N60478.AR.000018
NWS EARLE
5090.3a

ER SI 4
06/01/87
US EPA PREL. ASSESSMENT F

July 1987

Preliminary Assessment

for

RCRA Corrective Action Program

Naval Weapons Station Earle
Colts Neck, Monmouth County, New Jersey

EPA ID NJ0170022172

N. J. Department of Environmental Protection
Divisions of Environmental Quality
Waste Management
Water Resources

Prepared by the Division

NAVAL WEAPONS STATION EARLE
COLTS NECK, MONMOUTH COUNTY, NEW JERSEY

This narrative was prepared from information gathered during a file search of federal, state, and local agencies. However, the Department of the Navy is believed to possess additional information, which has not yet been made available, that would be useful in supplementing the information contained within the body of this report. It is therefore recommended that efforts be made by applicable state and federal agencies to obtain copies of monitoring and sampling results which the Department of the Navy may have in their possession.

The Naval Weapons Station Earle includes approximately 10,482 acres in the Main Base and 706 acres in the Waterfront and Chapel Hill Areas. The Main Base contains portions of Howell, Wall, and Colts Neck Townships and the Borough of Tinton Falls. The Waterfront and Chapel Areas are both located in Middletown Township. This site was approved as a suitable location for a naval ammunition depot in June 1943. Construction began immediately and was substantially completed by June 1944. Previous use of the land was limited to farms and single family dwellings. The current mission at Earle includes the receiving, issuing, maintenance, renovation and storage of ammunition, explosives, expendable ordnance items and weapons and technical ordnance material. This also includes the disposal of outdated or otherwise unusable ordnance. In addition, Earle provides administrative and logistics support to homeported ships and any additional tasks as directed by the Commander, Naval Sea Systems Command. Earle has the current capabilities to perform all typical weapons station functions except test and assembly of air and surface launched weapons.

There are four tenant activities currently in operation at Earle. The Defense Property Disposal Office, the Precious Metals Recovery Office and the Mobile Mine Assembly Group are located on the Main Base and are operated by the Department of Defense. The Oil and Hazardous Materials Simulated Environmental Tank Test is operated by the Environmental Protection Agency at the Waterfront.

The conditions which exist at Earle are such that the geologic and hydrologic conditions could favor the movement of pollutants in the groundwater. A large portion of the soils of the Main Base are sandy to sandy loam and are therefore moderately well to well drained. The soils are typically acidic with high iron and sulfur contents. Geologically, the Main Base contains outcrops of the Hornerstown Sand, Vincentown Formation, Kirkwood Formation, and the Cohansey Sand. The Waterfront and Chapel Hill Areas contain outcrops of the Wenonah Formation, Navesink Formation and Red Bank Sands.

The Cohansey Sand, Kirkwood Formation, Vincentown Formation, Red Bank Sand, Navesink Formation, the Mount Laurel and Wenonah Formation are aquifers of concern in the area. These formations lie above the Englishtown Formation but are separated from it by the Marshalltown formation which acts as a confining layer. The Manasquan, Hornerstown and Navesink Formations are considered to be poor aquifers, but they do allow some flow to get through to the underlying aquifers. The two principal aquifers which could be affected by contamination at the Main Base are the [illegible]

recharge area for both these aquifers. There are no public supply wells within five miles which utilize either of these aquifers, however both aquifers are used extensively for private domestic supplies. The 1984 HRS identified 318 private residences within a three mile radius who relied on private wells as the sole source of potable water. The average depth to groundwater at the Main Base is between thirteen to sixteen feet and generalized groundwater flow is to the southeast and east.

There are three major rivers draining the Main Base, the Shark River, the Manasquan River, and the Swimming River. There are three main drainage basins and several smaller subbasins. The Chapel Hill Area contains the headwaters of Compton Creek, Ware Creek and Wagner Creek all of which drain to Raritan Bay. The Waterfront Area has many streams which drain to both Raritan Bay and Sandy Hook Bay. Three of the streams which drain the Main Base are tributaries to rivers which are used for surface water reservoirs. Additionally, a surface water intake is located within three miles of the Main Base which is used for irrigation. None of the surface waters at the Waterfront or Chapel Hill Areas are used for water supply. Potable water for these areas are obtained from municipal sources. There are nine ponds and lakes on the Main Base totaling nineteen (19) acres.

A total of thirty four (34) solid waste management units have been identified at Earle, including five (5) RCRA regulated units. Twenty nine of these sites were identified during an Initial Assessment Study (IAS) which was performed as part of the Navy Assessment and Control of Installation Pollutants (NACIP) program by Fred C. Hart Associates in 1983.

A. <u>ORDANCE DEMILITARIZATION SITE, SECURED</u> <u>SITE 1</u>

This six (6) acre site was utilized from 1943 to 1974 for the burning of ordnance materials. Powder was placed in shallow trenches and accumulated to approximately 2000 pounds. At that time the powder was burned. However, it was not uncommon for the trenches to be covered without burning at the end of the day. It is believed that 90% of the material burned at this site was nitrocellulose. As an aid to ignition, black powder (75% KNO_3 or $NaNO_3$, 15% charcoal, and 10% sulfur) may also have been used. The area was demilitarized in 1975 by plowing and spreading of oil soaked hay. The area was then set ablaze. Currently, the area is used by the U.S. Army as a communication facility. Depth to the groundwater in this area is estimated at six (6) feet.

During the visual site inspection conducted by this Bureau in May 1987, readings of 2-3 ppm were observed on both the Organic Vapor Analyzer (OVA) and the HNu Photoionization Detector at various locations throughout the site. The OVA and HNu are not direct reading instruments. They detect organic vapors relative to methane and benzene respectively. For the purpose of the site inspection, they are used to measure relative levels of contamination in the field.

Due to the sandy conditions in the area and the relatively shallow ground water, it is recommended that monitoring wells be installed to determine if contamination exists, and direction of groundwater flow.

B. EXPLOSIVE ORDNANCE DISPOSAL SITE (EOD) SITE 2

This RCRA regulated eleven acre site has been used for the disposal of ordnance from on and off site since 1974. It is estimated that a total of 80,000 pounds of explosive and propellants have been disposed of at this site on an average of 800 pounds per month. Incendiary compositions are destroyed in unlined burn pits. Some of the particulates and all of the solid residues remain in the soil at the site. The explosives and propellants which have been disposed of at this site include the following: ammonium picrate, trinitro toluene, hexagon (cyclo-1, 3, 5 - trimethylene - 2, 4, 6 trinitramine, or RDX), Composition 4 (a mixture of hexagon and plasticizer), and double based propellants (nitrocellulose and nitroglycerine mixtures).

The depth to the groundwater has been approximated at six (6) feet. The soil is sandy and slopes downward to unlined pits which are near the water table. These pits contain water at times which percolates through the sand. According to Earle personnel, this standing water is also supplied by springs. The site is located within the recharge zone of the Vincentown Aquifer and groundwater flow is believed to be to the southeast. Several homes which may use this aquifer for their potable water supply are located less than one mile southeast of the site.

During the visual site inspection conducted by this Bureau in May 1987, several automobiles which had been detonated were observed. According to Earle personnel, most of the time these vehicles are emptied of gasoline and oil prior to detonation. The EOD range no longer accepts materials from off-site. Elevated readings (12-90 ppm) were detected by the HNu in various locations throughout the site.

There are currently four (4) groundwater monitoring wells along the periphery of this site which were sampled in July 1986. At the same time, soil, surface water and sediment samples were taken. Based on the results of this analysis and the determination of groundwater flow, it may be necessary to install additional wells at this site due to the solubility of the disposed material and the permeability of the surrounding soils.

C. LANDFILL SOUTHWEST OF "F" GROUP SITE 3

This five (5) acre landfill was used from 1960-1968 for the disposal of domestic and industrial wastes by open trench dumping followed by earthen covering and compaction. The wastes could have consisted of paints and paint thinners, solvents, varnishes and shellacs, acids, alcohols and caustics, pesticide containers and rinse waters, waste woods, small amounts of asbestos, and other industrial and domestic wastes. It is estimated that 4800 tons of wastes were disposed of in this landfill. This area is located within the recharge zone of the Kirkwood aquifer and the water table is estimated to be present at eight (8) to ten (10) feet. The soil of the area are sandy and groundwater flow is to the southeast and east. The domestic wells are located less than one mile to the south of the site. Surface waters nearby include some swampy channels within 200-300 feet and Mamahone Brook approximately 400 feet away.

During the May 1987 visual inspection conducted by this Bureau, low

open. Depending on the results of laboratory analysis of the monitoring wells and the determination of groundwater flow, additional wells and analysis may be required.

D. LANDFILL WEST OF "D" GROUP SITE 4

This five (5) acre landfill was used for the disposal of domestic and industrial wastes from 1943 to 1960. Typical operations included the burning of waste material in trenches prior to burial. Metals were separated from other wastes with alternate layers of refuse and compacted earthen cover. Approximately 10,200 tons of wastes were disposed of at this landfill and may have included domestic wastes, demolition wastes, pesticide containers and wash waters, paints, paint thinners, varnishes, shellacs, acids, alcohols, caustics, asbestos, and waste wood.

The landfill is located in the Cohansey Sands, a rapidly permeable sand formation which overlies the Kirkwood aquifer. This aquifer is used for domestic purposes with the nearest private users within 1.5 miles of the site. Ground water flow in the area is to the southeast. The landfill is within the area of Cranberry Hill. Several springs have been reported at the base of the hill, indicating that some groundwater in the Cohansey Sand may be perched. In addition, the site is located within 380 feet of Lake Earle.

A site inspection conducted by representatives of Fred C. Hart Associates in 1983 indicated inadequate or eroded cover along the eastern side at the landfill and some evidence that some construction debris was disposed of since closure. Areas of outwash were also down slope from the fill. Hart Associates indicated that lateral migration of contaminants to Lake Earle may have been responsible for catfish kills in the lake. Readings of greater than 2000 ppm on the HNu were detected at the landfill. Downhill of the landfill is Lake Earle. Readings of 7 ppm on the HNu were obtained near the bank of the lake.

Three ground water monitoring wells have been installed and were sampled in July 1986. Based on the results of this analysis and the determination of groundwater flow, additional wells and analysis may be required. It is recommended that Lake Earle be sampled to determined if contamination has occurred due to activity at this landfill.

E. LANDFILL WEST OF ARMY BARRICADES SITE 5

This thirteen acre landfill was used from 1968 to 1978 for the disposal of an indeterminant amount of wastes. These waste types would include paper, glass, plastic, pesticide containers and rinse waters, paints, paint thinners, solvents, varnishes, shellacs, acids, alcohols, caustics, and waste wood. These wastes were dumped into open pits, covered and compacted.

Depth to groundwater in this area is estimated to be ten to twelve feet, with the ground water flowing to the southeast. The nearest downgradient receptors would be located about one mile southeast of the site. The soils overlying the site are sandy with moderate permeabilities. The site is located within the recharge area of the Kirkwood aquifer.
The NJDEP approved final [illegible] and closu[illegible] of this landfill.

During the visual site inspection conducted by this Bureau in May 1987, readings of 5-30 ppm on the HNu and up to 900 ppm on the OVA were observed.

Four groundwater monitoring wells have been installed and were sampled in July 1986. Based on thse results and the direction of groundwater flow, additional wells and analysis may be required.

F. LANDFILL WEST OF NORMANDY ROAD SITE 6

This four acre landfill was used for the disposal of refuse generated by waterfront operations from 1943 to 1965, when approximately 2500 tons of refuge per year were disposed of here. Materials buried at this location were typically dumped over the edge of an embankment and covered. These wastes would include boxes, crates, packing materials, treated lumber, cans, drums, paint and solvent wastes.

It is believed that the area was a tidal marsh prior to the commencement of waste disposal activities. Since the landfill was closed, the waterfront recreation building was constructed on top of the site.

Surface drainage from the landfill will drain to an adjacent tidal marsh and Sandy Hook Bay. Sandy soils at the site favor the migration of potential contaminants to the groundwater. There is no known use, however, of the upper aquifer at the waterfront.

According to Naval personnel, prior to the mid 1970's, a sewage treatment plant which serviced the Waterfront Area was located near this location. During the May 1987 site inspection conducted by this Bureau, HNu readings ranging from 14 to greater than 2000 ppm were obtained along the periphery at the building. Because of the sandy soil conditions and these elevated readings, it is recommended that monitoring wells be installed at this location to determine the existance and extent of groundwater contamination.

G. LANDFILL SOUTH OF "P" BARRICADES SITE 7

This five acre site was used from 1965 to 1977 for general waste from the Waterfront Area. This would include munitions shipping wastes, shop waste from the Waterfront Public Works Shop, glass, wood, waste paint thinners, solvents, and domestic refuse. These materials were buried, earth covered, and compacted. The total amount of wastes disposed of at this location is unclear.

The site is located [illegible] the headwaters of Compton Creek, which drains through a tidal marsh to San[illegible] Bay. Sandy soils which cover the area may allow for the migration of p[illegible] contaminants. There is no known use for the upper aquifer at the Wa[illegible] and depth to groundwater in the area is estimated at twelve to fifteen [illegible]

NJDEP approved fi[illegible] closure of this landfill.

This area was in[illegible] the May 1987 inspection by this Bure[illegible] from the area o[illegible] there were numerous drums, [illegible] cans, lumber and [illegible] scattered haphazardly. Soil [illegible]

illegal disposal of wastes. A referral has been made to the Division of Hazardous Waste Management, Central Field Office

Soil gas readings in the covered area of the landfill reached 450 ppm on the OVA and 70 ppm on the HNu. Three monitoring wells were installed at this site and sampled in July 1986. Based on the results of this analysis and the determination of groundwater flow, additional wells and analysis may be required.

H. LANDFILL EAST OF S-186 SITE 8

This one acre site was used from 1943 to 1965 for the disposal of 20,000 to 30,000 cubic yards of dunnage, which is typically untreated lumber. The site consists of a burning area and landfill. Typically, the dunnage was burned and the remains were buried with other miscellaneous wastes. The soil of the area is compacted clay and gravel. The depth to groundwater is unknown.

No significant readings were obtained on either the OVA or HNu during this Bureau's May 1987 site inspection. Because of the lack of significant readings and the types of materials disposed of at this location, no further action is recommended at this site.

I. LANDFILL SOUTHEAST OF "P" BARRICADES SITE 9

This three acre site was used for the disposal of dunnage lumber from 1967 to 1972 with the total amount received approximated at 4500 to 7500 cubic yards. This lumber was stockpiled and burned. It was then buried in the landfill, possibly along with other unknown types of wastes. There is a small brook located within 200 feet of the site. The estimated depth to groundwater is fifteen feet.

A reading of 90 ppm on the HNu was obtained near the edge of the landfill during this Bureau's May 1987 site inspection. Readings decreased as the center of the landfill was approached. It is recommended that soil borings be taken throughout the landfill to determine the source and type of contamination present.

J. SCRAP METAL LANDFILL NEAR BUILDING S-589 SITE 10

This two acre site, also known as the "Box Yard", was used from 1953 to 1965. Unusable munitions and containers from spent munitions were buried in holes, 120 feet in diameter, spread over two acres. The site was also used for the disposal of spent grit [illegible] paint chips from ammunition rework operations. These paint chips typically [illegible] lead and zinc.

Shell casings and mu[illegible] containers were observed at this site in May 1987 during this Bureau's [illegible]pection. Low level readings (10 ppm HNu, 3 ppm OVA) were detected [illegible]time. Three groundwater monitoring wells were installed at this s[illegible]led in July 1986. Based on the results and the determination of [illegible] flow, additional analysis and wells may be required.

K. CONTRACT ORDNANCE DISPOSAL AREA SITE 11

This is a fan-shaped two (2) acre site which is used for the disposal of obsolete ordnance material. The years of activity and the quantity of wastes disposed are unknown. From 1974 to 1977, the site was used for fire fighting training exercises. A reject airplane or vehicle was placed in one of two unlined pits, soaked with fuel oil or waste oil and set ablaze. Any oil remaining after the fire was extinguished remained in the pit.

No significant readings were obtained during this Bureau's May 1987 site inspection. The site is presently inactive. Three groundwater monitoring wells have been installed and sampled in July 1986. At this time, soil samples were collected. Based on these results, and the determination of groundwater flow direction, additional wells and analysis may be required.

L. BATTERY ACID SPILL SITE SITE 12

This is an area at the Waterfront that was used for the disposal of acid electrolytes from batteries which were being sent off-site for reclamation. The period of use of this area and the total quantity disposed is unknown. The disposal site drains into a tidal marsh.

This site is currently being utilized as a supply warehouse and is asphalt covered. It is recommended that soil borings be taken to determine the presence of contamination.

M. DEFENSE PROPERTY DISPOSAL YARD SITE 13

This is an area used for the storage of scrap metals and forklift batteries. PCB containing transformers were stored here in open rail cars prior to their transport to controlled storage areas. It is unknown whether leakage occurred at this location.

Currently, this site is used for the storage of speciality carrier devices. Because the chance of any release is remote, no further action is recommended at this time.

N. DEFENSE PROPERTY DISPOSAL OFFICE WAREHOUSE SITE 14

This is a 16000, yd^2 warehouse storing items awaiting processing. In 1970, a mercury spill of unknown quantity occurred in this building. Clean-up operations were undertaken but records of neither the incident nor the clean-up are available.

This warehouse is now part of the Precious Metals Recovery Office. The building is adequately contained so that the chance of any release is remote. No further action is recommended at this location.

O. SLUDGE DISPOSAL SITE NEAR THE WATERFRONT SOUTH GATE SITE 15

This site was used for disposal of an unknown quantity possi

This area is currently utilized as a parking lot which was paved in approximately 1978. It is recommended that soil borings be taken in order to assess the extent of contamination.

P. FUEL LINE CONNECTING BUILDING C-19 AND C-50 SITE 16

This 400 foot piece of pipeline was used to transfer fuel oil from an underground storage tank to a dispensing station. In June 1977, a leak in the line was detected and use of the line was discontinued. Subsequent excavation determined that loss due to the leak was probably less than 50 gallons.

Upon excavation, it was found that the pipe was in poor condition. The pipe was removed and sealed at both ends. No further actions are recommended at this site.

Q. DISPOSAL AREA BEHIND TRAINING BARGE, WATERFRONT SITE 17

This area is currently being used as a disposal area for Waterfront Area. Typical materials include forklift vehicles, empty paint cans, old valves and construction debris. A site inspection conducted by representatives of Fred C. Hart Associates revealed an empty 55 gallon drum. Previous contents were unknown.

The area is currently used for personnel training and for storage of large pieces of scrap metal. During the May 1987 site inspection conducted by this Bureau, garbage bags, household appliances and other debris were observed over an embankment to an area adjoining adjacent wetlands. As this may constitute an illegal disposal of wastes, a referral has been made to the Division of Solid Waste Management.

R. DEMILITARIZATION FURNACE SITE 18

This is a RCRA regulated Demilitarization Furnace which was put into service in 1978 for the purpose of demilitarizing small caliber munitions and munition components, fuses, primers, cartridge-activated devices and illuminating signals. The objective of this furnace is not disposal but instead demilitarization and recovery of metal components. The total explosive content of items processed are a small percentage of the total weight. Items are processed which have no explosive content but must be demilitarized due to a classified configuration or component. Several tons of metals are generated annually by the demilitarization furnace. The furnace consists of a rotating retort furnace, a cyclone separator, a bag house and an induction fan. The site inspection by Hart Associates representatives revealed 50 square feet of soil which was contaminated with metal fragments dropping off the discharge conveyor as well as grease deposits. The residue generated consists of oxides of zinc, magnesium, cadmium, copp[illegible] iron, lead, calcium, potassium, aluminum, barium, chromium, strontium, and [illegible]mony.

Stack tests performed in [illegible] 1980 and 1982 all indicate the furnace was out of compliance in both emis[illegible]rates and particulate allowance. Curren[illegible] has installed control de[illegible] but have not performed stack testing. Soil which was covered [illegible] fragments near discharge conveyer

type of collection device be installed to prevent these metal fragments from becoming integrated with the soil. There was no sign of residue near the cyclone dust collector.

S. PAINT CHIP AND SLUDGE DISPOSAL AREA ADJACENT TO BUILDING S-34 SITE 19

This site was used for the disposal of paint chips and paint sludge which was generated during the maintenance of depth charges from the early 1940's to the early 1960's. Operations treated an estimated one thousand charges per year and included the removal of loose paint and rust by wire brushing and solvent baths followed by washing and repainting, all conducted on an outside platform. The wash water is believed to have contained a 5% slurry of paint scrappings which was continuously discharged at a rate of 7000 gallons per day through a drainage swale which emptied into Mingamahone Brook. This operation ceased in 1959 when a solvent paint stripping procedure, which used keolite as a solvent for the lead base paints, was initiated. This procedure was terminated around 1963 due to concerns regarding potential environmental effects on Mingamahone Brook aquafic life. During the four (4) years that this procedure was used, it is estimated that 100 gallons per year of a solvent/paint sludge mixture was disposed of outside the building. Building S-34 has since been condemned and barricade facilities were constructed on this site in the early 1970's.

No significant readings were observed during the May 1987 site inspection which was conducted by this Bureau. Three ground water monitoring wells have been installed and were sampled in July 1986. At this time, soil samples were also taken. Based on these analytical results and the determination of ground water flow, additional wells and analysis may be required.

T. GRIT DISPOSAL AREA, BUILDING 544 SITE 20

This site houses the operations of the Fleet Mobile Mine Facility, which has been a tenant operation since 1975. Operations consist of the reconditioning of underwater mines in two steps, paint removal and repainting, followed by the application of an antifouling compound. Wastes generated include laquer thinner, toluene thinner, dry cleaning solvent, zinc chromate primer, latex and lead-based paints, copper antifouling paint, acetone and water repellant grease. The fungicide applied is a mercurous chloride compound which breaks down to mercuric chloride and metallic mercury in the presence of sunlight. Also formed is a sticky brown exudate which is believed to contain PCB's. These materials are disposed of off-site under contract.

Accumulated grit and paint chips from paint removal operations are disposed of on a 1500 square foot section of ground behind the building and allowed to settle into the ground.

Significant readings ([illegible] than 1000 ppm on the OVA and greater than 2000 ppm on the HNu) were det[illegible] the drainage area to the rear of the building during the May 1987 s[illegible]tion conducted by this Bureau. Large amounts of grit were evident in [illegible]urrounding the facility. Due to these elevated readings, it is reco[illegible] monitoring wells be installed and soil borings taken to determine t[illegible] contamination.

U. WAREHOUSE AND CY[illegible] AREA SITE 21

This area serves as a RCRA regulated container storage area for dust removed from the air pollution control systems on the Demilitarization Furnace. From 1978 to 1982, these systems recovered an average of 25 drums per year of dusts containing oxides of cadmium, lead, barium and chromium. During these years an unidentified amount of dust spilled onto the soil. Around that time, the site was paved over.

Other materials observed stored at this site by Hart Associates in 1983 were expended torpedo battery containers and 200 empty drums of unknown original content which were stored on their sides allowing small quantities of residuals to leak onto the ground. This area has a total storage capacity of 24,000 gallons and includes solids such as paint residuals and ash.

During the May 1987 site inspection conducted by this Bureau, it was noted that these drums are stored on pallets on an asphalt pad. There is no secondary containment present. It is recommended that these drums be stored on an impermeable pad with secondary containment in order to prevent runoff/runon.

V. PAINT CHIP DISPOSAL AREA ADJACENT TO BUILDING D-2 SITE 22

This site was used for the hand painting of various ammunition components. In 1983, Hart Associates representatives observed a 50 square foot area of stressed vegetation and black discolored soils behind the building which was presumably the result of these painting operations. Currently the site is being refurbished as a modern painting facility.

Soil borings have been taken at this location in July 1986. Pending the results of this analysis additional soil borings and monitoring wells may be required to delineate the extent of contamination.

W. PAINT CHIP DISPOSAL AREA ADJACENT TO BUILDING D-5 SITE 23

This building has been used since the early 1970's for the repainting and stenciling of major items of ordnance. In the 1983 report, Hart Associates reported a bare area of approximately 200 square feet behind the building. There was evidence of paint spillage and hardened paint sludge present. This area is located 600 feet east of Lake Earle.

During this Bureau's May 1987 site inspection, no significant readings were observed. No further action is recommended for this site.

X. CLOSED PISTOL RANGE SITE 24

The pistol range is characterized by spent cartridges along a firing li[illegible] and bullets in an impact berm. It has been estimated that approximately 250 [illegible]s per year of lead in bullets was used at this site.

No further action is recommended for this site.

Y. CLOSED PISTOL RANGE [illegible]E 25

This range is similar in nature to Site 24. Additionally, Hart Associates noted the presence of other debris such as creosited railroad ties and bed springs in 1983.

No further action is recommended for this site.

Z. EXPLOSIVE "D" WASHOUT AREA, BUILDING GB-1 SITE 26

In the late 1960's, this site was used for the recovery and removal of ammonium picrate from shells. The explosive was dissolved into hot water, which was sent to a setting tank where cooling allowed for the precipitation and collection of the material for either disposal or reuse. Overflow from this tank traveled via an open tile pipe to an unlined pit located thirty feet east of the building. Further cooling in this pit also allowed for precipitation of the explosive, which was covered with diesel fuel and burned. Heavy rains which occurred before this burning occurred caused the washing of the explosive from the pit to Mingamahone Brook. It is estimated that 20,000 pounds of ammonium picrate could have been lost to the surface water in this manner.

From the late 1960's to the early 1970's, operations at this site included grit blasting and paint spraying. Thinners and solvents were disposed of outside the paint spraying operation. This practice could explain the 200 square feet of bare soil with sparse vegetative growth observed by Hart Associates.

At the time of the May 1987 inspection conducted by this Bureau, there was no activity at this location. No significant readings were detected. There was no surface water visible from the site, therefore any effects on Mingamahone Brook is questionable. No further action is recommended for this site.

AA. PROJECTILES REFURBISHING AREA SITE 27

At this site shot blasting, repainting and stenciling is performed for the refurbishment of projectiles. At the back of the building Hart Associates noted an area of 500 square feet covered with blasting shot and paint chips to a depth of about two (2) inches.

There was evidence of hardened paint observed during the site inspection conducted by this Bureau in May 1987. To the rear of the building in a washout area, readings of 1900 ppm were detected on the HNu. There was a pipe protruding from a hill behind the building. Below the discharge point of this pipe, 200 ppm was detected by the HNu. At the time of the inspection, the origin of this pipe could not be found. It is recommended that monitoring wells be installed to determine the extent of contamination and direction of ground water flow. Additional soil borings should be taken to assess the degree of contamination.

BB. WASTE OIL TANK SITE 28

This RCRA regulated underground waste oil tank which has been in service since 1964, overflowed in 1982 releasing several gallons on the soil surface. Poor housekeeping and substantial amounts of waste oil have been observed during RCRA inspections conducted by NJDEP in August 1982, and by the EPA in [illegible] 1985.

will be situated on a concrete pad. At the time of this writing (April 1987) waste oil is stored in drums in a RCRA regulated container storage area (QH-8). Prior to 1960, cutting oils from metals shop operations and other waste oils generated on site were either spread on the base's roads for the purpose of dust control, mixed with oil based pesticides for land applications and/or used as boiler fuels as a supplement to virgin oil products.

As this unit is undergoing closure which has been approved by the Bureau of Hazardous Waste Engineering, no further action is recommended.

CC. PCB SPILL SITE, BUILDING C-16 SITE 29

This site is the location of a spill which occurred due to a vandalized transformer. Within five days of the spill, over 120 cubic feet of soil was excavated and sent off site for disposal.

No further action is recommended for this site. There are no transformers currently at the site.

DD. CONTAINER STORAGE AREA, BUILDING QH-8

Wastes stored at this RCRA regulated area consist of both solids and liquids and include industrial solvents, amalgam, asbestos lagging, boiler water test solutions (contains mecuric nitrate), unused PCB containing transformers and clay (used as spill neutralizing and berming materials). Waste oils are being stored here on an interim basis until the construction of a 3000 gallon storage tank is complete. This an enclosed quonset hut building with a concrete floor and corrugated steel walls, with a maximum storage capacity at 1400 gallons.

During the May 1987 site inspection conducted by this Bureau, spills and leaking drums were observed inside the building. In addition, a furnace exists in the building which does not appear to be explosion proof. A referral has been made to the Division of Hazardous Waste Management, Central Field Office.

EE. PRECIOUS METALS RECOVERY FACILITY

In 1969, the silver reclamation division at Earle was established. At that time, they received 1,500,000 pounds of film, 10,700 pounds of battery cells and 23,830 pounds of silver bearing missle batteries. The operations consist of five (5) identical incinerators which are equipped with secondary stack burner controls. The ash is salvaged for silver recovery purposes and all operations are conducted on a batch basis at a rate of 329,000 pounds per year. Some of the materials accepted [illegible] processing, and the bottom ash of that system has been determined to be [illegible]rdous waste. However, the Bureau of Hazardous Waste Engineering is curren[illegible] [illegible]icipating the adoption of new NJAC regulations which could impact regula[illegible] [illegible]quirements for facilities which reclaim precious metals, before makin[illegible] [illegible]cision as to whether this operation and associated storage areas should [illegible] regulated.

Stack testing of th[illegible] [illegible]in August 1977 found all units to be in compliance with standards.

FF. BUILDING S-35

An additional area of environmental concern is Building S-35 which houses the Base's Ordnance Carpenter Shop. This is a wood working facility which has been in operation from the 1940's to the present time. Personnel who work in this building have complained that the potable water, which is supplied from a well which is drilled to a depth of 80 feet, has a foul smell and vinegar taste. This complaint was verified by the Fred C. Hart Associates.

A water sample was taken during this Bureau's May 1987 site inspection. The sample was agitated and a headspace reading was taken using the OVA. While in the survey mode, an initial reading of 8.5 parts per million as methane was recorded. The sample was then injected into the gas chromotography mode of the OVA. After the initial methane peak, three distinct peaks were observed. A referral for further analysis has been made to the Enforcement Branch of the EPA, and the Bureau of Safe Drinking Water.

GG. WASTEWATER TREATMENT PLANT

An additonal area of potential environmental concern is the wastewater treatment plant on the Main Base. This discharge is regulated under NJPDES #NJ0023540. Treatment consists of bar screening, grit removal, prechlorination followed by primary sedimentation and sludge digestion in Imhoff tanks. After digestion, the sludge is applied to sludge drying beds. Following the Imhoff tanks, filtration takes place in intermittant sand filters. Chlorination procedes final discharge. The discharge is directed to the Hockhockson Brook through outfall 001 at an average daily discharge of 0.080 million gallons per day. The Discharge Monitoring Reports (DMR) indicate that the effluent is of acceptable quality. However, there is concern about possible impacts of the effluent on the Navesink River Watershed. The Division of Water Resoures will be performing composite sampling of the effluent to delineate any adverse effects. In addition, some storm sewers which drain the Main Base discharge to the Hockhockson Brook. Composite sampling will serve to detect any potentially detrimental effects.

At the time of the May 1987 site inspection conducted by this Bureau, the sludge drying beds contained approximately one foot of sludge. HNu readings taken in the beds averaged 40 ppm. The integrity of these beds is unknown. It is recommended that the integrity of these beds be checked and if found to be in poor condition, monitoring wells should be installed. In addition, this sludge should be sampled as this material may contain hazardous constituents. Earle is currently seeking to secure a contractor for off site disposal of the sludge.

Off spec herbicides and insecticides, pesticide containers which were triple rinsed, and rinse waters from cleanup operations were typically buried in separate pits at Sites 3 and 5. However, some of these wastes, particularly the rinse waters were disposed of via sewer drains in the buildings. The quantity of materials disposed of in this fashion is not known. Other materials known to have been dumped via building sewer drains are water soluble degreasing solvents in the Fleet Support Department. It is unknown where these building drains discharge.

Potable water for the Main Base is supplied from two wells which are drilled on site (810 and 836 feet in depth). Prior to utilization, the water undergoes coagulation, filtration, chlorination, flouridation and pH adjustment. An average of 3.6 million gallons per month is produced for on station consumption. In the process approximately 250,000 gallons per month of filter backsash is generated and retained in a surface impoundment. The Bureau of Ground Water Quality Management is currently preparing a NJPDES Discharge to Ground Water Permit to address this impoundment.

Past power failures at the sewage treatment plant in March, April and July 1980 resulted in the discharge of raw and partially treated sewage to Hockhockson Brook. The effluent was chlorinated prior to release.

HH. OIL/WATER SEPARATION SYSTEM

An oil/water separation system will be constructed at the Waterfront to treat oily bilge from homeported ships and other Naval vessels which may utilize the Earle piers. Assocaited with this system will be a 50,000 barrel tank holding ballast, two (2) 10,000 gallons settling tanks and one (1) 10,000 barrel waste oil tank for a combined capacity of 80,000 barrels. In addition, the system will include pumping facilities, an oil/water treatment plant, interconnected piping and truck loading facilities. A ten (10) inch pipeline will be used to transfer the bilge from the piers to the facility at a rate of 3000 gallons per minute. The entire system will require approximately six (6) acres. Currently, the bilge is placed in tank cars and sent off site for disposal.

MANASQUAN RESERVOIR PROJECT

Of the four watershed boundaries present at the Main Base, one flows to the Manasquan River. There is concern that this quadrant of the Base may have a potential impact on the proposed Manasquan Reservoir Project. As a result, the sediments and surface waters of five streams which emanate from this quadrant were sampled by NJDEP in May 1985. One stream had elevated levels (85 ppb) of chlorobenzene present in the surface water. All other levels were at background concentrations. In 1983, the Monmouth County Health Department sampled five (5) brooks which originate from Earle and found high levels of heavy metals (as high as 2270 ppm chromium) associated with the sediments. Further sampling has been proposed by both the NJDEP and the Monmouth County Health Department.

SPILLS AND VIOLATIONS

Stack tests conducted at the Rotary Demilitarization Furnace in July 1979 and April and May 1980 revealed that the Demil Furnace was out of compliance with particulate allowance and emission rates. Additional stack testing at this furnace in January 1982 indicated that emission rates exceeded standards in all fifteen test runs. Currently, Earle is to have installed control devices and perform stack testing, however, they are reportedly having difficulty obtaining a contractor to conduct the stack testing.

In August 1983, one hundred gallons of #2 fuel oil leaked through a rust hole in a pipeline and entered Raritan Bay.

In October 1984, Earle received a Notice of Violation for utilizing a hauler who was not properly registered in February, 1984.

In October 1985, the EPA conducted an interim status compliance inspection. The Naval Weapons Station was found to be in violation of RCRA resulting from the failure to comply with regulations governing generators and treatment, storage and disposal facilities of hazardous wastes. Earle subsequently addressed all these violations. During this inspection, it was noted that waste oil had been discharged at three locations at the base, near the underground waste oil storage tank, near a 250 gallon waste oil container in the vicinity of Building C-50, and near the container storage area behind Building C-15. A Notice of Violation and Offer of Settlement was prepared to address these violations but was not issued as the Base is a Federal Facility.

In the past, spill cleanup procedures employed by the Fire Division typically involved the hosing down of a spill until it was diluted and washed off any roadway or other path. These operations would have resulted in the washing of any spill material onto the ground surface. In addition spills were generally not documented.

The Navy contracted with Roy F. Weston Associates in 1985 to perform a Confirmation Study in order to determine if significant contamination and significant migration pathways exist at eleven (11) of the twenty nine (29) sites identified at Earle by Hart Associates in 1983. This sequentially phased approach consists of Step I (A) Verification and Step I (B) Characterization. Step I (A) Verification is intended to find whether the particular contaminants outlined by Hart Associates and perhaps other toxic materials are present in quantities determined to be hazardous. Step I (B) will determine the level and horizontal and vertical extents of contamination. Geohydrology and ground water movement throughout the site will be addressed in this step. These actions will include the installation and monitoring of thirty one (31) monitoring wells and sixteen (16) soil borings throughout the sites and the collection of soil, sediment, and surface water samples from streams or marshes which are adjacent to any of the eleven (11) sites.

The sites which will be investigated are the following: Site 2 Ordnance Demilitarization Site, Site 3 Landfill Southwest of "F" Group, Site 4 Landfill West of "D" Group, Site 5 Landfill West of Army Barricades, Site 7 Landfill South of "P" Barricades, Site 10 Scrap Metal Landfill near Building 589, Site 11 Contract Ordnance Disposal Area, Site 19 Paint Chip and Sludge Disposal Area adjacent to Building S-34, Site 20 Grit Blasting Disposal Area Building 544, Site 22 Paint Chip Disposal Area adjacent to Building D-2, and Site 26 Explosive "D" Washout Area Building GB-1. The remaining eighteen (18) sites will not be addressed.

The Navy granted Weston Consultants permission to proceed with the proposed confirmation study despite protests from both the DEP and EPA regarding the scope and methods of the investigation. These objections relate to wording of parts of the workplan, lack of clearly defined site maps, criteria and methods to be used, number and [illegible] of monitoring wells, well [illegible] location and depth of [illegible] samples, sampling parameters [illegible]

The EPA has attempted to enter into a Federal Facility Agreement with the Navy. This agreement would direct the Navy to determine the nature and extent of release or potential release by implementing a sampling and analytical program. Following this program, if there is a necessity, the Navy would enter into a remedial investigation/feasibility study program. As of this time, the Navy has not signed this agreement. Presently Earle is proposed for inclusion on the EPA National Priority List (NPL). According to the 1986 SARA Amendments, Federal Facilities can be included on the NPL and upon inclusion, the facility must begin a remedial investigation and feasibility study within six (6) months.

GENERAL FACILITY FINDINGS AND RECOMMENDATIONS

The geological and hydrological conditions which exist at Earle favor the movement of contaminants in the ground water. The soils on the Main Base are typically sandy to sandy loam which are moderately well to well drained. These soils also tend to be acidic as the Main Base is on the outer edges of New Jersey's Pine Barrens. Generalized groundwater flow is to the southeast and east. Two principal aquifers which may be affected by contamination on the Main Base are the Vincentown and Kirkwood Formations. These two aquifers are used extensively for offsite domestic potable water supply.

Monitoring wells have been installed throughout the Base during the investigation of various sites in order to determine the presence of contamination, contaminant levels and the direction of localized groundwater flow. If the analysis of these monitoring wells indicate the potential for detrimental effects on populations and sensitive areas on the Base and the potable wells located off-site, additional wells should be installed and further analysis performed.

There are three (3) major rivers draining the Main Base, the Swimming River, the Manasquan River, and the Shark River. Three streams which drain the Main Base are tributaries to rivers which are used for surface water reservoirs. Nine ponds and lakes on the Main Base total nineteen (19) acres. The Waterfront Area contains the headwaters of three (3) creeks and many streams which drain to Raritan and Sandy Hook Bays.

Sampling in May 1985 by the NJDEP indicated chlorobenzene contamination in a stream which leads to the Manasquan Reservoir. Further sampling is planned by both NJDEP and the County Health Department. It is recommended that this sampling be expedited.

Activities on the Base may have had detrimental effects on nearby streams, ponds, and lakes. Some stream sampling occurred in July 1986 in conjunction with the Weston Confirmation Study. Based on the results of this analysis, further sampling may be required to address contaminant migration. Lake Earle should be sampled to determine the cause of the catfish kills reported by Fred C. Hart Associates.

The Hart Associates [illegible] report indicates that off spec [illegible] des and insecticides and rinsew[illegible] from pesticide containers as well a[illegible] oluable degreasing solvents ma[illegible] en disposed of via building sew[illegible] unknown where these a[illegible] ms lead. It is therefore re[illegible] at the

Historical practices of dealing with spills and waste oil may have contributed to contamination on site. Spills were generally not documented. Cleanup procedures involved the hosing down of a spill until it was diluted and washed off any roadway. This procedure would allow the spill material to be washed onto the ground surface.

Prior to 1960, cutting oils and other waste oils were spread on roads for dust control, mixed with oil based pesticides for land applications and/or used as supplemental boiler fuels.

UNIT ANALYSIS FINDINGS AND RECOMMENDATIONS

Ordnance Demilitarization Site, Secured Site 1

This six (6) acre site was used for the burning of ordnance materials from 1943 to 1974. Due to sandy conditions at the site, it is recommended that monitoring wells be installed to determine if contamination is present.

Explosive Ordnance Disposal Site Site 2

This RCRA regulated eleven (11) acre site has been used for the disposal of ordnance since 1974. Further recommendations should be based on the results of monitoring well analysis, soil, stream, and sediment samples which were taken in July 1986.

Landfill Southwest of "F" Group Site 3

This five (5) acre landfill was used for the disposal of domestic and industrial wastes from 1960 to 1968. Further recommendations should be based on the analytical results of monitoring well samples which were taken in July 1986.

Landfill West of "D" Group Site 4

This five (5) acre landfill was used from 1943 to 1960 for the disposal of domestic and industrial wastes. Further recommendations should be based on analytical results obtained from the July 1986 sampling of monitoring wells and springs. Additionally, it is recommended that samples be taken at Lake Earle to determine if the Lake has been affected by the landfill activity.

Landfill West of Army Barricades Site 5

This thirteen (13) acre landfill was used for the disposal of industrial wastes from 1968 to 1978. Further recommendations should be based on the analytical results obtained from the July 1986 sampling of monitoring wells at the site.

Landfill West of Normandy Road Site 6

This four (4) acre landfill was used for the disposal of wastes generated from Waterfront Operations from 1943 to 1965. Due to sandy soil conditions and elevated soil gas readings obtained in May 1987, it is recommended that monitoring wells be installed to determine the possible extent of groundwater contamination.

Landfill South of "P" Barricades Site 7

This five (5) acre landfill was used for the disposal of industrial and domestic waste generated at the Waterfront Area from 1965 to 1977. Further recommendations should be based on results obtained from the analysis of monitoring wells samples taken in July 1986. In addition, numerous drums, cans of oil, cans of paint, lumber and other debris were observed to be disposed of haphazardly during a May 1987 site inspection. As this landfill underwent certified closure approved by NJDEP, this area may constitute an illegal disposal of wastes. A referral has been made to the Division of Hazardous Waste Management, Central Field Office.

Landfill East of S-186 Site 8

This one (1) acre landfill was used in 1943 to 1965 for the disposal of dunnage. No further action is recommended at this site.

Landfill Southeast of "P" Barricades Site 9

This three (3) acre landfill was used for the disposal of dunnage and possibly other unknown types of waste from 1967 to 1972. Due to the uncertainty of waste types disposed and soil gas readings obtained during a May 1987 site inspection, it is recommended that soil borings be taken throughout the landfill to determine if contamination exists.

Scrap Metal Landfill Near Building S-589 Site 10

This two (2) acre site aka the "Box Yard", was used for the burial of unusable munitions and munition containers from 1953 to 1965. Further recommendations should be based on analytical results obtained from monitoring well, surface water and sediment analysis from samples taken in July 1986.

Contract Ordnance Disposal Area Site 11

This two (2) acre site was used for the disposal of obsolete ordnance for an unknown period of time. From 1974 to 1977, the area was used for fire fighting training exercises. Further recommendations should be based on analytical data obtained from monitoring wells and soil samples taken in July 1986.

Battery Acid Spill Site Site 12

This site was used for an unknown period of time for the disposal of battery acid electrolytes. Currently the site is asphalt covered and is used as a supply warehouse. It is recommended that soil borings be taken to determine the presence of contamination.

Defense Properly Disposal Yard Site 13

This area is used for the storage of scrap metal, and specialty carrier devices. Due to the remote possibility that spills occurred, no further action is recommended at this site.

Defense Property Disposal Office Warehouse Site 14

There was reportedly a spill of mercury in this warehouse in 1970. Currently the warehouse is part of the Precious Metals Recovery Office. Due to the remote possibility of release from this site, no further action is recommended.

Sludge Disposal Site Near the Waterfront South Gate Site 15

This site was used for the disposal of the unknown quantities of oily bilge in the early 1970's. The area was paved as a parking lot in 1978. It is recommended that soil borings be taken in order to assess the extent of contamination.

Fuel Line Connecting Building C-19 and C-50 Site 16

In June 1977, a small quantity of fuel oil leaked from this pipe due to its poor condition. At that time, the pipe was removed and sealed. No further action is recommended.

Disposal Area Behind Training Barge Site 17

This area is currently used for the disposal of large pieces of scrap metal and other materials generated during Waterfront Operations. During a May 1987 site inspection, garbage bags, household appliances and other debris were observed over an embankment to adjoining wetlands. As this activity may constitute an illegal disposal of wastes, a referral has been made to the Division of Solid Waste Management.

Demilitarization Furnace Site 18

This RCRA regulated furnace has been in service since 1978 and utilized for the demilitarization of small caliber munitions and their components, fuses, primers, cartridge actuated devices and illuminating signals. During a May 1987 site inspection, metal fragments which covered the ground were observed below the discharge conveyor. It is recommended that some type of collection device be installed to prevent these metal fragments from being integrated into the soil.

Stack tests performed in 1979, 1980 and 1982 all indicate the furnace was out of compliance in both emission rates and particulate allowance. Currently, Earle has installed control devices but are reportedly having difficulty securing a contractor to perform the stack testing. It is recommended that this testing be performed as soon as possible.

Paint Chip and Disposal Area Adjacent to Building S-34 Site 19

This site was used for the disposal of paint chips and sludge generated during the maintenance of depth charges from the early 1940's to the early 1960's. Further recommendations should be based on the results obtained from monitoring well, soil borings, surface water and sediment samples taken July 1986.

Grit Disposal Area Building 544 Site 20

This building houses the operations of the Fleet Mobile Mine Facility which has been a tenant operation since 1975. Soil borings were taken at this site in July 1986. During a May 1987 site inspection, significant soil gas readings were obtained from the drainage area behind the building. Due to the significant readings and the large amount of grit observed, it is recommended that monitoring wells be installed at the site. Additionally, based on the results obtained from the July 1986 soil borings, additional soil borings may be warrented.

Baghouse and Cyclone Dust Storage Area Site 21

This RCRA regulated container storage area is used for the storage of dust removed from the air pollution control devices on the Demilitarization Furnace. The absence of secondary containment was noted during the May 1987 site inspection. It is recommended that these containers be stored on a pad equipped with secondary containment in order to prevent runoff.

Paint Chip Disposal Area Adjacent to Building D-2 Site 22

This site was used for the disposal of paint chips generated from painting operations. In July 1986, soil borings were taken at this site. Further recommendations should be based on the analysis of these soil borings

Paint Chip Disposal Area Adjacent to Building D-5 Site 23

This building has been used since the 1970's for the painting of major items of ordnance. There were no significant soil gas readings obtained during a May 1987 site inspection. No further action is recommended for this site.

Closed Pistol Range Site 24

This site is characterized by spent cartridges and bullets in an impact berm. No further action is recommended for this site.

Closed Pistol Range Site 25

This range is similar in nature to Site 24. No further action is recommended for this site.

Explosive "D" Washout Area, Building GB-1 Site 26

This area was used for the recovery and removal of ammonium picrate from shells in the 1960's. No significant soil gas readings were obtained at this site in May 1987 during a site inspection. No further action is recommended for this site.

Projectiles Refurbishing A[illegible] Site 27

This site is utilized [illegible] shot bla[illegible]ng, repainting [illegible]ncilling of [illegible] as well [illegible] paint were

Waste Oil Tank- Site 28

This RCRA regulated waste oil tank has been in operation since 1964. Poor housekeeping practices at this tank have been noted on several occasions. No further action is recommended for this tank as a closure and removal plan has been approved by the Bureau of Hazardous Waste Engineering.

PCB Spill Site, Building C-16 Site 29

This site was the location of a PCB spill from a vandalized transformer. At the time of the spill, the soil was excavated and sent off site for disposal. No transformers are currently stored at this location. No further action is recommended for this site.

Container Storage Area, Building QH-8

This RCRA regulated storage area contains both solid and liquid hazardous wastes. During the May 1987 site inspection, spills and leaking unidentified pieces of equipment were noted in the building. The building also contained a furnace/heater which may not be explosion proof. A referral has been made to the Division of Hazardous Waste Management, Central Field Office.

Precious Metals Recovery Office

This office oversees precious metal recovery operations, receiving precious metal containing objects from throughout the Navy. These objects are incinerated for the recovery of the contained metals. Pending the adoption of new NJAC regulations, this operation and associated storage areas may be subject to RCRA regulations. No further action is recommended for this site at this time.

Building S-35

This Building houses the operation of the Ordnance Carpenter Shop. The 1983 Fred C. Hart Associates report indicates that potable water is derived from an eighty (80) foot well. Building personnel have complained about a foul smell and vinegar taste from the water. A headspace reading from a collected water sample by an OVA during the May 1987 inspection indicates possible volatile organic contamination. A referral has been made to the Enforcement Branch of EPA, and the Bureau of Safe Drinking Water.

Wastewater Treatment Plant

The treatment plant provides secondary treatment for wastes generated on the Main Base. Sludge which is derived from the process is held in drying beds. It is recommended that the integrity of these beds be checked and if found to be in poor conditions, monitoring wells should be installed. Additionally, the sludge should be sampled to determine if it contains hazardous materials.

Oil Water Separator

Manasquan Reservior Project

Contamination with heavy metals and organics have been observed in the surface waters and sediments from brooks and streams which have their origins in the Main Base. Further sampling has been proposed by the NJDEP and Monmouth County Health Department.

All actions taken at the site by the EPA should be integrated with previous activities and be closely coordinated with the NJDEP.