

SOIL AND SEDIMENT EROSION CONTROL PLAN  
FOR THE  
FORMER PESTICIDE SHOP  
NAVAL WEAPONS STATION - EARLE  
COLTS NECK, NEW JERSEY

*Issued:*

January 18, 2000

*Prepared for:*

Naval Facilities Engineering Command  
10 Industrial Highway  
Lester, PA 19113

*Prepared by:*

Foster Wheeler Environmental Corporation  
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REMEDIAL ACTION CONTRACT N62472-94-D-0398  
DELIVERY ORDER NO. 0034

SEDIMENT EROSION CONTROL PLAN  
FOR THE  
FORMER PESTICIDE SHOP  
NAVAL WEAPONS STATION - EARLE  
COLTS NECK, NEW JERSEY

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## 1.0 INTRODUCTION

This Soil Erosion and Sediment Control Plan is being submitted by Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) on behalf of the U.S. Navy. Foster Wheeler Environmental has been contracted (RAC Contract No. N62472-94-D-0398) by the Northern Division, Naval Facilities Engineering Command (Northern Division) to further delineate excavate/off-site disposal of pesticide-contaminated soils at the Former Pesticide Shop at the Naval Weapons Station (NWS) Earle located in Colts Neck, NJ.

This Soil Erosion and Sediment Control Plan contains the background of the site, the proposed remedial activities, the Soil Erosion and Sediment Control Plan Application (Appendix A), all the appropriate drawings and maps (Appendix B), hydrogeological and soil information (Appendix C), specifications on backfilling and seeding (Appendix D), and the schedule (Appendix E).

### 1.1 PROJECT LOCATION AND DESCRIPTION

NWS-Earle is located in east-central Monmouth County in the town of Colts Neck, New Jersey. Figure 2-1 in Appendix B depicts the Regional Site Map. Building S-186 (Former Pesticide Shop) is located on the Mainside portion of the base, north of the intersection of Esperance and Macassar Roads. Figure 2-2 in Appendix B depicts the site location.

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.

## 1.2 EXISTING DRAINAGE CONDITIONS

The site currently drains to a grassy area to the west and north, and a wooded areas to the northeast. The excavation activities will not modify the existing drainage flow at the site.

The existing storm water runoff occurs as shallow flow over compacted soils covered with vegetation. Presently there are no subsurface storm water conveyances installed in the area. All storm water flows overland as shallow sheet flow from south to northeast, discharging in a wooded area at the northeast portion of the site. The Soil Erosion and Sediment Control Plan and Details Drawing in Appendix B depicts the current flow patterns for the area of disturbance. Surface water flow then travels as shallow sheet flow to the northeast and ultimately discharges into a tributary to Hockhockson Brook.

## 2.0 SCOPE OF WORK

The objectives of the this effort are to further delineate and excavate soils with pesticide concentrations over the NJDEP Non-Residential Cleanup Criteria, and demolish the former pesticide building. The building demolition will include the removal of an asbestos transit roof, and the removal of all concrete pads associated with the building.

### 2.1 TASK 1 – DELINEATION OF AREA TO BE EXCAVATED

Previous investigations at the Former Pesticide Shop have indicated that the surface soils in the surrounding area are contaminated with chlordane and DDT above the NJDEP Residential and Non-Residential Cleanup Criteria. Based on the existing analytical data, the majority of the pesticide contamination is restricted to the top one to two feet of soil across the area of impact. There are areas where elevated pesticide concentrations were detected to 3 feet below grade. The scope of this removal action is to remove the soils with pesticide concentrations above the NJDEP Non-Residential Cleanup Criteria. In order to establish the area to be excavated, additional surface soil samples need to be obtained and analyzed to delineate the boundaries of the pesticide contamination above the NJDEP Non-Residential Cleanup Criteria.

Additional soil samples shall be obtained and analyzed in accordance to the Work Plan to be approved by the Navy.

### 2.2 TASK 2 – DEMOLITION OF THE FORMER PESTICIDE SHOP

The existing structure that was the Former Pesticide Shop is a 12-foot by 28-foot concrete block structure set upon poured concrete. The building is approximately 12 feet tall and has a transite asbestos roof. It is also reported that the roofing material may be painted

with a lead-based paint. There is a 10-foot by 14-foot concrete pad located immediately north of the building.

The scope of work includes the removal of the transite panels, and the demolition of the building and the associated concrete pads.

A backhoe, equipped with a hydraulic hammer, shall be used to break apart the concrete block wall and concrete foundation and stage the broken debris on plastic. If necessary, a water spray shall be used to minimize dust during the demolition. The concrete and concrete block shall be sampled and analyzed for waste characterization and disposal. Sections 4 and 5 provide details on the sampling and analyses of the demolition debris. There are no water or ~~sewer lines~~ entering or leaving the building. There is an old septic line that drains to a septic tank, to the north of the building. The septic tank, and the associated line, shall be excavated and removed as part of the soil excavation activities.

### 2.3 TASK 3 - CLEAR CUTTING

Approximately 0.5 acres shall be clear-cut in order to complete the soil removal activities around the Former Pesticide Shop. Mature trees and brush are located to the west, north and northeast of the Former Pesticide Shop, in the areas requiring soil excavation. Trees shall be cut down to the stumps and removed from the site for recycling. The stumps shall be excavated and disposed with the soils removed from the site. The brush removed from the site shall be chipped on site and removed for recycling. The wood chips will either be used on site, or taken to an off-site recycling facility.

All soil erosion controls shall be established prior to the clear-cutting operations at the site.

### 2.4 TASK 4 - SOIL EXCAVATION

The area to be excavated shall be staked out based on previous analytical results of soil samples, as well as the analytical results of additional soil delineation samples collected during this remedial action. Based upon the available analytical data, hazardous and non-hazardous soils will be generated during the remedial action at the Former Pesticide Shop. The majority of the excavated soil is anticipated to be non-hazardous. The soils on site shall be excavated and stock-piled based upon previous and newly obtained analytical results. The suspected hazardous soils shall be stock-piled in a separate location from the suspected non-hazardous soils. All soils will be properly sampled and analyzed to determine the proper waste classification.

The soils from the septic tank, including the piping, shall be stock-piled with the soils excavated from the area to the adjacent to the northern edge of the asphalt parking lot. The soils suspected to be hazardous shall be excavated, stock-piled and sampled for waste

characterization prior to any other soils to ensure that the soils are removed from the site before 90-days to comply with federal and state regulations.

The potentially hazardous soils will be placed on double-lined polyurethane sheeting (poly). Hay bales will be placed around the soil piles, and the poly will be placed up and around the hay bales to prevent run-off from the piles as well as prevent surface run-on. The piles will be covered with poly and anchored down.

The area of excavation shall be delineated with stakes prior to excavation. Grading stakes shall also be used to determine the approximate depth of excavation below existing grade. The majority of the site shall be excavated to a depth of 1.5 feet below the existing grade. This depth is based on the available data depicting the soil concentrations greater than the Non-Residential Cleanup Criteria. Several areas will require excavation to a depth greater than 1.5 feet below grade. It is anticipated that the areas around the concrete slab, north of the Pesticide Shop, and the area north of the asphalt parking lot will be excavated to a depth of three to four feet below grade. The former septic tank, which is four feet below grade, shall also be excavated to five to six feet below grade in the immediate area of the tank.

#### 2.5 TASK 5 – SURVEY OF EXCAVATION AND SAMPLE LOCATIONS

Once the excavation is completed, a licensed surveyor shall survey the extent of the excavation, and the locations of the individual confirmatory soil samples. The survey data shall be included in the Final Close-Out Report.

#### 2.6 TASK 6 – BACKFILLING OF EXCAVATION

The excavation shall be backfilled and re-graded after a review of the confirmatory soil laboratory analytical results. The excavation shall not be backfilled until a review of the confirmatory soil laboratory analyses determine that all the soils with concentrations of pesticides and arsenic over the NJDEP Non-Residential Cleanup Criteria have been removed and Navy direction is received.

Certified-clean fill and topsoil will be placed in the excavation to restore the site to the original grade elevations. A tracked bulldozer and a vibratory roller shall be used to place, grade and compact the fill material. The fill material shall be placed to within 6 inches of the final grade. The final 6 inches of the surface shall be backfilled with topsoil and seeded in accordance with Appendix D.

The topsoil shall be treated with lime and fertilizer, seeded and mulched upon the completion of the final grade. The topsoil will be tested in an approved laboratory to determine fertilization and liming requirements. The seed shall be placed in accordance with the specifications contained in Appendix D.

#### **4.0 SOIL AND EROSION CONTROL MEASURES DURING CONSTRUCTION ACTIVITIES**

There are three major phases of construction for remediation of the Former Pesticide Shop: 1) demolition of the existing structure; 2) clear cutting the trees and brush, 3) excavating the contaminated soils, and 4) backfilling, re-grading and seeding.

Prior to the start of any activities, silt fenced will be placed around the perimeter of the site as depicted in the Soil Erosion and Sediment Control Plan in Appendix B.

Excavated soils shall be stock-piled on plastic sheeting and covered. The soils shall be stockpiled within the silt fence prior to off-site removal to minimize potential erosion off-site. Excavated soils will be removed from the site within one to two weeks of excavation.

The excavation shall be backfilled and seeded in accordance to the specifications contained in Appendix D.

***APPENDIX A***  
***Soil Erosion and Sediment Control Plan Application***



For District Use Only	
Application Number	
Disposition	

## APPLICATION FOR SOIL EROSION AND SEDIMENT CONTROL PLAN CERTIFICATION

The enclosed soil erosion and sediment control plan and supporting information are submitted for certification pursuant to the Soil Erosion and Sediment Control Act, Chapter 251, P.L. 1975 as amended (NJSA 4:24-39 et seq.). An application for certification of a soil erosion and sediment control plan shall include the items listed on the reverse side of this form.

Name of Project <b>Former Pesticide Shop Remediation</b>		Project Location: Municipality <b>Monmouth</b>	
Project Street Address <b>Macassar Rd, Colts Neck, NJ</b>		Block <b>N/A</b>	Lot <b>N/A</b>
Project Owner(s) Name <b>U.S. Navy-contact Dan Zari</b>		Phone <b>(732) 866-2046</b>	
Project Owner(s) Address <b>201 Highway 34 South</b>		City <b>Colts Neck</b>	State <b>NJ</b>
Total Area of Project <b>1 Acre</b>	Total Area of Land to be Disturbed <b>5400 ft<sup>2</sup></b>	No. Dwelling or other Units <b>N/A</b>	Zip <b>07722</b>
Plans Prepared by* <b>Foster Wheeler Environmental Corporation</b>		Fee <b>\$ 330</b>	

Address <b>One Oxford Valley, Suite 200</b>		State <b>PA</b>	Zip <b>19047</b>	Phone <b>(215) 702-4015</b>
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Engineering related items of the Soil Erosion and Sediment Control Plan MUST be prepared by or under the direction of and be sealed by a Professional Engineer or Architect licensed in the State of New Jersey, in accordance with NJAC 13:27-6.1 et. seq.)

Person Responsible During Construction <b>Dan Zari</b>		Job Supervisor <b>Mike Heffron</b>	
Address <b>201 Highway, 34 South Bld C-23, Colts Neck</b>		Address <b>One Oxford Valley, Suite 200, Langhorne</b>	
State <b>NJ</b>	Zip <b>07722</b>	State <b>PA.</b>	Zip <b>19047</b>
Phone <b>(732) 866-2046</b>		Phone <b>(215) 702-4015</b>	

The applicant hereby certifies that all soil erosion and sediment control measures are designed in accordance with current Standards for Soil Erosion and Sediment Control in New Jersey and will be installed in accordance with those Standards and the plan as approved by the Soil Conservation District and agrees as follows:

- 1. To notify the District in writing at least 48 hours in advance of any land disturbance activity. Failure to provide such notification may result in additional inspection fees.
- 2. To notify the District upon completion of the Project. (Note: No certificate of occupancy can be granted until a report of compliance is issued by the District.
- 3. To maintain a copy of the certified plan on the project site during construction.
- 4. To allow District agents to go upon project lands for inspection.
- 5. That any conveyance of this project or portion thereof prior to its completion will transfer full responsibility for compliance with the certified plan to any subsequent owners.
- 6. To comply with all terms and conditions of this application and certified plan including payment of all fees prescribed by the district fee schedule hereby incorporated by reference.

The applicant hereby acknowledges that structural measures contained in the Soil Erosion and Sediment Control Plan are reviewed for adequacy to reduce offsite soil erosion and sedimentation and not for adequacy of structural design. The applicant shall retain full responsibility for any damages which may result from any construction activity notwithstanding district certification of the subject soil erosion and sediment control plan. It is understood that approval of the plan submitted with this application shall be valid only for the duration of the initial project approval granted by the municipality. All municipal renewals of this project will require resubmission and approval by the district. In no case shall this approval extend beyond three and one half years at which time resubmission and certification by the district will be required.

Applicant Certification		3. Plan determined complete:	
Signature _____	Date _____	Signature of District Official _____	Date _____
Applicant Name (Print) _____		4. Plan certified, denied or other action as noted above.	
Receipt of fee, plan and supporting documents is hereby acknowledged:		Special Remarks:	
Signature of District Official _____	Date _____	Signature of District Official _____	Date _____

If other than project owner, written authorization of owner must be attached.

FREEHOLD SOIL CONSERVATION DISTRICT

ADDENDUM TO APPLICATION

APPLICATION BY CORPORATION OR PARTNERSHIP

OWNERSHIP DISCLOSURE AFFIDAVIT

Freehold Soil Conservation District respectfully requests that all applicants submit a complete list of ownership for purposes of determining conflicts of interest between the applicant and the Board members or their professionals. Attach Rider if necessary.

A Corporation must also indicate its Registered Agency and Officers.

A Corporation or Partnership applying to the Freehold Soil Conservation District for Soil Erosion and Sediment Control Plan Certification, or applying for any other permits or review, shall list the names and addresses of all stockholders or individual partners owning at least 10% of its stock of any class, or at least 10% of the interest in the partnership, as the case may be.

This disclosure requirement is continuing during the Certification period and transfer of ownership more than 10% must be disclosed.

Name and address of Applicant: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(If Corporation: Name and Address of Registered Agent and Officers:)  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Stockholders/Partners:  
1. \_\_\_\_\_  
\_\_\_\_\_  
2. \_\_\_\_\_  
\_\_\_\_\_  
3. \_\_\_\_\_  
\_\_\_\_\_  
4. \_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Print Name of Authorized Signatory

\_\_\_\_\_  
Authorized Signature/Date

\_\_\_\_\_  
Title

Sworn to and subscribed before me  
this        day of                    19

\_\_\_\_\_  
NOTARY PUBLIC OF NEW JERSEY

An application for certification of a soil erosion and sediment control plan shall include the following items.

1. One copy of the complete subdivision, site plan or construction permit application, including key map as submitted to the municipality (Architectural drawings and building plans and specifications not required.) which includes the following:
  - a. Location of present and proposed drains and culverts with their discharge capacities and velocities and supporting computations and identification of conditions below outlets.
  - b. Delineation of any area subject to flooding from the 100-year storm in compliance with the Flood Plains Act (NJSA 58:16A) or applicable municipal zoning.
  - c. Delineation of streams, wetlands, pursuant to NJSA 13:98 and other significant natural features within the project area.
  - d. Soils and other natural resource information used. (Delineation of the project site on soil map is desirable.)
  - e. Land cover and use of area adjacent to the land disturbance.
  - f. All hydraulic and hydrologic data, specifically HEC1, HEC2, WSP2 and TR20 electronic input files, is used, of existing and proposed conditions and a completed copy of the Hydraulic and Hydrologic Data Base Summary Form, SSCC 251 HDF 1.
2. Four\* copies of the soil erosion and sediment control plan at the same scale as the site plan submitted to the municipality or other land use approval agency to include the following (this information shall be detailed on the plat):
  - a. Proposed sequence of development including duration of each phase in the sequence.
  - b. Site grading plan showing delineation of land areas to be disturbed including proposed cut and fill areas together with existing and proposed profiles of these.
  - c. Contours at a two\* foot interval, showing present and proposed ground elevation.
  - d. Locations of all streams and existing and proposed drains and culverts.
  - e. Stability analysis of all channels below all points of stormwater discharge which demonstrates a stable condition will exist or there will be no degradation of the existing stability.
  - f. Location and detail of all proposed erosion and sediment control structures including profiles, cross sections, appropriate notes, and supporting computations.
  - g. Location and detail of all proposed nonstructural methods of soil stabilization including types and rates of lime, fertilizer, seed, and mulch to be applied.
  - h. Control measures for non-growing season stabilization of exposed areas where the establishment of vegetation is planned as the final control measure.
  - i. For residential development - control measures to apply to dwelling construction on individual lots and notation that such control measures shall apply to subsequent owners if title is conveyed. This notation shall be shown on the final plat.
  - j. Plans for maintenance of permanent soil erosion and sediment control measures and facilities during and after construction, also indicating who shall have responsibility for such maintenance.
3. Appropriate fees: (As adopted by the individual district.)
4. Additional items as may be required.

\*(Individual districts may require modifications in the above list.)

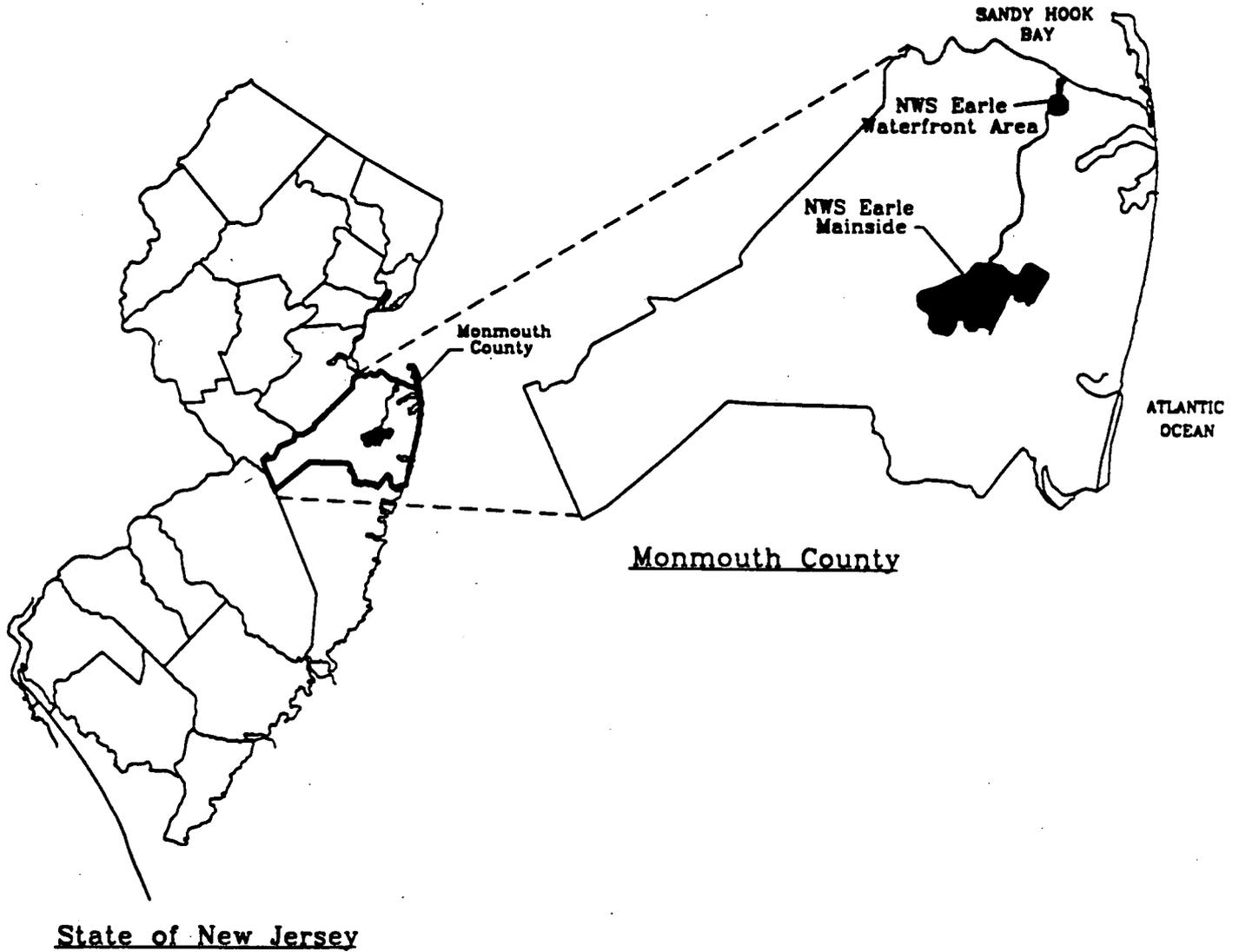
Addendum to Application For Soil Erosion and Sediment Control Plan Certification  
Naval Weapons Station-Earle, Colts Neck, New Jersey  
U.S. Navy Contract No. N62472-94-D-0398  
Delivery Order No. 0034  
Former Pesticide Shop

- 1.a. There are no existing or proposed drains or culverts associated with or in the vicinity of the site.
- 1.b. The project is not located within the 100-year flood plain. See the Flood Plain Map in Appendix B.
- 1.c. The topographic map in Appendix B depicts the site in relation to nearby streams.
- 1.d. The location of the project site is indicated on the soil map in Appendix C. Soils are predominately sands at the site. Specific soil type descriptions for soils with in and adjacent to the project area are also provided in Appendix C.
- 1.e. The figures in Appendix B depict the area adjacent to the site. The site is located on a secure Navy Base. The Former Pesticide Shop is located in a grassy and wooded area adjacent to buildings used for office personnel.
- 1.f. The site is located within the outcrop area of the Vincentown Formation. The Vincentown Formation in the vicinity of the site is comprised of brown pebbly, silty, fine-to medium grained sand. Based on slug test data collected from nearby monitoring wells, the hydraulic conductivity of the soils in the area range from  $1.39 \times 10^{-3}$  cm/sec to  $6.79 \times 10^{-4}$  cm/sec. Appendix C contains the section of the Remedial Investigation Report that provides the hydraulic conductivity data.
- 2.a. The duration of the project is depicted in the schedule located in Appendix E.
- 2.b. The site plan depicting the area to be disturbed is included in Appendix B. Only 1.5 feet of the upper soil surface shall be excavated to remove the contaminated soils, and then backfilled and compacted to match the existing grade. The existing topography shall not be altered.
- 2.c. The topographic map of the surrounding area provides the contour intervals. The site topography shall be maintained after the execution of the project.
- 2.d. There are no streams located in the immediate vicinity of the site. The topographic map in Appendix B depicts the locations of the nearest streams.

Addendum to Application For Soil Erosion and Sediment Control Plan Certification  
Naval Weapons Station-Earle, Colts Neck, New Jersey  
U.S. Navy Contract No. N62472-94-D-0398  
Delivery Order No. 0034  
Former Pesticide Shop

- 2.e. There are stormwater discharge areas in the immediate vicinity of the site. The overland flow at the site will not be changed by the proposed operations.
- 2.f. The location and detail of the proposed erosion and sediment control structures are included on the Soil Erosion Control Plan in Appendix B.
- 2.g. Soil stabilization details are provided in the general notes of the Soil Erosion Control Plan in Appendix B.
- 2.h. Silt fence will be left in place until vegetation has been established.
- 2.i. Not applicable, this in a non-residential application.
- 2.j. No permanent maintenance is required. Establishment of vegetation will return the site to natural condition.
- 3. The appropriate fee of \$330.00 is enclosed with this application.

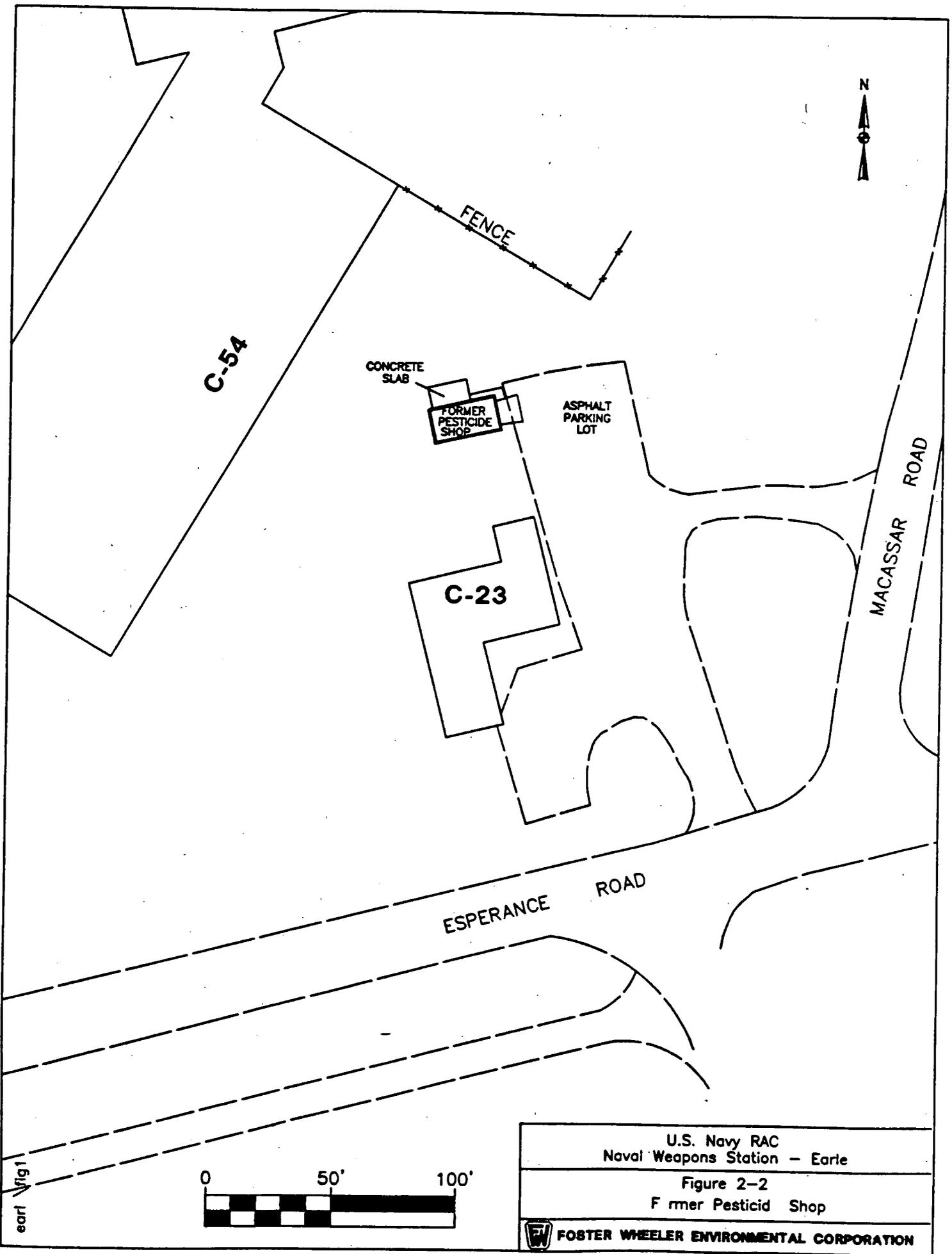
***APPENDIX B***  
***Drawings and Maps***



NOT TO SCALE

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

Figure 2-1  
Regional Site Map



C-54

FENCE

CONCRETE SLAB

FORMER PESTICIDE SHOP

ASPHALT PARKING LOT

C-23

MACASSAR ROAD

ESPERANCE ROAD

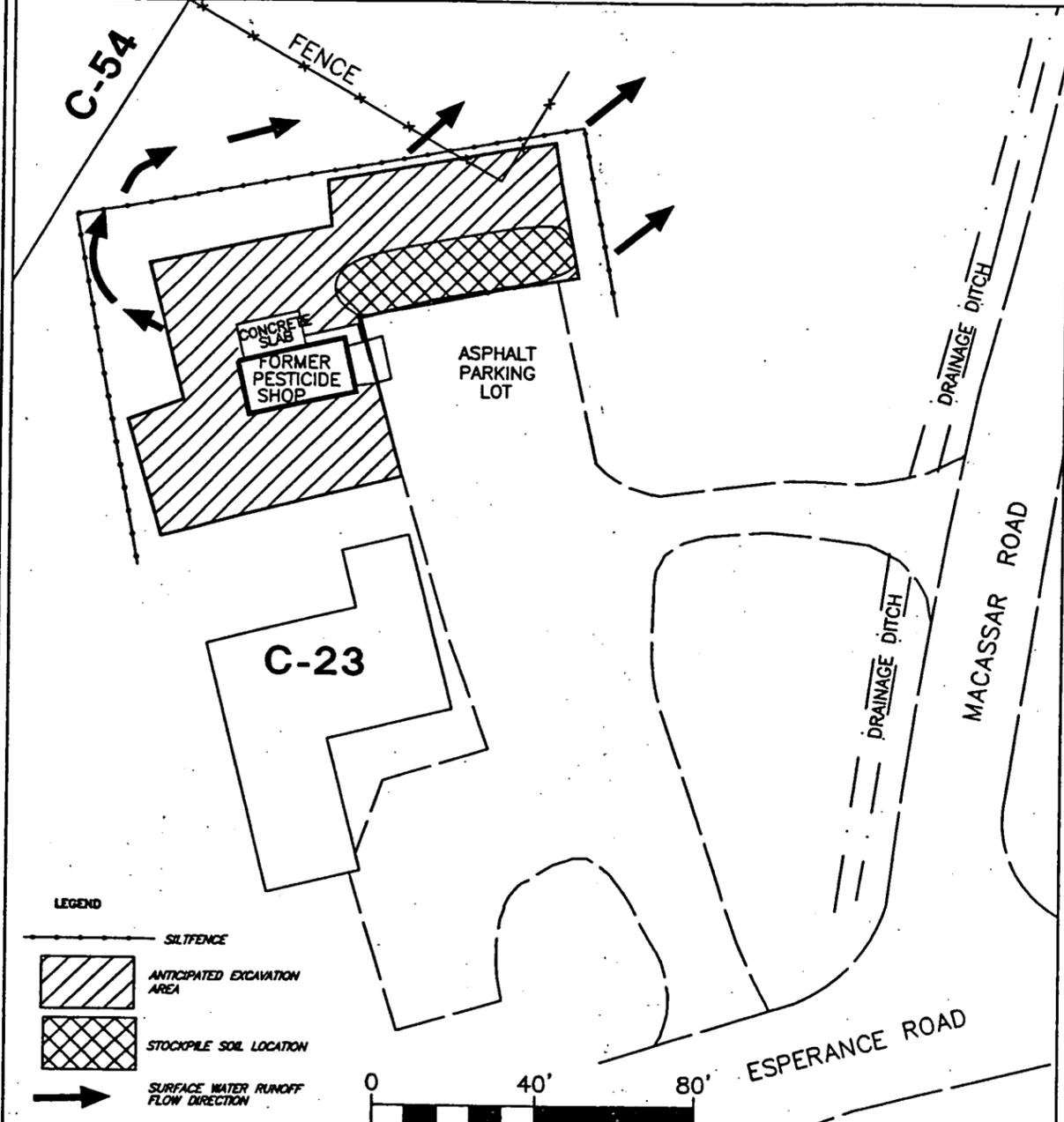
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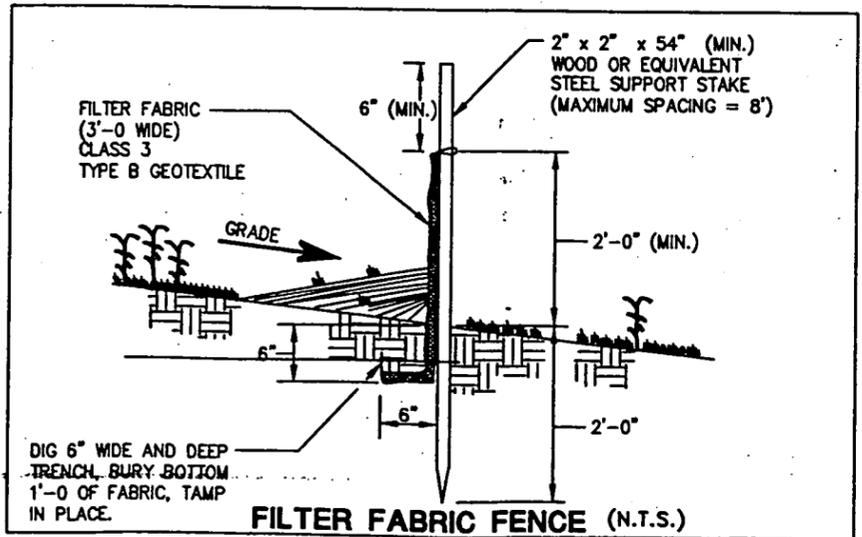
U.S. Navy RAC Naval Weapons Station - Earle
Figure 2-2 Former Pesticid Shop
 FOSTER WHEELER ENVIRONMENTAL CORPORATION

**SOIL EROSION AND SEDIMENT CONTROL NOTES**

- All soil erosion and sediment control practices are to be installed prior to any major soil disturbance, or in their proper sequence, and maintained until permanent protection is established.
- Any disturbed areas that will be left exposed more than thirty (30) days, and not subject to construction traffic, will immediately receive a temporary seeding. If the season prevents the establishment of a temporary cover, the disturbed areas will be mulched with straw, or equivalent material, at a rate of two tons per acre, according to state standards.
- Permanent vegetation to be seeded or sodded in all exposed areas within ten (10) days after final grading, mulch or suitable equivalent to be used as necessary for protection until seeding is established.
- All work to be done in accordance with the standards for soil erosion and sediment control of New Jersey.
- Immediately following initial disturbance or rough grading, all critical areas subject to erosion (i.e., steep slopes and roadway embankments) will receive a temporary seeding in combination with straw mulch or a suitable equivalent, at a rate of two (2) tons per acre, according to state standards.
- The standard for stabilized construction entrance requires the installation of a pad of 1-1/2 inch to 2 inch stone, at all construction driveways, immediately after initial site disturbance.
- In accordance with the standard for permanent vegetative cover for soil stabilization, any soil having a pH of 4 or less or containing iron sulfides shall be covered with a minimum of 12 inches of soil having a pH of 5 or more prior to seedbed preparation.
- The Freehold Soil Conservation District shall be notified seventy-two (72) hours in advance of any land disturbing activity.
- At the time the site preparation for permanent vegetative stabilization is going to be accomplished, any soil that will not provide a suitable environment to support adequate vegetative ground cover shall be removed or treated in such a way that will permanently adjust the soil conditions and render it suitable for vegetative ground cover. If the removal or treatment of the soil will not provide suitable conditions, nonvegetative means of permanent ground stabilization will have to be employed.
- In that N.J.S.A. 4:24-39 et.seq. requires that no certificates of occupancy be issued before the provisions of the certified plan for erosion control have been complied with for permanent measures, all site work for site plans and all work around individual lots in subdivision will have to be completed prior to the District issuing a report of compliance for the issuance of a certificate of occupancy by the municipality.
- Any changes to the certified soil erosion and sediment control plans will require the submission of revised soil erosion and sediment control plans to the District for recertification. The revised plans must meet all current state soil erosion and sediment control standards.
- Unfiltered dewatering is not permitted. Take all necessary precautions during all dewatering operations to minimize sediment transfer.
- Should the control of dust at the site be necessary, the site will be sprinkled until the surface is wet, temporary vegetative cover shall be established or mulch shall be applied in accordance with state standards for erosion control.
- All soil washed, dropped, spilled, or tracked outside the limit of disturbance or onto public right-of-ways will be removed immediately.
- The property owner shall be responsible for any erosion or sedimentation that may occur below stormwater outfalls or off-site as a result of construction of the project.
- Stockpile and staging locations determined in the field, shall be placed within the limit of disturbance according to the certified plan. Staging and stockpiles not located within the limit of disturbance will require certification of a revised soil erosion and sediment control plan. The District reserves the right to determine when certification of a new and separate soil erosion and sediment control plan will be required for these activities.
- All soil stockpiles are to be temporarily stabilized in accordance with Soil Erosion and Sediment Control Note 2.
- A copy of the certified soil erosion and sediment control plan will be available at the site.
- All temporary soil erosion measures must be inspected (and repaired if needed) after any significant rain event.



Sources: DELINEATION SAMPLING ANALYSIS REPORT, FORMER PESTICIDE SHOP. NUS, Brown & Root, Feb. 1998  
 REPORT FOR PESTICIDE INVESTIGATION, FOSTER WHEELER ENVIRONMENTAL CORPORATION, March, 1999.

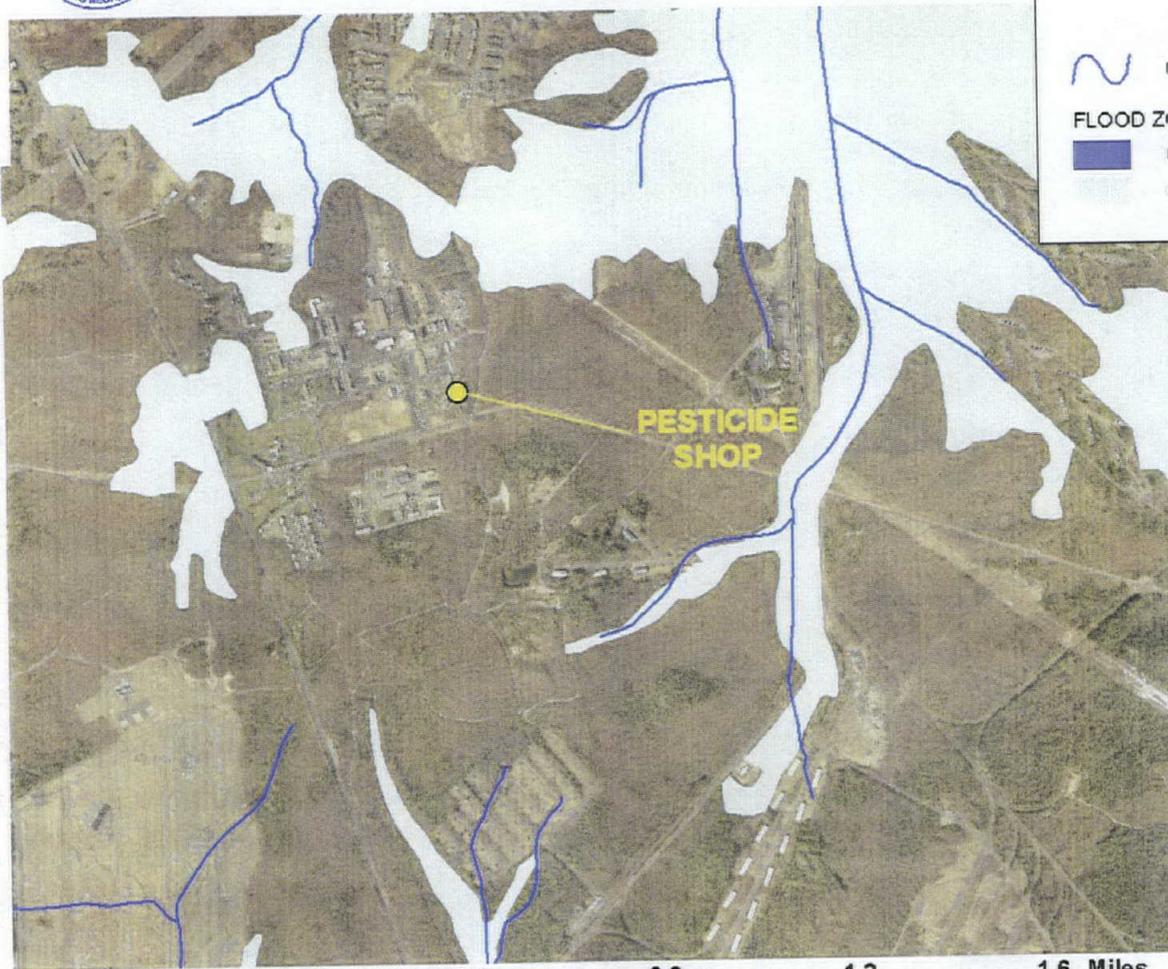


FOSTER WHEELER ENVIRONMENTAL		DATE	
ESK	CH ENR	DATE	DATE
SUBMITTED BY: (TYPE NAME)		DATE	DATE
DRAWN BY: (TYPE NAME)		DATE	DATE
OFFICE IN CHARGE		DATE	DATE
APPROVED		DATE	DATE
DEPARTMENT OF THE NAVY		NORTH DIV FOR COMMANDER, NAVFAC	
NAVAL FACILITIES ENGINEERING COMMAND		DATE	
PENNSYLVANIA		DATE	
NORTHERN DIVISION		DATE	
LESTER		DATE	
FORMER PESTICIDE SHOP		DATE	
SOIL EROSION & SEDIMENT CONTROL PLANS & DETAILS		DATE	
APPROVED		DATE	
DATE CREATED		DATE	
LATEST CHANGE		DATE	
CHANGED BY:		DATE	
SAT TO		DATE	
CODE LD. NO.		80091	
SCALE: AS NOTED		DATE	
SPEC. NO. 04-		DATE	
CONSTR. CONTR. NO.		DATE	
NAVFAC DRAWING NO.		DATE	
SHEET		OF	
SIZE:		DATE	
B		DATE	

*(Signature)*  
 NJ PROFESSIONAL ENGINEER NO. 381152



# PESTICIDE SHOP



**LEGEND**

 USGS HYDROGRAPHY LINES

**FLOOD ZONES**

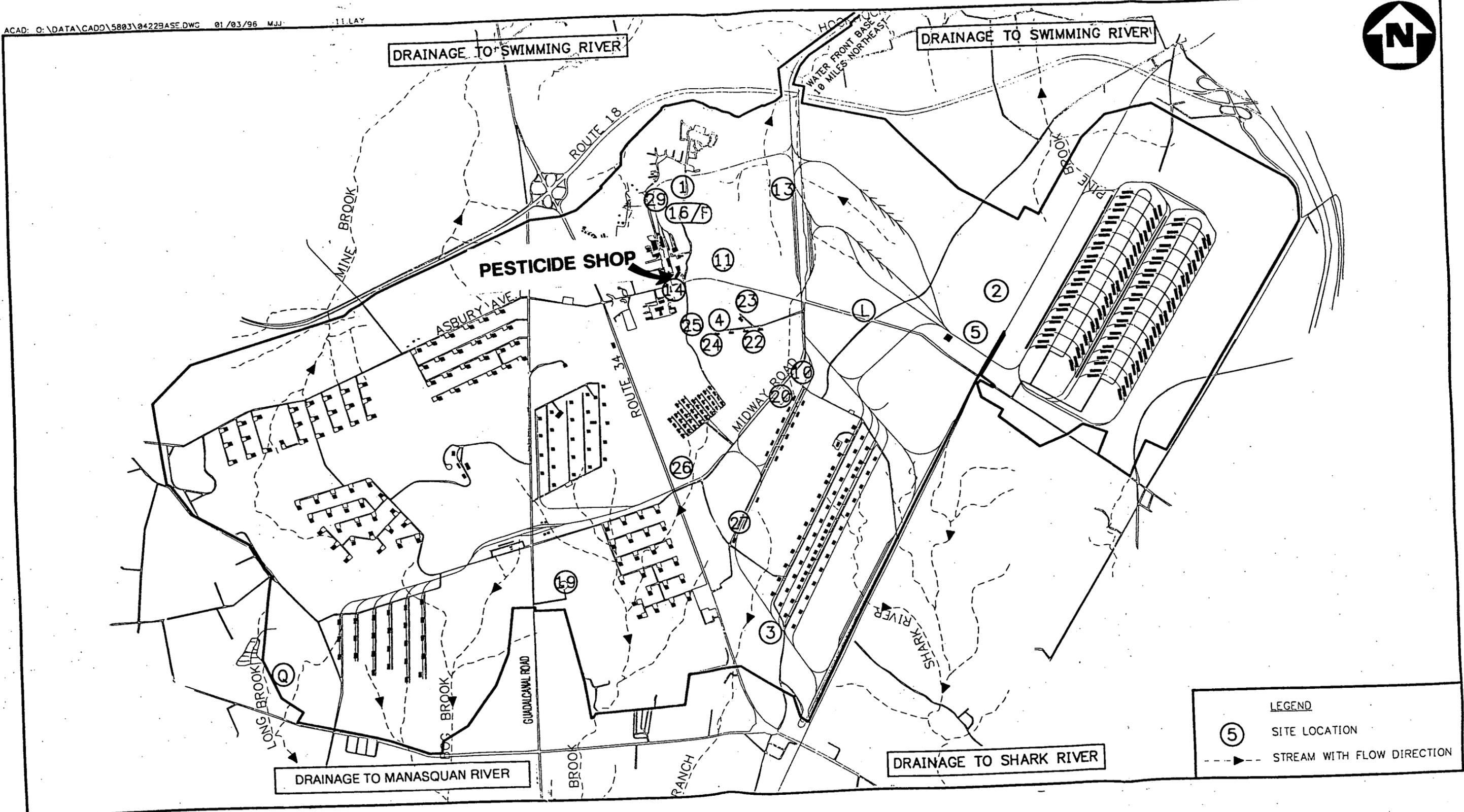
 USGS Floodprone.

 Undocumented Area



DIGITAL ORTHOPHOTOGRAPHY  
COPYRIGHT, 1997  
COUNTY OF MONMOUTH N.J.

Note: Since the NWS-Earle Base is a federal facility, no FEMA Flood Maps exist for streams on the base. The "Undocumented Flood Areas" are those areas where no flooding has been documented, however, areas of similar elevations in the area were found to have evidence of flooding.



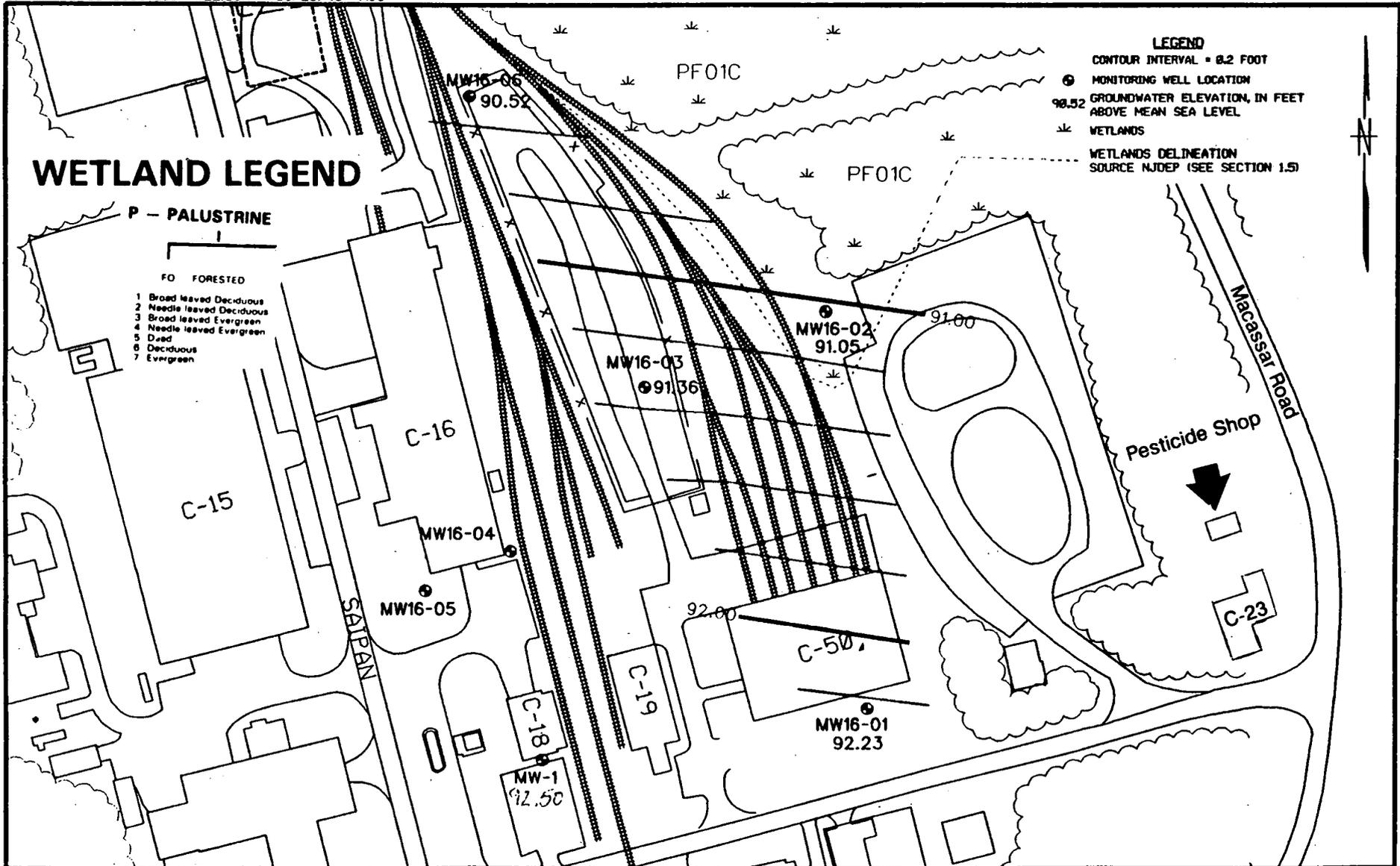
**SITE LOCATIONS AND SURFACE DRAINAGE MAP**  
NWS EARLE, COLTS NECK, NEW JERSEY



**FIGURE 1-1**

Source : **Brown & Root Environmental**  
RI Report, 1995



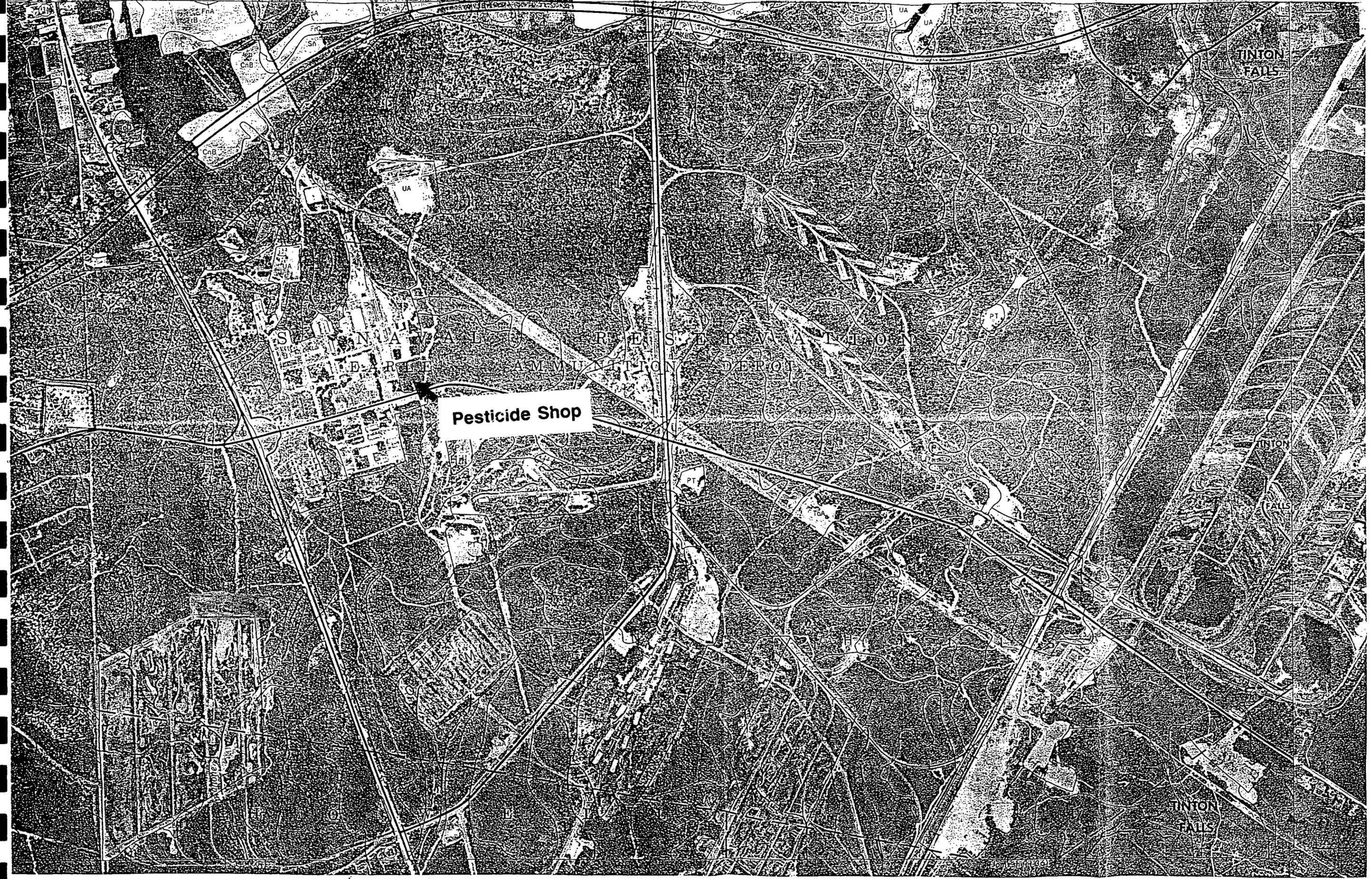


**WETLANDS DETERMINATION  
GROUNDWATER CONTOUR MAP OCTOBER 17, 1995  
SITE 16 AND EPIC SITE F**

**FIGURE 18-4**



***APPENDIX C***  
***Geological and Soil Information***



**Pesticide Shop**

This map is compiled on 1970 aerial photography by the U. S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and grid dimensions, if shown, are approximately indicated.

### SOIL LEGEND

Publication symbols consist of letters or a combination of letters and numbers. The initial two letters represent the kind of soil. A capital letter of A, B, C, D or E following the first two letters indicates the class of slope. Symbols without a slope letter are for nearly level soils, soils named for higher categories or for miscellaneous areas. A number following the letter represents an eroded phase.

SYMBOL	NAME	SYMBOL	NAME
AeA	Adelphia loam, 0 to 2 percent slopes	KeA	Keypport sandy loam, 0 to 2 percent slopes
AeB	Adelphia loam, 2 to 5 percent slopes	KeB	Keypport sandy loam, 2 to 5 percent slopes
ALA	Adelphia loam - Urban land complex, 0 to 5 percent slopes	KeC	Keypport sandy loam, 5 to 10 percent slopes
At	Atsion sand	KeD	Keypport sandy loam, 10 to 15 percent slopes
Cm	Colemantown loam	KGB	Keypport sandy loam - Urban land complex, 0 to 10 percent slopes
CnB	Collington sandy loam, 2 to 5 percent slopes	KIA	Kiej loamy sand, 0 to 3 percent slopes
CnC2	Collington sandy loam, 5 to 10 percent slopes, eroded	KmB	Kiej loamy sand, clayey substratum, 0 to 5 percent slopes
CnD3	Collington sandy loam, 10 to 15 percent slopes, severely eroded	KUA	Kiej loamy sand - Urban land complex, 0 to 3 percent slopes
CoA	Collington loam, 0 to 2 percent slopes	KvA	Kresson loam, 0 to 5 percent slopes
CRB	Collington sandy loam - Urban land complex, 0 to 10 percent slopes	LaA	Lakehurst sand, 0 to 2 percent slopes
CIB	Colts Neck sandy loam, 2 to 5 percent slopes	LeB	Lakewood sand, 0 to 5 percent slopes
CIC	Colts Neck sandy loam, 5 to 10 percent slopes	LeC	Lakewood sand, 5 to 10 percent slopes
CIC2	Colts Neck sandy loam, 5 to 10 percent slopes, eroded	Ma	Manahawkin muck
CID2	Colts Neck sandy loam, 10 to 15 percent slopes, eroded	MbC	Marlton sandy loam, 5 to 10 percent slopes
CIE2	Colts Neck sandy loam, 15 to 25 percent slopes, eroded	MIB	Marlton loam, 2 to 5 percent slopes
DnA	Downer loamy sand, 0 to 5 percent slopes	PeA	Pemberton loamy sand, 0 to 5 percent slopes
DnC	Downer loamy sand, 5 to 10 percent slopes	PhB	Phalanx loamy sand, 0 to 10 percent slopes
DoA	Downer sandy loam, 0 to 2 percent slopes	PhD	Phalanx loamy sand, 10 to 25 percent slopes
DoB	Downer sandy loam, 2 to 5 percent slopes	PT	Pits, sand and gravel
DJB	Downer sandy loam - Urban land complex, 0 to 10 percent slopes	PW	Psammets, waste substratum
En	Elkton loam	SaB	Sassafras sandy loam, 2 to 5 percent slopes
EvB	Evesboro sand, 2 to 5 percent slopes	SaC	Sassafras sandy loam, 5 to 10 percent slopes
EvC	Evesboro sand, 5 to 10 percent slopes	SaD	Sassafras sandy loam, 10 to 15 percent slopes
EvD	Evesboro sand, 10 to 15 percent slopes	SaE	Sassafras sandy loam, 15 to 25 percent slopes
EvE	Evesboro sand, 15 to 25 percent slopes	SgB	Sassafras gravelly sandy loam, 2 to 5 percent slopes
EWB	Evesboro sand - Urban land complex, 0 to 10 percent slopes	SgC	Sassafras gravelly sandy loam, 5 to 10 percent slopes
Fb	Fallsington loam	SIA	Sassafras loam, 0 to 2 percent slopes
FnA	Freehold loamy sand, 0 to 5 percent slopes	Sn	Shrewsbury sandy loam
FnC	Freehold loamy sand, 5 to 10 percent slopes	SS	Sulfaquents and Sulfihemists, frequently flooded
FrB	Freehold sandy loam, 2 to 5 percent slopes	ToA	Tinton loamy sand, 0 to 5 percent slopes
FrC	Freehold sandy loam, 5 to 10 percent slopes	ToC	Tinton loamy sand, 5 to 10 percent slopes
FrC2	Freehold sandy loam, 5 to 10 percent slopes, eroded	ToD	Tinton loamy sand, 10 to 25 percent slopes
FrD	Freehold sandy loam, 10 to 15 percent slopes	TUB	Tinton loamy sand - Urban land complex, 0 to 5 percent slopes
FrD2	Freehold sandy loam, 10 to 15 percent slopes, eroded	UA	Udorthents, smoothed
FrE2	Freehold sandy loam, 15 to 25 percent slopes, eroded	UD	Udorthents - Urban land complex, 0 to 3 percent slopes
FsA	Freehold loam, 0 to 2 percent slopes	UL	Urban land
FUB	Freehold sandy loam - Urban land complex, 0 to 10 percent slopes	WnB	Woodstown sandy loam, 2 to 5 percent slopes
HaB	Hammonton loamy sand, 0 to 3 percent slopes	WoA	Woodstown loam, 0 to 2 percent slopes
HbA	Hammonton sandy loam, 0 to 2 percent slopes		
HbB	Hammonton sandy loam, 2 to 5 percent slopes		
HLA	Hammonton sandy loam - Urban land complex, 0 to 3 percent slopes		
HnA	Holmdel sandy loam, 0 to 2 percent slopes		
HnB	Holmdel sandy loam, 2 to 5 percent slopes		
HUA	Holmdel sandy loam - Urban land complex, 0 to 5 percent slopes		
HwB	Hooksan sand, 0 to 5 percent slopes		
HxA	Hooksan Variant sand, 0 to 2 percent slopes		
HV	Humaquepts, frequently flooded		

### CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

#### CULTURAL FEATURES

BOUNDARIES	MISCELLANEOUS CULTURAL FEATURES
National, state or province	Farmstead, house (omit in urban areas)
County or parish	Church
Minor civil division	School
Reservation (national forest or park, state forest or park, and large airport)	Indian mound (label)
Land grant	Located object (label)
Limit of soil survey (label)	Tank (label)
Field sheet matchline & neatline	Wells, oil or gas
AD HOC BOUNDARY (label)	Windmill
Small airport, airfield, park, cemetery, or flood pool	Kitchen midden
STATE COORDINATE TICK	
LAND DIVISION CORNERS (sections and land grants)	
ROADS	
Divided (median shown if scale permits)	
Other roads	
Trail	
ROAD EMBLEM & DESIGNATIONS	
Interstate	
Federal	
State	
County, farm or ranch	
RAILROAD	
POWER TRANSMISSION LINE (normally not shown)	
PIPE LINE (normally not shown)	
FENCE (normally not shown)	
LEVEES	
Without road	
With road	
With railroad	
DAMS	
Large (to scale)	
Medium or small	
PITS	
Gravel pit	
Mine or quarry	

#### MISCELLANEOUS CULTURAL FEATURES

Farmstead, house (omit in urban areas)	
Church	
School	
Indian mound (label)	
Located object (label)	
Tank (label)	
Wells, oil or gas	
Windmill	
Kitchen midden	

#### WATER FEATURES

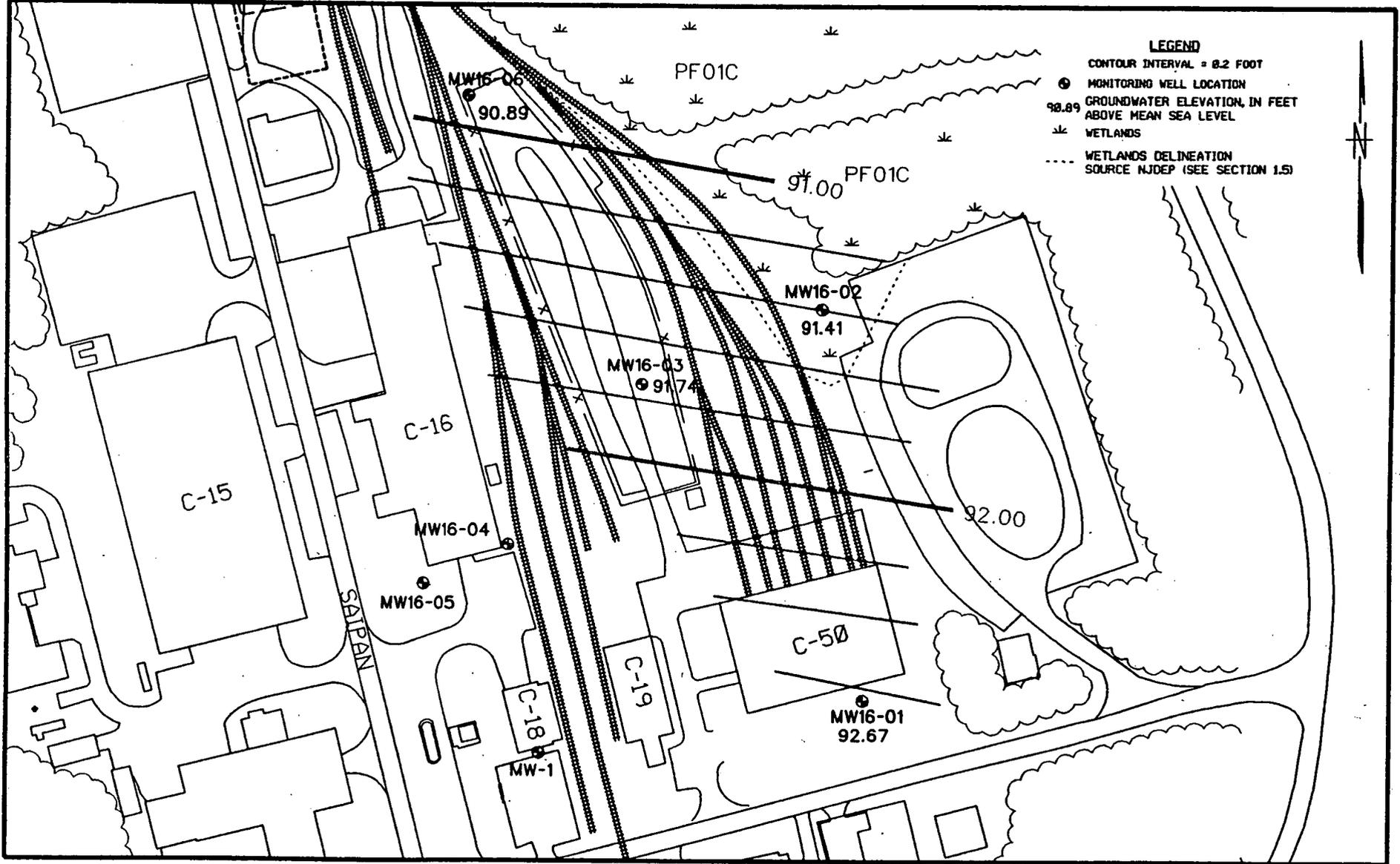
DRAINAGE	LAKES, PONDS AND RESERVOIRS
Perennial, double line	Perennial
Perennial, single line	Intermittent
Intermittent	Drainage end
Drainage end	Canals or ditches
Canals or ditches	Double-line (label)
Double-line (label)	Drainage and/or irrigation
Drainage and/or irrigation	

#### MISCELLANEOUS WATER FEATURES

Marsh or swamp	
Spring	
Well, artesian	
Well, irrigation	
Wet spot	

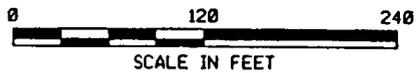
#### SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS	ESCARPMENTS
Escarpment (points down slope)	Bedrock (points down slope)
Other than bedrock (points down slope)	Other than bedrock (points down slope)
SHORT STEEP SLOPE	
GULLY	
DEPRESSION OR SINK	
SOIL SAMPLE SITE (normally not shown)	
MISCELLANEOUS	
Blowout	
Clay spot	
Gravelly spot	
Gumbo, slick or scabby spot (sodic)	
Dumps and other similar non soil areas	
Prominent hill or peak	
Rock outcrop (includes sandstone and shale)	
Saline spot	
Sandy spot	
Severely eroded spot	
Slide or slip (tips point upslope)	
Stony spot, very stony spot	



**GROUNDWATER CONTOUR MAP AUGUST 7, 1995  
SITE 16 AND EPIC SITE F**

**FIGURE 18-3**



**Table 18-3  
Site 16/F Monitoring Well Characteristics Summary  
NWS Earle, Colts Neck, New Jersey**

Monitoring Well Number	Total Depth <sup>(1)</sup> (feet)	Ground Surface Evaluation <sup>(2)</sup>			Approximate Depth to Water <sup>(1)</sup> (feet)	Screened Interval Depth <sup>(1)</sup> (feet)	Filter Pack Interval Depth <sup>(1)</sup> (feet)
		Top of Concrete Pad	Top of PVC Riser	Top of Standpipe			
MW16-1	16	101.05	102.34	103.01	8	6 to 16	3 to 16
MW16-2	15	96.57	98.48	99.03	6	5 to 15	4 to 15
MW16-3	16	99.85	99.59	99.86	9	6 to 16	3.5 to 16
MW16-4	18	102.29	104.30	104.84	11	8 to 18	6 to 18
MW16-5	18	102.27	104.14	104.80	10	8 to 18	6 to 18
MW16-6	17	96.99	98.73	99.31	7 to 8	7 to 17	5 to 17

(1) In feet below grade. Reading obtained during monitoring well installation. See Table 18-4 for more accurate measurements.  
 (2) In feet above mean sea level.

The wells were developed a minimum of 24 hours after installation. Groundwater temperature, pH, conductivity, and turbidity were monitored during development. All wells were developed until removed water was visibly clear of suspended solids. MW16-04 and MW16-05 were developed separately (in August 1995) after consideration of the significant product layer in the wells. Approximately 120 gallons of water were removed from MW16-01, MW16-03, and MW16-06. Approximately 240 gallons of water were removed from MW16-02. Approximately 150 gallons of water were removed from MW16-04 and MW16-05.

#### Static-Water-Level Measurements

In order to define groundwater flow directions and horizontal and vertical groundwater gradients, B&R Environmental collected two rounds of static-water-level measurements. The first round of water-level measurements was collected on August 7, 1995, the second on October 17 and October 18, 1995. Static-water levels were measured from the top of the PVC riser using an electronic water-level indicator (M-scope) or an interface probe and recorded to the nearest 0.01 foot. The water-table elevation ranged from approximately 90.89 to 92.67 feet above MSL during the first round of measurements and from approximately 90.52 to 92.50 feet above MSL during the second round. Water-level measurements are summarized in Table 18-4.

#### Groundwater Sampling

Groundwater samples were obtained from the six newly installed monitoring wells (MW16-01, MW16-02, MW16-03, MW16-04, MW16-05, and MW16-06) and the existing well (MW-1) to investigate the current level and extent of contamination and to provide data for use in the risk assessment and the evaluation of remedial action alternatives. The newly installed wells were sampled in August 1995 (MW16-04 and MW16-05 were sampled in September 1995). Field measurements collected during purging were pump rate (L/min), water level, pH, conductivity, temperature, turbidity, dissolved oxygen, and salinity.

Prior to sampling, B&R Environmental purged the wells (with the exception of MW16-04 and MW16-05), using the micro-purge protocol, to reduce turbidity until groundwater parameters stabilized within acceptable limits. Care was taken to ensure little or no drawdown in water levels occurred throughout the purge and sample process. MW16-04 and MW16-05 were not purged prior to sampling. Separate samples of the floating oil layer and aqueous layer were collected. B&R Environmental attempted to collect an uncontaminated groundwater sample from MW16-04 and MW16-05 through the floating oil layer. The team inserted a small-diameter PVC tube with a rubber glove septum on the down well end into the well below the oil/water interphase. A smaller-diameter tube was then inserted, piercing the rubber septum, and the team collected a sample of groundwater via a peristaltic pump.

**TABLE 18-4  
SITE 16/F STATIC WATER-LEVEL MEASUREMENT SUMMARY  
NWS EARLE, COLTS NECK, NEW JERSEY**

Monitoring Well Number	August 7, 1995			October 17 and October 18, 1995		
	Depth to Water Table <sup>(1)</sup> (feet)	Top of PVC Riser <sup>(2)</sup>	Elevation of Water Table <sup>(2)</sup>	Depth to Water Table <sup>(1)</sup> (feet)	Top of PVC Riser <sup>(2)</sup>	Elevation of Water Table <sup>(2)</sup>
MW16-01	9.67	102.34	92.67	10.11	102.34	92.23
MW16-02	7.07	98.48	91.41	7.43	98.48	91.05
MW16-03	7.85	99.59	91.74	8.23	99.59	91.36
MW16-04	<sup>(3)</sup>	104.30	<sup>(4)</sup>	not measured	104.30	-
MW16-05	<sup>(3)</sup>	104.14	<sup>(4)</sup>	not measured	104.14	-
MW16-06	7.84	98.73	90.89	8.21	98.73	90.52
MW-1	<sup>(5)</sup>	103.06	-	10.56	103.06	92.50

- <sup>(1)</sup> In feet below top of riser  
<sup>(2)</sup> In feet above mean sea level  
<sup>(3)</sup> Non-aqueous free-product layer present  
 August 17, 1995 measurements:  
 MW16-04: Top of free-product layer = 11.49 feet  
 Product - water interface = 14.38 feet  
 Free-product thickness = 2.89 feet  
 MW16-05: Top of free product layer = 11.56 feet  
 Product - water interface = 11.96 feet  
 Free-product thickness = 0.40 feet  
<sup>(4)</sup> Adjusted water-table elevations not calculated  
<sup>(5)</sup> Water level not measured

B&R Environmental submitted seven groundwater samples (16 GW 01 through 16 GW 06 and MW-01) to Lancaster Laboratories for TCL VOC, TCL SVOC, TAL metals, and TPH analyses. At the direction of NORTHDIV, 16 GW 02 and 16 GW 06 were also analyzed for dissolved TAL metals. GC fingerprint and specific gravity analyses were performed on the oily product layer from samples 16 GW 04 and 16 GW 05. Results of analyses performed on samples taken from MW16-04 and MW16-05 were not submitted for validation using the EPA Region II guidelines and are summarized in Table 18-5. Sample log sheets are presented in Appendix D.

#### 18.3.6 Slug Testing

Slug test were performed according to the procedure presented in Section 2.1.1.4. Hydraulic permeability (k) calculations are presented in Appendix H.

### 18.4 SITE CHARACTERISTICS

#### 18.4.1 Geology

Regional mapping places Site 16/F within the outcrop area of the Vincentown Formation; upper colluvium may be present at the site. The upper colluvium has a maximum thickness of 10 feet, the Vincentown Formation ranges between 10 and 130 feet in thickness, and the soil borings are no more than 20 feet deep. The lithology of the sediments encountered in the on-site borings generally agrees with the published description of the upper colluvium and the Vincentown Formation. In general, the borings encountered fill material, brown pebbly, silty, fine- to medium-grained sand (possibly representative of the upper colluvium), and brownish-yellow, olive, glauconitic, fine- to medium-grained sand (probably representative of the Vincentown Formation).

Based upon the boring log descriptions, borings 16 SB 13 and 16 SB 15 penetrated fill material and upper colluvium, boring 16 SB 12 penetrated the upper colluvium, borings 16 SB 09 through 16 SB 11, 16 SB 14, and 16 SB 18 penetrated fill material, upper colluvium, and the Vincentown Formation, and wells MW16-01 through MW16-06 and borings 16 SB 07, 16 SB 08, 16 SB 16, 16 SB 17, 16 SB 19, and 16 SB 20 penetrated upper colluvium and the Vincentown Formation.

#### 18.4.2 Hydrogeology

Groundwater in the upper colluvium and Vincentown aquifer beneath the site occurs under unconfined conditions and the geologic units are interpreted to be hydraulically interconnected. A free-product layer consisting of light, non-aqueous phase liquid (LNAPL) was discovered floating on top of shallow

groundwater in wells MW16-04 and MW16-05. The available data are not sufficient to define the areal extent, thickness, and movement of the free-product layer. Static-water-level measurements, water-table elevations, and depths to the free-product layer and product-water interface are summarized in Table 18-4. Groundwater elevations for August 1995 and October 1995 are contoured on Figures 18-3 and 18-4, respectively. The direction of shallow groundwater flow in the aquifer, as indicated by both the August and October groundwater contour maps, is toward the north. There does not appear to be a significant seasonal variation in groundwater flow direction.

Based on boring log descriptions, well MW16-06 is screened in the upper colluvium and the Vincentown Formation, and wells MW16-01 through MW16-05 are screened in the Vincentown Formation. The hydraulic conductivity calculated for MW16-01 (Vincentown Formation) is  $3.48 \times 10^{-4}$  cm/sec (0.99 ft/day). Two hydraulic conductivities were calculated for MW16-06 (upper colluvium and Vincentown Formation):  $1.39 \times 10^{-3}$  cm/sec (3.94 ft/day) from rising-head slug test data and  $6.79 \times 10^{-4}$  cm/sec (1.93 ft/day) from falling-head slug test data. Appendix H contains slug test data and calculations.

## 18.5 NATURE AND EXTENT OF CONTAMINATION

### 18.5.1 Surface Soils

Three site-related surface soil samples (16 SS 01 through 16 SS 03) were collected at Site 16 (Figure 18-2). Tables 18-6 and 18-7 present the occurrence and distribution of inorganic and organic chemicals detected in site-related surface soil samples and compare them to background as presented in Section 31. Table 18-6a presents a comparison of detected compounds to ARARs. Figure 18-5 presents sample locations with concentrations of compounds found above ARARs.

#### 18.5.1.1 Inorganics

Concentrations of antimony, barium, cadmium, chromium, copper, lead, magnesium, nickel, silver, and zinc in all site-related samples were greater than the ranges detected in background samples. Generally, higher levels of metals were found on 16 SS 01 and 16 SS 03.

#### 18.5.1.2 Organics

Fluoranthene (40 ug/kg to 84 ug/kg), pyrene (46 ug/kg), di-n-butyl phthalate (45 ug/kg to 48 ug/kg), and butylbenzyl phthalate (220 ug/kg) were detected in background surface soil samples. PAHs including benz(a)anthracene, benzo(a)pyrene, carbazole, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, indeno(1,2,3-cd)pyrene, fluoranthene, and pyrene were detected in all site-related surface soil samples at levels greater than background, ranging from 42 ug/kg to 4,400 ug/kg. The highest levels of PAHs were detected in sample 16 SS 03.

***APPENDIX D***  
***Backfilling and Seeding Specifications***

**SECTION 02110  
SITE CLEARING AND GRUBBING**

**PART 1 - GENERAL**

The work required under this Section includes furnishing all plant, labor, equipment, and materials for performing all operation required for clearing and grubbing the site.

**1.1 Definitions**

**1.1.1 Clearing:** Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including down timber, snags, brush, and rubbish occurring within the areas to be cleared.

**1.1.2 Grubbing:** Grubbing shall consist of the removal and disposal of stumps, roots larger than 1-½ inches in diameter, and matted roots and decayed matter to a depth not less than 12 inches below original ground in the designated grubbing areas.

**1.2 Dust Control**

The Contractor shall comply with dust control requirements specified on drawing C-2, note 13.

**PART 2 - REQUIRED WORK**

**2.1 Clearing:**

**2.1.1** Clearing shall consist of the removal of all trees (cut just above ground surface), brush, logs, limb wood, rubbish, and all other obstructions on the surface of the original ground within the limits of clearing shown on the Contract Drawings, except such trees and vegetation as may be directed by the Engineer or his designee to be left standing.

**2.1.2** Trees directed to be left standing within the cleared areas shall be trimmed of dead branches 1-½ inches or more in diameter and shall be trimmed of all branches to the heights directed. Limbs and branches to be trimmed shall be neatly cut close to the bole of the tree or main branches. Cuts more than 1-½ inches in diameter shall be painted with a tree-wound paint approved by the Engineer.

**2.1.3** Trees and vegetation to be left standing shall be protected from damage incident to clearing, and construction operations by the erection of barriers or by such other means as the circumstances require.

**2.2 Grubbing:**

The Contractor shall grub areas within the limit of disturbance shown on Contract Drawings.

**2.3 Disposal**

The Contractor shall dispose of all materials from clearing and grubbing off-site.

**END OF SECTION**

\*\*\*\*\*

**SECTION 02200  
EARTHWORK**

**PART 1 - GENERAL**

The work required under this section includes furnishing all labor, equipment and materials for performing all operations for soil excavation and placement of soil materials required to perform the remediation.

**1.1 Definitions**

1.1.1 **Soil Excavation:** Soil excavation shall consist of grading required to prepare the slope to a 4:1 slope.

1.1.2 **On Site Fill Material:** Soil material resulting from re-grading of the slope.

1.1.3 **Off-Site Clean Material:** Off-site clean material consists of clean soil material imported from an off-site source.

**1.2 Applicable Publications**

The latest edition of the following publications will be followed for the work to be performed.

ASTM D2216	Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock, and Soil-Aggregates Mixture
ASTM D698	Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5-1/2 lb. (2.49 kg ) Rammer and 12-inches (304.8 mm) Drop
ASTM-D1556	Density of Soil in Place by the Sand-Cone Method
ASTM-D2922	Density of Soil and Soil-Aggregate in Place by Nuclear Methods
ASTM-D3017	Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Method

**PART 2 - REQUIRED WORK**

2.1 The Contractor shall grade the site in accordance with the elevation contours presented on the Contract Drawings. Clearing and grubbing will be performed in accordance with Specification Section 02110. Topsoil shall be stripped and stockpiled separately. Soil cut from the site may be reused where fill is required as approved by the Engineer. The Contractor shall compact all materials placed to achieve the required density and moisture content.

2.2 During the grading operations, some excavation of the site and redistribution of the existing stockpiled material will be required to obtain the necessary grades shown on the Contract Drawings.

- 2.3 The Contractor shall perform the necessary surveys during the performance of the required work and submit the results to the Engineer for acceptance.
- 2.4 All equipment and material supplied by the Contractor shall be in good working condition and shall not be contaminated.
- 2.5 Soil material cut from the site shall be temporarily stockpiled on-site as directed by the Engineer.
- 2.6 The Contractor shall decontaminate all equipment prior to removal from the site in accordance with the Project Health and Safety Plan of this Contract.
- 2.7 The Contractor shall maintain all work areas free from excess dust to such reasonable degree as to avoid causing a hazard or nuisance to others. Dust control shall be performed as the work proceeds and wherever a dust nuisance or hazard occurs.
- 2.8 The Contractor shall furnish, install and maintain all erosion control measures as shown on the Contract Drawings during the course of placement operations.
- 2.9 Placement activities specified in this Section shall conform to safety requirements as specified in OSHA part 1926.

### PART 3 - QUALITY ASSURANCE

- 3.1 Field Inspection and Testing of the Placement and Compaction of the Material.
  - 3.1.1 The tests listed below shall be performed as specified. Field test reports shall be submitted daily for record as required.
    - (1) Laboratory Maximum Density: Laboratory maximum density tests shall be performed on all materials in accordance with ASTM D698. Prior to placing, at least two tests for each different material shall be performed on representative samples of the material to be placed. Additional tests shall be performed if the composition of the material being used is different than that previously tested.
    - (2) Moisture Content: At least two tests for each different material for moisture content shall be performed in accordance with ASTM D2216.
    - (3) In-Place Testing: In-place density and moisture content testing on the materials being placed shall be performed by nuclear materials in accordance with ASTM Standards D2922 and D3817 or the Sand Cone Method for density in accordance with ASTM Standard D1556. In-place density shall be determined at a depth of 12 inches below grade and the tests shall be performed for each 500 cubic yards placed but not less frequently than one test each day for each area being compacted. The nuclear density equipment shall be recalibrated whenever a different material is being placed and compacted.

3.1.2 The Contractor shall perform the necessary surveys required during the placement operations.

3.1.3 The Contractor shall give advance notice to the Engineer or his designee to witness and/or inspect all activities, particularly testing.

#### PART 4 - MATERIALS

##### 4.1 Fill Materials

###### 4.1.1 On-Site Fill Materials

On-site fill materials consist of soil material excavated during re-grading the site. The acceptability of on-site fill material for reuse as backfill shall be determined by the Engineer.

###### 4.1.2 Off Site Fill Material

The Contractor shall furnish sufficient amounts of off-site fill material from an off-site location as needed. Off-site fill material fill shall contain no sod, brush, roots, or other perishable materials. Off-site fill shall be obtained from off-site area(s) accepted by the Engineer or his designee.

###### 4.1.3 Off-Site Topsoil

The Contractor shall furnish sufficient amounts of off-site topsoil material required to provide a minimum of four inches of topsoil over disturbed areas to be vegetated. The Contractor may reuse stockpiled topsoil as approved by the Engineer.

#### PART 5 - EXECUTION

5.1 The Contractor shall rough grade the site as required to obtain the grades shown on the Contract Drawings.

5.2 A tolerance of minus 2 inches will be permitted for rough grading the site.

5.3 On-site fill, off-site fill material shall be placed in approximately horizontal layers not to exceed 12 inches and compacted to the rough graded lines.

5.4 Density of the common fill shall be a minimum of 90% of the maximum dry density achieved in Standard Proctor tests (ASTM D698-78) unless otherwise specified. The water content shall not vary more than plus or minus 3% of the optimum moisture content as determined in the lab and accepted by the Engineer. In-place density and moisture content testing on material shall be performed by nuclear methods in accordance with ASTM Standards ASTM D2922-80 and ASTM D3017-78 or the Sand Cone Method for density in accordance with ASTM Standard D1556-82. In-place density shall be determined at a depth of 12 inches below grade and tests shall be performed for each 500 cubic yards placed but not less frequently than one test each day for

area being compacted. The nuclear density equipment shall be recalibrated whenever a different soil is to be placed.

- 5.5 Off-site clean material, if required, shall be placed in approximately horizontal layers. The thickness of each layer before compaction shall not exceed 12 inches. Materials placed by dumping in piles or windrows shall be spread uniformly to not more than 12 inches thickness before being compacted.

END OF SECTION

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**SECTION 02485  
SEEDING AND EROSION PROTECTION**

**PART 1 - GENERAL**

The work required under this Section includes furnishing all plant, labor, equipment, and materials to provide fertilizer, mulching, and seeding for the site area, as well as any other disturbed areas requiring vegetation.

**1.1 Applicable Publications**

Standards for Soil Erosion and Sediment Control in New Jersey, Latest edition.

**PART 2 - MATERIALS**

**2.1 Fertilizers**

**2.1.1 Quality and Formulation**

Fertilizer may be either fluid or dry formulations of commercial carriers of available plant nutrients. Fertilizer shall contain total nitrogen, available phosphoric acid, and soluble potash in the ratio of 10-20-10.

**2.1.2 Basis of Acceptance**

Manufacturer's label or certificate indicating compliance with specifications. The Engineer or his designee reserves the right to reject any material that has become caked or otherwise damaged.

**2.2 Seeds**

**2.2.1 Quality**

Each species, variety, and strain of grasses, legumes, and cereals shall be as specified unless otherwise approved.

**2.2.1.1** Materials other than pure live seed shall comprise only nonviable seed, chaff, hulls, live seed of crop plants other than those specified, harmless inert matter and weed seeds except that weed seeds other than seed of noxious weeds will be permitted up to 1 percent of gross weight of each kind of seed. Legume seeds shall be accompanied by adequate amounts of proper inoculants unless accompanied by certification of preinoculation.

**2.2.1.2** The percentage of purity as shown on the label shall be acceptable. The percentage of germination as shown on the label shall be not less than the minimum percentage specified.

2.2.2 Packaging

Each kind of seed shall be furnished and delivered, unless otherwise approved, in separate, sealed containers, or bags acceptably sewn tight or sealed.

2.2.3 Seed Mixture

Seed mixture shall be:

<u>Name</u>	<u>Variety</u>	<u>Wt. of Seed Per Acre (lbs)</u>
Tall Fescue	Commercial	218
Ryegrass	Commercial	<u>88</u>
Total		300 lbs/acre

2.3 Mulch

Either hay or straw may be used for mulch. Hay for mulching shall be mowings of acceptable herbaceous growth free from noxious weeds. Straw for mulching shall be stalks of oats, wheat, rye or other approved crops free from noxious weeds. Materials which are low grade and unfit for farm use such as "U.S. Sample Grade" will be acceptable. Weight shall be calculated on the basis of material having not more than 15% of moisture content. In addition, wood chips, if available, may be used as mulch.

PART 3 - APPLICATION AND CONSTRUCTION

3.1 Fertilizer Application

Fertilizer shall be evenly spread over surface of soil in areas as directed. Rates of application shall be as required to promote plant growth. Tests required to determine rate of fertilizer application shall be made by the Contractor and the rate accepted by the Engineer. Any method of application which will ensure an even distribution will be acceptable.

3.2 Seeding Application

3.2.1 Rates

Rates for seeding shall be as specified.

### **3.2.2 Season**

Unless otherwise directed by the Engineer, work shall be performed during normal planting seasons of the year. The Contractor shall notify the Engineer at least 48 hours in advance of the time he intends to begin sowing seed and shall not proceed with such work until permission has been obtained. When delays in operations carry the work beyond dates which are specified, or when conditions of high winds, excessive moisture or ice are such that satisfactory results are not likely to be obtained for any stage of the work, the Engineer will stop work. Work shall be resumed with the Engineer's approval when desired results are likely to be obtained or when accepted corrective measures and procedures are adopted.

### **3.2.3 Ground Preparation and Seeding**

3.2.3.1 Areas to be seeded shall be maintained at approved grades. Irregularities and low places which will hold water shall be eliminated. Fertilizers and seeds shall be evenly distributed on the surfaces to be seeded. All mechanical equipment for soil preparation or seeding shall be as approved and shall pass parallel to the contours unless otherwise approved.

3.2.3.2 When directed by the Engineer, measured plots shall be established to determine if specified quantities of seed, fertilizer, and mulch are being applied. The finished surface of any area that is seeded shall not be rougher, more uneven or have more or larger stones, clods, roots, or other foreign materials than the area it adjoins.

3.2.3.3 Areas to be seeded shall be scarified sufficiently to break up surface crust immediately before seeding except where ground is loose and friable as immediately following grading or as otherwise approved. All stones over six inches in greatest dimension which are loose and subject to rolling or sliding or other sizes as specified and all other objects detrimental to mowing shall be removed and disposed of as approved. Fertilizers and seed may be mixed together immediately before placing. Methods of distribution such as by air or water pressure will be acceptable except that the seed shall not be injured in the process of spreading.

### **3.3 Mulching**

3.3.1 Surface of areas where mulch is to be applied shall be cleared of stones, stumps, wire, and other obstacles which might hinder subsequent seeding operations. Ground shall be harrowed or disked to produce a state of suitable tillage.

3.3.2 Mulch shall be spread uniformly in a continuous blanket of sufficient thickness to completely hide soil from view. Mulch may be spread before

or not later than three days after seeding unless otherwise approved. Anchorage to hold mulch in place may be applied by an approved method during mulching operation or subsequently.

3.3.3 Contractor shall install a vegetative mat, Miramat TM8, on all sloped areas, as manufactured by Mirafi or Engineer-approved equal. The mat shall be installed in accordance with manufacturer's recommendations.

#### 3.4 Erosion and Sediment Control

3.4.1 Contractor shall conduct his operations in accordance with the approved erosion and sediment control plan included in the Contract Documents. Temporary erosion and sediment control measures shall be provided and maintained until the permanent work is completed. The area of bare soil exposed at any given time by construction shall be restricted to a minimum.

### PART 4 - CARE DURING CONSTRUCTION

The Contractor shall care for seeded and mulched areas until final acceptance. Such care shall consist of repairing areas damaged following seeding or mulching operations due to wind, water, fire or other causes. Damaged areas shall be repaired to re-establish condition and grade of area prior to seeding and shall be re-fertilized, re-seeded, and re-mulched as specified herein. The Contractor shall keep seeded areas mowed until acceptance by cutting to a height of three inches when growth reaches six inches, or as directed.

### PART 5 - QUALITY CONTROL

5.1 When, in the judgment of the Engineer, at any time prior to acceptance, any area which has been seeded fails to produce a satisfactory growth of grass after a suitable period of time has elapsed, the Contractor shall re-seed and re-fertilize such areas as specified. If deemed necessary by the Engineer, the Contractor shall also re-mulch such areas at the rate specified.

END OF SECTION

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SEEDING AND EROSION PROTECTION**

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END OF SECTION

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SOIL TEST REPORT

Soil Testing Laboratory - New Jersey Agricultural Experiment Station  
 Cook College, Rutgers The State University of New Jersey  
 P.O. Box 902, Milltown, N.J. 08850 Ph. 732 932-9295

Foster Wheeler Environmental Corp.  
 Mark Miller

Date Received: 5/12/98  
 Date Reported: 05-20-1998

Referred To: S. Murphy, Ph.D.

Drop or Plant: grass

Serial No:

Sample Identification: Naval Weapons Station Earle

LAB NO: 3147

SOIL TEST RESULTS AND INTERPRETATION

Soil Texture: loam  
 Soil pH = 5.7 Medium-acid; pH slightly low for the growth of most crops  
 except for acid loving plants.

RELATIVE LEVEL

Available Nutrient	Soil test Value	VERY LOW	LOW	MEDIUM (Desirable Range)	HIGH	VERY HIGH	
Phosphorus	53 lb/acre	*****					
Potassium	98 lb/acre	*****					
Magnesium	201 lb/acre	*****					
Calcium	524 lb/acre	*****					

Copper = 2 ppm (Adequate)      Zinc = 1.7 ppm (Adequate)  
 Manganese = 10.4 ppm (Adequate)

LIME AND FERTILIZER RECOMMENDATION

Assuming New Seeding of grass:  
 Apply calcitic limestone at a rate of 60 pounds per 1000 sq ft and mix thoroughly (plow & disk or rototill) into the surface 4 to 6" of soil to raise pH to desirable range.  
 Along with the limestone, fertilizer of grade 0-10-30 (or similar analysis) can be applied and mixed in before planting at a rate of 6.25 pounds per 1000 sq ft.  
 (In case this cannot be obtained, an EQUIVALENT combination is:  
 "Triple superphosphate" 0-45-0 grade at 1.5 pounds/1000 sq ft  
 AND  
 "Potash" 0-0-60 grade at 3 pounds/1000 sq ft).



***APPENDIX E***  
***Construction Schedule***

