N60478.AR.000362
NWS EARLE
5090.3a

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

Prepare in quintuplicate (original and 4 copies)
CONTROL NO. 7B

CONTRACT NO.	DELIVERY ORDER	ACTIVITY LOCATION
N62472-94-D-0398	0017 Mod. #3	Earle Colts Neck, NJ

PROJECT TITLE:
SITES 22, 23 AND 27 REMEDIATION

FROM:	DATE
Foster Wheeler Environmental Corp. - Program QCM: Akram Aziz	September 4, 1996
TO:	DATE
COTR: P. BRIEGEL (3 copies)	SEPTEMBER 4, 1996

1. THE CONTRACTOR SUBMITTALS LISTED BELOW ARE FORWARDED FOR YOUR REVIEW AND RECOMMENDATIONS.
   (a) APPLY APPROPRIATE STAMP IMPRINT TO EACH SUBMITTAL AND INDICATE REVIEW COMMENTS, AS REQUIRED.
   (b) RETAIN ONE (1) COPY OF THIS TRANSMITTAL FORM AND RETURN REMAINING COPIES WITH REVIEWED SUBMITTALS TO ROICC.
2. THESE SUBMITTALS SHOULD BE RETURNED TO THIS OFFICE BY _____
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TO: CONTRACTOR	DATE

1. THE SUBMITTALS LISTED BELOW HAVE BEEN REVIEWED AND ARE APPROVED/DISAPPROVED AS SHOWN BELOW AND ON EACH STAMP IMPRINT.

COPY TO:
[ ] ROICC [ ] OTHER

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

ITEM NO.	SUBMITTAL DESCRIPTION	PREPARED/ SUBMITTED BY	APPROVED	DISAPPROVED	REMARKS
7B	SD-18, Records	A. Aziz			
	Revised Action Memo for				
	Environmental Evaluation and, EECA				

9/4/96

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 impacted soils at the Naval Weapons Station Earle Sites 22, 23 and 27 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 soils impacted by paint disposal operations to minimize the potential for migration of metals and PAHs in surface water and groundwater. The remedial action involves the excavation, transportation and off-site disposal of impacted soils. Post excavation sampling will be used to evaluate the effectiveness of the remedial alternative. Naval Weapons Station Earle will consider written and verbal comments on all the proposed alternatives before final selection of the remedial alternative and the issuance of a Decision Document reflecting this choice. Written comments must be postmarked by October 4, 1996.

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 alternatives should be sent to:

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

LNW96009

ACTION MEMORANDUM
SITES 22, 23, AND 27 PAINT DISPOSAL AREAS

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval of the proposed removal and disposal action described herein for Site 22 - Paint Chip Disposal Area, Site 23 - Paint Disposal Area, and Site 27 - Projectile Refurnishing Area at the Naval Weapons Station Earle (NAVWPNSTA), located in Monmouth County, New Jersey. The removal will be conducted by a contractor who has had specific experience in cleanup of disposal sites.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

1. Removal Site Evaluation

Site 22

Site 22 is a former paint chip disposal area where waste sand blasting material and paint wastes were disposed. The site is located south of Building D-2. Surface water run-off from Site 22 is expected to flow into a drainage ditch located to the south of Building D-2. The drainage ditch is approximately 275 feet in length and discharges into a marsh to the southeast. The groundwater conditions at Site 22 cannot be confirmed since monitoring wells were not installed on this site, however, the groundwater underlying the site is expected to occur under unconfined conditions in the Kirkwood and Vincentown aquifer. Groundwater flow direction at Site 22 is expected to be toward the north-northeast. The objective of this removal and disposal action is to remove the soils impacted by the former paint disposal operations to minimize the potential migration of metals and PAHs in soils from the site to the surface water via run-off and groundwater via infiltration.

Site 23

Site 23 is a former paint disposal area located southwest of Building D-5. Site 23 is partially paved and surface water run-off flows radially across the site into shallow drainage depressions located on three sides of the site. The surface water flows to a marshland located to the northeast of the site. There is also a tributary to the Hockhockson Brook approximately 500 feet southwest of the site. Groundwater underlying Site 23 occurs approximately 20 feet below grade under unconfined conditions in the upper colluvium of the Kirkwood and Vincentown aquifer. The groundwater flow direction below the site is to the north-northeast. The objective of this removal and disposal action is to remove the soils impacted by the former paint disposal

operations to minimize the potential migration of metals and PAHs in soils from the site to the surface water via run-off and groundwater via infiltration.

Site 27

Site 27 is a former disposal area where oil contaminated rags, paint chips and spent sandblasting shot were disposed. The site is located south of Building E-14. Surface water run-off from Site 27 flows southeast toward a small drainage ditch. The water in the drainage ditch apparently infiltrates and does not reach the east Branch of Mingamahone Brook located approximately 1,200 to 1,500 feet east-southeast of the site. The groundwater conditions at Site 27 cannot be confirmed since monitoring wells were not installed, however, the groundwater is expected to occur under unconfined conditions in the Kirkwood aquifer. Groundwater flow direction is expected to be toward the southwest. The objective of this removal and disposal action is to remove the soils impacted by the former disposal operations to minimize the potential migration of metals and PAHs in soils from the site to the surface water via run-off and groundwater via infiltration.

2. Physical Location

Site 22 is adjacent to Building D-2 which is located off an unnamed macadam road off Midway Road. The area to be excavated (soils intermixed with paint chips and sand blasting waste) is expected to be 50 feet by 100 feet by 1 foot deep.

Site 23 is adjacent to Building D-5 which is located off an unnamed macadam road off Midway Road. The area to be excavated (grayish-brown, fine-medium grained sand) is expected to be 75 feet by 50 feet by 3 feet deep at former boring location 23SB04.

Site 27 is adjacent to Building E-14 which is located on Oran Road. The area to be excavated (red-brown gravelly sand with some slag, sandblasting material, and paint chips) is expected to be 30 feet by 50 feet by 1 foot deep.

3. Site Characteristics

Regional mapping places Sites 22, 23 and 27 within the outcrop of the Kirkwood Formation. The Kirkwood Formation ranges in thickness between 60 and 100 feet in thickness and the soil borings ranged from 12 to 27 feet deep. Brown, pebbly, fine-grained sand with varying amounts of clay and silt and fine to coarse grained sand were encountered in the borings which generally agrees with published descriptions of the Kirkwood Formation. At least one boring at Site 23 may have penetrated the Vincentown Formation as a gluaconitic fine to medium grained sand was encountered which corresponds to published data of the Vincentown Formation.

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

Analytical results of soil samples collected from recent soil borings at Sites 22, 23, and 27 as part of the Remedial Investigation are included as Appendix A to this Action Memorandum. Analytical results from soil samples previously collected from Site 22 did not detect concentrations of any compounds above the NJDEP Residential or Non-Residential Direct Contact Cleanup Criteria concentrations. Analytical results from soil samples previously collected from Site 23 indicated that polyaromatic hydrocarbons (benzo (a) anthracene, benzo (a) pyrene, benzo(b) fluoranthene, benzo (k) fluoranthene, and indeno (1,2,3-cd) pyrene) were detected at concentrations above the NJDEP Non-Residential Direct Contact Cleanup Criteria concentrations. Cadmium was also detected at Site 23 in soil samples at a concentration above NJDEP Residential Direct Contact Cleanup Criteria concentration. Analytical results of three soil samples previously collected from the area of visual paint chip disposal at Site 27 revealed cadmium concentrations above the NJDEP Residential Direct Contact Cleanup Criteria concentration.

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 discussions concerning site clean up decisions, NAVWPNSTA Earle established a "Restoration Advisory Board" (RAB) 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 more of an opportunity for involvement in site specific discussions. Prior to RAB formation, a Technical Review Committee (TRC) met during normal business hours; representatives of the local municipalities and regulatory agencies attended TRC meetings. This proposed action at Sites 22, 23 and 27 have been discussed with the NAVWPNSTA Earle RAB.

The proposed excavation and removal of soils at Sites 22, 23 and 27 constitutes a non-time critical removal action as defined in the National Contingency Plan (NCP).

6. Maps Pictures and Other Graphic Representations

Maps of the sites are included with the analytical data as Appendix B of this Action Memorandum.

B. Other Actions Addressing Sites 22, 23 and 27

1. Previous Actions

A Site Investigation (SI) Report was prepared by Roy F. Weston, Inc. in January 1994. A Draft Remedial Investigation (RI) Report was completed in March 1996 by Brown and Root Environmental. Roy F. Weston *was* and Brown and Root *is* the Navy consulting firm employed for these investigations.

2. Current Action

The Final Remedial Investigation Report was submitted in July 1996 and is undergoing comment.

C. State and Local Authorities' Rule

1. State and Local Actions

The Sites are located in a secured ordinance area and require a permit for entry. The permit 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 USEPA. The potential for any continued State/Local response is unlikely.

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

A. Threats to Public Health or Welfare

Several PAHs were detected in soil samples at concentrations above the NJDEP Non-Residential Direct Contact Cleanup Criteria concentrations at Site 23. Cadmium was detected in soil samples above the NJDEP Residential Direct Contact Cleanup Criteria concentration at Sites 23 and 27. The Sites are located in a secure area and are not accessible to the general public.

B. Threats to the Environment

The benefit of this removal action will be to virtually eliminate any potential adverse impacts on ecological receptors such as birds, deer and wetlands in the site area.

IV. ENDANGERMENT DETERMINATION

Actual or threatened releases of pollutants and contaminants from the Sites, 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 impacted soils at each site will be excavated with a Case 580 backhoe, or equivalent. The soils will be direct loaded into dump trucks for transportation and off-site disposal. Given the limited size of each impacted area it is expected that this remedial action will be the most effective alternative. In accordance with the Resource Conservation and Recovery Act, the soils to be excavated will be subjected to the Toxicity Characteristic Leachate Procedure (TCLP) prior to removing the soils from the site in order to assure that the soils are disposed at a proper facility in accordance to all applicable regulations. Soil samples will be collected at the bottom corners of the excavations and analyzed in order to evaluate the effectiveness of the removal action. All post-excavation sampling and backfilling will be in accordance with the Technical Requirements for Site Remediation (N.J.A.C. 7:26E).

2. Contribution to Remedial Performance

No further action may be required based on the proposed removal action. Post-excavation sampling results will be compared to the NJDEP Non-Residential Direct Contact Cleanup Criteria to determine the need for any additional remediation.

3. Description of Alternative Technologies

Alternative technologies have been considered. Excavation and off-site disposal is the most effective and least expensive action.

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

An Engineering Evaluation/Cost Analysis has been prepared (Appendix C) and contains a discussion of alternatives considered before proposing this removal action.

5. Applicable or Relevant and Appropriate Requirements (ARARs)

The New Jersey Non-Residential Surface Soil Clean-up Standards will be used as clean up criteria for this removal action. The chemicals of concern at these sites and their respective NJDEP Non-Residential Clean-up Standards are: benzo(a) arthracene (4,000 ug/kg), benzo(a) pyrene (660 ug/kg), benzo (b) fluoranthene (4,000 ug/kg), benzo (K) fluoranthene (4,000 ug/kg), chrysene (40,000 ug/kg), dibenz (a,h) anthracene (660 ug/kg), indeno (1,2,3-cd), and pyrene (4,000 ug/kg).

6. Project Schedule

This project will begin in late September and will be completed by early October 1996.

B. Estimated Costs

The costs of the removal action is approximately $137,000. A detailed cost estimate is provided in the EE/CA.

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

Although metals and PAHs in the soils are relatively immobile, a delay in action would increase potential migration of these compounds via surface water run-off and groundwater infiltration as well as result in an increase in project cost.

VII. OUTSTANDING POLICY ISSUES

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

VIII. ENFORCEMENT

This removal action will be performed properly and in accordance with this Action Memorandum.

XI. RECOMMENDATION

This decision document represents the selected removal action for Sites 22 - Paint Chip Disposal Area, Site 23 - Paint Disposal Area and Site 27 - Projectile Refurnishing Area, at Naval Weapons Station Earle, Colts Neck, Monmouth County, New Jersey, developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended, and not inconsistent with the National Contingency Plan (NCP). This decision is based on the administrative record for Sites 22, 23 and 27.

APPENDIX A

ANALYTICAL RESULTS

TABLE 22-1a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 22

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	22-007-S001	22-007-S002	22-008-S001	22-008-S001-DU	22-008-S002	22-009-S001	SELECTED ARARS		
LOCATION:	22-007-S001	22-007-S002	22-008-S001	22-008-S001	22-008-S002	22-009-S001	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1992 RI/FS	1992 RI/FS	1992 RI/FS	1992 RI/FS	1992 RI/FS	1992 RI/FS			
INORGANICS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
aluminum	1370		3070			4350	-	-	-
arsenic	3.3		2.7			1.9	20.0	20.0	-
barium	7.2		5.3			9.6	700	47000	-
beryllium	0.22		0.45			0.30	1.00	1.00	-
calcium	55.2		39.4			9.7	-	-	-
chromium, total	17.1		48.2			46.8	-	500	-
copper	4.7		17.2			2.5	600	600	-
iron	8340		9480			5520	-	-	-
lead	29.8		6.3			8.0	400	600	-
magnesium	131		661			452	-	-	-
manganese	11.2		6.0			5.0	-	-	-
nickel			2.8				250	2400	-
potassium	530		2270			1710	-	-	-
selenium						0.35	63.0	3100	-
sodium	97.4		31.8			21.7	-	-	-
vanadium	12.6		36.1			25.8	370	7100	-
zinc	5.6		33.3			5.3	1500	1500	-
SEMIVOLATILES	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
anthracene			82.0 J				10000000	10000000	100000
benzo(a)anthracene			280 J	64.0 J			900	4000	500000
benzo(a)pyrene			210 J				660	660	100000
benzo(b)fluoranthene	71.0 J		260 J	62.0 J			900	4000	50000
benzo(g,h,i)perylene			100 J				-	-	-
benzo(k)fluoranthene	52.0 J		200 J	60.0 J			900	4000	500000
benzoic acid			54.0 J				-	-	-
bis(2-ethylhexyl)phthalate				97.0 J			49000	210000	100000
chrysene			270 J	73.0 J			9000	40000	500000
di-n-butylphthalate	58.0 J			71.0 J		60.0 J	5700000	10000000	100000

TABLE 22-1a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 22

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	22-007-S001	22-007-S002	22-008-S001	22-008-S001-DU	22-008-S002	22-009-S001	SELECTED ARARS		
LOCATION:	22-007-S001	22-007-S002	22-008-S001	22-008-S001	22-008-S002	22-009-S001	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1992 RI/FS	1992 RI/FS	1992 RI/FS	1992 RI/FS	1992 RI/FS	1992 RI/FS			
SEMIVOLATILES	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
fluoranthene	110 J		580	190 J			2300000	10000000	100000
Indeno(1,2,3-cd)pyrene			97.0 J				900	4000	500000
phenanthrene			230 J	81.0 J			-	-	-
pyrene	74.0 J		570	120 J			1700000	10000000	100000
PESTICIDES	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
4,4'-DDT	4.0 J					5.2 J	2000	9000	500000

TABLE 22-1a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 22

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	22-009-S002	22-009-S002-DUP	---	---	---	---	SELECTED ARARS		
LOCATION:	22-009-S002	22-009-S002	---	---	---	---	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1992 RI/FS	1992 RI/FS							
VOLATILES	**ug/kg**	**ug/kg**					**ug/kg**	**ug/kg**	**ug/kg**
1,1,1-trichloroethane	2.0 J						210000	1000000	50000

Footnotes to sample results:

No value - No positive result occurred for this parameter. (Refer to the complete analytical database appendix for detection limits.)

J - Value is estimated because concentration is below the quantitation limit or because of exceedance of data validation quality control criteria.

R - Positive result is considered rejected based on exceedance of data validation quality control criteria.

E - Result exceeds one or more of the selected ARARs.

Footnotes to soil criteria:

- - No standard is available for this chemical in this classification.

TABLE 23-4a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 23

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	23SB04-02	---	---	---	---	---	SELECTED ARARS		
LOCATION:	23SB04	---	---	---	---	---	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1995 RI								
INORGANICS	**mg/kg**						**mg/kg**	**mg/kg**	**mg/kg**
aluminum	1300						-	-	-
arsenic	5.3						20.0	20.0	-
barium	4.0						700	47000	-
calcium	243						-	-	-
chromium, total	152						-	500	-
copper	1.2						600	600	-
iron	3420						-	-	-
lead	12.0						400	600	-
magnesium	77.9						-	-	-
manganese	3.6						-	-	-
potassium	237						-	-	-
sodium	28.0						-	-	-
vanadium	16.4						370	7100	-
zinc	42.0						1500	1500	-
SEMIVOLATILES	**ug/kg**						**ug/kg**	**ug/kg**	**ug/kg**
acenaphthene	2700 J						3400000	10000000	100000
anthracene	5400						10000000	10000000	100000
benzo(a)anthracene	19000 E						900	4000	500000
benzo(a)pyrene	13000 E						660	660	100000
benzo(b)fluoranthene	14000 E						900	4000	50000
benzo(g,h,i)perylene	6800						-	-	-
benzo(k)fluoranthene	5000 E						900	4000	500000
bis(2-ethylhexyl)phthalate	380 J						49000	210000	100000
carbazole	2800 J						-	-	-
chrysene	19000 E						9000	40000	500000
dibenz(a,h)anthracene	2100 E J						660	660	100000
dibenzofuran	1500 J						-	-	-
fluoranthene	38000						2300000	10000000	100000

TABLE 23-4a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 23

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	23SB01-04	23SB01-16	23SB02-02	23SB02-16	23SB03-06	23SB03-14	SELECTED ARARS		
LOCATION:	23SB01	23SB01	23SB02	23SB02	23SB03	23SB03	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1995 RI	1995 RI	1995 RI	1995 RI	1995 RI	1995 RI			
INORGANICS	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**
aluminum	2450	3040	1430	1270	2790	2510	-	-	-
arsenic	6.7	16.2	2.2	10.4	7.9	11.1	20.0	20.0	-
barium	6.1	0.66	2.5	2.3	1.3	1.9	700	47000	-
beryllium	0.26	0.69	0.049	0.17	0.51	0.39	1.00	1.00	-
cadmium	0.87	1.5 E	0.35	1.1 E	0.86	0.85	1.00	100	-
calcium	718	424	68.1	31.9	76.0	60.3	-	-	-
chromium, total	53.8	91.2	13.1	45.7	67.3	69.9	-	500	-
copper	1.6		5.6				600	600	-
iron	10900	22300	3620	15200	11400	11500	-	-	-
lead	8.7 J	9.8 J	4.8 J	4.5 J	2.4	4.3 J	400	600	-
magnesium	734	1080	75.5	230	706	516	-	-	-
manganese	1.3		3.7				-	-	-
mercury	0.012 J		0.019 J			0.0080 J	14.0	270	-
nickel		1.8			1.1		250	2400	-
potassium	1510	3210	298	880	2530	1850	-	-	-
sodium	28.1	24.2	26.9	18.2	22.5	21.1	-	-	-
thallium	1.6 J	1.2 J	1.9 J	0.91 J	0.90 J	1.2 J	2.00	2.00	-
vanadium	79.8	178	13.9	86 5	103	103	370	7100	-
zinc	8.8 J	10.7 J	23.8 J	8 1 J	6.8 J	8.0 J	1500	1500	-
SEMIVOLATILES	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
bis(2-ethylhexyl)phtha'ate	590						49000	210000	100000
PESTICIDES	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
gamma-BHC (Lindane)			0.039 JN				520	2200	50000

TABLE 23-4a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 23

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	23SB04-02	---	---	---	---	---	SELECTED ARARS		
LOCATION:	23SB04	---	---	---	---	---	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1995 RI								
SEMIVOLATILES	**ug/kg**						**ug/kg**	**ug/kg**	**ug/kg**
fluorene	2900 J						2300000	10000000	100000
indeno(1,2,3-cd)pyrene	5600 E						900	4000	500000
phenanthrene	20000						-	-	-
pyrene	32000 J						1700000	10000000	100000

TABLE 26-1a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 27

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	27SB01-01	27SB01-03	27SB01-10	27SB02-01	27SB02-03	27SB02-10	SELECTED ARARS		
LOCATION:	27SB01	27SB01	27SB01	27SB02	27SB02	27SB02	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.			
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
aluminum	5090	1690	7530	3680	3350	2500	-	-	-
arsenic	2.8	1.1	0.73	1.8	1.6		20.0	20.0	-
barium	21.5	4.2	23.1	19.7	5.3	11.0	700	47000	-
beryllium	0.10		0.42			0.13	1.00	1.00	-
cadmium	2.1 E J	0.67 J		4.0 E J			1.00	100	-
calcium	156	46.3	179	502	232	176	-	-	-
chromium, total	191	18.8	10.4	26.7	9.3	5.8	-	500	-
cobalt	1.4		1.6				-	-	-
copper	11.6	3.0	4.2	39.9	1.7	4.5	600	600	-
iron	10100	3850	6250	7320	5300	2750	-	-	-
lead	105 J	9.9 J	4.6 J	46.4 J	2.9	4.6 J	400	600	-
magnesium	424	162	1090	341	216	364	-	-	-
manganese	18.4 J	18.0 J	45.6 J	31.3 J	19.1 J	20.7 J	-	-	-
mercury	0.044	0.029	0.033	0.053	0.037	0.033	14.0	270	-
nickel	3.0	0.91	5.0	3.4	1.8	1.0	250	2400	-
potassium	280	186	392	176	121	113	-	-	-
selenium	0.74						63.0	3100	-
silver		15.0					110	4100	-
sodium	19.6	18.8	34.2	19.2	11.8	33.2	-	-	-
vanadium	18.6 J	7.2	12.2 J	12.5 J	10.1	7.3	370	7100	-
zinc	323	14.0	16.7	258	5.2	18.5	1500	1500	-
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
bis(2-ethylhexyl)phthalate	840						49000	210000	100000
naphthalene	89.0 J						230000	4200000	100000
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4,4'-DDD	33.0					6.7	3000	12000	50000
4,4'-DDE	15.0 J			4.3		1.8 J	2000	9000	50000
4,4'-DDT	1.7 NJ	0.67 R		14.0 J			2000	9000	500000

TABLE 26-1a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 27

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	27SB01-01	27SB01-03	27SB01-10	27SB02-01	27SB02-03	27SB02-10	SELECTED ARARS		
LOCATION:	27SB01	27SB01	27SB01	27SB02	27SB02	27SB02	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.			
PESTICIDES	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**	**ug/kg**
Aroclor-1254		30.0 J		79.0		150	490	2000	50000
Aroclor-1260		12.0 J		94.0			490	2000	50000
alpha-BHC						0.14 R	-	-	-
alpha-chlordane		0.26 NJ		0.80 J		2.5 J	-	-	-
gamma-chlordane				0.33 R		0.41 R	-	-	-
heptachlor			0.27 J				150	650	50000
heptachlor epoxide						0.45 R	-	-	-

TABLE 26-1a

COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 27

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	27SB03-01	27SB03-03	27SB03-06	---	---	---	SELECTED ARARS		
LOCATION:	27SB03	27SB03	27SB03	---	---	---	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.						
INORGANICS	**mg/kg**	**mg/kg**	**mg/kg**				**mg/kg**	**mg/kg**	**mg/kg**
aluminum	1370	2660	4520				-	-	-
antimony	3.0						14.0	340	-
arsenic	3.9	1.2	0.79				20.0	20.0	-
barium	109	10.0	21.6				700	47000	-
beryllium	0.16	0.18	0.32				1.00	1.00	-
cadmium	52.4 E	1.5 E	1.3 E				1.00	100	-
calcium	572	168	161				-	-	-
chromium, total	146	10.4	14.5				-	500	-
cobalt	4.1	0.89	1.2				-	-	-
copper	150 J	4.8	9.8 J				600	600	-
iron	11800	4660	4970				-	-	-
lead	369	11.9	21.4				400	600	-
magnesium	180	323	673				-	-	-
manganese	104	37.2	38.1				-	-	-
mercury	0.12	0.030	0.033				14.0	270	-
nickel	10.6	2.2	3.5				250	2400	-
potassium	149	278	246				-	-	-
selenium	0.74 J						63.0	3100	-
sodium	48.0	23.3	44.8				-	-	-
vanadium	8.4	8.8	12.5				370	7100	-
zinc	320 J	16.1 J	23.3 J				1500	1500	-
SEMIVOLATILES	**ug/kg**	**ug/kg**	**ug/kg**				**ug/kg**	**ug/kg**	**ug/kg**
bis(2-ethylhexyl)phthalate	5600						49000	210000	100000
di-n-butylphthalate	58.0 J						5700000	10000000	100000
PESTICIDES	**ug/kg**	**ug/kg**	**ug/kg**				**ug/kg**	**ug/kg**	**ug/kg**
4,4'-DDD		0.34 J	0.28 J				3000	12000	50000
4,4'-DDE	16.0						2000	9000	50000
4,4'-DDT	47.0	1.5 J	1.5 J				2000	9000	500000

TABLE 26-1a

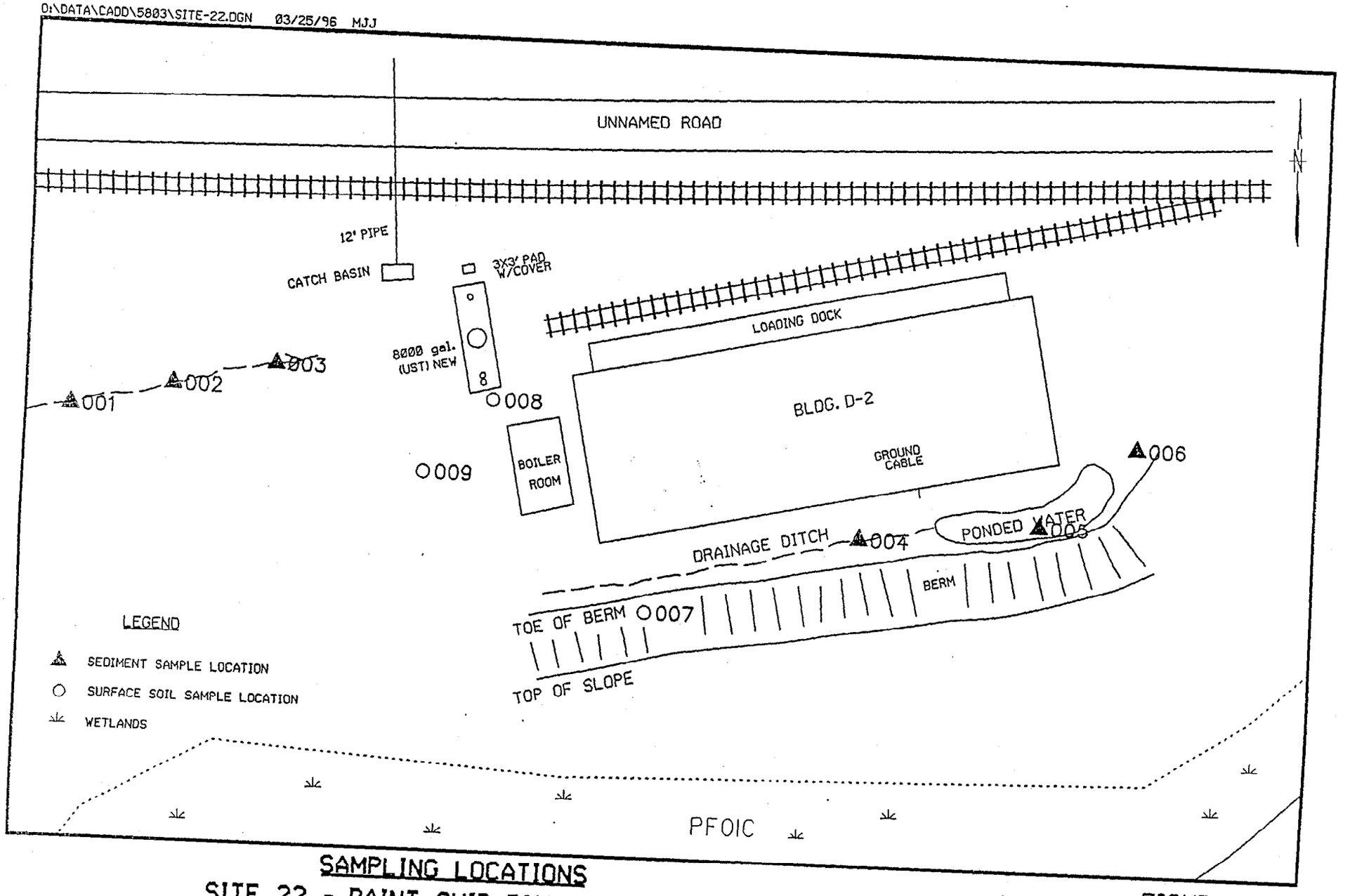
COMPARISON OF SUBSURFACE SOIL ANALYTICAL DATA TO ARARS - SITE 27

NWS EARLE, COLTS NECK, NEW JERSEY

SAMPLE NUMBER:	27SB03-01	27SB03-03	27SB03-06	---	---	---	SELECTED ARARS		
LOCATION:	27SB03	27SB03	27SB03	---	---	---	NJDEP Soil Residential Direct Contact Cleanup Criteria	NJDEP Soil Non-Residential Direct Contact Cleanup Criteria	NJDEP Soil Impact to Groundwater Cleanup Criteria
DATA SOURCE:	1995 RI, Dec.	1995 RI, Dec.	1995 RI, Dec.						
PESTICIDES	**ug/kg**	**ug/kg**	**ug/kg**				**ug/kg**	**ug/kg**	**ug/kg**
Aroclor-1260	300	15.0 J	16.0 J				490	2000	50000
alpha-chlordane	3.2		0.20 J				-	-	-
dieldrin	1.6 NJ						42.0	180	50000
endrin aldehyde	15.0 J						-	-	-
gamma-BHC (Lindane)	0.22 R						520	2200	50000
gamma-chlordane	1.4 R						-	-	-
heptachlor epoxide	0.17 R						-	-	-

APPENDIX B

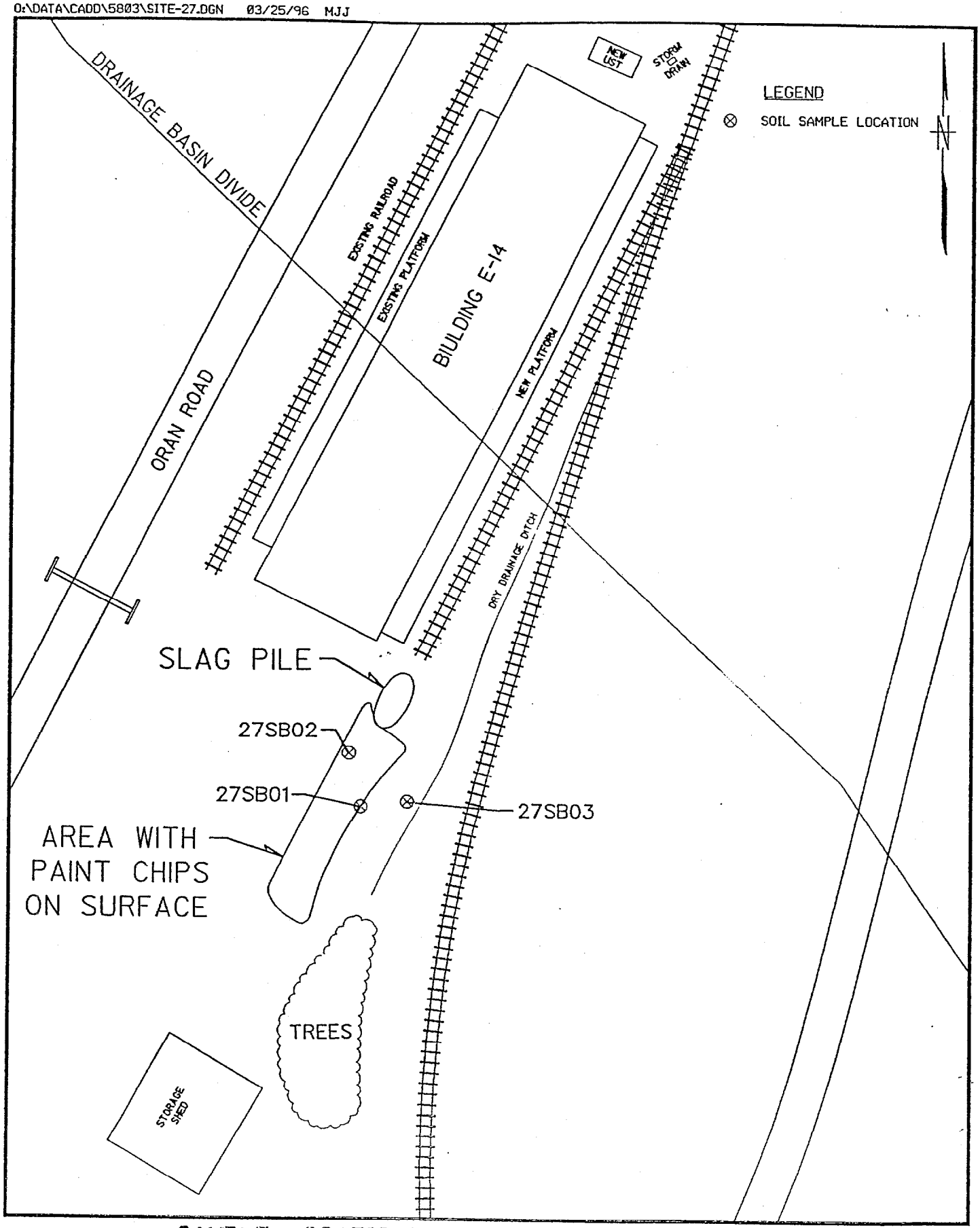
MAP



SAMPLING LOCATIONS
SITE 22 - PAINT CHIP DISPOSAL AREA

FIGURE 22-1

Brown & Root Environmental



SAMPLE LOCATIONS

SITE 27 - PROJECTILE REFURBISHING

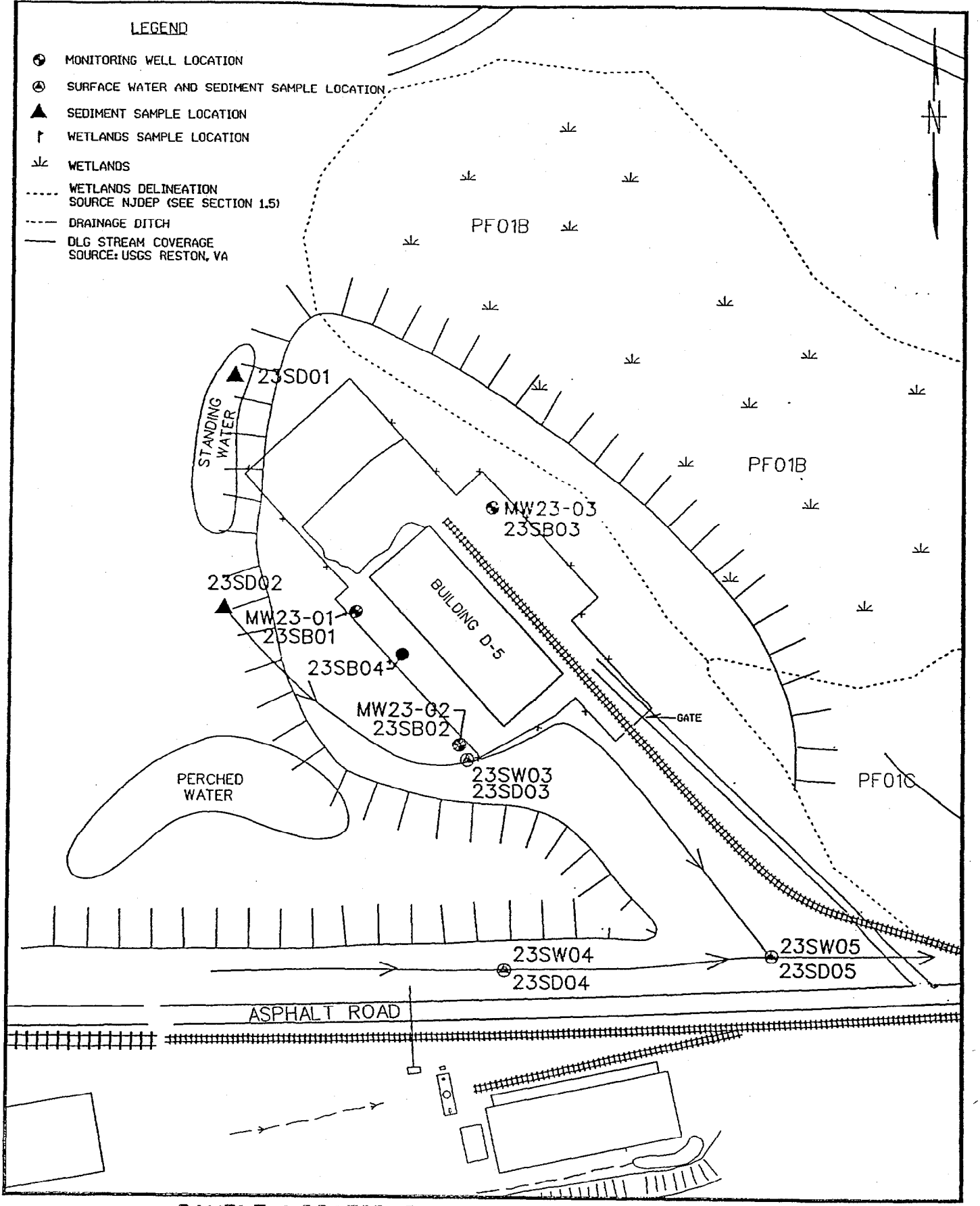
0 50 100

SCALE IN FEET

FIGURE 26-1

Brown & Root Environmental

O:\DATA\CADD\5803\SITE-23.DGN 03/25/96 MJJ



SAMPLE LOCATIONS
SITE 23 - PAINT DISPOSAL AREA

0 100 200
SCALE IN FEET

FIGURE 23-1

Brown & Root Environmental

APPENDIX C

ENGINEERING EVALUATION/COST ANALYSIS

ENGINEERING EVALUATION/COST ANALYSIS

CLEAN UP OF SITE 22 - PAINT CHIP DISPOSAL AREA, SITE 23 -PAINT DISPOSAL AREA, AND SITE 27 - PROJECTILE REFURNISHING AREA NAVAL WEAPONS STATION EARLE

INSTALLATION RESTORATION SITES 22, 23 AND 27

Prepared by
Tim Silar
Project Manager
Foster Wheeler Environmental Corporation
September, 1996

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 develops, evaluates and selects alternatives that will provide an effective interim remedy which is consistent with anticipated final remediation goals.

Naval Weapons Station Earle (NAVWPNSTA) Earle, Sites 22, 23, and 27 were areas used for the disposal of paint chips, paint sludge, and other paint-related materials. Because the sites are in close proximity and used to dispose of similar materials, they are considered together. The analytical results of soil samples collected from the site disposal areas revealed low concentrations of polyaromatic hydrocarbons (PAHs) and cadmium associated with past disposal practices.

The objective of the removal action is to remove the impacted soils at the three sites. The removal action will serve to minimize the potential for contaminant migration via surface water run-off and groundwater infiltration as well as any impacts from direct contact with the soils. This action is consistent with Navy Policy to close small disposal areas in an environmentally acceptable manner.

The Sites are currently located in a secured area. 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 Sites is expected to prevail.

This EE/CA has been prepared to provide documentation in the NAVWPNSTA Earle administrative record for the removal action selection at Sites 22, 23 and 27. 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 DESCRIPTION AND BACKGROUND

2.1.1 SITE 22

Site 22, located west of Building D-2, is a former sand blast and paint disposal area. The estimated dimensions of the Site 22 disposal area are 50 feet by 100 feet by 1 foot deep. Analytical results from samples previously collected in the disposal area did not reveal concentrations of any compound above the NJDEP Residential or Non-Residential Direct Contact Cleanup Criteria concentrations. However, limited soil removal and disposal will be executed. Excavation limits will be based on visual inspection of paint chips in the soil and post-excavation sampling. The site is accessible from a macadam road from Midway Road.

2.1.2 SITE 23

Site 23, located along the west side of Building D-5, is a former paint disposal area used from the early 1970s until approximately 1993. The estimated dimensions of the Site 23 disposal area are 75 feet by 50 feet by 3 feet deep. Analytical results from soil samples previously collected in the disposal area indicated that PAHs (benzo (a) anthracene, benzo (a) pyrene, benzo(b) fluoranthene, benzo (k) fluoranthene, and indeno (1,2,3-cd) pyrene) were detected at concentrations above the NJDEP Non-Residential Direct Contact Cleanup Criteria concentrations. Cadmium was also detected in soil samples at a concentration above NJDEP Residential Direct Contact Cleanup Criteria concentration. The disposal area is near former soil sample locations 23SB04, 23SB01 and 23SB02. There is an earthen berm, approximately 20 feet high, which surrounds the northern, eastern and western area of the site. The site is accessible from a macadam road from Midway Road.

2.1.3 SITE 27

Site 27, located southwest of Building E-14, is a former disposal area for oil-contaminated rags, paint chips, and spent sandblasting shot. The estimated dimensions of the disposal area are 30 feet by 50 feet by 1 foot deep. Analytical results from three soil samples previously collected in the disposal area revealed cadmium concentrations above the NJDEP Residential Direct Contact Cleanup Criteria concentration. The site is accessible from Oran Road.

2.2 PREVIOUS REMOVAL ACTIONS

There have been no known removal action at the Sites.

2.3 SOURCE, NATURE AND EXTENT OF CONTAMINATION

The Draft Remedial Investigation Report for the NAVWPNSTA Earle, dated March 1996 indicated the presence of some PAHs and cadmium in the soils at Site 23 above the regulatory action guidelines. Analytical results also revealed cadmium above the regulatory action guidelines in the soils at Site 27. The analytical results from the soils at Site 22 revealed that the concentrations were below regulatory action guidelines. The concern at these Sites is to remove the materials disposed in these areas along with the impacted soils in order to mitigate the potential migration of PAHs and cadmium in surface water via run-off and groundwater via infiltration.

2.4 ANALYTICAL DATA

In 1993, Brown & Root Environmental (the Navy contracted consultant) conducted the following Remedial Investigations at Sites 22, 23 and 27:

2.4.1 SITE 22

Six soil samples, three shallow (0-1 foot below ground surface(bgs))and three deep (2 feet bgs), were collected in the paint chip disposal area at Site 22. The three shallow soil samples were analyzed for total analyte list (TAL) inorganics, base neutral acids (BNAs), and target compound list (TCL) pesticides/PCBs; and the three deep samples were analyzed for TCL volatile organic compounds (VOCs).

2.4.2 SITE 23

Eight soil samples were collected and analyzed from three soil borings, which were used to install monitoring wells, and one hand auger boring as part of the remedial investigation at Site 23. Two soil samples were collected from two borings and three samples from one boring. In general, samples were collected at the interval with the highest HNU readings and directly above the water table. The soil sample from the hand augured boring was collected at 1.5 to 2.5 feet bgs. The subsurface soils samples were analyzed for TCL VOCs, TCL SVOCs, TCL pesticides/PCBs, and TAL inorganics. The third sample from boring MW23-3 was only analyzed for TCL VOCs. A sample from each boring was also submitted for explosives analysis. The analytical results revealed PAHs (benzo (a) anthracene, benzo (a) pyrene, benzo(b) fluoranthene, benzo (k) fluoranthene, and indeno (1,2,3-cd) pyrene) at concentrations above the NJDEP Non-Residential Direct Contact Cleanup Criteria concentrations. Cadmium was also detected in soil samples at a concentration above NJDEP Residential Direct Contact Cleanup Criteria concentration.

2.4.3 SITE 27

Soil samples were obtained from two soil borings during the remedial investigation. A total of 6 subsurface soil samples were collected from the two soil borings at three depth intervals (1 to 2 ft bgs, 3 to 4 ft. bgs, and 10 to 12 ft. bgs) and analyzed for TCL VOCs, TCL SVOCs, TAL inorganics and TCL pesticides/PCBs. Cadmium was detected in the shallow soils at concentrations above the Residential Direct Contact Cleanup Criteria, but below the Non-Residential Direct Contact Cleanup Criteria.

2.5 SITE RISK ASSESSMENT

Actual or threatened releases of pollutants or contaminants from this site, 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 REMOVAL ACTION OBJECTIVES

3.1 STATUTORY LIMITS ON 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 much shorter than 12 months.

3.2 DETERMINATION OF REMOVAL SCOPE

The scope of work for the Sites will include the excavation, transportation and off-site disposal of paint-related wastes and associated soils and backfilling the excavated areas with clean fill. Confirmation sampling will be conducted to demonstrate the efficiency of the removal action.

3.3 DETERMINATION OF REMOVAL SCHEDULE

The planned removal action will occur from October 7, 1996 through October 11, 1996. Analytical results of post-excavation samples will be available by the end of October 1996.

4.0 IDENTIFICATION OF REMOVAL 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

Although analytical results do not indicate that the Sites present any immediate threat, the lack of action to remove the disposal materials in the soils now would not mitigate a potential for run-off of inorganics and PAHs in surface water and/or infiltration to the groundwater.

4.2 INSTITUTIONAL CONTROLS

Institutional controls and containment is a grouping 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 sites, either by Naval instruction or local code. Site 22, 23 and 27 are within a Naval Installation that presently has limited public access. Additionally, these sites are within a secure area which has additional personnel restrictions.

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, inorganics and PAHs may be transported via erosion/depositional and infiltration processes.

4.2.2 CAPPING

The construction of a cap over Sites 22, 23 and 27 using any of the available capping materials such as asphalt, concrete, clay, bentonite or synthetic membranes to provide a low permeability cover.

INITIAL SCREENING

The geographic setting of these sites does not lend itself to capping within reasonable cost constraints; the inability of using this technology to meet the remediation goal removes it from further consideration.

4.2.3 IN SITU CONTAINMENT, 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 or loss of contaminant can occur is decreased, and 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, leachability prevention is not guaranteed. Therefore, this option has been eliminated from further consideration.

4.3 EXCAVATION AND OFF-SITE REMOVAL OF SOILS

Implementation of this alternative assures the removal of the potential contaminant source and is a common cost effective remedial alternative. The disposed material and visibly impacted soils will be excavated, transported and disposed off-site at a permitted disposal facility. Post excavation samples will be collected at each site to ensure that the removal action was effective. Upon receipt of the sample results concentrations will be compared to the NJDEP cleanup concentrations. If the sample concentrations are below cleanup concentrations, the excavated areas will be backfilled with clean fill material and topsoil, regraded and reseeded. If the soil concentrations are above the NJDEP cleanup concentrations (non-residential) the removal will continue until clean conditions are achieved.

INITIAL SCREENING

This option will provide for an effective remedy to remove the source of contamination. The total potential volume of soil to be excavated, transported and removed is approximately 658 cubic yards.

5.0 COMPARATIVE ANALYSIS OF REMOVAL ACTION ALTERNATIVES

Based on the initial screening of alternatives, the most effective alternative is described in paragraph 4.3. Exhibit 1 is the cost estimate for the total effort. The estimate incorporates the assumptions that the soils will not fail the TCLP test, thereby disposing of the soils off-site as non-hazardous and that post excavation sample concentrations will be below NJDEP cleanup concentration, thereby limiting the volume of soils to be excavated, transported and disposed. This is the only alternative which effectively removes the source and it is proposed that one round of post excavation sampling associated with this action will demonstrate cleanup effectiveness; therefore, the need for any further monitoring or analysis of the sites will be eliminated.

Contractor personnel will excavate the materials. Materials will be directly loaded into trucks for transportation of disposal. Post excavation sampling will be performed by contractor personnel; soil will subject to analysis for PAHs and/or cadmium. Excavated areas will be restored by contractor personnel.

6.0 RECOMMENDED REMOVAL ACTION ALTERNATIVE

The alternative described in paragraph 4.3 is the recommended alternative. The recommended alternative provides excellent protection to human health and the environment by removing the sources of contamination which pose a potential risk to receptors.

The New Jersey Non-Residential Surface Soil Clean-up Criteria will be used as clean-up standard for this removal action.

EXHIBIT 1

Remedial Action
Cost Estimate

Clean Up of Sites 22, 23 and 27
Installation Restoration Program
Naval Weapons Station Earle

August 1996

Remediation Labor	
Preparation, Planning, Procurement, Documentation	$ 22,820
Site Labor	$ 19,022
Subtotal Remediation Labor	41,842
Equipment/Supplies and Materials/Laboratory Cost	$11,881
Transportation/Disposal	$83,312
Total Job	$137,035