N60478.AR.001573
NWS EARLE
5090.3a

ACTION MEMORANDUM ENGINEERING EVALUATION COST ANALYSIS FORMER PESTICIDE SHOP NWS EARLE NJ

1/14/2000

FOSTER WHEELER ENVIRONMENTAL CORPORATION

000000729

EARL

Prepare in quintuplicate (original and 4 copies)

CONTRACTOR DRAWINGS & INFORMATION SUBMITTAL
NORTHNAVFACENGCOM 4335/3 (Rev. 6/80)

CONTROL NO 79

CONTRACT NO.	DELIVERY ORDER #	ACTIVITY LOCATION
N62472-94-D-0398	0034	Naval Weapons Station (NWS) @ Earle, Colts Neck, NJ

PROJECT TITLE:
REMEDIAL ACTIONS AT FORMER PESTICIDE SHOP

FROM:	DATE
Foster Wheeler Environmental Corp. Program QC Manager: Mark Miller	January 14, 2000
TO:	DATE
W FAUSTMAN (3 COPIES)	January 14, 2000

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FOR COMMANDING OFFICER, NORTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND — DATE

ITEM NO.	SUBMITTAL DESCRIPTION	PREPARED/ SUBMITTED BY	APPROVED	DISAPPROVED	REMARKS
105	SD-18, Records; Action Memorandum and EE/CA	M. Miller			

EARLE

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ACTION MEMORANDUM
ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

FORMER PESTICIDE SHOP

NAVAL WEAPONS STATION-EARLE
COLTS NECK, NEW JERSEY

Issued:

January 14, 2000

Prepared for:

Naval Facilities Engineering Command
10 Industrial Highway
Lester, PA 19113

Prepared by:

Foster Wheeler Environmental Corporation
2300 Lincoln Highway
One Oxford Valley
Suite 200
Langhorne, PA 19047-1829

REMEDIAL ACTION CONTRACT N62472-94-D-0398
DELIVERY ORDER NO. 0034

Upon review and approval, the following article shall be published in the Asbury Park Press.

UNITED STATES
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

This announces that an Action Memorandum, Engineering Evaluation and Cost Analysis (EE/CA) for the excavation and removal of pesticide-impacted soils at the Naval Weapons Station Earle Former Pesticide Shop under the Navy's Installation Restoration Program has been drafted. The Northern Division of the Naval Facilities Engineering Command, the lead agency for the site remedial activity, has recommended the removal of pesticide impacted soils at the Former Pesticide Shop to minimize the potential for exposure and migration of the pesticides. This remedial action involves the demolition of the Former Pesticide Shop, the excavation, transportation, and off-site disposal of approximately 500 cubic yards of soils contaminated with pesticides. Post excavation sampling will be used to evaluate the effectiveness of the remedial action. Naval Weapons Station Earle will consider written and verbal comments on the proposed actions before the final selection of the remedial action and issuance of a Decision Document reflecting this choice. Written comments must be postmarked **February 28, 2000.**

The Action Memorandum and EE/CA for this site may be reviewed at the repository listed below:

Monmouth County Library
Eastern Branch
Government Repository
Route 35
Shrewsbury, New Jersey 07701

Written comments on the proposed actions should be sent to:

Commanding Officer
Attn: Code 043
Naval Weapons Station Earle
Colts Neck, New Jersey 07722-5014

ACTION MEMORANDUM
ENGINEERING EVALUATION/COST ANALYSIS
FORMER PESTICIDE SHOP
NAVAL WEAPONS STATION-EARLE
COLTS NECK, NEW JERSEY

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ACTION MEMORANDUM
FORMER PESTICIDE SHOP

I. PURPOSE

The purpose of the Action Memorandum is to request and document approval of the remediation at the Former Pesticide Shop, at the Naval Weapons Station Earle (NAVWPNSTA Earle), located in Monmouth County, New Jersey. The soil remediation will be conducted by a contractor who has specific environmental and construction experience.

II. SITE CONDITIONS AND BACKGROUND

A. Site description

1. Site Evaluation

how ?

The main contaminants detected in the soils at the Former Pesticide Shop are DDT, DDE, DDD, and chlordane. Elevated concentrations of the pesticides could pose a direct threat to on-site workers and the environment.

The objective of the remedial action is to excavate soils with pesticide concentrations above the NJDEP Non-Residential Cleanup Criteria and dispose of the soils off-site at an approved facility. The existing building shall also be demolished and the rubble disposed off site. Removal of the impacted soils will minimize the potential hazards associated with direct contact and the migration/mobilization of the contaminants.

2. Physical Location

NWS-Earle is located in east-central Monmouth County in the town of Colts Neck, New Jersey. The Former Pesticide Shop is located on the Mainside portion of the base, north of the intersection of Esperance and Macassar Roads.

deposited ?

The building served as the Former Base Pesticide Shop, but is no longer in service. Apparently, containers and spraying containers were periodically rinsed out and some of the wastewaters were dumped outside the building. According to Navy personnel, the pesticides shop operated prior 1976, before RCRA regulations.

The Former Pesticide Shop (the shop) is located in a grassy wooded area between Building C-54 and Building C-23. The shop consists of a small concrete block building (25 ft. x 12 ft.) with an asbestos transite roof. The block building sits atop a poured concrete slab. There is also a 15 ft by 8 ft. concrete pad on the northwestern side of the building. The shop is bordered to the east by an asphalt parking lot, to the south by a

grassy area and Building C-23, to the west by a grassy, wooded area and Building C-54, and to the north by a wooded area. The shop sits atop a small knoll, which slopes to the north and northwest. An in-ground former septic leach tank is located approximately 15 feet north of the shop. The primitive septic tank consists of a concrete block in-ground structure, approximately 4 feet deep. The concrete blocks are spaced apart on the bottom to allow seepage to the surrounding area. A concrete lid covers the top of the tank. There are no drawings or plans available for the septic tank, but if it is similar to other tanks excavated at the facility, pea gravel or other more permeable material surrounds the concrete-block pit. An overhead electrical line from Building C-23 supplies power to the shop. There are no other utilities entering the shop. An underground line is evidenced south of the shop building.

3. Site Characteristics

Regional mapping places the Former Pesticide Shop within the outcrop area of the Vincentown Formation. The Vincentown Formation ranges between 10 and 130 feet in thickness. The sediments encountered in borings at a nearby site generally exhibit soil characteristics that agree with the published description of the Vincentown Formation. Soil borings in this site revealed brown pebbly, silty, fine to medium grained sand.

4. Release or Threatened Release into the Environment of a Hazardous Substance, or Pollutant, or Contaminant

The main contaminants detected at the Former Pesticide Shop are pesticides in the shallow soils. The laboratory analyses of soil samples collected in the area around the pesticide shop revealed the presence of chlordane (up to 75,000 ppm); 4,4' DDD (up to 1.5 ppm); 4,4' DDE (up to 1 ppm); and 4,4' DDT (up to 52 ppm).

Nine groundwater samples were collected from temporary wells installed around the Former Pesticide Shop. The laboratory analytical results of groundwater samples collected from two of these wells revealed a herbicide at concentrations above the NJDEP Groundwater Quality Criteria. Endosulfan I was detected in the groundwater at two temporary well locations at concentrations of 0.041 ug/l and 0.61 ug/l. The NJDEP Groundwater Quality Criteria for Endosulfan I is 0.40 ug/l.

BELOW .38, OVER 0.41, OVER .61

5. National Priority List (NPL) Status

NAVWPNSTA Earle (Colts Neck, New Jersey) was listed as an "NPL" site in August 1990. A Federal Facilities Agreement between the Department of the Navy and the United States Environmental Protection Agency (USEPA), Region II was finalized in February 1991. In accordance with Navy policy to include the members of the public in decisions concerning site clean up decisions, NAVWPNSTA Earle established a "Restoration Advisory Board" (RAB). The RAB is comprised of community members, representatives of the USEPA, New Jersey Department of

Environmental Protection (NJDEP), and the Navy. The RAB was officially formed in February 1995, and meets regularly after normal business hours to allow the working public an opportunity to participate in site-specific discussions. Prior to RAB formation, a Technical Review Committee (TRC) met during normal business hours; representatives of local municipalities and regulatory agencies attended TRC meetings. This proposed action at the Former Pesticide Shop has been discussed with the NAVWPNSTA Earle RAB.

The proposed Pesticide Shop Remediation is a non-time critical remedial action as defined in the National Contingency Plan (NCP).

6. Maps, Pictures, and Other Graphic Representations

Maps of the site are included in Appendix B of this Action Memorandum.

B. Other Actions Addressing Site 6 and 17

1. Previous Actions

Brown and Root Environmental conducted a soil investigation at the Former Pesticide Shop on April 21 and 22, 1998. Twenty-three soil borings around the Former Pesticide Shop were sampled from three discrete depths (surface, one and three-feet below grade). The soil samples were analyzed for chlorinated organic pesticides by SW-846 Method 8081A. Chlordane and 4,4'-DDT were the most frequently detected pesticides found in the soil samples. Chlordane was found in 20 of 23 surface soil samples; and 4,4' DDT was found in 13 of 23 surface soil samples. The laboratory analyses of soil samples collected in the area around the pesticide shop revealed the presence of: chlordane (up to 75,000 ppm); 4,4' DDD (up to 1.5 ppm); 4,4' DDE (up to 1 ppm); and 4,4' DDT (up to 52 ppm).

On December 4, 1998 and January 9, 1999, Foster Wheeler Environmental conducted a soil and groundwater investigation at the Former Pesticide Shop. The project objectives included utilizing direct-push methods to collect soil samples and groundwater samples for the laboratory analyses of pesticides. The purpose of the sample collection was twofold. Soil samples were collected to further delineate the vertical extent of pesticide contamination in the soils at the previously identified "hotspots". Groundwater samples were collected at the site to determine if pesticides impacted the groundwater. The soil investigation determined that the majority of the pesticide contamination in the soils was restricted to the upper 2 feet of soils. No pesticides migrated to the groundwater. One herbicide (Endosulfan I) was detected in two of nine groundwater samples obtained at the site at a concentration above the NJDEP Groundwater Quality Criteria. Appendix A contains the previous investigative reports.

2. **Current Action**

No current action other than this Action Memorandum. and EPA

C. **State and Local Authorities' Rule**

1. **State and Local Actions**

The site is located on the NWS-Earle Base, which is secured and requires a pass for entry. The pass can only be obtained from the NAVWPNSTA Earle Security office.

2. **Potential for Continued State/Local Response**

The Navy will lead the response under cooperative agreement with the NJDEP. The potential for any continued State/Local response in unlikely.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

A. **Threats to Public Health or Welfare**

Chlordane was found in 20 of 23 surface soil samples; and 4,4' DDT was found in 13 of 23 surface soil samples. The laboratory analyses of soil samples collected in the area around the pesticide shop revealed the presence of chlordane (up to 75,000 ppm); 4,4' DDD (up to 1.5 ppm); 4,4' DDE (up to 1 ppm); and 4,4' DDT (up to 52 ppm). The pesticides levels were concentrated in the first two feet of the soils and appear to be distributed in the soils around the former building and parking lot. Groundwater samples obtained from the site only revealed one herbicide at a concentration above the NJDEP Drinking Water Standards.

Municipal water is used in this area of the Station.

Public access to the site is strictly limited, as the site is located on a secure base. Risks to public health can be avoided by restricting future land use or groundwater use in the area of the pesticide shop. Groundwater is not currently used in the area of the pesticide shop

The remedial action proposed in this Action Memorandum should reduce the risks associated with the Former Pesticide Shop contamination.

B. **Threats to the Environment**

Direct contact of contaminated soils is the main threat to human health and the environment.

The remedial action proposed in this Action Memorandum will reduce potential adverse effects of the Former Pesticide Shop contaminants on human receptors as well as ecological receptors, such as animals and vegetation.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of pollutants and contaminants from the Former Pesticide Shop, if not addressed by implementing the response action selected for this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTION AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed Action Description

The proposed action at the Former Pesticide Shop includes the asbestos abatement of a transite roof, the demolition of the existing building, removal of all demolition debris, the excavation and removal of the former septic tank associated with the operations, and the excavation and removal of pesticide-contaminated soils with concentrations above the Non-Residential Cleanup Criteria. The remedial activities at the site will minimize the risks associated with direct-contact to the contaminants of concern.

2. Contribution to Remedial Performance

No further action may be required based upon the proposed removal action. Post-excavation sampling results will be compared to the NJDEP Non-Residential Cleanup Criteria to determine the need for additional action. Sample data that indicates levels of contaminants below the NJDEP Non-Residential Cleanup Criteria will demonstrate that the remedial action was effective. With NJDEP approval, no further action may be necessary.

3. Description of Alternative Technologies

Alternative technologies have been considered. It has been determined that the proposed action of soil removal and off-site disposal is the most effective and least expensive option.

4. Engineering Evaluation/Cost Analysis (EE/CA)

An Engineering Evaluation/Cost Analysis has been prepared and is included as Appendix C. It contains a detailed discussion of alternatives considered before selection the remedial action outlined in this Action Memorandum.

5. Applicable or Relevant and Appropriate Requirements (ARARs)

The New Jersey Non-Residential Direct Contact Soil Cleanup Criteria Standards, as outlined in the Findings and Recommendation for the Remediation of Historic Pesticide Contamination-Final Report. Historic Pesticide Contamination Task Force. March 1999, shall be used for the site ARARs.

6. Project Schedule

This project will begin on February 16, 2000 and be completed by March 14, 2000. Appendix D contains the complete schedule.

B. Estimated Costs

The estimated cost of the remedial action is approximately $250,000. A detailed cost estimate is provided in the EE/CA.

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Although the contaminants in the soils are relatively immobile, a delay in action would increase potential for direct contact exposure to these compounds. A delay or no action at this time could potentially impact on-site workers and the environment.

VII. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues that have not been discussed or addressed.

VIII. ENFORCEMENT

This remedial action will be performed properly and in accordance with this Action Memorandum, and all applicable federal, state, and local regulations.

IX. RECOMMENDATION

This decision document represents the selected remedial action for the Former Pesticide Shop, at Naval Weapons Station Earle, Colts Neck, Monmouth County, New Jersey. It was developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, and not inconsistent with the National Contingency Plan. This decision is based on the available data for the Former Pesticide Shop.

APPENDIX A

PREVIOUS INVESTIGATIVE REPORT

DELINEATION SAMPLING AND ANALYSIS

OLD PESTICIDE SHOP

NAVAL WEAPONS STATION

EARLE, NEW JERSEY

BACKGROUND AND LOCATION

NWS Earle is located in Monmouth County in east-central New Jersey. It is situated on approximately 11,134 acres, and includes a Mainside area, which is approximately ten miles inland from the Atlantic Ocean at Sandy Hook Bay, and a Waterfront area, which includes an ammunition depot and associated piers. The Mainside and Waterfront areas are linked by a narrow tract of land that serves as a right-of-way for a government road and railroad. The main entrance to NWS Earle is located off State Route 34.

NWS Earle was commissioned as a Naval Ammunition Depot on December 13, 1943, with the primary responsibility of furnishing ammunition to the naval fleet. The station's Ordnance Department coordinates all port services and logistic support for home-ported and visiting ships, conducts safety inspections, supervises ammunition loading for the United States Coast Guard, and provides afloat firefighting capability and standby tug services.

The Mainside area lies in the outer Coastal Plain, approximately ten miles inland from the Atlantic Ocean. The Mainside area is relatively flat, with elevations ranging from approximately 100 to 300 feet above mean sea level (MSL). The most significant topographic relief within the Mainside area is Hominy Hills, a northeast-southwest-trending group of low hills located near the center of the station.

Building S-186 (Old Pesticide Shop) located on the Mainside area, north of the intersection of Esperance and Macassar Roads served as the pesticide shop for the Mainside area. Two soil samples, one surface soil (0-0.5 ft. BGS) and one hand augured subsurface soil (1-2 ft. BGS), were collected north of Building S-186 in August 1995. Pesticides were detected in both of these samples, with the surface soil sample having much higher concentrations (390-140,000 ug/kg) than the subsurface sample (0.13-47 ug/kg). The pesticides detected in both samples included, Heptachlor, Aldrin, Dieldrin, 4,4'-DDD, 4,4'-DDT, alpha-Chlordane, and gamma-Chlordane.

RESULTS OF SCREENING SAMPLING AND ANALYSIS AT THE OLD PESTICIDE SHOP

Screening sampling was conducted at the Old Pesticide Shop on January 29, 1998. The objectives of the screening sampling and analysis (S&A) program was to determine if operations at the building had resulted in releases which had contaminated the building or surrounding area with organochlorine or organophosphorous pesticides.

The sampling was conducted in accordance with a sampling plan developed by Brown & Root Environmental following the New Jersey Department of Environmental Protection (NJDEP) Field Sampling Procedures Manual dated May 1992 and Brown & Root Environmental sampling standard operating procedures (SOPs). The following samples were obtained.

- Four wipe samples of interior wall surfaces from the Old Pesticide Shop
- Four core samples of concrete from the pad located in front of the Old Pesticide Shop
- Nine composite samples of surface soils surrounding the Old Pesticide Shop
- One sediment sample from the septic tank servicing the Old Pesticide Shop

All samples were analyzed for the full suite of Appendix IX Organochlorine Pesticides by EPA method SW-846 8081A and Appendix IX Organophosphorous pesticides by EPA Method SW-846 8141A.

A report on the results of the screening sampling dated March 11, 1998 stated the following conclusions regarding the soil at the Old Pesticides Shop:

The vertical and horizontal extent of organochlorine pesticide contamination should be further delineated. Additional surface and subsurface soils samples should be collected and analyzed for RCRA Appendix IX organochlorine pesticides. Near subsurface (one foot and three foot) soil samples should be taken to determine if any organochlorine pesticides have migrated to the subsurface. Subsurface samples could be limited to one foot and three foot depths because organochlorine pesticides are generally not mobile in soil. Therefore, little, if any, migration of organochlorine pesticides, found in surface soils, to subsurface soils is expected.

RESULTS OF DELINEATION SOIL SAMPLING AT OLD PESTICIDE SHOP

Sampling of surface and subsurface soils was conducted at the Old Pesticide Shop on April 21 and 22, 1998. Twenty-three soil locations at the Old Pesticide Shop were sampled at three different depths (surface, and one- and three-feet below ground surface). Attachment 1 contains the report of field sampling activities. All samples were analyzed for chlorinated organic pesticides by SW 846 8081A. Table 1 contains a summary of all positive detections. Included in Table 1 is a comparison to Region III industrial and residential soil standards for pesticides. Information is also included in Table 1 on concentrations of chlordane and heptachlor, which if completely leached, could result in the soil being classified as hazardous waste for disposal purposes.

Chlordane and 4,4'-DDT were the most prevalent pesticides found. Chlordane was found in 20 out of 23 surface soil samples. In eight 8 samples the Region III risk based standard for chlordane in industrial soil was exceeded. One surface soil sample exceeded the Region III chlordane standard for residential soil but was below the industrial standard. Chlordane concentrations decreased with depth. At the 1-foot and 3-foot levels, only 1 sample exceeded Region III industrial soil standards.

4,4'-DDT was found in 13 of 23 surface soil samples. In two surface soil samples the Region III industrial soil standard for 4,4'-DDT was exceeded. Concentrations in the subsurface soils did not exceed the Region III industrial standard.

4,4'-DDD and 4,4'-DDE were detected in several surface soil samples but in all cases in concentrations were well below the Region III industrial soil standards. Both compounds were found to a lesser extent in subsurface soils.

Beta-BHC was found in one surface sample at a low concentration (4 ug/kg) and was not detected in the subsurface. Heptachlor epoxide was found in two surface and one subsurface soil sample at low concentrations relative to the concentrations of other detected organochlorine pesticides.

Figure 1 shows the location of each of the 23 sampling points and the positive results for each of the three soil depths sampled at each point for 4,4'-DDD, 4,4-DDE, 4,4'-DDT and chlordane, the four most prevalent pesticides. Attachment 2 contains the analytical data summary.

TABLE 1

SUMMARY OF POSITIVE PESTICIDE DETECTIONS
OLD PESTICIDE SHOP
NWS EARLE
EARLE, NEW JERSEY
PAGE 1 OF 2

SAMPLE ID	4,4'-DDD	4,4'-DDE	4,4'-DDT	CHLORDANE	BETA-BHC	HEPTACHLOR EPOXIDE
Soil Residential	**2700**	**1900**	**1900**	**1800[1]**		**140**
Soil Industrial	**24000**	**17000**	**17000**	**16000[1]**		**1300[2]**
RB-DATE						
SS-10				31000[1]		
SS-10-DUP				21000[1]		
SB-10-01				450		
SB-10-03				4		
SS-11	19	150	850	330		
SB -11-01						
SB-11-03						
SS-12				200000[1]		
SB-12-01				1200[1]		
SB-12-03				250		
SS-13	1500	360	12000	720[1]		
SB-13-01	50	9	510	23		
SB-13-03	3		8	4		
SS-14	49	320	360	180		
SB-14-01		2	2		4	
SB-14-01 DUP		3	3			
SB-14-03						
SS-15	290	1000	1700	2600[1]		
SB-15-01		32	41	130		
SB-15-03			2			
SS-16		90	99			
SB-16-01		26	28			
SB-16-03		2	2			
SS-17		160	200			
SB-17-01						
SB-17-03						
SS-18				160000[1]		
SB-18-01				1200[1]		
SB-18-03				42000[1]		
SB-18-03 DUP				25000[1]		
SS-19				6600[1]		
SB-19-01				320		
SB-19-03	3			56		3
SS-20		17	29	430		6
SB-20-01				20		
SB-20-03				4		
SS-21			17	680[1]		24
SB-21-01				17		
SB-21-03						
SB-21-03 DUP				14		
SS-22				170000[1]		
SB-22-01				16000[1]		
SB-22-03				300		
SS-23				1300[1]		

TABLE 1

SUMMARY OF POSITIVE PESTICIDE DETECTIONS
OLD PESTICIDE SHOP
NWS EARLE
EARLE, NEW JERSEY

SAMPLE ID	4,4'-DDD	4,4'-DDE	4,4'-DDT	CHLORDANE	BETA-BHC	HEPTACHLOR EPOXIDE
Soil Residential	**2700**	**1900**	**1900**	**1800[1]**		**140**
Soil Industrial	**24000**	**17000**	**17000**	**16000[1]**		**1300[2]**
SB-23-01			2	53		
SB-23-03				10		
SS-24				30000[1]		
SS-24 DUP				32000[1]		
SB-24-01				180		
SB-24-03				28		2
SS-25				24000[1]		
SB-25-01				180		
SB-25-01 DUP				120		
SB-25-03				180		
SS-26		710	19000			
SS-26RE			20000			
SB-26-01		340	6300			
SB-26-03		420	590			
SS-27				650		
SB-27-01				28		
SB-27-03				5		
SS-28			52000	140000[1]		
SB-28-01			380	1900		
SB-28-03			5	9		
SS-29		8	16	73		
SB-29-01		55	77	200		
SB-29-03		6	9	19		
SB-29-03 DUP		15	35	77		
SS-30			350	2700[1]		
SB-30-01		200	840	210		
SB-30-03		4	9	13		
SS-31			12	170		
SB-31-01				23000000[1]		
SB-31-03		38	100	2000[1]		
SS-32				580		
SB-32-01	58	59				
SB-32-03		3		20		

All results in micrograms/kilogram (ug/kg)

=- Exceeds Region III residential soil standard

=- Exceeds Region III industrial soil standard

1 - Exceeds 20 X TC level of 30 ug/l

2 - Exceeds 20 X TC level of 8 ug/l

n:\data\bbre862\earle\pestdlin-xls

ATTACHMENT 1

FIELD TRIP REPORT

FIELD TRIP REPORT

FOR

DELINEATION SAMPLING at the OLD PESTICIDE SHOP and SCREENING SAMPLING at the OLD PRECIOUS METALS RECOVERY FACILITY at NWS EARLE

Prepared by

Brown & Root Environmental

May 1998

1.0 OLD PESTICIDE SHOP

1.1 Introduction

The primary objective of the additional sampling at the Old Pesticide Shop was to further delineate the contamination found during the screening sampling and analysis. In order to accomplish this objective additional sampling and analysis for chlorinated pesticides was conducted. The additional sampling consisted of collecting surface and subsurface soils, surrounding the building, at 23 different locations and from three depths (surface, one foot below ground surface, and three feet below ground surface). All samples were analyzed for chlorinated pesticides. The results of the additional sampling and analysis will be used as the basis for determining the potential extent of pesticide contamination.

1.2 Surface soil sampling

On April 20 and 21, 1998, 25 surface soil samples (including two duplicates) were collected at the Old Pesticide Shop. The locations were based upon the previous sampling event results and were selected in the field. The locations were spaced evenly at 7.5-foot by 15 to 20-foot spaces throughout the southern side of the site and 10 foot by 15 foot spaces throughout the northern side of the site.

The soil samples were collected according to NJDEP Field Sampling Procedures Manual dated May 1992 and B&R Environmental SOP SA-1.3. Stainless steel trowels were used to obtain the samples and were decontaminated with Liquidnox, water, methanol, and deionized water between sample locations. The soil samples were placed directly into laboratory supplied 8-ounce jars and stored on ice. All surface soil samples were analyzed for chlorinated pesticides at RECRA Lab Net in University Park, Illinois.

The surface soils generally consisted of grayish-dark brown silty fine grained sand with some organics. No elevated Photo Ionization Detector (PID) readings were observed or noted in the surface soils.

1.3 Subsurface soil sampling

On April 20 and 21, 1998, 25 subsurface soil samples (including two duplicates) were collected from a depth of 1-foot below ground surface (bgs) and 26 subsurface soil samples (including three duplicates) were collected from a depth of 3-feet bgs at the Old Pesticide Shop. The location of each subsurface soil sample corresponded with the same location as the surface soil sample.

A stainless steel hand auger and trowel were used to obtain the samples and were decontaminated with Liquidnox, water, methanol, and deionized water between sample locations. The soil samples were placed directly into laboratory supplied 8-ounce jars and stored on ice. All subsurface soil samples were analyzed for chlorinated pesticides at RECRA Lab Net in University Park, Illinois.

The subsurface soils at 1-foot bgs generally consisted of a dark grayish brown to grayish tan silty fine grained sand or an olive green clayey fine grained sand with some silt. Elevated PID readings were observed and noted at locations 25, 26, 28, and 29. These PID readings ranged between 1.0 PPM to 6.0 PPM. There were sweet aromatic odors observed at these same locations.

The subsurface soils at 3-feet bgs generally consisted of tan, orange-tan, or grayish brown silty fine grained sand with some subround pebbles. Elevated PID readings were observed and noted at locations 25, 26, and 29. These PID readings ranged between 1.2 PPM and 10.8 PPM. There were sweet aromatic odors observed at these same locations.

The hand auger soil borings were backfilled with the soil cuttings that were removed from each location.

2.0 Old Precious Metals Recovery Facility

2.1 Introduction

The primary objective of the sampling at the Precious Metals Recovery Facility was to determine if operations had resulted in contamination of the building interior or exterior structures, of the soil immediately surrounding the building, or of the drainage ditch located east and south of the building complex. In order to accomplish this objective a screening sampling and analysis for Target Analyte List Metals was conducted. The screening sampling consisted of wipe

ATTACHMENT 2

PESTICIDE SHOP

DELINEATION SAMPLING ANALYTICAL DATA

CTO154 - NWS EARLE
SOIL DATA
RECRA LABNET - CHICAGO
SDG: U04346

SAMPLE NUMBER:	186-DUP-01			186-DUP-02			186-SB-10-01			186-SB-10-03		
SAMPLE DATE:	04/20/98			04/20/98			04/20/98			04/20/98		
LABORATORY ID:	9804G346-004			9804G346-014			9804G346-002			9804G346-003		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	87.8 %			89.4 %			85.2 %			91.1 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	1900	U		1.8	U		38	U		1.8	U	
4,4'-DDE	1900	U		2.9			38	U		1.8	U	
4,4'-DDT	1200	J		2.5			38	U		1.8	U	
ALDRIN	940	U		0.90	U		19	U		0.90	U	
ALPHA-BHC	940	U		0.90	U		19	U		0.90	U	
BETA-BHC	940	U		0.90	U		19	U		0.90	U	
CHLORDANE	31000			3.6	U		450			3.6		
DELTA-BHC	940	U		0.90	U		19	U		0.90	U	
DIELDRIN	1900	U		1.8	U		38	U		1.8	U	
ENDOSULFAN I	940	U		0.90	U		19	U		0.90	U	
ENDOSULFAN II	1900	U		1.8	U		38	U		1.8	U	
ENDOSULFAN SULFATE	1900	U		1.8	U		38	U		1.8	U	
ENDRIN	1900	U		1.8	U		38	U		1.8	U	
ENDRIN ALDEHYDE	1900	U		1.8	U		38	U		1.8	U	
ENDRIN KETONE	1900	U		1.8	U		38	U		1.8	U	
GAMMA-BHC (LINDANE)	940	U		0.90	U		19	U		0.90	U	
HEPTACHLOR	940	U		0.90	U		19	U		0.90	U	
HEPTACHLOR EPOXIDE	940	U		0.90	U		19	U		0.90	U	
METHOXYCHLOR	9400	U		9.0	U		190	U		9.0	U	
TOXAPHENE	19000	U		18	U		380	U		18	U	

SAMPLE NUMBER:	186-SB-11-01			186-SB-11-03			186-SB-12-01			186-SB-12-03		
SAMPLE DATE:	04/20/98			04/20/98			04/20/98			04/20/98		
LABORATORY ID:	9804G346-007			9804G346-005			9804G346-009			9804G346-010		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	90.1 %			92.9 %			89.0 %			94.8 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	1.8	U		1.8	U		93	U		17	U	
4,4'-DDE	1.8	U		1.8	U		93	U		17	U	
4,4'-DDT	1.8	U		1.8	U		93	U		17	U	
ALDRIN	0.92	U		0.88	U		46	U		8.7	U	
ALPHA-BHC	0.92	U		0.88	U		46	U		8.7	U	
BETA-BHC	0.92	U		0.88	U		46	U		8.7	U	
CHLORDANE	3.7	U		3.5	U		1200			250		
DELTA-BHC	0.92	U		0.88	U		46	U		8.7	U	
DIELDRIN	1.8	U		1.8	U		93	U		17	U	
ENDOSULFAN I	0.92	U		0.88	U		46	U		8.7	U	
ENDOSULFAN II	1.8	U		1.8	U		93	U		17	U	
ENDOSULFAN SULFATE	1.8	U		1.8	U		93	U		17	U	
ENDRIN	1.8	U		1.8	U		93	U		17	U	
ENDRIN ALDEHYDE	1.8	U		1.8	U		93	U		17	U	
ENDRIN KETONE	1.8	U		1.8	U		93	U		17	U	
GAMMA-BHC (LINDANE)	0.92	U		0.88	U		46	U		8.7	U	
HEPTACHLOR	0.92	U		0.88	U		46	U		8.7	U	
HEPTACHLOR EPOXIDE	0.92	U		0.88	U		46	U		8.7	U	
METHOXYCHLOR	9.2	U		8.8	U		460	U		87	U	
TOXAPHENE	18	U		18	U		930	U		170	U	

SAMPLE NUMBER:	186-SB-13-01			186-SB-13-01RE			186-SB-13-03			186-SB-14-01		
SAMPLE DATE:	04/20/98			04/20/98			04/20/98			04/20/98		
LABORATORY ID:	9804G346-012			9804G346-012			9804G346-013			9804G346-016		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	90.9 %			90.9 %			93.5 %			91.9 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
PESTICIDES/PCBs												
4,4'-DDD	50			18	U		3.2			1.8	U	
4,4'-DDE	9.0			18	U		1.8	U		1.8		
4,4'-DDT	510			500			7.8			1.8		
ALDRIN	4.5	U		9.0	U		0.88	U		0.90	U	
ALPHA-BHC	4.5	U		9.0	U		0.88	U		0.90	U	
BETA-BHC	4.5	U		9.0	U		0.88	U		3.6		
CHLORDANE	23			36	U		4.4			3.6	U	
DELTA-BHC	4.5	U		9.0	U		0.88	U		0.90	U	
DIELDRIN	9.0	U		18	U		1.8	U		1.8	U	
ENDOSULFAN I	4.5	U		9.0	U		0.88	U		0.90	U	
ENDOSULFAN II	9.0	U		18	U		1.8	U		1.8	U	
ENDOSULFAN SULFATE	9.0	U		18	U		1.8	U		1.8	U	
ENDRIN	9.0	U		18	U		1.8	U		1.8	U	
ENDRIN ALDEHYDE	9.0	U		18	U		1.8	U		1.8	U	
ENDRIN KETONE	9.0	U		18	U		1.8	U		1.8	U	
GAMMA-BHC (LINDANE)	4.5	U		9.0	U		0.88	U		0.90	U	
HEPTACHLOR	4.5	U		9.0	U		0.88	U		0.90	U	
HEPTACHLOR EPOXIDE	4.5	U		9.0	U		0.88	U		0.90	U	
METHOXYCHLOR	45	U		90	U		8.8	U		9.0	U	
TOXAPHENE	90	U		180	U		18	U		18	U	

SAMPLE NUMBER:	186-SB-14-03	186-SB-15-01	186-SB-15-03	186-SS-10
SAMPLE DATE:	04/20/98	04/20/98	04/20/98	04/20/98
LABORATORY ID:	9804G346-017	9804G346-019	9804G346-020	9804G346-001
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	92.9 %	89.7 %	94.6 %	90.2 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	1.8	U		18	U		1.8	U		1800	U	
4,4'-DDE	1.8	U		32			1.4	J		1800	U	
4,4'-DDT	1.8	U		41			2.1			1800	U	
ALDRIN	0.89	U		9.2	U		0.88	U		910	U	
ALPHA-BHC	0.89	U		9.2	U		0.88	U		910	U	
BETA-BHC	0.89	U		9.2	U		0.88	U		910	U	
CHLORDANE	3.6	U		130			3.5	U		31000		
DELTA-BHC	0.89	U		9.2	U		0.88	U		910	U	
DIELDRIN	1.8	U		18	U		1.8	U		1800	U	
ENDOSULFAN I	0.89	U		9.2	U		0.88	U		910	U	
ENDOSULFAN II	1.8	U		18	U		1.8	U		1800	U	
ENDOSULFAN SULFATE	1.8	U		18	U		1.8	U		1800	U	
ENDRIN	1.8	U		18	U		1.8	U		1800	U	
ENDRIN ALDEHYDE	1.8	U		18	U		1.8	U		1800	U	
ENDRIN KETONE	1.8	U		18	U		1.8	U		1800	U	
GAMMA-BHC (LINDANE)	0.89	U		9.2	U		0.88	U		910	U	
HEPTACHLOR	0.89	U		9.2	U		0.88	U		910	U	
HEPTACHLOR EPOXIDE	0.89	U		9.2	U		0.88	U		910	U	
METHOXYCHLOR	8.9	U		92	U		8.8	U		9100	U	
TOXAPHENE	18	U		180	U		18	U		18000	U	

CTO154 - NWS EARLE
SOIL DATA
RECRA LABNET - CHICAGO
SDG: U04346

SAMPLE NUMBER:	186-SS-11			186-SS-12			186-SS-13			186-SS-13RE		
SAMPLE DATE:	04/20/98			04/20/98			04/20/98			04/20/98		
LABORATORY ID:	9804G346-006			9804G346-008			9804G346-011			9804G346-011		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	91.4 %			89.3 %			92.3 %			92.3 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
PESTICIDES/PCBs												
4,4'-DDD	19			18000	U		1500			890	U	
4,4'-DDE	150			18000	U		360			890	U	
4,4'-DDT	850			18000	U		12000			13000		
ALDRIN	18	U		9100	U		89	U		450	U	
ALPHA-BHC	18	U		9100	U		89	U		450	U	
BETA-BHC	18	U		9100	U		89	U		450	U	
CHLORDANE	330			200000			720			1800	U	
DELTA-BHC	18	U		9100	U		89	U		450	U	
DIELDRIN	36	U		18000	U		180	U		890	U	
ENDOSULFAN I	18	U		9100	U		89	U		450	U	
ENDOSULFAN II	36	U		18000	U		180	U		890	U	
ENDOSULFAN SULFATE	36	U		18000	U		180	U		890	U	
ENDRIN	36	U		18000	U		180	U		890	U	
ENDRIN ALDEHYDE	36	U		18000	U		180	U		890	U	
ENDRIN KETONE	36	U		18000	U		180	U		890	U	
GAMMA-BHC (LINDANE)	18	U		9100	U		89	U		450	U	
HEPTACHLOR	18	U		9100	U		89	U		450	U	
HEPTACHLOR EPOXIDE	18	U		9100	U		89	U		450	U	
METHOXYCHLOR	180	U		91000	U		890	U		4500	U	
TOXAPHENE	360	U		180000	U		1800	U		8900	U	

CTO154 - NWS EARLE
SOIL DATA
RECRA LABNET - CHICAGO
SDG: U04346

SAMPLE NUMBER:	186-SS-14	186-SS-15		
SAMPLE DATE:	04/20/98	04/20/98	/ /	/ /
LABORATORY ID:	9804G346-015	9804G346-018		
QC_TYPE:	NORMAL	NORMAL		
% SOLIDS:	84.1 %	78.8 %	100.0 %	100.0 %
UNITS:	UG/KG	UG/KG		
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	49			290								
4,4'-DDE	320			1000								
4,4'-DDT	360			1700								
ALDRIN	9.8	U		100	U							
ALPHA-BHC	9.8	U		100	U							
BETA-BHC	9.8	U		100	U							
CHLORDANE	180			2600								
DELTA-BHC	9.8	U		100	U							
DIELDRIN	20	U		210	U							
ENDOSULFAN I	9.8	U		100	U							
ENDOSULFAN II	20	U		210	U							
ENDOSULFAN SULFATE	20	U		210	U							
ENDRIN	20	U		210	U							
ENDRIN ALDEHYDE	20	U		210	U							
ENDRIN KETONE	20	U		210	U							
GAMMA-BHC (LINDANE)	9.8	U		100	U							
HEPTACHLOR	9.8	U		100	U							
HEPTACHLOR EPOXIDE	9.8	U		100	U							
METHOXYCHLOR	98	U		1000	U							
TOXAPHENE	200	U		2100	U							

CTO154 - NWS EARLE
SOIL DATA
RECRA LABNET - CHICAGO
SDG: U04347

SAMPLE NUMBER:	186-SB-21-03	186-SS-16	186-SS-17	186-SS-18
SAMPLE DATE:	04/21/98	04/20/98	04/20/98	04/20/98
LABORATORY ID:	9804G347-020	9804G347-001	9804G347-004	9804G347-008
QC_TYPE:	NORMAL	NORMAL	NORMAL	NORMAL
% SOLIDS:	93.1 %	81.1 %	88.4 %	90.7 %
UNITS:	UG/KG	UG/KG	UG/KG	UG/KG
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	1.8	U		10	U		18	U		1800	U	
4,4'-DDE	1.8	U		90			160			1800	U	
4,4'-DDT	1.8	U		99			200			1800	U	
ALDRIN	0.88	U		5.1	U		9.3	U		920	U	
ALPHA-BHC	0.88	U		5.1	U		9.3	U		920	U	
BETA-BHC	0.88	U		5.1	U		9.3	U		920	U	
CHLORDANE	3.5	U		20	U		37	U		180000		
DELTA-BHC	0.88	U		5.1	U		9.3	U		920	U	
DIELDRIN	1.8	U		10	U		18	U		1800	U	
ENDOSULFAN I	0.88	U		5.1	U		9.3	U		920	U	
ENDOSULFAN II	1.8	U		10	U		18	U		1800	U	
ENDOSULFAN SULFATE	1.8	U		10	U		18	U		1800	U	
ENDRIN	1.8	U		10	U		18	U		1800	U	
ENDRIN ALDEHYDE	1.8	U		10	U		18	U		1800	U	
ENDRIN KETONE	1.8	U		10	U		18	U		1800	U	
GAMMA-BHC (LINDANE)	0.88	U		5.1	U		9.3	U		920	U	
HEPTACHLOR	0.88	U		5.1	U		9.3	U		920	U	
HEPTACHLOR EPOXIDE	0.88	U		5.1	U		9.3	U		920	U	
METHOXYCHLOR	8.8	U		51	U		93	U		9200	U	
TOXAPHENE	18	U		100	U		180	U		18000	U	

CTO154 - NWS EARLE
SOIL DATA
RECRA LABNET - CHICAGO
SDG: U04347

SAMPLE NUMBER:	186-SS-19			186-SS-20			186-SS-21					
SAMPLE DATE:	04/20/98			04/21/98			04/21/98			/ /		
LABORATORY ID:	9804G347-011			9804G347-015			9804G347-018					
QC_TYPE:	NORMAL			NORMAL			NORMAL					
% SOLIDS:	91.5 %			92.1 %			93.7 %			100.0 %		
UNITS:	UG/KG			UG/KG			UG/KG					
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
PESTICIDES/PCBs												
4,4'-DDD	900	U		18	U		17	U				
4,4'-DDE	900	U		17			17	U				
4,4'-DDT	900	U		29			17					
ALDRIN	450	U		9.0	U		8.7	U				
ALPHA-BHC	450	U		9.0	U		8.7	U				
BETA-BHC	450	U		9.0	U		8.7	U				
CHLORDANE	6600			430			680					
DELTA-BHC	450	U		9.0	U		8.7	U				
DIELDRIN	900	U		18	U		17	U				
ENDOSULFAN I	450	U		9.0	U		8.7	U				
ENDOSULFAN II	900	U		18	U		17	U				
ENDOSULFAN SULFATE	900	U		18	U		17	U				
ENDRIN	900	U		18	U		17	U				
ENDRIN ALDEHYDE	900	U		18	U		17	U				
ENDRIN KETONE	900	U		18	U		17	U				
GAMMA-BHC (LINDANE)	450	U		9.0	U		8.7	U				
HEPTACHLOR	450	U		9.0	U		8.7	U				
HEPTACHLOR EPOXIDE	450	U		6.1			24					
METHOXYCHLOR	4500	U		90	U		87	U				
TOXAPHENE	9000	U		180	U		170	U				

CTO154 - NWS EARLE
SOIL DATA
RECRA LABNET - CHICAGO
SDG: U04376

SAMPLE NUMBER:	186-DUP-04			186-DUP-05			186-DUP-06			186-SB-22-01		
SAMPLE DATE:	04/21/98			04/21/98			04/21/98			04/21/98		
LABORATORY ID:	9804G376-001			9804G376-007			9804G376-017			9804G376-003		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	92.6 %			90.8 %			92.9 %			93.4 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	1.8	U		1800	U		18	U		880	U	
4,4'-DDE	1.8	U		1800	U		18	U		880	U	
4,4'-DDT	1.8	U		1800	U		18	U		880	U	
ALDRIN	0.88	U		910	U		8.8	U		440	U	
ALPHA-BHC	0.88	U		910	U		8.8	U		440	U	
BETA-BHC	0.88	U		910	U		8.8	U		440	U	
CHLORDANE	14			32000			120			18000		
DELTA-BHC	0.88	U		910	U		8.8	U		440	U	
DIELDRIN	1.8	U		1800	U		18	U		880	U	
ENDOSULFAN I	0.88	U		910	U		8.8	U		440	U	
ENDOSULFAN II	1.8	U		1800	U		18	U		880	U	
ENDOSULFAN SULFATE	1.8	U		1800	U		18	U		880	U	
ENDRIN	1.8	U		1800	U		18	U		880	U	
ENDRIN ALDEHYDE	1.8	U		1800	U		18	U		880	U	
ENDRIN KETONE	1.8	U		1800	U		18	U		880	U	
GAMMA-BHC (LINDANE)	0.88	U		910	U		8.8	U		440	U	
HEPTACHLOR	0.88	U		910	U		8.8	U		440	U	
HEPTACHLOR EPOXIDE	0.88	U		910	U		8.8	U		440	U	
METHOXYCHLOR	8.8	U		9100	U		88	U		4400	U	
TOXAPHENE	18	U		18000	U		180	U		8800	U	

SAMPLE NUMBER:	186-SB-24-03			186-SB-25-01			186-SB-25-03			186-SB-26-01		
SAMPLE DATE:	04/21/98			04/21/98			04/21/98			04/21/98		
LABORATORY ID:	9804G376-015			9804G376-016			9804G376-018			9804G376-019		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	87.3 %			92.2 %			88.7 %			92.1 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
PESTICIDES/PCBs												
4,4'-DDD	1.9	U		18	U		19	U		180	U	
4,4'-DDE	1.9	U		18	U		19	U		340		
4,4'-DDT	1.9	U		18	U		19	U		6300		
ALDRIN	0.95	U		8.9	U		9.3	U		89	U	
ALPHA-BHC	0.95	U		8.9	U		9.3	U		89	U	
BETA-BHC	0.95	U		8.9	U		9.3	U		89	U	
CHLORDANE	28			180			180			360	U	
DELTA-BHC	0.95	U		8.9	U		9.3	U		89	U	
DIELDRIN	1.9	U		18	U		19	U		180	U	
ENDOSULFAN I	0.95	U		8.9	U		9.3	U		89	U	
ENDOSULFAN II	1.9	U		18	U		19	U		180	U	
ENDOSULFAN SULFATE	1.9	U		18	U		19	U		180	U	
ENDRIN	1.9	U		18	U		19	U		180	U	
ENDRIN ALDEHYDE	1.9	U		18	U		19	U		180	U	
ENDRIN KETONE	1.9	U		18	U		19	U		180	U	
GAMMA-BHC (LINDANE)	0.95	U		8.9	U		9.3	U		89	U	
HEPTACHLOR	0.95	U		8.9	U		9.3	U		89	U	
HEPTACHLOR EPOXIDE	1.5			8.9	U		9.3	U		89	U	
METHOXYCHLOR	9.5	U		89	U		93	U		890	U	
TOXAPHENE	19	U		180	U		190	U		1800	U	

SAMPLE NUMBER:	186-SB-26-01RE			186-SB-26-03			186-SB-26-03RE			186-SS-22		
SAMPLE DATE:	04/21/98			04/21/98			04/21/98			04/21/98		
LABORATORY ID:	9804G376-019			9804G376-020			9804G376-020			9804G376-002		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	92.1 %			88.8 %			88.8 %			92.2 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	360	U		18	U		37	U		18000	U	
4,4'-DDE	360	U		420			37	U		18000	U	
4,4'-DDT	6500			590			570			18000	U	
ALDRIN	180	U		9.2	U		18	U		8900	U	
ALPHA-BHC	180	U		9.2	U		18	U		8900	U	
BETA-BHC	180	U		9.2	U		18	U		8900	U	
CHLORDANE	710	U		37	U		73	U		170000		
DELTA-BHC	180	U		9.2	U		18	U		8900	U	
DIELDRIN	360	U		18	U		37	U		18000	U	
ENDOSULFAN I	180	U		9.2	U		18	U		8900	U	
ENDOSULFAN II	360	U		18	U		37	U		18000	U	
ENDOSULFAN SULFATE	360	U		18	U		37	U		18000	U	
ENDRIN	360	U		18	U		37	U		18000	U	
ENDRIN ALDEHYDE	360	U		18	U		37	U		18000	U	
ENDRIN KETONE	360	U		18	U		37	U		18000	U	
GAMMA-BHC (LINDANE)	180	U		9.2	U		18	U		8900	U	
HEPTACHLOR	180	U		9.2	U		18	U		8900	U	
HEPTACHLOR EPOXIDE	180	U		9.2	U		18	U		8900	U	
METHOXYCHLOR	1800	U		92	U		180	U		89000	U	
TOXAPHENE	3600	U		180	U		370	U		180000	U	

SAMPLE NUMBER:	186-SS-23			186-SS-24			186-SS-25			186-SS-26		
SAMPLE DATE:	04/21/98			04/21/98			04/21/98			04/21/98		
LABORATORY ID:	9804G376-005			9804G376-006			9804G376-008			9804G376-009		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	83.2 %			90.5 %			87.4 %			91.0 %		
UNITS:	UG/KG			UG/KG			UG/KG			UG/KG		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
PESTICIDES/PCBs												
4,4'-DDD	98	U		1800	U		9500	U		180	U	
4,4'-DDE	98	U		1800	U		9500	U		710		
4,4'-DDT	98	U		1800	U		9500	U		19000		
ALDRIN	49	U		910	U		4700	U		90	U	
ALPHA-BHC	49	U		910	U		4700	U		90	U	
BETA-BHC	49	U		910	U		4700	U		90	U	
CHLORDANE	1300			30000			34000			360	U	
DELTA-BHC	49	U		910	U		4700	U		90	U	
DIELDRIN	98	U		1800	U		9500	U		180	U	
ENDOSULFAN I	49	U		910	U		4700	U		90	U	
ENDOSULFAN II	98	U		1800	U		9500	U		180	U	
ENDOSULFAN SULFATE	98	U		1800	U		9500	U		180	U	
ENDRIN	98	U		1800	U		9500	U		180	U	
ENDRIN ALDEHYDE	98	U		1800	U		9500	U		180	U	
ENDRIN KETONE	98	U		1800	U		9500	U		180	U	
GAMMA-BHC (LINDANE)	49	U		910	U		4700	U		90	U	
HEPTACHLOR	49	U		910	U		4700	U		90	U	
HEPTACHLOR EPOXIDE	49	U		910	U		4700	U		90	U	
METHOXYCHLOR	490	U		9100	U		47000	U		900	U	
TOXAPHENE	980	U		18000	U		95000	U		1800	U	

SAMPLE NUMBER:	186-SB-28-03			186-SB-29-01			186-SB-29-03			186-SB-30-01		
SAMPLE DATE:	04/21/98			04/21/98			04/21/98			04/21/98		
LABORATORY ID:	9804G377-004			9804G377-006			9804G377-007			9804G377-010		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	94.5 %			89.7 %			92.3 %			89.7 %		
UNITS:	%			%			%			%		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
PESTICIDES/PCBs												
4,4'-DDD	1.8	U		3.6	U		1.8	U		91	U	
4,4'-DDE	1.8	U		55			5.7			200		
4,4'-DDT	4.9			77			8.6			840		
ALDRIN	0.88	U		1.8	U		0.90	U		45	U	
ALPHA-BHC	0.88	U		1.8	U		0.90	U		45	U	
BETA-BHC	0.88	U		1.8	U		0.90	U		45	U	
CHLORDANE	8.9			200			19			210		
DELTA-BHC	0.88	U		1.8	U		0.90	U		45	U	
DIELDRIN	1.8	U		3.6	U		1.8	U		91	U	
ENDOSULFAN I	0.88	U		1.8	U		0.90	U		45	U	
ENDOSULFAN II	1.8	U		3.6	U		1.8	U		91	U	
ENDOSULFAN SULFATE	1.8	U		3.6	U		1.8	U		91	U	
ENDRIN	1.8	U		3.6	U		1.8	U		91	U	
ENDRIN ALDEHYDE	1.8	U		3.6	U		1.8	U		91	U	
ENDRIN KETONE	1.8	U		3.6	U		1.8	U		91	U	
GAMMA-BHC (LINDANE)	0.88	U		1.8	U		0.90	U		45	U	
HEPTACHLOR	0.88	U		1.8	U		0.90	U		45	U	
HEPTACHLOR EPOXIDE	0.88	U		1.8	U		0.90	U		45	U	
METHOXYCHLOR	8.8	U		18	U		9.0	U		450	U	
TOXAPHENE	18	U		36	U		18	U		910	U	

CTO154 - NWS EARLE
SOIL DATA
RECRA LABNET - CHICAGO
SDG: U04377

SAMPLE NUMBER:	186-SB-32-03			186-SS-29			186-SS-30			186-SS-31		
SAMPLE DATE:	04/21/98			04/21/98			04/21/98			04/21/98		
LABORATORY ID:	9804G377-017			9804G377-005			9804G377-009			9804G377-012		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	96.5 %			91.3 %			93.1 %			93.9 %		
UNITS:	%			%			%			%		
FIELD DUPLICATE OF:												
	RESULT	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**	**RESULT**	**QUAL**	**CODE**
PESTICIDES/PCBs												
4,4'-DDD	1.7	U		1.8	U		180	U		8.8	U	
4,4'-DDE	3.4			7.8			150	J		8.8	U	
4,4'-DDT	1.7	U		16			350			12		
ALDRIN	0.85	U		0.88	U		88	U		4.4	U	
ALPHA-BHC	0.85	U		0.88	U		88	U		4.4	U	
BETA-BHC	0.85	U		0.88	U		88	U		4.4	U	
CHLORDANE	20			73			2700			170		
DELTA-BHC	0.85	U		0.88	U		88	U		4.4	U	
DIELDRIN	1.7	U		1.8	U		180	U		8.8	U	
ENDOSULFAN I	0.85	U		0.88	U		88	U		4.4	U	
ENDOSULFAN II	1.7	U		1.8	U		180	U		8.8	U	
ENDOSULFAN SULFATE	1.7	U		1.8	U		180	U		8.8	U	
ENDRIN	1.7	U		1.8	U		180	U		8.8	U	
ENDRIN ALDEHYDE	1.7	U		1.8	U		180	U		8.8	U	
ENDRIN KETONE	1.7	U		1.8	U		180	U		8.8	U	
GAMMA-BHC (LINDANE)	0.85	U		0.88	U		88	U		4.4	U	
HEPTACHLOR	0.85	U		0.88	U		88	U		4.4	U	
HEPTACHLOR EPOXIDE	0.85	U		0.88	U		88	U		4.4	U	
METHOXYCHLOR	8.5	U		8.8	U		880	U		44	U	
TOXAPHENE	17	U		18	U		1800	U		88	U	

SAMPLE NUMBER:	186-SS-32			
SAMPLE DATE:	04/21/98	/ /	/ /	/ /
LABORATORY ID:	9804G377-015			
QC_TYPE:	NORMAL			
% SOLIDS:	94.4 %	100.0 %	100.0 %	100.0 %
UNITS:	%			
FIELD DUPLICATE OF:				

	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
PESTICIDES/PCBs												
4,4'-DDD	17	U										
4,4'-DDE	17	U										
4,4'-DDT	17	U										
ALDRIN	8.7	U										
ALPHA-BHC	8.7	U										
BETA-BHC	8.7	U										
CHLORDANE	580											
DELTA-BHC	8.7	U										
DIELDRIN	17	U										
ENDOSULFAN I	8.7	U										
ENDOSULFAN II	17	U										
ENDOSULFAN SULFATE	17	U										
ENDRIN	17	U										
ENDRIN ALDEHYDE	17	U										
ENDRIN KETONE	17	U										
GAMMA-BHC (LINDANE)	8.7	U										
HEPTACHLOR	8.7	U										
HEPTACHLOR EPOXIDE	8.7	U										
METHOXYCHLOR	87	U										
TOXAPHENE	170	U										

REPORT
FOR
PESTICIDE INVESTIGATION
AT
NAVAL WEAPONS STATION - EARLE
COLTS NECK, NEW JERSEY

Issued:

March 3, 1999

Prepared for:

Naval Facilities Engineering Command
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REMEDIAL ACTION CONTRACT N62472-94-D-0398
DELIVERY ORDER NO. 0034

REPORT
FOR
PESTICIDE INVESTIGATION
AT
NAVAL WEAPONS STATION - EARLE
COLTS NECK, NEW JERSEY

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APPENDICES

1.0 INTRODUCTION/ PROJECT OBJECTIVES

Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) was contracted by the Northern Division, Naval Facilities Engineering Command (NORDIV) to further delineate pesticide contamination at the former pesticide shop at the Naval Weapons Station (NWS) Earle located in Colts Neck, NJ. This Investigative Report is being submitted to satisfy the pre-construction submittal requirements included in paragraph 1.2.1, Pre- and Post-Construction Documentation of the Statement of Services for Delivery Order No. 0017, under Remedial Action Contract No. N62472-94-D-0398.

The project objectives included utilizing direct-push methods to collect soil samples and groundwater samples for the laboratory analyses of pesticides. The purpose of the sample collection was twofold. Soil samples were collected to further delineate the vertical extent of pesticide contamination in the soils at the previously identified "hotspots". Groundwater samples were collected at the site to determine if the groundwater was impacted by pesticides. This work was performed under Delivery Order No. 0034 to Navy Contract N62472-94-D-0398

2.0 PROJECT LOCATION AND DESCRIPTION

NWS-Earle is located in east-central Monmouth County in the town of Colts Neck, New Jersey. Building S-186 (Old Pesticide Shop) is located on the Mainside portion of the base, north of the intersection of Esperance and Macassar Roads. The building served as the former base pesticide shop, but is no longer in service. Apparently, containers and spraying containers were periodically rinsed out and some of the waste waters were dumped outside the building. Figure 1 depicts the site layout.

2.1 Previous Investigations

Surface and subsurface soil samples were collected during investigation efforts in January and April 1998. The soil samples were analyzed for chlorinated organic pesticides by SW-846 Method 8081A. Chlordane and 4,4'-DDT were the most frequently detected pesticides found in the soil samples. Chlordane was found in 20 out of 23 surface soil samples; 4,4' DDT was found in 13 of 23 surface soil samples. The laboratory analyses of soil samples collected in the area around the pesticide shop revealed chlordane (up to 200 ppm); 4,4' DDD (up to 1.5 ppm); 4,4' DDE (up to 1 ppm); and 4,4' DDT (up to 12 ppm).

The previous soil sample locations are shown on Figure 1 of this report, and the Delineation Sampling and Analysis Report from the Old Pesticide Shop is contained in the Work Plan for Pesticide Investigation at Naval Weapons Station - Earle Colts Neck, New Jersey issued November 30, 1998.

2.2 Site Conditions

The Former Pesticide Shop is located in a grassy wooded area between Building C-54 and Building C-23. The shop consists of a small brick building (25 ft. x 12 ft.) with a 15 ft. x 8 ft. concrete pad on the northwest side of the building. The Former Pesticide Shop sits atop a small knoll, which slopes to the northwest and north. An in-ground former septic leach tank is located to the north of the building. The site is bounded to the east by a paved parking area, to the northwest by Building C-54, to the south by the ROICC Office, and to the north by a fenced storage yard associated with Building C-54

2.2.1 Groundwater/Soil

There are no monitoring wells in the immediate area to determine depth to groundwater and groundwater flow direction. Based on topography, and monitoring wells located approximately 0.25 miles down gradient of the pesticide shop, the shallow groundwater was expected to be encountered at a depth of 10 to 15 feet below grade and flow toward the north. During investigation activities it was determined that groundwater ranged from 18 to 35 based on elevations at the sample locations.

Soils at the site are fine grained sands with some silt and minor pebbles.

3.0 SCOPE OF WORK

The objectives of this investigation were completed by utilizing a Geoprobe rig and the necessary equipment to collect soil samples and groundwater samples. A hydropunch attachment on the geoprobe was used to obtain groundwater samples for the laboratory analysis of pesticides.

3.1 TASK 1 - Project Planning/Management

Project Planning/Management activities included the preparation of pre-construction submittals, coordination of utility requirements, mobilization to the site, and Home Office support functions during the period of performance. The subtasks involved in Project Planning/Management are described below.

3.1.1 Subtask 1A - Pre-Construction Submittals

Foster Wheeler Environmental prepared and submitted the following pre-construction documents to the Navy:

Work Plan
The Work Plan for Pesticide Investigation at Naval Weapons Station - Earle Colts Neck, New Jersey (Work Plan) presented Foster Wheeler Environmental's approach to executing the project, including the site description, statement of work, procurement

approach, field procedures, materials, transportation and disposal data, and sampling and analytical requirements. The Work Plan was issued November 30, 1998.

Health and Safety Plan (HASP)
An existing HASP for previous drilling work at NWS-Earle was used for this effort. Foster Wheeler Environmental prepared an Activity Hazard Analysis (AHA) for this specific task included in the Work Plan.

The Activity Hazard Analysis (AHA) in Appendix B of the Work Plan was used for the specific hazards associated with this sampling task at the pesticide shop.

Sampling and Analysis Plan (SAP)
Foster Wheeler Environmental submitted the SAP for this investigation in the Work Plan for Pesticide Investigation at Naval Weapons Station - Earle Colts Neck, New Jersey.

The SAP presented the procedures for sampling and analysis for the Geoprobe and temporary well installation activities. The SAP specifically addressed the following areas:

- Analytical Requirements/Sample Collection Frequency
- Responsibilities of Site Personnel
- Sample Analytical Program
- Sample Packing and Shipping
- Documentation
- Field Sampling Program
- Quality Assurance/Quality Control
- Procedures for Field Changes and Corrective Actions
- Waste Removal/Regulatory Compliance

Site-specific Standard Operating Procedures were included (Section 5 of the Work Plan) to describe the sampling procedures. Any modifications to these SOPs due to field conditions or other unforeseen situations were recorded in the site logbook, documented on the appropriate Field Change Request (FCR) forms by site personnel, and approved by the Project Manager.

3.1.2 Subtask 1B - Mobilization

Mobilization consisted of contacting appropriate Navy personnel at NWS Earle to arrange for contractor passes, and to coordinate support requirements for the geoprobe work. A utility survey was conducted to determine all utility lines in the area. Any subsurface utilities were located by NWS-Earle Public Works personnel. A dig permit was obtained prior to any geoprobe work.

3.1.3 Subtask 1C - Home Office Support

Foster Wheeler Environmental's Langhorne, Pennsylvania office provided home office support for the project duration. Home office support includes the preparation of the required monthly progress, financial and technical reports.

3.2 TASK 2 - Permit Preparation/Submission

In accordance with the NJDEP, drilling permits were required because some Geoprobe borings were greater than 25 feet in depth. Well permits were not required because the hydropunch casing remained in the ground for less than 48 hours.

3.3 TASK 3 - Collection of Subsurface Soil Samples

The previous investigation at the site collected soil samples to a maximum depth of three feet below grade. Analytical results for two of the soil samples collected at the maximum depth revealed pesticide concentrations exceeding the EPA Region III Soil Clean-Up Standards for pesticides. The analyses of a soil sample from boring SB-18 revealed an exceedance of the EPA Industrial Standard for chlordane (SB-18-03 at 42,000 ug/kg). SB-18 was collected on the western side of the concrete pad adjacent the former pesticide shop. The analyses of a soil sample from boring SB-31 revealed an exceedance of the EPA Residential Standard for chlordane (SB-31-03 at 2,000 ug/kg). SB-31 was collected on the northern edge of the paved area, located east of the former pesticide shop.

Based on these two hot spots found during the previous investigation, additional subsurface soil samples were collected on December 4, 1998 at the former SB-18 and SB-31 locations. Samples were collected to a depth of 24 feet below grade and analyzed for pesticides to determine the maximum depth of contamination. Soil boring PS-SB-01 was adjacent to the original location of SB-18 and PS-SB02 was adjacent to the original location of SB-31 (Figure 1). The Geoprobe was used to advance a macro-core sampler to a starting depth of 4 feet below grade at the PS-SB-01 and 6 feet below grade at PS-SB-02. At each location, continuous subsurface samples were collected from 2' intervals down to 24 feet below grade. The soils were logged by a geologist to record the subsurface soil conditions. See Appendix A for the boring logs.

Groundwater was not found at either location within 24 feet below grade during the initial geoprobe work. Hydropunch samples were obtained at PS-SB01 and PS-SB-02 during the re-mobilization of the geoprobe on January 7, 1999 because a NJDEP permit was necessary to probe greater than 25 feet below grade.

3.4 TASK 4 - Collection of Groundwater Samples Using a Hydropunch

A hydropunch was used install temporary groundwater monitoring wells to collect groundwater samples for the laboratory analyses of pesticides. Nine soil borings surrounding the former Pesticide Shop were completed on December 4, 1998 and January

7, 1999. A groundwater sample was collected from each of the nine temporary well locations (Figure 1). Section 5.0 of the Work Plan details the collection methodology for using the hydropunch for groundwater sampling. No soil samples were obtained from these nine soil borings.

The collection depth of the groundwater samples was determined by water table depth and input from the Site Geologist. The depths of the water table ranged from 18 feet to approximately 35 feet depending on the elevation at the sample locations.

4.0 FIELD SAMPLING ACTIVITIES

Modifications to the existing SAP will be documented herein.

4.1 Sample Tracking System

A QA/QC duplicate sample was collected at PS-GW03 and designated PS-GW02.

4.2 Sample Analytical Requirements/Sample Collection Frequency

Analyses for Chlorinated Organic Pesticides was performed on both soil and aqueous samples collected around the Former Pesticide Shop.. One liter aqueous was collected for each aqueous sample.

Four surface soil samples were collected adjacent to Building C-23 and analyzed for Nitroamines.

Sample collection frequency was modified as described in Section 3.3 - Collection of Subsurface Soil Samples and Section 3.4 - Collection of Groundwater Samples using a Hydropunch.

4.3 Sampling Equipment and Procedures

4.3.1 Surface Soil Sample Collection

Surface soil samples were collected at 0 to 6 inches below grade using a decontaminated stainless steel hand trowel. The soil was placed directly into sample jars for laboratory analysis. Locations for sample collection were selected by Navy personnel and are located on Figure 1.

4.3.2 Subsurface Soil Sample Collection

Subsurface soil samples were collected using a dedicated sampling core on the Geoprobe as indicated in the Work Plan. Sample collection frequency was modified as described in Section 3.3 - Collection of Subsurface Soil Samples.

4.3.3 Groundwater Sample Collection

Groundwater samples were collected utilizing a Hydropunch following the procedures detailed in the Work Plan. Sample collection frequency was modified as described in Section 3.4 - Collection of Groundwater Samples.

4.3.4 Septic Tank Sludge Sample Collection

An underground septic tank exists to the north of the former Pesticide Shop. A stainless steel auger was used to access the sludge at the bottom of the tank. The sample was collected from a six inch interval of sludge near the bottom of the tank. The six inch interval was field composited and placed into the sample jars for laboratory analysis.

4.4 Waste Removal/Regulatory Compliance

As part of the Geoprobe work at the former pesticide shop, several investigation derived waste streams were generated. These included decontamination fluids, PPE, and other miscellaneous debris. These wastes were collected, stored separately, and will be disposed off site at a proper disposal facility. In accordance with NJDEP solid waste and/or Hazardous Waste Regulations, the investigative derived wastes (IDW) were disposed of as hazardous. In accordance to the Code of Federal Regulations, any wastes generated from this pesticide shop investigation was classified, transported, and disposed of as a hazardous waste, **U036** (chlordane), **U060 (DDD)**, and **U061** (DDT). One drum of solid waste and one drum of decontamination water were disposed off-site.

5.0 ANALYTICAL RESULTS

All samples from the December 1998 and January 1999 investigations were sent to Toxicon Corporation's Beford, Massachusetts, laboratory. Both the soil and groundwater samples were analyzed for Chlorinated Organic Pesticides, SW846 Method 608/8081A. Some samples were analyzed for Nitroamines, SW846 Method 8332. The laboratory data packages are found in Appendix B. Refer to Figure I for sample locations. Refer to the Pesticide Analytical Results, Table 5-1 - Soil Boring PS-SB01, Table 5-2 - Soil Boring PS-SB02, and Table 5-3 - Groundwater, following this discussion.

5.1 Surface Soil Samples

Four surface soil samples and one QA/QC duplicate sample were collected on December 11, 1998 to evaluate the presence of propellant residuals in the area near the RIOCC building (Building C-23). The sample points were located along the north and west side of the building. Refer to Figure 1 for approximate sample locations. Sample PS-SS01, PS-SS02, PS-SS03, PS-SS03D (duplicate of PS-SS03), and PS-SS04 were analyzed for Nitroamines-Nitroglycerin, Nitroguanidine, and Nitrocellulose. Analytical results indicate that all samples were non-detect (below the quantitation limit) for the parameters of concern. The analytical results are located in Appendix B.

5.2 Subsurface Soil Samples

Twenty one soil samples were collected from soil borings PS-SB01 and PS-SB02 on December 4, 1998. The analytical results were compared to the NJDEP Residential Direct Contact and Impact to Groundwater Soil Cleanup Criterion. Several samples (up to 22 feet below grade) indicated the presence of Chlordane, ranging from 0.026 to 40 mg/Kg. As there are no NJDEP Standards for Chlordane, the results were compared to EPA Region III Soil Cleanup Standards as in the previous investigation. Several samples exceeded both the Residential Standard (1.8 mg/kg) and the Industrial Standard (16 mg/kg).

One sample PS-SB01-06, collected at a depth of 4 to 6 feet below grade from soil boring PS-SB01 indicated a slight exceedance of the NJDEP Residential Direct Contact Soil Cleanup Criteria for Heptachlor. The NJDEP limit for Heptachlor is 0.15 mg/Kg and the sample result was 0.16 mg/Kg. The same sample indicated the presence of Heptachlor Epoxide at the same 4 to 6 foot interval. As there is no regulatory guidance on Heptachlor Epoxide, this result will not be compared to a regulatory limit. However, this depth interval at PS-SB01 will be addressed because of the slight Heptachlor exceedance. No other soil samples indicated concentrations above non-detect, or exceeded either the NJDEP Residential Direct Contact or the Impact to Groundwater Soil Cleanup Criterion.

Note that some laboratory detection limits for certain samples are above the NJDEP Cleanup Criteria for specific compounds. A careful review was made of past data and it was determined that the compounds in question were not detected at the site in the previous investigation. Based on this information, the current results are considered non-detect for those specific compounds.

5.3 Groundwater Samples

Three groundwater samples and one QA/QC duplicate sample (PS-GW03, PS-GW04, PS-GW05, and duplicate PS-GW02) were collected on December 4, 1998. Six groundwater samples (PS-GW1, PS-GW2, PS-GW6, PS-GW7, PS-GW8, and PS-GW09) were collected on January 7, 1999. Comparison of the analytical results to the Groundwater Quality Criteria indicate that two locations, PS-GW03 and PS-GW04, exceed the criteria of 0.4 ug/l for Endosulfan I. The concentration of Endosulfan I in PS-GW03 was 0.41 ug/l. Groundwater sample, PS-GW02, the duplicate of PS-GW03, was just below the criteria at 0.38 ug/l. The concentration of Endosulfan I in PS-GW04 was 0.61 ug/l. All other sample results are below the laboratory detection limits and do not indicate the presence of pesticides. The analytical results are summarized in Table 5-3, and the laboratory data package is located in Appendix B.

Note that the laboratory detection limits for some samples actually exceed the Groundwater Quality Criteria. However, comparison to the Practical Quantitation Limits (PQLs) set forth in Table 1 indicates that the laboratory detection limits are less than the

TABLE 5-1
NAVAL WEAPONS STATION-EARLE
DELIVERY ORDER 0034
PESTICIDE ANALYTICAL RESULTS
Soil Boring PS-SB01

Sample ID	Residential	Impact to	PS-SB01-04	PS-SB01-06	PS-SB01-08	PS-SB01-10	PS-SB01-12	PS-SB01-14
Date Collected	Direct Contact	Ground Water	12/4/98	12/4/98	12/4/98	12/4/98	12/4/98	12/4/98
Matrix	Soil Cleanup	Soil Cleanup	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Depth (feet)	Criteria	Criteria	2 to 4	4 to 6	6 to 8	8 to 10	10 to 12	12 to 14
Comment	(NJDEP)	(NJDEP)						
units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
a-BHC	na	na	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
g-BHC (Lindane)	0.52	50	<0.10	<0.10	<0.050	**<1.0**	<0.010	<0.050
b-BHC	na	na	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
Heptachlor	0.15	50	<0.10	0.16	<0.050	**<1.0**	<0.010	<0.050
d-BHC	na	na	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
Aldrin	0.04	50	**<0.10**	**<0.10**	<0.050	**<1.0**	<0.010	**<0.050**
Heptachlor Epoxide	na	na	<0.10	0.12	<0.050	<1.0	<0.010	<0.050
Endosulfan I	340	50	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
4,4'-DDE	2	50	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
Dieldrin	0.042	50	**<0.10**	**<0.10**	<0.050	**<1.0**	<0.010	**<0.050**
Endrin	17	50	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
4,4'-DDT	2	500	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
Endrin Aldehyde	na	na	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
Endosulfan Sulfate	na	na	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050
Chlordane	na	na	<0.10	3.8	1.1	40	<0.010	1.4
Toxaphene	0.10	50	<0.10	<0.10	<0.050	**<1.0**	<0.010	<0.050
Methoxychlor	280	50	<0.10	<0.10	<0.050	<1.0	<0.010	<0.050

< Less than detection limit given
na not applicable
Shaded results indicate an exceedance of the Soil Cleanup Criteria.
Bold results indicate that the laboratory detection limit is greater than the Soil Cleanup Critieria.

Pest Shop Data
PS-SB01

TABLE 5-1
NAVAL WEAPONS STATION-EARLE
DELIVERY ORDER 0034
PESTICIDE ANALYTICAL RESULTS
Soil Boring PS-SB01

Sample ID	Residential	Impact to	PS-SB01-16	PS-SB01-18	PS-SB01-20	PS-SB01-22	PS-SB01-24
Date Collected	Direct Contact	Ground Water	12/4/98	12/4/98	12/4/98	12/4/98	12/4/98
Matrix	Soil Cleanup	Soil Cleanup	SOIL	SOIL	SOIL	SOIL	SOIL
Depth (feet)	Criteria	Criteria	14 to 16	16 to 18	18 to 20	20 to 22	22 to 24
Comment	(NJDEP)	(NJDEP)					
units	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
a-BHC	na	na	<0.010	<0.010	<0.010	<0.50	<0.010
g-BHC (Lindane)	0.52	50	<0.010	<0.010	<0.010	<0.50	<0.010
b-BHC	na	na	<0.010	<0.010	<0.010	<0.50	<0.010
Heptachlor	0.15	50	<0.010	<0.010	<0.010	**<0.50**	<0.010
d-BHC	na	na	<0.010	<0.010	<0.010	<0.50	<0.010
Aldrin	0.04	50	<0.010	<0.010	<0.010	**<0.50**	<0.010
Heptachlor Epoxide	na	na	<0.010	<0.010	<0.010	<0.50	<0.010
Endosulfan I	340	50	<0.010	<0.010	<0.010	<0.50	<0.010
4,4'-DDE	2	50	<0.010	<0.010	<0.010	<0.50	<0.010
Dieldrin	0.042	50	<0.010	<0.010	<0.010	**<0.50**	<0.010
Endrin	17	50	<0.010	<0.010	<0.010	<0.50	<0.010
4,4'-DDT	2	500	<0.010	<0.010	<0.010	<0.50	<0.010
Endrin Aldehyde	na	na	<0.010	<0.010	<0.010	<0.50	<0.010
Endosulfan Sulfate	na	na	<0.010	<0.010	<0.010	<0.50	<0.010
Chlordane	na	na	<0.010	0.026	<0.010	18	<0.010
Toxaphene	0.10	50	<0.010	<0.010	<0.010	**<0.50**	<0.010
Methoxychlor	280	50	<0.010	<0.010	<0.010	<0.50	<0.010

< Less than detection limit given
na not applicable
Shaded results indicate an exceedance of the Soil Cleanup Criteria.
Bold results indicate that the laboratory detection limit is greater than the Soil Cleanup Critieria.

Pest Shop Data
PS-SB01

TABLE 5-3
NAVAL WEAPONS STATION-EARLE
DELIVERY ORDER 0034
PESTICIDE ANALYTICAL RESULTS
Groundwater

Sample ID	GROUNDWATER	PRACTICAL	PS-GW02	PS-GW03	PS-GW04	PS-GW05	PS-GW1	PS-GW2	PS-GW6	PS-GW7	PS-GW8
Date Collected	QUALITY	QUANTITATION	12/4/98	12/4/98	12/4/98	12/4/98	1/7/99	1/7/99	1/7/99	1/7/99	1/7/99
Matrix	CRITERIA	LIMIT (PQL)	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Comment	NJAC 7:9-6.11, Table 1	NJAC 7:9-6.11, Table 1	duplicate of PS-GW03								
units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
a-BHC	0.006	0.02	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
g-BHC (Lindane)	0.2	0.2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
b-BHC	0.2	0.04	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Heptachlor	0.008	0.4	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
d-BHC	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aldrin	0.002	0.04	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Heptachlor Epoxide	0.004	0.2	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan I	0.4	0.02	**0.38**	**0.41**	**0.61**	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDE	0.1	0.04	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Dieldrin	0.002	0.03	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin	2	0.04	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
4,4'-DDT	0.1	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Endrin Aldehyde	NA	NA	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Endosulfan Sulfate	0.4	0.08	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Chlordane	0.01	0.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Toxaphene	0.03	3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Methoxychlor	40	10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

< Less than lab detection limit
NA not available
Bold results indicate an exceedance
Some results exceed Quality Criteria. Comparison to PQL indicate lab detection is less than PQL. Results less than PQL are considered non-detect.
Pest Shop Data

PQLs. Analytical results that fall below the Table 1 PQLs are considered non-detect. Also, PS-GW09 was not analyzed because the laboratory did not have sufficient volume to perform analysis. Refer to the case narrative in the laboratory data package.

5.4 Septic Tank Sludge Sample

One sample was collected from the sludge within the septic tank on December 4, 1998. Sample PS-SL01 was analyzed for Chlorinated Organic Pesticides. The analytical results indicated elevated concentrations of Chlordane at 9.5 grams/kg.

6.0 CONCLUSIONS/RECOMMENDATIONS

Based on the previous and current analytical findings, Foster Wheeler Environmental recommends detailing an excavation plan to excavate and dispose of the pesticide contaminated soils. As discussed in this report, no soils have been impacted by Nitroamines. During the previous investigation, depth of pesticide contamination did not extend to greater than 3 feet below grade, except in soil borings SS-18 and SS-31. It is believed that during the December 1998 investigation, some of the more contaminated upper soils may have contaminated the samples collected at greater depths by smearing on the sample equipment or by falling into the boring hole. Special attention will be given to excavation activities at PS-SB01 (SS-18) and PS-SB02 (SS-31) to determine vertical and horizontal extent of the contamination. Once the area is excavated to an appropriate depth, confirmatory samples will be collected and analyzed to ensure that the contaminated soils have been removed, and the depth of excavation is sufficient to meet clean-up standards.

Analysis of groundwater indicates that the ground water at two locations, PS-GW03 and PS-GW04, has been slightly impacted by pesticides. Additional monitoring of the groundwater at these locations is recommended when the excavation of contaminated soil has been completed.

APPENDIX A

Borehole Log

PROJECT: NWS-EARLE
BORING NO.: PS-SB01
PROJECT LOCATION: PESTICIDE SHOP (PS)
SURFACE ELEVATION:
SUBCONTRACTOR/DRILLER: GES, MARK BATES
DATE STARTED: 12-04-98
FIELD GEOLOGIST: T. FOWLER
DATE COMPLETED: 12-04-98
DRILLING METHOD: GEOPROBE

REMARKS: N/A - NOT AVAILABLE NAB - NOT ABOVE BACKGROUND
MRAM - MINIRAM (HNu 0-10 PPM), (MINIRAM 0-0.6PPM)

Depth	Blows /6"	% Recov-ery	Color	Material Description	USCS Class-ification	Remarks	Profile
0				NO CORE			
2'				NO CORE			
4'		100		4-6' DK GRAY TO LIGHT GRAY (@6') TO YELLOWISH F TO VF SAND, DRY		PS-SB01-06	
6'		95		6-8' LT GRAY SAND @ TOP, THEN BWN SILT W/SOME SAND, DRY		PS-SB01-08 HNu - NAB MRAM - NAB	
8'		N/A		8-10' GRAY TO LT BRN VF TO M SAND, TR GRAVEL, SL MOIST		PS-SB01-10 HNu - NAB MRAM - NAB (IN HOLE: HNu - NAB MRAM - NAB)	
10'							

Borehole Log

PROJECT: NWS-EARLE
BORING NO.: PS-SB01 (CONT)
PROJECT LOCATION: PESTICIDE SHOP (PS)
SURFACE ELEVATION:
SUBCONTRACTOR/DRILLER:
DATE STARTED:
FIELD GEOLOGIST:
DATE COMPLETED:
DRILLING METHOD:

REMARKS:

Depth	Blows /6"	% Recov-ery	Color	Material Description	USCS Class-ification	Remarks	Profile
10'		95		10-12' GRAY BRN VF TO M SAND, DRY		PS-SB01-12 HNu - NAB MRAM - NAB	
12'		N/A		12-14' YELLOW BRN F TO M SAND, SL MOIST		PS-SB01-14 HNu - NAB MRAM - NAB	
14'		95		14-16' GRAY BRN TO YELLOW BRN F TO M SAND, DRY		PS-SB01-16 HNu - NAB MRAM - NAB	
16'		N/A		16-18' GRAY BRN TO YELLOW BRN F TO M SAND, DRY		PS-SB01-18 HNu - NAB MRAM - NAB	
18'		95		18-20' GRAY BRN TO YELLOW BRN F TO M SAND, DRY		PS-SB01-20 HNu - NAB MRAM - NAB	
20'							

Borehole Log

PROJECT: NWS-EARLE
BORING NO: PS-SB01 (CONT)
PROJECT LOCATION: PESTICIDE SHOP (PS)
SURFACE ELEVATION:
SUBCONTRACTOR/DRILLER:
DATE STARTED:
FIELD GEOLOGIST:
DATE COMPLETED:
DRILLING METHOD:
REMARKS:

Depth	Blows /6"	% Recov-ery	Color	Material Description	USCS Class-ification	Remarks	Profile
20'		95		20-22' BRN SILT AND SAND @ TOP, THEN YELLOW BRN F TO M SAND, DRY		PS-SB01-22	
22'				22-24' LT GRAY F TO M SAND, DRY		PS-SB01-24 HNu - NAB MRAM - NAB	
24'							
26'							
28'							
30'							

Borehole Log

PROJECT: NWS-EARLE
BORING NO: PS-SB02 (CONT)
PROJECT LOCATION: PESTICIDE SHOP (PS)
SURFACE ELEVATION:
SUBCONTRACTOR/DRILLER:
DATE STARTED:
FIELD GEOLOGIST:
DATE COMPLETED:
DRILLING METHOD:
REMARKS:

Depth	Blows /6"	% Recov-ery	Color	Material Description	USCS Class-ification	Remarks	Profile
10'		N/A		10–12' YELLOW BRN F TO M SAND, TR SILT		PS-SB02-12 HNu – NAB MRAM – NAB	
12'		N/A		12–14' YELLOW BRN F TO M SAND, DRY		PS-SB02-14 HNu – NAB MRAM – NAB	
14'		98		14–16' YELLOW BRN F TO M SAND, SL MOIST		PS-SB02-16 HNu – NAB MRAM – NAB	
16'		N/A		16–18' GRAY TO YELLOW BRN F TO M SAND, TR GRAVEL, DRY		PS-SB02-18 HNu – NAB MRAM – NAB	
18'		N/A		18–20' ORANGEISH F TO M SAND		PS-SB02-20 HNu – NAB MRAM – NAB	
20'							

Borehole Log

PROJECT: NWS-EARLE
BORING NO.: PS-SB02 (CONT)
PROJECT LOCATION: PESTICIDE SHOP (PS)
SURFACE ELEVATION:
SUBCONTRACTOR/DRILLER:
DATE STARTED:
FIELD GEOLOGIST:
DATE COMPLETED:
DRILLING METHOD:

REMARKS:

Depth	Blows /6"	% Recov-ery	Color	Material Description	USCS Class-ification	Remarks	Profile
20'		N/A		20-22' BRN SILT, SOME SAND @ TOP, TO YELLOW BRN F TO M SAND, DRY		PS-SB02-22 HNu - NAB MRAM - NAB	
22'		N/A		22-24' YELLOW BRN F TO M SAND, SL MOIST		PS-SB02-24 HNu - NAB MRAM - NAB	
24'							
26'							
28'							
30'							

APPENDIX B

Received: 12/05/98 12/10/98 08:35:32

	SAMPLE IDENTIFICATION
27	PS-FB01

SAMPLE ID PS-SB01-06 FRACTION 01A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:10:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.10
g-BHC (Lindane)	ND	0.10
b-BHC	ND	0.10
Heptachlor	0.16	0.10
d-BHC	ND	0.10
Aldrin	ND	0.10
Heptachlor Epoxide	0.12	0.10
Endosulfan I	ND	0.10
4,4'-DDE	ND	0.10
Dieldrin	ND	0.10
Endrin	ND	0.10
4,4'-DDD	ND	0.10
Endosulfan II	ND	0.10
4,4'-DDT	ND	0.10
Endrin Aldehyde	ND	0.10
Endosulfan Sulfate	ND	0.10
Chlordane	3.8	0.10
Toxaphene	ND	0.10
Methoxychlor	ND	0.10

Notes and Definitions for this Report:

UNITS:	mg/Kg
EXTRACTED:	12/07/98
DATE RUN:	12/09/98
ANALYST:	CK
INSTRUMENT:	HP2
DIL. FACTOR:	10

ND = not detected at detection limit

SAMPLE ID PS-SB01-08 FRACTION 02A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:11:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.050
g-BHC (Lindane)	ND	0.050
b-BHC	ND	0.050
Heptachlor	ND	0.050
d-BHC	ND	0.050
Aldrin	ND	0.050
Heptachlor Epoxide	ND	0.050
Endosulfan I	ND	0.050
4,4'-DDE	ND	0.050
Dieldrin	ND	0.050
Endrin	ND	0.050
4,4'-DDD	ND	0.050
Endosulfan II	ND	0.050
4,4'-DDT	ND	0.050
Endrin Aldehyde	ND	0.050
Endosulfan Sulfate	ND	0.050
Chlordane	1.1	0.050
Toxaphene	ND	0.050
Methoxychlor	ND	0.050

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 5

ND = not detected at detection limit

SAMPLE ID PS-SB01-10 FRACTION 03A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:20:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	1.0
g-BHC (Lindane)	ND	1.0
b-BHC	ND	1.0
Heptachlor	ND	1.0
d-BHC	ND	1.0
Aldrin	ND	1.0
Heptachlor Epoxide	ND	1.0
Endosulfan I	ND	1.0
4,4'-DDE	ND	1.0
Dieldrin	ND	1.0
Endrin	ND	1.0
4,4'-DDD	ND	1.0
Endosulfan II	ND	1.0
4,4'-DDT	ND	1.0
Endrin Aldehyde	ND	1.0
Endosulfan Sulfate	ND	1.0
Chlordane	40	1.0
Toxaphene	ND	1.0
Methoxychlor	ND	1.0

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 100

ND = not detected at detection limit

SAMPLE ID PS-S801-12 FRACTION 04A TEST CODE PEST S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:21:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS:	mg/Kg
EXTRACTED:	12/07/98
DATE RUN:	12/08/98
ANALYST:	CK
INSTRUMENT:	HP2
DIL. FACTOR:	1

ND = not detected at detection limit

SAMPLE ID PS-SB01-14 FRACTION 05A TEST CODE PEST S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:30:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.050
g-BHC (Lindane)	ND	0.050
b-BHC	ND	0.050
Heptachlor	ND	0.050
d-BHC	ND	0.050
Aldrin	ND	0.050
Heptachlor Epoxide	ND	0.050
Endosulfan I	ND	0.050
4,4'-DDE	ND	0.050
Dieldrin	ND	0.050
Endrin	ND	0.050
4,4'-DDD	ND	0.050
Endosulfan II	ND	0.050
4,4'-DDT	ND	0.050
Endrin Aldehyde	ND	0.050
Endosulfan Sulfate	ND	0.050
Chlordane	1.4	0.050
Toxaphene	ND	0.050
Methoxychlor	ND	0.050

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 5

ND = not detected at detection limit

SAMPLE ID PS-SB01-16 FRACTION 06A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:31:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1

ND = not detected at detection limit

SAMPLE ID PS-SB01-18 FRACTION 07A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:40:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	0.026	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS:	mg/Kg
EXTRACTED:	12/07/98
DATE RUN:	12/08/98
ANALYST:	CK
INSTRUMENT:	HP2
DIL. FACTOR:	1

ND = not detected at detection limit

SAMPLE ID PS-SB01-20 FRACTION 08A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:41:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1

ND = not detected at detection limit

Received: 12/05/98 Results by Sample

SAMPLE ID PS-SB01-22 FRACTION 09A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:49:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.50
g-BHC (Lindane)	ND	0.50
b-BHC	ND	0.50
Heptachlor	ND	0.50
d-BHC	ND	0.50
Aldrin	ND	0.50
Heptachlor Epoxide	ND	0.50
Endosulfan I	ND	0.50
4,4'-DDE	ND	0.50
Dieldrin	ND	0.50
Endrin	ND	0.50
4,4'-DDD	ND	0.50
Endosulfan II	ND	0.50
4,4'-DDT	ND	0.50
Endrin Aldehyde	ND	0.50
Endosulfan Sulfate	ND	0.50
Chlordane	18	0.50
Toxaphene	ND	0.50
Methoxychlor	ND	0.50

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 50

ND = not detected at detection limit

SAMPLE ID PS-SB01-24 FRACTION 10A TEST CODE PEST S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:50:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1

ND = not detected at detection limit

SAMPLE ID PS-SB01-04 FRACTION 11A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 09:00:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.50
g-BHC (Lindane)	ND	0.50
b-BHC	ND	0.50
Heptachlor	ND	0.50
d-BHC	ND	0.50
Aldrin	ND	0.50
Heptachlor Epoxide	ND	0.50
Endosulfan I	ND	0.50
4,4'-DDE	ND	0.50
Dieldrin	ND	0.50
Endrin	ND	0.50
4,4'-DDD	ND	0.50
Endosulfan II	ND	0.50
4,4'-DDT	ND	0.50
Endrin Aldehyde	ND	0.50
Endosulfan Sulfate	ND	0.50
Chlordane	6.4	0.50
Toxaphene	ND	0.50
Methoxychlor	ND	0.50

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 50

ND = not detected at detection limit

SAMPLE ID PS-SB02-06 FRACTION 12A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:02:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.10
g-BHC (Lindane)	ND	0.10
b-BHC	ND	0.10
Heptachlor	ND	0.10
d-BHC	ND	0.10
Aldrin	ND	0.10
Heptachlor Epoxide	ND	0.10
Endosulfan I	ND	0.10
4,4'-DDE	ND	0.10
Dieldrin	ND	0.10
Endrin	ND	0.10
4,4'-DDD	ND	0.10
Endosulfan II	ND	0.10
4,4'-DDT	ND	0.10
Endrin Aldehyde	ND	0.10
Endosulfan Sulfate	ND	0.10
Chlordane	2.9	0.10
Toxaphene	ND	0.10
Methoxychlor	ND	0.10

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 10

ND = not detected at detection limit

SAMPLE ID PS-SB02-08 FRACTION 13A TEST CODE PEST S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:03:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	0.032	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS:	mg/Kg
EXTRACTED:	12/07/98
DATE RUN:	12/08/98
ANALYST:	CK
INSTRUMENT:	HP2
DIL. FACTOR:	1

ND = not detected at detection limit

SAMPLE ID PS-SB02-10 FRACTION 14A TEST CODE PEST S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:11:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.20
g-BHC (Lindane)	ND	0.20
b-BHC	ND	0.20
Heptachlor	ND	0.20
d-BHC	ND	0.20
Aldrin	ND	0.20
Heptachlor Epoxide	ND	0.20
Endosulfan I	ND	0.20
4,4'-DDE	ND	0.20
Dieldrin	ND	0.20
Endrin	ND	0.20
4,4'-DDD	ND	0.20
Endosulfan II	ND	0.20
4,4'-DDT	ND	0.20
Endrin Aldehyde	ND	0.20
Endosulfan Sulfate	ND	0.20
Chlordane	4.9	0.20
Toxaphene	ND	0.20
Methoxychlor	ND	0.20

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 20

ND = not detected at detection limit

SAMPLE ID PS-SB02-12 FRACTION 15A TEST CODE PEST S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:12:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	0.018	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1

ND = not detected at detection limit

SAMPLE ID PS-SB02-14 FRACTION 16A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:26:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.10
g-BHC (Lindane)	ND	0.10
b-BHC	ND	0.10
Heptachlor	ND	0.10
d-BHC	ND	0.10
Aldrin	ND	0.10
Heptachlor Epoxide	ND	0.10
Endosulfan I	ND	0.10
4,4'-DDE	ND	0.10
Dieldrin	ND	0.10
Endrin	ND	0.10
4,4'-DDD	ND	0.10
Endosulfan II	ND	0.10
4,4'-DDT	ND	0.10
Endrin Aldehyde	ND	0.10
Endosulfan Sulfate	ND	0.10
Chlordane	2.2	0.10
Toxaphene	ND	0.10
Methoxychlor	ND	0.10

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 10

ND = not detected at detection limit

SAMPLE ID PS-SB02-16 FRACTION 17A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:27:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1

ND = not detected at detection limit

SAMPLE ID PS-SB02-18 FRACTION 18A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:38:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.20
g-BHC (Lindane)	ND	0.20
b-BHC	ND	0.20
Heptachlor	ND	0.20
d-BHC	ND	0.20
Aldrin	ND	0.20
Heptachlor Epoxide	ND	0.20
Endosulfan I	ND	0.20
4,4'-DDE	ND	0.20
Dieldrin	ND	0.20
Endrin	ND	0.20
4,4'-DDD	ND	0.20
Endosulfan II	ND	0.20
4,4'-DDT	ND	0.20
Endrin Aldehyde	ND	0.20
Endosulfan Sulfate	ND	0.20
Chlordane	6.8	0.20
Toxaphene	ND	0.20
Methoxychlor	ND	0.20

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 20

ND = not detected at detection limit

SAMPLE ID PS-SB02-20 FRACTION 19A TEST CODE PEST S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:39:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1

ND = not detected at detection limit

SAMPLE ID PS-SB02-22 FRACTION 20A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:50:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.020
g-BHC (Lindane)	ND	0.020
b-BHC	ND	0.020
Heptachlor	ND	0.020
d-BHC	ND	0.020
Aldrin	ND	0.020
Heptachlor Epoxide	ND	0.020
Endosulfan I	ND	0.020
4,4'-DDE	ND	0.020
Dieldrin	ND	0.020
Endrin	ND	0.020
4,4'-DDD	ND	0.020
Endosulfan II	ND	0.020
4,4'-DDT	ND	0.020
Endrin Aldehyde	ND	0.020
Endosulfan Sulfate	ND	0.020
Chlordane	0.28	0.020
Toxaphene	ND	0.020
Methoxychlor	ND	0.020

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 2

ND = not detected at detection limit

SAMPLE ID PS-SB02-24 FRACTION 21A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 10:51:00 Category SOIL

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

UNITS: mg/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1

ND = not detected at detection limit

SAMPLE ID PS-GW03 FRACTION 22A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 12/04/98 12:10:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	0.41	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

SAMPLE ID PS-GW04 FRACTION 23A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 12/04/98 13:10:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	0.61	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

SAMPLE ID PS-GW05 FRACTION 24A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 12/04/98 14:40:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

SAMPLE ID PS-GW02 FRACTION 25A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 12/04/98 11:50:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	0.38	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

SAMPLE ID PS-SL01 FRACTION 26A TEST CODE PEST_S NAME PESTICIDES - SOIL
Date & Time Collected 12/04/98 15:00:00 Category SLUDGE

PESTICIDES in SOIL

	RESULT	LIMIT
a-BHC	ND	0.10
g-BHC (Lindane)	ND	0.10
b-BHC	ND	0.10
Heptachlor	ND	0.10
d-BHC	ND	0.10
Aldrin	ND	0.10
Heptachlor Epoxide	ND	0.10
Endosulfan I	ND	0.10
4,4'-DDE	ND	0.10
Dieldrin	ND	0.10
Endrin	ND	0.10
4,4'-DDD	ND	0.10
Endosulfan II	ND	0.10
4,4'-DDT	ND	0.10
Endrin Aldehyde	ND	0.10
Endosulfan Sulfate	ND	0.10
Chlordane	9.5	0.10
Toxaphene	ND	0.10
Methoxychlor	ND	0.10

Notes and Definitions for this Report:

UNITS: g/Kg
EXTRACTED: 12/07/98
DATE RUN: 12/09/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 10000

ND = not detected at detection limit

SAMPLE ID PS-FB01 FRACTION 27A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 12/04/98 15:00:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 12/07/98
DATE RUN: 12/08/98
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

TEST CODE PEST S NAME PESTICIDES - SOIL

EPA Method: 8081. Organochlorine Pesticides & Polchlorinated Biphenyls by Gas Chromatography

Reference: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846 FINAL UPDATE 111, 1996. Office of Solid Waste, USEPA.

TEST CODE PEST W NAME PESTICIDES - WATER

EPA METHOD: 608 for water sample

Reference: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A. 40 CFR Part 136. Federal Register Vol. 49, No. 209, 1984.

TOXIKON
15 Wiggins Ave., Bedford, MA 01730
Telephone: (781) 275-3330
Fax: (781) 275-7478

1 of 1

CHAIN OF CUSTODY RECORD

WORK ORDER #: 98-12-124

DUE DATE : 12-09-98

COMPANY: Foster Wheeler Enviro.
ADDRESS: one Oxford Valley, Suite 200
Langhorne, PA 19047
PHONE #: (215) 702-4015 FAX #: (215) 702-4045
P.O. #: 34-000491
PROJECT MANAGER: M. G Hoffa
PROJECT ID/LOCATION: NWS - Earle

SAMPLE TYPE: 1. WASTEWATER, 2. SOIL, 3. SLUDGE, 4. OIL, 5. DRINKING WATER, 6. WATER (GW/MW/SW), 7. OTHER (SPECIFY)
CONTAINER TYPE: P - PLASTIC, G - GLASS, V - VOA

TOXIKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING DATE	SAMPLING TIME	PRESERVATIVE	ANALYSES: Chlorinated Organics/Pest.	SPECIAL INSTRUCTIONS/ COMMENTS
1	PS-SB01-06	2	8oz	G	1	12/4/98	0910	cool	✓	
2	PS-SB01-08					12/4/98	0911		✓	
3	PS-SB01-10						0920		✓	
4	PS-SB01-12						0921		✓	
5	PS-SB01-14						0930		✓	
6	PS-SB01-16						0931		✓	
7	PS-SB01-18						0940		✓	
8	PS-SB01-20						0941		✓	
9	PS-SB01-22						0949		✓	
10	PS-SB01-24						0950		✓	
11	PS-SB01-04						0900		✓	
12	PS-SB02-06	↓	↓	↓	↓	↓	1002	↓	✓	
13	PS-SB02-08	2	8oz	G	1	12/4/98	1003	cool	✓	

SAMPLED BY: Tom Fowler
DATE: 12-4-98
TIME: 15-30-

RELINQUISHED BY:
DATE: 12-4-98
TIME: 17:00

RELINQUISHED BY:
DATE: - -
TIME: - -

METHOD OF SHIPMENT: hand delivered

QUOTATION #:

RECEIVED BY:
DATE: - -
TIME: - -

RECEIVED FOR LAB BY: T. McCrostie
DATE: 12-5-98
TIME: 12-10-

COOLER TEMPERATURE: 3.2°

72hr TAT

☑ RUSH ..... BUSINESS DAY TURN AROUND
☐ ROUTINE

Sample disposal information
Are there any other known or suspected contaminants in these samples other than those listed above?
Yes ____ No ____ If Yes, 1st Known ____

TOXIKON
15 Wiggins Ave., Bedford, MA 01730
Telephone: (781) 275-3330
Fax: (781) 275-7478

JJ

CHAIN OF CUSTODY RECORD

WORK ORDER #: 10-12-127

DUE DATE : 12-09-98

COMPANY: Foster Wheeler Env Corp
ADDRESS: One Oxford Valley Suite 200
Langhorne PA 19047
PHONE #: (215) 702-4015 FAX #: (215) 702-4045
P.O. #: 34-000491
PROJECT MANAGER: Mike Hoffman
PROJECT ID/LOCATION: NWS Earle

SAMPLE TYPE: 1. WASTEWATER 2. SOIL 3. SLUDGE 4. OIL 5. DRINKING WATER 6. WATER (GW/MW/SW) 7. OTHER (SPECIFY)

CONTAINER TYPE: P - PLASTIC G - GLASS V - VOA

TOXIKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING DATE	SAMPLING TIME	PRESERVATIVE	Chlorinated organic pest.	SPECIAL INSTRUCTIONS/ COMMENTS
14	PS-SB02-10	2	8oz	G	1	12/4/98	1011	cool	✓	
15	PS-SB02-12	2	"	"	"	"	1012	"	✓	
16	PS-SB02-14	2	"	"	"	"	1026	"	✓	
17	PS-SB02-16	2	"	"	"	"	1027	"	✓	
18	PS-SB02-18	2	"	"	"	"	1038	"	✓	
19	PS-SB02-20	2	"	"	"	"	1039	"	✓	
20	PS-SB02-22	2	"	"	"	"	1050	"	✓	
21	PS-SB02-24	2	8oz	"	"	"	1051	"	✓	
22	PS-GW03	GW	1L	"	"	"	1210	"	✓	PHS
23	PS-GW04	GW	"	"	"	"	1310	"	✓	PHS
24	PS-GW05	GW	"	"	"	"	1440	"	✓	PHS
25	PS-GW02	GW	1L	G	1	12/4/98	1150	cool	✓	PHS
26	PS-S201	3	8oz	G	1	12/4/98	1500	cool	✓	PH6
27	PS-FB01	FldBl.	1L	G	1	12/4/98	1505	cool	✓	

SAMPLED BY: [signature]
DATE: 12-4-98
TIME: 15-30

RELINQUISHED BY: [signature]
DATE: 12-4-98
TIME: 17-00

RELINQUISHED BY:
DATE: - -
TIME: - -

METHOD OF SHIPMENT: Fed Ex

QUOTATION #:

RECEIVED BY:
DATE: - -
TIME: - -

RECEIVED FOR LAB BY: [signature]
DATE: 12-5-98
TIME: 12-10

COOLER TEMPERATURE: 3.2°C

72hr TAT

☑ RUSH ..... BUSINESS DAY TURN AROUND
☐ ROUTINE

Sample disposal information
Are there any other known or suspected contaminants in these samples other than those listed above?
Yes ____ No ____ If Yes, 1st Known ____

CASE NARRATIVE

Work Order: 9812129

All samples were analyzed within the method holding times.

No target compounds were detected in the method blanks.

TOXIKON

GC PESTICIDES/PCB ANALYSIS MS/MSD RECOVERIES (METHOD 608/8080)

PROJECT : 9812129
MATRIX : SOLIDS

LABORATORY CONTROL SPIKE LCS9812013

COMPOUND	SPIKE ADDED (ug)	CONTROL SPIKE (ug)	CONTROL % RECOVERY	QC LIMITS
gamma-BHC (Lindane)	0.2	0.174	87.0	25-111
Heptachlor	0.2	0.208	104.0	28-122
Aldrin	0.2	0.154	77.0	16-124
Dieldrin	0.8	0.872	109.0	28-128
Endrin	0.8	0.778	97.3	17-158
4,4'-DDT	0.8	0.836	104.5	27-132
*** AROCHLOR 1260	5.0	NA	NA	38-144

MATRIX SPIKE SAMPLE : MS9812129.1
DILUTION : 1X

COMPOUND	SPIKE ADDED (ug)	SAMPLE CONC. (ug)	MS CONC. (ug)	MS % RECOVERY
gamma-BHC (Lindane)	0.2	ND	0.151	75.5
Heptachlor	0.2	3.74	7.86	NC
Aldrin	0.2	ND	0.229	114.5
Dieldrin	0.8	ND	1.07	133.8
Endrin	0.8	ND	0.671	83.9
4,4'-DDT	0.8	ND	0.996	124.5
*** AROCHLOR 1260	5.0	NA	NA	NA

MATRIX SPIKE DUPLICATE : MSD9812129.1
DILUTION : 1X

					QC LIMITS	
COMPOUND	SPIKE ADDED (ug)	MSD CONC. (ug)	MSD % RECOVERY	% RPD	%RPD	RECOVERY
gamma-BHC (Lindane)	0.2	0.173	86.5	13.58	< 15	25-111
Heptachlor	0.2	7	NC	11.60	< 15	28-122
Aldrin	0.2	0.241	120.5	5.11	< 15	16-124
Dieldrin	0.8	1.1	137.5	2.76	< 15	28-128
Endrin	0.8	0.621	77.6	7.74	< 15	17-158
4,4'-DDT	0.8	0.887	110.9	11.58	<15	27-132
*** AROCHLOR 1260	5.0	NA	NA	NA	<15	38-144

*** Arochlor units in ppm (mg/L) (for "PCB ONLY" analysis)
NC = Not calculated when native concentration exceeds matrix spike amount.
D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS SURROGATE RECOVERIES (METHOD 608/8080)

PROJECT # : 9812129
MATRIX : SOLIDS

SAMPLE ID	2,4,5,6-Tetrachloro-M-Xylene	Decachlorobiphenyl
METHOD BLANK	69.5	80
LCS	82.8	79
MS9812129.1	70	68
MSD9812129.1	67	79.3
9812129.1	53	59.3
9812129.2	56.5	61
9812129.3	DILUTED OUT	DILUTED OUT
9812129.4	68	101
9812129.5	58	80
9812129.6	40.8	53
9812129.7	50	64.3
9812129.8	66.8	75.3
9812129.9	59	110.5
9812129.10	54.5	80
9812129.11	62.5	86.5
9812129.12	74.8	79.5
9812129.13	56.3	80
9812129.14	94.8	103.3
9812129.15	64.8	76
9812129.16	79.8	88
9812129.17	50	80
9812129.18	77.8	79.5
9812129.19	68	75.5
9812129.20	67	82.5

D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS MS/MSD RECOVERIES (METHOD 608/8080)

PROJECT : 9812129
MATRIX : SOLIDS

LABORATORY CONTROL SPIKE LCS9812014

COMPOUND	SPIKE ADDED (ug)	CONTROL SPIKE (ug)	CONTROL % RECOVERY	QC LIMITS
gamma-BHC (Lindane)	0.2	0.135	67.5	25-111
Heptachlor	0.2	0.154	77.0	28-122
Aldrin	0.2	0.199	99.5	16-124
Dieldrin	0.8	0.629	78.6	28-128
Endrin	0.8	0.683	85.4	17-158
4,4'-DDT	0.8	0.766	95.8	27-132
*** AROCHLOR 1260	5.0	NA	NA	38-144

MATRIX SPIKE SAMPLE : MS9812129.21
DILUTION : 1X

COMPOUND	SPIKE ADDED (ug)	SAMPLE CONC. (ug)	MS CONC. (ug)	MS % RECOVERY
gamma-BHC (Lindane)	0.2	ND	0.14	70.0
Heptachlor	0.2	ND	0.18	90.0
Aldrin	0.2	ND	0.244	122.0
Dieldrin	0.8	ND	0.69	86.3
Endrin	0.8	ND	0.733	91.6
4,4'-DDT	0.8	ND	0.803	100.4
*** AROCHLOR 1260	5.0	NA	NA	NA

MATRIX SPIKE DUPLICATE : MSD9812129.21
DILUTION : 1X

					QC LIMITS	
COMPOUND	SPIKE ADDED (ug)	MSD CONC. (ug)	MSD % RECOVERY	% RPD	%RPD	RECOVERY
gamma-BHC (Lindane)	0.2	0.133	66.5	5.13	< 15	25-111
Heptachlor	0.2	0.165	82.5	8.70	< 15	28-122
Aldrin	0.2	0.23	115.0	5.91	< 15	16-124
Dieldrin	0.8	0.675	84.4	2.20	< 15	28-128
Endrin	0.8	0.726	90.8	0.96	< 15	17-158
4,4'-DDT	0.8	0.791	98.9	1.51	<15	27-132
*** AROCHLOR 1260	5.0	NA	NA	NA	<15	38-144

*** Arochlor units in ppm (mg/L) (for "PCB ONLY" analysis)

D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS SURROGATE RECOVERIES
(METHOD 608/8080)

PROJECT # : 9812129
MATRIX : SOLIDS

SAMPLE ID	2,4,5,6-Tetrachloro-M-Xylene	Decachlorobiphenyl
METHOD BLANK	67.2	88.8
LCS	63.8	81.2
MS9812129.21	64.8	85
MSD9811129.21	61.8	82.5
9812129.21	61.8	82.5
9812129.26	DILUTED OUT	DILUTED OUT

D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS LCS/LCSD RECOVERIES (METHOD 608/8080)

PROJECT : 9812129
MATRIX : WATER

LABORATORY CONTROL SPIKE: LCS9811076

COMPOUND	SPIKE ADDED (ug/L)	LCS CONC. (ug/L)	LCS % RECOVERY	QC LIMITS
gamma-BHC (Lindane)	0.2	0.246	123.0	25-111
Heptachlor	0.2	0.185	92.5	28-122
Aldrin	0.2	0.201	100.5	16-124
Dieldrin	0.8	1.05	131.3	28-128
Endrin	0.8	1.25	156.3	17-158
4,4'-DDT	0.8	0.981	122.6	27-132
*** AROCHLOR 1260	5.0	NA	NA	38-144

LABORATORY CONTROL SPIKE DUPLICATE: LCSD9811076

					QC LIMITS	
COMPOUND	SPIKE ADDED (ug/L)	LCSD CONC. (ug/L)	LCSD % RECOVERY	% RPD	%RPD	RECOVERY
gamma-BHC (Lindane)	0.2	0.235	117.5	4.6	< 15	25-111
Heptachlor	0.2	0.165	82.5	11.4	< 15	28-122
Aldrin	0.2	0.174	87.0	14.4	< 15	16-124
Dieldrin	0.8	0.948	118.5	10.2	< 15	28-128
Endrin	0.8	1.12	140.0	11.0	< 15	17-158
4,4'-DDT	0.8	0.925	115.6	5.9	<15	27-132
*** AROCHLOR 1260	5.0	NA	NA	NA	<15	38-144

*** Arochlor units in ppm (mg/L) (for "PCB ONLY" analysis)
D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS SURROGATE RECOVERIES (METHOD 608/8080)

PROJECT # : 9812129
MATRIX : WATER

SAMPLE ID	2,4,5,6-Tetrachloro-M-Xylene	Decachlorobiphenyl
METHOD BLANK	88.8	104
LCS	91.2	105
LCSD	79.5	95.5
9812129.22	77	62.5
9812129.23	74	84.5
9812129.24	70.5	51.3
9812129.25	70.3	55.5
9812129.27	70.8	91.3

D - Indicates Diluted Out
INT - Indicates Interference

CASE NARRATIVE

Work Order: 9812129

All samples were analyzed within the method holding times.

No target compounds were detected in the method blanks.

TOXIKON

GC PESTICIDES/PCB ANALYSIS SURROGATE RECOVERIES
(METHOD 608/8080)

PROJECT # : 9812129
MATRIX : WATER

SAMPLE ID	2,4,5,6-Tetrachloro-M-Xylene	Decachlorobiphenyl
METHOD BLANK	88.8	104
LCS	91.2	105
LCSD	79.5	95.5
9812129.22	77	62.5
9812129.23	74	84.5
9812129.24	70.5	51.3
9812129.25	70.3	55.5
9812129.27	70.8	91.3

D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS LCS/LCSD RECOVERIES
(METHOD 608/8080)

PROJECT : 9812129
MATRIX : WATER

LABORATORY CONTROL SPIKE: LCS9811076

COMPOUND	SPIKE ADDED (ug/L)	LCS CONC. (ug/L)	LCS % RECOVERY	QC LIMITS
gamma-BHC (Lindane)	0.2	0.246	123.0	25-111
Heptachlor	0.2	0.185	92.5	28-122
Aldrin	0.2	0.201	100.5	16-124
Dieldrin	0.8	1.05	131.3	28-128
Endrin	0.8	1.25	156.3	17-158
4,4'-DDT	0.8	0.981	122.6	27-132
*** AROCHLOR 1260	5.0	NA	NA	38-144

LABORATORY CONTROL SPIKE DUPLICATE: LCSD9811076

					QC LIMITS	
COMPOUND	SPIKE ADDED (ug/L)	LCSD CONC. (ug/L)	LCSD % RECOVERY	% RPD	%RPD	RECOVERY
gamma-BHC (Lindane)	0.2	0.235	117.5	4.6	< 15	25-111
Heptachlor	0.2	0.165	82.5	11.4	< 15	28-122
Aldrin	0.2	0.174	87.0	14.4	< 15	16-124
Dieldrin	0.8	0.948	118.5	10.2	< 15	28-128
Endrin	0.8	1.12	140.0	11.0	< 15	17-158
4,4'-DDT	0.8	0.925	115.6	5.9	<15	27-132
*** AROCHLOR 1260	5.0	NA	NA	NA	<15	38-144

*** Arochlor units in ppm (mg/L) (for "PCB ONLY" analysis)
D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS SURROGATE RECOVERIES (METHOD 608/8080)

PROJECT # : 9812129
MATRIX : SOLIDS

SAMPLE ID	2,4,5,6-Tetrachloro-M-Xylene	Decachlorobiphenyl
METHOD BLANK	67.2	88.8
LCS	63.8	81.2
MS9812129.21	64.8	85
MSD9811129.21	61.8	82.5
9812129.21	61.8	82.5
9812129.26	DILUTED OUT	DILUTED OUT

D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS MS/MSD RECOVERIES (METHOD 608/8080)

PROJECT : 9812129
MATRIX : SOLIDS

LABORATORY CONTROL SPIKE LCS9812014

COMPOUND	SPIKE ADDED (ug)	CONTROL SPIKE (ug)	CONTROL % RECOVERY	QC LIMITS
gamma-BHC (Lindane)	0.2	0.135	67.5	25-111
Heptachlor	0.2	0.154	77.0	28-122
Aldrin	0.2	0.199	99.5	16-124
Dieldrin	0.8	0.629	78.6	28-128
Endrin	0.8	0.683	85.4	17-158
4,4'-DDT	0.8	0.766	95.8	27-132
*** AROCHLOR 1260	5.0	NA	NA	38-144

MATRIX SPIKE SAMPLE : MS9812129.21
DILUTION : 1X

COMPOUND	SPIKE ADDED (ug)	SAMPLE CONC. (ug)	MS CONC. (ug)	MS % RECOVERY
gamma-BHC (Lindane)	0.2	ND	0.14	70.0
Heptachlor	0.2	ND	0.18	90.0
Aldrin	0.2	ND	0.244	122.0
Dieldrin	0.8	ND	0.69	86.3
Endrin	0.8	ND	0.733	91.6
4,4'-DDT	0.8	ND	0.803	100.4
*** AROCHLOR 1260	5.0	NA	NA	NA

MATRIX SPIKE DUPLICATE : MSD9812129.21
DILUTION : 1X

					QC LIMITS	
COMPOUND	SPIKE ADDED (ug)	MSD CONC. (ug)	MSD % RECOVERY	% RPD	%RPD	RECOVERY
gamma-BHC (Lindane)	0.2	0.133	66.5	5.13	< 15	25-111
Heptachlor	0.2	0.165	82.5	8.70	< 15	28-122
Aldrin	0.2	0.23	115.0	5.91	< 15	16-124
Dieldrin	0.8	0.675	84.4	2.20	< 15	28-128
Endrin	0.8	0.726	90.8	0.96	< 15	17-158
4,4'-DDT	0.8	0.791	98.9	1.51	<15	27-132
*** AROCHLOR 1260	5.0	NA	NA	NA	<15	38-144

*** Arochlor units in ppm (mg/L) (for "PCB ONLY" analysis)

D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS SURROGATE RECOVERIES (METHOD 608/8080)

PROJECT # : 9812129
MATRIX : SOLIDS

SAMPLE ID	2,4,5,6-Tetrachloro-M-Xylene	Decachlorobiphenyl
METHOD BLANK	69.5	80
LCS	82.8	79
MS9812129.1	70	68
MSD9812129.1	67	79.3
9812129.1	53	59.3
9812129.2	56.5	61
9812129.3	DILUTED OUT	DILUTED OUT
9812129.4	68	101
9812129.5	58	80
9812129.6	40.8	53
9812129.7	50	64.3
9812129.8	66.8	75.3
9812129.9	59	110.5
9812129.10	54.5	80
9812129.11	62.5	86.5
9812129.12	74.8	79.5
9812129.13	56.3	80
9812129.14	94.8	103.3
9812129.15	64.8	76
9812129.16	79.8	88
9812129.17	50	80
9812129.18	77.8	79.5
9812129.19	68	75.5
9812129.20	67	82.5

D - Indicates Diluted Out
INT - Indicates Interference

TOXIKON

GC PESTICIDES/PCB ANALYSIS MS/MSD RECOVERIES (METHOD 608/8080)

PROJECT : 9812129
MATRIX : SOLIDS

LABORATORY CONTROL SPIKE LCS9812013

COMPOUND	SPIKE ADDED (ug)	CONTROL SPIKE (ug)	CONTROL % RECOVERY	QC LIMITS
gamma-BHC (Lindane)	0.2	0.174	87.0	25-111
Heptachlor	0.2	0.208	104.0	28-122
Aldrin	0.2	0.154	77.0	16-124
Dieldrin	0.8	0.872	109.0	28-128
Endrin	0.8	0.778	97.3	17-158
4,4'-DDT	0.8	0.836	104.5	27-132
*** AROCHLOR 1260	5.0	NA	NA	38-144

MATRIX SPIKE SAMPLE : MS9812129.1
DILUTION : 1X

COMPOUND	SPIKE ADDED (ug)	SAMPLE CONC. (ug)	MS CONC. (ug)	MS % RECOVERY
gamma-BHC (Lindane)	0.2	ND	0.151	75.5
Heptachlor	0.2	3.74	7.86	NC
Aldrin	0.2	ND	0.229	114.5
Dieldrin	0.8	ND	1.07	133.8
Endrin	0.8	ND	0.671	83.9
4,4'-DDT	0.8	ND	0.996	124.5
*** AROCHLOR 1260	5.0	NA	NA	NA

MATRIX SPIKE DUPLICATE : MSD9812129.1
DILUTION : 1X

COMPOUND	SPIKE ADDED (ug)	MSD CONC. (ug)	MSD % RECOVERY	% RPD	QC LIMITS %RPD	QC LIMITS RECOVERY
gamma-BHC (Lindane)	0.2	0.173	86.5	13.58	< 15	25-111
Heptachlor	0.2	7	NC	11.60	< 15	28-122
Aldrin	0.2	0.241	120.5	5.11	< 15	16-124
Dieldrin	0.8	1.1	137.5	2.76	< 15	28-128
Endrin	0.8	0.621	77.6	7.74	< 15	17-158
4,4'-DDT	0.8	0.887	110.9	11.58	<15	27-132
*** AROCHLOR 1260	5.0	NA	NA	NA	<15	38-144

*** Arochlor units in ppm (mg/L) (for "PCB ONLY" analysis)
NC = Not calculated when native concentration exceeds matrix spike amount.
D - Indicates Diluted Out
INT - Indicates Interference

Page 1 TOXIKON CORP. REPORT Work Order # 99-01-119
Received: 01/08/99 01/14/99 14:51:17

REPORT TO: FOSTER & WHEELER
1 OXFORD VALLEY, SUITE 200
LANGHORNE, PA. 19047
215-702-4007 FAX: 4045
ATTEN MICHAEL HEFFRON

PREPARED BY: TOXIKON CORPORATION
15 WIGGINS AVE
BEDFORD, MA 01730
ATTEN PAUL LEZBERG
PHONE (781)275-3330

CERTIFIED BY
CONTACT JAYSON

CLIENT FOSTER SAMPLES 7
COMPANY FOSTER & WHEELER
FACILITY 1 OXFORD VALLEY, SUITE 200
LANGHORNE, PA. 19047

MA CERT # M-MA064: TRACE METALS, SULFATE, CYANIDE, RES. FREE CHLORINE, Ca, TOTAL ALK., TDS, pH, THMs, VOC, PEST., NUTRIENTS. DEMAND, O&G, PHENOLICS, PCBs . CT DHS #PH-0563, NY #10778 FL HRS E87143, NJ DEP 59538, NC DWR286, SC 89002, NH 204091-C.

WORK ID NWS EARLE PESTICIDES
TAKEN 1/7/99
TRANS
TYPE WATER
P.O. #
INVOICE under separate cover

VERIFIED BY:

SAMPLE IDENTIFICATION	TEST CODES and NAMES used on this workorder
01 PS-GW1	PEST W PESTICIDES - WATER
02 PS-GW2	
03 PS-GW6	
04 PS-GW7	
05 PS-GW8	
06 PS-GW-09	
07 PS-TB01	

06 PS-GW-09 - NOT ENOUGH VOLUME TO RUN SAMPLE. CJ 1-29-99

Page 2 TOXIKON CORP. REPORT Work Order # 99-01-119
Received: 01/08/99 Results by Sample

SAMPLE ID PS-GW1 FRACTION 01A TEST CODE PEST_W NAME PESTICIDES - WATER
Date & Time Collected 01/07/99 15:30:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 01/09/99
DATE RUN: 01/13/99
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

Page 3 TOXIKON CORP. REPORT Work Order # 99-01-119
Received: 01/08/99 Results by Sample

SAMPLE ID PS-GW2 FRACTION 02A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 01/07/99 14:45:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 01/09/99
DATE RUN: 01/13/99
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

Page 4 TOXIKON CORP. REPORT Work Order # 99-01-119
Received: 01/08/99 Results by Sample

SAMPLE ID PS-GW6 FRACTION 03A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 01/07/99 10:05:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 01/09/99
DATE RUN: 01/13/99
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

Page 5 TOXIKON CORP. REPORT Work Order # 99-01-119
Received: 01/08/99 Results by Sample

SAMPLE ID PS-GW7 FRACTION 04A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 01/07/99 11:30:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 01/09/99
DATE RUN: 01/13/99
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

Page 6 TOXIKON CORP. REPORT Work Order # 99-01-119
Received: 01/08/99 Results by Sample

SAMPLE ID PS-GW8 FRACTION 05A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 01/07/99 12:35:00 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 01/09/99
DATE RUN: 01/13/99
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

SAMPLE ID PS-TB01 FRACTION 07A TEST CODE PEST W NAME PESTICIDES - WATER
Date & Time Collected 01/07/99 Category WATER

PESTICIDES in WATER

	RESULT	LIMIT
a-BHC	ND	0.010
g-BHC (Lindane)	ND	0.010
b-BHC	ND	0.010
Heptachlor	ND	0.010
d-BHC	ND	0.010
Aldrin	ND	0.010
Heptachlor Epoxide	ND	0.010
Endosulfan I	ND	0.010
4,4'-DDE	ND	0.010
Dieldrin	ND	0.010
Endrin	ND	0.010
4,4'-DDD	ND	0.010
Endosulfan II	ND	0.010
4,4'-DDT	ND	0.010
Endrin Aldehyde	ND	0.010
Endosulfan Sulfate	ND	0.010
Chlordane	ND	0.010
Toxaphene	ND	0.010
Methoxychlor	ND	0.010

Notes and Definitions for this Report:

EXTRACTED: 01/11/99
DATE RUN: 01/13/99
ANALYST: CK
INSTRUMENT: HP2
DIL. FACTOR: 1
UNITS: ug/L

ND = not detected at detection limit

Received: 01/08/99 Test Methodology

TEST CODE PEST W NAME PESTICIDES - WATER

EPA METHOD: 608 for water sample

Reference: Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. Appendix A. 40 CFR Part 136. Federal Register Vol. 49, No. 209, 1984.

TOXIKON
15 Wiggins Ave., Bedford, MA 01730
Telephone: (781) 275-3330
Fax: (781) 275-7478

CHAIN OF CUSTODY RECORD

WORK ORDER #: 99-01-119
DUE DATE : 01-13-99

01/14/99 15:21 FAX

COMPANY: Foster Wheeler Environ.
ADDRESS: One Oxford Valley, Suite 200
Langhorne, PA 19047
PHONE #: (215) 702-4045 FAX #: (215) 702-4045
P.O. #:
PROJECT MANAGER: Mike Heffron
PROJECT ID/LOCATION: NWS - Earle Pesticides

SAMPLE TYPE
1. WASTEWATER
2. SOIL
3. SLUDGE
4. OIL
5. DRINKING WATER
6. WATER (GW/MW/SW)
7. OTHER (SPECIFY

CONTAINER TYPE
P - PLASTIC
G - GLASS
V - VOA

TOXIKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER SIZE	CONTAINER TYPE	CONTAINER #	SAMPLING DATE	SAMPLING TIME	PRESERVATIVE	ANALYSES: Pesticides [3081A]	SPECIAL INSTRUCTIONS/ COMMENTS
1	PS-GW1	GW	1L	G	1	1/7/99	1530	n/a	X	PH=6
2	PS-GW2						1445		X	PH=6
3	PS-GW6						1005		X	PH=6
4	PS-GW7						1130		X	PH=6
5	PS-GW8						1235		X	PH=6
6	PS-GW09						1545		X	PH=6 (TWO STARS) Do MS/MSD
~~X~~	~~PS-GW10~~				2				~~X~~	PH=6 NO PS GW 10 ~~Do MS/MSD~~
7	PS-TB01	TB	small	P	1	1/7/99		n/a	X	PH=6

SAMPLED BY: CTORION
DATE: 1-7-99
TIME: 16-00

RELINQUISHED BY: CJORION
DATE: 1-7-99
TIME: 16-30-00

RELINQUISHED BY:
DATE: -
TIME: -

METHOD OF SHIPMENT: FEDEX

QUOTATION #:

RECEIVED BY:
DATE: -
TIME: -

RECEIVED FOR LAB BY: J. Mintar
DATE: 01-08-99
TIME: 13-52

COOLER TEMPERATURE

72 hr

☒ RUSH ..... BUSINESS DAY TURN AROUND
☐ ROUTINE

Sample disposal information
Are there any other known or suspected contaminants in these samples other than those listed above?

☒10

TOXIKON

ISO-9001 Certified
Celebrating 20 Years of Excellence

FACSIMILE INSTRUCTION SHEET

Date: 1/14

Name: Michael Heffron

Company: Foster + Wheeler

Fax #: 915-702-4045

From: Michael Heffron

Total No. of Pages Including Cover Sheet: _____

If you do not receive all of the pages, please call (781) 275-3330. Thank you. Notes:

STATEMENT OF CONFIDENTIALITY

15 Wiggins Avenue • Bedford, Massachusetts 01730
(781) 275-3330

Project#9901119

Case Narrative

Fraction 6, sample ID PS-GW-09, was not run due to insufficient quantity of sample. Two 1-L jars were provided. One was labeled MS by the client and the other labeled MSD by the client. The two jars were spiked by the lab and extracted. No third jar was provided for a sample run.

GP Work Order # 9812122

SAMPLE ANALYSIS REPORT

Prepared For:

FOSTER WHEELER ENVIRONMENTAL
2300 LINCOLN HWY EAST
LANGHORNE, PA 19047

NAVAL WEAPONS STATION-EARLE

Prepared By:

GPL Laboratories, LLLP
202 Perry Parkway
Gaithersburg, MD 20877

January 6, 1999

Cathy Blose for
Yemane Yohannes, Laboratory Director

GPL LABORATORIES, LLLP
ANALYTICAL RESULTS

Project: NAVAL WEAPONS STATION-EARLE

FOSTER WHEELER ENVIRONMENTAL
2300 LINCOLN HWY EAST
LANGHORNE, PA 19047
Atten: MIKE HEFFRON

GPL LABORATORIES, LLLP
202 Perry Parkway
Gaithersburg, MD 20877

Atten: Client Services
Phone: (301) 926-6802

Certified by: CB

SAMPLE IDENTIFICATION

GP ID	Client ID
9812122-01A	PS-SS01
9812122-02A	PS-SS02
9812122-03A	PS-SS03
9812122-04A	PS-SS03D
9812122-05A	PS-SS04
9812122-05B	

roject: NAVAL WEAPONS STATION-EARLE

GPL LABORATORIES, LLLP
ORGANIC ANALYSIS RESULTS

GP ID: 9812122-01 Matrix: SOIL
Client ID: PS-SS01 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitroglycerin	8330M		BQL	5000.0	ug/Kg	1	12/19/98	12/27/98 LF
Nitroguanidine	HPLC		BQL	510.0	ug/Kg	1	12/19/98	12/28/98 LF

GP ID: 9812122-02 Matrix: SOIL
Client ID: PS-SS02 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitroglycerin	8330M		BQL	5000.0	ug/Kg	1	12/19/98	12/28/98 LF
Nitroguanidine	HPLC		BQL	510.0	ug/Kg	1	12/19/98	12/28/98 LF

GP ID: 9812122-03 Matrix: SOIL
Client ID: PS-SS03 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitroglycerin	8330M		BQL	5000.0	ug/Kg	1	12/19/98	12/28/98 LF
Nitroguanidine	HPLC		BQL	510.0	ug/Kg	1	12/19/98	12/28/98 LF

GP ID: 9812122-04 Matrix: SOIL
Client ID: PS-SS03D Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitroglycerin	8330M		BQL	5000.0	ug/Kg	1	12/19/98	12/28/98 LF
Nitroguanidine	HPLC		BQL	510.0	ug/Kg	1	12/19/98	12/28/98 LF

GP ID: 9812122-05 Matrix: SOIL
Client ID: PS-SS04 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitroglycerin	8330M		BQL	5000.0	ug/Kg	1	12/19/98	12/28/98 LF
Nitroguanidine	HPLC		BQL	510.0	ug/Kg	1	12/19/98	12/28/98 LF

Project: NAVAL WEAPONS STATION-EARLE

GPL LABORATORIES, LLLP
WET CHEMISTRY ANALYSIS RESULTS

GP ID: 9812122-01 Matrix: SOIL
Client ID: PS-SS01 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitrocellulose	IAAP		BQL	37.6	mg/Kg	1	12/30/98	12/31/98 DCB
Percent Solids	MCAWW 160.3	91.1			%			01/06/99 DCB

GP ID: 9812122-02 Matrix: SOIL
Client ID: PS-SS02 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitrocellulose	IAAP		BQL	32.9	mg/Kg	1	12/30/98	12/31/98 DCB
Percent Solids	MCAWW 160.3	94.4			%			01/06/99 DCB

GP ID: 9812122-03 Matrix: SOIL
Client ID: PS-SS03 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitrocellulose	IAAP		BQL	32.2	mg/Kg	1	12/30/98	12/31/98 DCB
Percent Solids	MCAWW 160.3	93.1			%			01/06/99 DCB

GP ID: 9812122-04 Matrix: SOIL
Client ID: PS-SS03D Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitrocellulose	IAAP		BQL	30.7	mg/Kg	1	12/30/98	12/31/98 DCB
Percent Solids	MCAWW 160.3	92.3			%			01/06/99 DCB

GP ID: 9812122-05 Matrix: SOIL
Client ID: PS-SS04 Collected: 12/11/98

Parameter	Method	Result		Rep.Lim.	Units	Dil.	Prepared	Analyzed By
Nitrocellulose	IAAP		BQL	28.7	mg/Kg	1	12/30/98	12/31/98 DCB
Percent Solids	MCAWW 160.3	94.3			%			01/06/99 DCB

GPL LABORATORIES, LLLP

Possible notes and definitions for this report:

BQL	= Below Quantitation Limit
J	= Value is less than the reporting limits but greater than zero
P	= Indicates that there is greater than 25% difference for detected pesticide/Aroclor results between the two GC columns
B	= Indicates that the compound was found in the associated blank
E	= Indicates that the concentration exceeded the calibration range of the instrument
U	= Indicates that the compound was analyzed for but not detected. number indicates the detection limit
D	= Indicates that the compound was found in an analysis at a secondary dilution factor
*	= Value obtained from a 1:5 dilution
+	= Value obtained from a 1:10 dilution
#	= Value obtained from a 1:20 dilution
=	= Value obtained from a 1:25 dilution
^	= Value obtained from a 1:50 dilution
~	= Value obtained from a 1:100 dilution
!	= Value obtained from a 1:250 dilution
@	= Value obtained from a 1:125 dilution (medium level)
$	= Value obtained from a 1:500 dilution
&	= Value obtained from a 1:1000 dilution
N	= Flashpoint not observed; heated to specified limit
R	= Flammable at room temperature
TNTC	= Too numerous to count
B.P.	= Detection limit taken from boiling point
F.F.	= Sample gave off flammable fumes

GPL LABORATORIES, LLLP

202 Perry Parkway
Gaithersburg, MD 20877
(301) 926-6802
Fax (301) 840-1209

Contract #/Billing Reference: P.O# 015185

1 of 1 Pgs.

Project: Niagara Wireless Station - Eagle
Client: Foster Wheeler Environ.
Send Results To: Foster Wheeler Environ. Attn: Hoffman
Address: One Oxford Valley Suite 200
Langhorne, PA 19047
Phone: (215) 702-4015

Sample ID#	Date Sampled	Time Sampled	Sample Matrix	Sampler's Initials	Nitro glycerine	Nitro cellulose	Nitro guanidine	Lab Cooler No.	CLIENT COMMENTS
PS-5501	12/11/98		Soil	MH	X	X	X		
PS-5502	↓		↓	MH	X	X	X		
PS-5503				MH	X	X	X		
PS-5503D				MH	X	X	X		
PS-5504	↓		↓	MH	X	X	X		Do MS/MSD

Turnaround Time:
# of Containers: 1 1 1
Container Type: Glass 32oz, Clear 32oz, Glass 32oz
Preservative Used: N/A N/A N/A
Type of Analysis:

Relinquished By:	Date/Time	Received By:	Relinquished By:	Received for Laboratory By:	Date/Time
[signature]	12/14/98			[signature]	12/14/98 10:45
Relinquished By:	Date/Time	Received By:	Date/Time / Shipper:	Airbill No.:	
Relinquished By:	Date/Time	Received By:	Lab Comments:	Temp: F.C.	

G.P. W.O. 98-12122

ENVIRONMENTAL SERVICES

SAMPLE RECEIPT CHECKLIST

P.O. No. 44 [illegible]

Client Name Foster Wheeler

Date Received 12/4/98

Time Received 1:05 PM

Received By [illegible]

Carrier Name Fedex

Prepared (Logged In) By [illegible] Initials 12/4/98 Date

Project [illegible]

Site [illegible]

VOA Holding Blank I.D. No. _____

	YES	NO
Airbill/Manifest Present? No. 8078336455	X	—
Shipping Container in Good Condition?	X	—
Custody Seals Present on Shipping Container? Condition: Good ____ Broken ____	—	X
Chain-of-Custody Present?	X	—
Chain-of-Custody Agrees with Sample Labels?	X	—
Chain-of-Custody Signed?	X	—
Packing Present in Shipping Container? Type of Packing Bubble wrap	X	—
Custody Seals on Sample Bottles? Condition: Good ____ Broken ____	—	X
Total Number of Sample Bottles 6		
Total Number of Samples 5		
Samples Intact?	X	—
Sufficient Sample Volume for Indicated Test?	X	—

	YES	NO
Trip Blanks Received? No. of Sets ____	—	X
VOA Vials Have Zero Headspace?	—	X
Preservatives Added to Sample?	X	X
pH Check Required? Performed By? ____	—	X
Ice Present in Shipping Container?	X	(Blue)

Container #	Temperature
#1	4.6

Project Manager Contacted?
Name: [illegible]
Date Contacted: 12/4/98

Any NO response must be detailed in the comments section below. If items are not applicable to particular samples or contracts, they should be marked N/A.

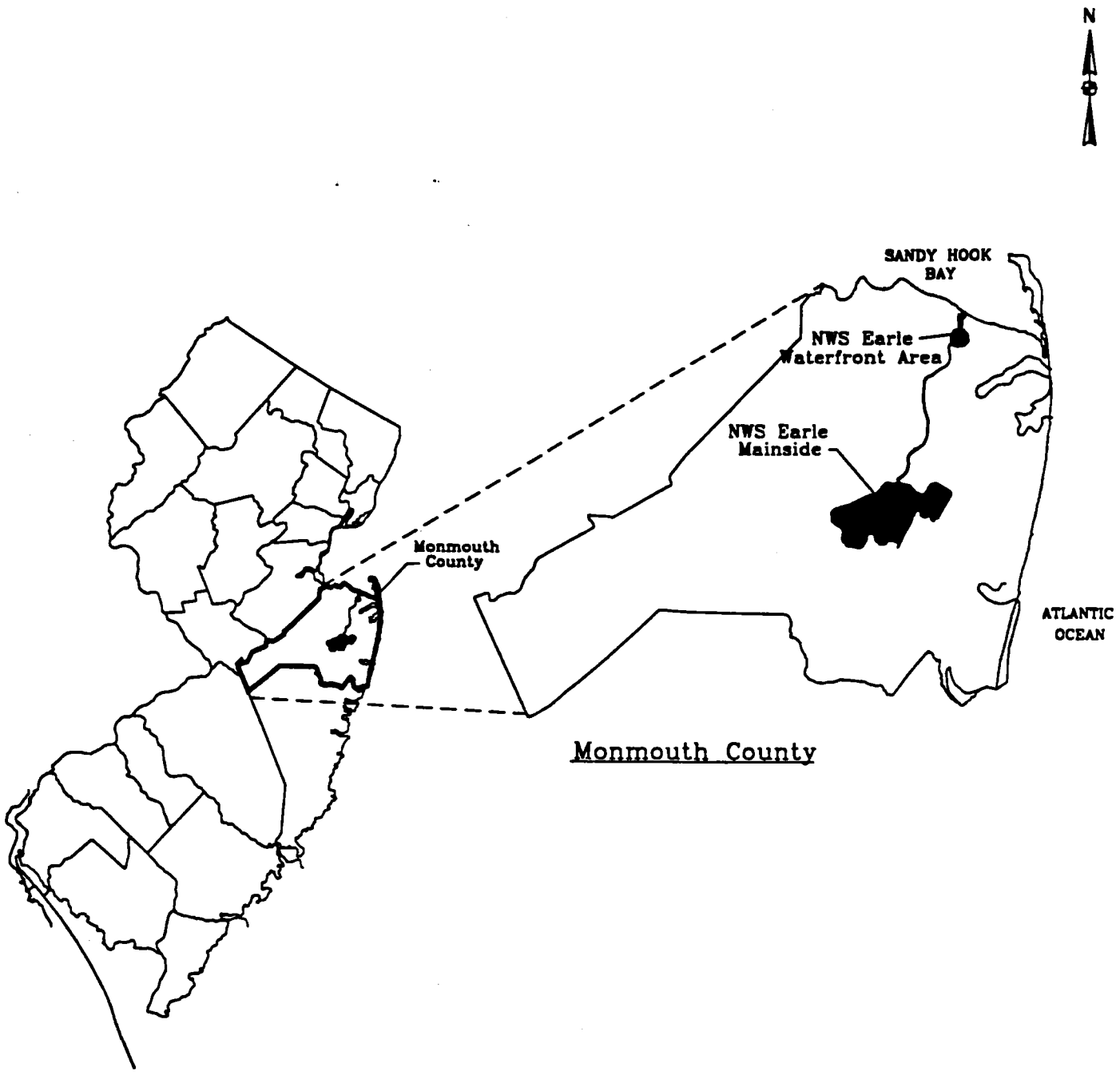
COMMENTS: _____

Checklist Completed by [illegible]

Date 12/4/98

APPENDIX B

MAPS/FIGURES



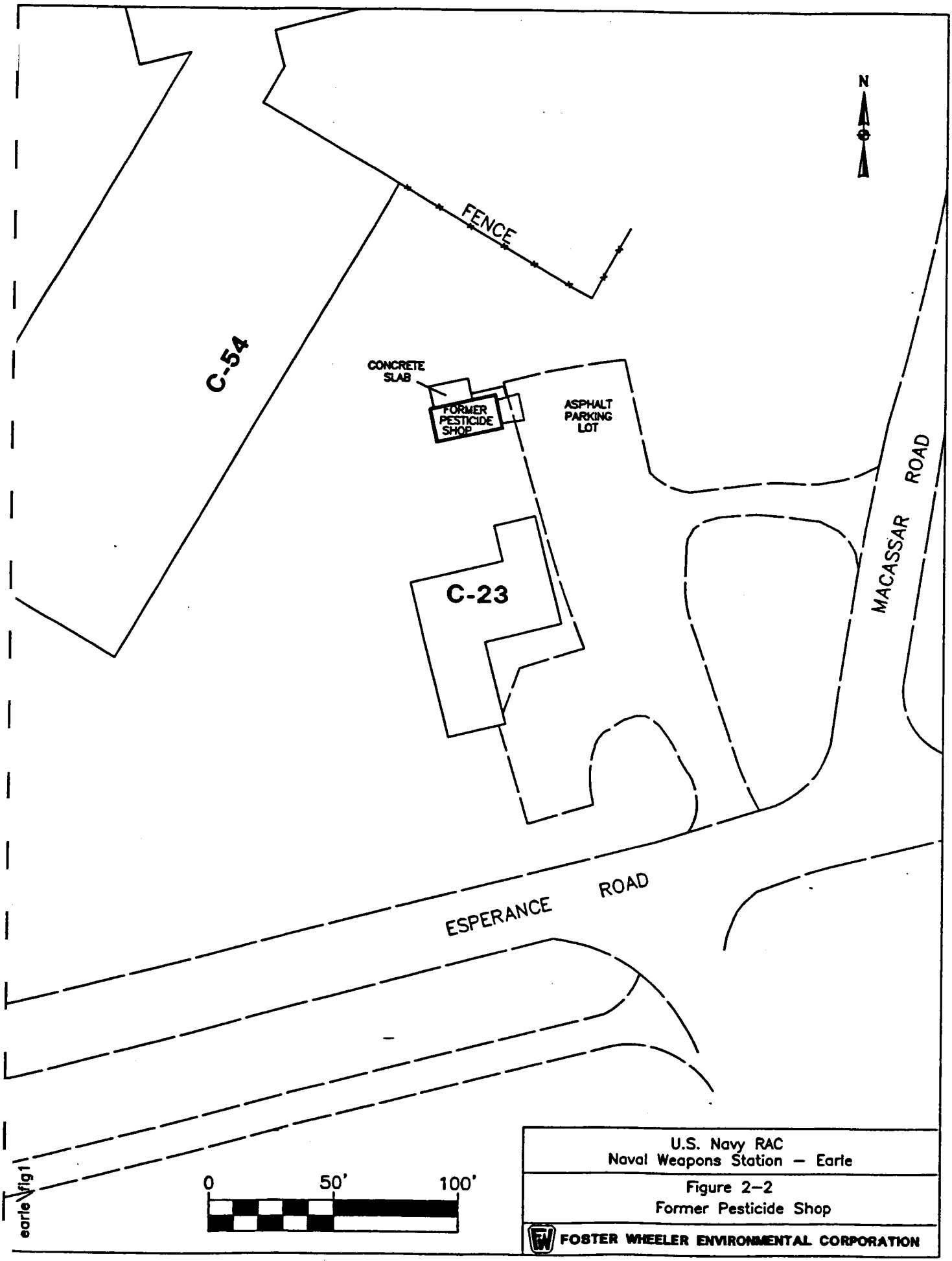
NOT TO SCALE

U.S. Navy RAC
NWS-Earle, Colts Neck, N.J.

Figure 2-1
Regional Site Map

FOSTER WHEELER ENVIRONMENTAL CORPORATION

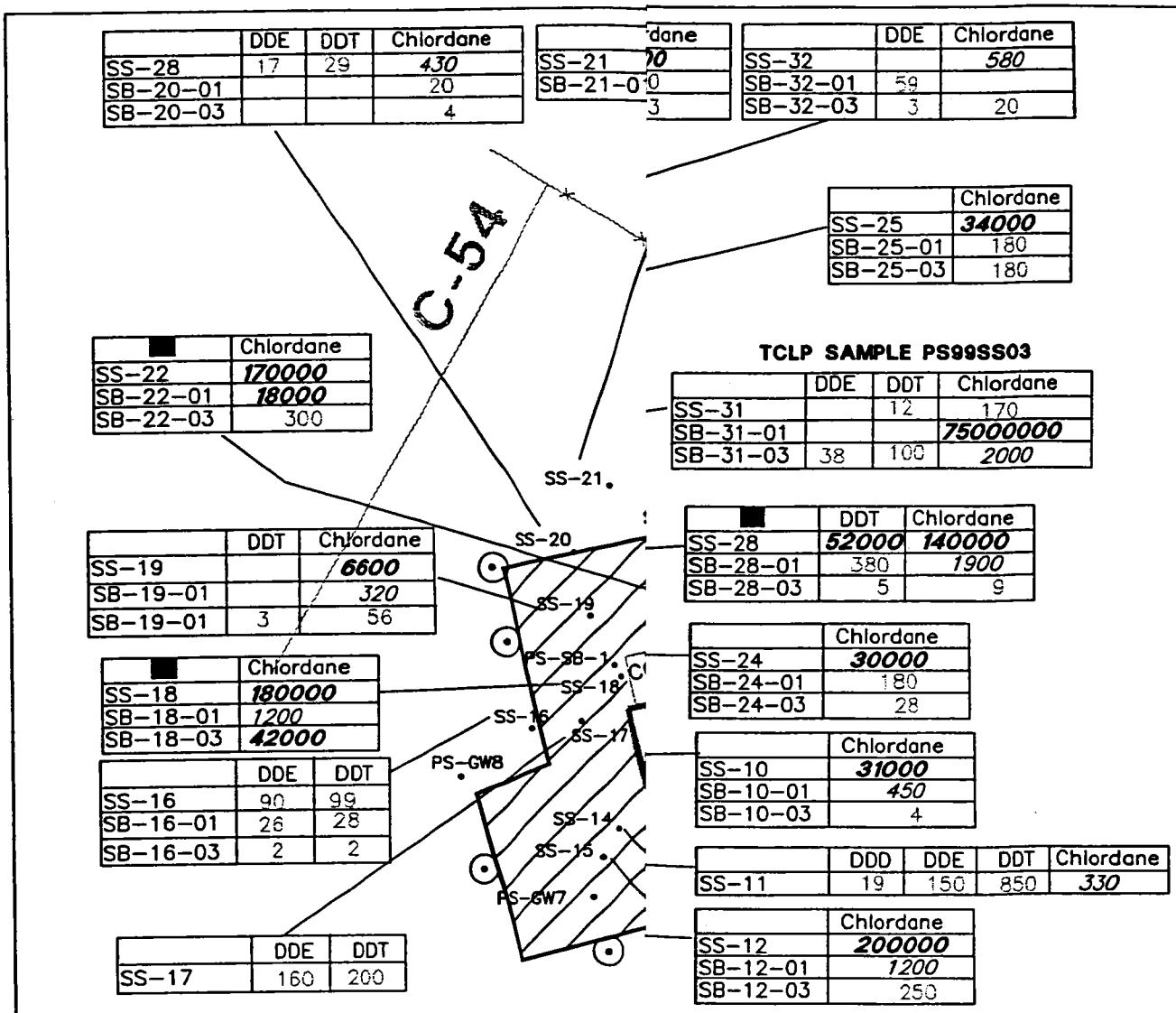
earle\county



U.S. Navy RAC
Naval Weapons Station — Earle

Figure 2–2
Former Pesticide Shop

FOSTER WHEELER ENVIRONMENTAL CORPORATION


C-54
SS-28 | 17 | 29 | 430
SB-20-01 | | | 20
SB-20-03 | | | 4
SS-21
SB-21-0
SS-32 | | 580
SB-32-01 | 59 |
SB-32-03 | 3 | 20
SS-25 | 34000
SB-25-01 | 180
SB-25-03 | 180
SS-22 | 170000
SB-22-01 | 18000
SB-22-03 | 300
TCLP SAMPLE PS99SS03
SS-31 | | 12 | 170
SB-31-01 | | | 75000000
SB-31-03 | 38 | 100 | 2000
SS-19 | | 6600
SB-19-01 | | 320
SB-19-01 | 3 | 56
SS-28 | 52000 | 140000
SB-28-01 | 380 | 1900
SB-28-03 | 5 | 9
SS-18 | 180000
SB-18-01 | 1200
SB-18-03 | 42000
SS-24 | 30000
SB-24-01 | 180
SB-24-03 | 28
SS-16 | 90 | 99
SB-16-01 | 26 | 28
SB-16-03 | 2 | 2
SS-10 | 31000
SB-10-01 | 450
SB-10-03 | 4
SS-11 | 19 | 150 | 850 | 330
SS-17 | 160 | 200
SS-12 | 200000
SB-12-01 | 1200
SB-12-03 | 250
SS-20
SS-19
PS-SB-1
SS-18
SS-16
SS-17
PS-GW8
SS-14
SS-15
PS-GW7
PS-SS0
PS-SS03
PS-SS03D
PS-SS04
E SOIL
ORING
WATER
S NJDEP GROUNDWATER QUALITY STANDARDS (ug/l)
S NJDEP RESIDENTIAL STANDARD
S NJDEP NON-RESIDENTIAL SOIL STANDARD
D
E
T
NAL SOIL SAMPLE LOCATIONS
ATED EXCAVATION AREA
AMPLE PS99SS01
AMPLE PS99SS02
RESULTS IN UG/KG
0
30'
60'
Sources: DE
PE
U.S. Navy RAC
Naval Weapons Station – Earle
Figure 3-1
Former Pesticide Shop
Anticipated Soil Removal Area
FOSTER WHEELER ENVIRONMENTAL CORPORATION
earle\fig4-1.dwg

APPENDIX C

ENGINEERING EVALUATION/COST ANALYSIS

ENGINEERING EVALUATION/COST ANALYSIS

FORMER PESTICIDE SHOP
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

Prepared by: Mike Heffron
Project Manager
Foster Wheeler Environmental Corporation
January 2000

1.0 EXECUTIVE SUMMARY

An Engineering Evaluation/Cost Analysis (EE/CA) is a comparative analysis of remedial options for a National Priority List (NPL) site. The EE/CA enables the development, evaluation, and selection of alternatives that will provide an effective interim remedy that is consistent with anticipated final remediation goals.

Naval Weapons Station Earle (NAVWPNSTA Earle), Former Pesticide Shop, which is no longer in service, was used to mix and store pesticides and herbicides used on the base. Apparently, containers and spraying containers were periodically rinsed out and some of the wastewaters were dumped outside the building. According to Navy personnel, the pesticides shop operated prior 1976, before RCRA regulations.

The objective of the remedial action is to remove the impacted soils and dispose of them at an appropriate facility. The analytical results of soil samples collected around the Former Pesticide Shop revealed concentrations of pesticides in the shallow soils above the NJDEP Non-Residential Cleanup Criteria. At least one of the soil samples revealed a concentration of pesticides (chlordane) characterizing the soil in some areas as hazardous waste.

The site is currently located on a secure Navy base. There is no near term or long term plan to convert this area to residential use; the current military-unique land use in the area of the site is expected to prevail.

This EE/CA has been prepared to provide documentation in the NAVWPNSTA Earle administrative record for the remedial action selected at the Former Pesticide Shop. Following a 30-day public comment period, a responsiveness summary will be prepared to address any concerns that may arise.

2.0 SITE CHARACTERIZATION AND BACKGROUND

2.1 SITE DESCPITION AND BACKGROUND

The Former Pesticide Shop is located on the Mainside portion of the base, north of the intersection of Esperance and Macassar Roads. The building served as the Former Base Pesticide Shop, but is no longer in service. Apparently, containers and spraying containers were periodically rinsed out and some of the wastewaters were dumped outside the building. According to Navy personnel, the pesticides shop operated prior 1976, before RCRA regulations.

The Former Pesticide Shop (the shop) is located in a grassy wooded area between Building C-54 and Building C-23. The shop consists of a small concrete block building (25 ft. x 12 ft.) with an asbestos transite roof. The block building sits atop a poured concrete slab. There is also a 15 ft by 8 ft. concrete pad on the northwestern side of the

building. The shop is bordered to the east by an asphalt parking lot, to the south by a grassy area and Building C-23, to the west by a grassy, wooded area and Building C-54, and to the north by a wooded area. The shop sits atop a small knoll, which slopes to the north and northwest. An in-ground former septic leach tank is located approximately 15 feet north of the shop. The primitive septic tank consists of a concrete block in-ground structure, approximately 4 feet deep. The concrete blocks are spaced apart on the bottom to allow seepage to the surrounding area. A concrete lid covers the top of the tank. There are no drawings or plans available for the septic tank, but if it is similar to other tanks excavated at the facility, pea gravel or other more permeable material surrounds the concrete-block pit. An overhead electrical line from Building C-23 supplies power to the shop. There are no other utilities entering the shop.

The laboratory analyses of soil samples collected during previous investigations at the Former Pesticide Shop revealed that the shallow soils (0- 1.5 ft) in the surrounding area contained concentrations of pesticides above the NJDEP Non-Residential Cleanup Criteria.

2.2 PREVIOUS REMEDIAL ACTIONS

There have been no known remedial actions at the site.

2.3 SOURCE, NATURE AND EXTENT OF CONTAMINATION

Chlordane was found in 20 of 23 surface soil samples collected from the soils surrounding the Former Pesticide Shop; and 4,4' DDT was found in 13 of 23 surface soil samples. The majority of the pesticide contamination is concentrated in the first 1.5 feet of the soils. Pesticides are typically non-mobile, and tend to bind to the organic matter in soils. The suspected area of contamination at the site is approximately ¼ acre. The actual extent of the surficial soil contamination shall be determined as part of this remedial action.

2.4 ANALYTICAL DATA

Brown and Root Environmental conducted a soil investigation at the Former Pesticide Shop on April 21 and 22, 1998. Twenty-three soil borings around the Former Pesticide Shop were sampled from three discrete depths (surface, one and three-feet below grade). The soil samples were analyzed for chlorinated organic pesticides by SW-846 Method 8081A. Chlordane and 4,4'-DDT were the most frequently detected pesticides found in the soil samples. Chlordane was found in 20 of 23 surface soil samples; and 4,4' DDT was found in 13 of 23 surface soil samples. The laboratory analyses of soil samples collected in the area around the pesticide shop revealed the presence of: chlordane (up to 75,000 ppm); 4,4' DDD (up to 1.5 ppm); 4,4' DDE (up to 1 ppm); and 4,4' DDT (up to 52 ppm).

On December 4, 1998 and January 9, 1999, Foster Wheeler Environmental conducted a soil and groundwater investigation at the Former Pesticide Shop. The project objectives included utilizing direct-push methods to collect soil samples and groundwater samples for the laboratory analyses of pesticides. The purpose of the sample collection was twofold. Soil samples were collected to further delineate the vertical extent of pesticide contamination in the soils at the previously identified "hotspots". Groundwater samples were collected at the site to determine if pesticides impacted the groundwater. The soil investigation determined that the majority of the pesticide contamination in the soils was restricted to the upper 2 feet of soils. No pesticides migrated to the groundwater. One herbicide (Endosulfan I) was detected in two of nine groundwater samples obtained at the site at a concentration above the NJDEP Groundwater Quality Criteria.

2.5 SITE RISK ASSESSMENT

Actual or threatened releases of pollutants or contaminants from the Former Pesticide Shop, if not addressed by implementing a remedial action, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

3.0 **IDENTIFICATION OF REMENDIAL ACTION OBJECTIVES**

3.1 STATUTORY LIMITS IN REMOVAL ACTIONS

Removal actions are generally limited by statute to a maximum cost of two million dollars and a maximum duration of 12 months, except as provided for under two types of exemptions available (emergency and consistency). The 12 month time limit and two million dollar statutory limit are governed by applicable portions of CERCLA Section 104 (b) (1). As described in this report, the proposed removal action is to incur costs of less than two million dollars and occur within a time period less than 12 months.

3.2 DETERMINATION OF REMEDIAL SCOPE

The scope of work for the Former Pesticide Shop includes an asbestos abatement of a transite roof, the demolition of the existing building, clearing of trees and vegetation, excavation of the former septic tank, and the excavation and removal of soils with pesticide concentrations greater than the NJDEP Non-Residential Cleanup Criteria.

3.3 DETERMINATION OF REMEDIAL SCHEDULE

The planned remedial action will occur from February 16, 2000 through March 14, 2000. The post-remedial report will be submitted April 10, 2000.

4.0 **INDENTIFICATION OF REMEDIAL ACTION ALTERNATIVES**

4.1 NO ACTION

No action is not a technology, but it is an option. This option entails taking no remedial measures. "No action" does not include future monitoring or future migration assessment. This option is generally considered as a baseline for comparison to other remedial actions.

Initial Screening

The analytical results of the soil samples indicate that the site could present an immediate direct contact threat. The lack of action to would not decrease the potential for direct contact exposure and potential mobilization of contaminants in soils via surface water runoff.

4.2 INSTITUTIONAL CONTROLS

Institutional controls and containment is a group of options that would slow or stop the contaminant exposure to receptors, and in some cases, the environment. These options include land use restrictions, capping with various materials, and containment via stabilization and solidification.

4.2.1 Land Use Restrictions

Land use restriction is the official limiting of access to the site, either by Navy instruction, or local code. The Pesticide Shop is within a Navy installation that presently has limited public access.

Initial Screening

Land use restriction would provide limited protection and assessment of future land use and property ownership and control can not be firmly established. Even under limited access, the contaminants may be transported via erosion/depositional processes.

4.2.2 Capping

Capping would consist of the construction of a cap over the soils at the Former Pesticide Shop using one of the available capping methods, such as asphalt, concrete, clay, bentonite, or synthetic membranes, to provide a low permeability cover.

Initial Screening

The geographic setting of the site would lend itself to capping within reasonable constraints. The capping would require clear cutting trees and vegetation as well as

grading and placement of sub-base material. There are still areas of soil contamination that have concentrations of chlordane that would require excavation due to the hazardous classification. Capping was a potential alternative, but would still require much of the same construction activities that would be employed for the source removal.

4.2.3 In-Situ Containment by Stabilization/Solidification

In solidification, a reagent is added to transform the contaminated soil into a solid like material. In stabilization, a reagent is added to transform the material so that the hazardous constituents are in a less mobile form. When both solidification and stabilization are performed, the handling and physical characteristics of the waste are improved. The surface area of the waste mass across which the transfer of loss of contaminants can occur is decreased. Also, the solubility of the hazardous constituent is limited.

Initial Screening

Although this option is technically feasible and may be effective in binding the contaminants in place, leaching of contaminants may not be prevented, and hazardous concentrations of soils would still require excavation. Therefore, this option has been eliminated from further consideration.

4.3 EXCAVATION AND OFF SITE DISPOSAL OF SOILS

Implementation of this alternative assures the removal of the potential contaminant source and is a common cost effective remedial alternative. The impacted soils will be excavated, transported, and disposed of off site at an appropriate disposal facility. Post-excavation sample collection will ensure that the removal action was effective. Upon receipt of the analytical results, concentrations will be compared to the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria. If the sample concentrations are below the cleanup criteria, the excavated areas will be backfilled with certified clean fill material and topsoil, regraded, and seeded. If the concentrations exceed the NJDEP Non-Residential Direct Contact Soil Cleanup Criteria, the removal of soils will continue until clean conditions are achieved, and confirmed by sample analysis.

This remedial alternative will also include the removal and disposal of the asbestos (transite) roof on the former pesticide building, and the demolition of the building and all associated foundations. The construction debris shall be laboratory analyzed, and then disposed off-site at an approved disposal facility. The former septic tank, and associated lines, shall also be excavated and removed as part of this remedial action.

Initial Screening

This option will provide for an effective remedy to remove the source of contamination, and thereby, reduce or remove the risks associated with the contamination. The

laboratory analyses of confirmatory soil samples will document that the remedial goals have been met. The total potential volume of soil to be excavated, transported, and disposed of is approximately 500 cubic yards.

5.0 COMPARATIVE ANALYSIS OF REMEDIAL ACTION ALTERNATIVES

Based on the initial screening of alternatives, the most effective alternative is described in Section 4.3. Exhibit 1 is the cost estimate for the total effort. This is the only alternative that effectively removes the source. This alternative includes the demolition of the existing pesticide shop building, something that would have also been addressed under some of the other alternatives.

6.0 RECOMMENDED REMEDIAL ACTION ALTERNATIVE

The alternative described in **Section 4.3** is the recommended alternative. The recommended alternative provides excellent protection to human health and the environment by removing the soils with the elevated concentrations of pesticide contamination, while also removing the former septic tank area as a source of future contamination. This reduces the potential risk to the environment and the environmental receptors.

EXHIBIT 1

Remedial Action Cost Estimate

Soil Excavation and Building Demolition
at the Former Pesticide Shop
Installation Restoration Program
Naval Weapons Station Earle

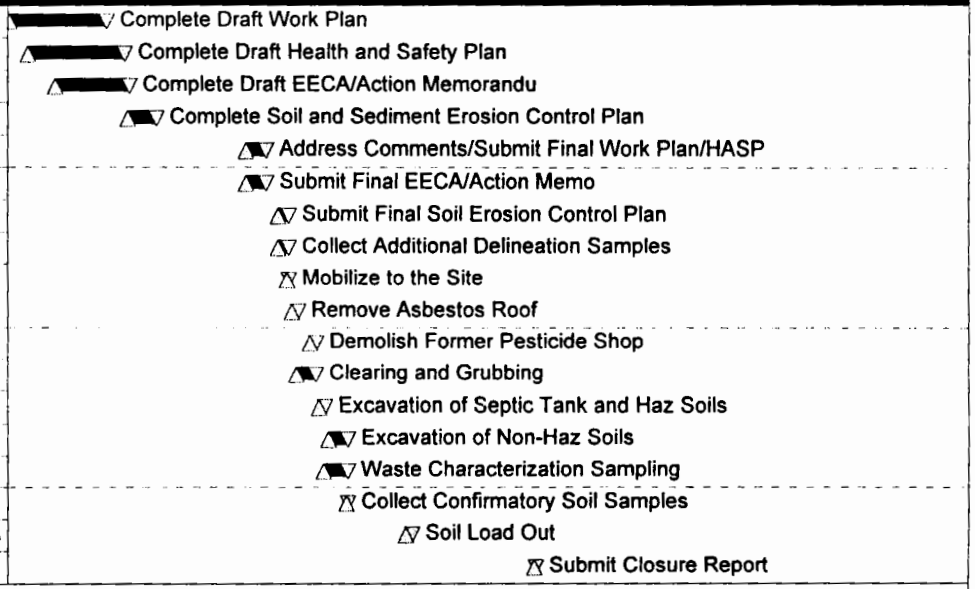
January, 2000

Remediation Labor	
Preparation, Planning, Procurement, Documentation	$11,500
Site Labor	$38,000
Subtotal Remediation Labor	$49,500
Equipment/Supplies and Materials/Laboratory Cost	$77,067
Transportation/Disposal	$125,425
Total Job	$251,992

APPENDIX D

SCHEDULE

Act ID	Description	Orig Dur	Rem Dur	Early Start	Early Finish
1000	Complete Draft Work Plan	1d	0	17DEC99 A	07JAN00 A
1040	Complete Draft Health and Safety Plan	1d	0	21DEC99 A	11JAN00 A
1050	Complete Draft EECA/Action Memorandu	1d	0	27DEC99 A	12JAN00 A
1070	Complete Soil and Sediment Erosion Control	1d	0	12JAN00 A	18JAN00 A
1080	Address Comments/Submit Final Work	1d	0	07FEB00 A	11FEB00 A
1090	Submit Final EECA/Action Memo	1d	0	07FEB00 A	11FEB00 A
1180	Submit Final Soil Erosion Control Plan	1d	0	14FEB00 A	16FEB00 A
1190	Collect Additional Delineation Samples	1d	0	14FEB00 A	16FEB00 A
1200	Mobilize to the Site	1d	0	16FEB00 A	16FEB00 A
1210	Remove Asbestos Roof	1d	0	17FEB00 A	18FEB00 A
1220	Demolish Former Pesticide Shop	1d	0	21FEB00 A	22FEB00 A
1230	Clearing and Grubbing	1d	0	18FEB00 A	22FEB00 A
1240	Excavation of Septic Tank and Haz Soils	1d	0	23FEB00 A	24FEB00 A
1250	Excavation of Non-Haz Soils	1d	0	25FEB00 A	29FEB00 A
1260	Waste Characterization Sampling	1d	0	24FEB00 A	29FEB00 A
1270	Collect Confirmatory Soil Samples	1d	0	29FEB00 A	29FEB00 A
1280	Soil Load Out	1d	0	13MAR00 A	14MAR00 A
1290	Submit Closure Report	1d	0	10APR00 A	10APR00 A



- Early start point
- Early finish point
- Early bar
- Late finish point
- Total float bar
- Progress bar
- Critical bar
- Summary bar
- Progress point
- Critical point
- Summary point
- Start milestone point
- Finish milestone point

FIGURE 9-1
NWS-EARLE
PESTICIDE SHOP
SCHEDULE OF ACTIVITIES

Date	Revision	Checked	Approved
07JAN00		MH	