY

Canonie Environmental

DATE: 8-28-89	FIGURE 1	DRAWING NUMBER 88-149-A58
SCALE: AS SHOWN		

DRAWING NUMBER 88-149-A58
DRAWN BY TGK 8-28-89
CHECKED BY
APPROVED BY
REVISIONS NO. DATE

14th St.



SCALE

10 0 10 FEET

TANK LOCATION PLAN
OAKLAND, CALIFORNIA

PREPARED FOR

SOUTHERN PACIFIC
TRANSPORTATION COMPANY

LEGEND:

△ TANK TO BE REMOVED

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DATE: 8-28-89	FIGURE 2	DRAWING NUMBER 88-149-A59
SCALE: AS SHOWN		

REVISIONS	NO.	DATE

DRAWN BY	TGK	8-28-89
CHECKED BY	CJ	8-30-89
APPROVED BY	KTD	8-30-89

DRAWING NUMBER 88-149-A59