

January 13, 1999

PROTECTION 99 JAN 19 PM 3: 43

Mr. John Ward
Wells Fargo Trust
Asset Management Division
Trust Real Estate Department
P.O. Box 63939
San Francisco, California 94163

Re: Revised Work Plan

490 43rd Street, Oakland, California (Blumert Trust)

ACC Project No. 95-6305-001.01

Dear Mr. Ward:

Enclosed please find two copies of the revised Work Plan for additional site investigation and remediation for the site at 490 43rd Street, Oakland, California. This work is designed to address concerns of the Alameda County Health Care Services Agency (ACHCSA), Department of Environmental Health, presented in their October 13, 1998 letter. ACC Environmental Consultants, Inc. (ACC), is forwarding one copy of this Work Plan to Mr. Barney Chan at the ACHCSA for review and approval according to requirements of the Underground Storage Tank Cleanup Fund. ACC would like to schedule work as soon as the plan is approved and finalized.

The work described in this Work Plan is designed to enhance natural bioremediation at the site, document improved groundwater quality, and obtain the data necessary to warrant regulatory site closure by August 1999.

If you have any questions regarding the revised Work Plan, please contact me at (510) 638-8400.

Sincerely,

David DeMent, RG Senior Geologist

Mr Barney Chan, ACHCSA ✓

Mr. Kenneth Cheitlin, McShane, Schnack & Cheitlin

Enclosure

cc:



REVISED WORK PLAN ADDITIONAL SITE INVESTIGATION AND REMEDIATION

490 43RD STREET OAKLAND, CALIFORNIA

ACC Project No. 95-6305-001.01

Prepared for:

Mr. John Ward Wells Fargo Trust P.O. Box 63939 San Francisco, California 94163

January 13, 1999

Prepared by:

Stephen Southern, REA

Senior Environmental Assessor

Reviewed by:

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TABLE OF CONTENTS

			Page	
1.0	INTRODUCTION			
2.0	BAC	BACKGROUND		
3.0	DISC	CUSSION	2	
4.0	PROPOSED SCOPE OF WORK		3	
	4.1	Confirm Dissolved Oxygen Levels		
	4.2	Introduce Oxygen Releasing Compound (ORC®)		
	4.3	Soil Borings	4	
	4.4	Monitoring Well Installation		
	4.5	Groundwater Monitoring		
	4.6	Risk Assessment		
	4.7	Confirmation Soil Borings	7	
5.0	RAT	TONALE FOR PROPOSED SCOPE OF WORK	7	
6.0	HEA	HEALTH AND SAFETY PLAN.		
7.0	TEC	TECHNICAL REPORT		
FIGU	JRES			

- 1 Location Map2 Site Plan
- 3 Boring Location Map

REVISED WORK PLAN ADDITIONAL SITE INVESTIGATION AND REMEDIATION 490 43RD STREET, OAKLAND, CALIFORNIA

1.0 INTRODUCTION

This Work Plan has been prepared by ACC Environmental Consultants, Inc. (ACC) at the request of Wells Fargo Bank on behalf of the Blumert Trust, for work to be performed at the site located at 490 43rd Street, Oakland, California (Figure 1). This Work Plan was prepared to address a request of the Alameda County Health Care Services Agency (ACHCSA) for additional site investigation and delineation of impacted groundwater, and includes data obtained from the December 12, 1998 sampling event. The Work Plan includes protocols for soil sampling in borings and collection of groundwater samples in borings and monitoring wells.

2.0 BACKGROUND

The site is located at the northeastern corner of Telegraph Avenue and 43rd Street, Oakland, California (Figure 2). The property is relatively flat, at an elevation of approximately 90 feet above mean sea level (MSL). The predominant groundwater flow direction is to the south-southwest.

The facility formerly operated one 1,000-gallon gasoline underground storage tank (UST) and one 350-gallon mineral spirit UST, which were removed on December 11, 1991 (Figure 2). Laboratory analysis of soil samples collected underneath the gasoline UST indicated concentrations up to 220 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPHg) and minor concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX). Laboratory analysis of soil samples collected underneath the mineral spirit UST indicated concentrations up to 25 ppm mineral spirits. Groundwater was observed in the excavation at a depth of approximately 12.5 feet below ground surface (bgs). The tank pit, which formerly contained both USTs, was overexcavated on March 31, 1992, to remove additional impacted soil. Laboratory analysis of soil samples collected from excavation sidewalls indicated concentrations up to 720 ppm TPHg, 30 ppm BTEX constituents, and 190 ppm mineral spirits.

Three groundwater monitoring wells were installed on April 12, 1993, by Kaprealian Engineering, Inc., (KEI) and have been monitored periodically since installation. Gradient was calculated at approximately 0.01 foot/foot and flow direction has consistently been to the south-southwest. Groundwater samples collected from the monitoring wells indicated elevated TPHg and mineral spirit concentrations.

On June 1, 1994, KEI drilled exploratory soil borings EB1 and EB2. Concentrations of TPHg and mineral spirits ranging from 28 to 180 ppm were detected in soil samples collected from boring EB2 at depths of 10 and 12 feet bgs. Grab groundwater samples collected from borings EB1 and EB2 indicated concentrations of TPHg at 3,400 parts per billion (ppb) and 9,200 ppb, respectively, and mineral spirits at 7,000 ppb and 3,700 ppb, respectively. Sieve analysis of saturated soil at the site determined that the soil is classified as silty sand (SM)

To further evaluate the extent of hydrocarbon impact to soil and groundwater, ACC performed an exploratory boring investigation in April 1996. ACC drilled two exploratory soil borings (SB1 and SB2) to characterize soil conditions in the immediate vicinity of the former tank excavation and six additional exploratory borings (B3 through B8) upgradient and downgradient of the former USTs to characterize groundwater in the general vicinity of the former tank excavation. Concentrations of mineral spirits were detected in sample SB1-9.0 at 52 ppm and in sample SB2-9.0 at 78 ppm. Grab groundwater samples were collected from borings B3 through B8 and analyzed for TPHg, BTEX, and mineral spirits. Concentrations of TPHg ranged from nondetectable in samples collected from borings B3 and B8 to 46,000 ppb in boring B6. Concentrations of mineral spirits ranged from nondetectable in samples collected from borings B3 and B8 to 16,000 ppb in boring B7.

Petroleum hydrocarbon impacts to shallow groundwater were not fully delineated, but concentrations of TPHg and mineral spirits appeared to have migrated preferentially along utility trench lines. Field observations indicated general aquifer quality to be poor, and subsurface groundwater migration is believed to be minimal based on soil type, flat hydraulic gradient, and minimal surface water infiltration.

In a letter to Wells Fargo Bank dated October 17, 1996, ACHCSA approved biannual groundwater monitoring, the installation of one additional monitoring well, and evaluation of options to artificially introduce dissolved oxygen (DO) into shallow groundwater to assist natural bioremediation processes. Agreement on the well location and method of introducing DO into groundwater has not been made between ACHCSA and ACC. Biannual groundwater monitoring and sampling has been conducted since December 1996. During this time, concentrations of petroleum hydrocarbons have decreased slightly in wells MW-1 and MW-3 and remained essentially unchanged in well MW-2.

3.0 DISCUSSION

Monitoring wells MW-1 through MW-3 have been periodically monitored since April 1993. Since May 1996, there has been a strong correlation between groundwater elevation changes and changes in concentrations of gasoline and mineral spirit constituents in groundwater. This correlation is normally observed at sites with similar hydrogeological conditions and a residual source of petroleum hydrocarbons in soil. Apparently, residual petroleum hydrocarbons exist in soil located under the existing building that was not removed during UST removal.

Subsurface site investigation performed downgradient of the USTs revealed varying concentrations of the constituents of concern. These concentrations were more indicative of preferential migration along utility pathways than typical diffusion-driven migration in the confirmed groundwater flow direction. Historical groundwater analytical results indicate seasonal fluctuations and generally decreasing concentrations of the constituents of concern. These decreases indicate that natural biodegradation processes are occurring. Natural attenuation processes typically limit any downgradient migration of petroleum hydrocarbons and preferentially degrade short-chain or "light-end" petroleum hydrocarbons. Natural bioremedial processes in effect at the site can be assisted by enhancing DO levels by introducing oxygen releasing compound (ORC[®]).

4.0 PROPOSED SCOPE OF WORK

4.1 Confirm Dissolved Oxygen Levels

Groundwater samples from each monitoring well have been analyzed for DO, pH, specific conductance, turbidity, salinity, and temperature in the field using a portable Horiba U-10[®] meter and continuous flow cell. Immediately prior to introducing ORC®, groundwater samples will be collected from existing monitoring wells MW-1 through MW-3 and carefully evaluated for their respective DO concentrations. In addition, confirmation groundwater samples will be collected? from each well for DO analysis by the analytical laboratory.

4.2 Introduce Oxygen Releasing Compound (ORC®)

ACC believes that natural bioremediation is occurring at the site and the process could be enhanced by introducing supplemental DO into groundwater through the introduction of ORC®. ORC® can be introduced through direct injection in soil borings and placing ORC® socks directly into the existing groundwater monitoring wells. ORC® is manufactured by Regenesis Bioremediation Products, San Diego, California.

ACC proposes to introduce ORC® into groundwater through injection in borings placed at approximate 10-foot intervals in locations designed to allow groundwater to disseminate DO between the borings locations. The ORC® dissolves and continually releases DO into the groundwater for approximately 9 to 12 months under typical conditions. The quantity of ORC® required was based on 14,600 cubic feet of impacted groundwater, an estimated porosity of 30 percent, a seepage velocity of 0.03 feet per day (equivalent to simple diffusion), and an average petroleum hydrocarbon concentration of 6,000 ppb (versus an area-weighted average of 2,120 ppb based on concentrations reported during the last 12 months). The calculated volume of petroleum hydrocarbons in groundwater is 0.7 gallons or approximately 4 to 5 pounds. Assuming a 3:1 ORC® to petroleum hydrocarbon ratio, a 100 percent increase for chemical and biological oxygen demands, a 100 percent increase for problems associated with ORC® injection, and a 100 percent contingency, approximately 60 pounds of ORC® would need to be introduced to enhance the degradation of all petroleum hydrocarbons remaining in groundwater at the site. In order to disseminate DO uniformly and create a barrier of DO to limit migration of impacted groundwater, ACC proposes to increase the calculated requirement of 60 pounds of ORC® five-fold to 300 pounds. of ORC®. Approximately 10 pounds of ORC® would be introduced into twenty borings and 20 pounds of ORC® would be introduced into 5 select borings (shown on Figure 3). Additionally, DO would be available to follow any preferential pathways and enhance natural degradation downgradient of the primary source area adjacent to the former USTs.

Due to the proximity of the three monitoring wells, it should be possible to evaluate the effectiveness of ORC[®] in reducing petroleum hydrocarbon concentrations by sampling and monitoring wells MW-1 through MW-3. DO concentrations will be monitored and documented in all three monitoring wells using a portable Horiba U-10[®] meter and continuous flow cell and by

collecting confirmation groundwater samples from each well for DO analysis by the analytical NO laboratory.

4.3 Soil Borings

Excavation and drilling permits will be obtained from the ACHCSA and City of Oakland before drilling and sampling activities. The locations of the proposed borings will be marked with white paint. Underground Service Alert will be notified at least 48 hours before commencing work.

Twenty-five borings will be drilled using a Geoprobe®, 2-inch-diameter, hydraulically driven sampling probe operated under the supervision of a C-57 licensed contractor. A soil sample will be collected in each boring at the capillary fringe. The borings will be located approximately 10 feet apart in locations estimated to be in areas of impacted groundwater or useful in retarding offsite migration of any dissolved-phase constituents of concern. Proposed boring locations for ORC® injection are illustrated on Figure 3.

Following collection of each soil sample from the capillary fringe, the Geoprobe® will be driven approximately 6 to 7 feet into the saturated zone. An ACC geologist will observe as each sampling probe is advanced. Boring and drilling protocols will be followed during field activities.

During drilling, undisturbed soil samples may be obtained for geotechnical classification at five-foot intervals, distinct lithologic changes, and at the soil/groundwater interface. Sampling will begin at a depth of approximately 8.5 feet bgs. An ACC geologist will observe drilling, identify the subsurface materials in the borings using visual and manual methods, and classify the materials as drilling progresses according to the Unified Soil Classification System. This work will be performed under the supervision of a California Registered Geologist. The hydraulic Geoprobe® work will be conducted in one day and no drill cuttings will be generated during this work.

After completion of drilling, an ORC® and water mixture grout consisting of 20 pounds of ORC® to 3 gallons of water will be injected into each boring at approximately 0.5 gallon of ORC® grout per one foot of boring while removing the probes. ORC® consists of magnesium peroxide that will slowly release dissolved oxygen into the groundwater zone for approximately 9 to 12 months.

The ORC® grout will be injected into each boring at depths from approximately the soil/groundwater interface to approximately 7 feet into the saturated zone. After installation of the ORC® grout, the lines and probes will be flushed with approximately 3 to 4 gallons of water to clean the probes. maximize the ORC® grout placed in each boring location, and help disseminate the ORC® in the vicinity of the boring. Portland cement grout will be introduced into each boring above the ORC® to complete each boring to just below the surface. The surface of each probe location will be completed with concrete or asphalt to grade to match the surrounding material.

4.3.1 Sample Collection Borings

Five of the borings will be drilled specifically to collect soil and grab groundwater samples to characterize current soil and groundwater conditions along 43rd Street primarily beyond the extent of the monitoring wells. The attached Figure 3 illustrates the proposed sample collection boring locations. Actual boring locations may vary slightly based on field observations, utilities, or unknown physical constraints. Boring and drilling protocol during field activities will follow California State Water Quality Control Board and local guidelines.

One soil sample from each of the five sample collection borings will be logged, characterized, and placed in an insulated, pre-chilled container. A said amount of one soil and one grab groundwater sample (if groundwater is encountered) from each boring will be submitted to a state-certified analytical testing laboratory following chain of custody for analysis of TPHg, BTEX, and methyl tertiary butyl ether (MTBE) by EPA Method 5030/8015/8020 and TPH as mineral spirits by EPA Method 3510/8015M. This data will be used for site characterization and risk assessment purposes.

During drilling, undisturbed soil samples will be obtained for chemical analyses and geotechnical classification in two-foot intervals above and into the soil/groundwater interface. Sampling will begin at approximately 10.5 feet bgs or 1.5 feet above groundwater. The anticipated depth of groundwater is 12 feet bgs. After soil sampling is completed, the probe will be advanced to approximately 15 feet bgs and a grab groundwater sample will be collected from each boring when groundwater is encountered during drilling.

4.4 Monitoring Well Installation

After receipt of analytical results of the boring investigation, ACC may drill one boring at the site and convert it to a groundwater monitoring well. The proposed well location is illustrated on Figure 3; however, the exact location may differ due to field conditions and/or results of the boring investigation. If necessary, the well installation will be conducted in a manner consistent with ACHCSA and Regional Water Quality Control Board (RWQCB) requirements.

The boring for the monitoring well will be drilled with a mobile B-53 drill rig equipped with 8-inch-diameter hollow-stem augers. During drilling, soil samples will be obtained every 5 feet, at any noted changes in lithology, and at the soil/groundwater interface. Samples will be collected by driving a California modified split spoon sampler driven 18 inches into undisturbed soil.

Cuttings will be placed in capped drums, sampled, labeled, and left on site pending the analytical results. A minimum of one soil sample will be submitted to a state-certified analytical laboratory for analysis of TPHg, BTEX, and MTBE by EPA Method 5030/8015/8020 and TPH as mineral spirits by EPA Method 3510/8015M. Drums will be labeled with contents, suspected constituents, date filled, expected removal date, company name, phone number of technical contact, and name of generator. Drums will be disposed at an accepting facility after analytical results have been received.

10 1 is preferred

The boring for the monitoring well will be drilled to an estimated depth of 25 feet bgs or approximately 10 feet into the first encountered saturated soil zone. The total depth of the monitoring well will be contingent upon lithology and depth to groundwater. The boring for the monitoring well will be terminated 20 feet below the top of first encountered water or if the water bearing zone is underlain by more than 5 feet of low permeability material interpreted to be an aquitard. The well will be sealed with a minimum of a 10-foot seal, or as field conditions dictate, to best meet the RWQCB and ACHCSA specifications.

The boring will be converted into a 2-inch-diameter monitoring well. The monitoring well will be screened with 0.020-inch slotted Schedule 40 polyvinyl chloride from a depth of approximately 15 to 25 feet bgs. Packing material consisting of #2/12 sand will be used as annular fill and will be added through the hollow-stem augers from the bottom of the screened depth to 1 to 2 feet above the top of the screen. A minimum 1-foot thick seal consisting of bentonite will be added to the top of the sand pack and the remaining annulus will be filled with neat cement. The well will then be completed with a water tight, traffic-rated steel vault box cemented over the top of the well with a locking expansion cap and bolted lid.

In accordance with RWQCB guidelines, the well will not be developed until at least 72 hours have elapsed after completion of construction. Additionally, the well will not be sampled until at least 72 hours have elapsed following completion of well development. Well development will be performed with a surge block and the well will be bailed manually. Well development generally stabilizes the annular sandpack and may help restore natural hydraulic properties between the annular sandpack and the adjacent soils. Well development will continue until purged water is free of sand, silt, and turbidity and improvement in water clarity is no longer observed. During development, pH, specific conductance, and temperature of the return water from the water pump will be measured. Well development will proceed until these field measured water quality parameters have stabilized and the water appears to be at its greatest possible clarity.

4.5 Groundwater Monitoring



Groundwater samples will be collected from the existing groundwater monitoring wells and submitted to an analytical laboratory following chain of custody protocol for analysis of TPHg, BTEX, and MTBE by EPA Method 5030/8015/8020 and TPH as mineral spirits by EPA Method 3510/8015M. Well sampling is tentatively scheduled for March 1999, and a confirmation well sampling may be conducted in June 1999. At this time, quarterly groundwater sampling will be conducted specifically to evaluate the results of ORC® introduction and document improving groundwater quality.

Prior to each sampling event, the water level elevations will be measured in all existing wells. Each well will be sampled using a new, clean, disposable teflor bailer attached to new, clean string. Sample vials and bottles will be filled to overflowing and sealed so that no air is trapped in the vial or bottle. Once filled, samples shall be inverted and tapped to test for air bubbles. Samples will be contained in EPA approved vials and bottles. Some analyses may require separate sample containers in accordance with EPA methods described in 40 CFR Part 136 and SW-846.

NOI

Water samples intended for volatile hydrocarbon analysis will be contained in 40-milliliter VOA vials. Water samples intended for TPH as mineral spirit analysis will be stored in 1-liter amber glass bottles to reduce degradation by sunlight. Preserved sample containers will be utilized if a prolonged holding time (greater than 5 days) is expected prior to analysis.

Sample containers will be labeled with self-adhesive, pre-printed tags. Labels will contain appropriate information in waterproof ink such as time and date of sampling and site address.

All samples will be stored in pre-chilled insulated containers to be delivered to a state-certified laboratory for appropriate analysis. All purged water will be stored on site in steel, DOT-approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact, and phone number. The drums will be left on site for subsequent disposal at an accepting facility pending receipt of analytical results.

4.6 Risk Assessment

If necessary, a Tier 1 Risk Assessment will be performed for the site. ACC will meet with the ACHCSA regarding the Tier 1 evaluation to discuss parameters of risk and evaluate potential receptors. ACC will review existing data (including previous investigations conducted on site, monitoring reports, analytical data, boring logs, soil lithology, groundwater gradient, and information obtained in work described in this Work Plan) and prepare a working profile for the site for each risk parameter. Chemicals of concern will be determined and toxicity data compiled for each chemical.

The exposure assessment will include researching zoning restrictions and land use information, planning documents, well surveys within 500 feet of the site, and other pertinent information and evaluating exposure routes. A toxicity assessment (including risk level and receptors) will be performed for each chemical of concern and included in the Tier 1 evaluation.

4.7 Confirmation Soil Borings for weed it well installed.

If groundwater monitoring results and a Tier 1 risk evaluation are inconclusive, verification borings may be drilled at the exact locations of the five sample collection borings drilled to collect soil and grab groundwater samples during ORC® injection work. Grab groundwater samples can be collected and analyzed for the constituents of concern, and analytical results can be compared to the original grab groundwater analytical results. If confirmation grab groundwater samples are collected, ACC recommends that a minimum of 6 months elapse between sample collections.

5.0 RATIONALE FOR PROPOSED SCOPE OF WORK

ACC has evaluated the results of previous subsurface site investigation and believes that natural bioremediation is the only feasible and cost-effective remedial alternative. Minor concentrations of gasoline constituents and mineral spirits continue to leach into shallow groundwater and are

migrating with it. Due to poor aquifer quality, groundwater migration is believed to predominantly follow preferential pathways and a measurable, defined "plume" of impacted groundwater is difficult to determine. Previous exploratory boring analytical results are anomalous. Existing utilities, a former downgradient UST, and physical structures make conventional subsurface investigation difficult to perform and evaluate.

ACC believes that natural bioremediation processes can be enhanced by introducing DO through the use of ORC®. DO concentrations can be directly measured in the three existing monitoring wells and the results of enhanced DO can be evaluated in regards to decreasing TPHg and BTEX concentrations in the three existing monitoring wells. The proposed locations for the introduction of ORC® should maximize the benefit of higher DO levels by their proximity to the original source and by taking advantage of the existing groundwater flow direction. In addition, DO should follow any existing preferential pathways and assist in the further natural degradation of potential dissolved-phase petroleum hydrocarbons to minimize downgradient migration potential.

Required

ACC does not agree with ACHCSA's request for analysis of bio-indicator parameters other than DO. Each sampling event during which DO, oxidation-potential alkalinity, nitrates, sulfates, and ferrous iron are analyzed in three wells would cost approximately \$420, and the cost would be \$478 if nitrites and sulfides were included. For \$420, approximately 42 pounds of ORC® could be introduced into groundwater; theoretically, enough ORC® to address the calculated pounds of petroleum hydrocarbons. Since DO will be utilized almost exclusively as an electron acceptor when available, analysis for this parameter is necessary and cost effective. ACC believes that analysis of additional parameters would be unnecessary.

Based on data available at this time, and the fact that the unauthorized release from the former gasoline UST located at 489 43rd Street has never been characterized to any degree, ACC does not believe that a downgradient monitoring well will produce meaningful data regarding groundwater conditions downgradient of 490 43rd Street and adjacent to 489 43rd Street. However, if analytical results of grab groundwater samples collected from borings advanced in locations progressively further from the former UST excavation (boring locations illustrated on Figure 3) indicate a decreasing trend, a new groundwater monitoring well may yield useful information. An additional monitoring well is not necessary to document the effect of introducing ORC[®], but may yield useful information about groundwater quality. Therefore, ACC would like to reserve the installation of an additional monitoring well until additional information is available to warrant it and assist in proper well placement.

This proposed work is consistent with the guidelines provided in the ASTM document E 1739-95, Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites and natural attenuation guidelines provided in the Environmental Protection Agency document EPA 510-B-94-003. How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites, A Guide for Corrective Action Plan Reviewers.

6.0 HEALTH AND SAFETY PLAN

A site-specific Health and Safety Plan which encompasses the proposed work within the area and complies with the requirements of 29 CFR Part 1910.120 will be written. A copy of the Health and Safety Plan will be kept on site during field work operations and will be available for reference by appropriate parties during the work.

7.0 TECHNICAL REPORTS

A technical report discussing the subsurface findings will be submitted to Mr. John Ward, Wells Fargo Trust, for review and acknowledgement. A copy of the final report will be supplied to Wells Fargo Trust for submission to the ACHCSA under their cover letter. Reports will be reviewed and stamped by an appropriate registered professional.

Groundwater monitoring reports will be submitted after each monitoring well sampling event.





