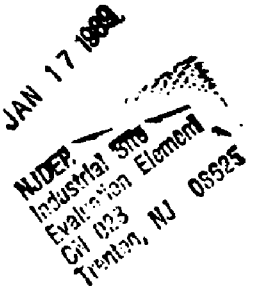
ENVIRON

January 12, 1989

State of New Jersey
Department of Environmental Protection
Division of Hazardous Waste Management
401 East State Street
Trenton, NJ 08625-0028



Attention: Ravi Gupta, Case Manager

Re: Airwick Industries, Inc.
Carlstadt Boro, Bergen County
ECRA Case #85195

Dear Mr. Gupta:

Enclosed please find three copies of the report "Presentation of Phase II Sampling Plan Results and Conceptual Remediation Plan for Airwick Industries, Inc." dated January 12, 1989.

Feel free to contact me if you need any further assistance.

Sincerely,

Frank Anastasi

Frank S. Anastasi
Senior Associate

FSA:vfj

Enclosures 3

ENVIRON Corporation · Counsel in Health and Environmental Science
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PRESENTATION OF PHASE II SAMPLING PLAN RESULTS AND CONCEPTUAL REMEDIATION PLAN FOR AIRWICK INDUSTRIES, INC.

CARLSDADT, NEW JERSEY FACILITY
ECRA CASE No. 85195

Prepared for

CIBA-GEIGY, Limited

Prepared by

ENVIRON Corporation
Washington, D.C.

January 12, 1989

C O N T E N T S

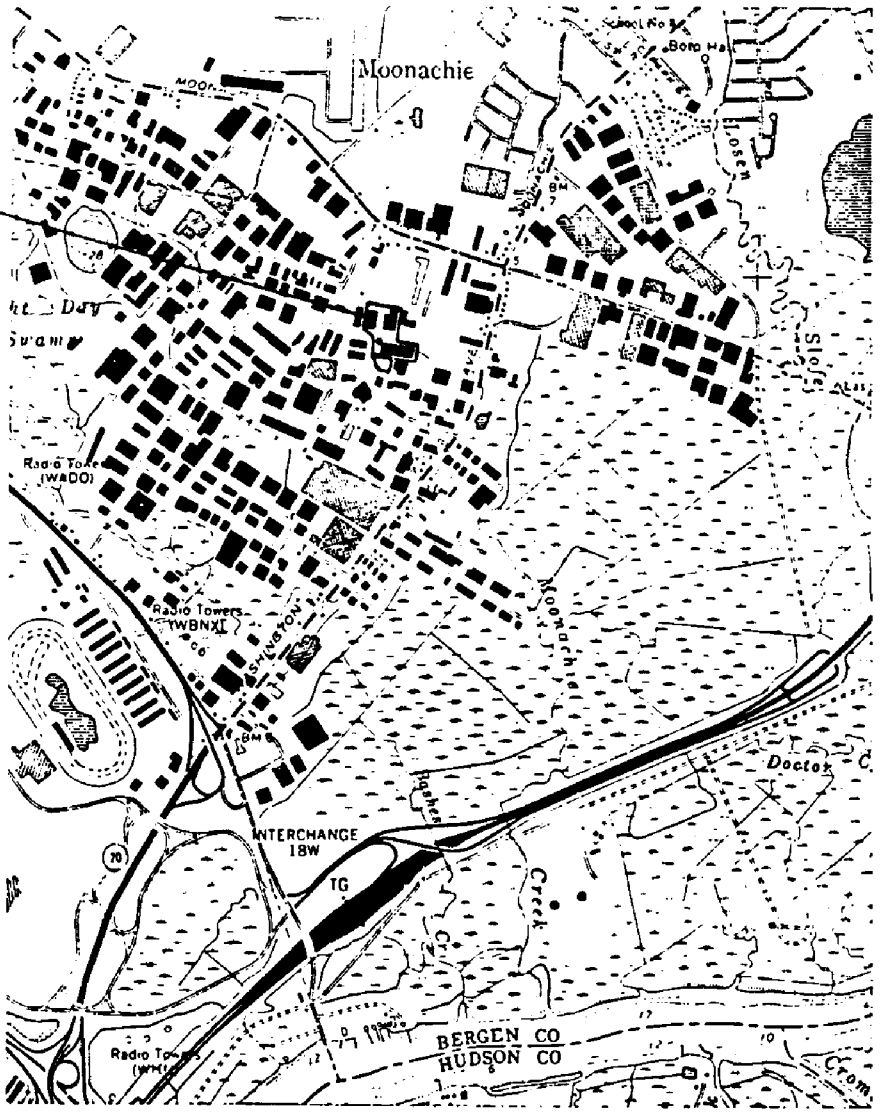
I. INTRODUCTION

A. Background

On December 20, 1984, CIBA-GEIGY, Limited, agreed to the sale of stock of the parent company of Airwick Industries, Inc., to Reckitt and Coleman, plc., thereby triggering the requirements of the Environmental Cleanup Responsibility Act (ECRA). In accordance with these ECRA requirements, a General Information Statement (GIS) dated March 22, 1985 and a Site Evaluation Submission (SES) dated April 19, 1985, were submitted to the New Jersey Department of Environmental Protection (NJDEP). Included in the SES was a Phase I Sampling Plan prepared by ENVIRON for Airwick's Carlstadt facility. After revision in February, 1986, the plan was approved by NJDEP on April 1, 1987 and implemented in May 1987. The results were submitted to NJDEP on June 30, 1987. On July 30, 1987 a Phase II Sampling and Initial Remediation Plan was submitted to NJDEP. This plan was subsequently approved with provisions in August, 1988. Our September 7, 1988 letter to Kenneth Hart, NJDEP, documented understandings reached in telephone conversations between ENVIRON and NJDEP concerning the conditions of approval relating to sampling protocols. On September 9, ENVIRON met with Ravi Gupta, NJDEP Case Manager, at the site to establish field locations of sampling points and monitoring wells. As discussed, it was agreed that remediation of certain areas of soil contamination delineated in the Phase I investigation and discussed in the Phase II Sampling and Initial Remediation Plan would be postponed pending results of the Phase II investigations and the development of a site cleanup plan. The Phase II Sampling Plan commenced on September 19, 1988; field work was completed in October, 1988.

B. Purpose and Scope

This report presents the results of the Phase II soil and ground water sampling program conducted at Airwick Industries' Carlstadt facility (figure 1) during September and October of



Source: USGS Topographic Series, Weehawkin Quadrangle, N.J. and N.Y., Photorevised, 1981.

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SITE LOCATION MAP

Figure 1

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1988. The program was designed to delineate the vertical and horizontal extent of previously detected contamination.

The initial site evaluation identified six Areas of Environmental Concern (AECs), which are summarized in table 1. Total Petroleum Hydrocarbons (TPHCs) were found in soil near an underground tank in AEC-1 at concentrations greater than the ECRA cleanup guideline (table 2). TPHCs also exceeded the cleanup guideline in shallow soil in a localized area of AEC-2. AEC-3 was eliminated after sampling indicated concentrations of contaminants were below cleanup guidelines. TPHCs, volatile organic chemicals (VOCs), base/neutral extractable organic chemicals (BNs) and mercury concentrations in soils and ground water were found in one location in AEC-4. TPHCs and BNs concentrations in soil in a portion of AEC-5 also exceeded cleanup guidelines. Finally, TPHCs concentrations in soil from AEC-6 only marginally exceeded the cleanup guideline.

To further delineate the nature and distribution of contaminants, four additional monitoring wells were constructed (in AECs-1, 5, 6 and at the upgradient property boundary); soil samples were collected in AEC-4 and AEC-5; and ground water samples were collected in AECs-1, 3, 4, 5 and 6 and the upgradient well. In the Phase II sampling, 48 soil samples, seven ground water samples and nine blank samples (wash blanks and trip blanks) were collected and analyzed. The results of the Phase I and Phase II sampling have been evaluated by ENVIRON and a conceptual cleanup plan has been developed.

Section II of this report describes the field techniques used to implement the Phase II Sampling Plan and documents any field adjustments made while carrying out the plan. Section III presents the findings of the investigation, including site-specific geology and hydrogeology, analytical results from soil and ground water samples, and a summary of the analytical results describing their significance. Section IV presents an assessment of the distribution of contamination at the site, and Section V presents a conceptual cleanup plan for the site.

TABLE 1

Areas of Environmental Concern

Area of Environmental Concern	Rationale for Selection
1	Area of underground tank (10,000 gallon tank with No. 4 fuel oil) and area of reported fuel oil loss from a replaced fuel tank.
2	Waste storage area for soil contaminated with No. 2 and No. 4 fuel oil.
4	Former dry well disposal area.
5	Former wastewater disposal area and area of potential contamination resulting from underground chemical storage tank vent overflow.
6	Former dry well receiving boiler room discharge.

NOTE: Former AEC 3 was eliminated because sampling in this area, according to a NJDEP approved plan, was completed prior to this investigation and found no environmental contamination.

TABLE 2

ECRA Soil Cleanup Guidelines

Parameter	Concentrations
Total Petroleum Hydrocarbons (TPHCs)	100 ppm
Priority Pollutants:	
Acid Extractable Organics (AEs)	Case-by-case
Base/Neutral Extractable Organics (BNs)	10 ppm
Pesticides	Case-by-case
Polychlorinated Biphenyls (PCBs)	1-5 ppm
Volatile Organics (VOCs)	1 ppm
Phenols	Case-by-case
Cyanide (Cn)	12 ppm
Priority Pollutant Metals (PPMs)	
Antimony	2 ppm
Arsenic	20 ppm
Beryllium	400 ppm
Cadmium	3 ppm
Chromium	100 ppm
Copper	170 ppm
Lead	100 ppm
Mercury	1 ppm
Nickel	100 ppm
Selenium	4 ppm
Silver	5 ppm
Thallium	5 ppm
Zinc	350 ppm

NOTE: ECRA cleanup guidelines for soil are based on communications with ISEE personnel.

II. FIELD INVESTIGATION

A. Sample Collection

The Phase II Sampling Plan consisted of three shallow hand-auger borings performed in Area of Environmental Concern 5 (AEC-5), five deep hollow-stem auger borings (in AEC-4 and AEC-5), and construction of four ground water monitoring wells (MW01, MW05, MW06 and MW10). Soil and ground water samples were collected as proposed in the approved Sampling Plan. Field conditions, however, necessitated minor changes in the location of several sampling points. These changes were made in keeping with the intent and objectives of the Phase II Sampling Plan; were approved by NJDEP personnel; and are described herein.

Table 3 lists locations and chemical analyses for the soil and ground water sampling. The sampling locations are illustrated on figure 2. Table 4 lists the analytical methods used in testing both the soil and ground water samples. Logs of all soil borings and monitoring well construction specifications are presented in Appendix I.

1. Soil Sampling

As proposed in the approved Sampling Plan, soil borings 401, 402, 403 and 404 were drilled with hollow-stem augers. Borings for monitoring well construction also were drilled using this technique. Soil samples from borings 503, 504, and 505 were collected using a hand auger. All soil borings completed with a hollow-stem auger rig were drilled by Empire Soils Investigation, Inc.. Following sample collection, all of the soil borings not converted to monitoring wells were sealed with grout.

In general, eight soil samples were collected from each of the soil borings 401, 402, 403, and 404 using a split-spoon sampler. Soil samples were collected for chemical analysis and stratigraphic information at two

TABLE 3
Phase II Soil and Ground Water Sampling Locations and Analyses

AEC[1]	Sampling Location	Number and Type of Samples per Location	Analyses
1	MW01	1 Ground Water Sample	TPHC, AE/BN, VOC, TDS,
4	401,402, 403,404	Hollow-stem Auger Boring 8 Soil Samples:	TPHC, AE/BN, VOC, mercury
	MW05[2]	• 0-0.5 feet • 2-2.5 feet • 4-4.5 feet • 6-6.5 feet • 8-8.5 feet • 10-10.5 feet • 12-12.5 feet • 14-14.5 feet	
4[2]	MW00,MW04, MW05,	1 Ground Water Sample	TPHC, AE/BN, VOC, TDS, Priority Pollutant Metals
5	503, 504, 505	Hand Auger 2 Soil Samples: • 0-0.5 feet • 4-4.5 feet	TPHC, BN
6	MW06,	1 Ground Water Sample	TPHC, AE/BN, VOC, TDS, Priority Pollutant Metals
--	MW10[3]	1 Ground Water Sample	TPHC, AE/BN, VOC, TDS, Priority Pollutant Metals

1/ Area of Environmental Concern

2/ MW00, MW05, and MW06 are all downgradient from AEC-4.

3/ MW10 is the upgradient (background) monitoring well.

TABLE 4
EPA-Approved Analytical Methods*

Parameter	Water	Soil
Total Petroleum Hydrocarbons (TPHC)	418.1	418.1
Volatile Organic Compounds (VOC)	624	8240
Acid Extractables/Base Neutrals (AE/BN)	625	8270
Priority Pollutant Metals		
Antimony	204.1	1040
Arsenic	206.2	7060
Beryllium	210.1	7090
Cadmium	213.1	7130
Chromium	218.1	7190
Copper	220.1	7210
Lead	239.1	7420
Mercury	245.1	7470
Nickel	249.1	7520
Selenium	270.2	7740
Silver	272.1	7760
Thallium	279.1	7840
Zinc	289.1	7950

* Numbers refer to methods included in USEPA SW846.

foot intervals, with the initial sample taken from the ground surface to a depth of two feet. The portions of the soil samples collected for chemical analysis for a variety of parameters were 0-0.5 feet, 2-2.5 feet, 4-4.5 feet, 6-6.5 feet, 8-8.5 feet, 10-10.5 feet, 12-12.5 feet, and 14-14.5 feet, in accordance with the plan. The exception to this scheme was soil boring 404 where only a limited sample was available from the 14-14.5 foot interval due to a shale fragment wedged within the split-spoon tip and refusal of the spoon sampler at 14 feet. Only enough soil was available for analysis of volatile organic compounds in that sample (443A-0404-SB08). Additionally, soil sampling was conducted during the drilling of monitoring well MW05 using the same sampling procedure discussed above.

Six soil samples were collected from the three shallow, hand-auger soil borings (503, 504, and 505). Limited access prevented using the truck-mounted drilling rig and hollow-stem auger technique at these locations. In each boring, one sample was collected from the 0-0.5 foot interval and the other was collected from the 4.5-5 foot interval. Moist to wet samples from the 4.5 - 5 foot depth in all three soil borings provided evidence that the deeper samples were located at the soil/water interface.

The actual locations of soil borings 401, 403, and 404 and monitoring well MW05 were adjusted slightly from those proposed due to the presence of an underground tank and associated piping situated in the vicinity of AEC-4 and AEC-5. These field modifications were approved by an on-site inspector from NJDEP on September 21, 1988. Specifically, boring 401 was relocated to 25 feet south of monitoring well MW04, boring 403 was relocated to 25 feet north-northwest of MW04, and boring 404 was relocated 25 feet north-northeast of MW04. All of the relocated soil borings are within AEC-4 and their locations are consistent with the proposed sampling plan goal of

defining the extent of contamination in this area. Moreover, boring 404 was relocated along the boundary of AEC-4 and AEC-5 and will serve to define the extent of contamination for both of these areas of concern. Monitoring well MW05 was constructed approximately 25 feet west of its proposed original location due to the presence of the tank and piping. Nevertheless, MW05's new location is directly downgradient from AEC-4 and sampling at this location will supply the intended ground water information for this area. All adjustments of sampling locations were approved by an inspector from NJDEP.

2. Ground Water Sampling

Following the proposals in the approved Sampling Plan, monitoring wells MW01, MW06, and MW10 were located in AEC-1, AEC-6, and upgradient from the Airwick plant, respectively. As previously discussed, MW05 was relocated slightly from its proposed location due to an underground storage tank. The locations of all monitoring wells present at the site are illustrated in figure 2.

Monitoring wells MW01, MW05, MW06, and MW10 were installed as proposed and approved. All monitoring wells were constructed within hollow-stem augers. The total augered depths were 16.5 feet for MW01 and MW05, 17 feet for MW10, and 13 feet for MW06. These wells were constructed of 4-inch diameter, threaded flush-joint schedule 40 PVC casing. Monitoring wells MW01, MW05, and MW10 were screened over the lower 10 feet of the boring. MW06 was constructed with an 8-foot screen due to its shallow depth (13 feet) . Each well utilized enough PVC casing to ensure at least 2 feet of stickup above ground surface. All wells were built with a sand pack at least one foot above the screen and sealed with at least one foot of bentonite pellets. The remaining construction

consisted of cement grout from the top of the bentonite seal to the ground surface. A protective steel casing with a locking cap was secured at the surface by a concrete pad at each well. New Jersey well permit tags were affixed to each protective casing.

All four monitoring wells were developed by pumping shortly after installation. All water produced during development was contained in 55-gallon drums for disposal in an appropriate manner. Monitoring wells MW01 and MW10, both relatively high producing wells, were pumped for a total of two hours and produced approximately 86 gallons and 165 gallons, respectively. In contrast, wells MW05 and MW06 were relatively poor producers. Surging, by pumping then starting and stopping the pump (so that water is alternately drawn into the well through the screen and backflushed through the screen) was necessary to properly develop these wells. Monitoring well MW05 was developed for approximately six hours (55 gallons produced) while MW06 was developed for approximately five hours (46 gallons produced). Following development, ground water levels were measured in each monitoring well. The initial measurements were taken on September 22, 1988, with subsequent measurements taken on October 29, 1988. Boring logs, as-built construction diagrams, and details of well completion and development are contained in Appendix I.

Monitoring wells MW00 and MW04 (installed as part of the Phase I Sampling Plan) and MW01, MW05, MW06, and MW10 were all sampled by National Environmental Testing, Inc. (NET), on October 4, 1988*. First, the depth to water and total depth of the well were first measured at each well

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* Phase II ground water sampling originally took place on September 29, 1988. Due to an error by NET in preservation of samples, the entire sampling procedure was repeated on October 4, 1988. No analyses was performed on the September 29th samples, which were reportedly properly disposed of by the laboratory.

to calculate the volume of water within each well casing. Before sampling, each monitoring well was then purged of at least three well volumes of water with an ISCO peristaltic pump. The purged water was monitored continuously for temperature, conductivity, and pH changes. The purging process was terminated only after at least three well volumes of water were removed and the physical parameters appeared to stabilize.

All ground water samples were collected within one hour of purging using teflon bailers. Each monitoring well was dedicated an individual bailer which had been precleaned in the NET Laboratory. Samples were taken by gently lowering the bailer into the well until it was completely submerged. The bailer was retrieved from the well and water was poured into appropriately preserved containers for individual chemical analyses according to current NJDEP and ECRA guidelines. The samples were placed on ice in a cooler and transported to the laboratory on the same day they were collected. Appropriate chain-of-custody and sampling documentation was maintained for all samples; copies of these records appear in the NET laboratory reports contained in Appendix III.

B. Quality Assurance/Quality Control

1. Decontamination Procedures

Before construction of soil borings, all split-spoon samplers and hollow-stem augers were decontaminated by steam cleaning with potable water. After each sample was collected, the samplers were decontaminated prior to use again. All drilling and sampling equipment was likewise decontaminated between use at subsequent borings. Laboratory-cleaned bottles were used for each sample collected. Fresh latex gloves were used each time a soil or ground water sample was collected.

2. Wash Blanks, Trip Blanks, and Duplicate Samples

To ensure the effectiveness of decontamination procedures, four wash blanks were collected; three during soil sampling and a fourth during ground water sampling. These wash blanks were tested for all relevant chemical parameters. Wash blanks were collected after decontamination of either the split-spoon sampler (soil samples) or bailer (water samples). Following decontamination, distilled water was poured over the sampling instrument and subsequently bottled as a wash blank sample. Thus, any contamination not removed during decontamination would be observed in the wash blank. In addition, two trip blanks were used to monitor ground water and soil sample handling, transport, and storage. Both the ground water and soil trip blanks were tested for VOCs. To monitor reproductibility and ensure quality control, three duplicate samples (two soil and one ground water) were collected and analyzed for all relevant parameters. The soil duplicates were taken by homogenizing the soil samples, then spitting them into two fractions. The analytical data for all QA/QC samples is reported along with the soil and ground water samples in the NET laboratory report.

C. Sample Identification

All samples taken in the field were identified by a 12-digit code, (e.g., 443A-0401-SB01). The first four digits corresponds to the ENVIRON job number, which in all cases in this report is 443A. The next four digits refer to the sample location, such as 0401 for soil sampling location 401 or MW01 for monitor well MW01. The last four digits refer to the sample description and sequence, such as SB01 (the first soil boring sample) or GW01 (the first ground water sample).

site. Monitoring wells MW01, MW04, and MW10 produced relatively greater amounts of water while MW00, MW02, MW05, and MW06 were relatively poor-producing wells. Appendix I contains notes taken during well development which indicate the pumping times and volumes of water produced from each well.

C. Analytical Results

1. Overview

In this section, the analytical results for the Phase II soil and ground water samples are presented. Summary tables have been developed based on the reports of analyses received from the NET laboratory which show the sample number, location, depth interval, and parameters detected at or above detection limits. Copies of the individual sample analyses sheets are contained in Appendix II. Complete copies of the Tier II reports from NET, including all data, QA/QC information and required documentation of sample analyses, is contained in Appendix III.

While ENVIRON notes the qualitative importance of the Tentatively Identified Compounds (TICs) reported by NET, the substantial uncertainty in their quantification (up to 500% variance from the actual value) makes it difficult to accurately include these chemicals in any AE, BN, or VOC total. The TIC data, therefore, have not been included in the analyses of this study.

2. Results of Soil Samples

AEC-4 is the location of a dry well which was formerly used for waste water disposal. During the Phase I study of this area, TPHC concentrations in six of the eight soil samples collected during the installation of monitoring well MW04 exceeded the ECRA cleanup guideline (100 ppm). MW04 soil samples from 10 to 10.5

feet and 12 to 12.5 feet contained VOCs at levels above the ECRA cleanup guideline (1 ppm); BNs exceeded the guideline (10 ppm) in MW04 samples from 4 to 12.5 feet; and mercury exceeded the guideline (1 ppm) in the 14 to 14.5 feet sample. In the Phase II study of AEC-4, four soil borings (401, 402, 403, and 404) were located in the area to determine the lateral as well as vertical extent of these chemicals in the soil.

Concentrations of all parameters found in soil samples from AEC-4 Phase II soil borings are presented in table 5. The Phase II analyses indicate that seven of the eight soil samples collected from soil boring 403 contain TPHC concentrations exceeding ECRA cleanup guideline. Concentrations ranged from 124 ppm to 750 ppm and were generally higher from 10 to 14.5 feet than near the surface in this boring. Additionally, three soil samples from boring 404 (collected within the 8 to 12.5 feet depth interval) and one soil sample from boring 402 (collected from the 2-2.5 feet depth interval) exhibited TPHC in concentrations above the guideline. In boring 404, TPHCs ranged from 473 to 650 ppm. In boring 402, the sample contained 208 ppm TPHCs. Samples from soil boring 401 were found to contain TPHCs at levels below the ECRA cleanup guideline.

VOC contamination above the ECRA cleanup guideline (1 ppm) was detected in AEC-4 soil samples during the Phase I study. MW04 soil samples from 10-10.5 feet and 12-12.5 feet contained VOC concentrations of 17.13 and 3.1 ppm, respectively. None of the Phase II soil samples, however, collected within AEC-4 contained VOC concentrations above 1 ppm.

The Phase I study of AEC-4 revealed BN concentrations above the ECRA cleanup guideline (10 ppm) between depths of 4 and 12.5 feet in MW04. Concentrations ranged from 19.8 to 288 ppm, with the highest concentration found in the sample from 8 to 8.5 feet. In contrast, the Phase II

TABLE 5

Results of Analyses of Soil Samples -- Airwick's Carlstadt Facility (ug/kg)

Sample Number	Location	Depth Interval (ft)	Mercury	TPHC	Total VOCs	Total BNs	Total AEs
PHASE II RESULTS							
443A-0401-SB01	AEC-4	0 - 0.5	134	94,200[1]	15	100	0
443A-0401-SB02	AEC-4	2 - 2.5	<110	45,600[1]	4	0	0
443A-0401-SB03	AEC-4	4 - 4.5	<100	37,200[1]	10	0	0
443A-0401-SB04	AEC-4	6 - 6.5	<110	47,300[1]	10	260	0
443A-0401-SB05	AEC-4	8 - 8.5	<83	<11,100[1]	0	0	0
443A-0401-SB06	AEC-4	10 - 10.5	<110	29,000[1]	4	0	0
443A-0401-SBC	AEC-4	12 - 12.5	<120	15,400[1]	5	0	0
443A-0401-SB08	AEC-4	14 - 14.5	<0.09] wet	30,800[1]	4	0	0
443A-0402-SB01	AEC-4	0 - 0.5	<80	13,300	0	0	0
443A-0402-SB02	AEC-4	2 - 2.5	<100	208,000	0	0	0
443A-0402-SB03	AEC-4	4 - 4.5	1,460	26,600	10	190	0
443A-0402-SB04	AEC-4	6 - 6.5	1,260	14,100[1]	0	0	0
443A-0402-SB05	AEC-4	8 - 8.5	<110	<11,600[1]	13	0	0
443A-0402-SB06	AEC-4	10 - 10.5	<89	<11,600[1]	11	0	0
443A-0402-SB07	AEC-4	12 - 12.5	<90	20,400[1]	4	0	0
443A-0402-SB08	AEC-4	14 - 14.5	<79	87,500[1]	15	120	0
443A-0403-SB01	AEC-4	0 - 0.5	<97	320,000	0	0	0
443A-0403-SB02	AEC-4	2 - 2.5	340	124,000	0	140	0
443A-0403-SB03	AEC-4	4 - 4.5	<110	157,000	4	1,137	0
443A-0403-SB04	AEC-4	6 - 6.5	243	144,000	6	440	0
443A-0403-SB05	AEC-4	8 - 8.5	365	94,700	7	350	0
443A-0403-SB06	AEC-4	10 - 10.5	<100	750,000	0	330	0
443A-0403-SB26	AEC-4	10 - 10.5	<105	590,000	12	600	0
443A-0403-SB07	AEC-4	12 - 12.5	<110	379,000	116	0	0
443A-0403-SB08	AEC-4	14 - 14.5	<98	360,000	42	680	0
443A-0404-SB01	AEC-4	0 - 0.5	218	<11,200	25	0	0
443A-0404-SB02	AEC-4	2 - 2.5	538	<10,600	4	0	0
443A-0404-SB03	AEC-4	4 - 4.5	264	<10,600	0	0	0
443A-0404-SB04	AEC-4	6 - 6.5	284	<11,100	0	0	0
443A-0404-SB05	AEC-4	8 - 8.5	<70	506,000	0	260	0
443A-0404-SB06	AEC-4	10 - 10.5	832	650,000	104	2,900	0
443A-0404-SB07	AEC-4	12 - 12.5	287	473,000	0	0	0
443A-0404-SB08	AEC-4	14 - 14.5	N/A[2]	N/A[2]	4	N/A[2]	N/A[2]

1 = Sample exceeding holding time before analyses conducted
2 = Insufficient sample retrieved from borehole; volatile organics analyses performed only
N/A = Parameter not analyzed

TABLE 5 (Continued)

Sample Number	Location	Depth Interval (ft)	Mercury	TPHC	Total VOCs	Total BNs	Total AEs
443A-MW05-SB01	AEC-5	0 - 0.5	1680	400,000	N/A	0	N/A
443A-MW05-SB02	AEC-5	2 - 2.5	<110	153,000	N/A	2,890	N/A
443A-MW05-SB03	AEC-5	4 - 4.5	<87	81,700	N/A	0	N/A
443A-MW05-SB04	AEC-5	6 - 6.5	<55	<10,400	N/A	96	N/A
443A-MW05-SB05	AEC-5	8 - 8.5	<103	<10,800	N/A	440	N/A
443A-MW05-SB06	AEC-5	10 - 10.5	<68	<11,200	N/A	0	N/A
443A-MW05-SB07	AEC-5	12 - 12.5	178	<11,800	N/A	0	N/A
443A-MW05-SB08	AEC-5	14 - 14.5	<110	<11,900	N/A	0	N/A
443A-MW05-SB28	AEC-5	14 - 14.5	<120	<12,000	N/A	180	N/A
443A-0503-SB01	AEC-5	0 - 0.5	N/A	80,000	N/A	91,900	N/A
443A-0503-SB02	AEC-5	4 - 4.5	N/A	<12,500	N/A	0	N/A
443A-0504-SB01	AEC-5	0 - 0.5	N/A	<12,500	N/A	0	N/A
443A-0504-SB02	AEC-5	4 - 4.5	N/A	84,000	N/A	1,430	N/A
443A-0505-SB01	AEC-5	0 - 0.5	N/A	79,600	N/A	0	N/A
443A-0505-SB02	AEC-5	4 - 4.5	N/A	<11,400	N/A	0	N/A
PHASE I RESULTS[3]							
443A-MW00-SB02	MW00	2 - 2.5		210,000			
443A-MW00-SB04	MW00	6 - 6.5		260,000			
443A-MW04-SB01	AEC-4	2 - 2.5		280,000			
443A-MW04-SB03	AEC-4	4 - 4.5		1,300,000		41,100	N/A
443A-MW04-SB04	AEC-4	6 - 6.5		3,800,000		49,900	N/A
443A-MW04-SB05	AEC-4	8 - 8.5		5,100,000		288,000	N/A
443A-MW04-SB06	AEC-4	10 - 10.5		860,000	17,130	82,000	N/A
443A-MW04-SB07	AEC-4	12 - 12.5		210,000	3,100	19,800	N/A
443A-MW04-SB08	AEC-4	14 - 14.5	11,000				
443A-0101-SB01	AEC-1	6 - 6.5		100,000			
443A-0103-SB01	AEC-1	6 - 6.5		350,000			
443A-0104-SB01	AEC-1	6 - 6.5		150,000			
443A-0202-TR21	AEC-2	0 - 0.5		120,000			
443A-0202-TR02	AEC-2	2 - 2.5		590,000			
443A-0501-SB01	AEC-5	0 - 0.5		180,000			
443A-0501-SB03	AEC-5	3 - 3.5		1,100,000			
443A-0501-SB04	AEC-5	5 - 5.5		120,000			
443A-0502-SB01	AEC-5	0 - 0.5		140,000		48,340	
443A-0601-SB01	AEC-6	0 - 0.5		110,000			
443A-0601-SB02	AEC-6	2 - 2.5		150,000			

60

1 = Sample exceeding holding time before analyses conducted
2 = Insufficient sample retrieved from borehole; volatile organics analyses performed only.
3 = Phase I results are given only for those samples in which ECRA soil cleanup guidelines were exceeded
N/A = Parameter not analyzed

BN results for AEC-4 indicate no concentrations above the ECRA guideline. Furthermore, although AEs were found in soil samples from MW04 in Phase I sampling at concentrations ranging up to 27 ppm, none of the Phase II soil samples analyzed for AEs contained any of these organic substances. No ECRA soil cleanup guideline has been established for AEs.

In the Phase I study, one soil sample at sample location MW04, (collected from the 14.0-14.5 feet depth interval) contained 11 ppm of mercury, a concentration over the ECRA cleanup guideline (1 ppm). The Phase II analyses of AEC-4 soil samples showed two soil samples from boring 402, collected from the 4-4.5 feet and 6-6.5 feet depth intervals, contained mercury at concentrations of 1.46 and 1.26 ppm, respectively. None of the remaining AEC-4 soil boring samples contained mercury in excess of the cleanup guideline.

AEC-5 was formerly used for wastewater disposal and is near the location of a chemical overflow vent for an underground storage tank. The results of the Phase I study indicated TPHC concentrations in excess of the ECRA guideline (100 ppm) in borings 501 and 502. Soil boring 501 samples at 0-0.5 feet, 3-3.5 feet, and 5-5.5 feet contained TPHC concentrations of 180, 1,100, and 120 ppm, respectively. Only the surface sample of boring 502 contained TPHCs (140 ppm) above the guideline. Two Phase II soil samples from the MW05 boring (0 to 0.5 and 2 to 2.5 feet) contained TPHCs at concentrations of 400 and 153 ppm, respectively. TPHCs in the remaining samples from MW05 and in the other borings in AEC-5 (503, 504, and 505) did not contain any TPHCs above the guideline.

In AEC-5, only one soil sample exceeded the ECRA cleanup guideline for BN (10 ppm) during the Phase I study. This occurred at boring 502, where the surface soil sample (0-0.5 feet) contained 48.34 ppm total BNs. In the Phase II survey, only the surface sample (0-0.5

feet) from boring 503 exceeded the ECRA cleanup guideline for BNs. The total concentration of BNs in this sample was 91.9 ppm.

3. Results of Ground Water Samples

Ground water samples were collected from the three previously installed Phase I monitoring wells (MW00, MW02 and MW04) in May, 1987. In Phase II sampling, wells MW00 and MW04 and the four recently installed monitoring wells (MW01, MW05, MW06, and MW10) were sampled in October, 1988. All Phase II ground water samples were analyzed for priority pollutant metals (PPMs), total dissolved solids (TDSs), TPHCs and VOCs. In addition, samples from monitoring wells MW00, MW01, and MW04 were analyzed for BNs and samples from monitoring wells MW05, MW06, and MW10 were analyzed for AEs.

The Phase I ground water analysis suggested that ground water was contaminated in AEC-4 at the Airwick facility. The total VOCs concentration was 691 ppb; BNs were at 263 ppb and total AEs were found at 68 ppb. Mercury was also detected in ground water from this well at 2 ppb. The Phase I ground water sample from monitoring well MW00 was found to contain only one VOC (trichloroethylene) at 6 ppb. All other Phase I monitoring wells at the facility were free of contamination in the May, 1987 sampling event.

Tables 6 and 7 present a summary of the results of Phase II ground water analyses and include the results from Phase I samples in which organics were detected. The Phase II ground water analyses indicate TPHC concentrations are less than the detection limits (100 ppb) for all of the monitoring wells sampled. Total dissolved solids for the six wells sampled ranged from a low of less than 1 ppm to a high of 750 ppm. Priority Pollutant metal (PPM) were found at very low concentrations; most were below detection limits.

TABLE 6

Results of Inorganic Analyses of Ground Water Samples

Airwick's Carlstadt facility (ug/l)

Well: Sample ID: Priority Pollutant Metals	MW00 443A-MW00-GW02	MW01 443A-MW01-GW01	MW04 443A-MW04 GW02	MW05 443A-MW05-GW01	MW05 443A-MW05-GW11	MW06 443A-MW06-GW01	MW10 443A-MW10-GW01
Beryllium	<5	N/A	<5	<5	<5	<5	<5
Cadmium	6	N/A	5	<5	<5	<5	5
Chromium	10	N/A	<10	20	20	<10	10
Copper	40	N/A	37	40	40	20	<10
Nickel	50	N/A	<20	25	26	<20	<2
Silver	<10	N/A	<10	<10	<10	<10	<10
Zinc	20	N/A	21	60	70	20	<10
Antimony	<5	N/A	<5	<5	<5	<5	<5
Arsenic	<4	N/A	<4	7	7	<4	<4
Lead	8	N/A	19	22	20	42	<5
Scandium	<3	N/A	<3	<3	<3	<3	<3
Thallium	<5	N/A	<5	<5	<5	<5	<5
Mercury	<0.2	N/A	<0.2	0.4	0.5	0.2	0.3
TDS	560,000	750,000	640,000	280,000	290,000	330,000	<1000
TPHC	<100	<100	<100	<100	<100	<100	<100

N/A = Parameter Not Analyzed

TABLE 7
Results of Organic Analyses of Ground Water Samples
Airwick's Garlstadt Facility (ug/l)

Well Sample ID:	MW00 1/ 443A-MW00-GW01	MW00 443A-MW00-GW02	MW01 443A-MW01-GW01	MW04 1/ 443A-MW04-GW01	MW04 443A-MW04-GW02	MW05 443A-MW05-GW01	MW05 443A-MW05-GW11	MW06 443A-MW06-GW01	MW10 443A-MW10-GW01
Toluene	-	-	-	260	50	-	-	-	-
Trichloroethylene	6	7	-	-	-	-	-	-	-
1,1,1-Trichloroethane	-	-	-	390	33	-	-	-	-
1,1-Dichloroethane	-	-	-	43	12	-	-	-	-
Methylene Chloride	-	-	-	-	4	-	-	-	-
Chloroform	-	17	-	-	-	-	-	4	-
1,2-Dichlorobenzene	-	-	-	63	48	-	-	-	-
Bromodichloromethane	-	3	-	-	-	-	-	-	-
Phthalates	-	-	-	200	9	-	-	4	-

- = Not detected at or above detection limit

1/ = Phase I results shown for wells in which organics were detected at or above detection limit

Within AEC-4, the Phase I ground water samples from MW04 contained VOCs, BNs, AEs, and mercury. The Phase II analysis did not detect mercury or any other PPM contamination. A comparison between the Phase I and Phase II VOC analyses for monitoring well MW04 reveals that 1,1,1-trichloroethane, 1,1-dichloroethane, 1,2- orobenzene, and toluene were detected in both sampling events, although the Phase II sample had significantly lower levels. A VOC (methylene chloride) and a BN (phthalate) were detected in the Phase II sample, however, at 4 ppb and 9 ppb, respectively. Methylene chloride and phthalates are commonly detected at similar levels in blanks as well as in environmental samples. Such common occurrences of these chemicals are generally regarded as laboratory and/or field procedure - induced contamination, i.e., an error not indicative of actual environmental contamination. In the laboratory method blanks for the soil samples collected in this Phase II investigation, both methylene chloride and phthalates were detected at concentrations of 1 to 6 and 81 ppb, respectively. Therefore, the presence of these two chemicals is presumed to be an artifact of laboratory or field procedures. The Phase I results of the organic analyses of monitoring well MW04 also are summarized in table 7.

In the Phase I ground water analysis of MW00, no AE or BN contamination was observed. The only volatile contaminant detected was trichloroethylene at 6 ppb. In the Phase II sampling event, no AEs or BNs were found; small amounts of VOCs were, however, detected. Chloroform and bromodichloromethane were found at concentrations of 17 and 3 ppb, respectively within the MW00 ground water sample. These chemicals are found in chlorinated public water supplies, and commonly are detected in blanks and environmental samples. The detection of these chemicals at levels such as these is generally regarded as a result

of some laboratory and/or field procedure-induced contamination and is not indicative of actual environmental contamination. Therefore, the reported detection of these two chemicals is presumed to be an artifact of laboratory or field procedures. In addition, trichloroethylene was found at 7 ppb. The occurrence of this VOC at low levels (slightly above the detection limit) is not sufficient to reach conclusions concerning the nature and extent, if any, of VOC contamination in this location.

In the ground water sample from MW06, one VOC (chloroform) and one BN (phthalate) were detected at 4 ppb each. As these chemicals are likely artifacts of laboratory or field activities and the reported concentration are only slightly above detection limits, no VOC or BN contamination of ground water is indicated in AEC-6.

4. Quality Assurance/Quality Control

Two trip blanks accompanied the shipment of soil sample containers from the laboratory to the site and the storage and transport of soil samples back to the laboratory. They were both analyzed for VOCs. In addition, one trip blank accompanied the shipment and storage of the ground water containers and samples. This blank was also analyzed for VOCs. Four wash blanks were collected during the Phase II sampling. Three wash blanks (443A-MW05-WB01, 443A-0402-WB01, and 443-0404-WB01) were collected during soil sampling activities. The MW05 and SB402 wash blanks were analyzed for TPHC, AE and BNs, and mercury. The 402 and 404 wash blanks were analyzed for VOCs. One wash blank (443A-MW06-WB01) was collected during ground water sampling. It was analyzed for VOCs, AEs and BNs, PPMs, TDS, and TPHC. Two duplicate soil samples (443A-0403-SB26 and 443A-MW05-SB28) were collected during collection of soil samples at soil boring 403 and

monitoring well MW05, respectively. The 403 duplicate was analyzed for VOCs, AEs and BNs. The MW05 duplicate soil sample was analyzed for BNs, TPHCs, and mercury. One duplicate ground water sample (443A-MW05-GW11) was collected during the Phase II ground water sampling event. This duplicate sample was analyzed for AEs, BNs and VOCs. The lab sheets showing results for all blanks and duplicates are contained in Appendix II.

The analysis of the two trip blanks that accompanied the soil samples to the laboratory and were tested for VOCs did not indicate the presence of any VOCs. No VOC or BN contamination was present in the three wash blanks collected during soil sampling. The only detectable chemicals were found in wash blanks from MW05 and soil boring 402. Both of these blanks contained trace amounts of TPHCs (0.2 and 0.5 ppm respectively), and the wash blank from boring 402 contained 0.9 ppb of mercury. Of the two duplicate soil samples, the 403 duplicate contained trace levels of 1,2- and 1,4-dichlorobenzenes which were not found in the primary sample. The MW05 duplicate soil sample contained 180 ppb of bis(2-ethylhexyl)phthalate while the primary MW05 soil sample did not. With respect to the eight laboratory method blanks, BN analyses indicated di-n-butylphthalate was present in one blank at 81 ppb. Additionally, four of the eight laboratory method blanks contained trace amounts of methylene chloride (ranging from 1 to 6 ppb) while one of the eight contained a trace amount (6 ppb) of acetone. All the chemicals present in the laboratory method blank are considered to be laboratory artifacts or method contaminants, as is the phthalate detected in the MW05 duplicate sample. This conclusion must be considered when evaluating the occurrence of BNs and VOCs at similar (low) levels in the environmental samples collected at the site.

The one trip blank that accompanied the ground water quality samples to the laboratory and was tested for VOCs

did not contain any VOC. In addition, the one wash blank collected during ground water sampling contained no significant concentrations of the target compounds for which it was tested. For the one duplicate ground water quality sample, bis(2-ethylhexyl) phthalate was detected in the duplicate but not in the primary sample. However, the concentration of this chemical was very low and it is believed to be a laboratory artifact. With respect to laboratory blanks, a low level of 1,1-dichloroethene was present in one blank.

IV. DISCUSSION

A. Quality Assurance/Quality Control

The quality control samples for the soil and ground water sampling consisted of wash blanks, trip blanks, method blanks, and matrix spike samples. Duplicate samples were collected to insure consistency between samples. Additionally, quality control procedures reported by the laboratory included mass spectrometric tuning performance standards, initial instrument calibration and continuous calibrations. Review of these data indicate the sampling and analyses methods and protocols were successful in generating high quality environmental sample data upon which this site assessment can be based with a high degree of confidence. Full details of laboratory procedures and protocols important to QA/QC are reported in the narrative section of each of NET's Tier II reports (Appendix III).

One issue relating to QA/QC warrants discussion, however. Thirteen soil samples were not analyzed for TPHCs within the goal of 28 days from sample collection. These samples (all eight samples from boring 401); and SB04, SB05, SB06, SB07 and SB08 from boring 402) were analyzed within 34 days of collection, however, and this event does not appear to have had a significant effect on sample results. Concentrations of TPHCs for only two of these samples exceed 50 ppm, half the ECRA cleanup standard of 100 ppm. Sample 443A-0402-SB08 (14 to 14.5 feet) and 443A-0401-SB01 (0 to 0.5 feet) were found to contain 94.2 and 87.5 ppm TPHCs, respectively. The samples collected from 4 to 12.5 feet in boring 402 which were all analyzed within 28 days, exhibited TPHCs concentrations ranging from <11.6 to 26.6 ppm. These low concentrations would tend to support the conclusion that although a small portion of TPHCs in sample 443A-0402-SB08 may have dissipated before analysis, it is unlikely that analysis within 28 days would have detected a significantly higher concentration of TPHCs (such as greater than 100 ppm, the ECRA cleanup guideline). Regarding the samples from boring 401, all but the surface sample contained

less than 50 ppm TPHCs, and concentrations generally decreased with depth. Even if sample 443A-0401-SB01 (0 to 0.5 feet) lost some TPHCs between 28 and 34 days after collection, it is unlikely that the initial TPHC content exceeded 100 ppm by a significant degree.

B. Soil and Ground Water Samples

The Phase I and II sampling and analyses have adequately defined the nature and extent of soil and ground water contamination at the Airwick site. Phase I and II ground water monitoring has delineated limited VOC and BN contamination in AEC-4, and suggests additional monitoring is required to further evaluate VOC contamination, if any, in MW00. Figure 10 shows the distribution of contamination in soils; figure 11 shows the distribution of contamination in ground water. The major findings of this investigation can be summarized as follows:

- Localized areas of TPHC soil contamination exceeding the ECRA cleanup guideline exist at the site. Surficial contamination (0 to 2.5 feet) exists in localized areas of AEC-1, AEC-2, AEC-4 and AEC-5, while deeper contamination (up to 14.5 feet deep) exists only in portions of AEC-4.

- In the Phase I study, shallow soils underlying parking areas in AEC-6 (location 601) and at MW00 were found to contain TPHCs at levels only marginally exceeding the ECRA cleanup guideline. As the occurrence of the TPHCs can likely be attributed to the presence of asphalt paving and vehicular traffic, this is not considered an environmental concern.

- Surficial soil containing mercury at levels only marginally exceeding the ECRA cleanup guideline was detected in a few localized areas, however, this does not present an environmental concern.

- Only two soil samples from MW04 contained concentrations of VOCs above the ECRA cleanup guideline. These samples were from 12 to 12.5 and 14 to 14.5 feet. VOC contamination in soils appears to be limited to the vicinity of MW04 in AEC-4.

- Low levels of AEs were detected in soil at MW04 in Phase I. No AE contamination was observed in soil or ground water in the Phase II samples. AE contamination, therefore, is not a concern at the site.

- BN soil contamination is limited to only surficial soil in a limited portion of AEC-5 and deeper soil in the immediate vicinity of well MW04 in AEC-4.

- Ground water contamination is only confirmed in the immediate area of MW04 and is limited to VOCs and one BN (1,2-dichlorobenzene). The concentrations of these chemicals have shown a marked decline over the past year.

- Low levels of VOCs were present in samples from MW00. Two of these VOCs are commonly observed in blank samples and may be indicative of laboratory or field procedures. The other VOC (trichloroethylene) was detected at levels near the detection limit, has not been found in other monitoring wells at the site, and has not been linked to any known source.

As shown by results of Phase I and Phase II investigations and discussed in the preceeding section of this report, soil contamination is a localized phenomenon at the Airwick site. Sampling in areas where potential sources of contamination are known to exist, or may have existed, has shown localized, shallow soil contamination is present in AEC-1, AEC-2, AEC-4

and AEC-5. Deeper soil contamination was identified only in AEC-4. The close spacing of soil sampling locations indicates that the extent of contamination is sufficiently delineated.

Based on the Phase I and Phase II TPHC results from AEC-4, soils in the area around MW04 and borings 403 and 404 contain TPHCs at concentrations that exceed ECRA cleanup guidelines (100 ppm). These data suggest that both the MW04 and 403 locations may share a common contamination source. The absence of contamination in the shallow 404 soil samples suggests a subsurface source such as the past dry well use. The presence of TPHCs is of limited areal extent and while their concentrations exceed the ECRA guideline, the concentrations are relatively low (i.e., 100s of ppm). Furthermore, no TPHCs were detected in ground water at MW04 or in downgradient monitoring wells, indicating that TPHCs in soils in AEC-4 are not a source of ground water contamination.

Soil from the Phase II sampling locations 401, 402, 403 and 404 did not contain VOCs at levels above the guideline (1 ppm). These locations are each only 25 feet from MW04, where VOC contamination was detected. Therefore, VOC soil contamination is limited in AEC-4 to the vicinity of well MW04. The vertical extent of VOC contamination was limited to a depth between 10 and 12.5 feet in the MW04 boring. Likewise, the BN and AE soil contamination within AEC-4 is limited in extent to the vicinity of well MW04 and only at depths greater than 4 feet. The BN chemicals consist of phthalates and polycyclic aromatic hydrocarbons (PAHs). As previously discussed, phthalates are commonly introduced in laboratory and/or field procedures. These chemicals, which are components of plasticizers, are commonly found in urban soils at levels similar to those detected at the Airwick site. PAHs are ubiquitous in urban soils due to endogenous (plant synthesis, fires, volcanic eruptions) and anthropogenic (fossil fuel burning) sources. They are found in air, water, and food as well. The NJDEP (Sophia Stokman) has prepared a Guidance Document on cleanup levels in which 25.5 to 1000 ppm are

proposed as acceptable levels for various phthalate esters in residential soil. The levels of phthalates found in the majority of soil samples from AEC-4 are much lower than this range. Only in MW04 at depths over 4 feet did soil samples from AEC-4 contain phthalate concentrations greater than these levels. With the exception of one sample, these contaminants are present in AEC-4 at levels of the same order of magnitude as those considered acceptable for residential soils, and with the limited potential for human exposure, this does not appear to be a significant area of concern. Moreover, only 9 ppb of phthalate was found in the Phase II ground water sample from MW04.

The samples from area AEC-4 which were found to contain mercury in concentrations exceeding the ECRA cleanup guideline only exceeded the guideline marginally; thus mercury contamination in this area appears to be very limited and does not pose an environmental concern.

TPHC and BN contamination in AEC-5 was found to be very localized, and is of a surficial nature (0-0.5 feet). Therefore, this area is not of significant concern, and is easily remedied.

The only confirmed ground water contamination identified at the site is in the vicinity of MW04. As figure 11 shows, the extent of this contamination is well defined. Within about 10 feet to the southeast of MW04 lies an open drainage ditch which flows along the southeastern boundary of the site in AEC-4. Elevations of ground water in MW04 are generally about +3.5 to +4 feet msl. The elevation of water in the ditch has been observed to be on the order of about +8 feet msl. Based on this information, the contaminant plume in the vicinity of MW04 would not be expected to extend beyond the property boundary to the southeast.

Well MW05 is located approximately 50 feet directly downgradient from MW04; wells MW06 and MW00 are located further downgradient from MW04. The absence of VOCs in ground water at MW05 indicates that the contaminant plume's extent is less than

50 feet. As the downgradient extent of the plume would be expected to be the greatest in the downgradient direction, the extent of the plume to the east and west is likely less than 50 feet. Furthermore, the absence of the VOCs detected in MW04, in samples taken from wells MW06 and MW00, is further indication that a discrete plume of contaminants has not moved from beyond AEC-4 and past MW05 to AEC-6 or the vicinity of MW00.

This analysis of the extent of contaminated ground water provides an additional conclusion; activities at the Carlstadt site have not resulted in off-site ground water contamination. Moreover, as part of the Phase II study, a survey was conducted of NJDEP records to identify off-site wells in the vicinity of Airwick. Appendix III contains the results of this survey, in which no shallow ground water wells were identified within a one-mile radius of the Carlstadt site. All nearby wells are used as industrial wells and these wells are completed at depths of 200 feet or more.

V. CONCEPTUAL CLEANUP PLAN

Based on Phase I and Phase II sampling results, a conceptual cleanup plan has been developed to address the Airwick facility. This plan proposes soil excavation with off-site disposal and an additional round of ground water monitoring. Once NJDEP concurs with this conceptual plan, a detailed cleanup plan, including a schedule for completion and cost estimate, will be submitted to NJDEP.

A. Surficial Soils

Phase I and Phase II sampling at the Airwick facility delineated several localized areas where surficial or near-surface soils are associated with obvious sources of contamination and were found to contain concentrations of contaminants greater than the ECRA cleanup guidelines. These areas and their proposed remediation are summarized as follows:

1. AEC-1: Phase I sampling identified TPHC-contaminated soil surrounding the former underground petroleum storage tank (that was removed and replaced with a new tank). In the vicinity of sampling locations 103 and 104, a two-foot wide section of soil extending one foot beyond sampling locations 103 and 104 will be excavated to a depth of 7.5 feet as previously proposed.

2. AEC-2: Phase I sampling identified TPHC-contaminated soil in the vicinity of sampling location 202 where petroleum contaminated soil had been stored. An 8-foot by 8-foot area of soil centered on location 202 will be excavated to a depth of 3.5 feet as previously proposed.

3. AEC-4: Phase II sampling identified TPHC-contaminated soil in the 2 to 2.5 foot sample from boring 402 at 208 ppm. As this is the only sample from this boring that contained TPHCs above the guideline and the level is relatively low, no cleanup is proposed.

4. AEC-5: Phase I sampling identified TPHC-contaminated soil at locations 501 and 502, and BN contamination at 502. At Phase II sampling locations 503, 504 and 505, no TPHC contamination above ECRA guidelines was observed, although TPHC contamination was identified from 0 to 2.5 feet at MW05. Additionally in AEC-5, Phase II sampling identified BN contamination above ECRA guidelines at location 503. A 4-foot by 4-foot area of soil centered at MW05 will be excavated to a depth of three feet. Two 2-foot by 2-foot areas of soil centered on locations 501 and 502 will be excavated to depths of six feet and one foot, respectively. A two-foot by two-foot area of soil centered on 503 will be excavated to 3 feet.

Following excavation of the above shallow soil, two post-excavation samples will be collected from each location in AEC-1 and AEC-2, and from locations 501 and MW05, in accordance with ECRA protocols and analyzed for TPHC. Post-excavation samples from location 502 will be analyzed for TPHCs and BNs, and from location 503 a post excavation sample will be analyzed for BNs. A report will be submitted to NJDEP which documents the excavation and presents the results of post-excavation soil sample analyses.

B. Deep Soils

Phase I and II sampling delineated TPHC contamination above ECRA guidelines at sampling locations MW04 and 403 to depths of 12.5 feet and 14.5 feet, respectively.

Additionally, TPHC contamination was found in boring 404 from 8 to 12.5 feet below ground surface. VOCs were detected in soils at MW04 between 10 and 12.5 feet. BNs were found in boring MW04 at depths between 4 to 12.5 feet at levels exceeding the ECRA guidelines.

The occurrence of TPHCs is apparently a very localized phenomenon and the likelihood that contaminants are immobilized in the soil is evidenced by the absence of TPHCs in the ground water in any on-site monitoring well at a level greater than the detection limits. In all instances, this deep soil contamination is of the same order of magnitude as the ECRA guideline (100s of ppm).

As mentioned above, BNs and VOCs were detected in soil in the boring for MW04 in levels exceeding the guideline. However, these levels do not appear to represent a significant active source of ground water contamination. This is evidenced by the decline over time and present low levels of BNs and VOCs in the ground water at MW04 and the absence of these chemicals at downgradient wells.

Because of the relatively low level of contamination in isolated pockets in these deeper soils, the absence of TPHC contamination in ground water, and the limited opportunities (if any) for future human exposure, excavation of deep soils in AEC-4 is not proposed. It would be prudent to observe the future trend of contaminants in ground water at MW04 for an additional study period to determine the soil's impact on ground water quality and the apparent rate of natural degradation which has been observed since the Phase I study. Continued monitoring of ground water quality would be compromised by excavation of soil at MW04 which would necessitate destruction of the well.

C. Ground Water

As discussed in Section IV, the only ground water contamination confirmed at the Airwick facility is in well MW04. Wells MW05 and MW06, located downgradient from MW04,

based on one round of sampling are free of contaminants. This indicates that any contaminant plume in the vicinity of MW04 is very localized. Furthermore, TPHCs and AEs were not detected in the ground water at this location. The VOCs observed in MW00 have not been found in other wells on-site and with the exception of trichloroethylene, the other contaminants could be indicative of field or laboratory procedures, not environmental contamination. Furthermore, trichloroethylene was detected at levels near the detection limit during both sampling events. No source of trichloroethylene contamination has been identified onsite.

Based on the results of Phase I and II investigations, the level of contaminants in well MW04 appears to be declining. Moreover, no continuous source of the VOCs has been identified to exist at the site, and these compounds were not found to be migrating downgradient.

To confirm these preliminary conclusions, it is prudent to conduct an additional round of ground water sampling from monitor wells MW04, MW05, MW06, MW00, and MW10. This sampling event is proposed, assuming timely NJDEP concurrence, for some time before June, 1989, and will (1) provide additional data on the limited areal extent of ground water contamination; (2) provide additional evidence as to the rate of the observed declining trend of contaminant concentrations in MW04; and (3) provide additional data as to the occurrence of low levels of trichloroethylene in well MW00 not observed anywhere else on site.

0250c:01/13/89:19:sjr:PM

DEP-090
12/90

New Jersey Department of Environmental Protection

COMMUNICATIONS CENTER NOTIFICATION REPORT

Received 3/04/91 TD Log# 2798

Operator ANTHONY A.G. Reviewed By A.G. Case# 91-3-4-1604-15

Reported By
JOHN LIPYANEK
Street Address

Notification Type Facility
Affiliation
AIRWICK INDUST.
Municipality

Phone
201-933-8201
State
NJ

Incident Location: Facility
Site: AIRWICK INDUST.
Phone 201-933-8201

Street Address	Municipality	County	State
111 COMMERCE RD	CARLSTADT	BERGEN	NJ

Location Type Commercial Incident Date 1/17/91 Time 0700

Substance Released OIL FUEL #4
Amount Released ( ): UNK
ID Known State Liquid CAS# Release Is Terminated
Additional Substances
Substance Contained? Y Hazardous Material? Y TCPA? N A310 Letter? Y
COMU Code 0205 Referral Code 099

Incident Description L.U.S.T.

Injuries? N Public Evac? N Facility Evac? N Public Exposure? N
Police On Scene? N Firemen On Scene? N DEP Requested? N Wind Sp/Dir

Contamination Of Land Receiving Water
Status at Scene
ONE 12,000 GALLON UST WAS EXCAVATED AND TEST RESULT PROVED SOIL WAS CONTAMINATED. FURTHER SOIL TESTS AND SOIL REMOVAL WILL BE DONE...

Responsible Party Known
Party AIRWICK INDUST.
Contact JOHN LIPYANEK Phone 201-933-8201
Title MGR.

Street Address	Municipality	County	State
111 COMMERCE RD	CARLSTADT	BERGEN	NJ

OFFICIALS NOTIFIED

	Name	Affiliation	Phone	Date	Time
NJSP	OEM		609-882-2000	3/04/91	
MUNIC	CARLSTADT BORO	SGT BERTA	201-438-4300	3/04/91	1611
OTHER					

	Name	Affiliation	Method	Date	Time	T/M
1	DEQ	HQ1	MAILED	3/04/91		M
2						
3						

COMMENTS

Presentation of the
ECRA Sampling Results
for the
Airwick Industries, Inc. Facility
Carlstadt, New Jersey

Volume I of II
ECRA Case No. 85195

Prepared for:

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Airwick Industries, Carlstadt, New Jersey

ECRA Case No. 85195

C O N T E N T S

C O N T E N T S (continued)

Airwick Industries, Carlstadt, New Jersey

ECRA Case No. 85195

Airwick Industries, Carlstadt, New Jersey

ECRA Case No. 85195

I. INTRODUCTION

A. Background

On December 20, 1984, CIBA-GEIGY, Limited, agreed to the sale of stock of the parent company of Airwick Industries, Inc., to Reckitt and Coleman, plc., thereby triggering the requirements of the Environmental Cleanup Responsibility Act (ECRA). In accordance with these ECRA requirements, a General Information Statement (GIS) dated March 22, 1985 and a Site Evaluation Submission (SES) dated April 19, 1985, were submitted by Airwick Industries, Inc. to the New Jersey Department of Environmental Protection (NJDEP). Included in the SES was a Sampling Plan prepared by ENVIRON for Airwick Industries, Inc. The Sampling Plan was revised in February, 1986. On April 1, 1987, the NJDEP issued written approval of the Revised Sampling Plan. Implementation of the Revised Sampling Plan began on May 11, 1987 and was completed on May 21, 1987.

B. Purpose and Scope

This report presents the results of the sampling program conducted at Airwick Industries' Carlstadt facility during May of 1987. The facility includes the properties at 111 and 179 Commerce Road and leased warehouse space at 145 Commerce Road. The program was designed to determine the nature and extent of any soil contamination and to

determine whether or not ground water contamination exists.[1] To accomplish this, soil and ground water samples were collected and analyzed for selected constituents which, if present, could possibly be of concern.

The Revised Sampling Plan identified areas of environmental concern (AECs) using a combination of the past history of spills and the presence and use of hazardous materials during the plant's normal operations. A list of these AECs, with a short description of each, is given in Table I-2. The locations of the AECs are shown on Figure 1. The Revised Sampling Plan proposed to collect soil samples from nine borings, two monitoring wells, and two backhoe trenches, and collect ground water samples from three monitoring wells.

The analytical results of these samples were used to determine if soil and ground water contamination exists. In those cases where the analytical results indicate an absence of contamination in an AEC, that AEC will be dropped from consideration and no further sampling will be conducted. Where contamination has been found, additional sampling may be recommended to delineate the extent of such contamination so that an appropriate cleanup plan can be developed.

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1 "Contamination" by a particular substance is defined for this study as concentrations that exceed current ECRA cleanup guidelines established by the NJDEP for soil and ground water (Table I-1). Although these informal cleanup guidelines are being used to simplify this presentation of the sampling results, neither ENVIRON nor Airwick Industries is suggesting that the cleanup guidelines are a proper or appropriate basis for a site cleanup. For example, it may ultimately prove more appropriate to use a health and environmental risk analysis to determine appropriate cleanup levels.

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Table I-1. ECRA Cleanup Guidelines

Parameter	Soil	Ground Water
Total Petroleum Hydrocarbons (TPHCs)	100 ppm	1,000 ppb
Priority Pollutants:		
Acid Extractable Organics (AEs)	Case-by-case	50 ppb
Base/Neutral Extractable Organics (BNs)	10 ppm	50 ppb
Pesticides	Case-by-case	Case-by-case
Polychlorinated Biphenyls (PCBs)	1-5 ppm	0.001 ppb
Volatile Organics (VOCs)	1 ppm	10 ppb
Phenols	Case-by-case	3,500 ppb
Cyanide (Cn)	12 ppm	200 ppb
Priority Pollutant Metals (PPMs)*		
Antimony	2 ppm	--
Arsenic	20 ppm	50 ppb
Beryllium	400 ppm	--
Cadmium	3 ppm	10 ppb
Chromium	100 ppm	50 ppb
Copper	170 ppm	1,000 ppb
Lead	100 ppm	50 ppb
Mercury	1 ppm	2 ppb
Nickel	100 ppm	--
Selenium	4 ppm	10 ppb
Silver	5 ppm	50 ppb
Thallium	5 ppm	--
Zinc	350 ppm	5,000 ppb

* ECRA cleanup guidelines for Priority Pollutant Metals in ground water are derived from NJAC 7:9-6.6

-- Indicates no cleanup level listed in NJAC 7:9-6.6

ppm parts per million (mg/kg)

ppb parts per billion (ug/l)

NOTE: ECRA cleanup guidelines are taken from an in-house memorandum distributed by BISE personnel and not established in an administrative code.

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Table I-2. Areas of Environmental Concern

Area of Environmental Concern	Rationale for Selection
1	Area of underground tank (10,000 gallon tank with No. 4 fuel oil) and area of reported fuel oil loss from a replaced fuel tank.
2	Waste disposal area for soil contaminated with No. 2 and No. 4 fuel oil.
4	Former dry well disposal area.
5	Former waste water disposal area and area of potential contamination resulting from underground chemical storage tank vent overflow.
6	Former dry well receiving boiler room discharge.

Note: Former AEC 3 was eliminated because sampling in this area, according to a NJDEP approved plan, was completed prior to this investigation and found no environmental contamination.

Section II of this report describes the field methodologies used to implement the Revised Sampling Plan and describes any deviations from this approved sampling plan. Section III describes the results of the sampling program, including the site-specific geology and hydrogeology and analytical results for the soil and ground water samples. Section IV discusses contaminants detected below cleanup guidelines and potential sources for contaminants which were detected above cleanup guidelines, and Section V presents conclusions that can be reached based on the current data and recommendations for further activities at this site.

II. METHODOLOGY

A. Sample Collection

The following is a description of the sample collection techniques used to implement the sampling plan. The techniques used were those proposed in the approved sampling plan except in the following cases. Soil boring 502 was proposed as a hollow stem auger boring; however, due to access problems, soil samples were collected using a hand auger. In several soil samples, the analytical parameters cyanide and phenol were not analyzed for due to insufficient sample. These samples are identified in Volume II of this report.

The numbering system for monitoring wells, soil borings and backhoe trenches was modified to better reflect the location of the sampling point. For example, the monitoring well that was constructed in AEC 4 is numbered MW04. Soil boring 501 is located in AEC 5 and backhoe trench 201 is located in AEC 2. Table I-3 lists the actual sample locations, depths, and analyses performed. The sample locations are illustrated on a site map (Figure 1). All sampling locations and elevations were surveyed by James M. Stewart, Inc., licensed surveyors. Boring logs and construction specifications for all borings and monitoring wells are presented in Appendix I.

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Table I-3. Actual Sampling Locations and Analyses

AEC [1]	Sampling Location	Number and Type of Samples per Location	Analysis [2]
1	0101-0106	Hollow Stem Auger Borings 2 Soil Samples: • 6.0 - 6.5 feet • 9.5 - 10.0 feet	TPHCs
2	MW02	Monitoring Well 1 Ground Water Sample	TPHCs, PP+40
	0201, 0202	Backhoe Trenches 4 Soil Samples: • 0.0 - 0.5 feet • 2.0 - 2.5 feet • 5.0 - 5.5 feet • 8.0 - 8.5 feet	TPHCs
4	MW04	Monitoring Well 8 Soil Samples: • 0 - 0.5 feet • 2.0 - 2.5 feet • 4.0 - 4.5 feet • 6.0 - 6.5 feet • 8.0 - 8.5 feet • 10.0 - 10.5 feet • 12.0 - 12.5 feet • 14.0 - 14.5 feet 1 Ground Water Sample	TPHCs, PP+40 TPHCs, PP+40
5	0501	Hollow Stem Auger Boring 5 Soil Samples: • 0 - 0.5 feet • 1.0 - 1.5 feet • 3.0 - 3.5 feet • 5.0 - 5.5 feet • 7.5 - 8.0 feet	TPHCs, PP+40

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Table I-3. Actual Sampling Locations and Analyses (continued)

AEC [1]	Sampling Location	Number and Type of Samples per Location	Analysis [2]
	0502	Hand Auger Boring 4 Soil Samples: • 0 - 0.5 feet • 1.0 - 1.5 feet • 3.0 - 3.5 feet • 5.0 - 5.5 feet • 7.0 - 7.5 feet	TPHCs, PP+40
6	0601	Hollow Stem Auger Boring 4 Soil Samples: • 0 - 0.5 feet • 2.0 - 2.5 feet • 4.0 - 4.5 feet • 6.0 - 6.5 feet	TPHCs, PP+40
Background	MW00	Monitoring Well 6 Soil Samples: • 0 - 0.5 feet • 2.0 - 2.5 feet • 4.0 - 4.5 feet • 6.0 - 6.5 feet • 8.0 - 8.5 feet • 9.0 - 9.5 feet 1 Ground Water Sample	TPHCs, PP+40 TPHCs, PP+40

1 AEC - Area of Environmental Concern

2 TPHCs - Total Petroleum Hydrocarbons
PP+40 - EPA Priority Pollutants plus 40 unidentified peaks

III. RESULTS

A. Geology

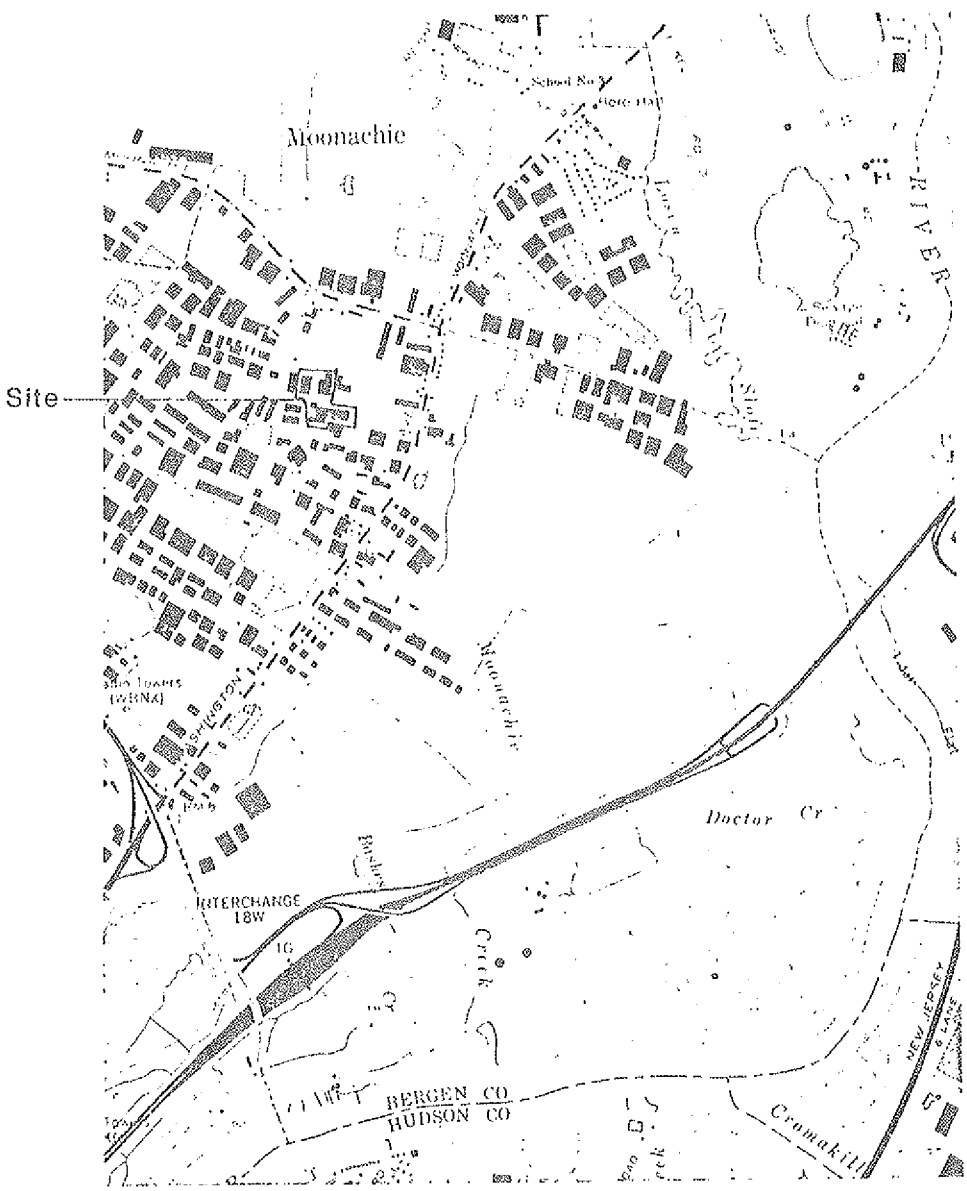
1. Regional Geology

The Airwick Industries, Inc. Carlstadt facility is located in Carlstadt, Bergen County, in the Piedmont Physiographic Province in New Jersey. The area is underlain by Pleistocene deposits of glacial clay, sand, and gravel which overlie the Triassic Brunswick formation (bedrock). The Brunswick formation is part of the Newark group and consists of soft red shale with sandstone beds.

2. Site Geology

Nine soil borings and three monitoring wells were drilled to a maximum depth of 18 feet below ground surface. All borings drilled at the site encountered essentially the same sediments and rock type.

The location of the Carlstadt facility is highlighted on a U.S.G.S. Quadrangle in Figure 2. The elevations of the sampling locations at the site, relative to mean sea level (MSL), are displayed in Figure 3. The area surrounding the buildings and parking lots is relatively flat. Elevation varies by approximately eight feet across the site. The unpaved area designated as the low drain area is topographically the lowest area of the site, and the



ENVIRON
Counsel in Health and Environmental Science

Site Location Map

Source: USGS Topographic Series
Weehawken Quadrangle, N.J.-N.Y.
Photorevised, 1981.

Figure 2

2. Site Hydrogeology

At the Carlstadt facility, ground water was encountered at a depth of 6 to 10 feet below the ground surface. Figure 8 is a site map illustrating the elevation of ground water within each of the monitoring wells installed at the facility. These elevations suggest that ground water movement is to the north.

C. Analytical Results

1. Overview

In this section, the analytical results for soil and water samples collected across the site are described in relation to the AEC from which they were taken. These samples include soil collected from borings and monitoring well installations and ground water collected from the completed monitoring wells as well as quality assurance/quality control (QA/QC) samples. Concentrations of detected compounds are described only as falling either above or below the ECRA cleanup guidelines as listed in Table I-1. The information summarized in this section is supplemented by the summary tables of analytical results for soil (Table II-2) and ground water (Table II-3) in Volume II of this report.

2. Results of Soil and Water Samples

With the exceptions of the soil borings in AEC 1 and the backhoe trenches of AEC 2, all soil and ground water samples were analyzed

for TPHCs, VOCs, acid extractable organics (AEs), base/neutral extractable organics (BNs), pesticides, polychlorinated biphenyls (PCBs), phenols, cyanide (CN), and Priority Pollutant Metals (PPMs). The soil borings in AEC 1 and the backhoe trenches of AEC 2 were analyzed for TPHCs only.

AEC 1 is where a previously installed underground fuel oil storage tank is reported to have leaked. That tank and the visibly contaminated soil were removed and a new tank was installed prior to the preparation and implementation of this sampling plan. Six hollow stem auger borings (101-106) were drilled in this AEC and two soil samples were collected from each boring. For each boring, a sample was collected at the 6.0-6.5 foot interval and the 9.5-10.0 foot interval. These samples were analyzed for TPHCs. The analytical results are summarized in Volume II, Table II-2. The samples collected from the 6.0-6.5 foot interval for soil borings 101, 103, and 104 were either at or above the ECRA cleanup guideline for TPHCs. The sample from boring 101 was at the criterion, the others exceeded it.

The sample from boring 104 was only slightly above the guideline (i.e., 150 ppm). None of the samples collected from the deeper interval in soil borings 101, 103, and 104 or from either interval in soil borings 102, 105, and 106 had TPHC concentrations exceeding the ECRA guideline.

AEC 2 is where soil contaminated with fuel oil was disposed. Ground water monitoring well MW02 and backhoe trenches 201 and 202

were installed in this area. Two ground water samples were collected from MW02 and analyzed for TPHCs, AEs, BNs, pesticides, PCBs, VOCs, phenols, CN, and PPMs. These analytical results are summarized in Volume II, Table II-3. Grab soil samples were collected from the backhoe trenches at intervals 0.0-0.5 feet, 2.0-2.5 feet, 5.0-5.5 feet, and 8.0-8.5 feet. Duplicate samples were collected for the 0.0-0.5 foot interval of backhoe trench 202. One sample was collected for all other intervals. These soil samples were analyzed for TPHCs. Analytical results are summarized in Volume II, Table II-2. Soil samples collected from the 0.0-0.5 foot and the 2.0-2.5 foot interval of backhoe trench 202 exceeded the ECRA cleanup standard for TPHCs; however, one of these samples (0.0-0.5 foot) only slightly exceeded the standard (i.e., 120 ppm). No other samples from either trench exceeded ECRA guidelines. The ground water samples collected from MW02 did not exceed any ECRA cleanup guideline for the analyses performed.

AEC 4 is the location of a dry well formerly used for disposal. Ground water monitoring well MW04 was installed in this area. During construction of this well, soil samples were collected from six-inch intervals beginning at depths 0, 2, 4, 6, 8, 10, 12, and 14 feet. These soil samples were analyzed for TPHCs and the PP+40. Two ground water samples were collected from MW04 and analyzed for TPHCs and PP+40. Analytical results are summarized in Volume II, Table II-2 and Table II-3. With the exceptions of the soil samples

collected from the 2.0-2.5 foot and the 14.0-14.5 foot intervals, all the soil samples collected from MW04 exceeded the ECRA cleanup guideline for TPHCs. The soil samples collected from the intervals beginning at depths 4, 6, 8, 10, and 12 feet exceeded the ECRA cleanup guideline for BNs. The soil samples collected from the intervals beginning at depths 10 and 12 feet also exceeded the ECRA guideline for VOCs. The soil sample collected from the 14.0-14.5 foot interval exceeded the ECRA guideline for mercury. Both ground water samples collected from MW04 exceeded the ECRA guidelines for BNs and AEs. One of these ground water samples indicated a mercury content at the ECRA cleanup standard.

AEC 5 was formerly used for waste water disposal and is the location of potential contamination from a chemical overflow vent on an underground chemical storage tank. Hollow stem auger soil boring 501 and hand auger soil boring 502 were located in this area. From each of these borings, a soil sample was collected from each of five six-inch intervals beginning at depths 0, 1, 3, and 5 feet; and at 7.5 feet for boring 501 and 7.0 feet for boring 502. A duplicate sample was collected from the 0.0-0.5 foot interval of boring 501. All soil samples collected from this area were analyzed for TPHCs and PP+40. Analytical results are summarized in Volume II, Table II-2.

The soil samples collected from boring 501 for the intervals beginning at 0, 3, and 5 feet exceeded the ECRA cleanup guideline

for TPHCs. However, the sample from the 5.0-5.5 foot interval exceeded the standard only slightly (i.e., 120 ppm). The soil sample collected from the 0.0-0.5 foot interval of boring 502 exceeded the ECRA cleanup guidelines for TPHCs (slightly, at 140 ppm) and for BNs.

AEC 6 is the location of a dry well used for boiler discharge disposal. Hollow stem auger soil boring 601 was located in this area. Samples were collected from six-inch intervals beginning at depths 0, 2, 4, and 6 feet. A duplicate sample was collected from the first interval and one sample from all the rest. These soil samples were analyzed for TPHCs and PP+40. Analytical results are summarized in Volume II, Table II-2. The following soil samples were the only samples to exceed an ECRA cleanup guideline: 0.0-0.5 and 2.0-2.5 foot slightly exceeded the guideline for TPHCs (i.e. 110 and 150 ppm, respectively), and the 6.0-6.5 foot interval exceeded the ECRA cleanup guideline for antimony.

In addition to the samples taken from the AECs, soil and ground water samples were collected and analyzed from ground water monitoring well MW00. These samples represent indicators of background conditions at the site. Soil samples were collected during construction of monitoring well MW00 from six-inch intervals beginning at depths 0, 2, 4, 6, 8, and 9 feet. Duplicate samples were collected from the 0.0-0.5 foot interval; one sample was collected from the rest. Also, one ground water sample was

collected. All the soil and ground water samples were analyzed for TPHCs and PP+40. Analytical results are summarized in Volume II, Table II-2 and Table II-3. None of the results for any of these samples exceeded the ECRA cleanup guideline, except for the following: soil samples collected from the 2.0-2.5 and the 6.0-6.5 foot intervals exceeded the ECRA guideline for TPHCs.

3. Quality Assurance/Quality Control

a. Trip Blanks

Four trip blanks accompanied the shipment and storage of soil and ground water samples to the laboratory and were analyzed for VOCs. Table II-12 presents the analytical results of the trip blanks. Trip blank 443A-TB-870512 was the only sample in which a compound was above the minimum detectable limits. This compound was methylene chloride (2 ug/l). No other VOCs were detected in any trip blanks.

b. Wash Blanks

The analytical results for the three wash blanks are presented in Table II-12. Wash blank 443A-MW04-WB01 was analyzed for TPHCs, VOCs, AE/BNs, PPMs, and cyanide. Wash blank 443A-0601-WB01 was analyzed for TPHCs, VOCs, PPMs, and cyanide. Wash blank 443A-MW04-WB02 was analyzed for TPHCs, VOCs, AE/BNs, PPMs, cyanide, phenols, pesticides, and PCBs.

In wash blank 443A-MW04-WB01 the compounds that were reported above minimum detectable limits are as follows: TPHCs were detected at 200 ug/l, the base/neutral extractable compound diethylphtalate was detected at 7 ug/l, the acid extractable compound phenol was detected at 8 ug/l, and the PPMs that were detected are arsenic (68 ug/l), copper (366 ug/l), nickel (48 ug/l) and zinc (158 ug/l).

In wash blank 443A-0601-WB01, the only compound reported above minimum detection limits was copper at a concentration of 123 ug/l. In wash blank 443A-MW04-WB02 mercury was detected at a concentration of 1.3 ug/l.

c. Duplicate Samples

Two duplicate soil samples from sample locations 501 and 601 were collected and analyzed for TPHCs and PP+40. One duplicate soil sample was collected from sample location 202 and analyzed for TPHCs. Two duplicate ground water samples were collected from monitoring wells MW02 and MW04, and analyzed for TPHCs and PP+40. The results for these samples are summarized in Table II-11. The difference between any two duplicate values when calculated as a percentage of the smaller value, was less than 50 percent in 97 percent of the parameters that were tested for in the samples. No analytical test indicated consistent or excessive variation between results.

IV. DISCUSSION

A. Quality Assurance/Quality Control

The results of the quality assurance/quality control measures taken during sampling and laboratory analysis are discussed below. In general the results are consistent and do not indicate any problems in the validity of the analytical results.

1. Trip Blanks

As discussed in Section III, only one of the four trip blanks (443A-TB-870512) was contaminated with VOCs. Methylene chloride was detected at a concentration of 2 ug/l. Methylene chloride was not detected in any samples that this trip blank accompanied. These analyses indicate that no cross contamination occurred that would discredit the analytical results for samples collected at the facility.

2. Wash Blanks

Several compounds were detected in wash blank 443A-MW04-WB01. These compounds include TPHCs (200 ug/l), diethlyphthalate (7 ug/l), phenol (8 ug/l), arsenic (68 ug/l), copper (366 ug/l), nickel (48 ug/l), and zinc (158 ug/l). These results suggest inadequate decontamination of the drill rig after construction of monitoring well MW04 and prior to drilling of monitoring well MW02 (i.e., wash

blank 443A-MW04-WB01 was collected from the drill rig during this period of time). Analytical results for the ground water sample collected from MW02 do not indicate contaminant concentrations similar to those detected in the wash blank. The MW02 ground water sample had contaminant concentrations much lower than the wash blank. These results suggest that significant cross contamination resulting from the use of the inadequately cleaned drill rig is unlikely to have occurred.

In wash blank 443A-0601-WB01, 123 ug/l of copper was detected. This wash blank was collected from the drill rig subsequent to construction of boring 601 and prior to drilling of monitoring well MW00. Analytical results for soil samples collected from monitoring well MW00 do not exceed the ECRA cleanup guideline for copper.

In wash blank 443A-MW04-WB02, 1.3 ug/l of mercury was detected. This wash blank was collected using a laboratory cleaned teflon bailer and deionized water. This occurrence of mercury will be investigated further, as discussed in Section V of this report.

3. Duplicates

The results for only one pair of duplicate samples indicated detected compound concentrations that differ by an order of magnitude or more between the duplicate samples. The analyses of duplicate samples 443A-0501-5B01 and 443A-0501-5B21 indicated TPHC concentrations of 180 mg/kg and 35 mg/kg, respectively. This variation may be due to incomplete homogenization of the sample prior to splitting.

4. Laboratory Method Blanks

The laboratory method blanks contained acceptable concentrations of VOCs relative to ECRA cleanup guidelines. Most of the detected chemicals were common laboratory chemicals and are reported in Century Laboratory Reports F1180, F1191, F1213, F1226, and F1297.

B. Parameters Detected Below Cleanup Guidelines

All soil and ground water samples from AECs 4, 5, and 6 and the background monitoring well MW00 were analyzed for pesticides, PCBs, cyanide, and phenols. None of these samples had concentrations of pesticides, PCBs, cyanide or phenols which exceeded the ECRA cleanup guidelines. These substances will require no further investigation or cleanup.

C. Parameters Detected Above Cleanup Guidelines

Total petroleum hydrocarbons, VOCs, AE/BNs, and PPMs were detected at concentrations exceeding ECRA cleanup guidelines in one AEC or more. For each of these contaminants the pattern of occurrence and potential sources are discussed below.

1. Total Petroleum Hydrocarbons

All TPHC concentrations in ground water samples were below ECRA cleanup guidelines. The contamination of soil by TPHCs has been detected in AECs 1, 2, 4, 5, and 6. Soil contamination in each of these areas is discussed below.

In AEC 1, TPHC contamination was detected at a depth of 6.0-6.5 feet. No TPHC contamination was detected in samples collected from 9.5-10.0 feet. Only these two depths were sampled in AEC 1. In boring 101, TPHC concentration equaled the ECRA cleanup guideline (100 mg/kg) for the 6.0-6.5 foot interval. In boring 104, TPHC concentration exceeded the ECRA cleanup guideline (150 mg/kg) for the 6.0-6.5 foot interval. These concentrations are not considered to be of concern.

TPHCs were detected at a concentration of 350 mg/kg in boring 103 at a depth of 6.0-6.5 feet. TPHC concentrations in soil samples collected from the same depth in the borings adjacent to boring 103 are significantly lower than the concentrations in boring 103, indicating that the contamination in boring 103 is very limited in its horizontal extent. The absence of contamination in samples collected from 9.5-10.0 feet suggests that this contamination is also limited in vertical extent and that ground water below this area has not been impacted by TPHCs in the soil.

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In AEC 2 TPHC contamination has been detected above ECRA cleanup guidelines in two soil samples from sample location 202. Surface soil sample 443A-0202-TR21 marginally exceeded the ECRA cleanup guideline (120 mg/kg) and the analysis for the duplicate of this soil sample, 443A-0202-TR01, was below the ECRA cleanup guideline (89 mg/kg). These results are not considered indicative of TPHC contamination of concern. In the soil sample collected from a depth of 2.0-2.5 feet, TPHC contamination was detected at a concentration of 590 mg/kg. Soil samples collected from 5.0 feet and deeper at this sample location did not exceed the ECRA cleanup guideline. Ground water samples from monitoring well MW02 indicate ground water has not been impacted by TPHCs or PP+40 in this AEC.

In AEC 4, TPHC concentrations in soil samples from monitoring well MW04 exceed ECRA cleanup guidelines in all but two samples. Soil samples collected from 2.0-2.5 feet (62 mg/kg) and from 14.0-14.5 feet (58 mg/kg) are below ECRA cleanup guidelines. TPHC concentrations in those samples that exceed cleanup guidelines range from 210 mg/kg to 5,100 mg/kg with the highest concentration being detected in soil collected from 7.0-7.5 feet.

TPHC contamination above ECRA cleanup guidelines was detected in soils collected from AEC 5 in boring 501 and 502. In boring 501, soil samples 0.0-0.5 feet (180 mg/kg), 3.0-3.5 feet (1,100 mg/kg) and 5.0-5.5 feet (120 mg/kg) contain TPHC concentrations above cleanup guidelines. In boring 502, TPHC contamination was detected

in surface soil sample 443A-0502-S[illegible] (140 mg/kg). Soil samples collected below the surface did not exceed the ECRA cleanup guideline; therefore, the analytical results suggest the contamination around boring 502 is a surface condition.

In AEC 6, the TPHC concentrations detected in soil samples from boring 601 at the surface and at 2.0-2.5 feet marginally exceed the ECRA cleanup guideline (110 mg/kg and 150 mg/kg, respectively). The location of boring 601 (an area used for vehicle parking) and the degree of contamination suggest that these results should not be considered TPHC contamination of concern. The absence of TPHC contamination at depths below 2.5 feet suggests that ground water below this area has not been impacted by TPHCs in this AEC.

2. Volatile Organic Compounds

VOC contamination above ECRA cleanup guidelines has been detected in only one AEC. In AEC 4, both soil and ground water have been contaminated by VOCs. At sample location MW04 soil samples from 10.0-10.5 feet (17.3 mg/kg) and 12.0-12.5 feet (3.1 mg/kg) both exceed the cleanup guideline for VOCs. In addition, analytical results for ground water samples from monitoring well MW04 indicate contamination from VOCs at a concentration of 691 ug/l.

3. Extractable Organic Chemicals

In AEC 4, AE/BNs have been detected in the soil and ground water at levels that exceed the ECRA cleanup guidelines. Soil samples collected from monitoring well MW04 at depths of 4.0 to 12.5 feet contained concentrations of BNs ranging from 288 mg/kg to 19.8 mg/kg with the highest concentrations being detected at the sample interval from 8.0-8.5 feet. In addition, ground water samples from monitoring well MW04 contained BN contamination of 263 ug/l and AE contamination of 68 ug/l.

In AEC 5, only one sample exceeded the ECRA cleanup guideline for BNs. At sample location 501, surface soil sample 443A-0501-SB01 was found to contain BNs at a concentration of 48.3 mg/kg.

4. Priority Pollutant Metals

Priority Pollutant Metals were detected above ECRA cleanup guidelines in AECs 4 and 6. In AEC 4, at sample location MW04, one soil sample collected from 14.0-14.5 feet contained mercury at a concentration of 11 mg/kg. In addition, the ground water sample collected from monitoring well MW04 indicated a mercury concentration of 2 ug/l. This concentration is the ECRA cleanup guideline.

At sample location 601 in AEC 6, the soil sample from 6.0-6.5 feet (443A-0601-SB04) was found to be contaminated with antimony at a concentration of 18.2 mg/kg.

V. CONCLUSIONS AND RECOMMENDATIONS

A. General

As discussed below, several conclusions regarding the quality of soil and ground water at the Airwick Industries facility can be reached based on the data collected to date. To design an appropriate cleanup plan, however, further characterization of the soil and ground water at the site through additional data collection and analysis will be necessary. A Phase Two Sampling Plan to address these additional data needs is being prepared for submission to the NJDEP. The conclusions that have been reached based on the data presented in this report and the recommendations for additional data collection are discussed below.

B. Conclusions

1. Soil Contamination Related to On-Site Activities

Soil contamination in AECs 1, 2, 4, and 5 appears consistent with past activities in these areas. In AEC 1, the slightly elevated concentrations of TPHCs found at the 6.0-6.5 feet interval in borings 101, 103, and 104 could have resulted from incomplete removal of contaminated soil near the leaking fuel tank that was removed from this area. It should be noted that these values are not inconsistent with background values of TPHCs found at MW00. Similarly, the TPHC analytical results for AEC 2 are consistent with

the reported disposal of the contaminated soil from AEC 1, and only the sample from the 2.0-2.5 foot interval of trench 202 indicated a concentration of potential concern.

AEC 4 is clearly contaminated and will require cleanup actions. Almost all soil samples taken from MW04 exceeded ECRA cleanup guidelines for TPHCs as well as BNs and VOCs. The degree of contamination at the surface compared to contamination at deeper depths is consistent with the former use of the dry well in the area. That is, contamination is greatest at depths below the surface, where waste may have entered the soil from the well, than at the surface.

The surface soil sampled in AEC 5 indicates high levels of BNs and very slightly elevated levels of TPHCs. This surface contamination is consistent with the reported surface disposal of wastes in this area. The higher TPHC concentration at a depth of 3 feet is inconsistent.

2. Ground Water Contamination Related to On-Site Activities

Ground water contamination is present in MW04. This contamination consists of BNs, AEs, and VOCs. This is consistent with the former use of the dry well in this area.

3. Contamination Not Related to On-Site Activities

The occurrence of elevated levels of mercury in MW04 and antimony in boring 601 is likely associated with background

existence of these metals and not with on-site activities. Mercury was found to exceed the ECRA cleanup standard in the soil sample collected at interval 14.0-14.5 feet in MW04. Mercury was also detected at the ECRA standard in only one of two ground water samples collected from MW04. Antimony was found to exceed the ECRA standard at depth 0.0-0.5 foot in Boring 601. Neither mercury nor antimony is known to have been used at the facility. This fact plus the occurrence of this metal in the soil only at the deepest intervals sampled indicates that they are likely background contaminants not associated with facility activities. However, the occurrence of mercury in the wash blank from the teflon bailer leaves open the possibility that the mercury found in the samples from MW04 was introduced in the laboratory. This issue will be investigated further in the Phase Two Sampling Plan discussed below.

C. Recommendations

Certain additional sampling must precede the development of a cleanup plan. This sampling will be designed to: (1) further delineate the areal extent of soil contamination in AECs where remedial action is necessary; (2) refine the current understanding of the nature and extent of ground water contamination in AEC 4; and (3) further characterize the ground water flow regime in the area of ground water contamination. Airwick Industries, Inc. proposes to submit to the NJDEP a detailed Phase Two Sampling Plan which will describe the locations and sampling of soil

and ground water which will be necessary to move toward a cleanup consistent with ECRA standards.

In addition, Airwick Industries, Inc. may begin to develop an approach for determining cleanup levels for future remedial action at the site. The approach may ultimately invoke an evaluation of the health and environmental risks associated with exposure to substances present at the facility. Airwick Industries, Inc. will keep the NJDEP apprised of its progress in this area.

ENVIRON Corporation
Counsel in Health and Environmental Science

January 20, 1987

Mr. Charles Trautman
Bureau of Industrial Site Evaluation
Division of Waste Management
New Jersey Department of Environmental Protection
401 East State Street
Trenton, New Jersey 08628

Re: Airwick Industries, Inc.
111 Commerce Road
Carlstadt, NJ 07072
Case #85195

Dear Charles:

Enclosed please find the sampling report and results for the USEPA dioxin study done for the Airwick Industries, Inc. facility in Carlstadt, New Jersey. Samples were taken on October 3 1984 as part of the Tier 3 National Dioxin Study. As you can see, the highest concentration of dioxin, found in sediment duplicate DB007706, was 44 ppt, well below the 1 ppb New Jersey dioxin action level.

If you have any questions, please do not hesitate to call me at (202) 337-7444.

Very truly yours,

Joyce S. Schlesinger, P.E.
Principal

JSS/RM:slh

Enclosure

cc: Edward A. Hogan, Esq.
James I. Hendrickson

The Flour Mill, 1000 Potomac St., N.W.
Washington, D.C. 20007 • (202) 337-7444

NATIONAL DIOXIN STUDY - TIER 3
AIRWICK INDUSTRIES, INC.
CARLSTADT, NEW JERSEY

SAMPLING REPORT & RESULTS

Airwick Industries, Inc. Sampling Report

TABLE OF CONTENTS

1.0 Project Name: "National Dioxin Study" - Region II, Tier 3 Investigation of Airwick Industries, Inc.

2.0 Project Requested by: U.S. EPA, as part of EPA's overall Dioxin Strategy

3.0 Date of Request: October 1983 - February 1984

4.0 Date of Project Initiation: April 1984

5.0 Regional Project Coordinator: Richard Spear (201/321-6685)
Environmental Services Division
U.S. EPA, Region II

6.0 Regional Quality Assurance Officers: Richard Spear (201/321-6685)
Gerald McKenna (201/321-6645)
Environmental Services Division
U.S. EPA, Region II

7.0 Project Description

7.1 Project Objectives

The objective of this investigation was to determine whether environmental samples collected at Airwick Industries, Inc. are contaminated with 2,3,7,8-TCDD.

7.2 Site Description

Airwick Industries, Inc. is located at the following address:

111 Commerce Road
Carlstadt, NJ 07072
(201) 933-8200

This address corresponds to longitude 74°3'2" and latitude 40°49'50". The site is approximately 6 acres in size and is 85% unaccessible to soil sampling due to buildings and asphalt. An open drainage ditch is located adjacent to the main manufacturing building.

For the period from 1974 to 1983, Airwick Industries, Inc. formulated a total of 1,810 pounds of hexachlorophene. During this same period, 34 pounds of hexachlorophene was discharged as waste to the Bergen County Utility Authority. The use of hexachlorophene was permanently terminated in December 1983.

7.3 Sampling Locations and Analysis

Location	Matrix	No. of Samples	Strategy	Analysis
Facility	Soil	20	directed	ppb (CLP)
Facility	Sediment	5	directed	ppt (TROIKA)
Matrix Spike	Soil	1	QC	ppb (CLP)
Performance	Soil	2	QC	ppb (CLP)
Field Duplicate	Soil	1	QC	ppb (CLP)
Performance	Sediment	2	QC	ppt (TROIKA)
Field Duplicate	Sediment	1	QC	ppt (TROIKA)

7.4 Sampling Design

Three soil samples were taken from the landfill area located immediately behind the parking area and adjacent to the main manufacturing building. These sample locations are denoted by 1*, 2*, 3*. Nine soil samples were taken from the depression behind the landfill area and behind the main manufacturing building. These sample locations are denoted by 4*, 5*, 6*, 7*, 8*, 9*, 10*, 11*, 12*. Five soil samples were taken from the ditch running from the southwest to the southeast corners of the main manufacturing building. These sample locations are denoted by 13*, 14*, 15*, 16*, 17*. Five sediment samples were taken from the ditch running from the southwest corner of the main manufacturing building to the culvert at Commerce Road. These sample locations are denoted by 18*, 19*, 20*, 21*, and 22*. Finally, three soil samples were taken above the buried storage tanks located adjacent to Commerce Road. These locations are denoted by 23*, 24*, and 25*.

The sample locations are described on Figure 1. Actual sampling times are shown below:

Case Number 3379

TIME	FIELD ID	SAMPLE #	REMARKS
0920	3	DB002301	soil -- rear of parking lot
0932	2	DB002302	soil -- rear of parking lot
0947	1	DB002303	soil -- rear of parking lot
1004	4	DB002304	soil -- rear of parking lot
1019	5	DB002305	soil -- rear of parking lot
1028	6	DB002306	soil -- rear of parking lot
1034	7	DB002307	soil -- rear of parking lot
1040	8	DB002308	soil -- rear of parking lot
1046	9	DB002309	soil -- rear of parking lot

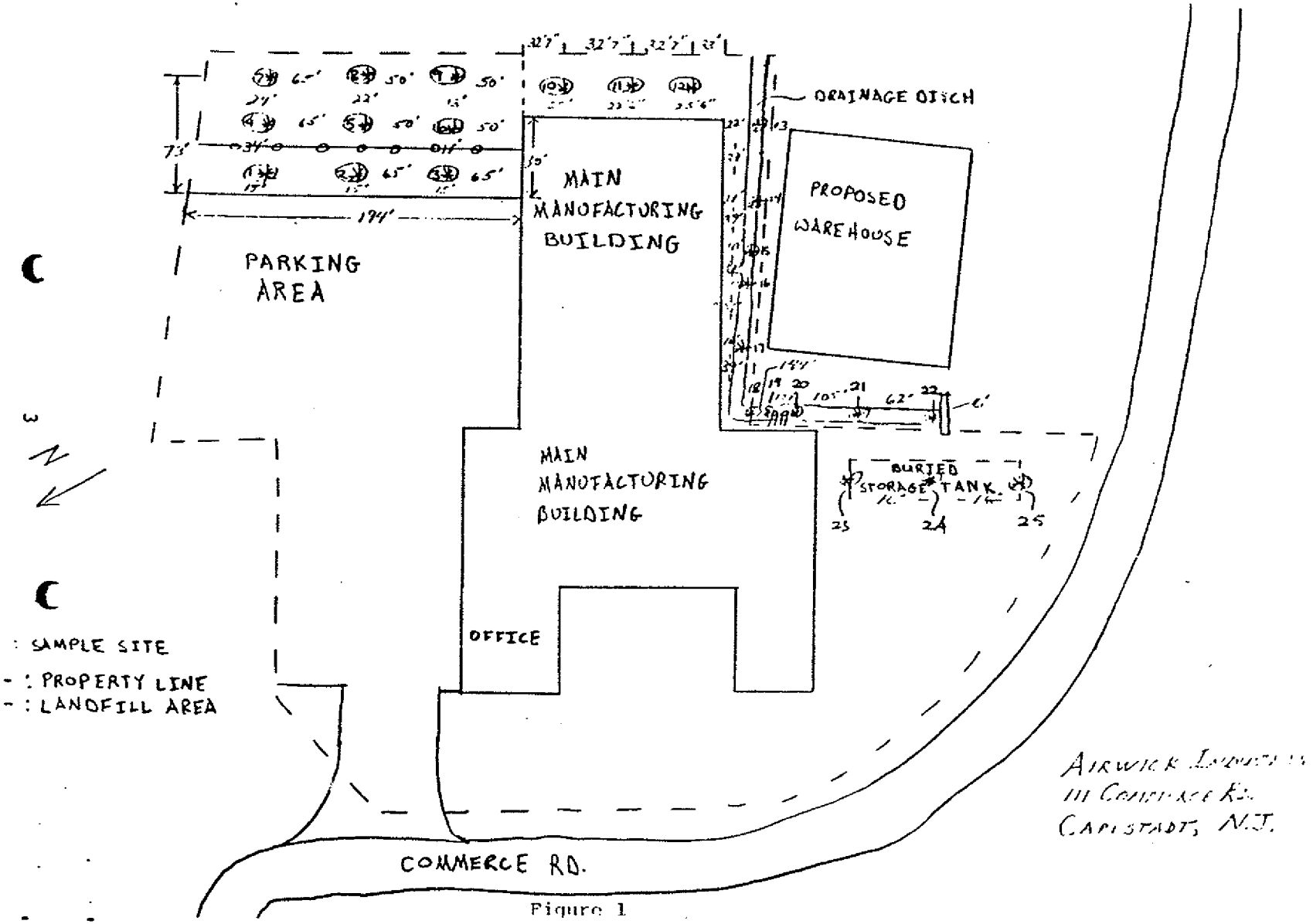

Figure 1

TIME	FIELD ID	SAMPLE #	REMARKS
1150	10	DB002310	soil -- rear of main mfg bldg
1156	11	DB002311	soil -- rear of main mfg bldg
1202	12	DB002312	soil -- rear of main mfg bldg
1234	25	DB002313	soil -- buried storage tank area
1235	24	DB002314	soil -- buried storage tank area
1240	23	DB002315	soil -- buried storage tank area
1543	13	DB002316	soil -- low area side main mfg bldg
1553	14	DB002317	soil -- low area side main mfg bldg
1602	15	DB002318	soil -- low area side main mfg bldg
1610	16	DB002319	soil -- low area side main mfg bldg
1615	17	DB002320	soil -- low area side main mfg bldg
1645	26	DB002321	blank
1645	27	DB002322	PE U77JD392
1034	28	DB002323	field duplicate 07 dup
1650	29	DB002324	PE N4OXXB5E

Episode Number 2443

1450	18	DB007701	sediment--drainage ditch
1434	19	DB007702	sediment--drainage ditch
1402	20	DB007703	sediment--drainage ditch
1347	21	DB007704	sediment--drainage ditch
1328	22	DB007705	sediment--drainage ditch
-	20 dup	DB007706	field dup 20 dup
-	Airwick1	DB007707	P.E.
-	Airwick2	DB007708	P.E.

NATIONAL DIOXIN STUDY
Sampling Results - Airwick Industries, Inc.

EPA SAMPLE NUMBER	2,3,7,8 TCDD CONC. (ppb)	DETECTION LIMIT (ppb)
Soils:		
DB002301	ND	0.08
DB002302	ND	0.10
DB002303	ND	0.46
DB002304	ND	0.45
DB002305	ND	0.03
DB002306	ND	0.10
DB002307 duplicate I	ND	0.04
DB002308	ND	0.02
DB002309	ND	0.02
DB002310	ND	0.02
DB002311	ND	0.03
DB002312	ND	0.10
DB002313	ND	0.02
DB002314 #	ND	0.02
DB002315	ND	0.48
DB002316	ND	0.03
DB002317	ND	0.03
DB002318	ND	0.17
DB002319	ND	0.04
DB002320	ND	0.39
DB002321 matrix spike-1 ppb	0.76	-
DB002322 performance sample	4.5 **	-
DB002323 duplicate I	ND	0.28
DB002324 performance sample	4.3 *	-

EPA SAMPLE NUMBER	2,3,7,8 TCDD CONC.(ppt)	DETECTION LIMIT (ppt)
Sediments:		
DB007701	4	-
DB007702	4	-
DB007703 duplicate II	NA	-
DB007704	ND	2.00
DB007705	8	-
DB007706 duplicate II	44	-
DB007707 performance	28 ***	-
DB007708 performance	34 ***	-

* actual value = 3.80 ppb
** actual value = 7.77 ppb
*** actual value = 25 ppt
ND not detected
NA not analyzed due to loss of sample or analytical difficulties