

**MULTI-MEDIA SAMPLING REPORT FOR THE
BRANDEIS-BARDIN INSTITUTE
AND
THE SANTA MONICA
MOUNTAINS CONSERVANCY**

VOLUME II

MARCH 10, 1993

PREPARED FOR:

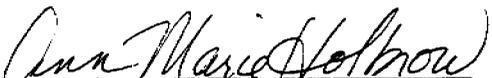
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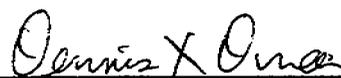
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DOCUMENT 1:

"Analytical Results Report, Off-Site Multi-Media Sample Collection at the Santa Susana Field Laboratory". S. Cohen and Associates for the United States Environmental Protection Agency, Office of Radiation and Indoor Air. January 1993

DOCUMENT 2:

"Department of Health Services Participation in Multi-Media Sampling in the Vicinity of Rocketdyne SSFL". California Department of Health Services. February 19, 1993.





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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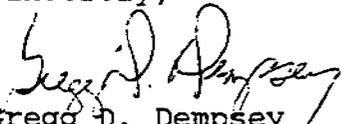
Dr. Arlene Giliberto
Rocketdyne Division
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Dear Dr. Giliberto:

Enclosed please find the "Analytical Results Report, Off-Site Multi-Media Sample Collection at the Santa Susana Field Laboratory."

You and your contractor, McLaren Hart, have permission to duplicate this report for the purposes of an Appendix in the "Multi-Media Sampling Report for the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy."

Sincerely,


Gregg D. Dempsey
Chief, Field Studies Branch

Enclosures

cc: Ann Holbrow, McLaren Hart ←
Arnold Robbins, EPA Region 9 (w/o)

ANALYTICAL RESULTS REPORT
OFF-SITE, MULTI-MEDIA
SAMPLE COLLECTION AT THE
SANTA SUSANA FIELD LABORATORY

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Work Assignment 2-58

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January 1993

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1.0 Introduction

The Santa Susana Field Laboratory (SSFL) is located in the Simi Hills of eastern Ventura County, west of Chatsworth, California. The facility, which is operated by Rockwell International Corporation's Rocketdyne Division for the United States Department of Energy (DOE), occupies approximately 2,600 acres. Beginning in the early 1950s, programs including nuclear engineering, research and development, and manufacturing operations have been conducted in Area IV of the facility.

Investigations at the SSFL have indicated that groundwater underlying the property contains volatile organic compounds (GWR91). Radiological contamination has also been found onsite in the soils of areas at one time dedicated to nuclear research activities conducted under contract to DOE. Remediation of some contaminated areas have been completed. Rocketdyne is currently performing remediation or has plans to remediate other areas.

Remediation of the following areas have been completed:

Areas of the Radioactive Materials Disposal Facility Watershed were completed in 1979.

The Sodium Reactor Experimental Facility was completed in 1983.

The Sodium Burn Pit was completed in December of 1992.

Rocketdyne is currently performing radiological remediation of the following areas:

Building 59, Space Nuclear Auxiliary Power System (SNAP), is projected to be completed in 1993.

Building 5, Uranium Carbide Fuel Fabrication Facility, is projected to be completed in 1993.

Building 64, Storage Facility, is projected to be completed in 1993.

Building 20, Hot Lab, is projected for completion in 1995.

Rocketdyne plans to conduct remediation operations of the following areas:
Building 12, Space Nuclear Auxiliary Power System (SNAP), is projected to begin in 1994.

Radioactive Materials Disposal Facility is projected to begin in 1998

Because several areas on the SSFL site were identified as being contaminated with radioactivity and/or volatile organic compounds, the potential for contamination of properties around the SSFL became a concern. To assess this potential the United States Environmental Protection Agency's (EPA) Region IX Office and Office of Radiation and Indoor Air (ORIA), Las Vegas Facility, the State of California's Department of Health Services (CaDHS), and Rockwell International's Rocketdyne Division designed an environmental sampling program to determine if offsite contamination had occurred.

A workplan entitled, "Workplan for Multi-Media Sampling at the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy," was prepared by McLaren/Hart ChemRisk, a contractor to Rocketdyne, which identified the areas and media to be sampled and the analyses to be performed. Samples were collected during March and April of 1992 by McLaren/Hart ChemRisk in accordance with this workplan. Field observations were documented on behalf of EPA by an S. Cohen and Associates, Inc. (SC&A) representative who observed sample collection to insure that proper sampling procedures were followed, appropriate locations were sampled, and sample splits, where required, were obtained. These activities are described fully in an SC&A report (SCA92).

Approximately fifteen percent of the samples identified in the McLaren/Hart ChemRisk workplan were collected as split samples and divided between the EPA and McLaren/Hart Chemrisk for analysis. The analytical results from the split samples will be compared to determine if significant differences exist in the results between the EPA laboratory and the McLaren Hart laboratory. McLaren/Hart ChemRisk and Rocketdyne are responsible for performing the comparison and preparing a report detailing the results of that comparison.

Results of the analyses performed on the EPA portion of the split samples are tabulated in this report. A summary regarding methodology and quality control is also provided.

2.0 Analytical Approach

Radiochemical and chemical analyses to be performed were identified in the McLaren/Hart ChemRisk workplan. Additional analyses not specified in the workplan were performed by the EPA for isotopic uranium and tritium. Except for iodine-129 the EPA radiochemical analyses were performed at the National Air and Radiation Environmental Laboratory; iodine-129 and all chemical analyses were performed for the EPA by International Technology (IT) Middlebrook Pike laboratory in Knoxville, Tennessee. The McLaren/Hart ChemRisk laboratory performed their own analyses for chemicals but subcontracted the radiochemical analyses to Teledyne Isotopes in Westwood, New Jersey.

3.0 Sample Custody

Sample custody was conducted in accordance with Contract Laboratory Procedures (CLP), 1988 SOW. Once samples were received and accepted at the designated EPA laboratory, they remained under chain of custody in accordance with procedures including, but not limited to:

1. Identification of the responsible party acting as sample custodian who is authorized to sign for incoming samples, obtain documents of the shipment, and verify the date entered into the sample custody records.
2. Provision for a laboratory sample custody log in which serial numbers were assigned to samples received.
3. Laboratory sample custody procedures for handling, storage, and dispersment of samples for analyses.

4.0 Methodology

4.1. NAREL Radiochemical Analyses

4.1.1 Gross Alpha and Gross Beta

Water samples were prepared for gross alpha and gross beta analysis in accordance with EERF 00-01 (EPA84a). Samples were then counted for 100 minutes on a low-background gas proportional counting system. Results of these analyses are listed in Table 1.

4.1.2 Gamma Spectroscopy

Samples were analyzed for gamma emitting radionuclides by gamma spectroscopy in accordance with EPA 901.1 (EPA80a), using high purity germanium detectors. Prior to analysis, soil samples were dried at 100^o C and blended to obtain a uniform product. A 400 ml geometry was prepared and counted for 1000 minutes. Water samples were placed in a 1 liter Marinelli beaker and counted for 1000 minutes. Fruit samples were homogenized in a blender, a 400 mL sample was then obtained and counted for 1000 minutes. A summary of the results of these analyses are listed in Tables 2-A, 2-B, and 2-C. The complete gamma spectroscopy results for each sample is compiled in Appendix A, "Gamma Spectroscopy Complete Results."

4.1.3 Tritium

Samples were analyzed for tritium in accordance with EERF H-01 (EPA84b) and EPA 906.0 (EPA80b). The samples were counted for 100 minutes by a liquid scintillation counter. Results of these analyses are listed in Tables 3-A, 3-B, and 3-C.

4.1.4 Isotopic Plutonium

Samples were analyzed for isotopic plutonium in accordance with EERF Pu-01 (EPA84c). In accordance with the procedure, the samples were counted for 1000 minutes by alpha spectroscopy. Results of these analyses are listed in Tables 4-A, 4-B, and 4-C.

4.1.5 Isotopic Uranium

Only soil samples were analyzed for isotopic uranium. Isotopic uranium analyses were performed in accordance with EERF 00-06 (EPA84d). The samples were counted for 1000 minutes by a surface barrier alpha spectroscopy detector. Results of these analyses are listed in Table 5.

4.1.6 Strontium-90

Soil and fruit samples were analyzed for strontium-90 in accordance with EERF Sr-01 (EPA84e). Water samples were analyzed in accordance with EERF Sr-04 (EPA84f). After performing these procedures, the samples were counted for 100 minutes on a multidetector, low-background beta counting system. Results of these analyses are listed in Tables 6-A, 6-B, and 6-C.

4.1.7 Iodine-129

Analysis for iodine-129 in soil and water was performed by International Technology Corporation by column and chemical extraction in accordance with RSL-307 (IT87). After performing this procedure, the samples were counted on a liquid scintillation counter. Fruit samples were analyzed in accordance with RD3219 (IT91) by Low Energy Photon Detector (LEPD). Results of these analyses are listed in Tables 7-A, 7-B, and 7-C.

4.2

Chemical Analysis

International Technology performed all analyses for chemicals. Only soil and water samples were analyzed for chemicals.

4.2.1 Volatile Organic Compounds (VOCs)

Analyses for VOCs were performed in accordance with SW-846 method 8240 (SW86a). A summary of the results of these analyses are listed in Tables 8-A and 8-B. The analytical results for each compound are compiled in Appendix B, "Chemical Analyses Complete Results." The details of the analyses are contained in the case narratives compiled in Appendix C, "Case Narratives For Chemical Analyses."

4.2.2 Semivolatile Organic Compounds (SVOCs)

Analyses for SVOCs in soils were performed in accordance with SW-846 method 8270 (SW86b). Water analyses were performed in accordance with SW-846 method 8310m (SW86b), and EPA method 610. A summary of the results of these analyses are listed in Tables 9-A and 9-B. The analytical results for each compound are compiled in Appendix B, "Chemical Analysis Complete Results." The details of the analyses are contained in the case narratives compiled in Appendix C, "Case Narratives for Chemical Analyses."

4.2.3 Priority Pollutant Metals (PPM)

Analyses for PPMs were performed in accordance with SW-846 methods 7470 (SW86c), 7471 (SW86d), 7060 (SW86e), 7741 (SW86f), 7841 (SW86g), and 6010 (SW86h). Results of these analyses are listed in Tables 10-A and 10-B.

The details of these analyses are contained in the case narratives and are compiled in Appendix C, "Case Narratives for Chemical Analyses."

5.0 Additional Analyses

When the result of an EPA or Teledyne laboratory analysis was questionable, the analysis was performed again by the EPA to verify the original result. When the Teledyne laboratory produced a questionable result, a laboratory split was prepared from that sample and sent to the EPA for a confirmatory analysis. The results of these analyses are contained in Table 11.

6.0 Quality Control

6.1 Radiochemical Analyses

6.1.1 Radiochemical analyses were performed on the samples by both S. Cohen and Associates, Inc. (SC&A) and EPA personnel who are qualified to perform the approved procedures. Quality control samples were analyzed concurrently with the site samples in order to assure the accuracy and precision of the analytical procedure and instrumentation. Quality control samples were analyzed according to the following schedule:

| | |
|---------------------------|---------|
| Duplicate Sample Analysis | 1 in 10 |
| Matrix Spike | 1 in 20 |
| Matrix Spike Duplicate | 1 in 20 |
| Method Blanks | 1 in 20 |

The results of the radiochemical analyses quality control samples are compiled in Appendix D, "Quality Control Samples."

Chemical Analyses

Analyses for chemicals and iodine-129 was performed by International Technology. International Technology is approved by the EPA as a CLP laboratory and is certified by the State of California. Quality control samples were analyzed concurrently with the site samples in order to assure accuracy and precision of the analytical procedure and instrumentation. Quality control samples were analyzed according to the following schedule:

| | |
|------------------------|--|
| Matrix Spike | 1 in 20 |
| Matrix Spike Duplicate | 1 in 20 |
| Method Blanks | 1 in 20 |
| Travel Blanks | 1 per Shipment Containing Samples For VOCs Analysis |

The results of chemical analyses quality control samples are compiled in Appendix D, "Quality Control Samples."

6.3

Accuracy

Accuracy is a measurement of the agreement between an experimental determination and the true value of the parameter being measured. Spiking of reference material into an actual sample matrix is the preferred technique for evaluating accuracy because it provides an indication of the matrix effects on the analytical accuracy. Accuracy, defined as percent accuracy (PA), is calculated by the following equation:

$$PA = \frac{|SSR - SR|}{SA} \times 100\%$$

where:

PA = Percent Accuracy

SSR = Spiked Sample Result

SA = Spike Added

SR = Sample Result

6.4

Precision

Precision is a measure of the degree of repeatability of a set of results obtained from duplicate analyses made under the same conditions. Precision is expressed as relative percent difference (RPD), and is calculated by the following equation:

$$RPD = \frac{(S_1 - S_2)}{\left(\frac{S_1 + S_2}{2}\right)} \times 100\%$$

where:

RPD = Relative Percent Difference

S₁ = Larger of the two measured results

S₂ = Smaller of the two measured results

7.0 Discussion of EPA Results

7.1 Gross Alpha and Gross Beta

The results of all gross alpha and gross beta analyses (Table 1) were less than the minimum detectable activity (MDA) with the exception of two sample areas at the Radioactive Materials Disposal Facility Watershed on the Brandeis-Bardin Institute/Rocketdyne Facility Border Ravine Area. All values in the table greater than the MDA are within safe drinking water limits (CFR91). However, it should be noted that these samples were ground water or surface water and were not drinking water. Drinking water standards are cited because they provide the most conservative limits for comparison.

7.2 Gamma Spectroscopy

Cs-137 was the only radionuclide with values greater than the MDA except for those naturally occurring. Cs-137 (Tables 2-A, 2-B, and 2-C) was detected at several locations in near background concentrations. The concentrations detected are consistent with those found in other areas of the United States and are thought to be a result of fallout from nuclear weapons testing. An additional analysis for Cs-137 was performed by the EPA on a laboratory split sample with questionable results from the Teledyne laboratory. The additional analysis, (Table 11-A) confirmed the Teledyne result, which was ultimately determined to be consistent with the other Cs-137 values.

A list of Cs-137 concentrations in soil from several areas in the state of California was compiled from the Environmental Radiation Ambient Monitoring System (ERAMS) data base at the NAREL and is included in Appendix E, "Cs-137 in California Soils."

Tritium

The results of tritium analyses, (Tables 3-A, 3-B, and 3-C), on field split samples were near or below the MDA, approximately 200 pCi/L. However, some of the samples analyzed by Teledyne laboratories that were not collected as split samples indicated the presence of tritium. To confirm these results, the Teledyne laboratory provided a laboratory split of these samples to the EPA for analysis. If the integrity of the laboratory split sample was not acceptable upon arrival at the EPA, or the amount of water recovered during the azeotropic distillation was not sufficient to provide a reasonable and useful detection limit, the analytical value was not reported. The results of the EPA analyses on the laboratory split samples confirmed the presence of slightly elevated levels of tritium in six samples collected from sample areas at the Radioactive Materials Disposal Facility Watershed located at the Brandeis-Bardin Institute/Rocketdyne Facility Border Ravine Area (Table 11-B). In addition, somewhat higher levels of tritium were confirmed in two samples collected from areas at the Building 59 Watershed located at the Brandeis-Bardin Institute/Rocketdyne Facility Border Ravine Area (Table 11-B). All values in the table greater than the MDA are within the safe drinking water limits (CFR91). However, it should be noted that these samples were water that was extracted from soil, and not drinking water. Drinking water standards are cited because they provide the most conservative limits for comparison.

Isotopic Plutonium

Concentrations of Pu-238 and Pu-239 were identified near or below the MDA in all samples (Tables 4-A, 4-B, and 4-C). The concentrations that were detected are consistent with those levels found in other areas of the United States and are thought to be a result of fallout from nuclear weapons testing and from space generators which have burned on atmospheric reentry.

7.5

Isotopic Uranium

U-234, U-235, and U-238 are naturally occurring radionuclides in the environment. Although uranium analyses were not required by the workplan, the EPA analyzed their field split portion of soil samples for this radionuclide in order to determine if it was present in naturally occurring quantities (Table 5). Its analysis was readily available from the plutonium procedure, and it provided additional characterization of the radionuclide content of the area. Normal concentrations of these radionuclides in the ratio of 1:0.05:1 U-238, U-235, and U-234, respectively, were detected.

7.6

Strontium-90

The results of Sr-90 were all less than the MDA with the exception of one water sample (Tables 6-A, 6-B, and 6-C). A concentration of 7.79 pCi/L was detected at the Radioactive Materials Disposal Facility Watershed located at the Brandeis-Bardin Institute/Rocketdyne Facility Border Ravine Area. The sample was reanalyzed three times, and results of 7.80, 7.71 and 7.43 pCi/L were obtained (Table 11-C). Subsequently, a laboratory split sample was received from the Teledyne laboratory and analyzed. The result from this analysis was 6.66 pCi/L.

7.7

Iodine-129

The results of all I-129 analyses were less than the MDA (Tables 7-A, 7-B and 7-C).

Volatile Organic Compounds (VOCs)

Trace amounts of methylene chloride and acetone were identified in seven samples (Tables 8-A and 8-B). Although these compounds were not identified in the method blanks, it is believed that such small concentrations are the results of laboratory contamination, since they are used routinely in the IT laboratory.

Trichloroethene (TCE) was identified in the Well By The Gate sample from the Santa Monica Mountains Conservancy. A concentration of 13 ppb was identified and is considered to be a significant level. TCE is a common solvent that was frequently used at the SSFL in large volumes.

An additional analysis was performed on a second sample collected at a later date from the Antenna Well, because the first sample collected by McLaren/Hart ChemRisk contained a trace amount of laboratory solvent. The result of the second analysis (Table 11-D) was negative.

Semivolatile Organic Compounds (SVOCs)

With the exception of one water sample collected at the Radioactive Materials Disposal Facility at the Brandeis-Bardin Institute/Rocketdyne Facility Border Ravine Border, no SVOCs were detected (Tables 9-A and 9-B). Fluoranthrene was detected at a concentration of .33 ppb was reported for this sample. Fluoranthrene is usually a by-product of combustion and is not considered significant at this level.

Priority Pollutant Metals

The results of all metal analyses were within normal ranges except for one sample (Tables 10-A and 10-B). The lead concentration in a sample collected at the Former Rocketdyne Shooting Range located at the Santa Monica Mountains Conservancy was 225 ppm. Because this area was once used as a shooting range, the elevated lead concentration was not unexpected. This area is currently being remediated.

8.0 Conclusions and Recommendations

A total of five laboratories participated in analyzing split samples collected for this study:

McLaren/Hart

California Department of Public Health

Brandeis-Bardin Consultant

Teledyne

United States Environmental Protection Agency

Although no formal review of the completed data set compiled by McLaren/Hart ChemRisk was performed by SC&A, a review of the results in this study and a comparison of the results from analyses by different laboratories of split samples were made as the study progressed. It is important to note that in almost every sample, no detectable amount or only amounts near the limits of detection were observed for the analytes, except in the specific samples described below.

Several results of the radioanalyses of the EPA split samples do indicate, however, the need for additional study in two areas of the Brandeis-Bardin Institute/Rocketdyne Facility Border. Those areas are identified as follows:

1. Some locations at the watershed area of Building 59 were identified as having tritium concentrations of approximately 10,000 pCi/L (Table 11-B) of water that was extracted from soil. It should be noted that the tritium contamination was identified in water extracted from soil and not from ground water or surface water that could be consumed. Because the tritium is within the water in the soil, exposure, if any, by inhalation is not significant. Also the location of the contamination is in a remote area which is unoccupied and not used for agricultural purposes. Therefore, at this time there is not a potential for exposure by ingestion of food products. Eventhough these were not drinking

water samples, if the conservative safe drinking water limit for tritium of 20,000 pCi/L (CFR91) is used for comparison purposes, the levels of tritium identified do not present a health concern at this point. In addition, drainage areas below this location were also sampled and analyzed with negative results. However, the results do indicate a source of contamination is present somewhere on the SSFL site, and further studies should be conducted to identify that source.

2. The second area that should be studied is the ground water found at the Radioactive Materials Disposal Facility. Both the EPA and the Teledyne laboratory identified the presence of Sr-90 at levels below the safe drinking water limit of 8 pCi/L (CFR91) (Tables 6-B and 11-C). However, there was a wide variation between the results of 7.79 pCi/L attained by the EPA and 1.1 pCi/L attained by Teledyne. Subsequent analysis by the EPA of the remainder of their sample as well as of a laboratory split sample acquired from the Teledyne laboratory all indicate approximately 7 pCi/L of Sr-90 present. Since the results of the EPA quality control sample was outside standard control limits and since all the sample was used during testing by the EPA and Teledyne laboratories, this area should be sampled again to clarify the Sr-90 value. It should be noted that this location is in a remote area and does not represent a health concern at this point. Also, the drainage areas below this location were sampled and analyzed with negative results.

The results of chemical analyses also indicate areas for additional examination:

1. Long term studies should be instituted at the Santa Monica Mountains Conservancy Well by the Gate where Trichloroethene was confirmed to be present in the ground water at levels above the safe drinking water limit (Table 8-B). These studies are already being conducted on the Rocketdyne site where this compound has been identified in the ground water.

2. Upon completion of the remediation of the Former Rocketdyne Shooting Range on the Santa Monica Mountains Conservancy, confirmatory sampling and analysis should be conducted to assure the removal of lead was successful (Table 10-A).

References

- CFR91 "Maximum Contaminants Levels for Beta Particle and Photon Radioactivity from Man-Made Radionuclides in Community Water Systems," Code of Federal Registry, Title 40, Part 141.16, July 1, 1991.
- EPA80 Prescribed Procedures for Measurements of Radioactivity in Drinking Water, EPA/600/4-80-032, August, 1980.
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- EPA80b Ibid., Method 906.0, "Tritium"
- EPA84 Eastern Environmental Radiation Facility Radiochemistry Procedures Manual, EPA/520/5-84-006, 1984
- EPA84a Ibid., "Radiochemical Determination of Gross Alpha and Gross Beta Particle Activity in Water," Section C, 00-01.
- EPA84b Ibid., "Radiochemical Determination of Tritium in Milk, Soil, Urine, Vegetation and Other Biological Samples: Azeotropic Method," Section C, H-01.
- EPA84c Ibid., "Radiochemical Determination of Plutonium in Ashed Samples, Soil, Coal, Fly ash, Ores, Vegetation, Biota and Water," Section C, Pu-01.
- EPA84d Ibid., "Radiochemical Determination of Thorium and Uranium in Ashed Samples Including Soil, Coal, Fly Ash, Ores, Vegetation and Biota: Fusion Method, " Section C, 00-06.

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- SW86c Ibid., 1A, "Mercury In Liquid Waste (Manual Cold-Vapor Technique)," Method 7470
- SW86d Ibid., Vol.1A, "Mercury In Solid or Semisolid Waste (Manual Cold-Vapor Technique)," Method 7471.
- SW86e Ibid., Vol. 1A, "Arsenic (Atomic Absorption, Furnace Technique)," Method 7060.
- SW86f Ibid., Vol.1A, "Selenium (Atomic Absorption, Gaseous Hydride)," Method 7741.
- SW86g Ibid., Vol. 1A, "Thallium (Atomic Absorption, Furnace Technique)," Method 7841.
- SW86h Ibid., Vol. 1A, "Inductively Coupled Plasma Atomic Emission Spectroscopy," Method 6010.

TABLE 1
RADIOANALYTICAL RESULTS
GROSS ALPHA AND GROSS BETA IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|-------------------|------------------|
| | | | | | | Gross Alpha pCi/L | Gross Beta pCi/L |
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196745 | SSFL92.1879 | <2.4 | 5.2 ± 1.5 |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196733 | SSFL92.1880 | <1.6 | 4.2 ± 1.5 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197333 | SSFL92.3057 | 2.5 ± 1.6 | 18.5 ± 2.10 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 197857 | SSFL92.3066 | 2.3 ± 1.5 | 10.9 ± 1.6 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|------------------|------------------|--------------|----------------------------|-------------------------|-------------------|------------------|
| | | | | | | Gross Alpha pCi/L | Gross Beta pCi/L |
| 3/11/92 | Antenna Well | 05 | 01 | 196709 | SSFL92.1759 | <3.8 | 5.5 ± 3.4 |
| 3/11/92 | Well By The Gate | 07 | 01 | 170710 | SSFL92.1758 | <4.4 | <5.0 |
| 3/18/92 | Spring | 08 | 01 | 171807 | SSFL92.1945 | <4.6 | <4.6 |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|-------------|------------------|--------------|----------------------------|-------------------------|-------------------|------------------|
| | | | | | | Gross Alpha pCi/L | Gross Beta pCi/L |
| 3/12/92 | Rocky Peak | 01 | 02 | 196720 | SSFL92.1760 | <5.2 | <5.3 |

TABLE 2-A
RADIOANALYTICAL RESULTS
CESIUM-137 IN SOIL

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/Gdry |
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90285 | SSFL92.1956 | .035 ± .012 |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90136 | SSFL92.1889 | .26 ± .018 |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88283 | SSFL92.1888 | .034 ± .012 |
| 3/18/92 | Picnic Area | 05 | 77 | 90034 | SSFL92.1955 | .086 ± .014 |
| 3/17/92 | House of the Book | 06 | 92 | 89183 | SSFL92.1887 | <.033 |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89284 | SSFL92.2046 | .056 ± .018 |
| 3/18/92 | Main House Orchard | 12 | 20 | 90085 | SSFL92.1954 | .084 ± .017 |
| 3/17/92 | Avacado Grove | 13 | 24 | 88936 | SSFL92.1890 | .030 ± .011 |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88415 | SSFL92.1891 | .015 ± .008 |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89587 | SSFL92.3048 | .041 ± .013 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 89888 | SSFL92.3052 | <.0171 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 03 | 89883 | SSFL92.3051 | .008 ± .008 |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89335 | SSFL92.3270 | .086 ± .016 |
| 4/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89234 | SSFL92.3070 | .088 ± .018 |
| 4/21/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90436 | SSFL92.3079 | .055 ± .010 |

TABLE 2-A (Contd)
RADIOANALYTICAL RESULTS
CESIUM-137 IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|-------------|
| | | | | | | pCi/Gdry |
| 3/23/92 | The Visitor Center Parking Lot | 01 | 04 | 88583 | SSFL92.2591 | .054 ± .017 |
| 3/11/92 | The Existing Road System | 02 | 19 | 88384 | SSFL92.1775 | .12 ± .01 |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88336 | SSFL92.1774 | .17 ± .02 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|-------------------|------------------|--------------|----------------------------|-------------------------|-------------|
| | | | | | | pCi/Gdry |
| 3/10/92 | Santa Susana Park | 02 | 07 | 88497 | SSFL92.1773 | .19 ± .013 |
| 3/12/92 | Bell Canyon | 03 | 59 | 88344 | SSFL 92.1836 | .017 ± .018 |
| 3/13/92 | Western Location | 04 | 29 | 88240 | SSFL92.1837 | .15 ± .01 |

TABLE 2-B
RADIOANALYTICAL RESULTS
CESIUM-127 IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|--------|
| | | | | | | pCi/L |
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196774 | SSFL92.1881 | < 4.3 |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196732 | SSFL92.1882 | < 8.1 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 197329 | SSFL92.3055 | < 4.7 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed RD-30 | 16 | RD-30 | 197856 | SSFL92.3065 | <4.8 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|----------------|------------------|--------------|----------------------------|-------------------------|--------|
| | | | | | | pCi/L |
| 3/23/92 | Antenna Well | 05 | 01 | 196708 | SSFL92.1755 | <5.5 |
| 3/11/92 | Well Near Gate | 07 | 01 | 17078 | SSFL92.1754 | <4.6 |
| 3/18/92 | Spring | 08 | 01 | 171806 | SSFL92.1946 | < 4.3 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|-------------|------------------|--------------|----------------------------|-------------------------|--------|
| | | | | | | pCi/L |
| 3/12/92 | Rocky Peak | 01 | 02 | 196719 | SSFL92.1756 | <4.7 |

TABLE 2-C
RADIOANALYTICAL RESULTS
CESIUM-137 IN FRUIT

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|--------------------|------------------|--------------|--------|----------------------------|-------------------------|----------|
| | | | | | | | pCi/Gwet |
| 3/18/92 | Main House Orchard | 12 | 06 | Lemons | None | SSFL92.1936 | <.013 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|------------------|------------------|--------------|--------|----------------------------|-------------------------|----------|
| | | | | | | | pCi/Gwet |
| 3/11/92 | The Orange Grove | 04 | 03 | Orange | 90227 | SSFL92.1834 | <.013 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | Cs-137 |
|-----------------|-------------|------------------|--------------|-----------|----------------------------|-------------------------|----------|
| | | | | | | | pCi/Gwet |
| 3/13/92 | Happy Camp | 07 | 01 | Avocados | 90245 | SSFL92.1833 | <.021 |
| 3/13/92 | Happy Camp | 07 | 04 | Lemons | 89725 | SSFL92.1835 | <.013 |
| 3/23/92 | Supermarket | 08 | 04 | Tangerine | 89732 | SSFL92.2089 | <.010 |

TABLE 3-A
RADIOANALYTICAL RESULTS
TRITIUM IN SOIL

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCVL |
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90285 | SSFL92.1956 | <200 |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90136 | SSFL92.1889 | <209 |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88283 | SSFL92.1888 | <200 |
| 3/18/92 | Picnic Area | 05 | 77 | 90034 | SSFL92.1955 | <200 |
| 3/17/92 | House of the Book | 06 | 92 | 89183 | SSFL92.1887 | <210 |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89284 | SSFL92.2046 | <200 |
| 3/18/92 | Main House Orchard | 12 | 20 | 90085 | SSFL92.1954 | <200 |
| 3/17/92 | Avocado Grove | 13 | 24 | 88935 | SSFL92.1890 | <206 |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88415 | SSFL92.1891 | <200 |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89587 | SSFL92.3048 | <171 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 89888 | SSFL92.3052 | <190 |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89335 | SSFL92.3070 | <190 |
| 4/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89234 | SSFL92.3073 | <200 |
| 4/21/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90436 | SSFL92.3079 | <200 |

TABLE 3-A (Contd)
RADIOANALYTICAL RESULTS
TRITIUM IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/23/92 | The Visitor Center Parking Lot | 01 | 04 | 88583 | SSFL92.2591 | <224 |
| 3/11/92 | The Existing Road System | 02 | 19 | 88384 | SSFL92.1775 | <200 |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88336 | SSFL92.1774 | <200 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|-------------------|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/10/92 | Santa Susana Park | 02 | 07 | 88497 | SSFL92.1773 | <200 |
| 3/12/92 | Bell Canyon | 03 | 59 | 88344 | SSFL92.1836 | <210 |
| 3/13/92 | Western Location | 04 | 29 | 88240 | SSFL92.1837 | <209 |

TABLE 3-B
RADIOANALYTICAL RESULTS
TRITIUM IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196746 | SSFL92.1885 | <200 |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196733 | SSFL92.1886 | <200 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197331 | SSFL92.3056 | <191 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed RD-30 | 16 | RD-30 | 197860 | SSFL92.3069 | <191 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|------------------|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/23/92 | Antenna Well | 05 | 01 | 196710 | SSFL92.1767 | <200 |
| 3/11/92 | Well By The Gate | 07 | 01 | 170729 | SSFL92.1766 | <200 |
| 3/18/92 | Spring | 08 | 01 | 171808 | SSFL92.1947 | <200 |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|-------------|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/12/92 | Rocky Peak | 01 | 02 | 196725 | SSFL92.1768 | <200 |

TABLE 3-C
RADIOANALYTICAL RESULTS
TRITIUM IN FRUIT

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|--------------------|------------------|--------------|-------|----------------------------|-------------------------|---------------|
| | | | | | | | pCi/L |
| 3/18/92 | Main House Orchard | 12 | 06 | Lemon | None | SSFL92.1937 | <190 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|------------------|------------------|--------------|--------|----------------------------|-------------------------|---------------|
| | | | | | | | pCi/L |
| 3/11/92 | The Orange Grove | 04 | 03 | Orange | 90227 | SSFL92.4045 | 350 ± 200 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|-------------|------------------|--------------|-----------|----------------------------|-------------------------|---------------|
| | | | | | | | pCi/L |
| 3/13/92 | Happy Camp | 07 | 01 | Avocado | 90245 | SSFL92.2043 | <206 |
| 3/13/92 | Happy Camp | 07 | 04 | Lemon | 89725 | SSFL92.4033 | 400 ± 200 |
| 3/23/92 | Supermarket | 08 | 04 | Tangerine | 89732 | SSFL92.4042 | 400 ± 200 |

TABLE 4-A
RADIOANALYTICAL RESULTS
PLUTONIUM IN SOIL

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|-----------------|-----------------|
| | | | | | | Pu-238 pCi/Gdry | Pu-239 pCi/Gdry |
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90284 | SSFL92.1950 | <.02 | <.015 |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90135 | SSFL92.1898 | .04 ± .05 | <.023 |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88282 | SSFL92.1900 | .03 ± .02 | <.016 |
| 3/18/92 | Picnic Area | 05 | 77 | 90033 | SSFL92.1948 | .03 ± .03 | .015 ± .02 |
| 3/17/92 | House of the Book | 06 | 92 | 89182 | SSFL92.1897 | .031 ± .05 | <.022 |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89283 | SSFL92.2047 | .02 ± .03 | <.008 |
| 3/18/92 | Main House Orchard | 12 | 20 | 90084 | SSFL92.1949 | .03 ± .04 | <.019 |
| 3/17/92 | Avacado Grove | 13 | 24 | 88935 | SSFL92.1896 | <.03 | <.021 |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88414 | SSFL92.1899 | <.02 | <.011 |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89586 | SSFL92.3049 | <.02 | <.011 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 89887 | SSFL92.3053 | <.02 | <.019 |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89339 | SSFL92.3071 | .027 ± .03 | <.008 |
| 4/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89233 | SSFL92.3074 | <.02 | <.015 |
| 4/21/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90435 | SSFL92.3080 | .03 ± .05 | <.020 |

TABLE 4-A (Contd)

RADIOANALYTICAL RESULTS
PLUTONIUM IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|-----------------|-----------------|
| | | | | | | Pu-238 pCi/Gdry | Pu-239 pCi/Gdry |
| 3/23/92 | The Visitor Center | 01 | 04 | 88582 | SSFL92.2592 | .02 ± .03 | .010 ± .02 |
| 3/11/92 | The Existing Road | 02 | 19 | 88383 | SSFL92.1780 | <0.43 | <.032 |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88335 | SSFL92.1781 | <.03 | <.027 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|-------------------|------------------|--------------|----------------------------|-------------------------|-----------------|-----------------|
| | | | | | | Pu-238 pCi/Gdry | Pu-239 pCi/Gdry |
| 3/10/92 | Santa Susana Park | 02 | 07 | 88496 | SSFL92.1779 | .05 ± .05 | .064± .06 |
| 3/12/92 | Bell Canyon | 03 | 59 | 88341 | SSFL92.1839 | .02 ± .03 | <.018 |
| 3/13/92 | Western Location | 04 | 29 | 88238 | SSFL92.1840 | <.04 | <.023 |

TABLE 4-B
RADIOANALYTICAL RESULTS
PLUTONIUM IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|--------------|
| | | | | | | Pu-238 pCi/L | Pu-239 pCi/L |
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196747 | SSFL92.2219 | <.02 | <.04 |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196734 | SSFL92.2218 | <.027 | <.02 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 197337 | SSFL92.3059 | <.04 | <.03 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed RD-30 | 16 | RD-30 | 197858 | SSFL92.3069 | <.05 | <.04 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|----------------|------------------|--------------|----------------------------|-------------------------|---------------|--------------|
| | | | | | | Pu-238 pCi/L | Pu-239 pCi/L |
| 3/11/92 | Antenna Well | 05 | 01 | 196711 | SSFL92.1771 | <.06 | <.05 |
| 3/11/92 | Well Near Gate | 07 | 01 | 170728 | SSFL92.1770 | <.04 | <.03 |
| 3/18/92 | Spring | 08 | 01 | 171809 | SSFL92.1943 | <.08 | <.02 |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|-------------|------------------|--------------|----------------------------|-------------------------|---------------|--------------|
| | | | | | | Pu-238 pCi/L | Pu-239 pCi/L |
| 3/12/92 | Rocky Peak | 01 | 02 | 196721 | SSFL92.1772 | <.04 | <.03 |

TABLE 4-C

RADIOANALYTICAL ANALYSES
PLUTONIUM IN FRUIT

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|--------------------|------------------|--------------|-------|----------------------------|-------------------------|-----------------|-----------------|
| | | | | | | | Pu-238 pCi/Gwet | Pu-239 pCi/Gwet |
| 3/18/92 | Main House Orchard | 12 | 06 | Lemon | None | SSFL92.1939 | <.00009 | <.0007 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|------------------|------------------|--------------|--------|----------------------------|-------------------------|------------------|------------------|
| | | | | | | | Pu-238 pCi/ Gwet | Pu-239 pCi/ Gwet |
| 3/11/92 | The Orange Grove | 04 | 03 | Orange | 90227 | SSFL92.4044 | <.0001 | <.0001 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | |
|-----------------|-------------|------------------|--------------|-----------|----------------------------|-------------------------|-----------------|-----------------|
| | | | | | | | Pu-238 pCi/Gwet | Pu-239 pCi/Gwet |
| 3/13/92 | Happy Camp | 07 | 01 | Avocado | 90245 | SSFL92.2045 | <.000618 | <.000584 |
| 3/13/92 | Happy Camp | 07 | 04 | Lemon | 89725 | SSFL92.4032 | <.00009 | <.00008 |
| 3/23/92 | Supermarket | 08 | 04 | Tangerine | 89732 | SSFL92.4041 | <.0001 | <.00009 |

TABLE 5

**RADIOANALYTICAL RESULTS
URANIUM IN SOIL**

BRANDEIS BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | | |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|----------------|----------------|----------------|
| | | | | | | U-234 pCi/Gash | U-235 pCi/Gash | U-238 pCi/Gash |
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90284 | SSFL92.1950 | .995 ± .23 | .0599 ± .05 | 1.04 ± .24 |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90135 | SSFL92.1898 | 1.12 ± .26 | .0391 ± .04 | .943 ± .24 |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88282 | SSFL92.1900 | 1.09 ± .27 | .0657 ± .06 | .943 ± .24 |
| 3/18/92 | Picnic Area | 05 | 77 | 90033 | SSFL92.1948 | 1.15 ± .24 | .0452 ± .04 | 1.20 ± .25 |
| 3/17/92 | House of the Book | 06 | 92 | 89182 | SSFL92.1897 | 1.05 ± .25 | .0398 ± .04 | 1.03 ± .25 |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89283 | SSFL92.2047 | 1.15 ± .25 | .0810 ± .06 | 1.05 ± .24 |
| 3/18/92 | ain House Orchard | 12 | 20 | 90084 | SSFL92.1949 | .954 ± .21 | .0541 ± .04 | .916 ± .21 |
| 3/17/92 | Avacado Grove | 13 | 24 | 88935 | SSFL92.1896 | .964 ± .21 | .04340 ± .04 | .879 ± .20 |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88414 | SSFL92.1899 | 1.86 ± .39 | .101 ± .07 | 1.79 ± .38 |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89586 | SSFL92.3049 | .682 ± .17 | .0387 ± .04 | .658 ± .17 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 89887 | SSFL92.3053 | .540 ± .16 | .0302 ± .04 | .588 ± .17 |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89339 | SSFL92.3071 | 1.09 ± .24 | .0580 ± .05 | 1.08 ± .24 |
| 4/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89233 | SSFL92.3074 | .930 ± .23 | .0284 ± .04 | .726 ± .20 |
| 4/21/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90435 | SSFL92.3080 | .731 ± .21 | .0429 ± .05 | .663 ± .20 |

TABLE 5 (Contd)
RADIOANALYTICAL RESULTS
URANIUM IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | | |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|----------------|----------------|----------------|
| | | | | | | U-234 pCi/Gash | U-235 pCi/Gash | U-238 pCi/Gash |
| 3/23/92 | The Visitor Center Parking Lot | 01 | 04 | 88582 | SSFL92.2592 | 1.20 ± .24 | .0494 ± .04 | .953 ± .20 |
| 3/11/92 | The Existing Road | 02 | 9 | 88383 | SSFL92.1780 | 1.01 ± .25 | .0581 ± .05 | .852 ± .23 |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88335 | SSFL92.1781 | .700 ± .24 | .0644 ± .07 | .827 ± .26 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results | | |
|-----------------|-------------------|------------------|--------------|----------------------------|-------------------------|----------------|----------------|----------------|
| | | | | | | U-234 pCi/Gash | U-235 pCi/Gash | U-238 pCi/Gash |
| 3/10/92 | Santa Susana Park | 02 | 07 | 88496 | SSFL92.1779 | .933 ± .27 | .0531 ± .06 | 1.00 ± .28 |
| 3/12/92 | Bell Canyon | 03 | 59 | 88341 | SSFL92.1839 | 2.20 ± .34 | .0113 ± .04 | 2.07 ± .33 |
| 3/13/92 | Western Location | 04 | 29 | 88238 | SSFL92.1840 | 1.16 ± .26 | 3.23 ± .04 | 1.11 ± .26 |

TABLE 6-A
RADIOANALYTICAL RESULTS
STRONTIUM-90 IN SOIL

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/GDRY |
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90283 | SSFL92.1952 | <.69 |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90134 | SSFL92.1893 | <.66 |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88281 | SSFL92.1901 | <.71 |
| 3/18/92 | Picnic Area | 05 | 77 | 90032 | SSFL92.1951 | <.71 |
| 3/17/92 | House of The Book | 06 | 92 | 89181 | SSFL92.1892 | <.70 |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89282 | SSFL92.2048 | <.68 |
| 3/18/92 | Main House Orchard | 12 | 20 | 90083 | SSFL92.1953 | <.74 |
| 3/17/92 | Avocado Grove | 13 | 24 | 88934 | SSFL92.1894 | <.65 |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88434 | SSFL92.1895 | <.71 |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89584 | SSFL92.3050 | <.73 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 89885 | SSFL92.3054 | <.63 |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89332 | SSFL92.3072 | <.66 |
| 4/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89232 | SSFL92.3075 | <.62 |
| 4/23/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90433 | SSFL92.3081 | <.74 |

TABLE 6-A (Contd)
RADIOANALYTICAL RESULTS
STRONTIUM-90 IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/GDRY |
| 3/23/92 | The Visitor Center Parking Lot | 01 | 04 | 88581 | SSFL92.2589 | <71 |
| 3/11/92 | The Existing Road System | 02 | 19 | 88382 | SSFL92.1776 | <75 |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88334 | SSFL92.1778 | <69 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|-------------------|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/GDRY |
| 3/10/92 | Santa Susana Park | 02 | 07 | 88495 | SSFL92.1777 | <68 |
| 3/12/92 | Bell Canyon | 03 | 59 | 88341 | SSFL92.1839 | <72 |
| 3/13/92 | Western Location | 04 | 29 | 88238 | SSFL92.1838 | <67 |

TABLE 6-B
RADIOANALYTICAL RESULTS
STRONTIUM-90 IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196748 | SSFL92.1883 | <.78 |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196736 | SSFL92.1884 | <.99 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197335 | SSFL92.3058 | 7.79 ± .5 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed RD-30 | 16 | RD-30 | 197860 | SSFL92.3068 | <.53 |

SANTA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|------------------|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/11/92 | Antenna Well | 05 | 01 | 196712 | SSFL92.1762 | <.74 |
| 3/11/92 | Well By The Gate | 07 | 01 | 170715 | SSFL92.1761 | <.86 |
| 3/18/92 | Spring | 08 | 01 | 171810 | SSFL92.1944 | <.80 |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|-------------|------------------|--------------|----------------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/12/92 | Rocky Peak | 01 | 02 | 196722 | SSFL92.1763 | <.87 |

TABLE 6-C

RADIOANALYTICAL RESULTS
STRONTIUM-90 IN FRUIT

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|--------------------|------------------|--------------|--------|----------------------------|-------------------------|---------------|
| | | | | | | | pCi/GWET |
| 3/18/92 | Main House Orchard | 12 | 06 | Lemons | None | SSFL92.1938 | <.006 |

SANTA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|------------------|------------------|--------------|--------|----------------------------|-------------------------|---------------|
| | | | | | | | pCi/GWET |
| 3/11/92 | The Orange Grove | 04 | 03 | Orange | 90227 | SSFL92.4043 | <.005 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|-------------|------------------|--------------|-----------|----------------------------|-------------------------|---------------|
| | | | | | | | pCi/GWET |
| 3/13/92 | Happy Camp | 07 | 01 | Avocado | 90245 | SSFL92.2044 | <.023 |
| 3/13/92 | Happy Camp | 07 | 04 | Lemons | 89725 | SSFL92.4031 | <.003 |
| 3/23/92 | Supermarket | 08 | 04 | Tangerine | 89732 | SSFL92.4040 | <.004 |

TABLE 7-A

**RADIOANALYTICAL RESULTS
IODINE-129 IN SOIL**

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|---|------------------|--------------|----------------------------|------------------------|--------------|
| | | | | | | pCi/g |
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90289 | S20304404A | <.23 |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90146 | S20303705A | <.28 |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88287 | S20303703A | <.29 |
| 3/18/92 | Picnic Area | 05 | 77 | 90038 | S20304402A | <.23 |
| 3/17/92 | House of The Book | 06 | 92 | 89187 | S20303707A | <.28 |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89288 | S20305001A | <.16 |
| 3/18/92 | Main House Orchard | 12 | 20 | 90089 | S20304403A | <.23 |
| 3/17/92 | Avocado Grove | 13 | 24 | 88940 | S20303706A | <.29 |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88440 | S20303704A | <.28 |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89585 | S20405405A | <.17 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 89886 | S20406101A | <.17 |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89334 | S20404605A | <.17 |
| 4/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89238 | S20404601A | <.17 |
| 4/23/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90434 | S20406102A | <.17 |

TABLE 7-A (Contd)

RADIOANALYTICAL RESULTS
IODINE-129 IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|---|------------------|--------------|----------------------------|------------------------|--------------|
| | | | | | | pCi/g |
| 3/23/92 | The Visitor Center Parking Lot | 01 | 04 | 88587 | S20305601A | <16 |
| 3/11/92 | The Existing Road System | 02 | 19 | 88388 | S20303403A | <27 |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88340 | S20303402A | <27 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|-------------------|------------------|--------------|----------------------------|------------------------|--------------|
| | | | | | | pCi/g |
| 3/10/92 | Santa Susana Park | 02 | 07 | 88495 | S20303401A | <37 |
| 3/12/92 | Bell Canyon | 03 | 59 | 88342 | S20303501A | <27 |
| 3/13/92 | Western Location | 04 | 29 | 88250 | S20303502A | <27 |

TABLE 7-B (Contd)
RADIOANALYTICAL RESULTS
IODINE-129 IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|---|------------------|--------------|----------------------------|------------------------|--------------|
| | | | | | | pCi/l |
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196749 | S20303702A | <3.3 |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196737 | S20303701A | <3.3 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 197339 | S20405401A | <2.5 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|------------------|------------------|--------------|----------------------------|------------------------|--------------|
| | | | | | | pCi/l |
| 3/11/92 | Antenna Well | 05 | 01 | 196718 | S20303407A | <3.3 |
| 3/11/92 | Well By The Gate | 07 | 01 | 196713 | S20303406A | <3.3 |
| 3/18/92 | Spring | 08 | 01 | 171811 | S20304401A | <3.3 |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|-------------|------------------|--------------|----------------------------|------------------------|--------------|
| | | | | | | pCi/l |
| 3/12/92 | Rocky Peak | 01 | 02 | 196723 | S20303404A | <3.3 |

TABLE 7-C

RADIOANALYTICAL RESULTS
IODINE-129 IN FRUIT

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|--------------------|------------------|--------------|-------|----------------------------|------------------------|--------------|
| | | | | | | | pCi/g |
| 3/18/92 | Main House Orchard | 12 | 06 | Lemon | NONE | W204071 | <.079 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|------------------|------------------|--------------|--------|----------------------------|------------------------|--------------|
| | | | | | | | pCi/g |
| 3/11/92 | The Orange Grove | 04 | 03 | Orange | 90227 | W204071 | <.082 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | Media | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|-------------|------------------|--------------|-----------|----------------------------|------------------------|--------------|
| | | | | | | | pCi/g |
| 3/13/92 | Happy Camp | 07 | 01 | Avocado | 90245 | W204071 | <.17 |
| 3/13/92 | Happy Camp | 07 | 04 | Lemon | 89725 | W204071 | <.040 |
| 3/23/92 | Supermarket | 08 | 04 | Tangerine | 89732 | W204071 | <.078 |

TABLE 8-A

**CHEMICAL ANALYSES RESULTS
VOLATILE ORGANIC COMPOUNDS IN SOIL**

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|---|------------------|--------------|----------------------------|------------------------|---|
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90287 | SON50985 SS8089 | U |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90138 | SON50975 SS7876 | Acetone 27 ppb |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88285 | SON50975 SS7872 | U |
| 3/18/92 | Picnic Area | 05 | 77 | 90036 | SON50985 SS8088 | U |
| 3/17/92 | House of the Book | 06 | 92 | 89185 | SS7873 | U |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89261 | SON50998 SS8331 | U |
| 3/18/92 | Main House Orchard | 12 | 20 | 90887 | SS8090R | U |
| 3/17/92 | Avacodo Grove | 13 | 24 | 88938 | SON50975 SS7874 | U |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88438 | SON50975 SS7875 | U |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89589 | SON51257 K1228 | Methylene Chloride 17 ppb Acetone 19 ppb |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 89890 | SON51263 K1268 | Methylene Chloride 7 ppb |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89337 | SON51247 K1228 | U |
| 4/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89236 | SON51247 K1229 | U |
| 4/23/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90438 | SON51263 K1269 | Acetone 30 ppb |

U = Compound Not Detected

TABLE 8-A (Contd)
CHEMICAL ANALYSES RESULTS
VOLATILE ORGANIC COMPOUNDS IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|---|------------------|--------------|----------------------------|------------------------|--------------------------|
| 3/23/92 | The Visitor Center Parking Lot | 01 | 04 | 88585 | SON51018 SS8428 | Methylene Chloride 6 ppb |
| 3/11/92 | The Existing Road System | 02 | 19 | 88386 | SON50938 SS7603 | U |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88338 | SON50938 SS7604 | Acetone 23 ppb |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|-------------------|------------------|--------------|----------------------------|------------------------|----------------|
| 3/10/92 | Santa Susana Park | 02 | 07 | 88498 | SON50938 SS7602 | Acetone 12 ppb |
| 3/12/92 | Bell Canyon | 03 | 59 | 88346 | SON50952 SS7704 | U |
| 3/13/92 | Western Location | 04 | 29 | 88242 | SON50952 SS7707 | U |

U = Compound Not Detected

TABLE 8-B
CHEMICAL ANALYSES RESULTS
VOLATILE ORGANIC COMPOUNDS IN WATER

BRANDEIS-BARDIN INSTITUTE

| | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|---------|---|------------------|--------------|----------------------------|------------------------|--------------|
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196739 | SON50975 SS7886 | U |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196727 | SON50975 SS7887 | U |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197319 | SON51257 K1229 | U |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|------------------|------------------|--------------|----------------------------|------------------------|-----------------------|
| 3/23/92 | Antenna Well | 05 | 01 | 196701 | SON50938 SS7609 | U |
| 3/11/92 | Well By The Gate | 07 | 01 | 170701 | SON50938 SS7610 | Trichloroethene 13ppb |
| 3/18/92 | Spring | 08 | 01 | 171801 | SON50985 SS8084 | U |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T. Results |
|-----------------|-------------|------------------|--------------|----------------------------|------------------------|--------------|
| 3/12/92 | Rocky Peak | 01 | 02 | 196714 | SON50938 SS7608 | U |

U = Compound Not Detected

TABLE 9-A

**CHEMICAL ANALYSES RESULTS
SEMIVOLATILE ORGANIC COMPOUNDS IN SOIL**

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T Results |
|-----------------|---|------------------|--------------|----------------------------|------------------------|-------------|
| 3/18/92 | Perimeter of the Playground | 01 | 56 | 90286 | SON50985 SS8089 | U |
| 3/17/92 | Campsite Area 1 | 03 | 05 | 90137 | SON50975 SS7876 | U |
| 3/16/92 | Campsite Area 2 | 04 | 21 | 88284 | SON50975 SS7877 | U |
| 3/18/92 | Picnic Area | 05 | 77 | 90035 | SON50985 SS8091 | U |
| 3/17/92 | House of the Book | 06 | 92 | 89184 | SS7878 | U |
| 3/18/92 | Vegetable Garden | 11 | 61 | 89285 | SON50998 SS8332 | U |
| 3/18/92 | Main House Orchard | 12 | 20 | 90086 | SS8093 | U |
| 3/17/92 | Avacodo Grove | 13 | 24 | 88937 | SON50975 SS7879 | U |
| 3/16/92 | Old Well Campsite | 14 | 79 | 88437 | SON50975 SS7880 | U |
| 4/22/92 | RD-51 Watershed | 15 | 05 | 89588 | SON51257 K1227 | U |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 89889 | SON51263 K1270 | U |
| 4/22/92 | Building 59 Watershed | 17 | 01 | 89336 | SON51247 K1131 | U |
| 4/21/92 | Sodium Bum Pit Watershed | 18 | 01 | 89235 | SON51247 K1132 | U |
| 4/23/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90437 | SON51263 K1271 | U |

U = Compound Not Detected

TABLE 9-A (Contd)

CHEMICAL ANALYSES RESULTS
SEMIVOLATILE ORGANIC COMPOUNDS IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T Results |
|-----------------|---|------------------|--------------|----------------------------|------------------------|-------------|
| 3/23/92 | The Visitor Center Parking Lot | 01 | 04 | 88584 | SON51018 SS8487 | U |
| 3/11/92 | The Existing Road System | 02 | 19 | 88385 | SON50938 SS7606 | U |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 01 | 88337 | SON50938 SS7607 | U |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | I.T Results |
|-----------------|-------------------|------------------|--------------|----------------------------|------------------------|-------------|
| 3/10/92 | Santa Susana Park | 02 | 07 | 88500 | SON50938 SS7605 | U |
| 3/12/92 | Bell Canyon | 03 | 59 | 88345 | SON50952 SS7709 | U |
| 3/13/92 | Western Location | 04 | 29 | 88241 | SON50952 SS7712R | U |

U = Compound Not Detected

TABLE 9-B
CHEMICAL ANALYSES RESULTS
SEMIVOLATILE ORGANIC COMPOUNDS IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | I.T. Laboratory Number | I.T Results |
|-----------------|---|------------------|--------------|----------------------|------------------------|----------------------|
| 3/17/92 | Campsite Area 1 | 03 | 01 | 196743 | SON50975 SS7891 | U |
| 3/16/92 | Campsite Area 2 | 04 | 01 | 196731 | SON50975 SS7892 | U |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 197327 | SON51257 K1239 | Fluoranthene .33 ppb |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | I.T. Laboratory Number | I.T Results |
|-----------------|------------------|------------------|--------------|----------------------|------------------------|-------------|
| 3/23/92 | Antenna Well | 05 | 01 | 196707 | SON50938 SS7618 | U |
| 3/11/92 | Well By The Gate | 07 | 01 | 1707051 | SON50938 SS7619 | U |
| 3/18/92 | Spring | 08 | 01 | 171805 | SON50985 SS8087 | U |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | I.T. Laboratory Number | I.T Results |
|-----------------|-------------|------------------|--------------|----------------------|------------------------|-------------|
| 3/12/92 | Rocky Peak | 01 | 02 | 196718 | SON50938 SS7617 | U |

U = Compound Not Detected

TABLE 10-A

CHEMICAL ANALYSES RESULTS
METALS IN SOIL

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | Priority Pollutant Metals ppm | | | | | | | | | | |
|-----------------|-----------------------------|------------------|--------------|----------------------------|------------------------|-------------------------------|-----|------|------|------|------|------|------|------|------|------|
| | | | | | | As | Be | Cr | Cu | Pb | Ni | Se | Zn | Ag | Hg | Cd |
| 03/18/92 | Perimeter of the Playground | 01 | 56 | 90285 | SON50985 SS8095 | 6.7 | 0.7 | 22.0 | 20.0 | 15.8 | 17.0 | <0.2 | 71.1 | <0.5 | <0.1 | <0.5 |
| 03/17/92 | Campsite Area 1 | 03 | 05 | 90146 | SON50975 SS7881 | 2.8 | 0.4 | 11.0 | 8.0 | 13.8 | 11.0 | <0.2 | 39.7 | <0.5 | <0.1 | <0.5 |
| 03/16/92 | Campsite Area 2 | 04 | 21 | 88285 | SON50975 SS7882 | 3.7 | 0.3 | 7.0 | 6.0 | 5.3 | 5.0 | <0.2 | 36.6 | <.5 | <.1 | <0.5 |
| 03/18/92 | Picnic Area | 05 | 77 | 90037 | SON50985 SS8094 | 2.9 | 0.4 | 11.0 | 13.0 | 14.0 | 10.0 | <0.2 | 44.1 | <0.5 | <0.1 | <0.5 |
| 03/17/92 | House of Book | 06 | 92 | 50975 | SON50975 SS7883 | 6.1 | 0.7 | 12.0 | 18.0 | 12.6 | 10.0 | <0.2 | 52.4 | <.5 | <0.1 | 1.1 |
| 03/18/92 | Vegetable Garden | 11 | 61 | 89287 | SON50998 SS8333 | 2.4 | 0.5 | 15.0 | 23.0 | 11.4 | 12.0 | <0.2 | 67.0 | <0.5 | <0.1 | <0.5 |
| 03/18/92 | Main House Orchard | 12 | 20 | 90088 | SON50985 SS8096 | 1.8 | 0.5 | 15.0 | 18.0 | 19.0 | 11.0 | <0.2 | 72.4 | <0.5 | <0.1 | <0.5 |
| 03/17/92 | Avocado Grove | 13 | 24 | 88939 | SON50975 SS7884 | 4.9 | 0.8 | 19.0 | 15.0 | 10.3 | 15.0 | <0.2 | 62.8 | <0.5 | <0.1 | <0.5 |
| 03/16/92 | Old Well Campsite | 14 | 79 | 88439 | SON50975 SS7885 | 2.8 | 0.5 | 13.0 | 22.0 | 5.5 | 9.0 | <0.2 | 45.0 | <0.5 | <0.1 | <0.5 |

**TABLE 10-A (Contd)
CHEMICAL ANALYSES RESULTS
METALS IN SOIL**

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | Priority Pollutant Metals ppm | | | | | | | | | | |
|-----------------|---|------------------|--------------|----------------------------|------------------------|-------------------------------|-----|------|-----|-----|-----|------|------|------|------|------|
| | | | | | | As | Be | Cr | Cu | Pb | Ni | Se | Zn | Ag | Hg | Cd |
| 04/22/92 | RD-51 Watershed | 15 | 05 | 89590 | SON51257 K1227 | 1.6 | 0.2 | 17.0 | 5.0 | 9.3 | 6.0 | <0.2 | 68.9 | <0.5 | <0.1 | <0.5 |
| 04/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 89889 | SON51263 K1270 | 1.2 | 0.2 | 5.0 | 6.0 | 2.0 | 3.0 | <0.2 | 21.1 | <0.5 | <0.1 | <0.5 |
| 04/22/92 | Building 59 Watershed | 17 | 01 | 89338 | SON51247 K1134 | 2.5 | 0.4 | 13.0 | 6.0 | 4.5 | 9.0 | <0.2 | 54.4 | <0.5 | <0.1 | <0.5 |
| 04/21/92 | Sodium Burn Pit Watershed | 18 | 01 | 89237 | SON51247 K1135 | 13.8 | 0.2 | 7.0 | 4.0 | 6.5 | 5.0 | <0.2 | 22.4 | <0.5 | 0.4 | <0.5 |
| 04/21/92 | Sodium Reactor Experimental Watershed | 19 | 03 | 90437 | SON51263 K1271 | 1.9 | 0.2 | 6.0 | 6.0 | 3.5 | 5.0 | <0.2 | 56.0 | <0.5 | <0.1 | <0.5 |

TABLE 10-A (Contd.)

CHEMICAL ANALYSES RESULTS
METALS IN SOIL

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | Priority Pollutant Metals ppm | | | | | | | | | | |
|-----------------|--------------------|------------------|--------------|----------------------------|------------------------|-------------------------------|-----|------|------|-------|------|------|------|------|------|------|
| | | | | | | As | Be | Cr | Cu | Pb | Ni | Se | Zn | Ag | Hg | Cd |
| 03/23/92 | The Visitor Center | 01 | 04 | 88586 | SS8491 | 5.4 | 0.8 | 21.0 | 22.0 | 14.0 | 15.0 | <0.2 | 67.1 | <0.5 | <0.1 | <0.5 |
| 03/11/92 | The Existing Road | 02 | 19 | 88387 | SON50938 SS7600 | 4.0 | 0.5 | 12.0 | 10.0 | 10.8 | 10.0 | <0.2 | 40.3 | <0.5 | <0.1 | <0.5 |
| 03/11/92 | Shooting Range | 03 | 01 | 88339 | SON50938 SS7601 | 5.7 | 0.3 | 8.0 | 7.0 | 225.0 | 6.0 | <0.2 | 28.8 | <0.5 | <0.1 | <0.5 |

BACKGROUND LOCATIONS

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | Priority Pollutant Metals ppm | | | | | | | | | | |
|-----------------|-------------------|------------------|--------------|----------------------------|------------------------|-------------------------------|-----|------|------|------|------|------|------|-----|------|------|
| | | | | | | As | Be | Cr | Cu | Pb | Ni | Se | Zn | Ag | Hg | Cd |
| 03/10/92 | Santa Susana Park | 02 | 07 | 88499 | SON50938 SS7599 | 3.6 | 0.3 | 9.0 | 8.0 | 22.8 | 6.0 | <0.2 | 37.6 | 0.5 | <0.1 | <0.5 |
| 03/12/92 | Bell Canyon | 03 | 59 | 88347 | SON50952 SS7713 | 4.8 | 0.6 | 62.0 | 40.0 | 5.3 | 70.0 | 0.6 | 85.5 | 1.6 | <0.1 | 5.0 |
| 03/13/92 | Western Location | 04 | 29 | 88243 | SON50952 SS7716 | 4.7 | 1.0 | 30.0 | 14.0 | 10.5 | 17.0 | <0.2 | 75.0 | 0.8 | <0.1 | <0.5 |

**TABLE 10-B
CHEMICAL ANALYSES RESULTS
METALS IN WATER**

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | Priority Pollutant Metals ppm | | | | | | | | | | |
|-----------------|--|------------------|--------------|----------------------------|------------------------|-------------------------------|-------|------|------|-------|------|-------|------|-------|-------|-------|
| | | | | | | As | Be | Cr | Cu | Pb | Ni | Se | Zn | Ag | Hg | Cd |
| 03/17/92 | Campsite Area 1 | 03 | 01 | 196750 | SON50975 SS7889 | <.002 | <.001 | <.01 | <.01 | <.002 | <.2 | <.002 | .016 | <.005 | <.001 | <.005 |
| 03/16/92 | Campsite Area 2 | 04 | 01 | 196738 | SON50975 SS7890 | <.002 | <.001 | <.01 | <.01 | <.002 | <.02 | <.002 | .010 | <.005 | <.001 | <.005 |
| 04/22/92 | Radioactive Materials Disposal Watershed | 16 | 01 | 197341 | SON51257 K1235 | <.002 | <.001 | <.01 | <.01 | <.002 | <.02 | <.002 | .014 | <.005 | <.001 | <.005 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | Priority Pollutant Metals ppm | | | | | | | | | | |
|-----------------|-------------|------------------|--------------|----------------------------|------------------------|-------------------------------|-------|------|------|-------|------|-------|------|-------|-------|-------|
| | | | | | | As | Be | Cr | Cu | Pb | Ni | Se | Zn | Ag | Hg | Cd |
| 03/18/92 | Spring | 08 | 01 | 171812 | SON50985 SS8086 | <.002 | <.001 | <.01 | <.01 | <.002 | <.02 | <.008 | .023 | <.005 | <.001 | <.005 |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | USEPA Sample Serial Number | I.T. Laboratory Number | Priority Pollutant Metals ppm | | | | | | | | | | |
|-----------------|-------------|------------------|--------------|----------------------------|------------------------|-------------------------------|-------|------|------|-------|------|-------|------|-------|-------|-------|
| | | | | | | As | Be | Cr | Cu | Pb | Ni | Se | Zn | Ag | Hg | Cd |
| 03/12/92 | Rocky Peak | 01 | 02 | 196724 | SON50938 SS7614 | <.002 | <.001 | <.01 | <.01 | <.002 | <.02 | <.002 | .020 | <.005 | <.001 | <.005 |

TABLE 11-A
ADDITIONAL ANALYSES
GAMMA SPECTROSCOPY
Cs-137 IN SOIL

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|--------------------|------------------|--------------|----------------------|-------------------------|---------------|
| | | | | | | pCi/gdry |
| 3/18/92 | Main House Orchard | 12 | 23 | 70872 | SSFL192.5414 | .125 ± .0162 |

BACKGROUND LOCATION

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|------------------|------------------|--------------|----------------------|-------------------------|---------------|
| | | | | | | pCi/gdry |
| 3/13/92 | Western Location | 04 | 25 | | SSFL192.5413 | .113 ± .0142 |

TABLE 11-B
ADDITIONAL ANALYSES
TRITIUM IN SOIL

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|--|------------------|--------------|----------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/16/92 | Campsite Area 2 | 04 | 97 | -- | SSFL92.4305 | <192 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01 | 197315 | SSFL92.8940 | 1687 ± 171 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed2 | 16 | 02SC | 89859 | SSFL92.6230 | 873 ± 176 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 02SA | 89857 | SSFL92.6940 | 1679 ± 913 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 03 | 89863 | SSFL92.6941 | 1845 ± 525 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 04SA | 89869 | SSFL92.6942 | 1764 ± 173 |
| 4/22/92 | Building 59 Watershed | 16 | 04SC | 74374 | SSFL92.6229 | 1422 ± 172 |
| 4/22/92 | Building 59 Watershed | 17 | 02 | -- | SSFL92.5111 | <200 |
| 4/22/92 | Building 59 Watershed | 17 | 03 | 74329 | SSFL92.5415 | 12380 ± 371 |
| 4/22/92 | Building 59 Watershed | 17 | 04 | 74331 | SSFL92.5712 | 9855 ± 325 |

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 3/11/92 | Former Rocketdyne Employee Shooting Range | 03 | 15 | SPS1839 | SSFL92.8937 | <869 |

TABLE 11-C
ADDITIONAL ANALYSES
STRONTIUM-90 IN WATER

BRANDEIS-BARDIN INSTITUTE

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|---|------------------|--------------|----------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197306 | SSFL92.8467 | 6.66 ± 0.48 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197333 | SSFL92.3058A | 7.80 ± 0.5 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197329 | SSFL92.3058B | 7.71 ± 1.08 |
| 4/22/92 | Radioactive Materials Disposal Facility Watershed | 16 | 01B | 197331 | SSFL92.3058C | 7.43 ± 0.85 |

TABLE 11-D
ADDITIONAL ANALYSES
VOLATILE ORGANIC COMPOUNDS IN WATER

SANTA MONICA MOUNTAINS CONSERVANCY

| Collection Date | Sample Area | Sample Area Code | Block Number | Sample Serial Number | NAREL Laboratory Number | NAREL Results |
|-----------------|--------------|------------------|--------------|----------------------|-------------------------|---------------|
| | | | | | | pCi/L |
| 4/23/92 | Antenna Well | 05 | 03 | 197885 - 197888 | N/A | U |



APPENDIX A

Gamma Spectroscopy Complete Results

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01754
 Collection date, time 3/11/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/12/92 13:20
 Length of count 1000 min
 Sample size 0.958000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| PB-212 | 3.2900E+00 | 140.12 % | PCI/L | 3/11/92 |
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=8.23E+01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=4.32E+03 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=2.30E+03 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=4.59E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=1.79E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=5.70E+01 |

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/19/92 12:57
 Length of count 1000 min
 Sample size 0.958000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=8.24E+01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=4.30E+03 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=3.48E+03 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=4.98E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=1.87E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=4.98E+01 |

Sample Location
 Sample ID SSFL92.01755
 Collection date, time 3/11/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/12/92 13:20
 Length of count 1000 min
 Sample size 0.947000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=9.89E+01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=4.75E+03 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=2.42E+03 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=5.45E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=1.81E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 3/11/92 MDA=5.52E+01 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01756
 Collection date, time 3/12/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/15/92 14:21
 Length of count 1000 min
 Sample size 0.974000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 3/12/92 MDA=7.68E+01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/12/92 MDA=3.94E+03 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/12/92 MDA=2.22E+03 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/12/92 MDA=4.70E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/12/92 MDA=1.49E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 3/12/92 MDA=4.69E+01 |

Sample Location
 Sample ID SSFL92.01773
 Collection date, time 3/11/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/25/92 14:41
 Length of count 1000 min
 Sample size 501.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.2700E+00 | 2.27 % | PCI/GDRY | 3/13/92 |
| RA-226 | 2.6400E+00 | 11.63 % | PCI/GDRY | 3/13/92 |
| PB-212 | 1.6000E+00 | 2.07 % | PCI/GDRY | 3/13/92 |
| TL-208 | 5.3500E-01 | 3.18 % | PCI/GDRY | 3/13/92 |
| RA-228 | 1.7000E+00 | 2.81 % | PCI/GDRY | 3/13/92 |
| BI-214 | 1.1800E+00 | 2.49 % | PCI/GDRY | 3/13/92 |
| CS-137 | 1.9000E-01 | 7.05 % | PCI/GDRY | 3/13/92 |
| K-40 | 2.8900E+01 | 1.29 % | PCI/GDRY | 3/13/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01774
 Collection date, time 3/11/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Length of count 1000 min
 Date, time counted 3/25/92 14:42
 Length of count 1000 min
 Sample size 276.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 7.6900E-01 | 3.82 % | PCI/GDRY | 3/13/92 |
| RA-226 | 1.5700E+00 | 18.60 % | PCI/GDRY | 3/13/92 |
| PB-212 | 9.7500E-01 | 3.36 % | PCI/GDRY | 3/13/92 |
| TL-208 | 3.3800E-01 | 5.38 % | PCI/GDRY | 3/13/92 |
| RA-228 | 1.0400E+00 | 5.01 % | PCI/GDRY | 3/13/92 |
| CS-137 | 1.7000E-01 | 9.65 % | PCI/GDRY | 3/13/92 |
| K-40 | 2.2600E+01 | 1.92 % | PCI/GDRY | 3/13/92 |

Sample Location
 Sample ID SSFL92.01775
 Collection date, time 3/11/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/26/92 14:56
 Length of count 1000 min
 Sample size 445.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.2100E+00 | 2.37 % | PCI/GDRY | 3/11/92 |
| RA-226 | 2.6700E+00 | 11.12 % | PCI/GDRY | 3/11/92 |
| BI-214 | 1.0600E+00 | 2.94 % | PCI/GDRY | 3/11/92 |
| PB-212 | 1.5100E+00 | 2.18 % | PCI/GDRY | 3/11/92 |
| TL-208 | 4.7400E-01 | 3.67 % | PCI/GDRY | 3/11/92 |
| RA-228 | 1.5100E+00 | 3.12 % | PCI/GDRY | 3/11/92 |
| CS-137 | 1.2100E-01 | 11.24 % | PCI/GDRY | 3/11/92 |
| K-40 | 2.9000E+01 | 1.46 % | PCI/GDRY | 3/11/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01833
 Collection date, time 3/13/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/25/92 14:41
 Length of count 1000 min
 Sample size 209.000 GWET

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| K-40 | 5.4000E+00 | 5.52 % | PCI/G | 3/13/92 |
| RA-226 | 0.0000E+00 | 0.00 % | PCI/G | 3/13/92 MDA=3.44E-01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/G | 3/13/92 MDA=5.93E-02 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/G | 3/13/92 MDA=1.26E-01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/G | 3/13/92 MDA=2.12E-02 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/G | 3/13/92 MDA=7.78E-02 |

Sample Location
 Sample ID SSFL92.01834
 Collection date, time 3/13/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/ 6/92 13:42
 Length of count 1000 min
 Sample size 318.000 GWET

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|----------------------|
| K-40 | 1.5900E+00 | 9.18 % | PCI/GWET | 3/13/92 |
| RA-226 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=1.89E-01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=1.06E+00 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=7.00E-01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=1.29E-02 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=4.57E-02 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01835
 Collection date, time 3/13/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/ 6/92 13:42
 Length of count 1000 min
 Sample size 466.000 GWET

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|----------------------|
| PB-212 | 1.2500E-02 | 88.80 % | PCI/GWET | 3/13/92 |
| K-40 | 9.1000E-01 | 14.62 % | PCI/GWET | 3/13/92 |
| RA-226 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=1.91E-01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=1.08E+00 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=6.77E-01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=1.29E-02 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/13/92 MDA=5.53E-02 |

Sample Location
 Sample ID SSFL92.01836
 Collection date, time 3/13/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/26/92 14:56
 Length of count 1000 min
 Sample size 287.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 2.2700E+00 | 2.36 % | PCI/G | 3/13/92 |
| RA-226 | 5.7400E+00 | 8.24 % | PCI/G | 3/13/92 |
| BI-214 | 2.2200E+00 | 3.05 % | PCI/G | 3/13/92 |
| PB-212 | 8.8800E-01 | 4.49 % | PCI/G | 3/13/92 |
| RA-228 | 9.0800E-01 | 7.38 % | PCI/G | 3/13/92 |
| TL-208 | 2.7900E-01 | 10.18 % | PCI/G | 3/13/92 |
| K-40 | 1.3400E+01 | 4.44 % | PCI/G | 3/13/92 |
| CS-137 | 1.7300E-02 | 101.16 % | PCI/G | 3/13/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01837
 Collection date, time 3/13/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/26/92 14:56
 Length of count 1000 min
 Sample size 435.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.2100E+00 | 2.39 % | PCI/G | 3/13/92 |
| RA-226 | 3.0700E+00 | 9.41 % | PCI/G | 3/13/92 |
| BI-214 | 1.0800E+00 | 2.78 % | PCI/G | 3/13/92 |
| PB-212 | 1.6600E+00 | 1.95 % | PCI/G | 3/13/92 |
| TL-208 | 5.4300E-01 | 3.35 % | PCI/G | 3/13/92 |
| RA-228 | 1.6700E+00 | 2.74 % | PCI/G | 3/13/92 |
| CS-137 | 1.5300E-01 | 8.89 % | PCI/G | 3/13/92 |
| K-40 | 2.4000E+01 | 1.64 % | PCI/G | 3/13/92 |

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/19/92 12:57
 Length of count 1000 min
 Sample size 435.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.2500E+00 | 2.78 % | PCI/G | 3/13/92 |
| RA-226 | 3.2900E+00 | 11.12 % | PCI/G | 3/13/92 |
| PB-212 | 1.7700E+00 | 2.29 % | PCI/G | 3/13/92 |
| TL-208 | 5.7800E-01 | 3.72 % | PCI/G | 3/13/92 |
| RA-228 | 1.7700E+00 | 3.29 % | PCI/G | 3/13/92 |
| BI-214 | 1.0900E+00 | 3.12 % | PCI/G | 3/13/92 |
| CS-137 | 1.6700E-01 | 9.40 % | PCI/G | 3/13/92 |
| K-40 | 2.3900E+01 | 1.74 % | PCI/G | 3/13/92 |

Sample Location
 Sample ID SSFL92.01881
 Collection date, time 3/17/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/24/92 14:45
 Length of count 1000 min
 Sample size 0.985000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 6.2900E+01 | 100.48 % | PCI/L | 3/17/92 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=7.29E+00 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=2.07E+01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=4.26E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=1.60E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=6.24E+01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=4.26 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01882
 Collection date, time 3/17/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/24/92 14:45
 Length of count 1000 min
 Sample size 0.980000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=1.12E+02 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=1.13E+01 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=3.34E+01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=8.07E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=2.69E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 3/17/92 MDA=8.81E+01 |

Sample Location
 Sample ID SSFL92.01887
 Collection date, time 3/17/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 4/ 7/92 13:40
 Length of count 1000 min
 Sample size 622.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|--------------------|
| PB-214 | 1.1000E+00 | 3.13 % | PCI/G | 3/17/92 |
| RA-226 | 2.6700E+00 | 13.97 % | PCI/G | 3/17/92 |
| BI-214 | 9.3900E-01 | 3.88 % | PCI/G | 3/17/92 |
| PB-212 | 1.5800E+00 | 2.51 % | PCI/G | 3/17/92 |
| TL-208 | 5.1200E-01 | 4.08 % | PCI/G | 3/17/92 |
| RA-228 | 1.5800E+00 | 3.58 % | PCI/G | 3/17/92 |
| K-40 | 2.5300E+01 | 1.75 % | PCI/G | 3/17/92 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/G | 3/17/92 MDA=0.0325 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01888
 Collection date, time 3/16/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 4/ 7/92 13:39
 Length of count 1000 min
 Sample size 484.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.2200E+00 | 2.55 % | PCI/G | 3/16/92 |
| RA-226 | 2.6700E+00 | 11.27 % | PCI/G | 3/16/92 |
| BI-214 | 1.0400E+00 | 3.04 % | PCI/G | 3/16/92 |
| PB-212 | 1.6900E+00 | 2.06 % | PCI/G | 3/16/92 |
| TL-208 | 5.7300E-01 | 3.28 % | PCI/G | 3/16/92 |
| RA-228 | 1.7000E+00 | 3.00 % | PCI/G | 3/16/92 |
| CS-137 | 3.4100E-02 | 34.31 % | PCI/G | 3/16/92 |
| K-40 | 2.5200E+01 | 1.52 % | PCI/G | 3/16/92 |

Sample Location
 Sample ID SSFL92.01889
 Collection date, time 3/17/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 4/ 7/92 13:39
 Length of count 1000 min
 Sample size 370.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.4300E+00 | 2.62 % | PCI/G | 3/17/92 |
| RA-226 | 3.5000E+00 | 10.37 % | PCI/G | 3/17/92 |
| PB-212 | 1.8500E+00 | 2.19 % | PCI/G | 3/17/92 |
| TL-208 | 5.9700E-01 | 3.65 % | PCI/G | 3/17/92 |
| RA-228 | 1.8600E+00 | 3.04 % | PCI/G | 3/17/92 |
| BI-214 | 1.3000E+00 | 2.78 % | PCI/G | 3/17/92 |
| CS-137 | 2.5600E-01 | 6.91 % | PCI/G | 3/17/92 |
| K-40 | 3.0500E+01 | 1.48 % | PCI/G | 3/17/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01890
 Collection date, time 3/17/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 4/ 7/92 13:40
 Length of count 1000 min
 Sample size 439.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.1400E+00 | 2.97 % | PCI/GDRY | 3/17/92 |
| RA-226 | 2.2900E+00 | 15.20 % | PCI/GDRY | 3/17/92 |
| PB-212 | 1.6300E+00 | 2.34 % | PCI/GDRY | 3/17/92 |
| TL-208 | 5.1800E-01 | 3.90 % | PCI/GDRY | 3/17/92 |
| RA-228 | 1.6100E+00 | 3.40 % | PCI/GDRY | 3/17/92 |
| BI-214 | 9.4200E-01 | 3.52 % | PCI/GDRY | 3/17/92 |
| CS-137 | 2.9900E-02 | 37.46 % | PCI/GDRY | 3/17/92 |
| K-40 | 2.0800E+01 | 1.91 % | PCI/GDRY | 3/17/92 |

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/17/92 14:09
 Length of count 1000 min
 Sample size 439.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 9.8300E-01 | 3.60 % | PCI/GDRY | 3/17/92 |
| RA-226 | 2.5200E+00 | 15.24 % | PCI/GDRY | 3/17/92 |
| BI-214 | 8.6400E-01 | 4.65 % | PCI/GDRY | 3/17/92 |
| PB-212 | 1.4000E+00 | 2.92 % | PCI/GDRY | 3/17/92 |
| TL-208 | 4.5000E-01 | 4.96 % | PCI/GDRY | 3/17/92 |
| RA-228 | 1.4600E+00 | 4.29 % | PCI/GDRY | 3/17/92 |
| CS-137 | 4.1200E-02 | 31.80 % | PCI/GDRY | 3/17/92 |
| K-40 | 1.8200E+01 | 2.35 % | PCI/GDRY | 3/17/92 |

Sample Location
 Sample ID SSFL92.01891
 Collection date, time 3/16/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 4/ 8/92 13:51
 Length of count 1000 min
 Sample size 620.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.0700E+00 | 2.10 % | PCI/G | 3/16/92 |
| RA-226 | 2.5100E+00 | 9.64 % | PCI/G | 3/16/92 |
| BI-214 | 9.7500E-01 | 2.57 % | PCI/G | 3/16/92 |
| PB-212 | 1.4000E+00 | 1.83 % | PCI/G | 3/16/92 |
| TL-208 | 4.5900E-01 | 3.22 % | PCI/G | 3/16/92 |
| RA-228 | 1.4300E+00 | 2.67 % | PCI/G | 3/16/92 |
| K-40 | 2.4700E+01 | 1.33 % | PCI/G | 3/16/92 |
| CS-137 | 1.5000E-02 | 50.00 % | PCI/GDRY | 3/16/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.01936
 Collection date, time 3/18/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/17/92 14:09
 Length of count 1000 min
 Sample size 409.000 GWET

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|----------------------|
| RA-226 | 1.4900E-01 | 132.21 % | PCI/GWET | 3/18/92 |
| K-40 | 1.0400E+00 | 11.92 % | PCI/GWET | 3/18/92 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/18/92 MDA=1.10E+01 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/18/92 MDA=5.18E+00 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/18/92 MDA=1.26E-02 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/18/92 MDA=4.18E-02 |

Sample Location
 Sample ID SSFL92.01946
 Collection date, time 3/18/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 3/24/92 14:45
 Length of count 1000 min
 Sample size 0.981000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| K-40 | 1.8900E+01 | 175.13 % | PCI/L | 3/18/92 |
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=6.89E+01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=6.10E+00 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=1.80E+01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=4.33E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=1.42E+01 |

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/18/92 14:27
 Length of count 1000 min
 Sample size 0.981000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=1.19E+02 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=5.81E+03 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=3.28E+03 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=7.69E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=3.14E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 3/18/92 MDA=9.22E+01 |

Gamma Spectroscopy Results

Sample Location
Sample ID SSFL92.01954
Collection date, time 3/18/92 0:00
Type of analysis GAMMA SPECTROSCOPY
Date, time counted 3/26/92 14:56
Length of count 1000 min
Sample size 512.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.1100E+00 | 2.82 % | PCI/G | 3/18/92 |
| RA-226 | 2.2300E+00 | 15.65 % | PCI/G | 3/18/92 |
| PB-212 | 1.3100E+00 | 2.40 % | PCI/G | 3/18/92 |
| TL-208 | 4.2800E-01 | 4.98 % | PCI/G | 3/18/92 |
| RA-228 | 1.3000E+00 | 4.28 % | PCI/G | 3/18/92 |
| BI-214 | 1.0300E+00 | 3.49 % | PCI/G | 3/18/92 |
| CS-137 | 8.4100E-02 | 20.10 % | PCI/G | 3/18/92 |
| K-40 | 2.5100E+01 | 2.04 % | PCI/G | 3/18/92 |

Sample Location
Sample ID SSFL92.01955
Collection date, time 3/18/92 0:00
Type of analysis GAMMA SPECTROSCOPY
Date, time counted 3/26/92 14:56
Length of count 1000 min
Sample size 483.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.3500E+00 | 2.56 % | PCI/G | 3/19/92 |
| RA-226 | 2.7100E+00 | 12.18 % | PCI/G | 3/19/92 |
| BI-214 | 1.1600E+00 | 3.03 % | PCI/G | 3/19/92 |
| PB-212 | 2.1900E+00 | 1.85 % | PCI/G | 3/19/92 |
| TL-208 | 7.0100E-01 | 3.10 % | PCI/G | 3/19/92 |
| RA-228 | 2.1300E+00 | 2.70 % | PCI/G | 3/19/92 |
| CS-137 | 8.6400E-02 | 15.86 % | PCI/G | 3/19/92 |
| K-40 | 2.9800E+01 | 1.58 % | PCI/G | 3/19/92 |

Gamma Spectroscopy Results

Sample Location
Sample ID SSFL92.01956
Collection date, time 3/18/92 0:00
Type of analysis GAMMA SPECTROSCOPY
Date, time counted 3/26/92 14:56
Length of count 1000 min
Sample size 443.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.0700E+00 | 2.86 % | PCI/G | 3/17/92 |
| RA-226 | 2.7100E+00 | 11.14 % | PCI/G | 3/17/92 |
| BI-214 | 9.6700E-01 | 3.35 % | PCI/G | 3/17/92 |
| PB-212 | 1.5500E+00 | 2.23 % | PCI/G | 3/17/92 |
| TL-208 | 5.1300E-01 | 3.61 % | PCI/G | 3/17/92 |
| RA-228 | 1.5500E+00 | 3.04 % | PCI/G | 3/17/92 |
| CS-137 | 3.5100E-02 | 34.47 % | PCI/G | 3/17/92 |
| K-40 | 2.2400E+01 | 1.71 % | PCI/G | 3/17/92 |

Sample Location
Sample ID SSFL92.02046
Collection date, time 3/18/92 0:00
Type of analysis GAMMA SPECTROSCOPY
Date, time counted 4/ 8/92 13:52
Length of count 1000 min
Sample size 575.000 G

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|---------|
| PB-214 | 1.0100E+00 | 3.38 % | PCI/G | 3/18/92 |
| RA-226 | 2.1500E+00 | 15.44 % | PCI/G | 3/18/92 |
| PB-212 | 1.2800E+00 | 2.84 % | PCI/G | 3/18/92 |
| TL-208 | 4.1500E-01 | 5.49 % | PCI/G | 3/18/92 |
| RA-228 | 1.2800E+00 | 4.71 % | PCI/G | 3/18/92 |
| CS-137 | 5.5600E-02 | 33.09 % | PCI/G | 3/18/92 |
| K-40 | 2.1600E+01 | 2.54 % | PCI/G | 3/18/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.02089
 Collection date, time 3/23/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/ 6/92 13:41
 Length of count 1000 min
 Sample size 451.000 GWET

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|----------------------|
| PB-212 | 1.2500E-02 | 96.80 % | PCI/GWET | 3/23/92 |
| K-40 | 1.5400E+00 | 8.05 % | PCI/GWET | 3/23/92 |
| RA-226 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=1.59E-01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=3.96E-01 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=3.32E-01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=1.01E-02 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=3.60E-02 |

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/17/92 14:09
 Length of count 1000 min
 Sample size 451.000 GWET

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|----------------------|
| K-40 | 1.5500E+00 | 7.42 % | PCI/GWET | 3/23/92 |
| RA-226 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=1.66E-01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=8.06E+00 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=3.52E+00 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=9.39E-03 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/GWET | 3/23/92 MDA=4.19E-02 |

Sample Location
 Sample ID SSFL92.02591
 Collection date, time 3/23/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/ 6/92 13:41
 Length of count 1000 min
 Sample size 250.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.2900E+00 | 3.48 % | PCI/GDRY | 3/23/92 |
| RA-226 | 2.2600E+00 | 20.71 % | PCI/GDRY | 3/23/92 |
| BI-214 | 1.1100E+00 | 4.54 % | PCI/GDRY | 3/23/92 |
| PB-212 | 1.5700E+00 | 3.39 % | PCI/GDRY | 3/23/92 |
| TL-208 | 4.9600E-01 | 5.65 % | PCI/GDRY | 3/23/92 |
| RA-228 | 1.4900E+00 | 5.28 % | PCI/GDRY | 3/23/92 |
| CS-137 | 5.3400E-02 | 31.84 % | PCI/GDRY | 3/23/92 |
| K-40 | 2.3600E+01 | 2.54 % | PCI/GDRY | 3/23/92 |

Gamma Spectroscopy Results

Sample Location
Sample ID SSFL92.03048
Collection date, time 4/22/92 0:00
Type of analysis GAMMA SPECTROSCOPY
Date, time counted 6/19/92 12:57
Length of count 1000 min
Sample size 587.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 7.8800E-01 | 3.83 % | PCI/GDRY | 4/22/92 |
| RA-226 | 1.5000E+00 | 20.73 % | PCI/GDRY | 4/22/92 |
| PB-212 | 1.0500E+00 | 3.30 % | PCI/GDRY | 4/22/92 |
| TL-208 | 3.2800E-01 | 5.52 % | PCI/GDRY | 4/22/92 |
| RA-228 | 1.0000E+00 | 5.36 % | PCI/GDRY | 4/22/92 |
| CS-137 | 4.0700E-02 | 30.96 % | PCI/GDRY | 4/22/92 |
| K-40 | 2.4000E+01 | 1.85 % | PCI/GDRY | 4/22/92 |

Sample Location
Sample ID SSFL92.03051
Collection date, time 4/22/92 0:00
Type of analysis GAMMA SPECTROSCOPY
Date, time counted 5/18/92 14:13
Length of count 1000 min
Sample size 622.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 5.6300E-01 | 3.71 % | PCI/GDRY | 4/22/92 |
| RA-226 | 1.1200E+00 | 22.68 % | PCI/GDRY | 4/22/92 |
| PB-212 | 6.6200E-01 | 3.67 % | PCI/GDRY | 4/22/92 |
| TL-208 | 2.2400E-01 | 5.67 % | PCI/GDRY | 4/22/92 |
| RA-228 | 7.0900E-01 | 4.34 % | PCI/GDRY | 4/22/92 |
| K-40 | 2.3600E+01 | 1.44 % | PCI/GDRY | 4/22/92 |
| CS-137 | 7.8000E-03 | 103.85 % | PCI/GDRY | 4/22/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.03052
 Collection date, time 4/22/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/18/92 14:13
 Length of count 1000 min
 Sample size 650.000 GDRY

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/17/92 14:45
 Length of count 1000 min
 Sample size 650.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|-------------------|
| PB-214 | 6.6300E-01 | 3.33 % | PCI/GDRY | 4/22/92 |
| RA-226 | 1.4500E+00 | 14.62 % | PCI/GDRY | 4/22/92 |
| BI-214 | 6.0900E-01 | 3.58 % | PCI/GDRY | 4/22/92 |
| PB-212 | 8.1800E-01 | 2.92 % | PCI/GDRY | 4/22/92 |
| TL-208 | 2.7000E-01 | 4.70 % | PCI/GDRY | 4/22/92 |
| RA-228 | 8.2000E-01 | 3.98 % | PCI/GDRY | 4/22/92 |
| K-40 | 2.2900E+01 | 1.35 % | PCI/GDRY | 4/22/92 |
| CS-137 | 0.0000E+00 | 0.00 % | | 4/22/92 MDA=.0171 |

Sample Location
 Sample ID SSFL92.03055
 Collection date, time 4/22/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/19/92 14:27
 Length of count 1000 min
 Sample size 0.977000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=7.69E+01 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=1.60E+01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=4.65 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.03065
 Collection date, time 4/22/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/19/92 14:27
 Length of count 1000 min
 Sample size 0.983000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=8.35E+01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=4.17E+01 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=6.49E+01 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=4.85E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=1.64E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=5.84E+01 |

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/19/92 12:57
 Length of count 1000 min
 Sample size 0.983000 L

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|-------|----------------------|
| RA-226 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=7.65E+01 |
| I-131 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=5.79E+02 |
| BA-140 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=3.23E+02 |
| CS-137 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=4.80E+00 |
| RA-228 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=1.64E+01 |
| K-40 | 0.0000E+00 | 0.00 % | PCI/L | 4/22/92 MDA=5.99E+01 |

Sample Location
 Sample ID SSFL92.03070
 Collection date, time 4/21/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/12/92 13:21
 Length of count 1000 min
 Sample size 518.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.1800E+00 | 2.71 % | PCI/GDRY | 4/21/92 |
| RA-226 | 2.7500E+00 | 13.93 % | PCI/GDRY | 4/21/92 |
| PB-212 | 1.4400E+00 | 2.33 % | PCI/GDRY | 4/21/92 |
| TL-208 | 4.5800E-01 | 4.63 % | PCI/GDRY | 4/21/92 |
| RA-228 | 1.4800E+00 | 3.86 % | PCI/GDRY | 4/21/92 |
| BI-214 | 1.0400E+00 | 3.61 % | PCI/GDRY | 4/21/92 |
| CS-137 | 8.5700E-02 | 18.55 % | PCI/GDRY | 4/21/92 |
| K-40 | 2.3900E+01 | 2.08 % | PCI/GDRY | 4/21/92 |

Gamma Spectroscopy Results

Sample Location
 Sample ID SSFL92.03070X
 Collection date, time 4/21/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/18/92 14:13
 Length of count 1000 min
 Sample size 518.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.1500E+00 | 2.71 % | PCI/GDRY | 4/21/92 |
| RA-226 | 2.6200E+00 | 12.94 % | PCI/GDRY | 4/21/92 |
| PB-212 | 1.4200E+00 | 2.29 % | PCI/GDRY | 4/21/92 |
| TL-208 | 4.6500E-01 | 4.67 % | PCI/GDRY | 4/21/92 |
| RA-228 | 1.4400E+00 | 3.88 % | PCI/GDRY | 4/21/92 |
| BI-214 | 1.0400E+00 | 3.68 % | PCI/GDRY | 4/21/92 |
| CS-137 | 8.6700E-02 | 19.26 % | PCI/GDRY | 4/21/92 |
| K-40 | 2.4000E+01 | 2.07 % | PCI/GDRY | 4/21/92 |

Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 6/11/92 14:10
 Length of count 1000 min
 Sample size 518.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.1700E+00 | 2.52 % | PCI/GDRY | 4/21/92 |
| RA-226 | 2.5100E+00 | 13.11 % | PCI/GDRY | 4/21/92 |
| BI-214 | 1.0600E+00 | 3.06 % | PCI/GDRY | 4/21/92 |
| PB-212 | 1.4100E+00 | 2.24 % | PCI/GDRY | 4/21/92 |
| TL-208 | 4.7000E-01 | 3.91 % | PCI/GDRY | 4/21/92 |
| RA-228 | 1.4700E+00 | 3.16 % | PCI/GDRY | 4/21/92 |
| CS-137 | 9.9500E-02 | 13.27 % | PCI/GDRY | 4/21/92 |
| K-40 | 2.4500E+01 | 1.69 % | PCI/GDRY | 4/21/92 |

Sample Location
 Sample ID SSFL92.03073
 Collection date, time 4/21/92 0:00
 Type of analysis GAMMA SPECTROSCOPY
 Date, time counted 5/18/92 14:13
 Length of count 1000 min
 Sample size 397.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 1.2800E+00 | 4.23 % | PCI/GDRY | 4/21/92 |
| RA-226 | 3.1500E+00 | 20.25 % | PCI/GDRY | 4/21/92 |
| PB-212 | 1.5700E+00 | 3.87 % | PCI/GDRY | 4/21/92 |
| TL-208 | 5.0000E-01 | 6.58 % | PCI/GDRY | 4/21/92 |
| RA-228 | 1.5600E+00 | 4.91 % | PCI/GDRY | 4/21/92 |
| CS-137 | 8.0300E-02 | 21.92 % | PCI/GDRY | 4/21/92 |
| K-40 | 2.6200E+01 | 2.33 % | PCI/GDRY | 4/21/92 |

Gamma Spectroscopy Results

Sample Location
Sample ID SSFL92.03079
Collection date, time 4/21/92 0:00
Type of analysis GAMMA SPECTROSCOPY
Date, time counted 5/18/92 14:30
Length of count 1000 min
Sample size 583.000 GDRY

| NUCLIDE | ACTIVITY | 2 SIG ERROR | UNITS | DATE |
|---------|------------|-------------|----------|---------|
| PB-214 | 8.0100E-01 | 3.52 % | PCI/GDRY | 4/23/92 |
| RA-226 | 1.6400E+00 | 16.89 % | PCI/GDRY | 4/23/92 |
| BI-214 | 6.8300E-01 | 4.32 % | PCI/GDRY | 4/23/92 |
| PB-212 | 9.4500E-01 | 3.26 % | PCI/GDRY | 4/23/92 |
| TL-208 | 3.0600E-01 | 5.16 % | PCI/GDRY | 4/23/92 |
| RA-228 | 9.9700E-01 | 4.45 % | PCI/GDRY | 4/23/92 |
| CS-137 | 5.4600E-02 | 17.45 % | PCI/GDRY | 4/23/92 |
| K-40 | 2.3900E+01 | 1.45 % | PCI/GDRY | 4/23/92 |



APPENDIX B

Chemical Analyses Complete Results

- Section 1.
- a. Volatile Organic Compounds In Soil
Brandeis-Bardin Institute
Santa Monica Mountains Conservancy
Background Locations
 - b. Volatile Organic Compounds In Water
Brandeis-Bardin Institute
Santa Monica Mountains Conservancy
Background Locations
- Section 2.
- a. Semivolatile Organic Compounds In Soil
Brandeis-Bardin Institute
Santa Monica Mountains Conservancy
Background Locations
 - b. Semivolatile Organic Compounds In Water
Brandeis-Bardin Institute
Santa Monica Mountains Conservancy
Background Locations

Section 1. a. Volatile Organic Compounds In Soil
Brandeis-Bardin Institute

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

VOLATILE ORGANIC ANALYSIS

Results in µg/kg (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB01056SE/90287

Lab Sample ID: SS8089

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 12 U | 1,2-dichloropropane | 6 U |
| bromomethane | 12 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 12 U | trichloroethene | 6 U |
| chloroethane | 12 U | dibromochloromethane | 6 U |
| methylene chloride | 10 B | 1,1,2-trichloroethane | 6 U |
| acetone | 12 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 12 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 12 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 12 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 12 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/26/92
Dilution Factor: 1.00
% Moisture: 17

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 1
0305

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB03005SE/90138
Lab Sample ID: SS7871

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 13 U | 1,2-dichloropropane | 6 U |
| bromomethane | 13 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 13 U | trichloroethene | 6 U |
| chloroethane | 13 U | dibromochloromethane | 6 U |
| methylene chloride | 73 B | 1,1,2-trichloroethane | 6 U |
| acetone | 27 | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 13 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 13 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 13 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 13 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/25/92
Dilution Factor: 1.00
% Moisture: 22

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB04021SE/88285

Lab Sample ID: SS7872

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 11 U | 1,2-dichloropropane | 5 U |
| bromomethane | 11 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 11 U | trichloroethene | 5 U |
| chloroethane | 11 U | dibromochloromethane | 5 U |
| methylene chloride | 10 B | 1,1,2-trichloroethane | 5 U |
| acetone | 11 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 11 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 11 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 11 U | toluene | 2 J |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 11 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/25/92

Dilution Factor: 1.00

% Moisture: 9

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Picnic Area
0577

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50985

Client Project ID: Sanford, Cohen and Associates

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB05077SE/90036
Lab Sample ID: SS8088

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 11 U | 1,2-dichloropropane | 6 U |
| bromomethane | 11 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 11 U | trichloroethene | 6 U |
| chloroethane | 11 U | dibromochloromethane | 6 U |
| methylene chloride | 5 BJ | 1,1,2-trichloroethane | 6 U |
| acetone | 12 B | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 11 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 11 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 11 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 11 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/26/92
Dilution Factor: 1.00
% Moisture: 12

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB06092SE/89185
 Lab Sample ID: SS7873

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 11 U | 1,2-dichloropropane | 6 U |
| bromomethane | 11 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 11 U | trichloroethene | 6 U |
| chloroethane | 11 U | dibromochloromethane | 6 U |
| methylene chloride | 6 B | 1,1,2-trichloroethane | 6 U |
| acetone | 11 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 11 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 11 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 11 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 11 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/25/92
 Dilution Factor: 1.00
 % Moisture: 11

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Vegetable Garden
1161

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB11061SE/89261
Lab Sample ID: SS8331

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 12 U | 1,2-dichloropropane | 6 U |
| bromomethane | 12 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 12 U | trichloroethene | 6 U |
| chloroethane | 12 U | dibromochloromethane | 6 U |
| methylene chloride | 3 J | 1,1,2-trichloroethane | 6 U |
| acetone | 12 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 12 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 12 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 12 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 12 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylene (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92
Dilution Factor: 1.00
% Moisture: 14

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Main House Orchard
1220

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB12020SE/90087
Lab Sample ID: SS8090R

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 11 U | 1,2-dichloropropane | 6 U |
| bromomethane | 11 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 11 U | trichloroethene | 6 U |
| chloroethane | 11 U | dibromochloromethane | 6 U |
| methylene chloride | 3 BJ | 1,1,2-trichloroethane | 6 U |
| acetone | 11 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 11 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 11 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 11 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 11 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blanks as well as the sample.

Date of Analysis: 03/26/92
Dilution Factor: 1.00
% Moisture: 12

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB13024SE/88938

Lab Sample ID: SS7874

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 12 U | 1,2-dichloropropane | 6 U |
| bromomethane | 12 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 12 U | trichloroethene | 6 U |
| chloroethane | 12 U | dibromochloromethane | 6 U |
| methylene chloride | 19 B | 1,1,2-trichloroethane | 6 U |
| acetone | 12 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 12 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 12 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 12 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 12 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/25/92

Dilution Factor: 1.00

% Moisture: 18

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Old Well Campsite
1479

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB14079SE/88438
Lab Sample ID: SS7875

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 11 U | 1,2-dichloropropane | 6 U |
| bromomethane | 11 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 11 U | trichloroethene | 6 U |
| chloroethane | 11 U | dibromochloromethane | 6 U |
| methylene chloride | 10 B | 1,1,2-trichloroethane | 6 U |
| acetone | 11 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 11 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 11 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 11 U | toluene | 2 J |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 11 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/25/92
Dilution Factor: 1.00
% Moisture: 11

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB15005SE/89589
Lab Sample ID: K1228

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 17 | 1,1,2-trichloroethane | 5 U |
| acetone | 19 | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 2 J |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/01/92
Dilution Factor: 1.00
% Moisture: 1

Sanford, Cohen and Associates
May 29, 1992

Brandeis-Bardin Institute
Radioactive Materials Disposal Facility
1601

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB16001BSE/89890

Lab Sample ID: K1268

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 13 U | 1,2-dichloropropane | 6 U |
| bromomethane | 13 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 13 U | trichloroethene | 6 U |
| chloroethane | 13 U | dibromochloromethane | 6 U |
| methylene chloride | 7 | 1,1,2-trichloroethane | 6 U |
| acetone | 10 J | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 13 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 13 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 13 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 13 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/01/92

Dilution Factor: 1.00

% Moisture: 21

Sanford, Cohen and Associates
June 23, 1992

Brandeis-Bardin Institute
Building 59 Watershed
1701

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB017001SE/89337
Lab Sample ID: K1128

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 12 U | cis-1,3-dichloropropene | 6 U |
| bromomethane | 12 U | trichloroethene | 6 U |
| vinyl chloride | 12 U | dibromochloromethane | 6 U |
| chloroethane | 12 U | 1,1,2-trichloroethane | 6 U |
| methylene chloride | 7 B | benzene | 6 U |
| acetone | 3 J | trans-1,3-dichloropropene | 6 U |
| carbon disulfide | 6 U | bromoform | 6 U |
| 1,1-dichloroethene | 6 U | 4-methyl-2-pentanone | 12 U |
| 1,1-dichloroethane | 6 U | 2-hexanone | 12 U |
| 1,2-dichloroethene (total) | 6 U | tetrachloroethene | 6 U |
| chloroform | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 1,2-dichloroethane | 6 U | toluene | 6 U |
| 2-butanone | 12 U | chlorobenzene | 6 U |
| 1,1,1-trichloroethane | 6 U | ethylbenzene | 6 U |
| carbon tetrachloride | 6 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| 1,2-dichloropropane | 6 U | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 04/27/92
Dilution Factor: 1.0
% Moisture: 18

Sanford, Cohen and Associates
June 23, 1992

Brandeis-Bardin Institute
Sodium Burn Pit Watershed
1801

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB180001SE/89236

Lab Sample ID: K1129

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 14 U | cis-1,3-dichloropropene | 7 U |
| bromomethane | 14 U | trichloroethene | 7 U |
| vinyl chloride | 14 U | dibromochloromethane | 7 U |
| chloroethane | 14 U | 1,1,2-trichloroethane | 7 U |
| methylene chloride | 16 B | benzene | 7 U |
| acetone | 14 U | trans-1,3-dichloropropene | 7 U |
| carbon disulfide | 7 U | bromoform | 7 U |
| 1,1-dichloroethene | 7 U | 4-methyl-2-pentanone | 14 U |
| 1,1-dichloroethane | 7 U | 2-hexanone | 14 U |
| 1,2-dichloroethene (total) | 7 U | tetrachloroethene | 7 U |
| chloroform | 7 U | 1,1,2,2-tetrachloroethane | 7 U |
| 1,2-dichloroethane | 7 U | toluene | 7 U |
| 2-butanone | 14 U | chlorobenzene | 7 U |
| 1,1,1-trichloroethane | 7 U | ethylbenzene | 7 U |
| carbon tetrachloride | 7 U | styrene | 7 U |
| bromodichloromethane | 7 U | xylenes (total) | 7 U |
| 1,2-dichloropropane | 7 U | 1,1,2-trichlorotrifluoroethane | 7 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 04/27/92

Dilution Factor: 1.0

% Moisture: 29

Sanford, Cohen and Associates
May 29, 1992

Brandeis-Bardin Institute
Sodium Reactor Experimental Watershed
1903

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB19003SE/90438
Lab Sample ID: K1269

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 14 U | 1,2-dichloropropane | 7 U |
| bromomethane | 14 U | cis-1,3-dichloropropene | 7 U |
| vinyl chloride | 14 U | trichloroethene | 7 U |
| chloroethane | 14 U | dibromochloromethane | 7 U |
| methylene chloride | 4 J | 1,1,2-trichloroethane | 7 U |
| acetone | 30 | benzene | 7 U |
| carbon disulfide | 7 U | trans-1,3-dichloropropene | 7 U |
| 1,1-dichloroethene | 7 U | bromoform | 7 U |
| 1,1-dichloroethane | 7 U | 4-methyl-2-pentanone | 14 U |
| 1,2-dichloroethene (total) | 7 U | 2-hexanone | 14 U |
| chloroform | 7 U | tetrachloroethene | 7 U |
| 1,2-dichloroethane | 7 U | 1,1,2,2-tetrachloroethane | 7 U |
| 2-butanone | 14 U | toluene | 7 U |
| 1,1,1-trichloroethane | 7 U | chlorobenzene | 7 U |
| carbon tetrachloride | 7 U | ethylbenzene | 7 U |
| vinyl acetate | 14 U | styrene | 4 J |
| bromodichloromethane | 7 U | xylenes (total) | 7 U |
| | | 1,1,2-trichlorotrifluoroethane | 7 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/01/92
Dilution Factor: 1.00
% Moisture: 29

Section 1. a. Volatile Organic Compounds In Soil
Santa Monica Mountains Conservancy

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

VOLATILE ORGANIC ANALYSIS

Results in µg/kg (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: ESM01004SE/88585
 Lab Sample ID: SS8482

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 11 U | 1,2-dichloropropane | 6 U |
| bromomethane | 11 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 11 U | trichloroethene | 6 U |
| chloroethane | 11 U | dibromochloromethane | 6 U |
| methylene chloride | 6 | 1,1,2-trichloroethane | 6 U |
| acetone | 11 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 11 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 11 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 11 U | toluene | 4 J |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 11 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92
 Dilution Factor: 1.00
 % Moisture: 10

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: ESM02019SE/88386
 Lab Sample ID: SS7603

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 12 U | 1,2-dichloropropane | 6 U |
| bromomethane | 12 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 12 U | trichloroethene | 6 U |
| chloroethane | 12 U | dibromochloromethane | 6 U |
| methylene chloride | 5 BJ | 1,1,2-trichloroethane | 6 U |
| acetone | 12 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 12 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 12 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 12 U | toluene | 1 BJ |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 1 J |
| vinyl acetate | 12 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/17/92
 Dilution Factor: 1.00
 % Moisture: 15

Sanford, Cohen and Associates
April 8, 1992

Santa Monica Mountains Conservancy
Former Rocketdyne Employee Shooting Range
0301

IT ANALYTICAL SERVICES
1815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37928

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in µg/kg (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: ^SEXM03001SE/88338
Lab Sample ID: SS7604

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 13 U | 1,2-dichloropropane | 6 U |
| bromomethane | 13 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 13 U | trichloroethene | 6 U |
| chloroethane | 13 U | dibromochloromethane | 6 U |
| methylene chloride | 5 BJ | 1,1,2-trichloroethane | 6 U |
| acetone | 23 | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 13 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 13 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 13 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 2 J |
| vinyl acetate | 13 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylenes (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/17/92
Dilution Factor: 1.00
% Moisture: 22

Section 1. a. Volatile Organic Compounds In Soil
Background Locations

Sanford, Cohen and Associates
April 8, 1992

Background Location
Santa Susana Park
0207

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG02007SE/88498
Lab Sample ID: SS7602

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 BJ | 1,1,2-trichloroethane | 5 U |
| acetone | 12 | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 1 BJ |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 1 J |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/17/92
Dilution Factor: 1.00
% Moisture: 4

Sanford, Cohen and Associates
April 16, 1992

Background Location
Bell Canyon
0359

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG03059SE/88346

Lab Sample ID: SS7704

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 15 U | 1,2-dichloropropane | 7 U |
| bromomethane | 15 U | cis-1,3-dichloropropene | 7 U |
| vinyl chloride | 15 U | trichloroethene | 7 U |
| chloroethane | 15 U | dibromochloromethane | 7 U |
| methylene chloride | 3 J | 1,1,2-trichloroethane | 7 U |
| acetone | 7 J | benzene | 7 U |
| carbon disulfide | 7 U | trans-1,3-dichloropropene | 7 U |
| 1,1-dichloroethene | 7 U | bromoform | 7 U |
| 1,1-dichloroethane | 7 U | 4-methyl-2-pentanone | 15 U |
| 1,2-dichloroethene (total) | 7 U | 2-hexanone | 15 U |
| chloroform | 7 U | tetrachloroethene | 7 U |
| 1,2-dichloroethane | 7 U | 1,1,2,2-tetrachloroethane | 7 U |
| 2-butanone | 15 U | toluene | 7 U |
| 1,1,1-trichloroethane | 7 U | chlorobenzene | 7 U |
| carbon tetrachloride | 7 U | ethylbenzene | 7 U |
| vinyl acetate | 15 U | styrene | 7 U |
| bromodichloromethane | 7 U | xylene (total) | 7 U |
| | | 1,1,2-trichlorotrifluoroethane | 7 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/19/92

Dilution Factor: 1.00

% Moisture: 32

Sanford, Cohen and Associates
April 16, 1992

Background Location
Western Location
0429

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: EBG04029SE/88242
Lab Sample ID: SS7707

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 13 U | 1,2-dichloropropane | 6 U |
| bromomethane | 13 U | cis-1,3-dichloropropene | 6 U |
| vinyl chloride | 13 U | trichloroethene | 6 U |
| chloroethane | 13 U | dibromochloromethane | 6 U |
| methylene chloride | 2 J | 1,1,2-trichloroethane | 6 U |
| acetone | 13 U | benzene | 6 U |
| carbon disulfide | 6 U | trans-1,3-dichloropropene | 6 U |
| 1,1-dichloroethene | 6 U | bromoform | 6 U |
| 1,1-dichloroethane | 6 U | 4-methyl-2-pentanone | 13 U |
| 1,2-dichloroethene (total) | 6 U | 2-hexanone | 13 U |
| chloroform | 6 U | tetrachloroethene | 6 U |
| 1,2-dichloroethane | 6 U | 1,1,2,2-tetrachloroethane | 6 U |
| 2-butanone | 13 U | toluene | 6 U |
| 1,1,1-trichloroethane | 6 U | chlorobenzene | 6 U |
| carbon tetrachloride | 6 U | ethylbenzene | 6 U |
| vinyl acetate | 13 U | styrene | 6 U |
| bromodichloromethane | 6 U | xylene (total) | 6 U |
| | | 1,1,2-trichlorotrifluoroethane | 6 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/19/92
Dilution Factor: 1.00
% Moisture: 21

Section 1. b. Volatile Organic Compounds In Water
Brandeis-Bardin Institute

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 1
0301

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: EBB03001WH/196739
Lab Sample ID: SS7886

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 100 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 50 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 50 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 100 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/26/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 2
0401

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: EBB04001WH/196727

Lab Sample ID: SS7887

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 7 BJ | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 50 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 50 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 100 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/26/92

Dilution Factor: 1.00

Sanford, Cohen and Associates
June 1, 1992

Brandeis-Bardin Institute
Radioactive Materials Disposal Facility
1601

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: EBB16001BWH/197319
Lab Sample ID: K1229

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/30/92
Dilution Factor: 1.00

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: ESM05001GH/196701
 Lab Sample ID: SS7609

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/18/92
 Dilution Factor: 1.00

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

VOLATILE ORGANIC ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID: ESM05003WH/197885
 Lab Sample ID: K1266

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/30/92
 Dilution Factor: 1.00

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID: ESM07001GH/170701

Lab Sample ID: SS7610

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 13 |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/18/92

Dilution Factor: 1.00

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

VOLATILE ORGANIC ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID: ESM08001WH/171801

Lab Sample ID: SS8084

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/26/92

Dilution Factor: 1.00

Section 1. b. Volatile Organic Compounds In Water
Background Locations

Sanford, Cohen and Associates
April 8, 1992

Background Location
Rocky Peak
0102

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: EBG01002WH/196714
Lab Sample ID: SS7608

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 BJ | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 03/18/92
Dilution Factor: 1.00

Section 2. a. Semivolatile Organic Compounds In Soil
Brandeis-Bardin Institute

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Perimeter Of The Playground
0156

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 3

Job Number: SON 50985

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB01056SD/90286
Lab Sample ID: SS8092

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 780 U | bis(2-chloroisopropyl)ether | 780 U |
| acenaphthylene | 780 U | bis(2-ethylhexyl)phthalate | 520 JB |
| anthracene | 780 U | 4-bromophenyl phenyl ether | 780 U |
| benzidine | 3,900 U | 2-chloronaphthalene | 780 U |
| benzo(a)anthracene | 780 U | 4-chlorophenyl phenyl ether | 780 U |
| benzo(b)fluoranthene | 780 U | chrysene | 780 U |
| benzo(k)fluoranthene | 780 U | dibenz(a,h)anthracene | 780 U |
| benzo(a)pyrene | 780 U | di-n-butylphthalate | 780 U |
| benzo(g,h,i)perylene | 780 U | 1,2-dichlorobenzene | 780 U |
| butylbenzylphthalate | 780 U | 1,3-dichlorobenzene | 780 U |
| bis(2-chloroethoxy)methane | 780 U | 1,4-dichlorobenzene | 780 U |
| bis(2-chloroethyl)ether | 780 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

Job Number: SON 50985

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB01056SD/90286
Lab Sample ID: SS8092

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 1,600 U | hexachloroethane | 780 U |
| diethylphthalate | 780 U | indeno(1,2,3-cd)pyrene | 780 U |
| dimethyl phthalate | 780 U | isophorone | 780 U |
| 2,4-dinitrotoluene | 780 U | naphthalene | 780 U |
| 2,6-dinitrotoluene | 780 U | nitrobenzene | 780 U |
| di-n-octyl phthalate | 780 U | n-nitroso-di-n-propylamine | 780 U |
| 1,2-diphenylhydrazine(1) | 780 U | n-nitrosodimethylamine | 780 U |
| fluoranthene | 780 U | n-nitrosodiphenylamine(2) | 780 U |
| fluorene | 780 U | phenanthrene | 780 U |
| hexachlorobenzene | 780 U | pyrene | 780 U |
| hexachlorobutadiene | 780 U | 1,2,4-trichlorobenzene | 780 U |
| hexachlorocyclopentadiene | 780 U | | |

- (1) Screened for as azobenzene
(2) Detected as diphenylamine

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

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Perimeter Of The Playground
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50985

ACID EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB01056SD/90286
Lab Sample ID: SS8092

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 780 U | 2-nitrophenol | 780 U |
| 2-chlorophenol | 780 U | 4-nitrophenol | 3,900 U |
| 2,4-dichlorophenol | 780 U | pentachlorophenol | 3,900 U |
| 2,4-dimethylphenol | 780 U | phenol | 780 U |
| 2,4-dinitrophenol | 3,900 U | 2,4,6-trichlorophenol | 780 U |
| 2-methyl-4,6-dinitrophenol | 3,900 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 1
0305

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50975

SEMIVOLATILE TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB03005SD/90137

Lab Sample ID: SS7876

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 400 U | bis(2-chloroethoxy)methane | 400 U |
| bis(2-chloroethyl)ether | 400 U | 2,4-dichlorophenol | 400 U |
| 2-chlorophenol | 400 U | 1,2,4-trichlorobenzene | 400 U |
| 1,3-dichlorobenzene | 400 U | naphthalene | 400 U |
| 1,4-dichlorobenzene | 400 U | 4-chloroaniline | 400 U |
| benzyl alcohol | 400 U | hexachlorobutadiene | 400 U |
| 1,2-dichlorobenzene | 400 U | 4-chloro-3-methylphenol | 400 U |
| 2-methylphenol | 400 U | 2-methylnaphthalene | 400 U |
| bis(2-chloroisopropyl)ether | 400 U | hexachlorocyclopentadiene | 400 U |
| 4-methylphenol | 400 U | 2,4,6-trichlorophenol | 400 U |
| n-nitroso-di-n-propylamine | 400 U | 2,4,5-trichlorophenol | 1,900 U |
| hexachloroethane | 400 U | 2-chloronaphthalene | 400 U |
| nitrobenzene | 400 U | 2-nitroaniline | 1,900 U |
| isophorone | 400 U | dimethyl phthalate | 400 U |
| 2-nitrophenol | 400 U | acenaphthylene | 400 U |
| 2,4-dimethylphenol | 400 U | 2,6-dinitrotoluene | 400 U |
| benzoic acid | 1,900 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 17

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 1
0305

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 50975

SEMIVOLATILE TARGET COMPOUND LIST (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB03005SD/90137

Lab Sample ID: SS7876

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,900 U | anthracene | 400 U |
| acenaphthene | 400 U | di-n-butylphthalate | 400 U |
| 2,4-dinitrophenol | 1,900 U | fluoranthene | 400 U |
| 4-nitrophenol | 1,900 U | pyrene | 400 U |
| dibenzofuran | 400 U | butylbenzylphthalate | 400 U |
| 2,4-dinitrotoluene | 400 U | 3,3'-dichlorobenzidine | 790 U |
| diethylphthalate | 400 U | benzo(a)anthracene | 400 U |
| 4-chlorophenyl-phenylether | 400 U | chrysene | 400 U |
| fluorene | 400 U | bis(2-ethylhexyl)phthalate | 70 BJ |
| 4-nitroaniline | 1,900 U | di-n-octylphthalate | 400 U |
| 4,6-dinitro-2-methylphenol | 1,900 U | benzo(b)fluoranthene | 400 U |
| n-nitrosodiphenylamine ¹ | 400 U | benzo(k)fluoranthene | 400 U |
| 4-bromophenyl-phenylether | 400 U | benzo(a)pyrene | 400 U |
| hexachlorobenzene | 400 U | indeno(1,2,3-cd)pyrene | 400 U |
| pentachlorophenol | 1,900 U | dibenzo(a,h)anthracene | 400 U |
| phenanthrene | 400 U | benzo(g,h,i)perylene | 400 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.
1 - Detected as diphenylamine.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 17

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 2
0421

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50975

SEMIVOLATILE TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB04021SD/88284

Lab Sample ID: SS7877

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 370 U | bis(2-chloroethoxy)methane | 370 U |
| bis(2-chloroethyl)ether | 370 U | 2,4-dichlorophenol | 370 U |
| 2-chlorophenol | 370 U | 1,2,4-trichlorobenzene | 370 U |
| 1,3-dichlorobenzene | 370 U | naphthalene | 370 U |
| 1,4-dichlorobenzene | 370 U | 4-chloroaniline | 370 U |
| benzyl alcohol | 370 U | hexachlorobutadiene | 370 U |
| 1,2-dichlorobenzene | 370 U | 4-chloro-3-methylphenol | 370 U |
| 2-methylphenol | 370 U | 2-methylnaphthalene | 370 U |
| bis(2-chloroisopropyl)ether | 370 U | hexachlorocyclopentadiene | 370 U |
| 4-methylphenol | 370 U | 2,4,6-trichlorophenol | 370 U |
| n-nitroso-di-n-propylamine | 370 U | 2,4,5-trichlorophenol | 1,800 U |
| hexachloroethane | 370 U | 2-chloronaphthalene | 370 U |
| nitrobenzene | 370 U | 2-nitroaniline | 1,800 U |
| isophorone | 370 U | dimethyl phthalate | 370 U |
| 2-nitrophenol | 370 U | acenaphthylene | 370 U |
| 2,4-dimethylphenol | 370 U | 2,6-dinitrotoluene | 370 U |
| benzoic acid | 1,800 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 11

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 2
0421

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50975

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

SEMIVOLATILE TARGET COMPOUND LIST (continued)
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB04021SD/88284
Lab Sample ID: SS7877

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,800 U | anthracene | 370 U |
| acenaphthene | 370 U | di-n-butylphthalate | 370 U |
| 2,4-dinitrophenol | 1,800 U | fluoranthene | 370 U |
| 4-nitrophenol | 1,800 U | pyrene | 370 U |
| dibenzofuran | 370 U | butylbenzylphthalate | 39 J |
| 2,4-dinitrotoluene | 370 U | 3,3'-dichlorobenzidine | 740 U |
| diethylphthalate | 370 U | benzo(a)anthracene | 370 U |
| 4-chlorophenyl-phenylether | 370 U | chrysene | 370 U |
| fluorene | 370 U | bis(2-ethylhexyl)phthalate | 79 BJ |
| 4-nitroaniline | 1,800 U | di-n-octylphthalate | 370 U |
| 4,6-dinitro-2-methylphenol | 1,800 U | benzo(b)fluoranthene | 370 U |
| n-nitrosodiphenylamine ¹ | 370 U | benzo(k)fluoranthene | 370 U |
| 4-bromophenyl-phenylether | 370 U | benzo(a)pyrene | 370 U |
| hexachlorobenzene | 370 U | indeno(1,2,3-cd)pyrene | 370 U |
| pentachlorophenol | 1,800 U | dibenzo(a,h)anthracene | 370 U |
| phenanthrene | 370 U | benzo(g,h,i)perylene | 370 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.
1 - Detected as diphenylamine.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 11

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Picnic Area
0577

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 3

Job Number: SON 50985

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB05077SD/90035
Lab Sample ID: SS8091

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 750 U | bis(2-chloroisopropyl)ether | 750 U |
| acenaphthylene | 750 U | bis(2-ethylhexyl)phthalate | 750 U |
| anthracene | 750 U | 4-bromophenyl phenyl ether | 750 U |
| benzidine | 3,700 U | 2-chloronaphthalene | 750 U |
| benzo(a)anthracene | 750 U | 4-chlorophenyl phenyl ether | 750 U |
| benzo(b)fluoranthene | 750 U | chrysene | 750 U |
| benzo(k)fluoranthene | 750 U | dibenz(a,h)anthracene | 750 U |
| benzo(a)pyrene | 750 U | di-n-butylphthalate | 750 U |
| benzo(g,h,i)perylene | 750 U | 1,2-dichlorobenzene | 750 U |
| butylbenzylphthalate | 750 U | 1,3-dichlorobenzene | 750 U |
| bis(2-chloroethoxy)methane | 750 U | 1,4-dichlorobenzene | 750 U |
| bis(2-chloroethyl)ether | 750 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Picnic Area
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50985

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

BASE/NEUTRAL EXTRACTABLE ORGANIC PRIORITY POLLUTANT ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB05077SD/90035
Lab Sample ID: SS8091

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 1,500 U | hexachloroethane | 750 U |
| diethylphthalate | 750 U | indeno(1,2,3-cd)pyrene | 750 U |
| dimethyl phthalate | 750 U | isophorone | 750 U |
| 2,4-dinitrotoluene | 750 U | naphthalene | 750 U |
| 2,6-dinitrotoluene | 750 U | nitrobenzene | 750 U |
| di-n-octyl phthalate | 750 U | n-nitroso-di-n-propylamine | 750 U |
| 1,2-diphenylhydrazine(1) | 750 U | n-nitrosodimethylamine | 750 U |
| fluoranthene | 750 U | n-nitrosodiphenylamine(2) | 750 U |
| fluorene | 750 U | phenanthrene | 750 U |
| hexachlorobenzene | 750 U | pyrene | 750 U |
| hexachlorobutadiene | 750 U | 1,2,4-trichlorobenzene | 750 U |
| hexachlorocyclopentadiene | 750 U | | |

- (1) Screened for as azobenzene
(2) Detected as diphenylamine

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50985

ACID EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB05077SD/90035
Lab Sample ID: SS8091

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 750 U | 2-nitrophenol | 750 U |
| 2-chlorophenol | 750 U | 4-nitrophenol | 3,700 U |
| 2,4-dichlorophenol | 750 U | pentachlorophenol | 3,700 U |
| 2,4-dimethylphenol | 750 U | phenol | 750 U |
| 2,4-dinitrophenol | 3,700 U | 2,4,6-trichlorophenol | 750 U |
| 2-methyl-4,6-dinitrophenol | 3,700 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 10, 1992

Brandeis Bardin Institute
House Of The Book
0692

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50975

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

SEMIVOLATILE TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB06092SD/89184

Lab Sample ID: SS7878

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 370 U | bis(2-chloroethoxy)methane | 370 U |
| bis(2-chloroethyl)ether | 370 U | 2,4-dichlorophenol | 370 U |
| 2-chlorophenol | 370 U | 1,2,4-trichlorobenzene | 370 U |
| 1,3-dichlorobenzene | 370 U | naphthalene | 370 U |
| 1,4-dichlorobenzene | 370 U | 4-chloroaniline | 370 U |
| benzyl alcohol | 370 U | hexachlorobutadiene | 370 U |
| 1,2-dichlorobenzene | 370 U | 4-chloro-3-methylphenol | 370 U |
| 2-methylphenol | 370 U | 2-methylnaphthalene | 370 U |
| bis(2-chloroisopropyl)ether | 370 U | hexachlorocyclopentadiene | 370 U |
| 4-methylphenol | 370 U | 2,4,6-trichlorophenol | 370 U |
| n-nitroso-di-n-propylamine | 370 U | 2,4,5-trichlorophenol | 1,800 U |
| hexachloroethane | 370 U | 2-chloronaphthalene | 370 U |
| nitrobenzene | 370 U | 2-nitroaniline | 1,800 U |
| isophorone | 370 U | dimethyl phthalate | 370 U |
| 2-nitrophenol | 370 U | acenaphthylene | 370 U |
| 2,4-dimethylphenol | 370 U | 2,6-dinitrotoluene | 370 U |
| benzoic acid | 1,800 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 10

Sanford, Cohen and Associates
April 10, 1992

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 50975

SEMIVOLATILE TARGET COMPOUND LIST (continued)
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB06092SD/89184
Lab Sample ID: SS7878

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,800 U | anthracene | 370 U |
| acenaphthene | 370 U | di-n-butylphthalate | 370 U |
| 2,4-dinitrophenol | 1,800 U | fluoranthene | 370 U |
| 4-nitrophenol | 1,800 U | pyrene | 370 U |
| dibenzofuran | 370 U | butylbenzylphthalate | 370 U |
| 2,4-dinitrotoluene | 370 U | 3,3'-dichlorobenzidine | 730 U |
| diethylphthalate | 370 U | benzo(a)anthracene | 370 U |
| 4-chlorophenyl-phenylether | 370 U | chrysene | 370 U |
| fluorene | 370 U | bis(2-ethylhexyl)phthalate | 48 BJ |
| 4-nitroaniline | 1,800 U | di-n-octylphthalate | 370 U |
| 4,6-dinitro-2-methylphenol | 1,800 U | benzo(b)fluoranthene | 370 U |
| n-nitrosodiphenylamine ¹ | 370 U | benzo(k)fluoranthene | 370 U |
| 4-bromophenyl-phenylether | 370 U | benzo(a)pyrene | 370 U |
| hexachlorobenzene | 370 U | indeno(1,2,3-cd)pyrene | 370 U |
| pentachlorophenol | 1,800 U | dibenzo(a,h)anthracene | 370 U |
| phenanthrene | 370 U | benzo(g,h,i)perylene | 370 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.
1 - Detected as diphenylamine.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 10

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Vegetable Garden
1161

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50998

SEMIVOLATILE ORGANICS ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB11061SD/89285

Lab Sample ID: SS8332

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 750 U | bis(2-chloroethoxy)methane | 750 U |
| bis(2-chloroethyl)ether | 750 U | 2,4-dichlorophenol | 750 U |
| 2-chlorophenol | 750 U | 1,2,4-trichlorobenzene | 750 U |
| 1,3-dichlorobenzene | 750 U | naphthalene | 750 U |
| 1,4-dichlorobenzene | 750 U | 4-chloroaniline | 750 U |
| benzyl alcohol | 750 U | hexachlorobutadiene | 750 U |
| 1,2-dichlorobenzene | 750 U | 4-chloro-3-methylphenol | 750 U |
| 2-methylphenol | 750 U | 2-methylnaphthalene | 750 U |
| bis(2-chloroisopropyl)ether | 750 U | hexachlorocyclopentadiene | 750 U |
| 4-methylphenol | 750 U | 2,4,6-trichlorophenol | 750 U |
| n-nitroso-di-n-propylamine | 750 U | 2,4,5-trichlorophenol | 3,600 U |
| hexachloroethane | 750 U | 2-chloronaphthalene | 750 U |
| nitrobenzene | 750 U | 2-nitroaniline | 3,600 U |
| isophorone | 750 U | dimethyl phthalate | 750 U |
| 2-nitrophenol | 750 U | acenaphthylene | 750 U |
| 2,4-dimethylphenol | 750 U | 2,6-dinitrotoluene | 750 U |
| benzoic acid | 3,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/31/92
Dilution Factor: 2.0
% Moisture: 12

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Vegetable Garden
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 50998

SEMIVOLATILE ORGANICS ANALYSIS (continued)
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB11061SD/89285
Lab Sample ID: SS8332

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 3,600 U | anthracene | 750 U |
| acenaphthene | 750 U | di-n-butylphthalate | 750 U |
| 2,4-dinitrophenol | 3,600 U | fluoranthene | 750 U |
| 4-nitrophenol | 3,600 U | pyrene | 750 U |
| dibenzofuran | 750 U | butylbenzylphthalate | 750 U |
| 2,4-dinitrotoluene | 750 U | 3,3'-dichlorobenzidine | 1,500 U |
| diethylphthalate | 750 U | benzo(a)anthracene | 750 U |
| 4-chlorophenyl-phenylether | 750 U | chrysene | 750 U |
| fluorene | 750 U | bis(2-ethylhexyl)phthalate | 3,500 U |
| 4-nitroaniline | 3,600 U | di-n-octylphthalate | 750 U |
| 4,6-dinitro-2-methylphenol | 3,600 U | benzo(b)fluoranthene | 750 U |
| n-nitrosodiphenylamine ¹ | 750 U | benzo(k)fluoranthene | 750 U |
| 4-bromophenyl-phenylether | 750 U | benzo(a)pyrene | 750 U |
| hexachlorobenzene | 750 U | indeno(1,2,3-cd)pyrene | 750 U |
| pentachlorophenol | 3,600 U | dibenzo(a,h)anthracene | 750 U |
| phenanthrene | 750 U | benzo(g,h,i)perylene | 750 U |

(1) Detected as diphenylamine.

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/31/92
Dilution Factor: 2.0
% Moisture: 12

Sanford, Cohen and Associates
April 21, 1992

Brandeis-Bardin Institute
Main House Orchard
1220

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 3

Job Number: SON 50985

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB12020SD/90086

Lab Sample ID: SS8093

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 740 U | bis(2-chloroisopropyl)ether | 740 U |
| acenaphthylene | 740 U | bis(2-ethylhexyl)phthalate | 220 JB |
| anthracene | 740 U | 4-bromophenyl phenyl ether | 740 U |
| benzidine | 3,700 U | 2-chloronaphthalene | 740 U |
| benzo(a)anthracene | 740 U | 4-chlorophenyl phenyl ether | 740 U |
| benzo(b)fluoranthene | 740 U | chrysene | 740 U |
| benzo(k)fluoranthene | 740 U | dibenz(a,h)anthracene | 740 U |
| benzo(a)pyrene | 740 U | di-n-butylphthalate | 740 U |
| benzo(g,h,i)perylene | 740 U | 1,2-dichlorobenzene | 740 U |
| butylbenzylphthalate | 740 U | 1,3-dichlorobenzene | 740 U |
| bis(2-chloroethoxy)methane | 740 U | 1,4-dichlorobenzene | 740 U |
| bis(2-chloroethyl)ether | 740 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- B - Analyte was found in the blank as well as the sample.

Date of Extraction: 03/25/92

Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

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Main House Orchard
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

Job Number: SON 50985

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB12020SD/90086
Lab Sample ID: SS8093

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 1,500 U | hexachloroethane | 740 U |
| diethylphthalate | 740 U | indeno(1,2,3-cd)pyrene | 740 U |
| dimethyl phthalate | 740 U | isophorone | 740 U |
| 2,4-dinitrotoluene | 740 U | naphthalene | 740 U |
| 2,6-dinitrotoluene | 740 U | nitrobenzene | 740 U |
| di-n-octyl phthalate | 740 U | n-nitroso-di-n-propylamine | 740 U |
| 1,2-diphenylhydrazine(1) | 740 U | n-nitrosodimethylamine | 740 U |
| fluoranthene | 740 U | n-nitrosodiphenylamine(2) | 740 U |
| fluorene | 740 U | phenanthrene | 740 U |
| hexachlorobenzene | 740 U | pyrene | 740 U |
| hexachlorobutadiene | 740 U | 1,2,4-trichlorobenzene | 740 U |
| hexachlorocyclopentadiene | 740 U | | |

(1) Screened for as azobenzene

(2) Detected as diphenylamine

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50985

ACID EXTRACTABLE ORGANIC PRIORITY POLLUTANT ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB12020SD/90086
Lab Sample ID: SS8093

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 740 U | 2-nitrophenol | 740 U |
| 2-chlorophenol | 740 U | 4-nitrophenol | 3,700 U |
| 2,4-dichlorophenol | 740 U | pentachlorophenol | 3,700 U |
| 2,4-dimethylphenol | 740 U | phenol | 740 U |
| 2,4-dinitrophenol | 3,700 U | 2,4,6-trichlorophenol | 740 U |
| 2-methyl-4,6-dinitrophenol | 3,700 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 10, 1992

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Avocado Grove
1324

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50975

SEMIVOLATILE TARGET COMPOUND LIST
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB13024SD/88937
Lab Sample ID: SS7879

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 400 U | bis(2-chloroethoxy)methane | 400 U |
| bis(2-chloroethyl)ether | 400 U | 2,4-dichlorophenol | 400 U |
| 2-chlorophenol | 400 U | 1,2,4-trichlorobenzene | 400 U |
| 1,3-dichlorobenzene | 400 U | naphthalene | 400 U |
| 1,4-dichlorobenzene | 400 U | 4-chloroaniline | 400 U |
| benzyl alcohol | 400 U | hexachlorobutadiene | 400 U |
| 1,2-dichlorobenzene | 400 U | 4-chloro-3-methylphenol | 400 U |
| 2-methylphenol | 400 U | 2-methylnaphthalene | 400 U |
| bis(2-chloroisopropyl)ether | 400 U | hexachlorocyclopentadiene | 400 U |
| 4-methylphenol | 400 U | 2,4,6-trichlorophenol | 400 U |
| n-nitroso-di-n-propylamine | 400 U | 2,4,5-trichlorophenol | 1,900 U |
| hexachloroethane | 400 U | 2-chloronaphthalene | 400 U |
| nitrobenzene | 400 U | 2-nitroaniline | 1,900 U |
| isophorone | 400 U | dimethyl phthalate | 400 U |
| 2-nitrophenol | 400 U | acenaphthylene | 400 U |
| 2,4-dimethylphenol | 400 U | 2,6-dinitrotoluene | 400 U |
| benzoic acid | 1,900 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 17

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Avocado Grove
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50975

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

SEMIVOLATILE TARGET COMPOUND LIST (continued)
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB13024SD/88937
Lab Sample ID: SS7879

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,900 U | anthracene | 400 U |
| acenaphthene | 400 U | di-n-butylphthalate | 400 U |
| 2,4-dinitrophenol | 1,900 U | fluoranthene | 400 U |
| 4-nitrophenol | 1,900 U | pyrene | 400 U |
| dibenzofuran | 400 U | butylbenzylphthalate | 400 U |
| 2,4-dinitrotoluene | 400 U | 3,3'-dichlorobenzidine | 790 U |
| diethylphthalate | 400 U | benzo(a)anthracene | 400 U |
| 4-chlorophenyl-phenylether | 400 U | chrysene | 400 U |
| fluorene | 400 U | bis(2-ethylhexyl)phthalate | 280 BJ |
| 4-nitroaniline | 1,900 U | di-n-octylphthalate | 400 U |
| 4,6-dinitro-2-methylphenol | 1,900 U | benzo(b)fluoranthene | 400 U |
| n-nitrosodiphenylamine ¹ | 400 U | benzo(k)fluoranthene | 400 U |
| 4-bromophenyl-phenylether | 400 U | benzo(a)pyrene | 400 U |
| hexachlorobenzene | 400 U | indeno(1,2,3-cd)pyrene | 400 U |
| pentachlorophenol | 1,900 U | dibenzo(a,h)anthracene | 400 U |
| phenanthrene | 400 U | benzo(g,h,i)perylene | 400 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.
1 - Detected as diphenylamine.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 17

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Old Well Campsite
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50975

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

SEMIVOLATILE TARGET COMPOUND LIST
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB14079SD/88437
Lab Sample ID: SS7880

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 370 U | bis(2-chloroethoxy)methane | 370 U |
| bis(2-chloroethyl)ether | 370 U | 2,4-dichlorophenol | 370 U |
| 2-chlorophenol | 370 U | 1,2,4-trichlorobenzene | 370 U |
| 1,3-dichlorobenzene | 370 U | naphthalene | 370 U |
| 1,4-dichlorobenzene | 370 U | 4-chloroaniline | 370 U |
| benzyl alcohol | 370 U | hexachlorobutadiene | 370 U |
| 1,2-dichlorobenzene | 370 U | 4-chloro-3-methylphenol | 370 U |
| 2-methylphenol | 370 U | 2-methylnaphthalene | 370 U |
| bis(2-chloroisopropyl)ether | 370 U | hexachlorocyclopentadiene | 370 U |
| 4-methylphenol | 370 U | 2,4,6-trichlorophenol | 370 U |
| n-nitroso-di-n-propylamine | 370 U | 2,4,5-trichlorophenol | 1,800 U |
| hexachloroethane | 370 U | 2-chloronaphthalene | 370 U |
| nitrobenzene | 370 U | 2-nitroaniline | 1,800 U |
| isophorone | 370 U | dimethyl phthalate | 370 U |
| 2-nitrophenol | 370 U | acenaphthylene | 370 U |
| 2,4-dimethylphenol | 370 U | 2,6-dinitrotoluene | 370 U |
| benzoic acid | 1,800 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 12

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Old Well Campsite
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50975

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

SEMIVOLATILE TARGET COMPOUND LIST (continued)
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB14079SD/88437
Lab Sample ID: SS7880

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,800 U | anthracene | 370 U |
| acenaphthene | 370 U | di-n-butylphthalate | 370 U |
| 2,4-dinitrophenol | 1,800 U | fluoranthene | 370 U |
| 4-nitrophenol | 1,800 U | pyrene | 370 U |
| dibenzofuran | 370 U | butylbenzylphthalate | 97 J |
| 2,4-dinitrotoluene | 370 U | 3,3'-dichlorobenzidine | 750 U |
| diethylphthalate | 370 U | benzo(a)anthracene | 370 U |
| 4-chlorophenyl-phenylether | 370 U | chrysene | 370 U |
| fluorene | 370 U | bis(2-ethylhexyl)phthalate | 110 BJ |
| 4-nitroaniline | 1,800 U | di-n-octylphthalate | 370 U |
| 4,6-dinitro-2-methylphenol | 1,800 U | benzo(b)fluoranthene | 370 U |
| n-nitrosodiphenylamine ¹ | 370 U | benzo(k)fluoranthene | 370 U |
| 4-bromophenyl-phenylether | 370 U | benzo(a)pyrene | 370 U |
| hexachlorobenzene | 370 U | indeno(1,2,3-cd)pyrene | 370 U |
| pentachlorophenol | 1,800 U | dibenzo(a,h)anthracene | 370 U |
| phenanthrene | 370 U | benzo(g,h,i)perylene | 370 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.
1 - Detected as diphenylamine.

Date of Extraction: 03/23/92
Date of Analysis: 03/30/92
Dilution Factor: 1.00
% Moisture: 12

Sanford, Cohen and Associates
June 1, 1992

Brandeis-Bardin Institute
RD 51 Watershed
1505

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51257

SEMIVOLATILE ORGANIC ANALYSIS
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB15005SD/89588
Lab Sample ID: K1227

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 670 U | bis(2-chloroethoxy)methane | 670 U |
| bis(2-chloroethyl)ether | 670 U | 2,4-dichlorophenol | 670 U |
| 2-chlorophenol | 670 U | 1,2,4-trichlorobenzene | 670 U |
| 1,3-dichlorobenzene | 670 U | naphthalene | 670 U |
| 1,4-dichlorobenzene | 670 U | 4-chloroaniline | 670 U |
| benzyl alcohol | 670 U | hexachlorobutadiene | 670 U |
| 1,2-dichlorobenzene | 670 U | 4-chloro-3-methylphenol | 670 U |
| 2-methylphenol | 670 U | 2-methylnaphthalene | 670 U |
| bis(2-chloroisopropyl)ether | 670 U | hexachlorocyclopentadiene | 670 U |
| 4-methylphenol | 670 U | 2,4,6-trichlorophenol | 670 U |
| n-nitroso-di-n-propylamine | 670 U | 2,4,5-trichlorophenol | 3,200 U |
| hexachloroethane | 670 U | 2-chloronaphthalene | 670 U |
| nitrobenzene | 670 U | 2-nitroaniline | 3,200 U |
| isophorone | 670 U | dimethyl phthalate | 670 U |
| 2-nitrophenol | 670 U | acenaphthylene | 670 U |
| 2,4-dimethylphenol | 670 U | 2,6-dinitrotoluene | 670 U |
| benzoic acid | 3,200 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/29/92
Date of Analysis: 05/05/92
Dilution Factor: 2.0
% Moisture: 1

Sanford, Cohen and Associates
June 1, 1992

Brandeis-Bardin Institute
RD 51 Watershed
1505

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51257

SEMIVOLATILE ORGANIC ANALYSIS (continued)
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB15005SD/89588
Lab Sample ID: K1227

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 3,200 U | anthracene | 670 U |
| acenaphthene | 670 U | di-n-butylphthalate | 670 U |
| 2,4-dinitrophenol | 3,200 U | fluoranthene | 670 U |
| 4-nitrophenol | 3,200 U | pyrene | 670 U |
| dibenzofuran | 670 U | butylbenzylphthalate | 670 U |
| 2,4-dinitrotoluene | 670 U | 3,3'-dichlorobenzidine | 1,300 U |
| diethylphthalate | 670 U | benzo(a)anthracene | 670 U |
| 4-chlorophenyl-phenylether | 670 U | chrysene | 670 U |
| fluorene | 670 U | bis(2-ethylhexyl)phthalate | 670 U |
| 4-nitroaniline | 3,200 U | di-n-octylphthalate | 670 U |
| 4,6-dinitro-2-methylphenol | 3,200 U | benzo(b)fluoranthene | 670 U |
| n-nitrosodiphenylamine ¹ | 670 U | benzo(k)fluoranthene | 670 U |
| 4-bromophenyl-phenylether | 670 U | benzo(a)pyrene | 670 U |
| hexachlorobenzene | 670 U | indeno(1,2,3-cd)pyrene | 670 U |
| pentachlorophenol | 3,200 U | dibenzo(a,h)anthracene | 670 U |
| phenanthrene | 670 U | benzo(g,h,i)perylene | 670 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
1 - Detected as diphenylamine.

Date of Extraction: 04/29/92
Date of Analysis: 05/05/92
Dilution Factor: 2.0
% Moisture: 1

Sanford, Cohen and Associates
May 29, 1992

Brandeis-Bardin Institute
Radioactive Materials Disposal Facility
Watershed

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51263

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: EBB16001BSD/89889
Lab Sample ID: K1270

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 420 U | bis(2-chloroethoxy)methane | 420 U |
| bis(2-chloroethyl)ether | 420 U | 2,4-dichlorophenol | 420 U |
| 2-chlorophenol | 420 U | 1,2,4-trichlorobenzene | 420 U |
| 1,3-dichlorobenzene | 420 U | naphthalene | 420 U |
| 1,4-dichlorobenzene | 420 U | 4-chloroaniline | 420 U |
| benzyl alcohol | 420 U | hexachlorobutadiene | 420 U |
| 1,2-dichlorobenzene | 420 U | 4-chloro-3-methylphenol | 420 U |
| 2-methylphenol | 420 U | 2-methylnaphthalene | 420 U |
| bis(2-chloroisopropyl)ether | 420 U | hexachlorocyclopentadiene | 420 U |
| 4-methylphenol | 420 U | 2,4,6-trichlorophenol | 420 U |
| n-nitroso-di-n-propylamine | 420 U | 2,4,5-trichlorophenol | 2,000 U |
| hexachloroethane | 420 U | 2-chloronaphthalene | 420 U |
| nitrobenzene | 420 U | 2-nitroaniline | 2,000 U |
| isophorone | 420 U | dimethyl phthalate | 420 U |
| 2-nitrophenol | 420 U | acenaphthylene | 420 U |
| 2,4-dimethylphenol | 420 U | 2,6-dinitrotoluene | 420 U |
| benzoic acid | 2,000 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/30/92
Date of Analysis: 05/05/92
Dilution Factor: 1.0
% Moisture: 21

Sanford, Cohen and Associates
May 29, 1992

Brandeis-Bardin Institute
Radioactive Materials Disposal Facility
Watershed
1601

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51263

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: EBB16001BSD/89889
Lab Sample ID: K1270

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 2,000 U | anthracene | 420 U |
| acenaphthene | 420 U | di-n-butylphthalate | 420 U |
| 2,4-dinitrophenol | 2,000 U | fluoranthene | 420 U |
| 4-nitrophenol | 2,000 U | pyrene | 420 U |
| dibenzofuran | 420 U | butylbenzylphthalate | 57 B |
| 2,4-dinitrotoluene | 420 U | 3,3'-dichlorobenzidine | 830 U |
| diethylphthalate | 420 U | benzo(a)anthracene | 420 U |
| 4-chlorophenyl-phenylether | 420 U | chrysene | 420 U |
| fluorene | 420 U | bis(2-ethylhexyl)phthalate | 150 J |
| 4-nitroaniline | 2,000 U | di-n-octylphthalate | 420 U |
| 4,6-dinitro-2-methylphenol | 2,000 U | benzo(b)fluoranthene | 420 U |
| n-nitrosodiphenylamine ¹ | 420 U | benzo(k)fluoranthene | 420 U |
| 4-bromophenyl-phenylether | 420 U | benzo(a)pyrene | 420 U |
| hexachlorobenzene | 420 U | indeno(1,2,3-cd)pyrene | 420 U |
| pentachlorophenol | 2,000 U | dibenzo(a,h)anthracene | 420 U |
| phenanthrene | 420 U | benzo(g,h,i)perylene | 420 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.
1 - Detected as diphenylamine.

Date of Extraction: 04/30/92
Date of Analysis: 05/05/92
Dilution Factor: 1.0
% Moisture: 21

Sanford, Cohen and Associates
June 23, 1992

Brandeis-Bardin Institute
Building 59 Watershed
1701

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51247

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB017001SD/89336

Lab Sample ID: K1131

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 400 U | bis(2-chloroethoxy)methane | 400 U |
| bis(2-chloroethyl)ether | 400 U | 2,4-dichlorophenol | 400 U |
| 2-chlorophenol | 400 U | 1,2,4-trichlorobenzene | 400 U |
| 1,3-dichlorobenzene | 400 U | naphthalene | 400 U |
| 1,4-dichlorobenzene | 400 U | 4-chloroaniline | 400 U |
| benzyl alcohol | 400 U | hexachlorobutadiene | 400 U |
| 1,2-dichlorobenzene | 400 U | 4-chloro-3-methylphenol | 400 U |
| 2-methylphenol | 400 U | 2-methylnaphthalene | 400 U |
| bis(2-chloroisopropyl)ether | 400 U | hexachlorocyclopentadiene | 400 U |
| 4-methylphenol | 400 U | 2,4,6-trichlorophenol | 400 U |
| n-nitroso-di-n-propylamine | 400 U | 2,4,5-trichlorophenol | 2,000 U |
| hexachloroethane | 400 U | 2-chloronaphthalene | 400 U |
| nitrobenzene | 400 U | 2-nitroaniline | 2,000 U |
| isophorone | 400 U | dimethyl phthalate | 400 U |
| 2-nitrophenol | 400 U | acenaphthylene | 400 U |
| 2,4-dimethylphenol | 400 U | 2,6-dinitrotoluene | 400 U |
| benzoic acid | 2,000 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92
Dilution Factor: 1.00
% Moisture: 18

Sanford, Cohen and Associates
June 23, 1992

Brandeis-Bardin Institute
Building 59 Watershed
1701

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51247

SEMIVOLATILE ORGANIC ANALYSIS (continued)
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB017001SD/89336
Lab Sample ID: K1131

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 2,000 U | anthracene | 400 U |
| acenaphthene | 400 U | di-n-butylphthalate | 86 J |
| 2,4-dinitrophenol | 2,000 U | fluoranthene | 400 U |
| 4-nitrophenol | 2,000 U | pyrene | 400 U |
| dibenzofuran | 400 U | butylbenzylphthalate | 61 J |
| 2,4-dinitrotoluene | 400 U | 3,3'-dichlorobenzidine | 810 U |
| diethylphthalate | 400 U | benzo(a)anthracene | 400 U |
| 4-chlorophenyl-phenylether | 400 U | chrysene | 400 U |
| fluorene | 400 U | bis(2-ethylhexyl)phthalate | 110 J |
| 4-nitroaniline | 2,000 U | di-n-octylphthalate | 400 U |
| 4,6-dinitro-2-methylphenol | 2,000 U | benzo(b)fluoranthene | 400 U |
| n-nitrosodiphenylamine ¹ | 400 U | benzo(k)fluoranthene | 400 U |
| 4-bromophenyl-phenylether | 400 U | benzo(a)pyrene | 400 U |
| hexachlorobenzene | 400 U | indeno(1,2,3-cd)pyrene | 400 U |
| pentachlorophenol | 2,000 U | dibenzo(a,h)anthracene | 400 U |
| phenanthrene | 400 U | benzo(g,h,i)perylene | 400 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
1 - Detected as diphenylamine.

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92
Dilution Factor: 1.00
% Moisture: 18

Sanford, Cohen and Associates
June 23, 1992

Brandeis-Bardin Institute
Sodium Burn Pit Watershed
1801

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 51247

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

SEMIVOLATILE ORGANIC ANALYSIS
Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBB180001SD/89235
Lab Sample ID: K1132

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 460 U | bis(2-chloroethoxy)methane | 460 U |
| bis(2-chloroethyl)ether | 460 U | 2,4-dichlorophenol | 460 U |
| 2-chlorophenol | 460 U | 1,2,4-trichlorobenzene | 460 U |
| 1,3-dichlorobenzene | 460 U | naphthalene | 460 U |
| 1,4-dichlorobenzene | 460 U | 4-chloroaniline | 460 U |
| benzyl alcohol | 460 U | hexachlorobutadiene | 460 U |
| 1,2-dichlorobenzene | 460 U | 4-chloro-3-methylphenol | 460 U |
| 2-methylphenol | 460 U | 2-methylnaphthalene | 460 U |
| bis(2-chloroisopropyl)ether | 460 U | hexachlorocyclopentadiene | 460 U |
| 4-methylphenol | 460 U | 2,4,6-trichlorophenol | 460 U |
| n-nitroso-di-n-propylamine | 460 U | 2,4,5-trichlorophenol | 2,200 U |
| hexachloroethane | 460 U | 2-chloronaphthalene | 460 U |
| nitrobenzene | 460 U | 2-nitroaniline | 2,200 U |
| isophorone | 460 U | dimethyl phthalate | 460 U |
| 2-nitrophenol | 460 U | acenaphthylene | 460 U |
| 2,4-dimethylphenol | 460 U | 2,6-dinitrotoluene | 460 U |
| benzoic acid | 52 J | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92
Dilution Factor: 1.00
% Moisture: 29

Sanford, Cohen and Associates
June 23, 1992

Brandeis-Bardin Institute
Sodium Burn Pit Watershed
1801

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 51247

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBB180001SD/89235

Lab Sample ID: K1132

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 2,200 U | anthracene | 460 U |
| acenaphthene | 460 U | di-n-butylphthalate | 460 U |
| 2,4-dinitrophenol | 2,200 U | fluoranthene | 460 U |
| 4-nitrophenol | 2,200 U | pyrene | 460 U |
| dibenzofuran | 460 U | butylbenzylphthalate | 120 J |
| 2,4-dinitrotoluene | 460 U | 3,3'-dichlorobenzidine | 920 U |
| diethylphthalate | 460 U | benzo(a)anthracene | 460 U |
| 4-chlorophenyl-phenylether | 460 U | chrysene | 460 U |
| fluorene | 460 U | bis(2-ethylhexyl)phthalate | 240 J |
| 4-nitroaniline | 2,200 U | di-n-octylphthalate | 460 U |
| 4,6-dinitro-2-methylphenol | 2,200 U | benzo(b)fluoranthene | 460 U |
| n-nitrosodiphenylamine ¹ | 460 U | benzo(k)fluoranthene | 460 U |
| 4-bromophenyl-phenylether | 460 U | benzo(a)pyrene | 460 U |
| hexachlorobenzene | 460 U | indeno(1,2,3-cd)pyrene | 460 U |
| pentachlorophenol | 2,200 U | dibenzo(a,h)anthracene | 460 U |
| phenanthrene | 460 U | benzo(g,h,i)perylene | 460 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
1 - Detected as diphenylamine.

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92
Dilution Factor: 1.00
% Moisture: 29

Sanford, Cohen and Associates
May 29, 1992

Brandeis-Bardin Institute
Sodium Reactor Experimental Watershed
1903

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 51263

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: EBB19003SD/90437
Lab Sample ID: K1271

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 460 U | bis(2-chloroethoxy)methane | 460 U |
| bis(2-chloroethyl)ether | 460 U | 2,4-dichlorophenol | 460 U |
| 2-chlorophenol | 460 U | 1,2,4-trichlorobenzene | 460 U |
| 1,3-dichlorobenzene | 460 U | naphthalene | 460 U |
| 1,4-dichlorobenzene | 460 U | 4-chloroaniline | 460 U |
| benzyl alcohol | 460 U | hexachlorobutadiene | 460 U |
| 1,2-dichlorobenzene | 460 U | 4-chloro-3-methylphenol | 460 U |
| 2-methylphenol | 460 U | 2-methylnaphthalene | 460 U |
| bis(2-chloroisopropyl)ether | 460 U | hexachlorocyclopentadiene | 460 U |
| 4-methylphenol | 150 J | 2,4,6-trichlorophenol | 460 U |
| n-nitroso-di-n-propylamine | 460 U | 2,4,5-trichlorophenol | 2,300 U |
| hexachloroethane | 460 U | 2-chloronaphthalene | 460 U |
| nitrobenzene | 460 U | 2-nitroaniline | 2,300 U |
| isophorone | 460 U | dimethyl phthalate | 460 U |
| 2-nitrophenol | 460 U | acenaphthylene | 460 U |
| 2,4-dimethylphenol | 460 U | 2,6-dinitrotoluene | 460 U |
| benzoic acid | 2,300 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/29/92
Date of Analysis: 05/05/92
Dilution Factor: 1.00
% Moisture: 29

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 2 of 2

Job Number: SON 51263

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: EBB19003SD/90437
 Lab Sample ID: K1271

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 2,300 U | anthracene | 460 U |
| acenaphthene | 460 U | di-n-butylphthalate | 460 U |
| 2,4-dinitrophenol | 2,300 U | fluoranthene | 460 U |
| 4-nitrophenol | 2,300 U | pyrene | 460 U |
| dibenzofuran | 460 U | butylbenzylphthalate | 220 J |
| 2,4-dinitrotoluene | 460 U | 3,3'-dichlorobenzidine | 930 U |
| diethylphthalate | 460 U | benzo(a)anthracene | 460 U |
| 4-chlorophenyl-phenylether | 460 U | chrysene | 460 U |
| fluorene | 460 U | bis(2-ethylhexyl)phthalate | 210 J |
| 4-nitroaniline | 2,300 U | di-n-octylphthalate | 460 U |
| 4,6-dinitro-2-methylphenol | 2,300 U | benzo(b)fluoranthene | 460 U |
| n-nitrosodiphenylamine ¹ | 460 U | benzo(k)fluoranthene | 460 U |
| 4-bromophenyl-phenylether | 460 U | benzo(a)pyrene | 460 U |
| hexachlorobenzene | 460 U | indeno(1,2,3-cd)pyrene | 460 U |
| pentachlorophenol | 2,300 U | dibenzo(a,h)anthracene | 460 U |
| phenanthrene | 460 U | benzo(g,h,i)perylene | 460 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- 1 - Detected as diphenylamine.

Date of Extraction: 04/29/92
 Date of Analysis: 05/05/92
 Dilution Factor: 1.00
 % Moisture: 29

Section 2. a. Semivolatile Organic Compounds In Soil
Santa Monica Mountains Conservancy

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 1 of 2

Job Number: SON 51018

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: ESM01004SD/88584

Lab Sample ID: SS8487

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 760 U | bis(2-chloroethoxy)methane | 760 U |
| bis(2-chloroethyl)ether | 760 U | 2,4-dichlorophenol | 760 U |
| 2-chlorophenol | 760 U | 1,2,4-trichlorobenzene | 760 U |
| 1,3-dichlorobenzene | 760 U | naphthalene | 760 U |
| 1,4-dichlorobenzene | 760 U | 4-chloroaniline | 760 U |
| benzyl alcohol | 760 U | hexachlorobutadiene | 760 U |
| 1,2-dichlorobenzene | 760 U | 4-chloro-3-methylphenol | 760 U |
| 2-methylphenol | 760 U | 2-methylnaphthalene | 760 U |
| bis(2-chloroisopropyl)ether | 760 U | hexachlorocyclopentadiene | 760 U |
| 4-methylphenol | 760 U | 2,4,6-trichlorophenol | 760 U |
| n-nitroso-di-n-propylamine | 760 U | 2,4,5-trichlorophenol | 3,700 U |
| hexachloroethane | 760 U | 2-chloronaphthalene | 760 U |
| nitrobenzene | 760 U | 2-nitroaniline | 3,700 U |
| isophorone | 760 U | dimethyl phthalate | 760 U |
| 2-nitrophenol | 760 U | acenaphthylene | 760 U |
| 2,4-dimethylphenol | 760 U | 2,6-dinitrotoluene | 760 U |
| benzoic acid | 3,700 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/30/92
 Date of Analysis: 04/02/92
 Dilution Factor: 2.0
 % Moisture: 13

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 2 of 2

Job Number: SON 51018

SEMIVOLATILE ORGANIC ANALYSIS (continued)
 Results in µg/kg (ppb) dry weight
 Sample Matrix: Soil

Client Sample ID: ESM01004SD/88584
 Lab Sample ID: SS8487

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 3,700 U | anthracene | 760 U |
| acenaphthene | 760 U | di-n-butylphthalate | 760 U |
| 2,4-dinitrophenol | 3,700 U | fluoranthene | 760 U |
| 4-nitrophenol | 3,700 U | pyrene | 760 U |
| dibenzofuran | 760 U | butylbenzylphthalate | 760 U |
| 2,4-dinitrotoluene | 760 U | 3,3'-dichlorobenzidine | 1,500 U |
| diethylphthalate | 760 U | benzo(a)anthracene | 760 U |
| 4-chlorophenyl-phenylether | 760 U | chrysene | 760 U |
| fluorene | 760 U | bis(2-ethylhexyl)phthalate | 180 J |
| 4-nitroaniline | 3,700 U | di-n-octylphthalate | 760 U |
| 4,6-dinitro-2-methylphenol | 3,700 U | benzo(b)fluoranthene | 760 U |
| n-nitrosodiphenylamine ¹ | 760 U | benzo(k)fluoranthene | 760 U |
| 4-bromophenyl-phenylether | 760 U | benzo(a)pyrene | 760 U |
| hexachlorobenzene | 760 U | indeno(1,2,3-cd)pyrene | 760 U |
| pentachlorophenol | 3,700 U | dibenzo(a,h)anthracene | 760 U |
| phenanthrene | 760 U | benzo(g,h,i)perylene | 760 U |

(1) Detected as diphenylamine.

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/30/92
 Date of Analysis: 04/02/92
 Dilution Factor: 2.0
 % Moisture: 13

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 1 of 2

SEMIVOLATILE TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: ESM02019SD/88385

Lab Sample ID: SS7606

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 390 U | bis(2-chloroethoxy)methane | 390 U |
| bis(2-chloroethyl)ether | 390 U | 2,4-dichlorophenol | 390 U |
| 2-chlorophenol | 390 U | 1,2,4-trichlorobenzene | 390 U |
| 1,3-dichlorobenzene | 390 U | naphthalene | 390 U |
| 1,4-dichlorobenzene | 390 U | 4-chloroaniline | 390 U |
| benzyl alcohol | 390 U | hexachlorobutadiene | 390 U |
| 1,2-dichlorobenzene | 390 U | 4-chloro-3-methylphenol | 390 U |
| 2-methylphenol | 390 U | 2-methylnaphthalene | 390 U |
| bis(2-chloroisopropyl)ether | 390 U | hexachlorocyclopentadiene | 390 U |
| 4-methylphenol | 390 U | 2,4,6-trichlorophenol | 390 U |
| n-nitroso-di-n-propylamine | 390 U | 2,4,5-trichlorophenol | 1,900 U |
| hexachloroethane | 390 U | 2-chloronaphthalene | 390 U |
| nitrobenzene | 390 U | 2-nitroaniline | 1,900 U |
| isophorone | 390 U | dimethyl phthalate | 390 U |
| 2-nitrophenol | 390 U | acenaphthylene | 390 U |
| 2,4-dimethylphenol | 390 U | 2,6-dinitrotoluene | 390 U |
| benzoic acid | 1,900 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
 Date of Analysis: 03/25/92
 Dilution Factor: 1.00
 % Moisture: 15

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

Analysis Sheet 2 of 2

SEMIVOLATILE TARGET COMPOUND LIST (continued)
 Results in µg/kg (ppb) dry weight
 Sample Matrix: Soil

Client Sample ID: ESM02019SD/88385
 Lab Sample ID: SS7606

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,900 U | anthracene | 390 U |
| acenaphthene | 390 U | di-n-butylphthalate | 390 U |
| 2,4-dinitrophenol | 1,900 U | fluoranthene | 390 U |
| 4-nitrophenol | 1,900 U | pyrene | 390 U |
| dibenzofuran | 390 U | butylbenzylphthalate | 390 U |
| 2,4-dinitrotoluene | 390 U | 3,3'-dichlorobenzidine | 770 U |
| diethylphthalate | 390 U | benzo(a)anthracene | 390 U |
| 4-chlorophenyl-phenylether | 390 U | chrysene | 390 U |
| fluorene | 390 U | bis(2-ethylhexyl)phthalate | 59 J |
| 4-nitroaniline | 1,900 U | di-n-octylphthalate | 390 U |
| 4,6-dinitro-2-methylphenol | 1,900 U | benzo(b)fluoranthene | 390 U |
| n-nitrosodiphenylamine ¹ | 390 U | benzo(k)fluoranthene | 390 U |
| 4-bromophenyl-phenylether | 390 U | benzo(a)pyrene | 390 U |
| hexachlorobenzene | 390 U | indeno(1,2,3-cd)pyrene | 390 U |
| pentachlorophenol | 1,900 U | dibenzo(a,h)anthracene | 390 U |
| phenanthrene | 390 U | benzo(g,h,i)perylene | 390 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- 1 - Detected as diphenylamine.

Date of Extraction: 03/17/92
 Date of Analysis: 03/25/92
 Dilution Factor: 1.00
 % Moisture: 15

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 1 of 2

Job Number: SON 50938

SEMIVOLATILE TARGET COMPOUND LIST

Results in µg/kg (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: ESM03001SD/88337

Lab Sample ID: SS7607

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 420 U | bis(2-chloroethoxy)methane | 420 U |
| bis(2-chloroethyl)ether | 420 U | 2,4-dichlorophenol | 420 U |
| 2-chlorophenol | 420 U | 1,2,4-trichlorobenzene | 420 U |
| 1,3-dichlorobenzene | 420 U | naphthalene | 420 U |
| 1,4-dichlorobenzene | 420 U | 4-chloroaniline | 420 U |
| benzyl alcohol | 420 U | hexachlorobutadiene | 420 U |
| 1,2-dichlorobenzene | 420 U | 4-chloro-3-methylphenol | 46 J |
| 2-methylphenol | 420 U | 2-methylnaphthalene | 420 U |
| bis(2-chloroisopropyl)ether | 420 U | hexachlorocyclopentadiene | 420 U |
| 4-methylphenol | 420 U | 2,4,6-trichlorophenol | 420 U |
| n-nitroso-di-n-propylamine | 420 U | 2,4,5-trichlorophenol | 2,000 U |
| hexachloroethane | 420 U | 2-chloronaphthalene | 420 U |
| nitrobenzene | 420 U | 2-nitroaniline | 2,000 U |
| isophorone | 420 U | dimethyl phthalate | 420 U |
| 2-nitrophenol | 420 U | acenaphthylene | 420 U |
| 2,4-dimethylphenol | 420 U | 2,6-dinitrotoluene | 420 U |
| benzoic acid | 2,000 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
 Date of Analysis: 03/25/92
 Dilution Factor: 1.00
 % Moisture: 22

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 2 of 2

Job Number: SON 50938

SEMIVOLATILE TARGET COMPOUND LIST (continued)
 Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
 Sample Matrix: Soil

Client Sample ID: ESM03001SD/88337
 Lab Sample ID: SS7607

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 2,000 U | anthracene | 66 J |
| acenaphthene | 420 U | di-n-butylphthalate | 420 U |
| 2,4-dinitrophenol | 2,000 U | fluoranthene | 240 J |
| 4-nitrophenol | 2,000 U | pyrene | 240 J |
| dibenzofuran | 420 U | butylbenzylphthalate | 420 U |
| 2,4-dinitrotoluene | 420 U | 3,3'-dichlorobenzidine | 840 U |
| diethylphthalate | 420 U | benzo(a)anthracene | 70 J |
| 4-chlorophenyl-phenylether | 420 U | chrysene | 95 J |
| fluorene | 420 U | bis(2-ethylhexyl)phthalate | 50 J |
| 4-nitroaniline | 2,000 U | di-n-octylphthalate | 420 U |
| 4,6-dinitro-2-methylphenol | 2,000 U | benzo(b)fluoranthene | 68 J |
| n-nitrosodiphenylamine ¹ | 420 U | benzo(k)fluoranthene | 420 U |
| 4-bromophenyl-phenylether | 420 U | benzo(a)pyrene | 420 U |
| hexachlorobenzene | 420 U | indeno(1,2,3-cd)pyrene | 420 U |
| pentachlorophenol | 100 J | dibenzo(a,h)anthracene | 420 U |
| phenanthrene | 210 J | benzo(g,h,i)perylene | 420 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.
 i - Detected as diphenylamine.

Date of Extraction: 03/17/92
 Date of Analysis: 03/25/92
 Dilution Factor: 1.00
 % Moisture: 22

Section 2. a. Semivolatile Organic Compounds In Soil
Background Locations

Sanford, Cohen and Associates
April 8, 1992

Background Location
Santa Susana Park
0207

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50938

SEMIVOLATILE TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight
Sample Matrix: Soil

Client Sample ID: EBG02007SD/88500
Lab Sample ID: SS7605

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 340 U | bis(2-chloroethoxy)methane | 340 U |
| bis(2-chloroethyl)ether | 340 U | 2,4-dichlorophenol | 340 U |
| 2-chlorophenol | 340 U | 1,2,4-trichlorobenzene | 340 U |
| 1,3-dichlorobenzene | 340 U | naphthalene | 340 U |
| 1,4-dichlorobenzene | 340 U | 4-chloroaniline | 340 U |
| benzyl alcohol | 340 U | hexachlorobutadiene | 340 U |
| 1,2-dichlorobenzene | 340 U | 4-chloro-3-methylphenol | 340 U |
| 2-methylphenol | 340 U | 2-methylnaphthalene | 340 U |
| bis(2-chloroisopropyl)ether | 340 U | hexachlorocyclopentadiene | 340 U |
| 4-methylphenol | 340 U | 2,4,6-trichlorophenol | 340 U |
| n-nitroso-di-n-propylamine | 340 U | 2,4,5-trichlorophenol | 1,700 U |
| hexachloroethane | 340 U | 2-chloronaphthalene | 340 U |
| nitrobenzene | 340 U | 2-nitroaniline | 1,700 U |
| isophorone | 340 U | dimethyl phthalate | 340 U |
| 2-nitrophenol | 340 U | acenaphthylene | 340 U |
| 2,4-dimethylphenol | 340 U | 2,6-dinitrotoluene | 340 U |
| benzoic acid | 1,700 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
Date of Analysis: 03/25/92
Dilution Factor: 1.00
% Moisture: 4

Sanford, Cohen and Associates
April 8, 1992

Background Location
Santa Susana Park
0207

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

Analysis Sheet 2 of 2

SEMIVOLATILE TARGET COMPOUND LIST (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG02007SD/88500

Lab Sample ID: SS7605

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,700 U | anthracene | 340 U |
| acenaphthene | 340 U | di-n-butylphthalate | 340 U |
| 2,4-dinitrophenol | 1,700 U | fluoranthene | 340 U |
| 4-nitrophenol | 1,700 U | pyrene | 340 U |
| dibenzofuran | 340 U | butylbenzylphthalate | 340 U |
| 2,4-dinitrotoluene | 340 U | 3,3'-dichlorobenzidine | 680 U |
| diethylphthalate | 340 U | benzo(a)anthracene | 340 U |
| 4-chlorophenyl-phenylether | 340 U | chrysene | 340 U |
| fluorene | 340 U | bis(2-ethylhexyl)phthalate | 36 J |
| 4-nitroaniline | 1,700 U | di-n-octylphthalate | 340 U |
| 4,6-dinitro-2-methylphenol | 1,700 U | benzo(b)fluoranthene | 340 U |
| n-nitrosodiphenylamine ¹ | 340 U | benzo(k)fluoranthene | 340 U |
| 4-bromophenyl-phenylether | 340 U | benzo(a)pyrene | 340 U |
| hexachlorobenzene | 340 U | indeno(1,2,3-cd)pyrene | 340 U |
| pentachlorophenol | 1,700 U | dibenzo(a,h)anthracene | 340 U |
| phenanthrene | 340 U | benzo(g,h,i)perylene | 340 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

1 - Detected as diphenylamine.

Date of Extraction: 03/17/92

Date of Analysis: 03/25/92

Dilution Factor: 1.00

% Moisture: 4

Sanford, Cohen and Associates
April 16, 1992

Background Location
Bell Canyon
0359

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

Analysis Sheet 1 of 3

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG03059SD/88345

Lab Sample ID: SS7709

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 980 U | bis(2-chloroisopropyl)ether | 980 U |
| acenaphthylene | 980 U | bis(2-ethylhexyl)phthalate | 980 U |
| anthracene | 980 U | 4-bromophenyl phenyl ether | 980 U |
| benzidine | 4,900 U | 2-chloronaphthalene | 980 U |
| benzo(a)anthracene | 980 U | 4-chlorophenyl phenyl ether | 980 U |
| benzo(b)fluoranthene | 980 U | chrysene | 980 U |
| benzo(k)fluoranthene | 980 U | dibenz(a,h)anthracene | 980 U |
| benzo(a)pyrene | 980 U | di-n-butylphthalate | 980 U |
| benzo(g,h,i)perylene | 980 U | 1,2-dichlorobenzene | 980 U |
| butylbenzylphthalate | 980 U | 1,3-dichlorobenzene | 980 U |
| bis(2-chloroethoxy)methane | 980 U | 1,4-dichlorobenzene | 980 U |
| bis(2-chloroethyl)ether | 980 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92

Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 16, 1992

Background Location
Bell Canyon
0359

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50952

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG03059SD/88345

Lab Sample ID: SS7709

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 2,000 U | hexachloroethane | 980 U |
| diethylphthalate | 980 U | indeno(1,2,3-cd)pyrene | 980 U |
| dimethyl phthalate | 980 U | isophorone | 980 U |
| 2,4-dinitrotoluene | 980 U | naphthalene | 980 U |
| 2,6-dinitrotoluene | 980 U | nitrobenzene | 980 U |
| di-n-octyl phthalate | 980 U | n-nitroso-di-n-propylamine | 980 U |
| 1,2-diphenylhydrazine(1) | 980 U | n-nitrosodimethylamine | 980 U |
| fluoranthene | 980 U | n-nitrosodiphenylamine(2) | 980 U |
| fluorene | 980 U | phenanthrene | 980 U |
| hexachlorobenzene | 980 U | pyrene | 980 U |
| hexachlorobutadiene | 980 U | 1,2,4-trichlorobenzene | 980 U |
| hexachlorocyclopentadiene | 980 U | | |

(1)-Screened for as azobenzene

(2)-Detected as diphenylamine

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 16, 1992

Background Location
Bell Canyon
03599

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50952

ACID EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG03059SD/88345
Lab Sample ID: SS7709

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 980 U | 2-nitrophenol | 980 U |
| 2-chlorophenol | 980 U | 4-nitrophenol | 4,900 U |
| 2,4-dichlorophenol | 980 U | pentachlorophenol | 4,900 U |
| 2,4-dimethylphenol | 980 U | phenol | 980 U |
| 2,4-dinitrophenol | 4,900 U | 2,4,6-trichlorophenol | 980 U |
| 2-methyl-4,6-dinitrophenol | 4,900 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 16, 1992

Background Location
Western Location
0429

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

Analysis Sheet 1 of 3

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG04029SD/88241
Lab Sample ID: SS7712R

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 840 U | bis(2-chloroisopropyl)ether | 840 U |
| acenaphthylene | 840 U | bis(2-ethylhexyl)phthalate | 840 U |
| anthracene | 840 U | 4-bromophenyl phenyl ether | 840 U |
| benzidine | 4,200 U | 2-chloronaphthalene | 840 U |
| benzo(a)anthracene | 840 U | 4-chlorophenyl phenyl ether | 840 U |
| benzo(b)fluoranthene | 840 U | chrysene | 840 U |
| benzo(k)fluoranthene | 840 U | dibenz(a,h)anthracene | 840 U |
| benzo(a)pyrene | 840 U | di-n-butylphthalate | 840 U |
| benzo(g,h,i)perylene | 840 U | 1,2-dichlorobenzene | 840 U |
| butylbenzylphthalate | 840 U | 1,3-dichlorobenzene | 840 U |
| bis(2-chloroethoxy)methane | 840 U | 1,4-dichlorobenzene | 840 U |
| bis(2-chloroethyl)ether | 840 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92
Date of Analysis: 04/06/92

Sanford, Cohen and Associates
April 16, 1992

Background Location
Western Location
0429

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

Job Number: SON 50952

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG04029SD/88241

Lab Sample ID: SS7712R

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 1,700 U | hexachloroethane | 840 U |
| diethylphthalate | 840 U | indeno(1,2,3-cd)pyrene | 840 U |
| dimethyl phthalate | 840 U | isophorone | 840 U |
| 2,4-dinitrotoluene | 840 U | naphthalene | 840 U |
| 2,6-dinitrotoluene | 840 U | nitrobenzene | 840 U |
| di-n-octyl phthalate | 840 U | n-nitroso-di-n-propylamine | 840 U |
| 1,2-diphenylhydrazine(1) | 840 U | n-nitrosodimethylamine | 840 U |
| fluoranthene | 840 U | n-nitrosodiphenylamine(2) | 840 U |
| fluorene | 840 U | phenanthrene | 840 U |
| hexachlorobenzene | 840 U | pyrene | 840 U |
| hexachlorobutadiene | 840 U | 1,2,4-trichlorobenzene | 840 U |
| hexachlorocyclopentadiene | 840 U | | |

(1)-Screened for as azobenzene

(2)-Detected as diphenylamine

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92

Date of Analysis: 04/06/92

Sanford, Cohen and Associates
April 16, 1992

Background Location
Western Location
0429

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50952

ACID EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: EBG04029SD/88241
Lab Sample ID: SS7712R

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 840 U | 2-nitrophenol | 840 U |
| 2-chlorophenol | 840 U | 4-nitrophenol | 4,200 U |
| 2,4-dichlorophenol | 840 U | pentachlorophenol | 4,200 U |
| 2,4-dimethylphenol | 840 U | phenol | 840 U |
| 2,4-dinitrophenol | 4,200 U | 2,4,6-trichlorophenol | 840 U |
| 2-methyl-4,6-dinitrophenol | 4,200 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92
Date of Analysis: 04/06/92

Section 2. b. Semivolatile Organic Compounds In Water
Brandeis-Bardin Institute

Sanford, Cohen and Associates
April 10, 1992

Brandeis-Bardin Institute
Campsite Area 1
Campsite Area 2
0301/0401
Analysis Sheet 1 of 1

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50975

Client Project ID: Sanford, Cohen and Associates

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

| Client Sample ID: Lab Sample ID: | Method Blank H0107 | EBB03001WF/196743 SS7891 | EBB04001WF/196731 SS7892 |
|-------------------------------------|-----------------------|-----------------------------|-----------------------------|
| naphthalene | 0.016 U | 0.16 U | 0.16 U |
| acenaphthylene | 0.016 U | 0.16 U | 0.16 U |
| acenaphthene | 0.0080 U | 0.080 U | 0.080 U |
| fluorene | 0.0080 U | 0.080 U | 0.080 U |
| phenanthrene | 0.0080 U | 0.080 U | 0.080 U |
| anthracene | 0.0080 U | 0.080 U | 0.080 U |
| fluoranthene | 0.0080 U | 0.080 U | 0.080 U |
| pyrene | 0.0080 U | 0.080 U | 0.080 U |
| benzo(a)anthracene | 0.0080 U | 0.080 U | 0.080 U |
| chrysene | 0.0080 U | 0.080 U | 0.080 U |
| benzo(b)fluoranthene | 0.0080 U | 0.080 U | 0.080 U |
| benzo(k)fluoranthene | 0.0080 U | 0.080 U | 0.080 U |
| benzo(a)pyrene | 0.0080 U | 0.080 U | 0.080 U |
| dibenzo(a,h)anthracene | 0.016 U | 0.16 U | 0.16 U |
| benzo(g,h,i)perylene | 0.0080 U | 0.080 U | 0.080 U |
| indeno(1,2,3-c,d)pyrene | 0.0080 U | 0.080 U | 0.080 U |

Extraction Date: 03/23/92
Analysis Date: 03/31/92

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
June 1, 1992

Brandeis-Bardin Institute
Radioactive Materials Disposal Facility
Watershed
1601

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 1

Job Number: SON 51257

POLYNUCLEAR AROMATIC HYDROCARBON ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

| Client Sample ID: Lab Sample ID: | Method Blank | EBB16001BWF/197327 |
|-------------------------------------|--------------|--------------------|
| | H0448 | K1239 |
| naphthalene | 0.016 U | 0.16 U* |
| acenaphthylene | 0.016 U | 0.16 U* |
| acenaphthene | 0.016 U | 0.16 U* |
| fluorene | 0.080 U* | 0.0080 U |
| phenanthrene | 0.0080 U | 0.0080 U |
| anthracene | 0.0080 U | 0.0080 U |
| fluoranthene | 0.0080 U | 0.33 |
| pyrene | 0.0080 U | 0.0080 U |
| benzo(a)anthracene | 0.0080 U | 0.0080 U |
| chrysene | 0.0080 U | 0.0080 U |
| benzo(b)fluoranthene | 0.0080 U | 0.0080 U |
| benzo(k)fluoranthene | 0.080 U* | 0.080 U* |
| benzo(a)pyrene | 0.0080 U | 0.0080 U |
| dibenzo(a,h)anthracene | 0.0080 U | 0.0080 U |
| benzo(g,h,i)perylene | 0.0080 U | 0.0080 U |
| indeno(1,2,3-c,d)pyrene | 0.0080 U | 0.0080 U |

Extraction Date: 04/29/92
Analysis Date: 05/22/92

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
* - Detection limit higher than normal due to sample matrix interferences.

Section 2. b. Semivolatile Organic Compounds In Water
Santa Monica Mountains Conservancy

Sanford, Cohen and Associates
April 8, 1992

Sanata Monica Mountains Conservancy
Antenna Well
0501

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

Analysis Sheet 1 of 1

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: ESM05001GG/196707
Lab Sample ID: SS7618

| <u>Compound</u> | <u>Concentration</u> |
|------------------------|----------------------|
| naphthalene | 10 U |
| acenaphthylene | 10 U |
| acenaphthene | 10 U |
| fluorene | 10 U |
| phenanthrene | 10 U |
| anthracene | 10 U |
| fluoranthene | 10 U |
| pyrene | 10 U |
| benzo(a)anthracene | 10 U |
| chrysene | 10 U |
| benzo(b)fluoranthene | 10 U |
| benzo(k)fluoranthene | 10 U |
| benzo(a)pyrene | 10 U |
| indeno(1,2,3-cd)pyrene | 10 U |
| dibenz(a,h)anthracene | 10 U |
| benzo(g,h,i)perylene | 10 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
Date of Analysis: 03/26/92
Dilution Factor: 1.0

Sanford, Cohen and Associates Santa Monica Mountains Conservancy
April 8, 1992 Well Near The Gate
0701

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 1

Job Number: SON 50938

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: ESM07001GG/170705
Lab Sample ID: SS7619

| <u>Compound</u> | <u>Concentration</u> |
|------------------------|----------------------|
| naphthalene | 10 U |
| acenaphthylene | 10 U |
| acenaphthene | 10 U |
| fluorene | 10 U |
| phenanthrene | 10 U |
| anthracene | 10 U |
| fluoranthene | 10 U |
| pyrene | 10 U |
| benzo(a)anthracene | 10 U |
| chrysene | 10 U |
| benzo(b)fluoranthene | 10 U |
| benzo(k)fluoranthene | 10 U |
| benzo(a)pyrene | 10 U |
| indeno(1,2,3-cd)pyrene | 10 U |
| dibenz(a,h)anthracene | 10 U |
| benzo(g,h,i)perylene | 10 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
Date of Analysis: 03/26/92
Dilution Factor: 1.0

Sanford, Cohen and Associates Santa Monica Mountains Conservancy
April 21, 1992 Spring 0801

JT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 1

Job Number: SON 50985

POLYNUCLEAR AROMATIC HYDROCARBONS ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID: ESM08001WF/171805
Lab Sample ID: SS8087

| <u>Compound</u> | <u>Concentration</u> |
|------------------------|----------------------|
| naphthalene | 0.16 U |
| acenaphthylene | 0.080 U |
| acenaphthene | 0.16 U |
| fluorene | 0.080 U |
| phenanthrene | 0.080 U |
| anthracene | 0.080 U |
| fluoranthene | 0.080 U |
| pyrene | 0.080 U |
| benzo(a)anthracene | 0.080 U |
| chrysene | 0.080 U |
| benzo(b)fluoranthene | 0.080 U |
| benzo(k)fluoranthene | 0.080 U |
| benzo(a)pyrene | 0.080 U |
| dibenzo(a,h)anthracene | 0.16 U |
| benzo(g,h,i)perylene | 0.16 U |
| indeno(1,2,3-cd)pyrene | 0.080 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
Date of Analysis: 03/31/92

Section 2. b. Semivolatile Organic Compounds In Water
Background Locations

Sanford, Cohen and Associates
April 8, 1992

Background Location
Rocky Peak
0102

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 1

Job Number: SON 50938

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: EBG01002WH/196718
Lab Sample ID: SS7617

| <u>Compound</u> | <u>Concentration</u> |
|------------------------|----------------------|
| naphthalene | 10 U |
| acenaphthylene | 10 U |
| acenaphthene | 10 U |
| fluorene | 10 U |
| phenanthrene | 10 U |
| anthracene | 10 U |
| fluoranthene | 10 U |
| pyrene | 10 U |
| benzo(a)anthracene | 10 U |
| chrysene | 10 U |
| benzo(b)fluoranthene | 10 U |
| benzo(k)fluoranthene | 10 U |
| benzo(a)pyrene | 10 U |
| indeno(1,2,3-cd)pyrene | 10 U |
| dibenz(a,h)anthracene | 10 U |
| benzo(g,h,i)perylene | 10 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
Date of Analysis: 03/26/92
Dilution Factor: 1.0



APPENDIX C

Case Narratives for Chemical Analyses



ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

April 7, 1992

Job Number: SON 50938

P.O. Number: N/A

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|-------------------------------------|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 03/16/92 |
| Number of Samples: | Six (6) |
| Sample Type: | Water - three (3), Soil - three (3) |

I. Introduction

On 03/16/92, three (3) water samples and three (3) soil samples arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

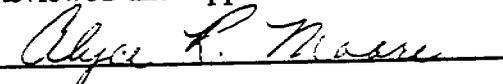
II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy, and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

Reviewed and Approved:


Alyce R. Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Sanford, Cohen and Associates
April 8, 1992

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

II. Analytical Results/Methodology (continued)

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on a Finnigan OWA GC/MS/DS. A single point calibration was used for 1,1,2-trichlorotrifluoroethane. The sample runs went well. MS/MSD analysis was performed for water samples using sample ESM07001GH with acceptable results. Associated QC samples for soil samples were analyzed with ITAS project SON 50952, sample EBG03059SE. The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS-XL GC/MS/DS. The sample runs went well. Due to a confusion on sample receipt, the water samples were extracted for polynuclear aromatic hydrocarbons for analysis by method 8270 instead of the requested 8310 method. Joe Stinson was notified and the samples were processed by method 8270. MS/MSD analysis was performed for water samples using sample ESM07001GG. Associated QC samples for soil samples were analyzed with ITAS project SON 50952, sample EBG03059SD. There were no other problems seen in final data review.

The samples were digested on 03/25/92 for ICP and 03/25 and 03/27 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 03/26/92; the GFAA analyses for arsenic, lead, selenium and thallium were performed from 03/26 to 03/29/92; the remaining metals were analyzed by ICP on 03/30/92. All run QC was acceptable. A duplicate/spike pair was prepared using sample number EBG01002WG. All results were within acceptable limits. Associated QC samples for soils were analyzed with ITAS project SON 50952, sample EBG03059SF. No other problems were encountered.



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ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

April 10, 1992

Job Number: SON 50975

P.O. Number: N/A

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|--|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 03/19/92 |
| Number of Samples: | Nine (9) |
| Sample Type: | Soil - Five (5), Water - Two (2), Trip Blank - (2) |

I. Introduction

On 03/19/92, five (5) soil samples, two (2) water samples and two (2) trip blanks arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

The samples were analyzed for polynuclear aromatic hydrocarbons based on modified EPA method 8310.

Reviewed and Approved:

Alyce R. Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Sanford, Cohen and Associates
April 10, 1992

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on a Finnigan OWA GC/MS/DS. The sample runs went well. The water samples were run by heated purge and referenced against Method Blank, a soil blank. The listed values for VBLK1 can be read directly as $\mu\text{g/liter}$ or $\mu\text{g/kg}$. Acetonitrile was seen in Method Blank 1 and Method Blank 2 at about scan 95, and was due to solvent carryover from the continuing calibration standard. Associated QC samples were analyzed with ITAS project SON 50952, sample EBG03059JE for soils and SON 50958, sample ESM07001GH for waters. The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan INCOS-XL GC/MS/DS. The sample runs went well. Associated QC samples were analyzed with ITAS project SON 50952, sample EBG03059SD. There were no problems seen in final data review.

The samples were analyzed for PNAs by method 8310 on 03/31/92. No problems were encountered. Associated QC samples were submitted with ITAS project SON 50938 and were analyzed by method 8270.

The samples were digested on 03/25/92 for ICP and 03/25/92 and 03/27/92 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 03/26/92; the GFAA analyses for arsenic, lead, selenium, and thallium were performed from 03/27 to 03/29/92; the remaining metals were analyzed by ICP on 03/30/92. All run QC was acceptable. Associated QC samples were analyzed with ITAS project SON 50952, sample EBG03059SF for soils and SON 50938, sample EBG01002WH for waters. Dilutions were necessary to put the sample results within the instrument's linear range or to dilute matrix interferences. No other problems were encountered.



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ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

April 16, 1992

Job Number: SON 50952

P.O. Number: N/A

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|--------------------------------------|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 03/17/92 |
| Number of Samples: | Three (3) |
| Sample Type: | Soil - Two (2), Trip Blank - One (1) |

I. Introduction

On 03/17/92, two (2) soil samples and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

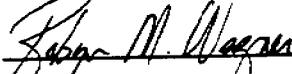
II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

Reviewed and Approved:



Robyn M. Wagner
Operations Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

C-5

IT Analytical Services, 5815 Middlebrook Pike, Knoxville, TN 37921

681-1-84

II. Analytical Results/Methodology (continued)

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on a Finnigan OWA GC/MS/DS. The sample runs went well. A single point calibration curve was used for the freon-113. MS/MSD analysis was performed on sample EBG03059SE with acceptable results. The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample runs generally went well, however, surrogate and spike recoveries in EBD03059SD MS indicated an inefficient extraction for this sample. Reextractions were immediately ordered and analyzed. Reextraction results showed good surrogate and spike recoveries. Only the original matrix spike extraction had low recoveries; the original extraction, matrix spike duplicate and reextractions of the sample, matrix spike and matrix spike duplicate showed acceptable recoveries. Since the reextraction was outside sample holding times and apparently not due to sample matrix, both the original and reextraction data were submitted for comparison. There were no problems seen in final data review.

The samples were digested on 03/23/92 for ICP and 03/20/92 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 03/24/92; the GFAA analyses for arsenic, lead, selenium, and thallium were performed from 03/25 through 03/30/92; the remaining metals were analyzed by ICP on 03/24/92. All run QC was acceptable. A duplicate/spike pair was prepared using sample number EBG03059SF. Spike recovery (accuracy) results were within acceptance limits for all parameters by ICP analysis except for antimony and cadmium. The cadmium spike recovery is just outside acceptance limits on the low side (74.0% recovery). Poor spike recovery for antimony on soil samples is well documented in chemical literature. Spike recovery results by GFAA and CVAA were within acceptance limits for all parameters except lead by GFAA. Sample nonhomogeneity, as well as matrix interferences, may be a contributing factor for this. Lead on sample EBG03059SF was reported by method of standard additions due to matrix interferences. Duplicate RPD (precision) results were within acceptance limits for all requested parameters by ICP. Duplicate RPD (precision) results by GFAA and CVAA were within acceptance limits for all parameters except for selenium and thallium by GFAA, which exhibited a slight variation. No other problems were encountered.



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CERTIFICATE OF ANALYSIS

April 21, 1992

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

P.O. Number: N/A

Job Number: SON 50998

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|--------------------------------------|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 03/24/92 |
| Number of Samples: | Two (2) |
| Sample Type: | Soil - One (1), Trip Blank - One (1) |

I. Introduction

On 03/24/92, one (1) soil sample and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. The soil sample is reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

Reviewed and Approved:

Robyn M. Wagner
Operations Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Sanford, Cohen and Associates
April 21, 1992

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on a Finnigan OWA GC/MS/DS. The sample runs went well. The travel blank was analyzed by heated purge allowing the results to be read as $\mu\text{g}/\text{liter}$ or $\mu\text{g}/\text{kg}$. A single point calibration curve was used for 1,1,2-trichlorotrifluoroethane. Associated QC samples were analyzed with ITAS project SON 50938, sample ESM07001GH. The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample runs went well. A moderate 1:2 dilution was performed by the analyst at the bench based on the appearance of the extract. Associated QC samples were analyzed with ITAS project SON 50952, sample EBG03059SD. There were no problems seen in final data review.

The samples were digested on 04/01/92 for ICP and 04/06/92 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 04/07/92; the GFAA analyses for arsenic, lead, selenium, and thallium were performed on 04/06/92; the remaining metals were analyzed by ICP on 04/02/92. All run QC was acceptable. Associated QC samples were analyzed with ITAS project SON 50952, sample EBG03059SF. No other problems were encountered.



ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

April 21, 1992

Job Number: SON 51018

P.O. Number: N/A

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|--------------------------------------|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 03/26/92 |
| Number of Samples: | Three (3) |
| Sample Type: | Soil - Two (2), Trip Blank - One (1) |

I. Introduction

On 03/26/92, two (2) soil samples and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

Reviewed and Approved:

Alyce R. Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Sanford, Cohen and Associates
April 21, 1992

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on a Finnigan OWA GC/MS/DS. The sample runs went well. A single point calibration was used for Freon-113. The travel blank was analyzed by heated purge and the results can be read directly as $\mu\text{g/liter}$ or $\mu\text{g/kg}$. An MS/MSD was performed using sample ESM01007SE with acceptable results.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample runs went well. ESM01004SD and ESM01007SB were spiked at twice the normal surrogate concentration; however, recoveries were within acceptable limits. An MS/MSD was performed using sample ESM01007SB with acceptable results. There were no problems seen in final data review.

The samples were digested on 04/01/92 for ICP and 04/06/92 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 04/07/92; the GFAA analyses for arsenic, lead, selenium, and thallium were performed from 04/06/92 to 04/08/92; the remaining metals were analyzed by ICP on 04/02/92. All run QC was acceptable. A duplicate/spike pair was prepared using sample number ESM01007SF. Spike recovery (accuracy) results were outside of control limits for antimony and selenium. A post digestion spike was performed and was outside of control limits for selenium, which indicates a matrix interference for selenium. Poor spike recovery for antimony is well documented in literature. Duplicate RPD (precision) results were acceptable for all parameters. No other problems were encountered.



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ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

April 21, 1992

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

P.O. Number: N/A

Job Number: SON 50985

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|---|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 03/20/92 |
| Number of Samples: | Five (5) |
| Sample Type: | Soil - Three (3), Water - One (1), Trip Blank - One (1) |

I. Introduction

On 03/20/92, three (3) soil samples, one (1) water sample and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

The samples were analyzed for polynuclear aromatic hydrocarbons based on modified EPA method 8310.

Reviewed and Approved:

Alyce R. Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Sanford, Cohen and Associates
April 21, 1992

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on a Finnigan OWA GC/MS/DS. The sample runs went well. A single point calibration curve was used for Freon-113; however, this target compound was not seen. The water samples were analyzed using a heated purge technique. Associated QC samples were analyzed with ITAS project SON 50938, sample ESM07001GH for waters and SON 50952, sample EBG03059JE for soils. The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Finnigan 4500 GC/MS/DS. The sample runs went well; however, a moderate dilution was applied by the analyst based on the appearance of the extracts. Associated QC samples were analyzed with ITAS project SON 50952, sample EBG03059SD. There were no other problems seen in final data review.

The samples were analyzed for PNAs by method 8310 on 03/31/92. Associated QC samples were analyzed with ITAS project SON 50938, sample ESM07001GG. No major problems were encountered.

The samples were digested on 03/26/92 and 03/27/92 for ICP and 03/26/92 for GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 03/30/92; the GFAA analyses for arsenic, lead, selenium and thallium were performed from 03/29 to 04/01/92; the remaining metals were analyzed by ICP on 03/30/92. All run QC was acceptable. Associated QC samples were analyzed with ITAS project SON 50938, sample EBG01002WH for waters and SON 50952, sample EBG03059SF for soils. No problems were encountered.



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ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

May 29, 1992

Job Number: SON 51263

P.O. Number: N/A

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|---|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 04/27/92 |
| Number of Samples: | Four (4) |
| Sample Type: | Soil - two (2), Water - one (1), Trip Blank - one (1) |

I. Introduction

On 04/27/92, two (2) soil samples, one (1) water sample and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

Reviewed and Approved:

Alyce R. Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Sanford, Cohen and Associates
May 29, 1992

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on two Finnigan OWA GC/MS/DS units. The samples runs went well. Associated QC samples were analyzed with ITAS project SON 51247, sample EMBB18001 for soils and SON 51257, sample EMBB16001 for waters.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Fison VG TRIO-1 GC/MS/DS. The sample runs went well. The sample extract was lost in the initial extraction of EBB16001BSE, and a reextraction was done within sample holding times. Method QC was acceptable. Associated QC samples were analyzed with ITAS project SON 51247, sample EMBB18001.

The samples were digested on 05/01/92 for ICP and GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 05/14/92; the GFAA analyses for arsenic, cadmium, lead, silver, selenium and thallium were performed from 05/04/92 to 05/06/92; the remaining metals were analyzed by ICP on 05/06/92. All run QC was acceptable. Associated QC samples were analyzed with ITAS project SON 51247, sample EMBB18001. The soil samples were screened for radioactivity as level II. Due to the amount of soil in the container for metals analysis, ITAS-Knoxville could not receive the containers. Therefore, the analyses were performed from the container designated for semivolatiles. No other problems were encountered.



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CERTIFICATE OF ANALYSIS

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

June 1, 1992

Job Number: SON 51257

P.O. Number: N/A

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|---|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 04/24/92 |
| Number of Samples: | Three (3) |
| Sample Type: | Soil - one (1), Water - one (1), Trip Blank - one (1) |

I. Introduction

On 04/24/92, one (1) soil sample, one (1) water sample and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

Reviewed and Approved:

Alyce R. Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

Sanford, Cohen and Associates
June 1, 1992

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

II. Analytical Results/Methodology (continued)

The samples were analyzed for polynuclear aromatic hydrocarbons based on modified EPA method 8310.

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on two Finnigan OWA GC/MS/DS units. The sample runs went well. An MS/MSD was performed using sample EBB16001BWH with acceptable results. Associated QC samples for soils were analyzed with ITAS project SON 51247, sample EMBB18001SE.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Fison VG TRIO-1 GC/MS/DS. The sample runs went well, however, due to the appearance of the extract, a moderate dilution was analyzed. Associated QC samples were analyzed with ITAS project SON 51247, sample EMBB18001SD. There were no problems seen in final data review.

The samples were analyzed for PNAs on 05/21 and 05/22/92. Some elevated detection limits were reported due to matrix interferences. Matrix spike/matrix spike duplicate analyses were performed using sample EBB16001BWF. Recoveries for anthracene were high. This was due to a contaminant found in the spiking solution. No other problems were encountered.

The soil sample was digested on 05/22/92 for ICP and GFAA. The sample for mercury analysis was prepared just prior to analysis. The CVAA analysis for mercury was performed on 05/18/92; the GFAA analyses for arsenic, lead, selenium and thallium were performed from 05/26/92 to 05/28/92; the remaining metals were analyzed by ICP on 05/26/92. All run QC was acceptable. Associated QC samples were analyzed with ITAS project SON 51247, sample EMBB18001SD. No problems were encountered.

The water sample was digested on 05/04/92 for ICP and GFAA. The sample for mercury analysis was prepared just prior to analysis. The CVAA analysis for mercury was performed on 05/05/92; the GFAA analyses for arsenic, lead, selenium and thallium were performed from 05/04/92 to 05/06/92; the remaining

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June 1, 1992

IT ANALYTICAL SERVICES
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KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

III. Quality Control (continued)

metals were analyzed by ICP on 05/06/92. All run QC was acceptable. A duplicate/spike pair was prepared using sample number EBB16001BWG. Spike recovery (accuracy) results were outside control limits for cadmium by ICP and lead by GFAA for both the spike and a post-digestion spike, indicating a possible matrix interference for both elements. Duplicate RPD (precision) results were within acceptance limits for all parameters. No other problems were encountered.



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CERTIFICATE OF ANALYSIS

Sanford, Cohen and Associates
c/o USEPA-NAREL
1504 Avenue A
Montgomery, AL 36115-2601
Attn: Joe Stinson

June 23, 1992

Job Number: SON 51247

P.O. Number: N/A

This is the Certificate of Analysis for the following samples:

| | |
|-----------------------|--|
| Client Project ID: | Sanford, Cohen and Associates |
| Date Received by Lab: | 04/23/92 |
| Number of Samples: | Four (4) |
| Sample Type: | Soil - three (3), Trip Blank - one (1) |

I. Introduction

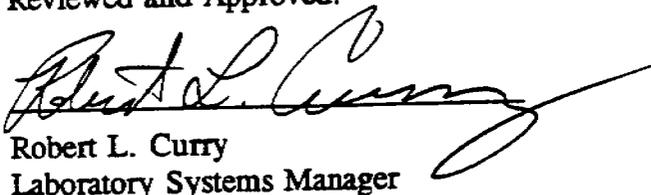
On 04/23/92, three (3) soil samples and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from Sanford, Cohen and Associates in Montgomery, Alabama, via the ITAS-Oak Ridge, Tennessee laboratory. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that the data are not blank corrected. Soil samples are reported on a dry weight basis.

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270.

Reviewed and Approved:


Robert L. Curry
Laboratory Systems Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA), and inductively coupled plasma spectroscopy (ICP) based on EPA SW-846 methods 7470, 7471, 7060, 7741, 7841 and 6010.

The samples were analyzed for Iodine-129 at the ITAS-Oak Ridge, Tennessee, laboratory. A copy of their report will follow.

III. Quality Control

The volatiles analyses were performed by purge and trap with a J&W DB-624 megabore column on a Finnigan OWA GC/MS/DS and a Finnigan INCOS-500 GC/MS/DS. The sample runs generally went well; however, the sample, Travel Blank, was inadvertently run outside sample holding time by one day. No targets were detected in this sample, and the data from the other samples are not negatively impacted. A single point calibration was used for 1,1,2-trichlorotrifluoroethane. The MS/MSD on sample EMBB18001SD for the volatiles fraction was analyzed fourteen (14) days outside sample holding times due to an error when logging the samples into the laboratory. The original sample was analyzed within holding time, and there was good agreement between the QC and sample.

The semivolatiles analyses were performed by direct injection of sample extract on a Restek XTI-5 capillary column on a Fisons VG TRIO-1 GC/MS/DS, with MS/MSD analyses performed on a Finnigan 4500. The MS/MSD on sample EMBB18001SD was extracted fourteen (14) days outside sample holding time due to an error when logging the samples into the laboratory. The original sample was extracted within sample holding time, and there was good agreement between the QC and sample. The sample runs went well. There were no other problems seen in final data review.

The samples were digested on 05/01/92 for ICP and GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 05/05/92; the GFAA analyses for arsenic, cadmium, lead, silver, selenium and thallium were performed on 05/04/92 and 05/06/92. The remaining metals were analyzed by ICP on 05/06/92. All run QC was acceptable. Due to an error when logging the samples into the laboratory, a spike and duplicate were not performed until a later date. The analyses were performed within holding time. The QC samples were digested on 05/18/92 for ICP and GFAA. The QC samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 05/18/92; the GFAA analyses for

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June 23, 1992

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KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

III. Quality Control (continued)

arsenic, lead, selenium, and thallium were performed from 05/18/92 to 05/21/92; the remaining metals were analyzed by ICP on 05/26/92. All run QC was acceptable. The duplicate/spike pair was prepared using sample number EMBB18001SF. Spike recovery (accuracy) results were acceptable for all parameters except cadmium and lead by ICP analysis and lead by GFAA analysis. Duplicate RPD (precision) results were acceptable for all parameters except for lead by ICP analysis and lead by GFAA analysis. Sample nonhomogeneity appeared to be the problem for lead since both the accuracy and precision results were outside acceptance limits. No other problems were encountered.



APPENDIX D

Quality Control Samples

TABLE RQ1-SS

QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES

MATRIX SPIKE, MATRIX SPIKE DUPLICATE RECOVERY

Media: Soil

For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Activity of Spike Added | Sample Activity pCi/Samp | MS Activity pCi/Samp | MSD Activity pCi/Samp | MS% Activity (Accuracy) | MSD% Activity (Accuracy) | %RPD (Precision) |
|------------|----------------|-------------------------|--------------------------|----------------------|-----------------------|-------------------------|--------------------------|------------------|
| EPA 900.0 | Cs-137 | 105.8 | 0.0534 | 90.3 | 84.9 | 85 | 80 | 6 |
| EERF H-01 | H ₃ | 917.0 | 0 | 800 | 790 | 87 | 86 | 1 |
| EERF Pu-01 | Pu-239 | 3.2 | 0.01 | 2.87 | 2.5 | 89 | 78 | 14 |
| EERF 00-06 | U-234 | 4.1 | 1.19 | 6.19 | 6.43 | 122 | 128 | 5 |
| | U-235 | 0.2 | 0.0724 | 0.34 | 0.36 | 132 | 144 | 9 |
| | U-238 | 4.1 | 0.953 | 6.43 | 7 | 134 | 147 | 10 |
| EERF Sr-01 | Sr-90 | 4.6 | 0 | 4.7 | 4.2 | 102 | 91 | 11 |
| RSL 307 | I-129 | 1072.6 | 0 | 1071 | 1072 | 100 | 100 | 0 |

TABLE RQ1-SD
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
COMPARISON OF DUPLICATE ANALYSIS

Media: Soil
 For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Original Sample Activity pCi/Unit | Duplicate Sample Activity pCi/Unit | RPD |
|------------|----------------|--------------------------------------|---------------------------------------|-----|
| EPA 900.0 | Cs-137 | .153 | .167 | 9 |
| | Cs-137 | .0299 | .0412 | 32 |
| EERF H-01 | H ₃ | <200 | <200 | N/A |
| | H ₃ | <200 | <200 | N/A |
| EERF Pu-01 | Pu-238 | <.024 | <.015 | N/A |
| | Pu-239 | <.015 | <.025 | N/A |
| | Pu-238 | .025 | <.020 | N/A |
| | Pu-239 | <.016 | .026 | N/A |
| EERF 00-06 | U-234 | 0.995 | 1.04 | 4 |
| | U-235 | 0.0599 | .0868 | 36 |
| | U-238 | 1.04 | 1.05 | 1 |
| | U-234 | 1.09 | 1.28 | 16 |
| | U-235 | 0.0657 | 0.0771 | 16 |
| | U-238 | 0.943 | 1.1 | 15 |
| EERF Sr-01 | Sr-90 | <.675 | <.525 | N/A |
| | | <.709 | <.520 | N/A |

TABLE RQ1-SB
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
REAGENT BLANK RESULTS

Media: Soil
 For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Sample Activity pCi/Unit |
|------------|----------------|-----------------------------|
| EPA 900.0 | Cs-137 | N/A |
| EERF H-01 | H ₃ | N/A |
| EERF Pu-01 | Pu-238 | <.009 |
| | Pu-239 | <.009 |
| EERF 0006 | U-234 | <.015 |
| | U-235 | <.012 |
| | U-238 | <.012 |
| EERF Sr-01 | Sr-90 | <.642 |

TABLE RQ1-SB
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
REAGENT BLANK RESULTS

D - 4

Media: Soil
 For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Sample Activity pCi/Unit |
|------------|----------------|-----------------------------|
| EPA 900.0 | Cs-137 | N/A |
| EERF H-01 | H ₃ | N/A |
| EERF Pu-01 | Pu-238 | <.009 |
| | Pu-239 | <.009 |
| EERF 0006 | U-234 | <.015 |
| | U-235 | <.012 |
| | U-238 | <.012 |
| EERF Sr-01 | Sr-90 | <.642 |

TABLE RQ1-WS
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES

MATRIX SPIKE, MATRIX SPIKE DUPLICATE RECOVERY

Media: Water
 For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Activity of Spike Added | Sample Activity pCi/Samp | MS Activity pCi/Samp | MSD Activity pCi/Samp | MS% Activity (Accuracy) | MSD% Activity (Accuracy) | %RPD (Precision) |
|------------|----------------|-------------------------|--------------------------|----------------------|-----------------------|-------------------------|--------------------------|------------------|
| EERF 00-01 | Gross Alpha | 7.1 | 0 | 6.5 | 6.5 | 92 | 92 | 0 |
| | Gross Beta | 10.6 | 0 | 9.12 | 9.65 | 86 | 91 | 6 |
| EPA 900.0 | Cs-137 | 26.0 | 0 | 25.8 | 26 | 99 | 100 | 1 |
| EERF H-01 | H ₃ | 458 | 0 | 466 | 452 | 102 | 99 | 3 |
| EERF Pu-01 | Pu-239 | 3.2 | 0 | 3.3 | 3.4 | 103 | 106 | 3 |
| EERF Sr-04 | Sr-90 | 4.6 | 0 | 3.42 | 4.61 | 74 | 100 | 30 |
| RSL 307 | I-129 | 1072.6 | 0 | 1072 | 1073 | 100 | 100 | 0 |

TABLE RQ1-WD
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
COMPARISON OF DUPLICATE ANALYSIS

Media: Water
 For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Original Sample Activity pCi/Unit | Duplicate Sample Activity pCi/Unit | RPD |
|------------|----------------|--------------------------------------|---------------------------------------|-----|
| EERF 00-01 | Gross Alpha | <1.62 | <7.69 | N/A |
| | Gross Beta | 4.2 | 3.7 | 13 |
| EPA 900.0 | Cs-137 | <4.33 | <7.69 | N/A |
| EERF H-01 | H ₃ | <200 | <200 | N/A |
| EERF Pu-01 | Pu-238 | <.0252 | <.0581 | N/A |
| | Pu-239 | <.0378 | <.0581 | N/A |
| EERF Sr-04 | Sr-90 | <.804 | <.750 | N/A |

TABLE RQ1-WB
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
REAGENT BLANK RESULTS

Media: Water
For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Sample Activity pCi/Unit |
|---------------|---------------------|-------------------------------------|
| EPA 900.0 | Cs-137 | N/A |
| EPA H-01 | H ₃ | N/A |
| EERF Pu-01 | Pu-238 | <.0428 |
| | Pu-239 | <.0465 |
| EERF Sr-04 | Sr-90 | <.733 |

TABLE RQ1-FS
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
MATRIX SPIKE, MATRIX SPIKE DUPLICATE RECOVERY

Media: Fruit
 For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Activity of Spike Added | Sample Activity pCi/Samp | MS Activity pCi/Samp | MSD Activity pCi/Samp | MS% Activity (Accuracy) | MSD% Activity (Accuracy) | %RPD (Precision) |
|------------|----------------|-------------------------|--------------------------|----------------------|-----------------------|-------------------------|--------------------------|------------------|
| EPA 900.0 | Cs-137 | 26.0 | 0 | 26.6 | 23.1 | 102 | 89 | 14 |
| EERF H-01 | H ₃ | 917 | 0 | 990 | 882 | 108 | 96 | 12 |
| EERF Pu-01 | Pu-239 | 3.2 | 0 | 3.29 | 3.06 | 103 | 96 | 7 |
| EERF Sr-01 | Sr-90 | 4.6 | 0 | 6.1 | 5.8 | 133 | 126 | 5 |
| RSL 307 | I-129 | 1.14 | 0 | .93 | 1.21 | 82 | 106 | 26 |

TABLE RQ1-FD
 QUALITY CONTROL SAMPLES
 RADIOCHEMICAL ANALYSES
 COMPARISON OF DUPLICATE ANALYSIS

Media: Fruit
 For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Original Sample Activity pCi/Unit | Duplicate Sample Activity pCi/Unit | RPD |
|------------|----------------|--------------------------------------|---------------------------------------|-----|
| EPA 900.0 | Cs-137 | <.0101 | <.0093 | N/A |
| EERF H-01 | H ₃ | <206 | <206 | N/A |
| EERF Pu-01 | Pu-238 | <.000618 | <.000508 | N/A |
| | Pu-239 | <.000584 | .00174 | N/A |
| EERF Sr-01 | Sr-90 | <.023 | <.022 | N/A |

TABLE RQ1-FB
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
REAGENT BLANK RESULTS

Media: Fruit
For Samples Collected: 3/10/92 - 3/23/92

| Method | Radionuclide | Sample Activity pCi/Unit |
|------------|----------------|-----------------------------|
| EPA 900.0 | Cs-137 | N/A |
| EERF H-01 | H ₃ | N/A |
| EERF Pu-01 | Pu-238 | <.009 |
| | Pu-239 | <.020 |
| EERF Sr-01 | Sr-90 | <.649 |

TABLE RQ2-SS

QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES

MATRIX SPIKE, MATRIX SPIKE DUPLICATE RECOVERY

Media: Soil

For Samples Collected: 4/21/92 - 4/22/92

| Method | Radionuclide | Activity of Spike Added | Sample Activity pCi/Samp | MS Activity pCi/Samp | MSD Activity pCi/Samp | MS% Activity (Accuracy) | MSD% Activity (Accuracy) | % RPD (Precision) |
|------------|----------------|-------------------------|--------------------------|----------------------|-----------------------|-------------------------|--------------------------|-------------------|
| EPA 900.0 | Cs-137 | 105.8 | 0.0534 | 90.3 | 79.3 | 85 | 75 | 13 |
| EERF H-01 | H ₃ | 458.0 | 0 | 402 | * | 88 | N/A | N/A |
| EERF Pu-01 | Pu-239 | 3.2 | 0 | 3.41 | 2.66 | 107 | 83 | 25 |
| EERF 00-06 | U-234 | 4.1 | 0.93 | 5.99 | 5.5 | 123 | 111 | 10 |
| | U-235 | 0.2 | 0.0284 | 0.35 | 0.32 | 159 | 147 | 8 |
| | U-238 | 4.1 | 0.726 | 6.23 | 5.77 | 134 | 123 | 9 |
| EERF Sr-01 | Sr-90 | 4.6 | 0 | 2.7 | 4.3 | 59* | 93 | 46 |
| RSL 307 | I-129 | 994.2 | 0 | 993.3 | 993.4 | 100 | 100 | 0 |

* = Sample Lost In Laboratory Accident

* = Value Outside Of Standard Control Limit

TABLE RQ2-SD
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
COMPARISON OF DUPLICATE ANALYSIS

Media: Soil
 For Samples Collected: 4/21/92 - 4/22/92

| Method | Radionuclide | Original Sample Activity pCi/Unit | Duplicate Sample Activity pCi/Unit | RPD |
|-------------|----------------|---|--|-----|
| EPA 900.0 | Cs-137 | <.0171 | <MDA | N/A |
| | Cs-137 | .0857 | .0867 | 1 |
| EERF H-01 | H ₃ | <190 | <200 | N/A |
| EERF Pu-01 | Pu-238 | .034 | <.023 | N/A |
| | Pu-239 | <.020 | <.016 | N/A |
| EERF '00-06 | U-234 | .731 | .626 | 15 |
| | U-235 | .0429 | .0293 | 38 |
| | U-238 | .663 | .582 | 13 |
| EERF Sr-01 | Sr-90 | <.737 | <.740 | N/A |

TABLE RQ2-SB
 QUALITY CONTROL SAMPLES
 RADIOCHEMICAL ANALYSES
 REAGENT BLANK RESULTS

Media: Soil
 For Samples Collected: 4/21/92 - 4/22/92

| Method | Radionuclide | Sample Activity pCi/Unit |
|------------|----------------|-----------------------------|
| EPA 900.0 | Cs-137 | N/A |
| EERF H-01 | H ₃ | N/A |
| EERF Pu-01 | Pu-238 | <.025 |
| | Pu-239 | <.017 |
| EERF 00-06 | U-234 | .045 |
| | U-235 | <.015 |
| | U-238 | .033 |
| EERF Sr-01 | Sr-90 | <.718 |

TABLE RQ2-WD
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
COMPARISON OF DUPLICATE ANALYSIS

Media: Water
 For Samples Collected: 4/21/92 - 4/22/92

| Method | Radionuclide | Original Sample Activity pCi/Unit | Duplicate Sample Activity pCi/Unit | RPD |
|------------|----------------|--------------------------------------|---------------------------------------|-----|
| EERF 00-01 | Gross Alpha | <5.19 | <5.25 | N/A |
| | Gross Beta | <4.67 | <5.55 | N/A |
| EPA 900.0 | Cs-137 | <4.80 | <4.85 | N/A |
| EERF H-01 | H ₃ | <191 | <191 | N/A |
| EERF Pu-01 | Pu-238 | <.0393 | <.0524 | N/A |
| | Pu-239 | <.0248 | <.0436 | N/A |
| EERF Sr-04 | Sr-90 | <.532 | <.872 | N/A |

TABLE RQ2-WB
QUALITY CONTROL SAMPLES
RADIOCHEMICAL ANALYSES
REAGENT BLANK RESULTS

Media: Water
 For Samples Collected: 4/21/92 - 4/22/92

| Method | Radionuclide | Sample Activity pCi/Unit |
|------------|----------------|-----------------------------|
| EPA 900.0 | Cs-137 | N/A |
| EERF H-01 | H ₃ | N/A |
| EERF Pu-01 | Pu-238 | .0424 |
| | Pu-239 | .0283 |
| EERF Sr-04 | Sr-90 | <.681 |

Section 2. Chemical Analyses

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50952

Client Project ID: Sanford, Cohen and Associates

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EBG03059SE/88346
Lab Sample ID: SS7704

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|--------------------|--------------------------|---------------------|-----------------|------------------|
| 1,1-dichloroethene | 73.5 | 7 U | 78.7 | 107 |
| trichloroethene | 73.5 | 7 U | 78.4 | 107 |
| benzene | 73.5 | 7 U | 77.6 | 106 |
| toluene | 73.5 | 7 U | 79.3 | 108 |
| chlorobenzene | 73.5 | 7 U | 75.6 | 103 |

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>MSD Conc.</u> | <u>MSD % Rec.</u> | <u>% RPD</u> |
|--------------------|--------------------------|------------------|-------------------|--------------|
| 1,1-dichloroethene | 73.5 | 68.5 | 93 | 14 |
| trichloroethene | 73.5 | 65.6 | 89 | 18 |
| benzene | 73.5 | 68.7 | 93 | 13 |
| toluene | 73.5 | 69.6 | 95 | 13 |
| chlorobenzene | 73.5 | 67.2 | 91 | 12 |

RPD = Relative Percent Difference

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date of Analysis: 03/19/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: ESM01007SE/88593
Lab Sample ID: SS8484 MS/SS8485 MSD

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|--------------------|--------------------------|---------------------|-----------------|------------------|
| 1,1-dichloroethene | 56.8 | 6 U | 55.7 | 98 |
| trichloroethene | 56.8 | 6 U | 69.1 | 122 |
| benzene | 56.8 | 6 U | 57.5 | 101 |
| toluene | 56.8 | 4.38 J | 58.2 | 95 |
| chlorobenzene | 56.8 | 6 U | 68.4 | 120 |

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>MSD Conc.</u> | <u>MSD % Rec.</u> | <u>% RPD</u> |
|--------------------|--------------------------|------------------|-------------------|--------------|
| 1,1-dichloroethene | 56.8 | 59.5 | 105 | -7 |
| trichloroethene | 56.8 | 67.0 | 118 | 3 |
| benzene | 56.8 | 56.1 | 99 | 2 |
| toluene | 56.8 | 56.7 | 92 | 3 |
| chlorobenzene | 56.8 | 65.9 | 116 | 3 |

RPD = Relative Percent Difference

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES
Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50952

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EBG03059SD/88345
Lab Sample ID: SS7709

| <u>Compound</u> | <u>Conc.</u> <u>Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|----------------------------|------------------------------------|---------------------|-----------------|------------------|
| phenol | 9,740 | 980 U | 5,920 | 61 |
| 2-chlorophenol | 9,740 | 980 U | 6,460 | 66 |
| 1,4-dichlorobenzene | 4,870 | 980 U | 2,630 | 54 |
| n-nitroso-di-n-propylamine | 4,870 | 980 U | 3,030 | 62 |
| 1,2,4-trichlorobenzene | 4,870 | 980 U | 3,100 | 64 |
| 4-chloro-3-methylphenol | 9,740 | 980 U | 6,670 | 68 |
| acenaphthene | 4,870 | 980 U | 3,680 | 76 |
| 4-nitrophenol | 9,740 | 4,900 U | 7,150 | 73 |
| 2,4-dinitrotoluene | 4,870 | 980 U | 3,330 | 68 |
| pentachlorophenol | 9,740 | 980 U | 3,710 | 38 |
| pyrene | 4,870 | 980 U | 3,310 | 68 |

Date of Extraction: 03/19/92
Date of Analysis: 03/30/92

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50952

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EBG03059SD/88345
Lab Sample ID: SS7709

| <u>Compound</u> | <u>Conc.</u> <u>Spike Added</u> | <u>MSD Conc.</u> | <u>MSD %Rec.</u> | <u>% RPD</u> |
|----------------------------|------------------------------------|------------------|------------------|--------------|
| phenol | 9,810 | 5,030 | 51 | 18 |
| 2-chlorophenol | 9,810 | 4,080 | 42 | 44 |
| 1,4-dichlorobenzene | 4,900 | 0 | 0 * | 200 * |
| n-nitroso-di-n-propylamine | 4,900 | 1,760 | 36 * | 53 * |
| 1,2,4-trichlorobenzene | 4,900 | 257 | 5 * | 171 * |
| 4-chloro-3-methylphenol | 9,810 | 5,180 | 53 | 25 |
| acenaphthene | 4,900 | 1,430 | 29 * | 90 * |
| 4-nitrophenol | 9,810 | 6,060 | 62 | 16 |
| 2,4-dinitrotoluene | 4,900 | 2,320 | 47 | 37 |
| pentachlorophenol | 9,810 | 4,550 | 46 | -19 |
| pyrene | 4,900 | 1,810 | 37 | 59 * |

RPD = Relative Percent Difference

Date of Extraction: 03/19/92
Date of Analysis: 03/30/92

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

*Values are outside QC limits.

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TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51018

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: ESM01007SB/88592
Lab Sample ID: SS8489 MS/SS8490 MSD

| <u>Compound</u> | <u>Conc.</u> <u>Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|----------------------------|------------------------------------|---------------------|-----------------|------------------|
| phenol | 7,250 | 710 U | 4,790 | 66 |
| 2-chlorophenol | 7,250 | 710 U | 5,180 | 71 |
| 1,4-dichlorobenzene | 3,620 | 710 U | 2,230 | 62 |
| n-nitroso-di-n-propylamine | 3,620 | 710 U | 2,300 | 64 |
| 1,2,4-trichlorobenzene | 3,620 | 710 U | 2,510 | 69 |
| 4-chloro-3-methylphenol | 7,250 | 710 U | 5,690 | 78 |
| acenaphthene | 3,620 | 710 U | 3,040 | 84 |
| 4-nitrophenol | 7,250 | 350 U | 5,910 | 82 |
| 2,4-dinitrotoluene | 3,620 | 710 U | 2,700 | 75 |
| pentachlorophenol | 7,250 | 350 U | 5,980 | 82 |
| pyrene | 3,620 | 710 U | 2,760 | 76 |

Date of Extraction: 03/30/92
Date of Analysis: 04/02/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51018

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: ESM01007SB/88592
Lab Sample ID: SS8489 MS/SS8490 MSD

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>MSD Conc.</u> | <u>MSD %Rec.</u> | <u>% RPD</u> |
|----------------------------|------------------------------|------------------|------------------|--------------|
| phenol | 7,250 | 5,750 | 79 | -18 |
| 2-chlorophenol | 7,250 | 6,050 | 83 | -16 |
| 1,4-dichlorobenzene | 3,620 | 2,420 | 67 | -8 |
| n-nitroso-di-n-propylamine | 3,620 | 2,520 | 70 | -9 |
| 1,2,4-trichlorobenzene | 3,620 | 2,820 | 78 | -12 |
| 4-chloro-3-methylphenol | 7,250 | 6,370 | 88 | -12 |
| acenaphthene | 3,620 | 3,380 | 93 | -10 |
| 4-nitrophenol | 7,250 | 6,670 | 92 | -11 |
| 2,4-dinitrotoluene | 3,620 | 2,980 | 82 | -9 |
| pentachlorophenol | 7,250 | 6,600 | 91 | -10 |
| pyrene | 3,620 | 3,050 | 84 | -10 |

RPD = Relative Percent Difference

Date of Extraction: 03/30/92
Date of Analysis: 04/02/92

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50952

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EBG03059SD/88345 RE
Lab Sample ID: SS7709 RE

| <u>Compound</u> | <u>Conc.</u> <u>Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|----------------------------|------------------------------------|---------------------|-----------------|------------------|
| phenol | 9,760 | 980 U | 6,850 | 70 |
| 2-chlorophenol | 9,760 | 980 U | 7,600 | 78 |
| 1,4-dichlorobenzene | 4,880 | 980 U | 3,200 | 66 |
| n-nitroso-di-n-propylamine | 4,880 | 980 U | 3,570 | 73 |
| 1,2,4-trichlorobenzene | 4,880 | 980 U | 3,640 | 75 |
| 4-chloro-3-methylphenol | 9,760 | 980 U | 7,730 | 79 |
| acenaphthene | 4,880 | 980 U | 3,910 | 80 |
| 4-nitrophenol | 9,760 | 4,900 U | 8,000 | 82 |
| 2,4-dinitrotoluene | 4,880 | 980 U | 3,680 | 75 |
| pentachlorophenol | 9,760 | 980 U | 6,850 | 70 |
| pyrene | 4,880 | 980 U | 3,530 | 72 |

Date of Extraction: 03/31/92
Date of Analysis: 04/03/92

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50952

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EBG03059SD/88345 RE
Lab Sample ID: SS7709 RE

| <u>Compound</u> | <u>Conc.</u> <u>Spike Added</u> | <u>MSD Conc.</u> | <u>MSD %Rec.</u> | <u>% RPD</u> |
|----------------------------|------------------------------------|------------------|------------------|--------------|
| phenol | 10,900 | 7,040 | 65 | 7 |
| 2-chlorophenol | 10,900 | 7,700 | 71 | 9 |
| 1,4-dichlorobenzene | 5,460 | 3,040 | 56 | 16 |
| n-nitroso-di-n-propylamine | 5,460 | 3,220 | 59 | 21 |
| 1,2,4-trichlorobenzene | 5,460 | 3,620 | 66 | 13 |
| 4-chloro-3-methylphenol | 10,900 | 8,010 | 73 | 8 |
| acenaphthene | 5,460 | 3,790 | 69 | 15 |
| 4-nitrophenol | 10,900 | 7,900 | 72 | 13 |
| 2,4-dinitrotoluene | 5,460 | 3,640 | 67 | 11 |
| pentachlorophenol | 10,900 | 7,100 | 65 | 7 |
| pyrene | 5,460 | 3,550 | 65 | 10 |

RPD = Relative Percent Difference

Date of Extraction: 03/31/92
Date of Analysis: 04/03/92

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

MATRIX SPIKE RECOVERY

Results in mg/kg (ppm) dry weight

Sample Matrix: Soil

Client Sample ID: EBG03059SF
Lab Sample ID: SS7713

| <u>Compound</u> | <u>Sample Conc.</u> | <u>Conc. Spike Added</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|-----------------|---------------------|------------------------------|-----------------|------------------|
| antimony | 3 U | 50 | 23 | 46.0 |
| beryllium | 0.6 | 5.0 | 6.0 | 108.0 |
| cadmium | 5.0 | 5.0 | 8.7 | 74.0 |
| chromium | 62 | 20 | 84 | 110.0 |
| copper | 40 | 25 | 65 | 100.0 |
| nickel | 70 | 50 | 113 | 86.0 |
| silver | 1.6 | 5.0 | 6.0 | 88.0 |
| zinc | 85.5 | 50 | 138 | 105.0 |
| arsenic | 4.8 | 4.0 | 8.2 | 85.0 |
| lead | 5.3 | 2.0 | 6.6 | 65.0 |
| selenium | 0.6 | 1.0 | 1.7 | 110.0 |
| thallium | 0.4 | 5.0 | 5.2 | 96.0 |
| mercury | 0.1 U | 1.0 | 1.0 | 100.0 |

Digestion Date: 03/23/92 (ICP), 03/20/92 (GFAA)
Analysis Date: 03/24/92 (ICP), 03/25/92 (GFAA), 03/24/92 (CVAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51018

POST DIGESTION SPIKE RECOVERY

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Soil

Client Sample ID: ESM01007SF/88594

Lab Sample ID: SS8492

| | <u>Control</u> <u>Limit % R</u> | <u>Spiked</u> <u>Sample Result</u> | <u>Sample Result</u> | <u>Spike Added</u> | <u>% Recovery</u> |
|----------|------------------------------------|---------------------------------------|----------------------|--------------------|-------------------|
| selenium | | 4.38 | 2.00 U | 10.0 | 43.8 N |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
N - Spiked sample recovery outside control limits.

Date of Digestion: 04/06/92 (GFAA)

Date of Analysis: 04/06/92 (GFAA)

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBG02007SE/88498 | 101 | 101 | 118 |
| ESM02019SE/88386 | 100 | 94 | 112 |
| ESM03001SE/88338 | 111 | 94 | 118 |
| Method Blank | 108 | 114 | 111 |

*Values in parenthesis represent USEPA contract required QC limits.

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBB03005SE/90138 | 102 | 85 | 93 |
| EBB04021SE/88285 | 98 | 92 | 94 |
| EBB06092SE/89185 | 96 | 95 | 93 |
| EBB13024SE/88938 | 103 | 101 | 99 |
| EBB14079SE/88438 | 100 | 98 | 100 |
| Method Blank | 97 | 97 | 100 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBG03059SE/88346 | 99 | 88 | 97 |
| EBG03059SE/88346 MS | 109 | 93 | 105 |
| EBG03059SE/88346 MSD | 99 | 88 | 97 |
| EBG04029SE/88242 | 101 | 90 | 96 |
| Method Blank | 101 | 98 | 101 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>VOLATILE</u> | |
|-------------------------|--|---------------------------------|---|
| | | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBB01056SE/90287 | 102 | 97 | 99 |
| EBB05077SE/90036 | 98 | 95 | 93 |
| EBB12020SE/90087 | 96 | 103 | 109 |
| Method Blank | 96 | 98 | 99 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBB11061SE/89261 | 99 | 97 | 96 |
| Method Blank | 96 | 97 | 92 |

*Values in parenthesis represent QC limits.

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April 21, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| ESM01004SE/88585 | 99 | 95 | 89 |
| ESM01007SE/88593 | 97 | 97 | 88 |
| ESM01007SE/88593 MS | 97 | 94 | 89 |
| ESM01007SE/88593 MSD | 97 | 95 | 94 |
| Method Blank | 96 | 97 | 92 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>SEMIVOLATILE</u> | | | | | |
|-------------------------|--|---|-------------------------------------|---------------------------------|---------------------------------------|---|
| | <u>Nitro-Benzene-D5 (23-120%)*</u> | <u>2-Fluoro-Biphenyl (30-116%)*</u> | <u>Terphenyl-D14 (18-137%)*</u> | <u>Phenol-D5 (24-113%)*</u> | <u>2-Fluoro-Phenol (26-121%)*</u> | <u>2,4,6-Tribromo-Phenol (18-122%)*</u> |
| EBG02007SD/88500 | 68 | 80 | 87 | 76 | 68 | 103 |
| ESM02019SD/88385 | 72 | 86 | 96 | 77 | 71 | 91 |
| ESM03001SD/88337 | 77 | 89 | 98 | 81 | 76 | 113 |
| Method Blank | 67 | 82 | 110 | 78 | 71 | 90 |

*Values in parenthesis represent USEPA contract required QC limits.

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| Client Sample ID | <u>SEMIVOLATILE</u> | | | | | |
|------------------|---|--|--|---------------------------------|--|---|
| | <u>Nitro- Benzene-D5 (23-120%)*</u> | <u>2-Fluoro- Biphenyl (30-115%)*</u> | <u>Terphenyl- D14 (18-137%)*</u> | <u>Phenol-D5 (24-113%)*</u> | <u>2-Fluoro- Phenol (25-121%)*</u> | <u>2,4,6- Tribromo- Phenol (19-122%)*</u> |
| EBB03005SD/90137 | 98 | 100 | 96 | 85 | 92 | 84 |
| EBB04021SD/88284 | 82 | 91 | 100 | 77 | 72 | 74 |
| EBB06092SD/89184 | 84 | 93 | 103 | 80 | 77 | 62 |
| EBB13024SD/88937 | 83 | 88 | 92 | 76 | 78 | 85 |
| EBB14079SD/88437 | 86 | 92 | 97 | 78 | 75 | 55 |
| Method Blank | 85 | 88 | 110 | 75 | 72 | 54 |

*Values in parenthesis represent required QC limits.

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 April 16, 1992

TABLE CQ1-SR
 QUALITY CONTROL SAMPLES
 CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
 5815 MIDDLEBROOK PIKE
 KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| Client Sample ID | <u>SEMIVOLATILE</u> | | | | | |
|-------------------------|------------------------------------|-------------------------------------|---------------------------------|-------------------------|-----------------------------------|---|
| | Nitro- Benzene-D5 (23-120%)* | 2-Fluoro- Biphenyl (30-116%)* | Terphenyl- D14 (18-137%)* | Phenol-D5 (24-113%)* | 2-Fluoro- Phenol (26-121%)* | 2,4,6- Tribromo- Phenol (18-122%)* |
| EBG03059SD/88345 | 62 | 68 | 71 | 64 | 69 | 78 |
| EBG03059SD/88345 RE | 86 | 84 | 88 | 93 | 87 | 85 |
| EBG04029SD/88241 | 78 | 86 | 87 | 94 | 94 | 87 |
| EBD03059SD/88345 MS | 30 | 20 ** | 47 | 57 | 44 | 51 |
| EBG03059SD/88345 MS RE | 65 | 70 | 74 | 70 | 70 | 77 |
| EBG03059SD/88345 MSD | 75 | 71 | 73 | 75 | 74 | 73 |
| EBG03059SD/88345 MSD RE | 78 | 78 | 81 | 81 | 79 | 82 |
| Method Blank 1 | 68 | 71 | 84 | 60 | 49 | 42 |
| Method Blank 2 | 88 | 86 | 94 | 94 | 90 | 73 |

*Values in parenthesis represent QC limits.

**Values are outside of QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>SEMIVOLATILE</u> | | | | | |
|-------------------------|---|--|--|---------------------------------|--|---|
| | <u>Nitro- Benzene-D5 (23-120%)*</u> | <u>2-Fluoro- Biphenyl (30-115%)*</u> | <u>Terphenyl- D14 (18-137%)*</u> | <u>Phenol-D5 (24-113%)*</u> | <u>2-Fluoro- Phenol (25-121%)*</u> | <u>2,4,6- Tribromo- Phenol (19-122%)*</u> |
| EBB11061SD/89285 | 81 | 87 | 91 | 96 | 104 | 98 |
| Method Blank | 69 | 81 | 88 | 71 | 70 | 79 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>SEMIVOLATILE</u> | | | | | |
|-------------------------|---|--|--|---------------------------------|--|---|
| | <u>Nitro- Benzene-D5 (23-120%)*</u> | <u>2-Fluoro- Biphenyl (30-115%)*</u> | <u>Terphenyl- D14 (18-137%)*</u> | <u>Phenol-D5 (24-113%)*</u> | <u>2-Fluoro- Phenol (25-121%)*</u> | <u>2,4,6- Tribromo- Phenol (19-122%)*</u> |
| ESM01004SD/88584 | 79 | 85 | 93 | 81 | 89 | 93 |
| ESM01007SB/88592 | 77 | 79 | 86 | 84 | 78 | 87 |
| ESM01007SB/88592 MS | 80 | 84 | 92 | 83 | 83 | 94 |
| ESM01007SB/88592 MSD | 86 | 93 | 93 | 87 | 90 | 95 |
| Method Blank | 83 | 81 | 96 | 82 | 80 | 69 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>SEMIVOLATILE</u> | | | | | |
|-------------------------|---|--|--|---------------------------------|--|---|
| | <u>Nitro- Benzene-D5 (23-120%)*</u> | <u>2-Fluoro- Biphenyl (30-116%)*</u> | <u>Terphenyl- D14 (18-137%)*</u> | <u>Phenol-D5 (24-113%)*</u> | <u>2-Fluoro- Phenol (26-121%)*</u> | <u>2,4,6- Tribromo- Phenol (18-122%)*</u> |
| EBB01056SD/90286 | 78 | 87 | 92 | 83 | 87 | 96 |
| EBB05077SD/90035 | 69 | 85 | 90 | 81 | 85 | 98 |
| EBB12020SD/90086 | 75 | 85 | 92 | 79 | 85 | 101 |
| Method Blank | 69 | 81 | 88 | 71 | 70 | 79 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SD
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

DUPLICATE ANALYSIS

Results in mg/kg (ppb) dry weight

Sample Matrix: Soil

Client Sample ID: ESM01007SF/88594
Lab Sample ID: SS8493

| <u>Parameter</u> | <u>Original Sample</u> | <u>Duplicate</u> | <u>RPD</u> |
|------------------|------------------------|------------------|------------|
| antimony | 3.8250 | 3.7240 | 2.7 |
| arsenic | 5.2100 | 5.7000 | 9.0 |
| beryllium | 0.8850 | 0.8870 | 0.2 |
| cadmium | 0.5000 U | 0.5000 U | |
| chromium | 21.0330 | 21.4810 | 2.1 |
| copper | 23.5590 | 22.4090 | 5.0 |
| lead | 13.5600 | 15.3900 | 12.6 |
| mercury | 0.1000 U | 0.1000 U | |
| nickel | 15.1230 | 16.8510 | 10.8 |
| selenium | 0.2000 U | 0.2000 U | |
| silver | 0.5000 U | 0.5000 U | |
| thallium | 0.2960 | 0.2910 | 1.7 |
| zinc | 67.0510 | 67.2710 | 0.3 |

Date of Digestion: 04/01/92 (ICP), 04/06/92 (GFAA)
Date of Analysis: 04/02/92 (ICP), 04/07/92 (CVAA), 04/06/92 (GFAA)

RPD = Relative percent difference

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank

Lab Sample ID: VB03172

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 J | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 1 J |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 2 J |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/17/92

Dilution Factor: 1.00

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: VB03252

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 2 J | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 1 J | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/25/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: VB03262

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 J | 1,1,2-trichloroethane | 5 U |
| acetone | 5 J | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/26/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank

Lab Sample ID: VB0327

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: VB0327

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylene (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50938

SEMIVOLATILE TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: H0066

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
Date of Analysis: 03/25/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
 April 8, 1992

TABLE CQ1-SB
 QUALITY CONTROL SAMPLES
 CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
 5815 MIDDLEBROOK PIKE
 KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 2 of 2

Job Number: SON 50938

SEMIVOLATILE TARGET COMPOUND LIST (continued)
 Results in $\mu\text{g}/\text{kg}$ (ppb)
 Sample Matrix: Soil

Client Sample ID: Method Blank
 Lab Sample ID: H0066

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 330 U |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- 1 - Detected as diphenylamine.

Date of Extraction: 03/17/92
 Date of Analysis: 03/25/92
 Dilution Factor: 1.00

Sanford, Cohen and Associates
 April 10, 1992

TABLE CQ1-SB
 QUALITY CONTROL SAMPLES
 CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
 5815 MIDDLEBROOK PIKE
 KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 1 of 2

Job Number: SON 50975

SEMIVOLATILE TARGET COMPOUND LIST

Results in $\mu\text{g}/\text{kg}$ (ppb)
 Sample Matrix: Soil

Client Sample ID: Method Blank
 Lab Sample ID: H0106

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
 J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
 Date of Analysis: 03/30/92
 Dilution Factor: 1.00

Sanford, Cohen and Associates
 April 10, 1992

TABLE CQ1-SB
 QUALITY CONTROL SAMPLES
 CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
 5815 MIDDLEBROOK PIKE
 KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
 Analysis Sheet 2 of 2

Job Number: SON 50975

SEMIVOLATILE TARGET COMPOUND LIST (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)
 Sample Matrix: Soil

Client Sample ID: Method Blank
 Lab Sample ID: H0106

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 330 U |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 52 J |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- 1 - Detected as diphenylamine.

Date of Extraction: 03/23/92
 Date of Analysis: 03/30/92
 Dilution Factor: 1.00

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 3

Job Number: SON 50952

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1
Lab Sample ID: BL0085

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 330 U | bis(2-chloroisopropyl)ether | 330 U |
| acenaphthylene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| anthracene | 330 U | 4-bromophenyl phenyl ether | 330 U |
| benzidine | 1,700 U | 2-chloronaphthalene | 330 U |
| benzo(a)anthracene | 330 U | 4-chlorophenyl phenyl ether | 330 U |
| benzo(b)fluoranthene | 330 U | chrysene | 330 U |
| benzo(k)fluoranthene | 330 U | dibenz(a,h)anthracene | 330 U |
| benzo(a)pyrene | 330 U | di-n-butylphthalate | 330 U |
| benzo(g,h,i)perylene | 330 U | 1,2-dichlorobenzene | 330 U |
| butylbenzylphthalate | 330 U | 1,3-dichlorobenzene | 330 U |
| bis(2-chloroethoxy)methane | 330 U | 1,4-dichlorobenzene | 330 U |
| bis(2-chloroethyl)ether | 330 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

Job Number: SON 50952

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1
Lab Sample ID: BL0085

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 660 U | hexachloroethane | 330 U |
| diethylphthalate | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| dimethyl phthalate | 330 U | isophorone | 330 U |
| 2,4-dinitrotoluene | 330 U | naphthalene | 330 U |
| 2,6-dinitrotoluene | 330 U | nitrobenzene | 330 U |
| di-n-octyl phthalate | 330 U | n-nitroso-di-n-propylamine | 330 U |
| 1,2-diphenylhydrazine(1) | 330 U | n-nitrosodimethylamine | 330 U |
| fluoranthene | 330 U | n-nitrosodiphenylamine(2) | 330 U |
| fluorene | 330 U | phenanthrene | 330 U |
| hexachlorobenzene | 330 U | pyrene | 330 U |
| hexachlorobutadiene | 330 U | 1,2,4-trichlorobenzene | 330 U |
| hexachlorocyclopentadiene | 330 U | | |

(1)-Screened for as azobenzene
(2)-Detected as diphenylamine

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92
Date of Analysis: 03/30/92

This method blank applies to the following samples: EBG03059SD, EBG04029SD, EBG3059SD MS, EBG03059SD MSD.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50952

ACID EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1
Lab Sample ID: BL0085

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 330 U | 2-nitrophenol | 330 U |
| 2-chlorophenol | 330 U | 4-nitrophenol | 1,700 U |
| 2,4-dichlorophenol | 330 U | pentachlorophenol | 1,700 U |
| 2,4-dimethylphenol | 330 U | phenol | 330 U |
| 2,4-dinitrophenol | 1,700 U | 2,4,6-trichlorophenol | 330 U |
| 2-methyl-4,6-dinitrophenol | 1,700 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/19/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 3

Job Number: SON 50952

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2
Lab Sample ID: BL0176

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 330 U | bis(2-chloroisopropyl)ether | 330 U |
| acenaphthylene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| anthracene | 330 U | 4-bromophenyl phenyl ether | 330 U |
| benzidine | 1,700 U | 2-chloronaphthalene | 330 U |
| benzo(a)anthracene | 330 U | 4-chlorophenyl phenyl ether | 330 U |
| benzo(b)fluoranthene | 330 U | chrysene | 330 U |
| benzo(k)fluoranthene | 330 U | dibenz(a,h)anthracene | 330 U |
| benzo(a)pyrene | 330 U | di-n-butylphthalate | 330 U |
| benzo(g,h,i)perylene | 330 U | 1,2-dichlorobenzene | 330 U |
| butylbenzylphthalate | 330 U | 1,3-dichlorobenzene | 330 U |
| bis(2-chloroethoxy)methane | 330 U | 1,4-dichlorobenzene | 330 U |
| bis(2-chloroethyl)ether | 330 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/31/92
Date of Analysis: 04/03/92

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

Job Number: SON 50952

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2
Lab Sample ID: BL0176

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 660 U | hexachloroethane | 330 U |
| diethylphthalate | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| dimethyl phthalate | 330 U | isophorone | 330 U |
| 2,4-dinitrotoluene | 330 U | naphthalene | 330 U |
| 2,6-dinitrotoluene | 330 U | nitrobenzene | 330 U |
| di-n-octyl phthalate | 330 U | n-nitroso-di-n-propylamine | 330 U |
| 1,2-diphenylhydrazine(1) | 330 U | n-nitrosodimethylamine | 330 U |
| fluoranthene | 330 U | n-nitrosodiphenylamine(2) | 330 U |
| fluorene | 330 U | phenanthrene | 330 U |
| hexachlorobenzene | 330 U | pyrene | 330 U |
| hexachlorobutadiene | 330 U | 1,2,4-trichlorobenzene | 330 U |
| hexachlorocyclopentadiene | 330 U | | |

(1)-Screened for as azobenzene
(2)-Detected as diphenylamine

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/31/92
Date of Analysis: 04/03/92

This method blank applies to the following samples: EBG03059SD RE, EBG03059SD MSD RE, EBG03059SD MS RE.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50952

ACID EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2
Lab Sample ID: BL0176

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 330 U | 2-nitrophenol | 330 U |
| chlorophenol | 330 U | 4-nitrophenol | 1,700 U |
| 1,2-dichlorophenol | 330 U | pentachlorophenol | 1,700 U |
| 1,4-dimethylphenol | 330 U | phenol | 330 U |
| 1,3-dinitrophenol | 1,700 U | 2,4,6-trichlorophenol | 330 U |
| 1-methyl-4,6-dinitrophenol | 1,700 U | | |

- Compound was analyzed for but not detected. The number is the detection limit for the sample.
- Indicates an estimated value less than the detection limit.

Date of Extraction: 03/31/92
Date of Analysis: 04/03/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 3

Job Number: SON 50985

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: BL0128

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------------|----------------------|
| acenaphthene | 330 U | bis(2-chloroisopropyl)ether | 330 U |
| acenaphthylene | 330 U | bis(2-ethylhexyl)phthalate | 35 J |
| anthracene | 330 U | 4-bromophenyl phenyl ether | 330 U |
| benzidine | 1,700 U | 2-chloronaphthalene | 330 U |
| benzo(a)anthracene | 330 U | 4-chlorophenyl phenyl ether | 330 U |
| benzo(b)fluoranthene | 330 U | chrysene | 330 U |
| benzo(k)fluoranthene | 330 U | dibenz(a,h)anthracene | 330 U |
| benzo(a)pyrene | 330 U | di-n-butylphthalate | 330 U |
| benzo(g,h,i)perylene | 330 U | 1,2-dichlorobenzene | 330 U |
| butylbenzylphthalate | 330 U | 1,3-dichlorobenzene | 330 U |
| bis(2-chloroethoxy)methane | 330 U | 1,4-dichlorobenzene | 330 U |
| bis(2-chloroethyl)ether | 330 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 3

Job Number: SON 50985

BASE/NEUTRAL EXTRACTABLE ORGANIC ANALYSIS
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: BL0128

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|---------------------------|----------------------|----------------------------|----------------------|
| 3,3'-dichlorobenzidine | 660 U | hexachloroethane | 330 U |
| diethylphthalate | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| dimethyl phthalate | 330 U | isophorone | 330 U |
| 2,4-dinitrotoluene | 330 U | naphthalene | 330 U |
| 2,6-dinitrotoluene | 330 U | nitrobenzene | 330 U |
| di-n-octyl phthalate | 330 U | n-nitroso-di-n-propylamine | 330 U |
| 1,2-diphenylhydrazine(1) | 330 U | n-nitrosodimethylamine | 330 U |
| fluoranthene | 330 U | n-nitrosodiphenylamine(2) | 330 U |
| fluorene | 330 U | phenanthrene | 330 U |
| hexachlorobenzene | 330 U | pyrene | 330 U |
| hexachlorobutadiene | 330 U | 1,2,4-trichlorobenzene | 330 U |
| hexachlorocyclopentadiene | 330 U | | |

- (1) Screened for as azobenzene
(2) Detected as diphenylamine

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 3 of 3

Job Number: SON 50985

ACID EXTRACTABLE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank

Lab Sample ID: BL0128

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|-----------------------|----------------------|
| 4-chloro-3-methylphenol | 330 U | 2-nitrophenol | 330 U |
| 2-chlorophenol | 330 U | 4-nitrophenol | 1,700 U |
| 2,4-dichlorophenol | 330 U | pentachlorophenol | 1,700 U |
| 2,4-dimethylphenol | 330 U | phenol | 330 U |
| 2,4-dinitrophenol | 1,700 U | 2,4,6-trichlorophenol | 330 U |
| 2-methyl-4,6-dinitrophenol | 1,700 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92
Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 50998

SEMIVOLATILE ORGANICS ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank

Lab Sample ID: BL0128

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 330 U |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

(1) Detected as diphenylamine.

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/25/92

Date of Analysis: 03/30/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51018

SEMIVOLATILE ORGANICS ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank

Lab Sample ID: BL0170

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/30/92

Date of Analysis: 04/02/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51018

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: BL0170

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 330 U |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

(1) Detected as diphenylamine.

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/30/92
Date of Analysis: 04/02/92

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51263

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1
Lab Sample ID: H0451

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/30/92
Date of Analysis: 05/05/92

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51263

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1
Lab Sample ID: H0451

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 82 J |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
1 - Detected as diphenylamine.

Date of Extraction: 04/30/92
Date of Analysis: 05/05/92

This method blank applies to sample EBB16001BSD.

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51263

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2
Lab Sample ID: H0447

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/29/92
Date of Analysis: 05/05/92

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51263

SEMIVOLATILE TARGET COMPOUND LIST (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2
Lab Sample ID: H0447

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 330 U |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
1 - Detected as diphenylamine.

Date of Extraction: 04/29/92
Date of Analysis: 05/05/92

This method blank applies to sample EBB19003SD.

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

| Client Sample ID: Lab Sample ID: | Method Blank <u>PBSE4664/PBSE4708/PBSC5050</u> |
|-------------------------------------|---|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 1 U |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 0.5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Digestion Date: 03/25/92 (ICP) 03/27/92 (GFAA)
Analysis Date: 03/26/92 (CVAA), 03/30/92 (ICP), 03/26/92 through 03/29/92 (GFAA)

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

PRIORITY POLLUTANT METALS ANALYSIS

Results in mg/kg (ppm) dry weight

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: PBSC5044/PBSE4636/PBSE4626

| <u>Compound</u> | <u>Concentration</u> |
|-----------------|----------------------|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 1 U |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 1.6 |

Digestion Date: 03/23/92 (ICP), 03/20/92 (GFAA)
Analysis Date: 03/24/92 (ICP), 03/25/92 (GFAA), 03/24/92 (CVAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

PRIORITY POLLUTANT METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: PBSC5060/PBSE4732/PBSE4765

| <u>Compound</u> | <u>Concentration</u> |
|-----------------|----------------------|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 2 |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 1.2 |

Digestion Date: 04/01/92 (ICP), 04/06/92 (GFAA)
Analysis Date: 04/02/92 (ICP), 04/06/92 (GFAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

PRIORITY POLLUTANT METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

| Client Sample ID: Lab Sample ID: | Method Blank <u>PBSC5056/PBSE4705/PBSE4700</u> |
|-------------------------------------|---|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 1 |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 0.8 |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Digestion Date: 03/26/92 (GFAA), 03/27/92 (ICP)
Analysis Date: 03/30/92 (ICP, CVAA), 03/29/92 through 04/01/92 (GFAA)

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

PRIORITY POLLUTANT METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: PBSC5060/PBSE4732/PBSE4765

| <u>Compound</u> | <u>Concentration</u> |
|-----------------|----------------------|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 2 |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 1.2 |

Digestion Date: 04/01/92 (ICP), 04/06/92 (GFAA)
Analysis Date: 04/02/92 (ICP), 04/07/92 (CVAA), 04/06/92 (GFAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ1-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: PBSE4968/PBSE4970/PBSC5094

| <u>Analyte</u> | <u>Result</u> |
|----------------|---------------|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 1 U |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 0.5 U |

Date of Digestion: 05/01/92

Date of Analysis: 05/06/92 (ICP), 05/14/92 (CVAA), 05/04 through 05/06/92 (GFAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

SOIL VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EMBB18001SE/89240
Lab Sample ID: K1130

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|--------------------|--------------------------|---------------------|-----------------|------------------|
| 1,1-dichloroethene | 68.5 | 7 U | 63.8 | 93 |
| trichloroethene | 68.5 | 7 U | 65.5 | 96 |
| benzene | 68.5 | 7 U | 59.7 | 87 |
| toluene | 68.5 | 7 U | 60.5 | 88 |
| chlorobenzene | 68.5 | 7 U | 62.7 | 92 |

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>MSD Conc.</u> | <u>MSD % Rec.</u> | <u>% RPD</u> |
|--------------------|--------------------------|------------------|-------------------|--------------|
| 1,1-dichloroethene | 68.5 | 69.7 | 102 | -9 |
| trichloroethene | 68.5 | 68.5 | 100 | -4 |
| benzene | 68.5 | 63.0 | 92 | -6 |
| toluene | 68.5 | 61.4 | 90 | -2 |
| chlorobenzene | 68.5 | 65.1 | 95 | -3 |

RPD = Relative Percent Difference

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/27/92

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51247

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EMBB18001SD/89243
Lab Sample ID: K1133

| <u>Compound</u> | <u>Conc.</u> <u>Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|----------------------------|------------------------------------|---------------------|-----------------|------------------|
| phenol | 9,120 | 450 U | 8,530 | 94 * |
| 2-chlorophenol | 9,120 | 450 U | 9,720 | 107 * |
| 1,4-dichlorobenzene | 4,560 | 450 U | 3,180 | 70 |
| n-nitroso-di-n-propylamine | 4,560 | 450 U | 4,310 | 95 |
| 1,2,4-trichlorobenzene | 4,560 | 450 U | 3,540 | 78 |
| 4-chloro-3-methylphenol | 9,120 | 450 U | 8,620 | 95 |
| acenaphthene | 4,560 | 450 U | 3,870 | 85 |
| 4-nitrophenol | 9,120 | 2,200 U | 7,390 | 81 |
| 2,4-dinitrotoluene | 4,560 | 450 U | 3,490 | 77 |
| pentachlorophenol | 9,120 | 2,200 U | 7,710 | 85 |
| pyrene | 4,560 | 450 U | 3,250 | 71 |

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

*Values are outside QC limits.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 51247

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY
(continued)

Results in $\mu\text{g}/\text{kg}$ (ppb) dry weight

Client Sample ID: EMBB18001SD/89243
Lab Sample ID: K1133

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>MSD Conc.</u> | <u>MSD %Rec.</u> | <u>% RPD</u> |
|----------------------------|------------------------------|------------------|------------------|--------------|
| phenol | 9,100 | 6,500 | 71 | 28 |
| 2-chlorophenol | 9,100 | 7,910 | 87 | 21 |
| 1,4-dichlorobenzene | 4,550 | 3,170 | 70 | 0 |
| n-nitroso-di-n-propylamine | 4,550 | 3,900 | 86 | 10 |
| 1,2,4-trichlorobenzene | 4,550 | 3,470 | 76 | 3 |
| 4-chloro-3-methylphenol | 9,100 | 7,870 | 86 | 10 |
| acenaphthene | 4,550 | 3,850 | 85 | 0 |
| 4-nitrophenol | 9,100 | 8,050 | 88 | -8 |
| 2,4-dinitrotoluene | 4,550 | 3,400 | 75 | 3 |
| pentachlorophenol | 9,100 | 8,640 | 95 | -11 |
| pyrene | 4,550 | 3,300 | 73 | -3 |

RPD = Relative Percent Difference

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

MATRIX SPIKE RECOVERY
Results in mg/kg (ppm) dry weight
Sample Matrix: Soil

Client Sample ID: EMBB18001SF/82945
Lab Sample ID: K1136

| | <u>Control</u> <u>Limit % R</u> | <u>Spiked</u> <u>Sample Result</u> | <u>Sample Result</u> | <u>Spike Added</u> | <u>% Recovery</u> |
|-----------|------------------------------------|---------------------------------------|----------------------|--------------------|-------------------|
| antimony | 75-125 | 42 | 4 | 50 | 76.0 |
| arsenic | 75-125 | 8.5 | 5.4 | 4.0 | 77.5 |
| beryllium | 75-125 | 5.3 | 0.2 | 5.0 | 102.0 |
| cadmium | 75-125 | 3.7 | 0.5 U | 5.0 | 74.0 N |
| chromium | 75-125 | 26 | 8 | 20 | 90.0 |
| copper | 75-125 | 26 | 3 | 25 | 92.0 |
| iron | | 10,900 | 9,610 | 100 | 1,290.0 |
| lead | 75-125 | 12.7 | 4.9 | 2.0 | 390.0 N |
| mercury | 75-125 | 1.6 | 0.4 | 1.0 | 120.0 |
| nickel | 75-125 | 49 | 5 | 50 | 88.8 |
| selenium | 75-125 | 0.8 | 0.2 U | 1.0 | 80.0 |
| silver | 75-125 | 4 | 0.5 U | 5.0 | 80.0 |
| thallium | | 5.6 | 0.3 | 5.0 | 106.0 |
| zinc | 75-125 | 71.7 | 25.9 | 50 | 91.6 |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
N - Spiked sample recovery outside control limits.

Date of Digestion: 05/18/92

Date of Analysis: 05/26/92 (ICP), 05/18/92 through 05/21/92 (GFAA), 05/18/92 (CVAA)

% Solids: 100.0

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ2-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBB16001BSE/89890 | 104 | 103 | 96 |
| EBB19003SE/90438 | 106 | 99 | 94 |
| Method Blank | 105 | 107 | 99 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBB15005SE/89589 | 83 | 98 | 99 |
| Method Blank | 105 | 107 | 99 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| EBB017001SE/89337 | 105 | 90 | 99 |
| EBB180001SE/89236 | 109 | 92 | 100 |
| EMBB18001SE/89240 | 96 | 92 | 96 |
| Method Blank 1 | 101 | 97 | 97 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(81-117%)*</u> | <u>BFB</u> <u>(74-121%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(70-121%)*</u> |
| Method Blank 2 | 99 | 99 | 100 |
| EMBB18001SE MS/89240 | 96 | 92 | 98 |
| EMBB18001SE MSD/89240 | 96 | 91 | 100 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ2-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>SEMIVOLATILE</u> | | | | | |
|-------------------------|---|--|--|---------------------------------|--|---|
| | <u>Nitro- Benzene-D5 (23-120%)*</u> | <u>2-Fluoro- Biphenyl (30-115%)*</u> | <u>Terphenyl- D14 (18-137%)*</u> | <u>Phenol-D5 (24-113%)*</u> | <u>2-Fluoro- Phenol (25-121%)*</u> | <u>2,4,6- Tribromo- Phenol (19-122%)*</u> |
| EBB16001BSD/89889 | 100 | 97 | 89 | 88 | 88 | 65 |
| EBB19003SD/90437 | 108 | 95 | 97 | 86 | 88 | 74 |
| Method Blank 2 | 88 | 88 | 91 | 72 | 64 | 48 |
| Method Blank 1 | 96 | 96 | 102 | 83 | 86 | 58 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-SR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

SOIL SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>SEMIVOLATILE</u> | | | | | |
|-------------------------|---|--|--|---------------------------------|--|---|
| | <u>Nitro- Benzene-D5 (23-120%)*</u> | <u>2-Fluoro- Biphenyl (30-115%)*</u> | <u>Terphenyl- D14 (18-137%)*</u> | <u>Phenol-D5 (24-113%)*</u> | <u>2-Fluoro- Phenol (25-121%)*</u> | <u>2,4,6- Tribromo- Phenol (19-122%)*</u> |
| EBB15005SD/89588 | 83 | 81 | 76 | 71 | 72 | 65 |
| Method Blank | 88 | 88 | 91 | 72 | 64 | 48 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SD
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

DUPLICATE ANALYSIS

Results in mg/kg (ppm) dry weight

Sample Matrix: Soil

Client Sample ID: EMBB18001SF/82945
Lab Sample ID: K1136

| <u>Parameter</u> | <u>Control Limit</u> | <u>Original Sample</u> | <u>Duplicate</u> | <u>RPD</u> |
|------------------|----------------------|------------------------|------------------|------------|
| antimony | 6.0 | 4 | 3 U | 200.0 |
| arsenic | | 5.4 | 5.2 | 4.2 |
| beryllium | | 0.2 | 0.2 | |
| cadmium | 0.5 | 0.5 U | 0.5 U | |
| chromium | | 8 | 9 | 11.8 |
| copper | 2.5 | 3 | 5 | 50.0 |
| iron | | 9,610 | 11,600 | 18.8 |
| lead | | 4.9 | 17.8 | 113.9 * |
| mercury | | 0.4 | 0.4 | |
| nickel | 4.0 | 5 | 6 | 18.2 |
| selenium | | 0.2 U | 0.2 U | |
| silver | | 0.5 U | 0.5 U | |
| thallium | 1.0 | 0.3 | 0.2 U | 200.0 |
| zinc | | 25.9 | 30.0 | 14.7 |

Date of Digestion: 05/18/92

Date of Analysis: 05/26/92 (ICP), 05/18/92 through 05/21/92 (GFAA), 05/18/92 (CVAA)

% Solids: 100.0

RPD = Relative percent difference

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- * - Duplicate analysis not within control limits.

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPELS
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: VB0501

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/01/92

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: VB0501

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/01/92

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPEES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1
Lab Sample ID: WB0427

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | cis-1,3-dichloropropene | 5 U |
| bromomethane | 10 U | trichloroethene | 5 U |
| vinyl chloride | 10 U | dibromochloromethane | 5 U |
| chloroethane | 10 U | 1,1,2-trichloroethane | 5 U |
| methylene chloride | 2 J | benzene | 5 U |
| acetone | 10 U | trans-1,3-dichloropropene | 5 U |
| carbon disulfide | 5 U | bromoform | 5 U |
| 1,1-dichloroethene | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,1-dichloroethane | 5 U | 2-hexanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | tetrachloroethene | 5 U |
| chloroform | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 1,2-dichloroethane | 5 U | toluene | 5 U |
| 2-butanone | 10 U | chlorobenzene | 5 U |
| 1,1,1-trichloroethane | 5 U | ethylbenzene | 5 U |
| carbon tetrachloride | 5 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| 1,2-dichloropropane | 5 U | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/27/92

This method blank applies to the following samples: EBB017001SE, EBB180001SE and EMBB18001SE.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2
Lab Sample ID: WB0519

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | cis-1,3-dichloropropene | 5 U |
| bromomethane | 10 U | trichloroethene | 5 U |
| vinyl chloride | 10 U | dibromochloromethane | 5 U |
| chloroethane | 10 U | 1,1,2-trichloroethane | 5 U |
| methylene chloride | 2 J | benzene | 5 U |
| acetone | 10 U | trans-1,3-dichloropropene | 5 U |
| carbon disulfide | 10 U | bromoform | 5 U |
| 1,1-dichloroethene | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,1-dichloroethane | 5 U | 2-hexanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | tetrachloroethene | 5 U |
| chloroform | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 1,2-dichloroethane | 5 U | toluene | 5 U |
| 2-butanone | 10 U | chlorobenzene | 5 U |
| 1,1,1-trichloroethane | 5 U | ethylbenzene | 5 U |
| carbon tetrachloride | 5 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| 1,2-dichloropropane | 5 U | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/19/92

This method blank applies to the following samples: EMBB18001SE MSD and EMBB18001SE MS.

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51257

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank

Lab Sample ID: H0447

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/29/92

Date of Analysis: 05/05/92

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51257

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: H0447

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 330 U |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
1 - Detected as diphenylamine.

Date of Extraction: 04/29/92
Date of Analysis: 05/05/92

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51247

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1
Lab Sample ID: H0419

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51247

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 1

Lab Sample ID: H0419

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 330 U |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 330 U |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
1 - Detected as diphenylamine.

Date of Extraction: 04/27/92
Date of Analysis: 05/01/92

This method blank applies to the following samples: EBB017001SD, EBB180001SD and EMBB18001SD.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51247

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2
Lab Sample ID: BL0595

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-----------------------------|----------------------|----------------------------|----------------------|
| phenol | 330 U | bis(2-chloroethoxy)methane | 330 U |
| bis(2-chloroethyl)ether | 330 U | 2,4-dichlorophenol | 330 U |
| 2-chlorophenol | 330 U | 1,2,4-trichlorobenzene | 330 U |
| 1,3-dichlorobenzene | 330 U | naphthalene | 330 U |
| 1,4-dichlorobenzene | 330 U | 4-chloroaniline | 330 U |
| benzyl alcohol | 330 U | hexachlorobutadiene | 330 U |
| 1,2-dichlorobenzene | 330 U | 4-chloro-3-methylphenol | 330 U |
| 2-methylphenol | 330 U | 2-methylnaphthalene | 330 U |
| bis(2-chloroisopropyl)ether | 330 U | hexachlorocyclopentadiene | 330 U |
| 4-methylphenol | 330 U | 2,4,6-trichlorophenol | 330 U |
| n-nitroso-di-n-propylamine | 330 U | 2,4,5-trichlorophenol | 1,600 U |
| hexachloroethane | 330 U | 2-chloronaphthalene | 330 U |
| nitrobenzene | 330 U | 2-nitroaniline | 1,600 U |
| isophorone | 330 U | dimethyl phthalate | 330 U |
| 2-nitrophenol | 330 U | acenaphthylene | 330 U |
| 2,4-dimethylphenol | 330 U | 2,6-dinitrotoluene | 330 U |
| benzoic acid | 1,600 U | | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 05/19/92
Date of Analysis: 06/10/92

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51247

SEMIVOLATILE ORGANIC ANALYSIS (continued)

Results in $\mu\text{g}/\text{kg}$ (ppb)

Sample Matrix: Soil

Client Sample ID: Method Blank 2

Lab Sample ID: BL0595

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|-------------------------------------|----------------------|----------------------------|----------------------|
| 3-nitroaniline | 1,600 U | anthracene | 330 U |
| acenaphthene | 330 U | di-n-butylphthalate | 330 U |
| 2,4-dinitrophenol | 1,600 U | fluoranthene | 330 U |
| 4-nitrophenol | 1,600 U | pyrene | 330 U |
| dibenzofuran | 330 U | butylbenzylphthalate | 60 J |
| 2,4-dinitrotoluene | 330 U | 3,3'-dichlorobenzidine | 660 U |
| diethylphthalate | 330 U | benzo(a)anthracene | 330 U |
| 4-chlorophenyl-phenylether | 330 U | chrysene | 330 U |
| fluorene | 330 U | bis(2-ethylhexyl)phthalate | 41 J |
| 4-nitroaniline | 1,600 U | di-n-octylphthalate | 330 U |
| 4,6-dinitro-2-methylphenol | 1,600 U | benzo(b)fluoranthene | 330 U |
| n-nitrosodiphenylamine ¹ | 330 U | benzo(k)fluoranthene | 330 U |
| 4-bromophenyl-phenylether | 330 U | benzo(a)pyrene | 330 U |
| hexachlorobenzene | 330 U | indeno(1,2,3-cd)pyrene | 330 U |
| pentachlorophenol | 1,600 U | dibenzo(a,h)anthracene | 330 U |
| phenanthrene | 330 U | benzo(g,h,i)perylene | 330 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

1 - Detected as diphenylamine.

Date of Extraction: 05/19/92

Date of Analysis: 06/10/92

This method blank applies to the following samples: EMBB18001SD MS, EMBB18001SD MSD

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: PBSI0094/PBSI0096/PBSC5098

| <u>Analyte</u> | <u>Result</u> |
|----------------|---------------|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 1 U |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 1.2 |

Date of Digestion: 05/22/92

Date of Analysis: 05/26/92 (ICP), 05/18/92 (CVAA), 05/26 - 05/28/92 (GFAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 51247

Client Project ID: Sanford, Cohen and Associates

METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: PBSE4968/PBSE4970/PBSC5082

| <u>Analyte</u> | <u>Result</u> |
|----------------|---------------|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 1 U |
| iron | 2 |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| thallium | 0.2 U |
| zinc | 0.5 U |

Date of Digestion: 05/01/92

Date of Analysis: 05/06/92 (ICP), 05/04/92 through 05/06/92 (GFAA), 05/05/92 (CVAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-SB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

METALS ANALYSIS

Results in mg/kg (ppm)

Sample Matrix: Soil

Client Sample ID: Method Blank
Lab Sample ID: PBSI0055/PBSI0053/PBSC5059

| <u>Analyte</u> | <u>Result</u> |
|----------------|---------------|
| antimony | 3 U |
| arsenic | 0.2 U |
| beryllium | 0.1 U |
| cadmium | 0.5 U |
| chromium | 1 U |
| copper | 1 U |
| lead | 0.2 U |
| mercury | 0.1 U |
| nickel | 2 U |
| selenium | 0.2 U |
| silver | 0.5 U |
| zinc | 1.9 |

Date of Digestion: 05/18/92

Date of Analysis: 05/26/92 (ICP), 05/18/92 through 05/21/92 (GFAA), 05/18/92 (CVAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

This method blank applies to the spike and duplicate analysis.

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WS
QUALITY CONTROL SAMPLE
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g/liter}$ (ppb)

Client Sample ID: ESM07001GH/170701/170702/170703
Lab Sample ID: SS7611 MS/SS7612 MSD

| <u>Compound</u> | <u>Sample Conc.</u> | <u>Conc. Spike Added</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|--------------------|---------------------|--------------------------|-----------------|------------------|
| 1,1-dichloroethene | 50.0 | 10 U | 45.7 | 91 |
| trichloroethene | 50.0 | 13.0 | 63.8 | 102 |
| benzene | 50.0 | 10 U | 51.7 | 103 |
| toluene | 50.0 | 10 U | 49.9 | 100 |
| chlorobenzene | 50.0 | 10 U | 51.5 | 103 |

| <u>Compound</u> | <u>MSD Conc.</u> | <u>Conc. Spike Added</u> | <u>MSD % Rec.</u> | <u>% RPD</u> |
|--------------------|------------------|--------------------------|-------------------|--------------|
| 1,1-dichloroethene | 50.0 | 49.1 | 98 | -7 |
| trichloroethene | 50.0 | 68.4 | 111 | -8 |
| benzene | 50.0 | 54.8 | 110 | -7 |
| toluene | 50.0 | 52.6 | 105 | -5 |
| chlorobenzene | 50.0 | 54.8 | 110 | -7 |

RPD = Relative Percent Difference

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/18/92

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

WATER SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g/liter}$ (ppb)

Client Sample ID: ESM07001GG/170705/170725
Lab Sample ID: SS7620 MS/SS7621 MSD

| | <u>Conc.</u> <u>Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|--------------|------------------------------------|---------------------|-----------------|------------------|
| acenaphthene | 200 | 10 U | 202 | 101 |
| pyrene | 200 | 10 U | 191 | 96 |

| | <u>Conc.</u> <u>Spike Added</u> | <u>MSD Conc.</u> | <u>MSD %Rec.</u> | <u>%RPD</u> |
|--------------|------------------------------------|------------------|------------------|-------------|
| acenaphthene | 200 | 205 | 102 | -1 |
| pyrene | 200 | 196 | 98 | -2 |

RPD = Relative Percent Difference

Date of Extraction: 03/17/92
Date of Analysis: 03/26/92

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLE
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| EBG01002WH/196714 | 97 | 94 | 96 |
| ESM05001GH/196701 | 102 | 99 | 102 |
| ESM07001GH/170701 | 101 | 99 | 99 |
| ESM07001GHMS/170702 | 92 | 90 | 91 |
| ESM07001GHMSD/170703 | 92 | 92 | 92 |
| Method Blank | 99 | 99 | 99 |

*Values in parenthesis represent USEPA contract required QC limits.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>VOLATILE</u> | |
|-------------------------|--|---------------------------------|---|
| | | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| Travel Blank | 100 | 97 | 96 |
| Method Blank | 101 | 98 | 101 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| Travel Blank | 103 | 100 | 91 |
| Method Blank | 96 | 97 | 92 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| ESM08001WH/171801 | 98 | 97 | 100 |
| Travel Blank | 98 | 100 | 102 |
| Method Blank | 96 | 98 | 99 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| Travel Blank | 97 | 98 | 91 |
| Method Blank | 96 | 97 | 92 |

*Values in parenthesis represent contract required QC limits.

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| ESM05003WH/197885 | 108 | 109 | 97 |
| Travel Blank | 104 | 106 | 89 |
| Method Blank | 103 | 104 | 98 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>Lab Sample ID</u> | <u>1-Fluoronaphthalene</u> |
|-------------------------|----------------------|----------------------------|
| Method Blank | H0107 B-1 | 56 |
| ESM08001WF/171805 | SS8087 | 45 |

*No QC limits have been established at this time.

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ1-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>Lab Sample ID</u> | <u>1-Fluoronaphthalene</u> |
|-------------------------|----------------------|----------------------------|
| Method Blank | H0107 B-1 | 56 |
| EBB03001WF/146743 | SS7891 | 52 |
| EBB04001WF/196731 | SS7892 | 52 |

*No QC limits have been established at this time.

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WD
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 50938

DUPLICATE ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: EBG01002WG/196726

Lab Sample ID: SS7615

| <u>Parameter</u> | <u>Control Limit</u> | <u>Original Sample</u> | <u>Duplicate</u> | <u>RPD</u> |
|------------------|----------------------|------------------------|------------------|------------|
| aluminum | | 0.040 U | 0.040 U | |
| antimony | | 0.030 U | 0.030 U | |
| arsenic | | 0.002 U | 0.002 U | |
| barium | | 0.038 | 0.038 | |
| beryllium | | 0.001 U | 0.001 U | |
| cadmium | 5.0 | 0.005 U | 0.005 U | |
| calcium | 5,000.0 | 13.6 | 13.3 | 2.2 |
| chromium | 10.0 | 0.010 U | 0.010 U | |
| cobalt | | 0.020 U | 0.020 U | |
| copper | | 0.010 U | 0.010 U | |
| iron | | 0.051 | 0.034 | 40.0 |
| lead | | 0.002 U | 0.002 U | |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Digestion Date: 03/25/92

Analysis Date: 03/30/92 (ICP), 03/26/92 (CVAA), 03/26/92 through 03/29/92 (GFAA)

RPD - Relative percent difference

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WD
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 50938

DUPLICATE ANALYSIS
(continued)

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: EBG01002WG/196726
Lab Sample ID: SS7615

| <u>Parameter</u> | <u>Control Limit</u> | <u>Original Sample</u> | <u>Duplicate</u> | <u>RPD</u> |
|------------------|----------------------|------------------------|------------------|------------|
| magnesium | | 4.47 | 4.42 | 1.1 |
| manganese | | 0.008 | 0.007 | 13.3 |
| mercury | 0.2 | 0.0002 U | 0.0002 U | |
| nickel | | 0.020 U | 0.020 U | |
| potassium | | 1.27 | 1.19 | 6.5 |
| selenium | | 0.002 U | 0.002 U | |
| silver | | 0.005 U | 0.005 U | |
| sodium | 5,000.0 | 9.74 | 9.64 | 1.0 |
| thallium | | 0.002 U | 0.002 U | |
| vanadium | | 0.010 U | 0.010 U | |
| zinc | 20.0 | 0.020 | 0.018 B | 10.5 |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
B - Value greater than instrument detection limit, but less than contract required quantitation limit.

Digestion Date: 03/25/92
Analysis Date: 03/30/92 (ICP), 03/26/92 (CVAA), 03/26/92 through 03/29/92 (GFAA)

RPD - Relative percent difference

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-WD
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

DUPLICATE ANALYSIS

Results in mg/kg (ppm) dry weight

Sample Matrix: Water

Client Sample ID: EBG03059SF

Lab Sample ID: SS7713

| <u>Parameter</u> | <u>Original Sample</u> | <u>Duplicate</u> | <u>RPD</u> |
|------------------|------------------------|------------------|------------|
| antimony | 3 U | 3 U | NC |
| beryllium | 0.6 | 0.6 | 0 |
| cadmium | 5.0 | 5.7 | 13.1 |
| chromium | 62 | 56 | 10.2 |
| copper | 40 | 38 | 5.1 |
| nickel | 70 | 70 | 0 |
| silver | 1.6 | 1.4 | 13.3 |
| zinc | 85.5 | 90.8 | 6.0 |
| arsenic | 4.8 | 5.1 | 6.1 |
| lead | 5.3 | 6.4 | 18.8 |
| selenium | 0.6 | 0.9 | 40.0 |
| thallium | 0.4 | 0.5 | 22.2 |
| mercury | 0.1 U | 0.1 U | NC |

Date of Analysis:

RPD = Relative percent difference

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.
- B - Value greater than instrument detection limit, but less than contract required quantitation limit.
- B - Analyte was found in the blank as well as the sample.
- NC - Not calculable

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: VB03188

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 J | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/18/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank 1
Lab Sample ID: VB03252

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 2 J | 1,1,2-trichloroethane | 5 U |
| acetone | 100 U | benzene | 5 U |
| carbon disulfide | 1 J | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 50 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 50 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 100 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylene (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/25/92
Dilution Factor: 1.00

This method blank applies to sample BBI0692.

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

VOLATILE ORGANIC TARGET COMPOUND LIST

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank 2

Lab Sample ID: VB03262

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 J | 1,1,2-trichloroethane | 5 U |
| acetone | 5 J | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 50 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 50 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 100 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/26/92

Dilution Factor: 1.00

This method blank applies to the following samples: BBI0421, EBB03001WH, EBB04001WH.

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: VB03194

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/19/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: VB03262

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 J | 1,1,2-trichloroethane | 5 U |
| acetone | 5 J | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/26/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: VB0327

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Job Number: SON 50998

Client Project ID: Sanford, Cohen and Associates

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: VB0327

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: H0060

| <u>Compound</u> | <u>Concentration</u> |
|------------------------|----------------------|
| naphthalene | 10 U |
| acenaphthylene | 10 U |
| acenaphthene | 10 U |
| fluorene | 10 U |
| phenanthrene | 10 U |
| anthracene | 10 U |
| fluoranthene | 10 U |
| pyrene | 10 U |
| benzo(a)anthracene | 10 U |
| chrysene | 10 U |
| benzo(b)fluoranthene | 10 U |
| benzo(k)fluoranthene | 10 U |
| benzo(a)pyrene | 10 U |
| indeno(1,2,3-cd)pyrene | 10 U |
| dibenz(a,h)anthracene | 10 U |
| benzo(g,h,i)perylene | 10 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/17/92
Date of Analysis: 03/26/92
Dilution Factor: 1.0

Sanford, Cohen and Associates
April 8, 1992

TABLE CQ1-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50938

METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

| Client Sample ID: Lab Sample ID: | Method Blank <u>PBWC5052/PBWE4658/PBWE4660</u> |
|-------------------------------------|---|
| antimony | 0.03 U |
| arsenic | 0.002 U |
| beryllium | 0.001 U |
| cadmium | 0.005 U |
| chromium | 0.01 U |
| copper | 0.02 |
| lead | 0.002 U |
| mercury | 0.001 U |
| nickel | 0.02 U |
| selenium | 0.002 U |
| silver | 0.005 U |
| thallium | 0.002 U |
| zinc | 0.005 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Digestion Date: 03/25/92

Analysis Date: 03/30/92 (ICP), 03/26/92 (CVAA), 03/26/92 through 03/29/92 (GFAA)

Sanford, Cohen and Associates
April 10, 1992

TABLE CQ-1WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50975

METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

| Client Sample ID: Lab Sample ID: | Method Blank <u>PBWE4658/PBWE4660/PBWC5052</u> |
|-------------------------------------|---|
| antimony | 0.03 U |
| arsenic | 0.002 U |
| beryllium | 0.001 U |
| cadmium | 0.005 U |
| chromium | 0.01 U |
| copper | 0.02 |
| lead | 0.002 U |
| mercury | 0.001 U |
| nickel | 0.02 U |
| selenium | 0.002 U |
| silver | 0.005 U |
| thallium | 0.002 U |
| zinc | 0.005 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Digestion Date: 03/25/92

Analysis Date: 03/26/92 (CVAA), 03/30/92 (ICP), 03/26/92 through 03/29/92 (GFAA)

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-WB3
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

PRIORITY POLLUTANT METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

| Client Sample ID: Lab Sample ID: | Method Blank <u>PBWCS054/PBWE4691/PBWE4694</u> |
|-------------------------------------|---|
| antimony | 0.03 U |
| arsenic | 0.002 U |
| beryllium | 0.001 U |
| cadmium | 0.005 U |
| chromium | 0.01 U |
| copper | 0.02 |
| lead | 0.002 U |
| mercury | 0.001 U |
| nickel | 0.02 U |
| selenium | 0.002 U |
| silver | 0.005 U |
| thallium | 0.002 U |
| zinc | 0.011 |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Digestion Date: 03/26/92

Analysis Date: 03/30/92 (ICP, CVAA), 03/29/92 through 04/01/92 (GFAA)

Sanford, Cohen and Associates
April 16, 1992

TABLE CQ1-TB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50952

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Travel Blank

Lab Sample ID: SS7708

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 8 J | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/19/92

Dilution Factor: 1.00

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-TB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Travel Blank
Lab Sample ID: SS8085

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/26/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-TB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50998

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Travel Blank
Lab Sample ID: SS8330

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 5 J | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92

Dilution Factor: 1.00

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ1-TB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51018

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Travel Blank

Lab Sample ID: SS8486

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 03/27/92

Dilution Factor: 1.00

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Results in $\mu\text{g/liter}$ (ppb)

Client Sample ID: EBB16001BWH/197319
Lab Sample ID: K1229

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>Sample Conc.</u> | <u>MS Conc.</u> | <u>MS % Rec.</u> |
|--------------------|--------------------------|---------------------|-----------------|------------------|
| 1,1-dichloroethene | 50.0 | 5.0 U | 57.0 | 114 |
| trichloroethene | 50.0 | 5.0 U | 46.4 | 93 |
| benzene | 50.0 | 5.0 U | 43.8 | 88 |
| toluene | 50.0 | 5.0 U | 47.2 | 94 |
| chlorobenzene | 50.0 | 5.0 U | 49.7 | 99 |

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>MSD Conc.</u> | <u>MSD % Rec.</u> | <u>% RPD</u> |
|--------------------|--------------------------|------------------|-------------------|--------------|
| 1,1-dichloroethene | 50.0 | 56.0 | 112 | 2 |
| trichloroethene | 50.0 | 46.1 | 92 | 1 |
| benzene | 50.0 | 42.3 | 85 | 3 |
| toluene | 50.0 | 44.9 | 90 | 4 |
| chlorobenzene | 50.0 | 48.9 | 98 | 1 |

RPD = Relative Percent Difference

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
- J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/30/92

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: EBB16001BWF/197328
Lab Sample ID: K1239-41

| <u>Compound</u> | <u>Conc. Spike Added</u> | <u>Sample Result</u> | <u>Conc. MS</u> | <u>% Rec.</u> | <u>Conc. MSD</u> | <u>% Rec.</u> | <u>RPD</u> |
|-------------------------|----------------------------------|--------------------------|---------------------|---------------|----------------------|---------------|------------|
| naphthalene | 100 | 0.16 U | 73 | 73 | 68 | 68 | 7.1 |
| acenaphthylene | 100 | 0.16 U | 79 | 79 | 59 | 59 | 29 |
| acenaphthene | 100 | 0.16 U | 77 | 77 | 68 | 68 | 12 |
| fluorene | 100 | 0.0080 U | 81 | 81 | 72 | 72 | 11 |
| phenanthrene | 100 | 0.0080 U | 81 | 81 | 72 | 72 | 11 |
| anthracene | 100 | 0.0080 U | 490 | 490 | 440 | 440 | 11 |
| fluoranthene | 100 | 0.33 | 84 | 84 | 73 | 73 | 14 |
| pyrene | 100 | 0.0080 U | 77 | 77 | 73 | 73 | 5.3 |
| benzo(a)anthracene | 100 | 0.0080 U | 97 | 97 | 91 | 91 | 6.4 |
| chrysene | 100 | 0.0080 U | 77 | 77 | 73 | 73 | 5.3 |
| benzo(b)fluoranthene | 100 | 0.0080 U | 82 | 82 | 78 | 78 | 5.0 |
| benzo(k)fluoranthene | 100 | 0.080 U | 76 | 76 | 74 | 74 | 2.7 |
| benzo(a)pyrene | 100 | 0.0080 U | 104 | 104 | 100 | 100 | 3.9 |
| dibenzo(a,h)anthracene | 100 | 0.0080 U | 83 | 83 | 79 | 79 | 4.9 |
| benzo(g,h,i)perylene | 100 | 0.0080 U | 86 | 86 | 80 | 80 | 7.2 |
| indeno(1,2,3-c,d)pyrene | 100 | 0.0080 U | 85 | 85 | 79 | 79 | 7.3 |

RPD = Relative Percent Difference

Date of Extraction: 04/29/92
Date of Analysis: 05/21/92

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51257

MATRIX SPIKE RECOVERY

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: EBB16001BWG/197342

Lab Sample ID: K1237

| | <u>Control</u> <u>Limit % R</u> | <u>Spiked</u> <u>Sample Result</u> | <u>Sample Result</u> | | <u>Spike Added</u> | <u>% Recovery</u> |
|-----------|------------------------------------|---------------------------------------|----------------------|--|--------------------|-------------------|
| antimony | 75-125 | 0.47 | 0.03 U | | 0.50 | 94.0 |
| arsenic | 75-125 | 0.035 | 0.002 U | | 0.040 | 87.5 |
| beryllium | 75-125 | 0.051 | 0.001 U | | 0.050 | 102.0 |
| cadmium | 75-125 | 0.033 | 0.005 U | | 0.050 | 66.0 |
| chromium | 75-125 | 0.19 | 0.01 U | | 0.20 | 95.0 |
| copper | 75-125 | 0.23 | 0.01 U | | 0.25 | 92.0 |
| lead | 75-125 | 0.012 | 0.002 U | | 0.020 | 60.0 |
| mercury | 75-125 | 0.009 | 0.001 U | | 0.010 | 90.0 |
| nickel | 75-125 | 0.45 | 0.02 U | | 0.50 | 90.0 |
| selenium | 75-125 | 0.009 | 0.002 U | | 0.010 | 90.0 |
| silver | 75-125 | 0.044 | 0.005 U | | 0.050 | 88.0 |
| thallium | 75-125 | 0.055 | 0.002 U | | 0.050 | 110.0 |
| zinc | 75-125 | 0.45 | 0.014 | | 0.50 | 87.2 |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date of Digestion: 05/04/92

Date of Analysis: 05/06/92 (ICP), 05/04 - 05/06/92 (GFAA), 05/05/92 (CVAA)

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WS
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51257

POST DIGESTION SPIKE SAMPLE RECOVERY

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: EBB16001BWG/197342
Lab Sample ID: K1237

| | <u>Control Limit % R</u> | <u>Spiked Sample Result</u> | <u>Sample Result</u> | <u>Spike Added</u> | <u>% Recovery</u> |
|---------|------------------------------|---------------------------------|----------------------|--------------------|-------------------|
| cadmium | | 0.031 | 0.005 U | 0.050 | 62.0 |
| lead | | 0.010 | 0.002 U | 0.020 | 50.0 |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date of Digestion: 05/04/92

Date of Analysis: 05/06/92 (ICP), 05/04 - 05/06/92 (GFAA), 05/05/92 (CVAA)

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WR
QUALITY CONTROL ANALYSES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| EBB16001BWH/197319 | 106 | 105 | 95 |
| EBB16001BWH MS/197323 | 108 | 107 | 93 |
| EBB16001BWH MSD/197324 | 101 | 104 | 91 |
| Travel Blank | 101 | 103 | 91 |
| Method Blank | 103 | 104 | 98 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

WATER SURROGATE PERCENT RECOVERY SUMMARY

| <u>Client Sample ID</u> | <u>VOLATILE</u> | | |
|-------------------------|--|---------------------------------|---|
| | <u>Toluene-D8</u> <u>(88-110%)*</u> | <u>BFB</u> <u>(86-115%)*</u> | <u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u> |
| Travel Blank | 100 | 96 | 87 |
| Method Blank | 98 | 96 | 90 |

*Values in parenthesis represent QC limits.

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WR
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

WATER SURROGATE PERCENT RECOVERY SUMMARY

POLYNUCLEAR AROMATIC HYDROCARBONS ANALYSIS

| <u>Client Sample ID</u> | <u>Lab Sample ID:</u> | <u>1-Fluoronaphthalene (50-150%)*</u> |
|-------------------------|-----------------------|---|
| Method Blank | H0448 | 91 |
| EBB16001BWF/197327 | K1239 | 86 |
| EBB16001BWF/197328 | K1240 MS | 95 |
| EBB16001BWF/197328 | K1241 MSD | 88 |

*Values in parentheses represent QC limits.

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WD
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 1 of 2

Job Number: SON 51257

DUPLICATE ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: EBB16001BWG/197342

Lab Sample ID: K1238

| <u>Parameter</u> | <u>Control Limit</u> | <u>Original Sample</u> | <u>Duplicate</u> | <u>RPD</u> |
|------------------|----------------------|------------------------|------------------|------------|
| antimony | | 0.03 U | 0.03 U | |
| arsenic | | 0.002 U | 0.002 U | |
| beryllium | | 0.001 U | 0.001 U | |
| cadmium | | 0.005 U | 0.005 U | |
| chromium | | 0.01 U | 0.01 U | |
| copper | | 0.01 U | 0.01 U | |
| lead | | 0.002 U | 0.002 U | |
| mercury | 0.2 | 0.001 U | 0.001 U | |

Date of Digestion: 05/04/92

Date of Analysis: 05/06/92 (ICP), 05/04 - 05/06/92 (GFAA), 05/05/92 (CVAA)

RPD = Relative percent difference

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WD
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates
Analysis Sheet 2 of 2

Job Number: SON 51257

DUPLICATE ANALYSIS (continued)

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: EBB16001BWG/197342
Lab Sample ID: K1238

| <u>Parameter</u> | <u>Control Limit</u> | <u>Original Sample</u> | <u>Duplicate</u> | <u>RPD</u> |
|------------------|----------------------|------------------------|------------------|------------|
| nickel | | 0.02 U | 0.02 U | |
| selenium | | 0.002 U | 0.002 U | |
| silver | | 0.005 U | 0.005 U | |
| thallium | | 0.002 U | 0.002 U | |
| zinc | | 0.014 | 0.013 | 7.4 |

Date of Digestion: 05/04/92

Date of Analysis: 05/06/92 (ICP), 05/04 - 05/06/92 (GFAA), 05/05/92 (CVAA)

RPD = Relative percent difference

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ2-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank

Lab Sample ID: EB0430

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 J | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 1 J |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/30/92

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: EB0430

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 1 J | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/30/92

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: EB0506

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | cis-1,3-dichloropropene | 5 U |
| bromomethane | 10 U | trichloroethene | 5 U |
| vinyl chloride | 10 U | dibromochloromethane | 5 U |
| chloroethane | 10 U | 1,1,2-trichloroethane | 5 U |
| methylene chloride | 1 J | benzene | 5 U |
| acetone | 10 U | trans-1,3-dichloropropene | 5 U |
| carbon disulfide | 5 U | bromoform | 5 U |
| 1,1-dichloroethene | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,1-dichloroethane | 5 U | 2-hexanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | tetrachloroethene | 5 U |
| chloroform | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 1,2-dichloroethane | 5 U | toluene | 5 U |
| 2-butanone | 10 U | chlorobenzene | 5 U |
| 1,1,1-trichloroethane | 5 U | ethylbenzene | 5 U |
| carbon tetrachloride | 5 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| 1,2-dichloropropane | 5 U | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/06/92

Sanford, Cohen and Associates
April 21, 1992

TABLE CQ2-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 50985

POLYNUCLEAR AROMATIC HYDROCARBONS ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: H0107

| <u>Compound</u> | <u>Concentration</u> |
|-------------------------|----------------------|
| naphthalene | 0.016 U |
| acenaphthylene | 0.0080 U |
| acenaphthene | 0.016 U |
| fluorene | 0.0080 U |
| phenanthrene | 0.0080 U |
| anthracene | 0.0080 U |
| fluoranthene | 0.0080 U |
| pyrene | 0.0080 U |
| benzo(a)anthracene | 0.0080 U |
| chrysene | 0.0080 U |
| benzo(b)fluoranthene | 0.0080 U |
| benzo(k)fluoranthene | 0.0080 U |
| benzo(a)pyrene | 0.0080 U |
| dibenzo(a,h)anthracene | 0.016 U |
| benzo(g,h,i)perylene | 0.016 U |
| indeno(1,2,3-c,d)pyrene | 0.0080 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Extraction: 03/23/92
Date of Analysis: 03/31/92

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-WB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: PBWE4976/PBWE4979/PBWC5084

| <u>Analyte</u> | <u>Result</u> |
|----------------|---------------|
| antimony | 0.03 U |
| arsenic | 0.002 U |
| beryllium | 0.001 U |
| cadmium | 0.005 U |
| chromium | 0.01 U |
| copper | 0.01 U |
| lead | 0.002 U |
| mercury | 0.001 U |
| nickel | 0.02 U |
| selenium | 0.002 U |
| silver | 0.005 U |
| thallium | 0.002 U |
| zinc | 0.005 U |

Date of Digestion: 05/04/92

Date of Analysis: 05/06/92 (ICP), 05/04 - 05/06/92 (GFAA), 05/05/92 (CVAA)

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Sanford, Cohen and Associates
May 29, 1992

TABLE CQ2-TB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51263

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Travel Blank
Lab Sample ID: K1267

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 2 B | 1,1,2-trichloroethane | 5 U |
| acetone | 10 U | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 3 J |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 6 |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

- U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.
B - Analyte was found in the blank as well as the sample.

Date of Analysis: 04/30/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
June 1, 1992

TABLE CQ2-TB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51257

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Travel Blank
Lab Sample ID: K1233

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | 1,2-dichloropropane | 5 U |
| bromomethane | 10 U | cis-1,3-dichloropropene | 5 U |
| vinyl chloride | 10 U | trichloroethene | 5 U |
| chloroethane | 10 U | dibromochloromethane | 5 U |
| methylene chloride | 5 U | 1,1,2-trichloroethane | 5 U |
| acetone | 7 J | benzene | 5 U |
| carbon disulfide | 5 U | trans-1,3-dichloropropene | 5 U |
| 1,1-dichloroethene | 5 U | bromoform | 5 U |
| 1,1-dichloroethane | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | 2-hexanone | 10 U |
| chloroform | 5 U | tetrachloroethene | 5 U |
| 1,2-dichloroethane | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 2-butanone | 10 U | toluene | 5 U |
| 1,1,1-trichloroethane | 5 U | chlorobenzene | 5 U |
| carbon tetrachloride | 5 U | ethylbenzene | 5 U |
| vinyl acetate | 10 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylenes (total) | 5 U |
| | | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 04/30/92
Dilution Factor: 1.00

Sanford, Cohen and Associates
June 23, 1992

TABLE CQ2-TB
QUALITY CONTROL SAMPLES
CHEMICAL ANALYSES

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: Sanford, Cohen and Associates

Job Number: SON 51247

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Travel Blank
Lab Sample ID: K1127

| <u>Compound</u> | <u>Concentration</u> | <u>Compound</u> | <u>Concentration</u> |
|----------------------------|----------------------|--------------------------------|----------------------|
| chloromethane | 10 U | cis-1,3-dichloropropene | 5 U |
| bromomethane | 10 U | trichloroethene | 5 U |
| vinyl chloride | 10 U | dibromochloromethane | 5 U |
| chloroethane | 10 U | 1,1,2-trichloroethane | 5 U |
| methylene chloride | 5 U | benzene | 5 U |
| acetone | 10 U | trans-1,3-dichloropropene | 5 U |
| carbon disulfide | 5 U | bromoform | 5 U |
| 1,1-dichloroethene | 5 U | 4-methyl-2-pentanone | 10 U |
| 1,1-dichloroethane | 5 U | 2-hexanone | 10 U |
| 1,2-dichloroethene (total) | 5 U | tetrachloroethene | 5 U |
| chloroform | 5 U | 1,1,2,2-tetrachloroethane | 5 U |
| 1,2-dichloroethane | 5 U | toluene | 5 U |
| 2-butanone | 10 U | chlorobenzene | 5 U |
| 1,1,1-trichloroethane | 5 U | ethylbenzene | 5 U |
| carbon tetrachloride | 5 U | styrene | 5 U |
| bromodichloromethane | 5 U | xylene (total) | 5 U |
| 1,2-dichloropropane | 5 U | 1,1,2-trichlorotrifluoroethane | 5 U |

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date of Analysis: 05/06/92
Dilution Factor: 1.00



APPENDIX E

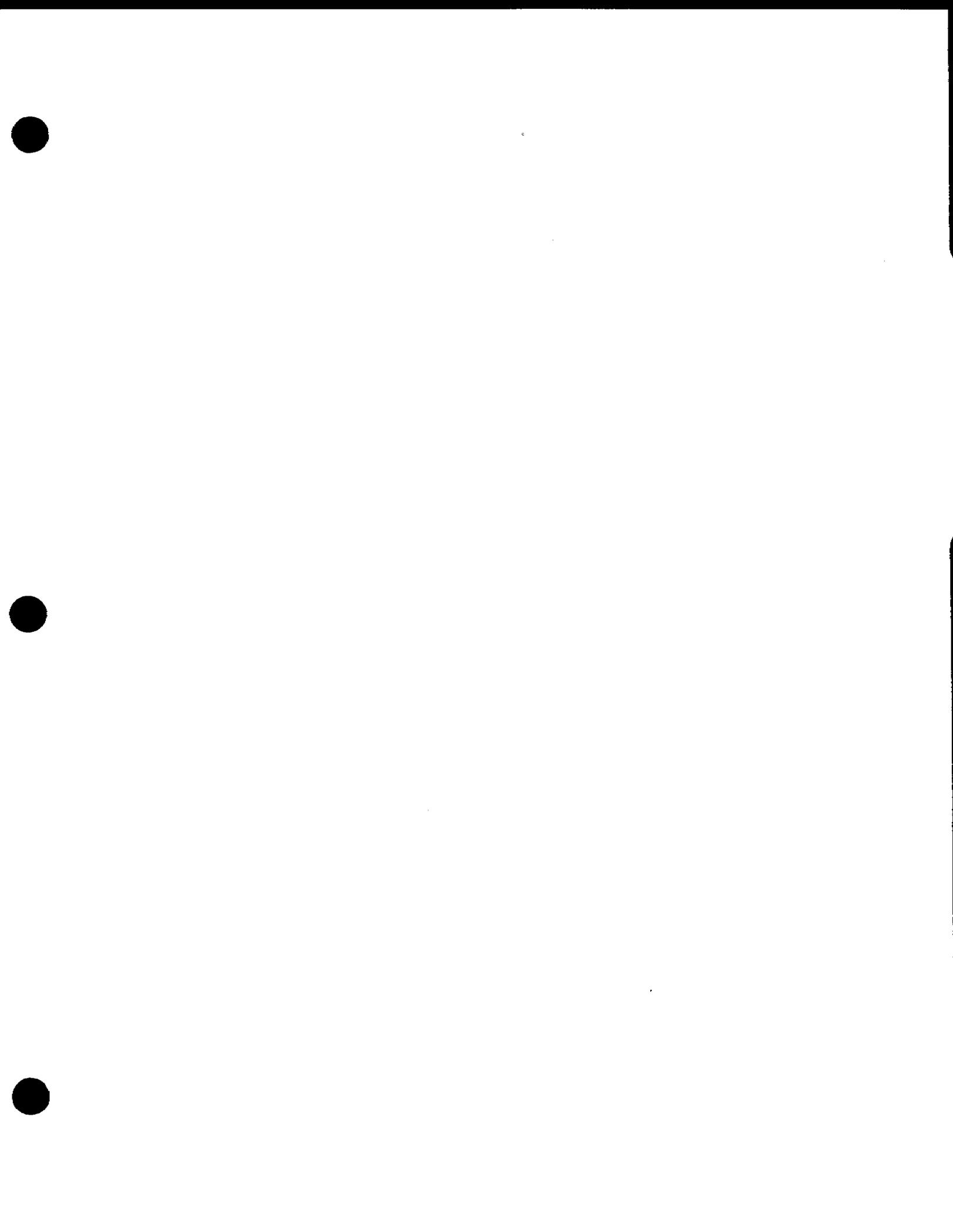
Cs-137 In California Soil

Cs-137 and H-3 in Soil
in California since 1987

| sample ID | Location | Collection Date | Cs-137 (pCi/g) | Cs-137 2 σ Error | H-3 (pCi/g) | H-3 2 σ Error |
|---------------|-----------------------|-----------------|----------------|-------------------------|-------------|----------------------|
| NST 87.04870 | CA: FARALLON ISLAND | 6/16/87 | 0.06 | 0.02 | NA | NA |
| NST 87.04871 | CA: FARALLON ISLAND | 6/16/87 | 0.04 | 0.02 | NA | NA |
| NST 87.04872 | CA: FARALLON ISLAND | 6/16/87 | 0.04 | 0.01 | NA | NA |
| NST 87.04873 | CA: FARALLON ISLAND | 6/16/87 | 0.03 | 0.02 | NA | NA |
| NST 87.04874 | CA: FARALLON ISLAND | 6/16/87 | 0.05 | 0.01 | NA | NA |
| NST 87.04875A | CA: SOUTHHAMPTON SHOA | 6/22/87 | 0.19 | 0.04 | NA | NA |
| NST 87.04875B | CA: SOUTHHAMPTON SHOA | 6/22/87 | 0.18 | 0.06 | NA | NA |
| NST 87.04876A | CA: SOUTHHAMPTON SHOA | 6/22/87 | 0.24 | 0.05 | NA | NA |
| NST 87.04876B | CA: SOUTHHAMPTON SHOA | 6/22/87 | 0.19 | 0.02 | NA | NA |
| NST 87.04877A | CA: SOUTHHAMPTON SHOA | 6/22/87 | 0.12 | 0.05 | NA | NA |
| NST 87.04877B | CA: SOUTHHAMPTON SHOA | 6/22/87 | 0.18 | 0.06 | NA | NA |
| NST 87.04877C | CA: SOUTHHAMPTON SHOA | 6/22/87 | 0.13 | 0.04 | NA | NA |
| NST 87.04878A | CA: HUNTERS POINT | 6/29/87 | 0.16 | 0.03 | NA | NA |
| NST 87.04878B | CA: HUNTERS POINT | 6/29/87 | 0.25 | 0.03 | NA | NA |
| NST 87.04879A | CA: HUNTERS POINT | 6/29/87 | 0.23 | 0.14 | NA | NA |
| NST 87.04879B | CA: HUNTERS POINT | 6/29/87 | 0.22 | 0.07 | NA | NA |
| NST 87.04879C | CA: HUNTERS POINT | 6/29/87 | 0.25 | 0.09 | NA | NA |
| NST 87.04880A | CA: HUNTERS POINT | 6/29/87 | 0.12 | 0.03 | NA | NA |
| NST 87.04880B | CA: HUNTERS POINT | 6/29/87 | 0.18 | 0.05 | NA | NA |
| NST 87.04880C | CA: HUNTERS POINT | 6/29/87 | 0.21 | 0.09 | NA | NA |
| NST 90.06915 | CA: SAN FRANCISCO BAY | 5/29/90 | 0.16 | 0.07 | NA | NA |
| NST 90.06916 | CA: SAN FRANCISCO BAY | 5/29/90 | 0.05 | 0.02 | NA | NA |
| NST 90.06917 | CA: SAN FRANCISCO BAY | 5/29/90 | 0.05 | 0.03 | NA | NA |
| NST 90.06921 | CA: SAN FRANCISCO BAY | 5/31/90 | 0.10 | 0.02 | NA | NA |
| NST 90.06922 | CA: SAN FRANCISCO BAY | 5/31/90 | 0.24 | 0.07 | NA | NA |
| NST 90.06923 | CA: SAN FRANCISCO BAY | 5/31/90 | 0.18 | 0.04 | NA | NA |

Cs-137 and H-3 in Soil
in California since 1987

| Sample ID | Location | Collection Date | Cs-137 (pci/g) | Cs-137 2 σ Error | H-3 (pci/g) | H-3 2 σ Error |
|--------------|------------------|-----------------|----------------|-------------------------|-------------|----------------------|
| T13C92.05723 | CA:SAN FRANCISCO | 1/13/92 | 0.13 | 0.04 | NA | NA |
| T13C92.05726 | CA:SAN FRANCISCO | 1/13/92 | 0.07 | 0.05 | NA | NA |
| T13C92.05732 | CA:SAN FRANCISCO | 1/13/92 | 0.03 | 0.01 | NA | NA |
| T13C92.05733 | CA:SAN FRANCISCO | 1/13/92 | 0.03 | 0.01 | NA | NA |



DEPARTMENT OF HEALTH SERVICES

714/744 P STREET
P.O. BOX 942732
SACRAMENTO, CA 94234-7320
(916) 445-0498



February 19, 1993

Mary Shoemaker, Director
Environmental Protection Department, T486
Rocketdyne Division
Rockwell International Corporation
6633 Canoga Avenue
Canoga Park, CA 91303

Dear Ms. Shoemaker:

Thank you for providing the Department of Health Services with the opportunity to participate in the **Multi-media Sampling at the Brandeis-Bardin Institute and the Santa Monica Mountain Conservancy**. We have enclosed a copy of the draft report which addresses our participation in the sampling project. We encourage a review of the document and are interested in any comments or questions anyone may have. We would also like to request that the report be placed in the public information repositories maintained for the Santa Susana Field Laboratory.

If you have any questions feel free to contact me at (916) 323-3023, or Gary Butner of my staff at (916) 323-5027.

Sincerely,

A handwritten signature in black ink that reads "Jack McGurk".

Jack McGurk
Acting Chief
Environmental Management Branch

Enclosure

cc: SSFL Workgroup Members
Arlene Giliberto, Ph.D.
Ed Ballard
Robert LeChevalier

DRAFT

Department of Health Services
Participation in Multi-Media Sampling
in the Vicinity of Rocketdyne SSFL

Introduction

The Rockwell International Corporation, Rocketdyne Division, developed a sampling plan to assess off-site contamination of properties adjacent to and north of the Rocketdyne Santa Susana Field Laboratory (SSFL). The Rocketdyne sampling plan included analysis for both chemical contaminants as well as radioactive materials. McLaren/Hart was contracted by Rockwell to perform sampling and prepare the final report.

The Environmental Management Branch of the California Department of Health Services (DHS) participated in the sampling program under the auspices of the Agreement in Principle (AIP) between the U.S. Department of Energy (DOE) and DHS. The AIP specifies that DHS will perform oversight of DOE environmental activities to ensure DOE is taking an environmentally responsible direction. The Energy Technology Engineering Center (ETEC) is a DOE operated facility within the boundary of SSFL. The ETEC facilities are used to test systems and components for use in energy, power conversion, and liquid metal development programs.

The scope of work for DHS in the AIP is confined to oversight of activities involving radioactive materials, so sample analysis was limited to radionuclide measurements. A detailed evaluation of sample site selection and collection methods was not performed by DHS. Participation by DHS in this sampling event was to provide an independent measurement of radioactivity in the environmental samples. Samples were collected when DHS staff was available to participate in each sampling event and therefore DHS samples were not randomly selected.

Sampling Methods

Seven McLaren/Hart samples were split with DHS, one was surface water and six were surface soil samples. All were collected from the Brandeis-Bardin Institute property, which is north of the SSFL. Figure 1 shows the sample locations listed in the McLaren/Hart workplan within the Brandeis-Bardin Institute property. DHS received split samples of the following locations: Campsite Area 2, Sodium (Na) Burn Pit Watershed, Building 59 Watershed, RD-51 Watershed, RMDF Watershed, and Sodium Reactor Experiment (SRE) Watershed. With one exception, Campsite Area 2, all split DHS samples were collected in ravine areas where runoff

from Rockwell facilities was possible. Sampling performed by Rockwell included environmental media such as soil, groundwater, surface water, fruits, and vegetables. As stated previously, DHS participated in the analysis of soil and surface water samples only.

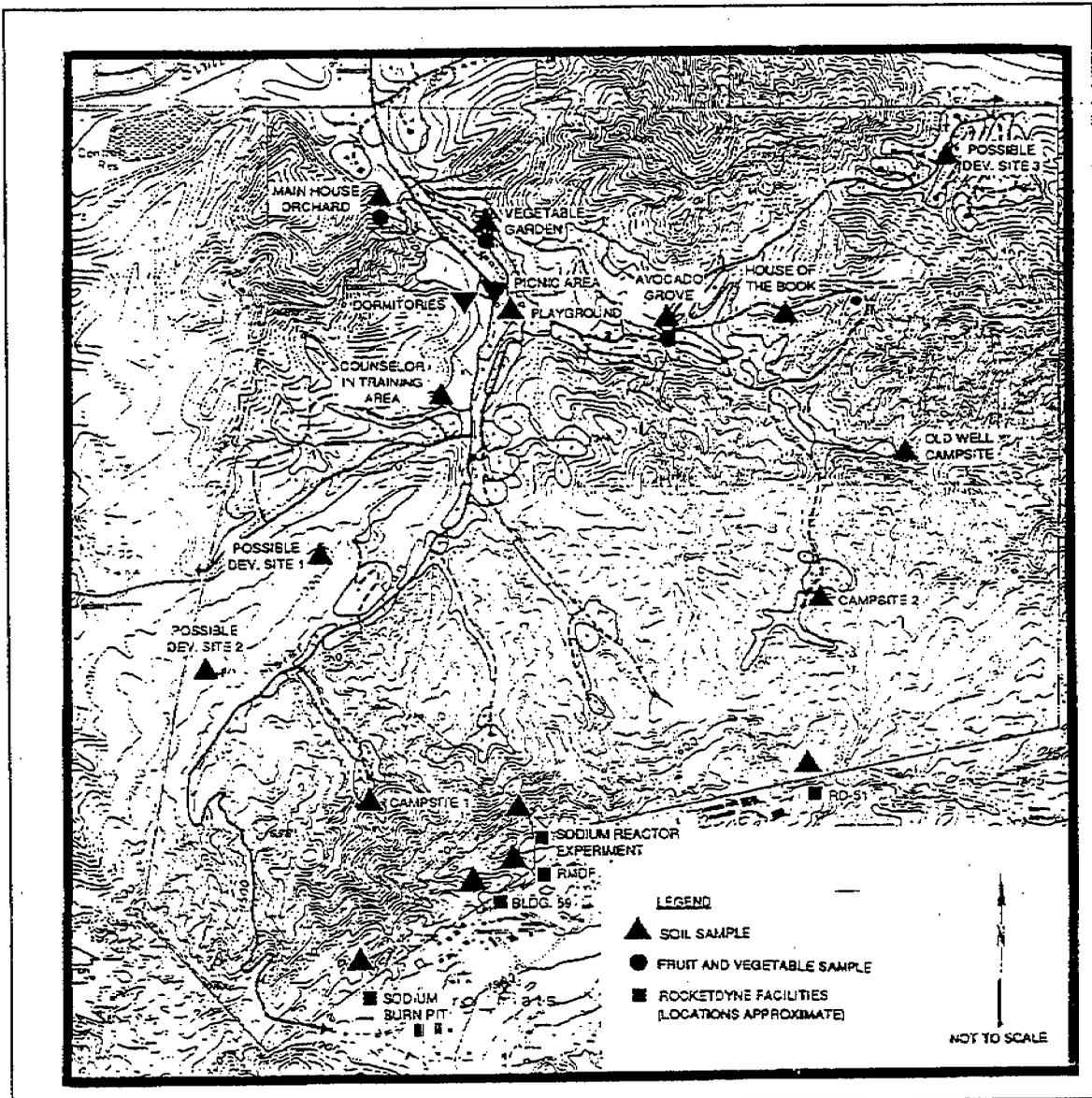


Figure 1. Brandeis-Bardin Institute

Samples analyzed by DHS were collected and prepared by McLaren/Hart under the direct observation of DHS or U. S. Environmental Protection Agency (USEPA) personnel in most cases. The sampling approach followed was presented in the workplan prepared by

McLaren/Hart¹. Procedures on sample collection are also detailed in that document.

Soil samples collected were from surface soil to a depth of 6 inches. Samples from ravine areas (Brandeis-Bardin sampling areas 15 through 19) were collected in locations likely to accumulate sediment and debris in the drainages that transport surface runoff. Split samples were prepared for more than one lab by collecting an additional core within the same sampling radius, mixing the soil for one minute with the cores taken by McLaren/Hart, and then dividing the contents. All soil samples (except Campsite Area 2) were found to have leaked a small amount of moisture (rainwater) in the shipping container during shipment. The soils were very moist from rain that occurred prior to collection.

Surface water samples were collected at sampling locations where surface water was present. Individual water samples from a single location were filtered and transferred to a large, clean bucket for mixing prior to partitioning of samples.

Analytical Methods

Sample preparation and analysis methods used are described in the California State Department of Health Services/Sanitation and Radiation Laboratory Manual of Radiological Procedures. Quality control procedures and detection limit calculations are also discussed in this document. Typical detection limits (limits vary with instrument background, count time, sample size, etc) for the radionuclides of concern are provided in Table 1.

Soil Analysis

Soil samples were analyzed for gamma emitting radionuclides and tritium. For gamma spectrometry, the soil samples are dried and sieved. About 200 grams of soil are placed in a canister for counting. Samples are normally counted from 500 to 1000 minutes.

For the tritium analysis, water from soil was extracted using a VirTis model

¹Workplan for Multi-Media Sampling at the Brandeis-Bardin Institute and the Santa Monica Mountains Conservancy, ChemRisk, Division of McLaren/Hart, February 10, 1992.

Table 1
Sanitation and Radiation Laboratory
Typical Detection Limits

| Sample Type | ¹³⁷ Cs pCi/l | Gross Alpha pCi/l | Gross Beta pCi/l | ³ H pCi/l |
|-------------|-------------------------|----------------------|---------------------|----------------------|
| Water | 8.0 | 0.40 | 2.50 | 260 |

| Sample Type | ⁴⁰ K pCi/g (dry) | ²³² Th pCi/g (dry) | ²³⁸ U pCi/g (dry) | ¹³⁷ Cs pCi/g (dry) | ³ H pCi/l |
|-------------|--------------------------------|----------------------------------|---------------------------------|----------------------------------|----------------------|
| Soil | 0.18 | 0.03 | 0.02 | 0.09 | 260 |

lyophilizer unit. After extraction, the SRL procedure for analysis follows EPA Method 906.0, "Tritium in Drinking Water". Sodium hydroxide pellets and 0.1 gram potassium permanganate were added to approximately 100 milliliters (ml) of extracted water and distilled. The first 10-15 ml fraction was discarded and approximately 50 ml of the distillate was collected. Two - 10 ml aliquots per sample were pipetted into separate scintillation vials and counted in the Packard 2200CA Liquid Scintillation Counter for 100 minutes each. Background and tritium standard samples are routinely counted before and after each run. The average of the duplicate aliquot results was reported.

Water Analysis

The water sample was analyzed for gamma emitting radionuclides using gamma spectrometry, for gross alpha using internal proportional counters, for gross beta using low-background counters, and for tritium using liquid scintillation counters. Procedures for these analyses are provided in the DHS laboratory manual and are based on methods provided in USEPA-680/4-75-001, USEPA 600/4-80-032 and Standard Methods for the Examination of Water and Wastewater².

²Standard Methods for the Examination of Water and Wastewater, L. S. Clesceri, et. al., 17th Edition, 1989.

Laboratory Results

Seven McLaren/Hart samples were split with DHS, one was surface water and six were soil samples. Table 2 provides a cross-reference between the McLaren/Hart numbering system and site description.

Table 2
Sample Identification Cross Reference

| Sample Location | McLaren/Hart Identification | Sample Type | Collection Date | Date Rec'd | Date Analyzed |
|---|-----------------------------|---------------|-----------------|------------|---------------|
| Brandeis-Bardin Camp Site Area 2 | DBB4097SC | Soil | 3/16/92 | 3/23/92 | 3/28/92 |
| Brandeis-Bardin Sodium Burn Pit Watershed | DBB18003WD | Surface water | 4/21/92 | 4/27/92 | 4/29/92 |
| Brandeis-Bardin Bldg 59 Watershed | DBB17003SC | Soil | 4/21/92 | 4/27/92 | 5/01/92 |
| Brandeis-Bardin Sodium Burn Pit Watershed | DBB18001ASC | Soil | 4/21/92 | 4/27/92 | 4/29/92 |
| Brandeis-Bardin RD-51 Watershed | DBB15001SC | Soil | 4/22/92 | 4/29/92 | 5/05/92 |
| Brandeis-Bardin RMDF Watershed | DBB16004SC | Soil | 4/22/92 | 4/29/92 | 5/06/92 |
| Brandeis-Bardin Sodium Reactor E. Watershed | DBB19002SC | Soil | 4/22/92 | 4/29/92 | 5/08/92 |

Soil Results

Soil samples were analyzed for tritium (Hydrogen-3) in soil moisture and gamma emitting radionuclides. The results of the analyses are listed in Table 3.

Potassium-40, Thorium-232, and Uranium-238 are all naturally occurring radionuclides that are widely distributed in the environment, and are normally found in soil in the concentrations reported here. These are all primordial radionuclides, meaning that they were present when the earth was formed some 4 billion years ago. Literature reports that Potassium-40 has typically been found in concentrations ranging from 17 picocuries/gram (pCi/g) to 50 pCi/g, which compare to our range of 20 to 24 pCi/g. Typical Thorium-232 concentrations range from 0.1 pCi/g to 1.3 pCi/g, as

compared to our range of 0.6 to 1.5 pCi/g. And typical Uranium-238 concentrations range from 0.4 to 1.3 pCi/g, as compared to our range of 0.3 to 1.0 pCi/g.³ It should also be noted here that in NCRP No.50, Radionuclides in Man's Environment⁴, it states that, ". . . significant variations of soil radioactivity with location and depth are common."

Cesium-137 is found today in the surface soil, primarily from deposition of fallout from past atmospheric testing of nuclear weapons. Cesium-137 is still detectable in the environment because of its relatively long half-life of 30 years. Cesium-137 was produced by some of the nuclear projects conducted at ETEC. In a study prepared by Pacific Northwest Laboratories⁵, Cesium-137 measurements in locations considered not affected by nuclear facilities (i.e., background locations), concentrations of Cesium-137 ranged from 0.2 pCi/g to 5.0 pCi/g, as compared to our range of 0.03 to 0.60 pCi/g. Our sampling did not include a background location, therefore typical concentrations for this region of California were not available for this report. An assessment of the range of Cesium-137 concentrations in the vicinity of SSFL at background locations will be made by DHS when the McLaren/Hart report becomes available.

Tritium (Hydrogen-3) is a naturally occurring radionuclide that is widely distributed in nature, and is also a possible contaminant from projects conducted at ETEC. After rainfall, tritium concentrations in soil moisture may reflect the tritium concentrations of the rainwater or runoff water. Concentrations in soil moisture from naturally occurring tritium would normally be below the detection limits of laboratory counters (usually less than 300 picocuries/liter (pCi/l)). The range of results found in our analyses was from the detection limit up to 11,000 pCi/l.

³Radioactivity in the Environment Sources, Distribution, and Surveillance, Ronald L. Kathren, Harwood Academic Publishers, 1984.

⁴Environmental Radiation Measurements, National Council on Radiation Protection and Measurements (NCRP), reprinted August 1, 1985.

⁵Transuranium and Other Long-Lived Radionuclides in the Terrestrial Environs of Nuclear Power Plants, Research Project 1059, Battelle, PNL, September, 1981.

Table 3
DHS Soil Analysis Results

| Sample Location | ⁴⁰ K pCi/g (dry) | ²³² Th pCi/g (dry) | ²³⁸ U pCi/g (dry) | ¹³⁷ Cs pCi/g (dry) | ³ H pCi/l |
|---|-----------------------------|-------------------------------|------------------------------|-------------------------------|----------------------|
| Brandeis-Bardin Campsite Area 2 | 13.8 ± 0.3 | 0.73 ± 0.05 | 0.43 ± 0.03 | 0.03 ± 0.01 | 2470 ± 200 |
| Brandeis-Bardin Sodium Pit Watershed | 21.3 ± 0.7 | 0.93 ± 0.07 | 0.67 ± 0.06 | 0.07 ± 0.02 | <260 |
| Brandeis-Bardin Bldg 59 Watershed | 21.9 ± 0.6 | 1.18 ± 0.08 | 0.92 ± 0.06 | 0.09 ± 0.02 | 10,700 ± 300 |
| Brandeis-Bardin RD-51 Watershed | 23.6 ± 0.6 | 0.65 ± 0.06 | 0.46 ± 0.04 | 0.04 ± 0.01 | 316 ± 152 |
| Brandeis-Bardin RMDF Watershed | 23.3 ± 0.7 | 1.48 ± 0.09 | 0.98 ± 0.06 | 0.60 ± 0.03 | 1900 ± 190 |
| Brandeis-Bardin Sodium Reactor E. Watershed | 20.8 ± 0.7 | 0.94 ± 0.08 | 0.66 ± 0.06 | 0.28 ± 0.03 | 444 ± 153 |

Surface Water Results

The surface water sample was analyzed for tritium, gross alpha and beta, and gamma emitting radionuclides. No radionuclides were detected above the detection limits. See Table 4 for results.

Table 4
DHS Surface Water Analysis Results

| Sample Location | ¹³⁷ Cs pCi/l | Gross Alpha pCi/l | Gross Beta pCi/l | ³ H pCi/l |
|----------------------------------|-------------------------|-------------------|------------------|----------------------|
| Brandeis-Bardin Na Pit Watershed | <8 | <0.40 | <2.50 | <260 |

Comparison of Laboratory Results

All McLaren/Hart samples were analyzed by Teledyne Isotopes in laboratories located in Illinois and New Jersey. Some samples were split with DHS and the USEPA. A listing of each laboratory's data is provided in Table 5. Similar methods were used for determining gamma emitting radionuclides, tritium in water and gross alpha and beta by the Teledyne, USEPA and DHS laboratories. Sample preparation varied among the laboratories for analysis of tritium in soil moisture. The use of vacuum distillation for extraction of water from soil was common to Teledyne and DHS. The USEPA used azeotropic distillation for the extraction of water from the soil.

Results were considered comparable if the concentrations reported were within the uncertainty ranges of samples collected at the same location. Of the 16 analyses compared, 14 were within (or very close to) the uncertainty range and therefore are considered comparable. Two DHS analysis results were well outside of this criteria: the tritium soil analysis for Campsite Area 2, and the Cesium-137 soil analysis for the RMDF Watershed. Reasons for discrepancies cannot always be determined. One possible cause is contamination of the sample during collection or transport.

Although the DHS laboratory does not normally perform reanalysis of tritium samples, a second analysis of a split of the original sample (DBB4097SA2) at Campsite Area 2, was conducted three months after receipt. The tritium concentration for this sample was 392 ± 153 pCi/l, which was lower than the initial analysis of 2470 ± 200 pCi/l. It is the policy of the laboratory to analyze tritium samples upon arrival and not store for reanalysis due to limitations discussed in NCRP 47.⁶ Thus the initial analysis results could not be confirmed by our laboratory. The initial concentration reported does not pose a risk to public health and good correlation was demonstrated on most results between the laboratories. However, to resolve discrepancies in sample results, an additional round of sampling may be performed for tritium at Campsite Area 2.

For the RMDF Watershed, SRL reported a Cesium-137 level of 0.60 ± 0.03 pCi/g as compared to the Teledyne level of 0.34 ± 0.04 pCi/g. A second sample aliquot measured a level of 0.48 ± 0.02 pCi/g Cesium-137. It is a possibility that these small differences in the levels are due to variations between the soil samples. The range of concentrations reported were still within what is normally found in soil.

Overall, the DHS analyses showed good correlation with the Teledyne and USEPA laboratory results.

⁶Tritium Measurement Techniques, National Council on Radiation Protection and Measurements Report No. 47, reprinted December 1, 1982.

Table 5
Comparison of Laboratory Results

Soil Samples

| Sample Location | Laboratory | ¹³⁷ Cs pCi/g | ³ H pCi/l |
|-------------------------------------|------------|-------------------------|----------------------|
| Campsite Area 2 | Teledyne | <0.03 | <200 |
| | USEPA | no analysis | <192 |
| | DHS | 0.03 ± .01 | 2470 ± 200 |
| RD-51 Watershed | Teledyne | .045 ± .026 | W |
| | DHS | .04 ± .01 | 316 ± 152 |
| RMDF Watershed | Teledyne | .34 ± .04 | 1300 ± 200 |
| | Teledyne | no analysis | 1600 ± 200 |
| | DHS | .60 ± .03 | 1900 ± 190 |
| Bldg 59 Watershed | Teledyne | .13 ± .03 | 10,800 ± 300 |
| | USEPA | no analysis | 12,380 ± 371 |
| | DHS | .09 ± .02 | 10,700 ± 300 |
| Sodium Burn Pit Watershed | Teledyne | .11 ± .03 | 120 ± 80 |
| | DHS | .07 ± .02 | <260 |
| Sodium Reactor Experiment Watershed | Teledyne | .24 ± .06 | <200 |
| | DHS | .28 ± .03 | 444 ± 153 |

Surface Water Sample

| Sample Location | Laboratory | ¹³⁷ Cs pCi/l | Gross alpha pCi/l | Gross beta pCi/l | ³ H pCi/l |
|---------------------------|------------|-------------------------|-------------------|------------------|----------------------|
| Sodium Burn Pit Watershed | Teledyne | <4 | <2 | <3 | <100 |
| | DHS | <8 | <.40 | <2.50 | <260 |

W - Withdrawn by Teledyne. See McLaren/Hart report for discussion.

Conclusions

The purpose of our involvement in this multi-media sampling in the vicinity of the Santa Susana Field Laboratory was to provide an independent measurement of radioactivity in the environmental samples. Although the number of samples split with DHS and analyzed by the DHS laboratory was limited, a review of our analyses showed good agreement with the Teledyne and EPA laboratories. Eighty-five percent (14 out of 16) of the analyses performed by the DHS laboratory were within an acceptable range of variability with the other laboratories results.

These conclusions are based solely on the sampling and analyses performed by DHS. A thorough review of the completed McLaren/Hart report will be made when the document is available.

A summary of the analysis results from the DHS laboratory is as follows: all radionuclide concentrations measured by the DHS laboratory, with the exception of tritium in soil moisture, were determined to be in the range of what is normally found in the California environment. This includes as a minimum the following radionuclides: Potassium-40, Thorium-232, Uranium-238, Cesium-137, and tritium (Hydrogen-3) in surface water.

However, tritium concentrations found in soil moisture had a higher concentration than what is normally found in the environment. The levels of tritium measured by the DHS laboratory do not pose a risk to public health for several reasons. First, there is no radiation exposure to individuals from the tritium because the area is unoccupied, and second, even in the highly unlikely event that the soil moisture was ingested, the dose would still be well below regulatory standards. An explanation of these conclusions is provided below.

Currently, the State of California does not have a standard for an acceptable amount of tritium in soil moisture. In general, when environmental radiological contamination has been caused by a licensee of the State of California, an evaluation is made to determine the potential exposure to the public. Once the amount of radiation dose is determined, it is then compared to the exposure standards for the public in the California Radiation Control Regulations (Title 17). The U.S. Department of Energy is not a licensee of the State of California so our regulations would not apply, however, they have equivalent standards and methods for evaluating radiation exposure.

The evaluation to determine the radiation dose includes all the potential pathways of exposure to humans: ingestion through the drinking of water, ingestion through the consumption of food products, inhalation, and direct radiation exposure (being close enough to the radiation source to have the radiation come in contact with the body). Conservative assumptions are made in the assessment to ensure that the dose is not underestimated.

For the tritium in soil moisture found in our analyses, even if it is assumed that people occupied

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the area where it was found, pathways to the public would not exist. The moisture in this soil is not potable water and therefore would not be consumed. Food products are not grown in the ravine locations where the tritium in the soil moisture was found limiting the potential for ingestion. The tritium is in the soil moisture, thus the inhalation pathway is negligible (and submersion dose would be negligible also since it is assumed to be equal to inhalation dose). The direct radiation pathway is not measurable for tritium because the beta particles emitted from decay are not sufficient energy to penetrate the protective outer layer of skin cells. If the extreme assumption is made that the soil moisture was consumed, the highest value reported by our laboratory of 10,700 pCi/l is below the USEPA drinking water standard of 20,000 pCi/l. The USEPA determined that it is safe to drink water that contains levels of tritium below 20,000 pCi/l.⁷

The California Agreement In Principle Program will continue to evaluate the environmental monitoring program currently in effect for the DOE facility. Our evaluation will include a review of the environmental sampling program at the Energy Technology and Engineering Center (ETEC) and of potential release pathways of radioactive materials to the environment. This review may entail additional independent sampling and analyses. As stated earlier, the final multi-media sampling report prepared by McLaren/Hart will be reviewed when released.

⁷National Interim Primary Drinking Water Regulations, U.S. EPA, EPA-570/9-76-003.