



ENVIRONMENTAL BIO-SYSTEMS, INC.

Innovative Solutions for a Better Environment

August 22, 1990

Zaccor Corporation
791 Hamilton Avenue
Menlo Park, California 94025

Attention: Mr. Gary Zaccor

The following documentation concerns the initial tank removal sampling and assessment performed by Environmental Bio-Systems, Inc. for the Zaccor Corporation, on June 4, 1990 at:

**ALAMEDA FIRE DEPARTMENT
2401 ENCINAL AVENUE
ALAMEDA, CALIFORNIA**

EBS was retained by Zaccor Corporation to perform the following services:

- collect soil samples from beneath underground storage tanks (UST's) as indicated by the local implementing agency representative.
- transport all samples to Mobile Chem Labs, Inc.
- collect a sample from stockpiled material generated during tank removal operations.
- provide a written summary of observations, procedures, and analytical results including a diagram of sampling locations.

On the above specified date, one 180 gallon diesel tank and one 500 gallon gasoline tank were removed. Subsequent sampling of the surrounding soil within the tank pit excavation was performed in the presence of Inspector Katherine Chesick of the Alameda County Department of Environmental Health.

FIELD OBSERVATIONS

Tank A was a 500 gallon gasoline tank constructed of single walled steel. A visual inspection of the tank did not reveal any rusting, pitting, or holes.

Tank B was a 180 gallon diesel tank constructed of single walled steel. A visual inspection of the tank did not reveal any rusting, pitting, or holes.

Following excavation of the tanks, approximately 100 cubic yards of suspected hydrocarbon impacted soil was removed from around and below the tanks. Excavation was guided by both visual and olfactory analysis of soils being removed.

The extent of excavation was reached at a maximum of between 10 to 15 feet below grade with the pit widened at the southern end and sides.

Confirmatory samples were collected from the pit walls at that point at which it was judged that the extent of soil contamination in excess of allowable limits had been reached and removed.

A monitoring well was exposed in the east wall of the pit. Examination of the well revealed that the casing was bent around a galvanized pipe which extends from the northeastern end of the pit in a southeasterly direction toward the building.

SAMPLING

A single soil sample (sample #S1) was collected at a depth of 10.0 feet below grade (backfill/native soil interface) beneath the center of tank A.

Sample #S2 was collected from a depth of 10.0 feet below grade at the backfill/native soil interface beneath tank B.

Soil sample #S3 was collected from the wall of the southeastern corner of the tank pit, adjacent to the non-fill end of tank A, at a depth of 9.5 feet below grade.

Composite soil sample #SC4 A-D was collected from the stockpiled soil which was generated during tank removal operations.

Soil sample #S5 was collected from the western wall of the tank pit, near the fill end of tank A, at an approximate depth of 15 feet below grade.

Soil sample #S6 was collected from the wall of the southwestern corner of the tank pit, near the non-fill end of tank A, at an approximate depth of 15 feet below grade.

SAMPLE ANALYSES

Sample #S1 was analyzed for total petroleum hydrocarbons (TPH) calculated as gasoline, benzene, toluene, ethylbenzene, and xylenes (BTEX).

Sample #S2 was analyzed for TPH calculated as diesel and BTEX.

Sample #S3 was analyzed for TPH calculated as gasoline and BTEX.

Sample #SC4 A-D was analyzed for TPH calculated as gasoline, TPH calculated as diesel, organic lead, and BTEX.

Sample #S5 was analyzed for TPH calculated as gasoline and BTEX.

Sample #S6 was analyzed for TPH calculated as gasoline and BTEX.

Confirmatory samples were collected from the pit walls at that point at which it was judged that the extent of soil contamination in excess of allowable limits had been reached and removed.

A monitoring well was exposed in the east wall of the pit. Examination of the well revealed that the casing was bent around a galvanized pipe which extends from the northeastern end of the pit in a southeasterly direction toward the building.

SAMPLING

A single soil sample (sample #S1) was collected at a depth of 10.0 feet below grade (backfill/native soil interface) beneath the center of tank A.

Sample #S2 was collected from a depth of 10.0 feet below grade at the backfill/native soil interface beneath tank B.

Soil sample #S3 was collected from the wall of the southeastern corner of the tank pit, adjacent to the non-fill end of tank A, at a depth of 9.5 feet below grade.

Composite soil sample #SC4 A-D was collected from the stockpiled soil which was generated during tank removal operations.

Soil sample #S5 was collected from the western wall of the tank pit, near the fill end of tank A, at an approximate depth of 15 feet below grade.

Soil sample #S6 was collected from the wall of the southwestern corner of the tank pit, near the non-fill end of tank A, at an approximate depth of 15 feet below grade.

SAMPLE ANALYSES

Sample #S1 was analyzed for total petroleum hydrocarbons (TPH) calculated as gasoline, benzene, toluene, ethylbenzene, and xylenes (BTEX).

Sample #S2 was analyzed for TPH calculated as diesel and BTEX.

Sample #S3 was analyzed for TPH calculated as gasoline and BTEX.

Sample #SC4 A-D was analyzed for TPH calculated as gasoline, TPH calculated as diesel, organic lead, and BTEX.

Sample #S5 was analyzed for TPH calculated as gasoline and BTEX.

Sample #S6 was analyzed for TPH calculated as gasoline and BTEX.

SAMPLING METHODOLOGY

Soil sample material from the tank pits was removed using a backhoe bucket. After removing the first three to four inches of soil just above the teeth of the bucket, presumably slough, samples were contained by driving clean brass tubes (1.92" x 6") into the exposed layer of soil. Soil was packed into the tubes to eliminate the possibility of headspace. Thus prepared, the ends of the tubes were wrapped with aluminum foil and sealed with plastic caps. After removing excess foil, tape was applied to the seams between cap and tube in an effort to reduce the evaporative loss of volatile constituents. Soil samples collected from stockpiled material were contained by driving clean brass tubes into the soil lying approximately 12 inches within the pile.

Samples were placed on ice in a cooler and transported under chain of custody documentation to Mobile Chem Labs, Inc., a certified hazardous materials testing laboratory (HMTL #289).

Analytical methods used by Mobile Chem Labs, Inc. were consistent with procedures presented in EPA document SW-846.

RESULTS

The certified analytical report documenting the findings of sample analyses has been attached to this report.

Sample #S1 contained TPH as gasoline at a concentration of 3.2 parts per million (ppm), toluene at 0.3 ppm, and xylenes at 0.4 ppm.

Sample #S2 did not contain detectable concentrations of TPH calculated as gasoline, TPH calculated as diesel, or BTEX at the given limits of detections for each of these constituents.

Sample #S3 did not contain detectable concentrations of TPH calculated as gasoline or BTEX at the given limits of detections for each of these constituents.

Sample #SC4 A-D contained TPH as gasoline at a concentration of 85 ppm, TPH as diesel at 37 ppm, benzene at 0.3 ppm, toluene at 2.4 ppm, xylenes at 7.7 ppm, and ethylbenzene at 1.6 ppm. Organic lead was not detected above the lower limits of detection.

Sample #S5 contained TPH as gasoline at a concentration of 1.7 ppm and xylenes at 0.1 ppm.

Sample #S6 contained TPH as gasoline at a concentration of 12 ppm, benzene at 0.2 ppm, xylenes at 0.6 ppm, and ethylbenzene at 0.3 ppm.

RECOMMENDATIONS

The State Water Resources Control Board document, Leaking Underground Fuel Tank Field Manual (LUFT), supported by the San Francisco Regional Water Quality Control Board (SFRWQCB), defines acceptable limits and appropriate actions in dealing with tank removal and associated contamination.

The presence of fuel hydrocarbons in samples #S1, #SC4 A-D, #S5, and #S6 requires that further investigatory action be taken. In accordance with the LUFT manual, further investigatory actions would include the installation of at least one groundwater monitoring well within ten feet of the former tank pit for the collection of groundwater quality data. Also in accordance with LUFT guidelines, a minimum of three groundwater reference points are necessary in order to determine groundwater flow direction beneath the site. This requirement may be satisfied by the installation of two additional groundwater reference points, either peizometers or wells. The three reference points will allow triangulation and subsequent evaluation of the groundwater gradient. Properly installed and screened wells located on adjacent properties (if any) may qualify as eligible reference points.

The groundwater monitoring well existing on site may constitute a valid reference point. However, it must be determined whether disturbance caused during excavation of the tanks which partially exposed a portion of the well casing has compromised the sanitary seal. If the seal has been broken, the well should be abandoned according to the guidelines of the Alameda County Water District (ACWD).

Analytical results for composite sample #SC4 A-D indicate that this material is eligible for limited aeration on site or disposal at an accepting class II landfill facility.

8/22/90

ZACCOR CORP. @
ALAMEDA FIRE DEPARTMENT
ALAMEDA, CA

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REPORTAGE

Copies of the sampling report, the chain of custody, and the certified analytical report should be submitted to the SFRWQCB and the Alameda County Department of Environmental Health.

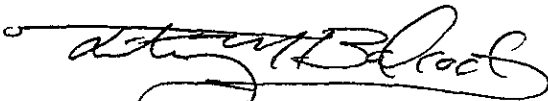
The following addresses have been listed for your convenience:

Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street
Room 700
Oakland, CA 94612
ATTN: Fuel Leaks Division

County of Alameda
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, CA 94621
ATTN: Katherine Chesick

If you have any questions, or if I may be of service please contact me at (415) 429-9988.

Sincerely,
ENVIRONMENTAL BIO-SYSTEMS, INC.

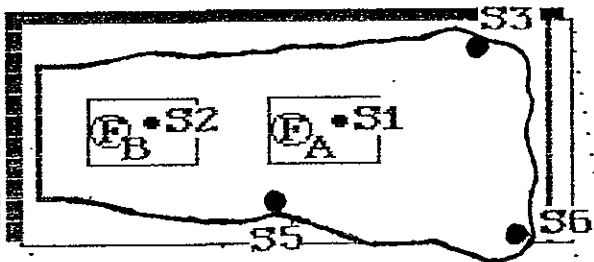


Timothy M. Babcock
Environmental Scientist

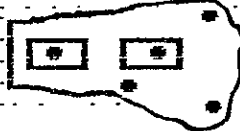
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ALAMEDA FIRE DEPT.
2401 ENCINAL AVE.
ALAMEDA, CA.
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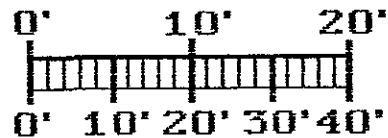
PROPERTY LINE



TANK PIT



BUILDING



PROPERTY LINE

SIDEWALK
ENCINAL AVE.

47'

SIDEWALK
PARK ST.