**Applied Geotechnology Inc.**

June 16, 1993



15,712.001

Mr. Don Seeberger
Washington Department of Ecology
Northwest Regional Office
3190 160th Avenue S.E.
Bellevue, Washington 98008-5452

Dear Mr. Seeberger:

**Site Contamination Containment Actions**
**MTCA Enforcement Order No. DE 92TC-N336**
**SAFCO Site**
**SeaTac, Washington**

## INTRODUCTION

This letter summarizes the results of the site contamination containment actions Applied Geotechnology Inc. (AGI) completed at the referenced site. These actions were conducted as required under Section IV (5) of the referenced Order and in general accordance with AGI's April 26, 1993 Work Plan, Amendment 4.

Initial surface soil sampling was performed April 27, 1993 after AGI personnel and a Washington Department of Ecology (Ecology) representative conducted a site walk and established background organic vapor concentrations. After receiving analytical results for the initial soil sampling, AGI personnel hand excavated and contained selected soils and collected confirmational soil samples on May 13, 1993. Figure 1 shows the background sampling, surface soil sampling, and soil excavation locations. Envirotech Systems Inc. (ESI) of Seattle, Washington assisted AGI with the soil excavation and containment activities. The chemical analyses were conducted by Analytical Technologies, Inc. (ATI) of Renton, Washington.

## IDENTIFICATION OF POTENTIALLY CONTAMINATED MATERIALS

On April 27, 1993, AGI personnel field screened the surface soils as described in Section 3.6.1 of the referenced Work Plan Amendment. An Ecology representative observed the screening activities.

Three background surface soil samples were collected to evaluate background organic vapor concentrations as measured in the headspace of a sealed polyethylene bag using an organic vapor meter equipped with a flame ionization detector (OVM-FID). The samples were collected from the in situ soils after the upper 4 to 6 inches of soil were removed. The three background surface soil sampling locations and field observations were as follows:

- Background Location 1 - A location on the western portion of the site, approximately 17 feet east of the west fence and near the middle of the site as measured from north to south. No visible signs of contamination were observed at this location.

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- Background Location 2 - Near the southeast corner of the site, approximately 7 to 8 feet north and west of the south and east fences. No visible signs of contamination were observed at this location.

- Background Location 3 - A background sample was collected approximately 45 feet west of the north end of the site. No visible signs of contamination were observed at this location.

Maximum headspace concentrations measured in these background samples ranged from 8.5 to 10 parts per million (ppm). Based on these results, AGI and the Ecology representative agreed that an FID concentration of 20 ppm would be the action level requiring the corresponding sample to be analyzed by Environmental Protection Agency (EPA) Method 8240 for volatile organic compounds (VOC).

AGI and the Ecology representative next visually screened the areas near Trailers B2, D, and G to identify areas of anomalous sheens, staining, and/or discoloration meeting the Work Plan criteria. Eight locations were identified as being potentially contaminated; these locations and the conditions observed were as follows:

- Location 1 - In the north area of the site, approximately 16 feet south of the north fence. Anomalous, black surface staining was visible at this location.

- Location 2 - Under the northwest corner of Flatbed Trailer B2. Yellow surface staining was visible at this location.

- Location 3 - Under the west side of Flatbed Trailer G. Surface staining and a sheen on surface water were observed at this location.

- Location 4 - Under the east side of Flatbed Trailer G. Surface staining and a sheen on surface water were observed at this location.

- Location 5 - Under the middle of Trailer D. Black surface staining was visible at this location.

- Location 6 - Under the middle of Flatbed Trailer B2. Black surface staining was visible at this location.

- Location 7 - At the southwest corner of Flatbed Trailer B2. A black, oil-like liquid and surface staining were observed at this location.

- Location 8 - The north side of Trailer B1. Anomalous, black surface staining was visible at this location.

A soil sample was collected from each location after the upper approximately 1/2 inch of soil was removed. Each sample was collected by using a decontaminated stainless steel spoon to place soil into a precleaned container provided by ATI. In addition, AGI collected a soil sample for headspace screening, and mapped and photographed each sample location. Each sample was

assigned a unique code consisting of the prefix SS (soil sample) and a number corresponding to the sample location. The sample locations and codes are shown on Figure 1.

Samples were placed into a cooler containing chilled artificial ice. Chain-of-custody procedures were used to control the samples and a chain-of-custody form was used to document sample handling. The samples were hand delivered to ATI on the day of collection.

The samples were analyzed for fuel hydrocarbons, metals, and VOCs by the procedures described in the Work Plan Amendment. VOC analyses were included for samples SS2 and SS7 due to detected headspace screening concentrations of 15 and 70 ppm, respectively. Sample SS2 was analyzed for VOCs as a conservative measure because its headspace reading was considered high when compared to the other samples collected from the site, which had headspace readings from 0 to 5.5 ppm. Tables 1 through 3 present the analytical chemistry results for the eight samples. Although site cleanup levels have not been established, we compared these results to the Washington Model Toxics Control Act (MTCA) Method A cleanup levels for industrial soils and an interim site-specific cleanup standard of 2,000 ppm total petroleum hydrocarbons (TPH) verbally agreed upon with an Ecology representative. This comparison showed hydrocarbons exceeded the cleanup standard.

**SOIL CONTAINMENT PROCEDURES**

AGI and ESI hand excavated and contained contaminated soils from the eight locations on May 13, 1993. During excavation, the soil was visually inspected for staining and was field screened with an OVM-FID. Excavation ceased when staining was no longer observed and when OVM-FID concentrations remained at 0 ppm or background; however, visually stained soils were left near locations 2 and 6 due to stability concerns about the adjacent semitrailer landing gear. A total of approximately 2-1/4 cubic yards of soil was excavated from the eight locations.

The excavated soils are currently contained in a common stockpile at the southeastern side of the site. The stockpile is underlain as well as covered with 6-mil-thick polyethylene plastic sheeting. The sides of the plastic sheeting are bermed. The cover extends over the sides of the berms to shed precipitation and sand bags secure the cover in place.

A soil sample was collected from the bottom of each excavated area to evaluate contaminant concentrations remaining in the in situ soils. The sampling procedures used were similar to those used for the surface soil sampling. Samples were sequentially numbered as they were collected in the same manner as for the surface soils. Table 4 lists the confirmation soil sample numbers and the corresponding surface soil sample locations. The confirmation samples were only analyzed for TPH by EPA Method 418.1 based on the initial sampling results, which showed:

- VOCs were not detected in the EPA Method 8240 analyses for samples SS2 and SS7.

- Metals concentrations complied with the MTCA Method A industrial soil cleanup levels.

- Concentrations of TPH quantified as gasoline and diesel were substantially lower than the concentrations of TPH quantified as other compounds.

Analytical results for the confirmational soil samples are presented in Table 4. These results indicate additional soil needs to be excavated at locations SS1, SS3, and SS7. Soil samples will be collected from the bases of the May 13 excavations and analyzed for TPH using EPA Method 418.1. Excavated soils will be added to the existing stockpile of contaminated soils.

Due to concerns about excavating adjacent to the Trailer B2 landing gear, AGI proposes leaving this soil in place until the trailer can be emptied and safely moved. In the interim, the in situ contaminated soils would be covered with 6-mil or thicker polyethylene sheeting to limit rainwater infiltration. The polyethylene sheeting would be weighted with sand bags and sloped to direct water away from this area.

We plan to complete the additional excavation and sampling by June 21, 1993. Please call us at (206) 453-8383 if you have questions.

Very truly yours,

APPLIED GEOTECHNOLOGY INC.

Monica P. Beckman
Health and Safety Manager

Steven R. Bruce, P.G.
Senior Hydrogeologist

MPB/SRB/jlh

Attachments

cc: Mr. R.G. Bjorneby
Mr. Bradley B. Jones; Gordon Thomas, et al.
Ms. Ms. Wendy Langhans; ACPC Inc.
Mr. Phil Anderson; Anderson & Rankin
Mr. Ali Kandi; TAM Engineering
Ms. Leslie C. Nellermoe; Heller Ehrman, et al.
Ms. Julie Reid; Kennedy Jenks Consultants

**Table 1**
**Surface Soil – Fuel Hydrocarbons**
**Quantified by EPA Methods WTPH–G, WTPH–D, and 418.1 Modified**
**Ecology Order No. DE 92TC–N336**
SAFCO Environmental Site
SeaTac, Washington

| Compound | Analytical Method | Sample I.D. SS1 | SS2 | SS3 | SS4 [a] | SS5 [b] | SS6 [b] | SS7 | SS8 |
|---|---|---|---|---|---|---|---|---|---|
| | | mg/kg | | | | | | | |
| Gasoline ($C_7$ – $C_{12}$) | WTPH–G | <6 | 45 | <6 | NA | NA | NA | 990 | <6 |
| Diesel ($C_{12}$ – $C_{24}$) | WTPH–D | 1,100 | 590 | 390 | NA | 260 | 850 | 2,200 | 58 |
| TPH | 418.1 Modified | 31,000 | 38,000 | 84,000 | NA | 5,600 | 27,000 | 66,000 | 250 |

Notes:

a) Gasoline, diesel, and petroleum hydrocarbon concentrations by Method WTPH–HCID were less than 20 mg/kg, 50 mg/kg, and 100 mg/kg, respectively; therefore, SS4 was not analyzed by Methods WTPH–G, WTPH–D, or 418.1 Modified.
b) The gasoline concentration by Method WTPH–HCID was less than 20 mg/kg; therefore, the sample was not analyzed by Method WTPH–G.
< – Not detected at the noted detection limit.
mg/kg – Milligrams per kilogram.
NA – Not analyzed.
TPH – Total petroleum hydrocarbons.

**Table 2**
**Surface Soil – Metals**
**Quantified by EPA Method 6010/7000 Series**
**Ecology Order No. DE 92TC–N336**
SAFCO Environmental Site
SeaTac, Washington

| Metal | EPA Test Method | Sample I.D. SS1 | SS2 | SS3 | SS4 | SS5 | SS6 | SS7 | SS8 |
|---|---|---|---|---|---|---|---|---|---|
| | | mg/kg | | | | | | | |
| Arsenic | 7060 | 4.8 | 5.0 | 3.4 | 1.9 | 5.1 | 4.5 | 5.6 | 6.8 |
| Cadmium | 6010 | <1.3 [a] | <0.31 | 3.1 [b] | <3.6 [b] | <1.5 [a] | 1.2 | <0.26 | 2.5 |
| Chromium | 6010 | 14 | 22 | 25 | 29 | 17 | 16 | 16 | 20 |
| Lead | 6010 | 56 | 39 | 9.3 | 16 | 14 | 50 | 280 | 180 |
| Mercury | 7471 | <0.11 | <0.11 | <0.11 | <0.13 | <0.11 | <0.11 | <0.11 | 0.24 |

Notes:

a) Dilution factor of 5.0 due to matrix interference.
b) Dilution factor of 10.0 due to matrix interference.
< – Not detected at the noted detection limit.
mg/kg – Milligrams per kilogram.

**Table 3**
**Surface Soil – Volatile Organic Compounds**
**Quantified by EPA Method 8240**
**Ecology Order No. DE 92TC–N336**
SAFCO Environmental Site
SeaTac, Washington

| Compound | Sample I.D. SS2 [a] (mg/kg) | SS7 [b] (mg/kg) |
|---|---|---|
| Benzene | <0.058 | <0.053 |
| Chlorobenzene | <0.058 | <0.053 |
| Ethylbenzene | <0.058 | <0.053 |
| Styrene | <0.058 | <0.053 |
| Toluene | <0.058 | <0.053 |
| Total Xylenes | <0.058 | <0.053 |
| Acetone | <1.2 | <1.1 |
| Bromodichloromethane | <0.058 | <0.053 |
| Bromoform | <0.29 | <0.27 |
| Bromomethane | <0.58 | <0.53 |
| 2–Butanone (MEK) | <0.58 | <0.53 |
| Carbon Disulfide | <0.058 | <0.053 |
| Carbon Tetrachloride | <0.058 | <0.053 |
| Chloroethane | <0.058 | <0.053 |
| Chloroform | <0.058 | <0.053 |
| Chloromethane | <0.58 | <0.53 |
| Dibromochloromethane | <0.058 | <0.053 |
| 1,1–Dichloroethane | <0.058 | <0.053 |
| 1,2–Dichloroethane | <0.058 | <0.053 |
| 1,1–Dichloroethene | <0.058 | <0.053 |
| 1,2–Dichloroethene (total) | <0.058 | <0.053 |
| 1,2–Dichloropropane | <0.058 | <0.053 |
| cis–1,3–Dichloropropene | <0.058 | <0.053 |
| trans–1,3–Dichloropropene | <0.058 | <0.053 |
| 2–Hexanone (MBK) | <0.58 | <0.53 |
| Methylene Chloride | <0.29 | <0.27 |
| 4–Methyl–2–pentanone (MIBK) | <0.58 | <0.53 |
| 1,1,2,2–Tetrachloroethane | <0.058 | <0.053 |
| Tetrachloroethene | <0.058 | <0.053 |
| 1,1,1–Trichloroethane | <0.058 | <0.053 |
| 1,1,2–Trichloroethane | <0.058 | <0.053 |
| Trichloroethene | <0.058 | <0.053 |
| Vinyl Acetate | <0.58 | <0.53 |
| Vinyl Chloride | <0.058 | <0.053 |

Notes:

Samples SS1, SS3, SS4, SS5, SS6, and SS8 were not analyzed because headspace results using an FID were below 20 ppm.

a) A methylated benzene compound was tentatively identified at an estimated concentrations of 0.47mg/kg. In addition, four unknown alkenes were detected at estimated concentrations of 0.93 mg/kg, 0.47 mg/kg, 3.4 mg/kg, and 1.6 mg/kg.

b) Five unknown alkanes were detected at estimated concentrations of 4.1 mg/kg, 9.6 mg/kg, 33 mg/kg, 17 mg/kg, and 32 mg/kg.

mg/kg – Milligrams per kilogram.

**Table 4**
**Confirmational Soil Samples – Total Petroleum Hydrocarbons**
**Quantified by EPA Method 418.1 Modified**
**Ecology Order No. DE 92TC–N336**
SAFCO Environmental Site
SeaTac, Washington

| Sample I.D. | Corresponding Surface Soil Sample I.D. | TPH (mg/kg) |
|---|---|---|
| SS9 | SS1 | 2,900 |
| SS10 | SS3 | 52,000 |
| SS11 | SS4 | 680 |
| SS12 | SS2 | 3,900 |
| SS13 | SS6 | 3,000 |
| SS14 | SS5 | 1,800 |
| SS15 | SS7 | 4,300 |
| SS16 | SS8 | 1,400 |

Note:

mg/kg – Milligrams per kilogram.

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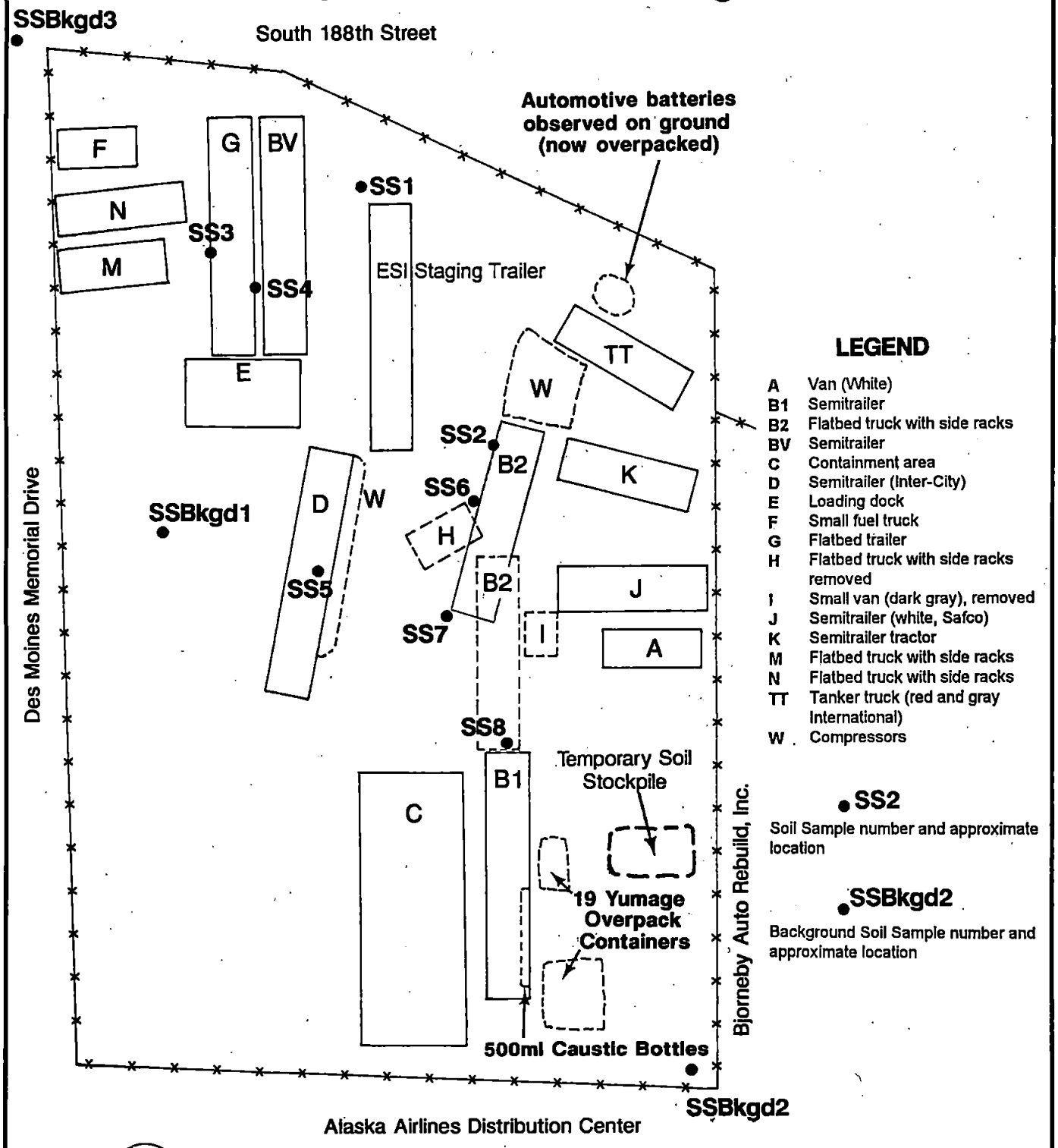


## LEGEND

| | |
|---|---|
| A | Van (White) |
| B1 | Semitrailer |
| B2 | Flatbed truck with side racks |
| BV | Semitrailer |
| C | Containment area |
| D | Semitrailer (Inter-City) |
| E | Loading dock |
| F | Small fuel truck |
| G | Flatbed trailer |
| H | Flatbed truck with side racks removed |
| I | Small van (dark gray), removed |
| J | Semitrailer (white, Safco) |
| K | Semitrailer tractor |
| M | Flatbed truck with side racks |
| N | Flatbed truck with side racks |
| TT | Tanker truck (red and gray International) |
| W | Compressors |

● SS2
Soil Sample number and approximate location

● SSBkgd2
Background Soil Sample number and approximate location

Note: Number of containers is estimated

**Applied Geotechnology Inc.**
Geotechnical Engineering
Geology & Hydrogeology

# Site Plan

SAFCO Site
SeaTac, Washington

FIGURE 1

| JOB NUMBER | DRAWN | APPROVED | DATE | REVISED | DATE |
|---|---|---|---|---|---|
| 15,712.001 | KM | | 16 Jun 93 | | |