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FINAL PRELIMINARY ASSESSMENT REPORT FOR BASEWIDE INVESTIGATION OF PER- AND POLYFLUOROALKYL SUBSTANCES

06/25/2019

MULTIMEDIA ENVIRONMENTAL COMPLIANCE GROUP

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Naval Facilities Engineering Command Southwest
San Diego, CA

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NAVAL AIR FACILITY EL CENTRO
EL CENTRO, CALIFORNIA

25 June 2019

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NAVAL AIR FACILITY EL CENTRO
EL CENTRO, CALIFORNIA

25 June 2019

Prepared for:

Department of the Navy
Naval Facilities Engineering Command Southwest
1220 Pacific Highway
San Diego, CA 92132

Prepared by:

Multi-Media Environmental Compliance Group
9177 Sky Park Court
San Diego CA 92123-4341
(858) 278-3600

Contract N62473-16-D-2405; Task Order No. N6247318F4445
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FINAL

PRELIMINARY ASSESSMENT REPORT

For

BASEWIDE INVESTIGATION OF PER- AND POLYFLUOROALKYL SUBSTANCES AT NAVAL AIR FACILITY EL CENTRO, EL CENTRO, CALIFORNIA

25 June 2019

Contract N62473-16-D-2405
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REVIEW AND APPROVAL

Project Manager:	Kurt R. Myers, P.G. No. 5683 MMEC Group	858-300-4348 Phone	06/21/2019 Date
Technical Lead:	Kevin Olness, P.G. No. 8950 MMEC Group	619-204-8195 Phone	06/21/2019 Date

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Acronyms and Abbreviations

AFFF ..... aqueous film-forming foam
AOC ..... areas of concern
AST ..... aboveground storage tank

BEI ..... Bechtel Environmental, Inc.
bgs ..... below ground surface

CERCLA..... Comprehensive Environmental Response, Compensation, and Liability Act
CNPS ..... California Native Plant Society

DON ..... United States Department of the Navy
DTSC ..... California Environmental Protection Agency Department of Toxic Substances Control
DWR..... California Department of Water Resources

EPCRA..... Emergency Planning and Community Right-to-Know Act
ERCE ..... Environmental and Energy Services Corporation

GAMA..... Groundwater Ambient Monitoring and Assessment Program

IID..... Imperial Irrigation District
INRMP..... Integrated Natural Resources Management Plan
IRP ..... Installation Restoration Program
ITRC..... Interstate Technology and Regulatory Council

JP ..... jet propellant
LHA..... lifetime health advisory
MBTA ..... Migratory Bird Treaty Act
MCAS..... Marine Corps Air Station
MMEC Group ..... Multi-Media Environmental Compliance Group
msl..... mean sea level

NAF ..... Naval Air Facility
NAAS ..... Naval Auxiliary Air Station
NALF ..... Naval Auxiliary Landing Field
NAS..... Naval Air Station
NAVFAC SW..... Naval Facilities Engineering Command Southwest
NCP..... National Oil and Hazardous Substances Pollution Contingency Plan
NEESA ..... Naval Energy and Environmental Support Activity

Acronyms and Abbreviations (continued)

NIRIS ..... Naval Installation Restoration Information Solution
NPTR ..... National Parachute Test Range

OEL ..... Other Environmental Liabilities

PA ..... Preliminary Assessment
PFAS ..... per- and polyfluoroalkyl substances
PFOA ..... perfluorooctanoic acid
PFBS ..... perfluorobutanesulfonic acid
PFC ..... perfluorinated compound
PFOS ..... perfluorooctane sulfonate
PPT ..... parts per trillion
PVC ..... polyvinyl chloride
RSL ..... Regional Screening Levels
RWQCB ..... California Regional Water Quality Control Board

TO ..... Task Order
TriEco-Tt ..... Joint Venture of Tri Eco LLC and Tetra Tech EM Inc.

USDA ..... United States Department of Agriculture
U.S. EPA ..... United States Environmental Protection Agency
USGS ..... United States Geological Survey
UST ..... underground storage tank

1.0 Introduction

This Preliminary Assessment (PA) report for the basewide investigation of per- and polyfluoroalkyl substances (PFAS) at Naval Air Facility (NAF) El Centro, California (Figure 1) has been prepared by the Multi-Media Environmental Compliance Group (MMEC Group), a joint venture comprising Wood Environment & Infrastructure Solutions, Inc. and KMEA, Inc., on behalf of the Naval Facilities Engineering Command Southwest (NAVFAC SW) under Contract Number N62473-16-D-2405, Task Order Number N62418F4445. Research is being conducted in general accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Sections 104 and 121; Executive Order 12580; and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This PA report provides findings from research conducted to identify potential PFAS areas of concern (AOCs).

1.1 General Background

PFAS are a class of synthetic organofluorine compounds that possess chemical structures that give them unique properties, including thermal stability and the ability to repel both water and oil. PFAS are characterized by carbon chains of varying lengths containing carbon-fluorine bonds. The strong electronegative force of the carbon-fluorine bond requires a large amount of energy to break, which makes PFAS extremely resistant to biodegradation, photo-oxidation, direct photolysis, and hydrolysis. They have been used in hundreds of industrial applications and consumer products such as carpeting, apparel, upholstery, personal care products, non-stick cookware, food paper wrappings, firefighting foams, and metal plating (United States Environmental Protection Agency [U.S. EPA], 2016a). Another widely known source of PFAS is from its use in aqueous film-forming foam (AFFF) at firefighting training areas, use in fire suppression systems in hangars and other buildings, and accidental release through storage, transport, and day-to-day handling. AFFF containing PFAS was manufactured as early as the mid-1960s and was put into routine use by the early 1970s and PFAS are still required as an integral component of AFFF by the military specification. In addition to hangar buildings and firefighting training areas, PFAS may be found in ordnance burn areas, plating shops, oil/water separators, and landfills/disposal areas.

In addition, some fire-resistant hydraulic fluids and pesticides are known to contain PFAS. PFAS may be present in areas where fire-resistant hydraulic fluid and pesticides were stored, used, spilled, or disposed of.

PFAS have been identified by the U.S. EPA as “emerging contaminants” (U.S. EPA, 2017) and are of environmental concern because of their persistence in the environment and in organisms, migration potential in aqueous systems (e.g., groundwater), historically ubiquitous use in commercial products, and possible health effects at low levels of exposure. At this time, only three of the thousands of PFAS compounds that have been manufactured have current U.S. EPA standards available: perfluorobutanesulfonic acid (PFBS), perfluorooctanoic acid (PFOA), and perfluorooctane sulfonate (PFOS). In 2016, U.S. EPA issued a drinking water lifetime health advisory (LHA) of 70 parts per trillion (ppt) for PFOA and PFOS. When both PFOA and PFOS are found in drinking water, the combined concentrations of PFOA and PFOS should be compared with the 70 ppt LHA level (U.S. EPA 2016a, 2016b, 2016c). While not legally enforceable, the LHA has been a driving force for investigation and remediation. Currently PFBS are the only PFAS listed in the November 2018 U.S. EPA Regional Screening Levels (RSLs). The generic RSL tables provide a noncancer reference dose, screening levels for soil and tap water, and soil screening levels for protection of groundwater (U.S. EPA, 2018) for PFBS only.

Initial production of PFAS compounds began in the late 1940s (DON, 2016). PFOS was utilized in stain and water-resistant products, while PFOA was utilized for protective coatings. The use of these compounds (mostly PFOS) in fire fighting foam began in the 1960s and were put into routine use by the early 1970s. PFBS, developed around 2003 to replace PFOS, is manufactured for use in paints, cleaning agents and water-impermeable products.

The production and use of long chain PFAS compounds, including PFOS and PFOA, has been reduced over the past 20 years. In 2000, the sole U.S. manufacturer (and principal worldwide manufacturer) announced their voluntary phase-out of perfluorooctanyl chemistries, which included the compounds PFOS and PFOA.

In 2006, the U.S. EPA invited eight major manufacturing companies in the PFAS industry to join a global stewardship program, the PFOA Stewardship Program, to commit to reducing PFOA, other longer-chained perfluorinated carboxylates, and related precursors that could be converted to these perfluorinated carboxylates from their global facility emissions and product content. The companies under the program were committed to achieve a 95 percent reduction in both facility emissions and product content levels by 2010 (from the established baseline in 2000), as well as committed to working toward the elimination of these chemicals in emissions and products by 2015 (U.S, EPA, 2006). The program was highly successful and all eight companies met the established goals. Complimenting the PFOA Stewardship Program, since 2000, U.S. EPA has issued additional regulations, known as Significant New Use Rules (SNURs)

under the Toxic Substances Control Act, to restrict any future use of production of PFAS. The SNURs requires manufacturers and processors of identified chemicals to notify U.S. EPA of new uses of these chemicals before they are commercialized. Over one hundred perfluoroalkyl carboxylic acid and perfluoroalkane sulfonate chemicals have been included (Interstate Technology and Regulatory Council [ITRC], 2017). The U.S. EPA anticipates finalizing a separate SNUR in late 2018 to ensure that PFAS phased out as part of the PFOA Stewardship Program do not re-enter the marketplace without review (see 80 Federal Register [FR] 2885).

In terms of mass/concentration at DON installations, use of AFFF is considered to have the greatest potential for release of PFAS compounds to the environment on Naval installations. Evidence showing the initial use of AFFF at DON installations includes the Military Specification (Mil Spec) for AFFF (MIL-F-24385), issued in 1969, and the DON's Qualified Products List from 1970 that included 3M Company's AFFF formulation (DON, 1969). The DON has used AFFF-containing PFAS in fire training exercises, in suppression of aircraft and other vehicle fires, and in aircraft hangar fire suppression systems at many of its installations across the United States. Despite the industry efforts to reduce the use of PFAS, some PFAS are still required as an integral component of AFFF by the current military specification.

The potential release mechanisms of PFAS to the environment at DON facilities include AFFF usage as part of the following activities:

- Fire training exercises at burn pits or structures
- Crash crew training exercises
- Hangar fire suppression system operations, testing, and accidental releases
- Firefighting and crash response vehicle testing and cleanout
- Emergency response actions, such as at aircraft and vehicle crash sites
- Responses to Class B or fuel fires
- Improper filling and leakage from storage tanks, firefighting trucks, or crash response vehicles

Other potential release mechanisms of PFAS include the release of PFAS from oil/water separators and landfills where PFAS-containing materials or waste were disposed of. PFAS can also be found at ordnance burn areas. A final potential release pathway may be from the use of PFAS in vapor suppression systems associated with chromium plating (DON, 2016).

1.2 Objective

The objective of the PA is to identify potential AOCs within the boundaries of NAF El Centro where PFAS were potentially handled, stored, used, or released. This report includes findings from research conducted to determine whether and where PFAS may have been released to the environment at NAF El Centro's main installation, current and former annexes, outlying fields, and ranges (the entire Base complex).

1.3 Scope

Research was conducted through (1) group discussion during the kickoff meeting, (2) personnel interviews, (3) online research (i.e., NAVFAC SW Administrative Record and Naval Installation Restoration Information Solution [NIRIS]), and (4) archival research at NAF El Centro to document AFFF storage and use at the installation. Additionally, MMEC Group conducted a site visit to NAF El Centro on May 30, 2018.

2.0 Installation Description

NAF El Centro is located approximately 7 miles northwest of El Centro, California, and 85 miles east of San Diego, California (Figure 1). NAF El Centro has had several names, including NAF, Naval Auxiliary Landing Field (NALF), Naval Air Station (NAS), Naval Auxiliary Air Station (NAAS), and National Parachute Test Range (NPTR). In 1942, the base was commissioned as a Marine Corps Air Station with duties involving the maintenance of air-to-ground targets and the maintenance of NAAS Holtville and NAAS Salton Sea. On May 1, 1946, the base was commissioned as NAS El Centro. The Naval Parachute Experimental Unit commenced action at NAS El Centro in 1947 and was followed by the Navy Air Technical Training Unit and the Fleet Air Gunnery Unit in 1949. In 1949, NAS El Centro was reduced to a NAAS with a mission of continuing support to the rotating fleet air squadrons and the Navy Parachute Unit. In 1951, the Department of Defense Air Force, Navy Parachute Test Facility was created when the 6511th Parachute Test Group joined with the Naval Parachute Unit. From 1951 to 1959, NAAS El Centro engaged in highly technical research and development programs to reduce piloted aircraft escape problems (DON, WestDiv, 1987).

From 1959 to 1962, NAAS El Centro was reduced to NALF El Centro with the duties of supporting the Navy Parachute Test Facility. In 1962, NALF El Centro was upgraded to the status of NAF El Centro. In 1964, the U.S. Naval Aerospace Recovery Facility was designated and in July 1973, it was combined with the NAF El Centro to form the NPTR. In July 1979, the parachute testing function was transferred to NAS China Lake, and the base became NAF El Centro again (DON, WestDiv, 1987).

For the first 35 years after commissioning, the mission of NAF El Centro was devoted to aeronautical escape system testing, evaluation, and design (Joint Venture of Tri Eco LLC and Tetra Tech EM Inc. [TriEco-Tt], 2012).

2.1 Mission and Land Use

The majority of NAF El Centro land is used for aircraft operations, aircraft maintenance, and the agricultural out-lease program. Other land uses include housing, administration, recreation, utilities, general maintenance, and supply and storage. Some NAF El Centro land remains undeveloped. Currently, NAF El Centro provides DON active and reserve aviation unit training and a location for operational activities. NAF El Centro has been used for gunnery, bombing, and carrier landing training, and air combat practice (Tierra Data System, 2014).

NAF El Centro's primary mission has been fleet support since the NPTR transitioned to NAF El Centro. Facility upgrades were conducted to accommodate fleet deployment training cycles (DON, WestDiv, 1987), as strong urban growth placed more pressure on coastal airfields, such as NAS North Island, MCAS Miramar, and NAS Lemoore. Increased training, which involves high-performance jet aircraft, has relocated to NAF El Centro because of its remote location and clear, sunny weather (DON, WestDiv, 1987).

Approximately 600 officers, enlisted personnel, and civilians currently occupy the base. The base provides services and housing for military personnel and maintains and operates facilities to support the aviation units and activities. These facilities have included a machine and welding shop, photographic laboratory, instrument laboratory, fabric shop, and transportation garage (MMEC Group, 2016).

2.2 Environmental Data

Sections 2.2.1 through 2.2.6 describe the environmental characteristics of the installation.

2.2.1 Physical Setting

NAF El Centro is located in the Colorado Desert geomorphic province of California (Norris and Webb, 1990). The Imperial Valley, where NAF El Centro is situated, occupies the north-central part of the Salton Trough, a large topographic and structural depression that extends from near Palm Springs to approximately 190 miles south reaching to the head of the Gulf of California. The lowest part of the trough is occupied by the Salton Sea, a saline lake fed primarily by waste irrigation water imported from the Colorado River. Much of the land surface in the Salton Trough is below sea level. Imperial Valley drains north into the Salton Sea, which is approximately 230 feet below mean sea level (msl) (MMEC Group, 2016).

The San Andreas Fault borders the eastern side of the Salton Trough just east of the Sand Hills. The Superstition Hills Fault and Superstition Mountain Fault also pass within 4.5 miles northwest of NAF El Centro. The Imperial Valley region thus experiences earthquakes of small to moderate size with magnitudes of 4.0 and greater (Tierra Data Systems, 2014). Imperial Valley is contiguous with the Mexicali Valley in Mexico and is flanked by the Chocolate Mountains on the northeast and the Peninsular Ranges of Southern California and Baja California on the southwest. Imperial Valley is divided into three regions: eastern, central, and western. NAF El Centro is located within the lowlands of central Imperial Valley, which is a broad, flat, northwest-sloping lowland that represents the bed of ancient Lake Cahuilla (Loeltz et al., 1975).

The Imperial Valley is divided into a central (Central Imperial Valley) lowland that is flanked by a broad alluvial plain on the east (Eastern Imperial Valley) and an area of low hills and alluvial slopes on the west (Western Imperial Valley). NAF El Centro is located within the central lowland, referred to as Central Imperial Valley (Bechtel Environmental, Inc. [BEI], 1996).

The Central Imperial Valley is a broad, flat lowland that slopes northwestward from approximately sea level at the international border to the shore of the Salton Sea. The Central Imperial Valley is drained by the Alamo and New Rivers, and by a network of drains installed to remove irrigation wastewater. Both the Alamo and New Rivers have wide channels incised as deep as 40 feet. Most of this cutting took place from 1905 to 1907, when the Colorado River flowed uncontrolled into these channels and established the present-day Salton Sea. The Central Imperial Valley lies entirely within the paleoshorelines of ancient Lake Cahuilla. As a result, surface conditions throughout the Central Imperial Valley are very similar, unlike those in the more diverse eastern and western parts of the valley. Soils formed from the lake bed deposits contain a large proportion of clay and silt, in contrast to the sandy soils of the eastern and western parts of the valley. The Central Imperial Valley is intensively cultivated (BEI, 1996).

2.2.2 Geology

Central Imperial Valley is underlain by alluvium and thick lacustrine deposits of silt and clay interspersed with coarse sand and gravel deposited in the basin as waters of ancient Lake Cahuilla evaporated. These deposits consist predominantly of sand and fine gravel around the margins of the Salton Trough and grade into silt and clay toward the axial portions (Dibblee, 1954). Below the alluvial and lacustrine deposits lies an unexposed succession of Tertiary and Quaternary sedimentary rocks which are composed predominantly of nonmarine sandstone and clays. The depth to bedrock is approximately 20,000 feet in the central portion of the valley (Rex, 1970).

Lithologic data collected in previous studies (Woodward-Clyde Consultants, 1989; Environmental and Energy Services Corporation [ERCE], 1991) indicate portions of NAS El Centro are underlain by homogeneous, slightly plastic to plastic, reddish-brown silty clay to clay while other portions of NAS El Centro are underlain by medium to fine grained sediments. These sediments are typically medium to fine sands, clays, and silts. Vertical contacts between the different soil horizons tend to be gradational, whereas lateral grain size changes are generally abrupt (IT Corporation, 1991).

2.2.3 Surface Water

NAF El Centro is within the Imperial Valley watershed, which encompasses approximately 5,500 square miles. Primary rivers are the New and Alamo, which originate in Mexico and flow northward from the Colorado River. The Colorado River water quality is naturally poor due to high salt content and is degraded further by the addition of irrigation, sewage, and industrial waste runoffs. Water originating from the Colorado River has been steadily declining in quality due to development by upstream users. The New River flows near the northwest corner of NAF El Centro (Tierra Data System, 2014).

The region's major source of water for domestic and agricultural use is the Colorado River. The Colorado River flows west to the Imperial Valley by way of the All-American Canal, built in 1940. The present Salton Sea, located on the site of a prehistoric lake, was formed between 1905 and 1907 by overflow of the Colorado River. Today, it serves as a drainage reservoir for irrigation return water and stormwater from the surrounding Coachella Valley, Imperial Valley, and Borrego Valley, and also receives drainage water from the Mexicali Valley in Mexico (California Regional Water Quality Control Board [RWQCB], 2014).

This area includes a small portion of NAF El Centro's northwestern boundary. Potential flooding is limited to an area along the western boundary extending approximately 1,200 feet onto NAF El Centro. Flash flooding during storms is generally restricted to washes with a width of 200 feet or greater, especially in areas with poor drainage or steep, rocky areas (NAF El Centro, 2014a). However, no flooding has occurred outside these floodplain areas since the stabilization of the present drainage and irrigation system (Western Division Naval Facilities Engineering Command [NAVFAC], 1988).

2.2.4 Groundwater

NAF El Centro is located in the Imperial Valley Groundwater Basin which is located in the Colorado Desert Hydrologic Region. Imperial Valley Groundwater Basin is located in the southeastern part of California at the international border with Mexico. The basin lies within the southern part of the Colorado Desert Hydrologic Region, south of the Salton Sea (DRW, 2004).

Imperial Valley Groundwater basin is bounded on the east by the Sand Hills and on the west by the impermeable rocks of the Fish Creek and Coyote Mountains. To the north the basin is bounded by the Salton Sea, which is the discharge point for groundwater in the basin. The physical groundwater basin extends across the border into Baja California where it underlies a contiguous part of the Mexicali Valley (CDPW, 1954).

However, in this report, the southern boundary of the Imperial Valley basin is defined politically as the international border with the Republic of Mexico. Major hydrologic features include the New and Alamo rivers, which flow north towards the Salton Sea. The rivers were formed in the mid to late 1800s when the Colorado River occasionally escaped the normal channel and flowed northward towards the present day Salton Sea (Setmire 1979). The All-American Canal (three branches) and the Coachella Canal also cross over the basin (California Department of Water Resources [DWR], 2004).

The basin has two major aquifers, separated at depth by a semi-permeable aquitard that averages 60 feet thick and reaches a maximum thickness of 280 feet. The aquifers consist mostly of alluvial deposits of late Tertiary and Quaternary age. Average thickness of the upper aquifer is 200 feet with a maximum thickness of 450 feet. The lower aquifer averages 380 feet thick with a maximum thickness of 1,500 feet. As much as 80 feet of fine-grained, low permeability prehistoric lake deposits have accumulated on the nearly flat valley floor and cause locally confined aquifer conditions (Montgomery Watson, 1995).

In general, the water table in the Central Imperial Valley is close to the ground surface because of the intensive agricultural irrigation in the area. This shallow occurrence of groundwater is a discontinuous perched system recharged by local irrigation practices. Near NAF El Centro, groundwater has historically been reported as shallow as 3 to 5 feet below ground surface (bgs) (United States Department of Agriculture [USDA], 1981). In March 1998, agricultural irrigation of surrounding fields was discontinued because of rising groundwater levels at NAF El Centro. In 2005, groundwater beneath NAF El Centro was reported to range from approximately 6 feet bgs at the southeastern corner of the base to approximately 39 feet bgs at the northwestern corner (BEI, 2005).

The general direction of groundwater flow in the Imperial Valley is toward the axial part of the valley and then northwestward toward the Salton Sea (Loeltz et al., 1975). The water levels recorded in most wells do not change appreciably between seasons, and, as a result, the groundwater flow directions do not change appreciably (BEI, 1996).

In the Imperial Valley, the main sources of groundwater recharge are seepage from canals and excessive irrigation water application. In the past, widespread water logging from over-watering of agricultural fields (to wash salts carried by the water from the plant root zone) spurred the installation of tile drains and ditches to carry off the excess water (Tierra Data System, 2014).

Groundwater recharge from the application of irrigation water is difficult to estimate; however, it is believed that most of the irrigation water is discharged to the New River through a network of underground drains. Recharge contribution from precipitation is assumed to be minimal because of the arid environment.

Existing beneficial uses of the New River include the following: freshwater replenishment, water contact recreation, non-contact water recreation, warm freshwater habitat, wildlife habitat, and preservation of rare, threatened, or endangered species. The potential beneficial use of the New River is for industrial service supply (RWQCB, 2014).

2.2.5 Drinking Water Supply

Drinking water for NAF El Centro is supplied by the water treatment facility located in the southwestern corner of the installation (Figure 2). The Imperial Irrigation District (IID) provides water from the Colorado River through a series of canals. Influent water from the Elder Canal is pumped into six sedimentation basins. After moving through the sedimentation basins, the influent water is treated with two different filter units, and then flows to chemical treatment tanks. The treated water is stored in two different reservoirs for a total capacity of 2.5 million gallons (NAF El Centro, 2014b).

The surrounding cities of Imperial, El Centro, and Seeley all use surface water for their drinking water supply. According to interviews and information obtained from GeoTracker's Groundwater Ambient Monitoring and Assessment Program (GAMA), California Water Science Center, United States Geological Survey (USGS), and DWR Water Data Library, no water supply wells or irrigation wells are present on or within 1 mile of NAF El Centro (Figure 3).

2.2.6 Biological/Ecological Profile

Information on habitats and the animal and plant species, including special-status species that may occur at NAF El Centro, is provided in detail in the Integrated Natural Resources Management Plan (INRMP). NAF El Centro and its ranges lie in the Colorado Desert, where vegetation is sparse. The greatest diversity of mammals is found at NAF El Centro where water is available and on East Mesa where a nearby canal provides access to water. Approximately 11 species of reptiles and amphibians, 19 species of mammals, and over 46 species of birds have been observed on NAF El Centro (Tierra Data Systems, 2014).

The potential federal threatened and endangered species include the Peirson's milk vetch (Astragalus magdalenae var. peirsonii), desert tortoise (Gopherus agassizii), peninsular bighorn sheep (Ovis Canadensis nelsoni), willow flycatcher (Empidonax traillii), and Yuma clapper rail (Rallus longirostris yumanensis). These species have the potential to occur at NAF El Centro and its ranges; however, currently no threatened and endangered species have been documented at NAF El Centro. A complete list of special-status species is included in in the INRMP; however, they have no designated critical habitats and no Biological Opinion is in place, because none of the listed species are common at NAF El Centro (Tierra Data Systems, 2014).

The California state species of special concern (SSC) found at NAF El Centro include the flat-tailed horned lizard (Phyrnosoma mcallii), Colorado Desert fringe-toed lizard (Uma notata), western burrowing owl (Athene cunicularia), prairie falcon (Falco mexicanus), LeConte's thrasher (Toxostoma lecontei), loggerhead shrike (Lanius ludovicianus), Crissal thrasher (Toxostoma crissale), vermilion flycatcher (Pyrocephalus rubinus), pallid bat (Antrozous pallidus), Yuma myotis (Myotis yumanensis).

Although NAF El Centro is not required to manage for sensitive species warranting stewardship, the DON recognizes the value of maintaining diverse ecosystems. The DON has identified specific objectives to protect the flat-tailed horned lizard and the western burrowing owl, which include habitat monitoring and rehabilitation and conducting surveys prior to construction or maintenance. The burrowing owl management plan was updated in 2010 and includes impact minimization measures. Project impact and facility maintenance impact minimization measures are carried out in accordance with Migratory Bird Treaty Act (MBTA) (Tierra Data Systems, 2014).

Most native birds on NAF El Centro or its ranges are neotropical migratory species because substantial migratory bird activity occurs in the area. The Imperial Valley is within the Pacific Flyway and is an active area for migratory birds because of the presence of the Salton Sea, a critical stopover point for neotropical migrants. The Sonny Bono Salton Sea National Wildlife Refuge, situated at the southern end of the Salton Sea and approximately 25 miles north of NAF El Centro, "supports one of the most diverse avian compositions in the United States," with more than 400 avian species recorded at the Sonny Bono Salton Sea National Wildlife Refuge, including numerous federally listed species (Tierra Data Systems, 2014).

No federally listed plant species are known to occur at NAF El Centro or its ranges. The most prevalent plant community of the Mojave and Colorado deserts, creosote scrub, constitutes most of the East and West Ranges. Many of the potentially occurring rare plants are expected to occur on active or relict dunes. It is prudent to protect this habitat

on NAF El Centro because endemic wildlife species may also reside there. The sand food, Thurber's pilostyles, and Wiggins' croton, which are considered rare by the California Native Plant Society (CNPS), occur within NAF El Centro and its ranges (Tierra Data Systems, 2014).

2.2.7 Potential Receptors

Potential receptors at NAF El Centro include current and potential future residential use, current and potential future commercial/industrial use, and current and future base personnel use. Potential exposure pathways identified for these receptors include soil and groundwater.

3.0 Research Activities

Research conducted to document PFAS use at NAF El Centro was through (1) group discussions during the kickoff meeting, (2) personnel interviews, (3) online research (i.e., NAVFAC SW Administrative Record and Naval Installation Restoration Information Solution [NIRIS]), and (4) archival research at NAF El Centro. Additionally, MMEC Group conducted a site visit to NAF El Centro on May 30, 2018. During the visit, MMEC Group personnel were escorted throughout NAF El Centro. In addition to the site walk, onsite interviews were conducted with civilian and military personnel, and with NAF El Centro employees to further identify potential AOCs at the installation.

Other areas where there is potential for materials known to contain PFAS to be located can include the following:

- Crash sites/aircraft fires
- Firefighting training areas
- Storage vessels/containers (underground storage tanks [USTs], aboveground storage tanks [ASTs], drums, buckets, etc.) where virgin or spent AFFF and materials known to contain PFAS were stored with or without secondary containment
- Areas where AFFF or materials known to contain PFAS were used or released, documented via personnel interviews, environmental reports, electronic or print media, etc.

During research, IRP sites and other areas of potential concern were identified and evaluated on the basis of how the area was historically or currently used.

Storage Area: An area where materials known to contain PFAS were stored in bulk. Identified storage containers/areas had to have contained the following materials:

- Materials known to contain PFAS;
- Virgin AFFF for use; and
- Spent AFFF and water mixture.

Usage/Spilled Area: An area where materials known to contain PFAS were discharged intentionally or unintentionally. Discharges include instances when:

- Materials known to contain PFAS were discharged intentionally (fire training exercises, equipment testing, or firefighting activities);
- Materials known to contain PFAS were released unintentionally (e.g. discharge from fire suppression system); and
- Materials known to contain PFAS were released through transport mechanisms (overland flow to surface water bodies).

Disposal Area: An area where materials known to contain PFAS were disposed of intentionally or unintentionally. Disposal areas include:

- Landfills
- Wastewater treatment plants (i.e., evaporation ponds and sludge beds)

3.1 Previous PFAS Investigations

No basewide investigations for PFAS have taken place at NAF El Centro at the time this PA Report was prepared.

3.2 Summary of Interviews

According to the DON, historical documentation of AFFF use and releases is often incomplete because records were not required. Therefore, in addition to document reviews, interviews will be crucial to understanding past practices and identifying the potential for environmental releases (DON, 2017). Sections 3.2.1 and 3.2.2 summarize interviews conducted as part of the PA.

3.2.1 Group Interviews

Two group interviews were conducted during the May 30, 2018 site visit.

Robert Fischer and William Kagele

Robert Fischer, Environmental Protection Specialist at NAF El Centro, and William Kagele, Water Program Manager at NAF El Centro, stated that on-base fire-suppression systems used water prior to approximately 2008. Four new hangars were built in approximately 2008: Hangars 2, 3, 4, and 5. These new hangars are equipped with fire-suppression systems containing AFFF. According to Mr. Fischer, AFFF is stored in 3,000-gallon tanks in buildings located between Hangars 2, 3, 4, and 5.

Mr. Fischer recalled an accidental release of AFFF in Hangar 3 which resulted in a release of AFFF that reached a height of approximately 8 feet within the hangar. Mr. Fischer suspected that the AFFF was eventually transported to the Wastewater Treatment Plant and the holding ponds via the sanitary sewer system. A follow-up phone interview with Mr. Kagele in June 2018 supported this assessment: the hangars are equipped with drains that transport fluid through the sanitary sewer to the Wastewater Treatment Plant.

When asked about sludge disposal practices at NAF El Centro, Mr. Fischer responded that waste sludge is disposed of offsite after being stored in six concrete-lined drying beds.

Based on the results of this group interview, the potential for PFAS contamination at Hangar 3, the sanitary sewer system near Hangar 3, and the Wastewater Treatment Plant, was evaluated further during the PA process. Conclusions can be found in Section 3.5.

Fire Station Personnel

A group interview was conducted with Fire Station personnel during the site visit conducted on May 30, 2018. Three areas of potential PFAS contamination were identified during the interview:

- A release of AFFF occurred at the wash rack west of Hangar 6 because of a stuck valve on a fire truck. The spilled AFFF drained into a nearby stormwater drain and the soil west of Hangar 6.
- The area north of IRP Sites 14 and 15 was used as a firefighting training area where AFFF was used in 2004 or 2006.
- AFFF was stored in the unpaved area north of the Fire Station (Building 137).

Based on the results of this group interview, the potential for PFAS contamination at the wash rack west of Hangar 6, the stormwater drain near Hangar 6, the suspected firefighting training area north of IRP Sites 14 and 15, and the unpaved AFFF storage area north of the Fire Station (Building 137), was evaluated further during the PA process. Conclusions can be found in Section 3.5.

3.2.2 Personnel Interviews

Personnel interviews were initiated by the submittal of a PFAS information questionnaire to NAF El Centro and were completed by Robert Fischer, Environmental Protection Specialist at NAF El Centro; William Kagele, Water Program Manager at NAF El Centro; Fire Chief Jose Oropeza, Fire Chief at NAF El Centro; Kris Haugh, Public Affairs Officer at NAF El Centro; and Rand Center, Community Planner at NAF El Centro (Appendix A).

Robert Fischer, Environmental Protection Specialist at NAF El Centro

Mr. Fischer supplied additional information to MMEC Group personnel following the May 20, 2018 site visit. Mr. Fischer provided a NAF El Centro base map on June 15, 2018, which included building numbers and brief building descriptions.

Mr. Fischer recalled the A-3D Skywarrior crash that occurred in 1964. He supplied video footage of the crash aftermath via email on June 20, 2018. To his knowledge, only water was used to suppress the fire resulting from the crash.

Based on the results of the interview, the A-3D Skywarrior crash was evaluated further during the PA. Conclusions can be found in Section 3.5.

Fire Chief Jose Oropeza, Fire Chief at NAF El Centro

Chief Oropeza was not available for an interview during the May 30, 2018 site visit. A follow-up phone call was conducted with Chief Oropeza on June 14, 2018. Chief Oropeza did not have additional information on the accidental AFFF releases described during the Fire Station personnel group interview.

Chief Oropeza recalled five aircraft mishaps on base and provided a figure with the approximate locations:

- An S-3 aircraft crashed in approximately 1978.
- An F-4 aircraft crashed in early 1970s and AFFF was likely used at the crash site.
- An A-7 aircraft crashed in 1980 and AFFF was likely used at the crash site.
- A T-34 aircraft crashed in the mid-1990s and AFFF was likely used at the crash site.
- An F/A-18 aircraft crashed 2011 and AFFF was not likely used at the crash site.

Chief Oropeza recalled that AFFF was likely deployed at the F-4 aircraft crash, the A-7 aircraft crash, and the T-34 aircraft crash.

Based on the results of the interview, the five aircraft mishaps were evaluated further during the PA process. Conclusions can be found in Section 3.5.

Kris Haugh, Public Affairs Officer at NAF El Centro

On July 5, 2018, an interview was conducted with Mr. Haugh, who has researched the A-3D Skywarrior crash extensively. Mr. Haugh stated the following:

In 1964, an A-3D Skywarrior hit a telephone pole, causing it to crash into an exchange, theater, and commissary, which were in the locations of current Building 364 and Buildings 335–339, and started a fire. According to Mr. Haugh, water was used to suppress the fires that resulted from the crash. This statement is supported by eyewitness accounts of the crash and video coverage. Mr. Haugh does not believe that AFFF was used as fire suppressant at this event.

Mr. Haugh was aware of the S-3 aircraft crash in the late 1970s described by Chief Oropeza. According to Mr. Haugh, there was no fire associated with the S-3 aircraft crash, and therefore no AFFF was deployed. Mr. Haugh did not have any information to add about other aircraft crashes described by Chief Oropeza; however, he was not aware of AFFF being used on any aircraft or structure fire on base.

Based on the results of the interview, the A-3D Skywarrior crash and the S-3 aircraft crash were evaluated further during the PA process. Conclusions can be found in Section 3.5.

Rand Center, Community Planner at NAF El Centro

An interview was conducted with Mr. Center on June 11, 2018. Mr. Center was unsure of the current storage location of AFFF concentrate. When asked about Building 426, a known AFFF storage building, Mr. Center had no further details.

Mr. Center indicated that the on-base fire stations were located in Buildings 137 and 142. According to Mr. Center, there are plans to build a new fire station, but the funding has not been approved. Currently, there is a campaign to get funding to update the current facilities rather than construct a new building.

In the 2014 Master Plan, the stormwater runoff on base is described as flowing to low-lying areas. When asked about the locations of the low-lying areas are, Mr. Center indicated that there is a stormwater drainage system on base. He said that there are concrete-lined channels that flow to the New River, which eventually flows to the Salton

Sea. He also indicated that there is a stormwater drainage system on the airfield, but it is totally ineffective because of collapsed pipes and disrepair.

Based on the results of the interview, the stormwater drainage system was evaluated further during the PA process. Conclusions can be found in Section 3.5.

3.3 Review of Records

MMEC Group conducted an internet search to obtain any available records such as historical images and drawings, technical reports, property records, news articles, and other available or appropriate information to document the use of materials known to contain PFAS at NAF El Centro. Online research was conducted by searching general internet/news sites and databases. General internet/news was searched using the following key words: “crash,” “fire,” “accident,” “emergency,” ‘response,” “mishap,” “PFAS,” “AFFF,” “aqueous film-forming foam,” “perfluorooctane sulfonate (PFOS),” “perfluorooctanoic acid (PFOA),” and “El Centro.”

The NIRIS database was a primary source of information because it includes most, if not all, environmental documents for NAF El Centro. Other general search engines were also used to locate news articles and other information. Online databases were searched for the following key words: “AFFF,” “electroplating,” “wastewater treatment/sludge area (ponds),” “firefighting training area,” “landfill,” “oil/water separators,” “vehicle wash station,” “drum or soil storage,” “fire suppression system,” “airfield,” “foam,” and “crash and fire.”

The following additional online resources were accessed for information:

- NIRIS – environmental documents and historic site and material use
- Assistant Secretary of the Navy, Energy, Installation, and Environment http://www.secnav.navy.mil/eie/pages/pfc-pfas.aspx
- NAVFAC SW Administrative Record – environmental documents and historic site and material use
- State Water Resources Control Board GeoTracker Database – environmental site documents
- California Environmental Protection Agency Department of Toxic Substances Control (DTSC) EnviroStor Database – environmental site documents
- DTSC Hazardous Waste Tracking System – hazardous and non-hazardous material handling

- GeoTracker GAMA – groundwater well locations
- California Water Science Center USGS
- California Department of Water Resources Water Data Library – water supply well logs and information
- Emergency Planning and Community Right-to-Know Act (EPCRA) – hazardous and non-hazardous material handling
- Other Environmental Liabilities (OEL) Database – hazardous and non-hazardous material handling

The information obtained during research was evaluated to identify areas at NAF El Centro where materials known to contain PFAS were potentially stored, used, spilled, or disposed of.

All research was documented using the research logs provided in Appendix B and relevant documents provided in Appendix C, which will be submitted on CD only.

3.4 Data Quality

As discussed in Section 1, the objective of the PA is to identify potential PFAS AOCs within the boundaries of NAF El Centro where PFAS were potentially handled, stored, used, or released. The PA includes all active and closed environmental sites, and other sites not included in the Installation Restoration Program (IRP) at NAF El Centro. To ensure that research activities were conducted sufficiently to fulfill these project objectives, a PFAS Research Checklist was used as a data quality tool to summarize the research activities discussed in Sections 4.1 and 4.2. The completed PFAS Research Checklist is included in Appendix D.

3.5 Summary of Findings

The PA assessed 42 sites in accordance with the DON's PFAS Site Guidance, primarily subsections INV1 through INV5 of the Investigation Section (DON, 2017). An assessment of each of the 42 sites is provided below and in Table 1 and identifies information relative to known or suspected areas for PFAS releases to the environment. The personnel interviews and correspondence cited above can be found in Appendix A, and the documents cited below can be found in Appendix C.

Of the 42 sites assessed, 22 sites were identified as potential PFAS AOCs and are recommended for further SI (Figure 4):

(1) Magazine Road Landfill (IRP Site 1). The site operated as a borrow pit from 1964 to 1965, and then as a municipal landfill without a liner or leachate collection system. Household waste with some construction and industrial waste was primarily collected. Monthly burning was conducted to reduce waste volume (NEESA, 1987; Appendix C). Consumer goods disposed of may have been treated with PFAS-containing non-stick and water/stain-resistant coatings. These coatings were available starting in the 1940s and 1950s, respectively. Use of AFFF containing PFAS began in the 1960s, so materials that came in contact with AFFF may have also been disposed in the landfill. Plating operations are known to contain PFAS (ITRC, 2017; Appendix C).

(2) Patrol Road Landfill (IRP Site 2). The Patrol Road Landfill contained two units. Unit #1 was a borrow area for runway fills. Pits inside Unit #1 filled with water from irrigation return from agricultural fields. The pits existed from 1955 until 1962 when they were filled with demolition debris consisting mostly of concrete (NEESA, 1987; Appendix C). Unit #2 was operated as a municipal landfill with various waste material from 1946 to 1965, when landfill operations were transferred to Magazine Road Landfill (NEESA, 1987; Appendix C). Consumer goods possibly treated with non-stick coatings and water/stain-resistant coatings may have been disposed of at the site. These coatings were available in the 1940s and 1950s, respectively. Use of AFFF containing PFAS began in the 1960s; materials that came in contact with AFFF may have also been disposed of in the landfill (ITRC, 2017; Appendix C).

(3) Sludge Burial Area (IRP Site 3). IRP Site 3 is located at the northwest corner of NAF El Centro, about 500 feet east of the Sewage Stabilization Pond. The sludge burial area was an unlined excavation pit used in 1986 for burial of sewage sludge previously removed from the drying bed in the sewage treatment plant (NEESA, 1987; Appendix C). Some PFAS are found in wastewater treatment plant effluent because conventional treatment methods may not remove PFAS efficiently. Treatment plants that receive industrial wastewater are particularly affected (ITRC, 2017; Appendix C).

(4) 4th Street Firefighting Training Area (IRP Site 4). IRP Site 4 is an earthen bermed, unlined 15-foot diameter pit, located just south of 4th Street at NAF El Centro. This site was active from 1963 to 1975. This site was used for firefighting training every weekend for nine months of the year during its operation, with documented use of AFFF (Naval Energy and Environmental Support Activity [NEESA], 1987; Appendix C). Use of AFFF containing PFAS began in the 1960s (ITRC, 2017, Appendix C), which overlaps with the dates

AFFF was used at this site. After training operations ceased in the area, IRP Site 4 was used as a burn site for confiscated drugs and drug paraphernalia (NEESA, 1987; Appendix C).

(5) Firefighting Training Area East of Hangar 3 (IRP Site 5). IRP Site 5 is located approximately 600 feet east of Hangar 3 at NAF El Centro. This site contained a circular area with an earthen berm and was used every weekend between 1958 and 1963 for firefighting training (NEESA, 1987; Appendix C) Use of AFFF containing PFAS began in the 1960s (ITRC, 2017; Appendix C), which overlaps with dates firefighting training was conducted at this site.

(6) Sewage Stabilization Ponds (IRP Site 10). IRP Site 10 is located in the northwest corner of the base and contains three unlined ponds which served as the only sewage treatment for the installation until 1976. Domestic and industrial sewage flowed into the ponds. No records documenting sludge removal were identified. The ponds serve as backup for when the sewage treatment plant went down (NEESA, 1987; Appendix C).

(7) Runway Burn Area (IRP Site 11). IRP Site 11 is a circular area approximately 200 feet in diameter located in the southern portion of NAF El Centro. This site was used for aircraft firefighting exercises from 1979 through 1980. The remains of a crashed T-28 were periodically set ablaze with jet propellant (JP)-5 and then extinguished as a firefighting training exercise (NEESA, 1987; Appendix C). Use of AFFF containing PFAS began in the 1960s (ITRC, 2017; Appendix C), which overlaps with dates firefighting exercises were conducted at this site.

(8) Firefighting Training Area (IRP Site 17). IRP Site 17 is a rectangular firefighting pit and measures 57 by 112 feet. The sides of the pit are earthen berms approximately 1 foot high. Beginning in 1980, this site was used for firefighting training. Training occurred at least once per month with approximately 25 gallons of AFFF used per training event (NEESA, 1987; Appendix C). Use of AFFF containing PFAS began in the 1960s (ITRC, 2017, Appendix C), which overlaps with that dates AFFF was used at this site.

(9) Tiffany Road Debris Area (IRP Site 18). The Tiffany Road Debris Area served as the primary waste disposal site until the Magazine Road Landfill was opened in 1965. After 1965, the site was used infrequently until it was abandoned in the mid-1970s. Materials at the site were burned for compaction. A second area north of the burn site reportedly contains demolition debris (drywall, wood, and metal), landscape waste, and a small quantity of domestic waste, possibly from off-base sources. The clarifier that was used to treat the base sewage before the sewage treatment ponds were constructed is located on this site. Reports indicate that the clarifier may have been compromised and cracked (General Dynamics, 2006;

Appendix C). Non-stick coatings and stain/water-resistant products were introduced in commercial products in the 1940s and 1950s, respectively. Consumer goods treated with these coatings may have been disposed of in the landfill (ITRC, 2017; Appendix C).

(10) Fire Station (Buildings 137 and 142). According to the 2014 Master Plan and interviews with Chief Oropeza and members of the NAF El Centro Fire Department, Building 137 (Hangar 1) currently and historically has been used to store firefighting vehicles. Building 142 currently and historically has been used for sleeping quarters and offices for firefighters (NAF El Centro, 2014b; Appendix C). According to a group interview with members of the NAF El Centro Fire Department, there was historical AFFF storage and usage just north of Building 137. The area north of Building 137 is unpaved (Appendix A).

(11) Fire Station Storage (Building 426). Building 426 is located on D Street, near the western boundary of the base. According to the 2014 Master Plan and interviews with Chief Oropeza, Building 426 currently and historically has been used to store AFFF concentrate and surplus firefighting equipment (NAF El Centro, 2014b; Appendix C). No records were identified that indicate leaks or spills of AFFF concentrate.

(12) Wastewater Treatment Plant (Building 120). Building 120 is located in the northwestern corner of the base. Industrial and maintenance operation waste streams travel through the sanitary sewer system to the Waste Water Treatment Plant. According to interviews with William Kagele, the hangars have floor drains that connect to the sanitary sewer system. Mr. Kagele and Mr. Fischer also indicated that Hangar 3 had an accidental release of AFFF that reached a height of 8 feet within the hangar. Mr. Fischer indicated that the foam was likely disposed of in the sewage treatment holding pond via the sewer sanitary system (Appendix A).

(13) Sanitary Sewer – Lift Stations (Buildings 122 and 446). Most wastewater pipes at the base are composed of vitrified clay and when broken are replaced with polyvinyl chloride (PVC) pipes. Underground suction ductile iron pipes at lift stations have reportedly corroded (NAF El Centro, 2014b; Appendix C). Industrial and maintenance operations waste streams may make their way to the sewer system. According to interviews with Mr. Kagele, the hangars have floor drains that connect to the sanitary sewer system. Buildings 122 and 446 are near the Fire Station and Hangar 3, which reportedly had a release of AFFF that entered the sanitary sewer system and may have infiltrated surrounding soils via leaking pipes (Appendix A).

(14) Storm drain. There are unlined drainage ditches throughout the base and a natural wash in the northwestern corner. Runoff that contained AFFF or fire-resistant hydraulic fluid would end up in the base stormwater drainage system (NEESA, 1987; Appendix C). There may have been a subsurface stormwater drainage system on the airfield, but the pipes have reportedly degraded to the

point of collapse and no longer function (NAF El Centro, 2014b, Appendix C). The degraded nature of the drainage system was confirmed in an interview with Mr. Center. According to a group interview with members of the NAF El Centro Fire Department, a release of AFFF occurred because of a stuck valve on one of the fire trucks at Hangar 6, and the spilled fluid drained to a nearby stormwater drainage ditch (Appendix A).

(15) Newly Constructed Hangars 2, 3, 4, and 5 (Buildings 820, 830, 840, and 850, respectively). According to interviews with Mr. Fischer, the newer hangars (Hangars 2, 3, 4, and 5) have AFFF flood systems for fire suppression. According to Mr. Fischer the AFFF flood systems have never been tested (Appendix A). Hangars with AFFF fire suppression have at least two approximately 900-gallon ASTs used to hold premixed AFFF. Maintenance of aircraft would occur in hangars, and aviation fire-resistant hydraulic fluid is known to contain PFAS (ITRC, 2017; Keml, 2004; Appendix C). However, no spills or releases of aviation hydraulic fluids have been reported. According to interviews with Mr. Kagele, the hangars have floor drains that connect to the sanitary sewer system (Appendix A).

(16) Newly Constructed Hangar 3 (Building 830). According to Mr. Fischer, there was an accidental release of one of the flood systems, resulting in AFFF reaching 8 feet in height in Hangar 3. Mr. Fischer indicated that the foam from the release was likely disposed of in the sewage treatment holding pond via the sanitary sewer system (Appendix A). According to interviews with Mr. Kagele, the hangars have floor drains that connect to the sanitary sewer system, which reportedly has a history of breaks and repairs.

(17) Accidental AFFF Release Area (near Hangar 6). According to a group interview with members of the NAF El Centro Fire Department, a release of AFFF occurred because of a stuck valve on one of the fire trucks in 2006 or 2008. The fluid drained to a nearby stormwater drainage ditch and the surrounding soil at Hangar 6 (Appendix A).

(18) Former Firefighting Training Area. According to a group interview with members of the NAF El Centro Fire Department, the area north of IRP Sites 14 and 15 was a former firefighting training area where AFFF was used in 2004 or 2006 (Appendix A).

(19) Wash Rack/Oil-Water Separator near Hangar 1. According to interviews with Mr. Fischer, this is one of two wash racks with oil-water separators near the runway and apron (Appendix A). This wash rack is south of Hangar 1 (Building 137, part of the fire station). AFFF was reportedly stored near the hangar and may have entered the oil-water separator and accumulated in the sludge. Aviation fire-resistant hydraulic fluids, which have been known to contain PFAS, may have been in the wastewater and entered the oil-water separator (ITRC, 2017; Keml, 2004; Appendix C).

(20) Wash Rack/Oil-Water Separator near Hangar 6. According to interviews with Mr. Fischer, this is one of two wash racks with oil-water separators near the runway and apron. This wash rack is south of Hangar 1 (Building 137, part of the fire station). AFFF was reportedly stored near the hangar, and may have entered the oil-water separator and accumulated in the sludge (Appendix A). Aviation fire-resistant hydraulic fluids, which have been known to contain PFAS, may have been in the wastewater and entered the oil-water separator (ITRC, 2017; Keml, 2004).

(21) T-34 Aircraft Crash. In 1995, a T-34 aircraft crashed Near Runway 12. AFFF usage is unknown, but use of AFFF containing PFAS began in the 1960s (ITRC, 2017). According to information provided by Chief Oropeza, AFFF was likely used at the scene of this crash. According to an interview with Mr. Haugh, AFFF has not been used on any aircraft or structure fire on the base, but he had no other details on this particular crash (Appendix A).

(22) F-4 Aircraft Crash. In 1972, an F-4 aircraft crashed south of IRP Site 8. AFFF usage is unknown, but use of AFFF containing PFAS began in the 1960s (ITRC, 2017; Appendix C). According to information provided by Chief Oropeza, AFFF was likely used at the scene of this crash. According to an interview with Mr. Haugh, AFFF has not been used on any aircraft or structure fire on the base, but he had no other details on this particular crash (Appendix A).

The following sites were included in the assessment, but were not identified as potential PFAS AOCs:

(1) Northwest Firefighting Training Area (IRP Site 6). The exact location of IRP Site 6 is unknown. It is located approximately 750 feet east of the sewage treatment plant. The firefighting training area was active from 1946 through 1958 and closed before use of AFFF containing PFAS, which began in the 1960s (NEESA, 1987; ITRC, 2017; Appendix C). No documentation was found that identified PFAS releases in this area.

(2) Abandoned Fuel Farm (IRP Site 7). IRP Site 7 is located 400 feet north of 4th Street. IRP Site 7 contained eleven 50,000-gallon USTs and twelve 25,000-gallon USTs. All USTs within the Abandoned Fuel Farm were decommissioned by 1958 (NEESA, 1987; Appendix C). No documentation was found that identified PFAS releases in this area.

(3) Scrapyard (IRP Site 8). IRP Site 8 is bordered on the south and west by the Patrol Road Landfill. IRP Site 8 is a rectangular area approximately 500 feet long and 250 feet wide and was constructed by the Defense Reutilization and Marketing Office in 1958 for the storage of salvaged metals prior to resale. Items stored in the IRP Site 8 include old refrigerators, water coolers, empty drums, tanks, paint cans, film and film canisters, sand blast equipment, and

spent transformers (NEESA, 1987; Appendix C). No documentation was found that identified PFAS releases in this area.

(4) Transformer Storage Area (IRP Site 9). IRP Site 9 consists of a 150 foot by 150 foot area used to store transformers from 1963 to 1983 (NEESA, 1987; Appendix C). Transformers are not typically associated with fluids known to contain PFAS (ITRC, 2017; Appendix C). No documentation was found that identified PFAS releases in this area.

(5) Open Burn Pit (IRP Site 12). IRP Site 12 is located on the eastern boundary of NAF El Centro and was used from 1981 to 1986 to dispose of confiscated drugs, drug paraphernalia, ceramic pipes, cardboard, tin-coated steel cans, mason jars, and wood. The fires were allowed to burn themselves out (NEESA, 1987; Appendix C). No documentation was found that identified PFAS releases in this area.

(6) Old Incinerator (IRP Site 13). IRP Site 13 is located in the northeast corner of the base was used for burning paper only (NEESA, 1987; Appendix C). The incinerator was used from 1941 to 1953. There were no materials identified that were likely to contain PFAS (ITRC, 2017; Appendix C).

(7) Fuel Farm Tank Rinsate Disposal Area (IRP Site 14). IRP Site 14 is located in the southwest corner of the fuel farm area. The site was used from 1960 to 1985 as a drainage area for fuel farm tank rinsate and sludge (NEESA, 1987; Appendix C). None of these fluids is known to contain PFAS (ITRC, 2017; Appendix C).

(8) Fuel Farm Filter Cleaning Area (IRP Site 15). IRP Site 15 is located in the northwest corner of the fuel farm area and received fuel during filter cleaning from 1958 to 1981. During the filter cleaning process, spilled fuel would be collected into sumps that were allowed to drain into the ground (NEESA, 1987; Appendix C). None of these fluids is known to contain PFAS (ITRC, 2017; Appendix C).

(9) Potassium Ferricyanide Spill Area (IRP Site 16). An AST containing potassium ferricyanide bleach ruptured in 1981, releasing approximately 100 gallons (NEESA, 1987; Appendix C). Potassium ferricyanide bleach is used in color photo processing and does not contain PFAS (ITRC, 2017; Appendix C).

(10) Wastewater – Force Main Pumps. Most wastewater pipes at the base are vitrified clay and when broken are replaced with PVC. Industrial and maintenance operations waste streams may make their way to the sanitary sewer system (NAF El Centro, 2014b; Appendix C). According to interviews with Mr. Kagele, the hangars have floor drains that connect to the sanitary sewer system. No reports of leaking force main pumps were identified (Appendix A).

(11) Potable Water Treatment. Potable water for NAF El Centro starts as raw water from the Elder Canal, which originates upgradient of the base. All potable water

for the installation goes through the water treatment facility (NAF El Centro, 2014b; Appendix C). The Elder Canal flows toward the New River near the northwestern portion of the base. (NEESA, 1987; Appendix C). It is unknown whether there are PFAS sources upgradient from the base. No documentation was found that identified any PFAS releases in this area.

(12) Old Hangars. The older hangars (1, 6, 7, 8, and 9) have water suppression systems. Hangar 1 is the current vehicle storage for the Fire Department. See Fire Station for additional information on Hangar 1. Maintenance of aircraft would occur in hangars and some hydraulic fluids/lubrication fluids may contain PFAS; however, based on documentation available, it is unclear if the hydraulic fluids/lubrication fluids that were present at this site contain PFAS, and no known release of products containing PFAS has been documented.

(13) A-3D Skywarrior Crash, October 1964. A wing of the crashed aircraft damaged the administration building, and a detached engine created a hole in the chapel. The aircraft crashed into the exchange, theater, and commissary, which were in the location of current Building 364 and Buildings 335-339, and started a fire. According to an interview with Kris Haugh, NAF El Centro Public Affairs Officer, eyewitness accounts and video indicate only water being used for fire suppression (Appendix A).

(14) A-7 Crash, 1980s. According to Mr. Haugh, this crash did not result in a fire. Mr. Haugh stated that photos had been taken of the crash and no fire was visible.

(15) F/A-18 Crash, 2011. According to information provided by Chief Oropeza, AFFF was not used at the scene of this crash. According to an interview with Mr. Haugh, AFFF has not been used on any aircraft or structure fire on the base, but he had no other details on this particular crash (Appendix A).

(16) S-3 Crash, 1978. According to Mr. Haugh, this crash did not result in a fire. He mentioned that photos had been taken of the crash site and no fire was visible (Appendix A).

(17) Hot Pit. The Hot Pit is located east of Hangar 1. Hot pits are used for refueling of aircraft while the engines are still running. No reports of aircraft or fuel fires requiring fire suppression at the Hot Pit were identified.

(18) Plating Shop. Plating wastes are reportedly present in the landfills and in the industrial waste streams (NEESA, 1987; Appendix C). However, research and interviews were unable to identify the location of a former plating shop. No records were found of spills or releases related to the plating shop.

(19) Photography Shop. There is mention of photography shop waste in the industrial waste streams as well as the release of potassium ferricyanide (IRP Site 16), which does not contain PFAS (NEESA, 1987; Appendix C). Some photography agents are known to contain PFAS, but there have been no documented releases of products known to contain PFAS.

(20) Hazardous Waste. Building 530 was identified as a Hazardous Waste Facility and Building 539 stores hazardous materials. No reports of spills or releases related to the hazardous waste operations were identified.

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4.0 Summary

The objective of the PA is to identify potential AOCs within the boundaries of NAF El Centro where PFAS were potentially handled, stored, used, or released.

Research was conducted through (1) group discussion during the kickoff meeting, (2) personnel interviews, (3) online research (i.e., NAVFAC SW Administrative Record and Naval Installation Restoration Information Solution [NIRIS]), and (4) archival research at NAF El Centro to document PFAS storage and use at the installation. Additionally, MMEC Group conducted a site visit to NAF El Centro on May 30, 2018.

Twenty-two potential AOCs were identified as having the potential to be impacted by materials known to contain PFAS:

(1) Magazine Road Landfill (IRP Site 1)

(2) Patrol Road Landfill (IRP Site 2)

(3) Sludge Burial Area (IRP Site 3)

(4) 4th Street Firefighting Training Area (IRP Site 4)

(5) Firefighting Training Area East of Hangar 3 (IRP Site 5)

(6) Sewage Stabilization Ponds (IRP Site 10)

(7) Runway Burn Area (IRP Site 11)

(8) Firefighting Training Area (IRP Site 17)

(9) Tiffany Road Debris Area (IRP Site 18)

(10) Fire Station (Buildings 137 and 142)

(11) Fire Station Storage (Building 426)

(12) Wastewater Treatment Plant (Building 120)

(13) Sanitary Sewer – Lift Stations (Buildings 122 and 446)

(14) Storm drain

(15) Newly Constructed Hangars 2, 3, 4, and 5 (Buildings 820, 830, 840, and 850, respectively)

(16) Newly Constructed Hangar 3 (Building 830)

(17) Accidental AFFF Release Area (near Hangar 6)

(18) Former Firefighting Training Area

(19) Wash Rack/Oil-Water Separator near Hangar 1

(20) Wash Rack/Oil-Water Separator near Hangar 6

(21) T-34 Aircraft Crash

(22) F-4 Aircraft Crash

Table 1 summarizes the potential PFAS AOCs and potential media/receptors identified during the research, and the locations of these AOCs are shown on Figure 4.

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Table

Table 1: Summary of Potential PFAS Areas of Concern

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Table 1
Summary of Potential PFAS Areas of Concern

IRP Site	Site Name, Status	Use Date	Current Location	Types of Materials Stored/Used/ Spilled/Disposed of	Potential for PFAS	Recommended Media to Sample	Justification for Potential Future Action or No Future Action	Documentation Reference
1	Magazine Road Landfill	1965 to 1983	Northern portion of NAF El Centro	Household rubbish, plating waste, asbestos, water bearing fuel, paint, solvents, spent 40-mm cartridges, photographic chemicals, film, sandblast grit, demolition debris, parachutes, used hydraulic fluids, motor oil, paint thinners, pesticides containers, and batteries.	Yes	Soil and Groundwater	The site operated as a borrow pit from 1964 to 1965, and then as a municipal landfill without a liner or leachate collection system. Household waste with some construction and industrial waste was primarily collected. Monthly burning was conducted to reduce waste volume (NEESA, 1987). Consumer goods disposed of may have been treated with PFAS-containing non-stick and water/stain-resistant coatings. These coatings were available starting in the 1940s and 1950s, respectively.Use of AFFF containing PFAS began in the 1960s, so materials that came in contact with AFFF may have also been disposed in the landfill (ITRC, 2017). Plating operations are known to contain PFAS (ITRC, 2017).	PA/SI (NEESA, 1987)
2	Patrol Road Landfill	1946 to 1965	Northwestern portion of NAF El Centro	Unit 1: Runway fill material, construction demolition debris (concrete, metals) Unit 2: Household rubbish, paint, solvents, photographic chemicals, ACM, fuels, oils, empty drums, mercury amalgam, batteries, parachutes, spray cans, spray paint filters, demolition debris, pesticides, tires, asphalt, wood	Yes	Soil and Groundwater	Unit 1: This area was a borrow area for runway fills. Pits filled with water from irrigation return from agricultural fields. Pits existed from 1955 until 1962 when they were filled with demolition debris consisting mostly of concrete (NEESA, 1987). Unit 2: This area was operated as a municipal landfill with various waste material from 1946 to 1965, when landfill operations were transferred to Magazine Road Landfill (NEESA, 1987). Consumer goods possibly treated with non-stick coatings and water/stain-resistant coatings may have been disposed of here. These coatings were available in the 1940s and 1950s, respectively. USe of AFFF containing PFAS began in the 1960s; materials that came in contact with AFFF may have also been disposed of in the landfill. Some pesticides are known to contain PFAS (ITRC, 2017).	PA/SI (NEESA, 1987)
3	Sludge Burial Area (Closed)	1986	Northwestern corner of NAF El Centro	Sewage sludge from sewage treatment plant	Yes	Soil and Groundwater	This site was an unlined excavation pit for burial of sewage sludge previously removed from the drying bed in the sewage treatment plant (NEESA, 1987). PFAS have been found in domestic sewage sludge. Some PFAS are frequently found in wastewater treatment plant effluent because conventional treatment methods may not remove PFAS efficiently. Treatment plants that receive industrial wastewater are particularly affected (ITRC, 2017).	PA/SI (NEESA, 1987)
4	4th Street Firefighting Training Area (Closed)	1963 to 1975	Western portion of NAF El Centro	AFFF	Yes	Soil and Groundwater	This area was used for firefighting training every weekend for nine months of the year during its operation, with documented use of AFFF. After training operations stopped in the area, it was used as a burn site for confiscated drugs and drug paraphernalia (NEESA 1987).	PA/SI (NEESA, 1987)
5	Firefighting Training Area East of Hangar 3 (Closed)	1958 to 1963	Central portion of NAF El Centro	AFFF	Yes	Soil and Groundwater	This unlined circular area with an earthen berm was used every weekend (NEESA, 1987). Use of AFFF containing PFAS began in the 1960s (ITRC, 2017).	PA/SI (NEESA, 1987)
6	Northwest Firefighting Training Area (Closed)	1946 to 1958	Northwestern corner of NAF El Centro	Arsenic, benzene, beryllium, TPH	No	NA	The firefighting training area closed before use of AFFF containing PFAS, which began in the 1960s (NEESA, 1987; ITRC, 2017). No documentation was found that identified PFAS releases in this area.	PA/SI (NEESA, 1987)
7	Abandoned Fuel Farm	1942 to 1958	Northwestern portion of NAF El Centro	Benzene, 1,2-DCA, VOCs, TPH-g	No	NA	All USTs were decommissioned by 1958 (NEESA, 1987). Fire suppression systems that may have been present existed before the use of AFFF containing PFAS, which began in the 1960s (ITRC, 2017). No documentation was found that identified PFAS releases in this area.	PA/SI (NEESA, 1987)
8	Scrapyard (Closed)	1958 to 1982	Northwestern portion of NAF El Centro	Old refrigerators, water coolers, empty drums, tanks, paint cans, film and film containers, sand blast equipment, spent transformers, and other scrap metal.	No	NA	This site was used by the DRMO for the storage of salvaged metals prior to resale. PFAS-containing materials could have been in the empty drums and tanks because of the years of operation, and residual material could have leaked (NEESA, 1987; ITRC, 2017). PFAS-containing coating aids are known to be used on films and papers for photography (Keml, 2004). No documentation was found that identified PFAS releases in this area.	PA/SI (NEESA, 1987)
9	Transformer Storage Area (Closed)	1963 to 1983	Northwestern portion of NAF El Centro	Leaked transformer fluid	No	NA	Contamination was limited to the upper 1 foot of soil and was removed (MMEC Group, 2018) Transformers are not typically associated with fluids known to contain PFAS (ITRC 2017).	Site Management Plan (MMEC Group, 2018)
10	Sewage Stabilization Ponds (Closed)	1940s to 1976	Northwestern corner of NAF El Centro	Sewage sludge	Yes	Soil and Groundwater	Three unlined ponds served as the only sewage treatment for the installation during the years of active use. Domestic and industrial sewage flowed into the ponds. No records documenting sludge removal were identified. The ponds served as backup for when the sewage treatment plant went down (NEESA, 1987). PFAS have been found in domestic sewage sludge. Some PFAS are frequently found in wastewater treatment plan effluent because conventional treatment methods do not efficiently remove PFAS. Treatment plants that receive industrial wastewater are particularly affected (ITRC, 2017).	PA/SI (NEESA, 1987)

Table 1
Summary of Potential PFAS Areas of Concern

IRP Site	Site Name, Status	Use Date	Current Location	Types of Materials Stored/Used/ Spilled/Disposed of	Potential for PFAS	Recommended Media to Sample	Justification for Potential Future Action or No Future Action	Documentation Reference
11	Runway Burn Area (Closed)	1979 to 1980	Southeastern portion of NAF El Centro	TPH and metals	Yes	Soil and Groundwater	This area was used for aircraft firefighting exercises during 1979 through 1980. The remains of a crashed T-28 were periodically set ablaze with JP-5 and then extinguished as a firefighting training exercise (NEESA, 1987). Use of firefighting foam containing PFAS began in the 1960s (ITRC, 2017).	PA/SI (NEESA, 1987)
12	Open Burn Pit (Closed)	1981 to 1986	Eastern portion of NAF El Centro	Confiscated drugs, drug paraphernalia, ceramic pipes, cardboard, tin-coated steel cans, mason jars, and wood	No	NA	The burn pit was used to dispose of confiscated drugs, drug paraphernalia, ceramic pipes, cardboard, tin-coated steel cans, mason jars, and wood. The fires were allowed to burn themselves out (NEESA, 1987). Some cardboard and food containers have coatings that contain PFAS to repel grease and moisture, so there is some potential for the presence of PFAS (ITRC, 2017). No documentation was found that identified PFAS releases in this area.	PA/SI (NEESA, 1987)
13	Old Incinerator (Closed)	1942 to 1953	Northern portion of NAF El Centro	No records of hazardous materials disposal at this site were identified.	No	NA	The incinerator was used for burning paper only (NEESA, 1987). There were no materials identified that were likely to contain PFAS (ITRC, 2017).	PA/SI (NEESA, 1987)
14	Fuel Farm Tank Rinsate Disposal Area (Closed)	1960 to 1985	Southeastern corner of NAF El Centro, includes RP 15	JP-4, JP-5, AVGAS (leaded), diesel fuel #2, and MOGAS	No	NA	The site was used as a drainage area for fuel farm tank rinsate and sludge (NEESA, 1987). None of these fluids is known to contain PFAS (ITRC, 2017).	PA/SI (NEESA, 1987)
15	Fuel Farm Filter Cleaning Area (Closed)	1958 to 1981	Southeastern corner of NAF El Centro, includes RP 14	JP-4, JP-5, AVGAS (leaded), diesel fuel #2, and MOGAS	No	NA	The site was used for fuel filter cleaning. During the filter cleaning process, spilled fuel would be collected into sumps that were allowed to drain into the ground (NEESA, 1987). None of these fluids is known to contain PFAS (ITRC, 2017).	PA/SI (NEESA, 1987)
16	Potassium Ferricyanide Spill Area (Closed)	1981	Southern portion of NAF El Centro	Potassium ferricyanide	No	NA	An AST containing potassium ferricyanide bleach ruptured in 1981, releasing approximately 100 gallons (NEESA, 1987). Potassium ferricyanide bleach is used in color photo processing and does not contain PFAS (ITRC, 2017).	PA/SI (NEESA, 1987)
17	Firefighting Training Area (Closed)	1980 to Unknown	Western portion of NAF El Centro	AFFF	Yes	Soil and Groundwater	Firefighting training occurred at least once per month with approximately 25 gallons of AFFF used per training event (ERCE 1990).	RP Site 17 PA (ERCE, 1990)
18	Tiffany Road Debris Area	Mid-1940s to Mid-1970s	Northwestern corner of NAF El Centro	Acids, corrosives, batteries, waste oil, potassium-ferric cyanide, formaldehyde, 60-mm film canisters, aircraft parts, gutted plane parts, beryllium brakes, parachutes, tires, wood, pallets, railroad ties, asbestos shingles and blankets, drums, various canisters, trash, miscellaneous scrap metal, and expended ammunition cartridges	Yes	Soil and Groundwater	The Tiffany Road Debris Area served as the primary waste disposal site until the Magazine Road Landfill was opened in 1965. After 1965, the site was used infrequently until it was abandoned in the mid-1970s. Materials at the site were burned for compaction. A second area north of the burn site reportedly contains demolition debris (drywall, wood, and metal), landscape waste, and a small quantity of domestic waste, possibly from off-base sources. The clarifier that was used to treat the base sewage before the sewage treatment ponds were constructed is located on this site. Reports indicate that the clarifier may have been compromised and cracked (General Dynamics, 2006). Non-stick coatings and stain/water-resistant products were introduced in commercial products in the 1940s and 1950s, respectively. Consumer goods treated with these coatings may have been disposed of in the landfill (ITRC, 2017).	Preliminary Environmental Assessment (General Dynamics, 2006)
NA	Fire Station	Unknown to Present	Buildings 137 and 142	AFFF	Yes	Soil and Groundwater	According to the 2014 Master Plan and interviews with Fire Chief Jose Oropeza, Building 137 (Hangar 1) current and historical uses included storage of firefighting vehicles. Building 142 current and historical uses include providing sleeping quarters and offices for firefighters. According to a group interview with members of the NAF El Centro Fire Department, there was historical AFFF storage and usage just north of Building 137.	Master Plan (NAF El Centro, 2014); Personal Interview - Fire Chief Oropeza; Group Interview - NAF El Centro Fire Department Personnel
NA	Fire Station Storage	Unknown to Present	Building 426	AFFF	Yes	Soil and Groundwater	According to the 2014 Master Plan and interviews with Chief Oropeza, Building 426 current and historical uses include storage of AFFF concentrate and surplus firefighting equipment. No records were identified that indicate that leaks or spills of AFFF concentrate occurred.	Master Plan (NAF El Centro, 2014); Personal Interview - Fire Chief Oropeza
NA	Wastewater - Sewage Treatment	Unknown to Present	Building 120	Industrial and domestic sewer discharge	Yes	Soil and Groundwater	Industrial and maintenance operations waste streams may make their way to the sanitary sewer system. According to interviews with Bill Kagele, Water Program Manager at NAF El Centro, the hangars have floor drains that connect to the sanitary sewer system. Mr. Kagele and Robert Fischer, Environmental Protection Specialist at NAF El Centro, also indicated that Hangar 3 had an accidental release of AFFF that reached a height of 8 feet. The foam was disposed of in the sewage treatment holding pond via the sanitary sewer system. Most wastewater pipes at the base are vitrified clay and when broken are replaced with PVC (NAF El Centro, 2014).	Master Plan (NAF El Centro, 2014); Personal Interviews - Bob Fischer and Bill Kagele

Table 1
Summary of Potential PFAS Areas of Concern

IRP Site	Site Name, Status	Use Date	Current Location	Types of Materials Stored/Used/ Spilled/Disposed of	Potential for PFAS	Recommended Media to Sample	Justification for Potential Future Action or No Future Action	Documentation Reference
NA	Wastewater - Lift Stations	Unknown to Present	Buildings 122 and 446	Industrial and domestic sewer discharge	Yes	Soil and Groundwater	Most wastewater pipes at the base are vitrified clay and when broken are replaced with PVC. Underground suction ductile iron pipes at lift stations have reportedly corroded. Industrial and maintenance operations waste streams may make their way to the sanitary sewer system (NAF El Centro, 2014). According to interviews with Mr. Kagele, the hangars have floor drains that connect to the sanitary sewer system. Buildings 122 and 446 are near the Fire Station and Hangar 3. AFFF that entered the sanitary sewer system may have infiltrated the soil via leaking pipes	Master Plan (NAF El Centro, 2014); Personal Interviews - Bob Fischer and Bill Kagele
NA	Wastewater - Force Main Pumps	Unknown to Present	Buildings 459 and 554	Industrial and domestic sewer discharge	No	NA	Most wastewater pipes at the base are vitrified clay and when broken are replaced with PVC. Industrial and maintenance operations waste streams may make their way to the sanitary sewer system (NAF El Centro, 2014). According to interviews with Mr. Kagele, the hangars have floor drains that connect to the sanitary sewer system. No reports of leaking force main pumps were identified.	Master Plan (NAF El Centro, 2014); Personal Interviews - Bob Fischer and Bill Kagele
NA	Stormwater	Unknown to Present	NA	AFFF	Yes	Soil and Groundwater	Surface water drainage in the vicinity of the base is controlled by the Rice and Elder Canals. The canals receive water from storm drainage channels, irrigation runoff, and shallow aquifers (NEESA, 1987). The canals drain into the New River, which ultimately drains into the Salton Sea. There are unlined drainage ditches throughout the base and a natural wash in the northwestern corner. Runoff that contained AFFF or fire-resistant hydraulic fluid would end up in the base stormwater drainage system (NEESA, 1987). There may have been a subsurface stormwater drainage system on the airfield, but the pipes have reportedly degraded to the point of collapse and no longer function (NAF El Centro, 2014). According to a group interview with members of the NAF El Centro Fire Department, a release of AFFF occurred because of a stuck valve on one of the fire trucks at Hangar 6; the spilled fluid drained to a nearby stormwater drainage ditch.	PA/SI (NEESA, 1987); Master Plan (NAF El Centro, 2014); Group Interview - NAF El Centro Fire Department Personnel
NA	Potable Water Treatment	Unknown to Present	Buildings: 334, 365 - Reservoirs 343 through 347, 352, 353 - Sediment Basins 350, 351 - Treatment Plant	Raw water	No	NA	Potable water for NAF El Centro starts as raw water from the Elder Canal, which originates upgradient of the base. All potable water for the installation goes through the water treatment facility (NAF El Centro, 2014). The Elder Canal flows toward the New River near the northwestern portion of the base. (NEESA, 1987). It is unknown whether there are PFAS sources upgradient from the base. No documentation was found that identified PFAS releases in this area.	PA/SI (NEESA, 1987); Master Plan (NAF El Centro, 2014);
NA	Old Hangars	Unknown to Present	Buildings: 137 (Hangar 1), 524 (Hangar 6), 502 (Hangar 7), 503 (Hangar 8), 505 (Hangar 9)	Hydraulic fluid	No	NA	The older hangars (1, 6, 7, 8, and 9) have water suppression systems. Hangar 1 is the current vehicle storage for the Fire Department. See Fire Station for additional information on Hangar 1. Maintenance of aircraft would occur in hangars and some hydraulic fluids/lubrication fluids may contain PFAS; however, based on documentation available, it is unclear if the hydraulic fluids/lubrication fluids that were present at this site contain PFAS, and no known release of products containing PFAS has been documented.	Personal Interviews - Bob Fischer and Bill Kagele; Group Interview - NAF El Centro Fire Department Personnel
NA	New Hangars	Unknown to Present	Buildings: 820 (Hangar 2), 830 (Hangar 3), 840 (Hangar 4), 850 (Hangar 5)	AFFF, hydraulic fluid	Yes	Soil and Groundwater	According to interviews with Mr. Fischer, the newer hangars (Hangars 2, 3, 4, and 5) have AFFF flood systems for fire suppression. According to Mr. Fischer, the AFFF flood systems have never been tested. Hangars with AFFF fire suppression systems have at least two approximately 900-gallon ASTs for premixed AFFF. Maintenance of aircraft would occur in hangars, and aviation fire-resistant hydraulic fluid is known to contain PFAS (ITRC, 2017; Keml, 2004). However, no spills or releases of aviation hydraulic fluids have been reported. According to interviews with Mr. Kagele, the hangars have floor drains that connect to the sanitary sewer system, which reportedly has a history of breaks and repairs	Personal Interviews - Bob Fischer and Bill Kagele; Group Interview - NAF El Centro Fire Department Personnel

Table 1
Summary of Potential PFAS Areas of Concern

IRP Site	Site Name, Status	Use Date	Current Location	Types of Materials Stored/Used/ Spilled/Disposed of	Potential for PFAS	Recommended Media to Sample	Justification for Potential Future Action or No Future Action	Documentation Reference
NA	AFFF Release in Hangar 3	Unknown to Present	Building 830 (Hangar 3)	AFFF, hydraulic fluid	Yes	Soil and Groundwater	According to interviews with Mr. Fischer, the newer hangars (Hangars 2, 3, 4, and 5) have AFFF flood systems for fire suppression systems. According to Mr. Fischer, the AFFF flood systems have never been tested. Mr. Fischer also indicated that there was an accidental release of one of the flood systems where the AFFF reached 8 feet high in Hangar 3. The foam from the release was disposed of in the sewage treatment holding pond via the sanitary sewer system, which reportedly has a history of breaks and repairs. Hangars with AFFF fire suppression systems have at least two approximately 900-gallon ASTs for premixed AFFF. Maintenance of aircraft would occur in hangars, and aviation fire-resistant hydraulic fluid is known to contain PFAS (ITRC, 2017; Keml, 2004). However, no spills or releases of aviation hydraulic fluids have been reported. Because of the age of Hangar 3 (built in the 2000s), the integrity of the floor is most likely in good condition. It is unlikely that the foam from the release saturated the soil surrounding the hangar.	Personal Interviews - Bob Fischer and Bill Kagele
NA	Accidental AFFF Release Area (near Hangar 6)	2006 or 2008	East of Hangar 6, storm drain	AFFF	Yes	Soil and Groundwater	According to a group interview with members of the NAF El Centro Fire Department, a release of AFFF occurred because of a stuck valve on one of the fire trucks in 2006 or 2008. The fluid drained to a nearby stormwater drainage ditch and the surrounding soil at Hangar 6	Group Interview - NAF El Centro Fire Department Personnel
NA	Former Firefighting Training Area	2004 or 2006	East of Hangar 9, south of the runway, north of IRP Sites 14 and 15	AFFF	Yes	Soil and Groundwater	According to a group interview with members of the NAF El Centro Fire Department, this area was a former firefighting training area where AFFF was used in 2004 or 2006.	Group Interview - NAF El Centro Fire Department Personnel
NA	Wash Rack and Oil/Water Separator near Hangar 1	Unknown to Present	Wash rack near Hangar 1	AFFF, hydraulic fluid	Yes	Soil and Groundwater	According to interviews with Mr. Fischer, this is one of two wash racks with oil-water separators near the runway and apron. This wash rack is south of Hangar 1 (Building 137, part of the fire station). AFFF was reportedly stored near the hangar, and may have entered the oil-water separator and accumulated in the sludge. Aviation fire-resistant hydraulic fluids, which have been known to contain PFAS, may have been in the wastewater and entered the oil-water separator (ITRC, 2017; Keml, 2004). It is unknown where sludge from the oil/water separator was disposed of prior to 1993. Since 1993, sludge from oil-water separators at the base has been disposed of offsite (DTSC, 2018)	Group Interview - NAF El Centro Fire Department Personnel; Personal Interviews - Bob Fischer and Bill Kagele; Hazardous Waste Tracking System (DTSC, 2018)
NA	Wash Rack and Oil/Water Separator Near Hangar 6	Unknown to Present	Wash rack near Hangar 6	AFFF, hydraulic fluid	Yes	Soil and Groundwater	According to interviews with Mr. Fischer, this is one of two wash racks with oil-water separators near the runway and apron. This wash rack is west of Hangar 6 (Building 524) and is listed as Building 541, Aircraft Wash Rack. AFFF was reportedly used near the hangar, and may have entered the oil-water separator and accumulated in the sludge. Aviation fire-resistant hydraulic fluids, which have been known to contain PFAS, may have been in the wastewater and entered the oil-water separator (ITRC, 2017; Keml, 2004). It is unknown where sludge from the oil-water separator was disposed of prior to 1993. Since 1993, sludge from oil-water separators at the base has been has been disposed of offsite (DTSC, 2018).	Personal Interviews - Bob Fischer and Bill Kagele. Hazardous Waste Tracking System (DTSC, 2018)
NA	A-3D Skywarrior Crash	October 27, 1964	Administration - Building 214 Chapel - Building 359 Exchange/Theater - Formerly located at Building 364 Commissary - Formerly located at Buildings 335-339 Pool - Building 374	NA	No	NA	The wing of the crashed aircraft damaged the administration building, and an engine created a hole in the chapel. The aircraft crashed into the exchange, theater, and commissary, which were in the location of current Building 364 and Buildings 335-339, and started a fire.The exchange, theater, and commissary were destroyed and were rebuilt in different locations (currently Building 201, Building 203, and Building 210, respectively). The fire spread west to the pool (Building 374). The administration building, chapel, and pool were repaired and are in the same locations they were in prior to the crash. According to an interview with Kris Haugh, NAF El Centro Public Affairs Office, eyewitness accounts and video indicate only water being used for fire suppression	Personal Interviews - Bob Fischer, Bill Kagele, and Kris Haugh
NA	A-7 Crash	1980s	Unknown	AFFF	No	NA	AFFF usage is unknown, but use of AFFF containing PFAS began in the 1960s (ITRC, 2017). According to information provided by Chief Oropeza, AFFF may have been used at the scene of this crash. Cheif Oropeza was unable to identify the location of the A-7 crash. According to an interview with Mr. Haugh, AFFF has not been used on any aircraft or structure fire on the base but he had no other details on this particular crash.	Personal Interviews - Fire Chief Oropeza and Kris Haugh
NA	T-34 Crash	1995	Near Runway 12 Left	AFFF	Yes	Soil and Groundwater	AFFF usage is unknown, but use of AFFF containing PFAS began in the 1960s (ITRC, 2017). According to information provided by Chief Oropeza, AFFF was likely used at the scene of this crash. According to an interview with Mr. Haugh, AFFF has not been used on any aircraft or structure fire on the base, but he had no other details on this particular crash.	Personal Interviews - Fire Chief Oropeza and Kris Haugh

Table 1
Summary of Potential PFAS Areas of Concern

IRP Site	Site Name, Status	Use Date	Current Location	Types of Materials Stored/Used/ Spilled/Disposed of	Potential for PFAS	Recommended Media to Sample	Justification for Potential Future Action or No Future Action	Documentation Reference
NA	F/A-18 Crash	2011	Unknown	AFFF	No	NA	According to information provided by Chief Oropeza, AFFF was not used at the scene of this crash. According to an interview with Mr. Haugh, AFFF has not been used on any aircraft or structure fire on the base, but he had no other details on this particular crash.	Personal Interviews - Fire Chief Oropeza and Kris Haugh
NA	S-3 Crash	1978	Near Taxiway G	NA	No	NA	According to Mr. Haugh, this crash did not result in a fire. He mentioned that photos had been taken of the crash and no fire was visible.	Personal Interview - Kris Haugh
NA	F-4 Crash	1972	Just south of IRP Site 8	AFFF	Yes	Soil and Groundwater	AFFF usage is unknown, but use of AFFF containing PFAS began in the 1960s (ITRC, 2017). According to information provided by Chief Oropeza, AFFF was likely used at the scene of this crash. According to an interview with Mr. Haugh, AFFF has not been used on any aircraft or structure fire on the base, but he had no other details on this particular crash.	Personal Interviews - Fire Chief Oropeza and Kris Haugh
NA	Hot Pit	Unknown to Present	East of Hangar 1 on the parking apron	None	No	NA	Hot pits are used for refueling of aircraft while the engines are still running. No reports of aircraft or fuel fires requiring fire suppression at the hot pit were identified.	NAF El Centro Development Map provided by Bob Fischer
NA	Plating Shop	Unknown	Unknown	Plating operation materials	No	NA	Plating wastes are reportedly present in the landfills and in the industrial waste streams (NEESA, 1987). However, research and interviews were unable to identify the location of a former plating shop. No records were found of spills or releases related to the plating shop.	PA/SI (NEESA, 1987)
NA	Photography Shop	Unknown	Building 565	Photography film and chemicals	No	NA	There is mention of photography shop waste in the industrial waste streams as well as the release of potassium ferricyanide (IRP 16), which does not contain PFAS (NEESA, 1987). Building 565 is currently the security building. Some photography agents are known to contain PFAS, but there have been no releases of products known to contain PFAS documented, other than at IRP 16.	PA/SI (NEESA, 1987)
NA	Hazardous Waste	Unknown to Present	Buildings: 530 - Hazardous Waste Facility 539 - Hazmat Storage	Various wastes	No	NA	No reports of spills or releases related to the hazardous waste operations were identified.	NA

Sources:
California Environmental Protection Agency Department of Toxic Substances Control (DTSC). 2018. Hazardous Waste Tracking System. June
ERC Environmental and Energy Services Co. (ERCE). 1990. Final Preliminary Assessment, Site 17 Fire Fighting Training Area. Februar
General Dynamics. 2006. Preliminary Environmental Assessment, Tiffany Road Debris Area. June 13
Interstate Technology Regulatory Council (ITRC). 2017. History and Use of Per- and Polyfluoroalkyl Substances (PFAS). November.
Naval Air Facility El Centro (NAF El Centro). 2014. NAF El Centro Master Plan Final Submittal. April
Naval Energy and Environmental Support Activity (NEESA). 1987. Draft Preliminary Assessment/Site Inspection of Naval Air Facility El Centro, El Centro, California. June
Swedish Chemicals Inspectorate (KemI) and the Swedish EPA, Sweden. 2004. Perfluorooctane Sulfonate (PFOS). August.

Acronyms/Abbreviations:
ACM = asbestos-containing material; AFFF = aqueous film-forming foam; AST = aboveground storage tank; AVGAS = aviation gasoline; DCA = dichloroethane; DRMO = Defense Reutilization and Marketing Office;
DTSC = California Environmental Protection Agency Department of Toxic Substance Control; ERCE = ERC Environmental and Energy Services Co. hazmat = hazardous materials; IRP = Installation Restoration Program;
ITRC = Interstate Technology Regulatory Council; JP = jet propellant; mm = millimeter(s); MMEC Group = Multi-Media Environmental Compliance Group; MOGAS = motor gas; NA = not applicable;
NAF = Naval Air Facility; NEESA = Naval Energy and Environmental Support Activity; PA/SI = Preliminary Assessment/Site Inspection; PFAS = per- and polyfluoroalkyl substance(s); PFOS = perfluorooctane sulfonate;
PVC = polyvinyl chloride; TPH = total petroleum hydrocarbons; TPH-g = total petroleum hydrocarbons as gasoline; UST = underground storage tank; VOC = volatile organic compoun

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Figures

Figure 1: Vicinity Map
Figure 2: Basewide Location Map
Figure 3: Well Locations
Figure 4: Potential PFAS Areas of Concern

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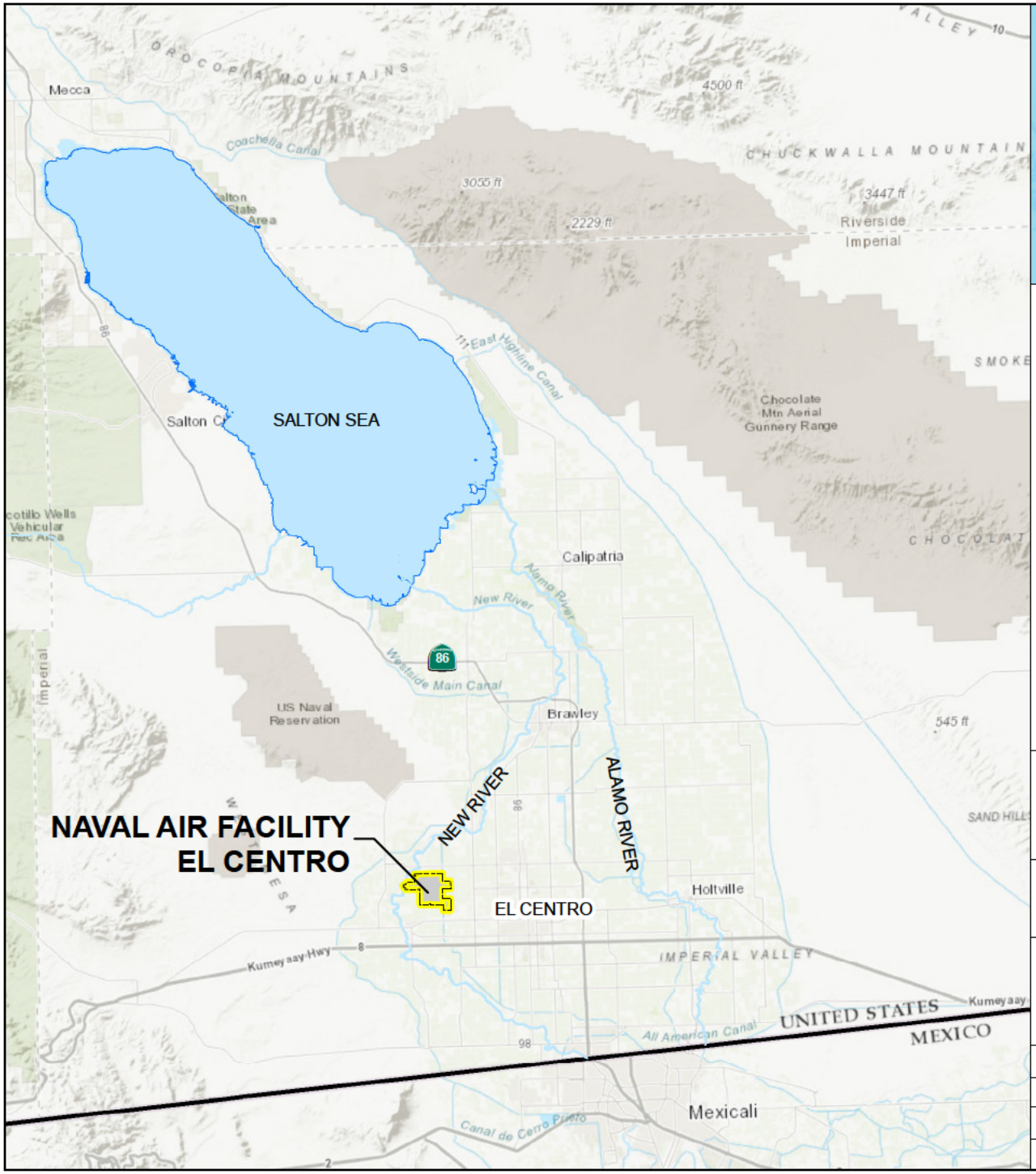

LEGEND

NAF EL CENTRO BOUNDARY

Notes:
NAF = Naval Air Facility

Basemap Source: ESRI Online Streaming Service 2018

N

0 5 10 20
In Miles
1 Inch = 10 Miles

Naval Air Facility El Centro, California
Preliminary Assessment Report for Base-Wide
Investigation of Per-and Polyfluoroalkyl Substances

Vicinity Map

PROJECT NO.	5026-18-7455	FIGURE
DATE	August 2018	1
DRAWN BY	KOB	
CHECKED BY	GS	

Date: 8/16/2018 Path: P:\Projects-South\CADGIS\AUTOCAD\5026-18\7445_PFAS_ElCentroGIS\Figs_PFAS_Prelim_Aug2018\7445_Figure1_VicinityMapV2.mxd

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Appendix A:
Interview Logs

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Interview Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Name: Bob Fischer and Bill Kagele **Position/Rank:** Environmental Protection Specialist and Water Program Manager

Contact Information (phone, e-mail): (760) 339-2284 and (760) 339-2532

Interviewer: Gabriela Staehle **Date:** May, 30, 2018

This Interview Form summarizes an in-person interview conducted with Bob Fischer and Bill Kagele on May 30, 2018. Additional email correspondence was conducted on June 15, June 18, June 20, and July 13, 2018 and the information provided therein is included in this Interview Form. Significant email correspondence will be included in Appendix D - Relevant Documents.

Years at or familiar with Installation:

Mr. Fischer and Mr. Kagele have worked on base for more than 15 years.

Was Aqueous Film Forming Foam (AFFF) used/stored on-base outside of Fire Training Areas (FTAs)? If so, where?
The buildings between Hangars 2, 3, 4, and 5 store AFFF in approximately 3,000 gallon containers.

No hangars stored AFFF between 1960 and 2000. Water suppression system were used in place of AFFF.

Were there hangars or buildings on-base with fire suppression systems? If yes, was AFFF used in these systems?
The New Hangars (2 through 5) contain AFFF fire-suppression systems. When asked in an email (July 13, 2018) if the AFFF fire-suppression systems inside Hangars 2 through 5 were tested (i.e. flooding), Mr. Fischer responded that to his knowledge, the AFFF systems had never been tested in this manner.

No hangars stored AFFF between 1960 and 2000. Water suppression system were used in place of AFFF.

Was there a fire station on-base? If yes, where was it located?
Yes. Hangar 1.

If no, what local fire station was on call for emergencies?
NA

Were there any planes crashes or fires on base? If so, was AFFF used to put out the fire and where were they located? Are there records available that we can have?
Yes, an A-3 aircraft crashed occurred in 1963. Instructed to ask the Fire Department. In an email dated

6/20/2018, Mr. Fischer provided a video of the 1963 crash. He noted that no visual evidence of AFFF usage in the stills and film clips.

Was there a truck washing area for fire trucks or emergency vehicles on-base? If yes, where was it located?
There is a wash rack between Hangar 1 and 2, west of Hangar 6, and adjacent to Building 157.

Was there an area used for annual calibration and testing of firefighting equipment that may have contained AFFF? If yes, where was it located?

NA

Is there an additional contact that could provide information of AFFF (name and contact info)?
Contact information was provided for Fire Chief Jose Oropeza

Mr. Fischer and Mr. Kagele introduced the MMEC Group personnel to Isabel Avila, QC/Work Control Manager. Isabel Avila later provided specifications on AFFF purchased by the facility.

Mr. Fischer and Mr. Kagele introduced the MMEC Group personnel to Dante Dinelli (Real Property Accountability Officer) and Rand Center (Community Planner).

Additional Comments:

An accidental release of AFFF occurred when the New Hangars were being built (approximately 2009). The release occurred inside Hangar 3 and AFFF rose to 8 feet inside the Hangar. The AFFF was routed to the Wastewater Treatment Plant holding pond (Emergency Storage Basin).

According to a phone call with Mr. Kagele on June 18, the hangars are equipped with drains that are routed to the WWTP.

No irrigation wells are located near the facility that are used for drinking water. Drinking water comes from the Colorado River.

No electroplating or manufacturing has occurred at the facility.

Fire Department Interview Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Name: Jose Oropeza **Position/Rank:** Installation Fire Chief

Contact Information (phone, e-mail): 760-339-2251, 760-693-9992, jose.oropeza@navy.mil

Interviewer: Gabriela Staehle **Date:** May 14, 2018

Fire Chief Oropeza provided this Interview Log on May, 2018. A follow-up phone call was conducted on June 14, 2018, and the information provided therein is also included in this Interview Form.

Years at or familiar with Installation (# and dates): 28yrs. 1990-present

Was Aqueous Film Forming Foam (AFFF) used/stored on-base outside of Fire Training Areas (FTAs)? If so, where? no

Were there hangars on-base with fire suppression systems? If yes, was AFFF used in these systems?
AFFF is currently used in hangar 2-5

Was there a fire station on-base? If yes, where was it located?
Yes currently located on Hangar 1 1987-present, previous site was hangar 3 (1970s – 1987) Building 137 is fire station.

- Current 426 storage "green AFFF" Ty class D foam 3%, Ansulite AFC 3A, 550 gallon, Concentrate added to trucks
- Don't remember ever mixing solution. (5 gallon bucket concentrate).

Were there any planes crashes or fires on base? If so, was AFFF used to put out the fire and where were they located? Are there records available that we can have?
There have been several aircraft mishaps on base, as I recall foam has been used very limited on the incidents I can recall

- Not sure if AFFF was deployed, but possibly.
- Mid 90s – incident taxiway bravo insects 12 and 30 likely AFFF used.
- 1977s – F-3 Crash
- 1972 – F-4, likely AFFFF used
- 2011- F-18 crash did not use foam.
- 1980- A-7 may have been foam

Was there a truck washing area for fire trucks or emergency vehicles on-base? If yes, where was it located?
Bldg 352 car wash, ramp area

Was there an area used for annual calibration and testing of firefighting equipment that may have contained AFFF? If yes, where was it located?

Unknown

No foam testing was conducted in the 90's

Is there an additional contact that could provide information of AFFF (name and contact info)?

Additional Comments:

Fire Department Interview Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Name: Group Interview **Position/Rank:** Fire Department

Contact Information (phone, e-mail): NA

Interviewer: Gabriela Staehle **Date:** May 30, 2018

During a site visit to NAF El Centro on May 30, 2018, a Group Interview was conducted with personnel from the Fire Department.

Years at or familiar with Installation (# and dates):

NA

Was Aqueous Film Forming Foam (AFFF) used/stored on-base outside of Fire Training Areas (FTAs)? If so, where?

AFFF was stored in the dirt area just north of the Fire Department (Hangar 1).

Were there hangars on-base with fire suppression systems? If yes, was AFFF used in these systems?
NA

Was there a fire station on-base? If yes, where was it located?
Yes, Hangar 1

Were there any planes crashes or fires on base? If so, was AFFF used to put out the fire and where were they located? Are there records available that we can have?
Instructed to interview Chief Jose Oropeza.

Was there a truck washing area for fire trucks or emergency vehicles on-base? If yes, where was it located?
Yes, west of Hangar 6. In either 2006 or 2008, a valve on a truck was stuck open at this wash rack. AFFF poured from the truck and drained to the stormdrain and soil west of the wash rack.

Was there an area used for annual calibration and testing of firefighting equipment that may have contained AFFF? If yes, where was it located?

No

Is there an additional contact that could provide information of AFFF (name and contact info)?
Fire Chief Oropeza

Additional Comments:

The fire pit located west of the Fire Station (IRP Site 14) was used starting in the 1980s. The fire training area was used every Sunday until the late 1990s. Different types of AFFF were used at this fire training area: Haylon More, Protein Foam, and AFFF. Now, a dry chemical is used for fire suppression.

An addition fire training location was identified north of the fuel farm.

Fire Department Interview Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Name: Kristopher Haugh **Position/Rank:** Public Affairs Officer

Contact Information (phone, e-mail): (760) 339-2673, kristopher.haugh@navy.mil

Interviewer: Gabriela Staehle **Date:** 7/5/18

Kristopher Haugh is a specialist on the 1964 A-3D Skywarrior crash, and was only asked about aircraft crashes at NAS El Centro.

Years at or familiar with Installation (# and dates):

NA

Was Aqueous Film Forming Foam (AFFF) used/stored on-base outside of Fire Training Areas (FTAs)? If so, where?

NA

Were there hangars on-base with fire suppression systems? If yes, was AFFF used in these systems?

NA

Was there a fire station on-base? If yes, where was it located?

NA

Were there any planes crashes or fires on base? If so, was AFFF used to put out the fire and where were they located? Are there records available that we can have?

Regarding the 1964 A-3D Sky Warrior crash:
The flight path was east to west. The plane hit a power line pole on the western side of the runway, the wing of the aircraft punched a hole in the Administration Building (Building 214), the engine came off of the aircraft and punched a hole into the Chapel (Building 359), and the rest of the debris landed near current Buildings 335, 337, and 339, where the old Commissary was. Fire spread from the initial location of impact (the power line) west to the swimming pool (Building 374).

A S-3 aircraft crashed just north of Taxiway G, but no fire resulted and no foam was used. I am unaware of the use of AFFF on any aircraft or structure fire.

Telephone Interview Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4311
Marine Corps Air Ground Combat Center Twentynine Palms California

Name: Rand Center **Position/Rank:** Planner

Contact Information (phone, e-mail): 760-339-2216

Interviewer: Charles Hackel **Date: June 11, 2018**

*Originally called for Dante Dinelli, Real Property Accountability Officer, at 760-339-2216 and was told Rand Center would be better to answer all questions.

Years at or familiar with Installation (# and dates):

Was Aqueous Film Forming Foam (AFFF) used/stored on-base outside of Fire Training Areas (FTAs)? If so, where?
Based on the 2014 Master Plan, storage of AFFF concentrate was located in Building 426. There was mention of future plans to consolidate most Hazardous Material Storage. When questioned about the current used of Building 426, Mr. Center indicated the building is currently vacant and is scheduled to be demolished. He was unsure of the current storage of AFFF concentrate.

Were there hangars or buildings on-base with fire suppression systems? If yes, was AFFF used in these systems?
N/A

Was there a fire station on-base? If yes, where was it located?
Still Buildings 137 and 142. There have been plans to build a new fire station but the funding has never been approved. Currently there is a campaign to get funding to update the current facilities instead of a new building.

If no, what local fire station was on call for emergencies?
N/A

Were there any planes crashes or fires on base? If so, was AFFF used to put out the fire and where were they located? Are there records available that we can have?
N/A

Was there a truck washing area for fire trucks or emergency vehicles on-base? If yes, where was it located?
Unsure, would have to talk to the fire station.

Was there an area used for annual calibration and testing of firefighting equipment that may have contained AFFF? If yes, where was it located?

Unsure of fire station practices.

Is there an additional contact that could provide information of AFFF (name and contact info)?

Contact the base fire station for all questions related to AFFF storage.

Contact base Environmental for questions related to Hazardous Material Storage.

Additional Comments:

In the 2014 Master Plan, the stormwater on base is described as flowing to low-lying areas. When asked about where the low-lying areas are, Mr. Center indicated that there is a stormwater drainage system on base. He said that there are concrete lined channels that flow to the New River, which eventually flow to the Sultan Sea. He also indicated that there is a stormwater drainage system on the airfield, but it is totally ineffective due to collapsed pipes and disrepair.

When asked about a potential building list to aid the investigation, Mr. Center indicated that the list that is available would be of no use due to how generic the building name is listed. He gave an example for building 426, which is listed as a warehouse. Mr. Center indicated that many of the support building on the building list were listed as either a warehouse or storage.

Was there a truck washing area for fire trucks or emergency vehicles on-base? If yes, where was it located?
NA

Was there an area used for annual calibration and testing of firefighting equipment that may have contained AFFF? If yes, where was it located?

NA

Is there an additional contact that could provide information of AFFF (name and contact info)?
NA

Additional Comments:

According to reviewed video and eyewitness accounts, only water was used to put out the resulting fires from the 1964 crash.

Appendix B:
Research Logs

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/11/2018 Researcher: Gabriela Staehle

Type of Research:

X	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Final Preliminary Assessment (PA) Site 17 Fire Fighting Training Area

Document Author: ERC Environmental and Energy Services Co.

Document Date: 2/23/1990

File Name: 1990 Final PA Site 17 ERCE

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: Site 17 was a Fire Fighting Training Area

"Site 17, the fire fighting pit, is rectangular in shape and measures 57 by 112 feet. The sides of the pit are created by earthen berms roughly I-foot tall. In addition, similar berms form a walkway to the center of the pit where lies a horizontal tank in simulation of an aircraft."

"the soils within the pit were darkly stained with what appeared to be petroleum hydrocarbons. A noticable odor of fuel hydrocarbons was also detected in the pit area. Cartridges from the facility's fuel farm were observed scattered randomly within the pit."

"Site 17, the fire fighting area, is first evident on a 1980 aerial photograph. The fire fighting pit was built in 1980 and has been used for training sessions approximately once every month since inception."

"Approximately 25 gallons of Aqueous Film Forming Foam (AFFF) is used per session to extinguish the fires." Hydraulic fliud and etc. burned in pit.

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/9/2018 Researcher: Gabriela Staehle

Type of Research:

X	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Installation Restoration Program Naval Air Facility, El Centro, California

Document Author: Naval Air Facility

Document Date: 7/1990

File Name: 1990 History on the Installation Restoration Program

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: 1990 summaries for IRP Sites 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 14, 15, 16, 17. All are of concern, except IRP Sites 7, 9, 14, 15, and 16.

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/8/2018 Researcher: Gabbi Staehle

Type of Research:

X	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Naval Air Facility, El Cento, Imperial County, California, Site Assessment Report

Document Author: Jacob's Engineering Group

Document Date: 7/26/1991

File Name: 1991 Site Assessment Study Jacob

Was a copy of the report obtained?

X	Yes
	No (provide reason)

Notes: Fuel Farm (includes IRP Sites 14 and 15)

"Between the years 1960 to 1985, the southwestern portion of the fuel farm was used as a runoff area for rinse water associated with cleaning the eight fuel farm storage tanks. The tanks were reportedly cleaned by filling the tanks with water and subsequently draining the tank dnseates onto the surface soils of the tank farm. The rinsate was then allowed to evaporate. Potential contaminants in this area are reported to include JP-4, JP-5, leaded AVGAS, Diesel Fuel #2 (DF-2) and MOGAS (leaded and unleaded)."

Potential AOC: Was there a fire suppression system? Water? AFFF? Flooding?

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/8/2018 Researcher: Gabriela Staehle

Type of Research:

x	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Federal Facility SI Review

Document Author: URS Consultants, Inc.

Document Date: 2/18/1993

File Name: 1991 Federal Facility Site Investigation URS

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: "Organochlorine pesticides and PCBs, organophosphorous pesticides, EDB, total phenols, cyanide, formaldehyde, and organic lead were not detected above the method detection limits in any of the soil samples taken at the Magazine Road Landfill" Rule out pesticides as a potential source of PFAS contamination. 1965-1983 –"During this time period, the burning of wastes (including hazardous wastes) was conducted approximately once a month. " Had fire suppression system?

"Soil samples were also analyzed for VOCs, PCBs and organochlorine pesticides, total cyanide, total phenols, EbB, and organic lead. None of these compounds were detected at or above the method detection limits" IRP Site 4

Some pesticides detected at IRP Site 8, Scrapyard. Also at IRP Site 8: "Old refrigerators, water coolers, empty drums, tanks, paint cans, film and film canisters, sandblasting equipment, spent electrical transformers, and other metallic materials. In 1983, five empty transformers were removed from the site. According to NEESA, fluid from these transformers probably leaked onto the ground within the site. This fluid may have contained PCBs. NEESA also reported that scrapyard workers observed stained soil on several occasions"

IRP Site 16 – no pesticides or other potential PFAS sources

IRP Site 10 – "These sources included the photographic shop, aircraft hangers and aprons, and the plating shop. Potential contaminants from these sources include JP-4 and JP-5 jet fuels, leaded and unleaded gasoline, hydraulic fluid, motor oil, ethylene glycol, trichloroethene (TCE), PCE, 1,1,2-trichloro-l,2,2-trifluorethane (Freon 113), plating wastes, and photographic solutions."

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/14/18 Researcher: Matthew Kiehler

Type of Research:

x	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Naval Air Facility, El Centro Installation Restoration Program

Document Author: Naval Air Facility

Document Date: 1995

File Name: 1995 Brocure on the Installation Restoration Program

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: Identifies Installation Restoration Sites and Potential Contaminants:

(1) Magazine Road Landfill – Asbestos, fuel, paint, solvents, photochemicals, acid

(2) Patrol Road Landfill – Asbestos, fuel, paint, solvents, photochemicals, acid

(3) Sludge Burial Area – Silver, cyanide

(4) 4th Street Fire Fighting Training Area – Burned leaded fuel, hydraulic fluid, confiscated drugs

(5) Fire Fighting Training Area Hangar #3 – Burned leaded fuel

(6) Northwest Fire Fighting Training Area – Burned leaded fuel

(7) Abandoned Fuel Farm – Leaded and diesel fuel

(8) Scrapyard – Empty drums, tanks, paint cans, transformers w/ PCB

(9) Transformer Storage Area – Transformers containing PCB

(10) Sewage Stabilization Ponds – Sewage, leaded fuel, motor fluids, photo solutions

(11) Runway Burn Area – Burned paper

(12) Open Burn Area – Burned confiscated drugs, ceramic, tin cans, wood

(13) Old Incinerator – Burned paper

(14) Fuel Farm Tank Rinseate Disposal – Leaded and diesel fuel

(15) Fuel Farm Filter Cleaning Area – Leaded and diesel fuel

(16) Potassium Ferricyanide Spill Area – Potassium ferricyanide

(17) Fire Fighting Training Area – Burned leaded and diesel fuel

Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/14/18 Researcher: Matthew Kiehler

Type of Research:

x	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Naval Air Facility El Centro, El Centro, California

Document Author: NAF El Centro

Document Date: 1998

File Name: 1998 Facility and site descriptions with maps

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: Provides overview of IRP Sites at NAF El Centro including Map, Site Description, and Relative Risk.

Information incorporated in Table 1.

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/8/18 Researcher: Matthew Kiehler

Type of Research:

x	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: CERT Report of Completion

Document Author:

Document Date: 12/18/01

File Name: 2001_12_18_CERT Report of Completion

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: "SITE 17 is a fire-fighting training area and measures approximately 57 by 112 feet and approximately 5 feet deep. Contamination at the site is the result of burning fuel/water mixtures during fire-fighting training activities. Dioxins, furans, Arocolor 1260 and phenanthrene were reported at concentrations above residential preliminary remediation goals (PRGs)."

"During the RA at Site 17, approximately 3,000 yd^3 (2042 yd^3 of dioxin-impacted soil and 935 yd^3 of TPH-impacted soil) were excavated and disposed off-site. Of the 22 confirmation samples collected at Site 17, none showed chemical concentrations exceeding the residential PRGs. A groundwater (GW) investigation was conducted to assess whether contaminates in soil had migrated to GW. The GW sampling results were below the maximum contaminant levels and GW has not been adversely impacted by the RA activities. Site 17 was backfilled with clean imported soil."

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/16/2018 Researcher: Gabriela Staehle

Type of Research:

X	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Final Tech Memorandum Extended Site Investigation IR Site 10, Ponds NOS. 2 and 3

Document Author: BECHTEL Environmental, Inc.

Document Date: 3/31/2004

File Name: 2004 Final TM for EST at Ponds 2 and 3 Site 10

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: Includes IRP Site 10

"The Navy has indicated that future land use of Site 10 will probably remain industrial and is considering using Pond Nos. 2 and 3 for temporary wastewater storage or sludge drying."

"Site 10 consists of three unlined ponds with bermed sides (Figure 2-1). The total area of Site 10 is approximately 6 acres. The largest pond (No.1) is about 550 by 250 feet at the pond bottom and about 10 feet deep. The two smaller ponds (Nos. 2 and 3) are about 250 by 125 feet at the pond bottoms and about 10 feet deep. The pond floors are approximately 2 feet below the adjacent grade, and the berms surrounding the ponds are approximately 6 to 8 feet above the adjacent grade.

The stabilization ponds functioned as the only sewage treatment for the base from the 1940s until 1976. Domestic and industrial sewage flowed into Pond No.1, where most solids settled out. When Pond No.1 was full, effluent flowed into Ponds Nos. 2 and 3, then to the New River. The accumulated sludge has not been removed from these ponds. Currently, all the ponds are dry and partially covered with local vegetation."

Contains a Figure with pond drainage out to New River – Figure 2-1 (pg. 16)
pesticide contamination:

"Two pesticides/PCBs, Aroclor 1254 and dieldrin, were reported above residential PRGs. An elevated concentration of Aroclor 1254 was reported in ECIO-31, and elevated concentrations of dieldrin were reported in samples ECI0-S30 and ECIO-S31."

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/16/2018 Researcher: Gabriela Staehle

Type of Research:

X	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Final Remedial Investigation Report For IR Site 2, Patrol Road Landfill

Document Author: Bechtel Environmental, Inc.

Document Date: 4/2004

File Name: 2004 Final RI for Patrol Road Landfill

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: Includes IRP Site 2

"Site 2, located in the northwest comer of NAP EI Centro, contains an inactive municipal landfill, piles of surface debris, and three former borrow pits filled with construction debris. Unit 1 was originally a borrow area for fill material used during construction to extend the main east-west runway and to relocate Patrol Road and the adjacent Elder Canal in 1953. The three borrow pits subsequently filled with water and existed as ponds from about 1955 to 1962. In 1962, the ponds were drained and filled with construction debris (mainly concrete). Unit 2 includes a ravine that served as a municipal landfill from about 1946 until 1965 when landfill operations were transferred to Site 1. A variety of wastes including household rubbish, various fuels and oils, solvents, batteries, paints, pesticides, and construction and demolition debris were disposed in this part of the site during that period. The landfill waste was apparently burned for volume reduction. Piles of surface debris consisting of concrete, metal, and pipe surround the formerlandfill; this debris includes asbestos-containing materials."

Figure 1-1 includes drainage channel (Pg 27)

"In accordance with provisions ofthe final Work Plan (BEI 2002), samples were collected from each wellpoint using a peristaltic pump fitted with single-use **Teflon®** tubing. Twelve regular and field duplicate groundwater samples were collected from the 10 temporary wellpoints.

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Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro, California

Date: 5/16/2018 Researcher: Gabriela Staehle

Type of Research:

X	Administrative Record/NIRIS
	Online Research
	Miscellaneous Document Review

Document Name: Final Updated Tank Management Plan

Document Author: BECHTEL Environmental, Inc.

Document Date: 2/2006

File Name: 2006 Final Updated Tank Management Plan UST 110.114.116.116A

Was a copy of the report obtained?

x	Yes
	No (provide reason)

Notes: A total of 202 known or suspected UST sites have been identified that are on property currently or previously controlled by NAF El Centro. None of the USTs are currently active.

What sort of fire suppression system was used near tanks?

"The Spill Prevention Control and Countermeasure Plan for NAF El Centro (SWDIV 1999) states specific measures to prevent future releases of petroleum to the environment."

Figure 2-2 Irrigation Canal – Pg. 45

Contains many building uses. – Pg. 73

List of ASTs, use of AFFF not mentioned in recommendations from Spill Prevention Control and Counter Measure Plan.

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Appendix C:
Relevant Documents, Articles, and Correspondence

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SEPTEMBER 1987

N60042.000047
NAF EL CENTRO
SSIC #5090.3

PRELIMINARY ASSESSMENT/ SITE INSPECTION OF NAVAL AIR FACILITY EL CENTRO, CALIFORNIA

NEESA 13-106

NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY
Port Hueneme, California 93043

RELEASE OF THIS DOCUMENT REQUIRES PRIOR NOTIFICATION OF THE CHIEF OFFICIAL OF THE STUDIED ACTIVITY.

PRELIMINARY ASSESSMENT/SITE INSPECTION

OF

NAVAL AIR FACILITY, EL CENTRO, CALIFORNIA

UIC: N60042

Prepared by:

PRELIMINARY ASSESSMENT/SITE INSPECTION TEAM MEMBERS

JEFFREY L. HENDRIX, PROJECT MANAGER
ENVIRONMENTAL ENGINEER

RONALD E. TICKLE, BIOLOGIST/ENVIRONMENTAL ENGINEER

STEPHEN E. EIKENBERRY, HYDROGEOLOGIST

VERN NOVSTRUP, CIVIL ENGINEER

ENVIRONMENTAL PROTECTION DEPARTMENT
NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY
CODE 112E
PORT HUENEME, CALIFORNIA 93043

SEPTEMBER 1987

EXECUTIVE SUMMARY

This report presents the results of the Preliminary Assessment/Site Inspection (PA/SI) conducted at the Naval Air Facility (NAF) El Centro, California. The purpose of the PA/SI is to identify and assess sites posing a potential threat to human health or to the environment due to contamination from past handling of hazardous materials.

Based on information from historical records, aerial photographs, on-site surveys, and personnel interviews; sixteen potentially contaminated sites were identified. Each site was evaluated for contamination characteristics, migration pathways, and biological receptors.

NAF El Centro is located on a Class III, unconfined aquifer that generally flows northwest towards the New River. Surface drainage is controlled by a series of man-made drainage ditches all leading to the New River. The New River is considered of poor quality due to contamination from various agricultural and industrial sources.

The PA/SI for NAF El Centro concludes that fourteen of the sixteen sites warrant further investigation under the Navy Installation Restoration (IR) Program to assess potential long-term impacts. Further work involving sampling and analyses is recommended to confirm the extent of any problems that may exist.

The fourteen sites recommended for further work are:

Site 1 - Magazine Road Landfill
Site 2 - Patrol Road Landfill
Site 3 - Sludge Burial Area
Site 4 - 4th Street Fire Fighting Training Area
Site 5 - Fire Fighting Training Area East of Hangar #3
Site 6 - Northwest Fire Fighting Training Area
Site 7 - Abandoned Fuel Farm
Site 8 - Scrapyard
Site 9 - Transformer Storage Area
Site 10 - Sewage Stabilization Ponds
Site 11 - Runway Burn Area
Site 14 - Fuel Farm Tank Rinseate Disposal Area
Site 15 - Fuel Farm Filter Cleaning Area
Site 16 - Potassium Ferricyanide Spill Area

Further work at these sites will determine whether a threat to human health or to the environment exists, the extent of contamination, and the potential for contaminant migration. The necessity for remedial actions, or cleanups, will then be determined by evaluating these results. If a site poses no threat to human health or to the environment, no further action will be recommended.

ACKNOWLEDGEMENT

The Preliminary Assessment/Site Inspection team wishes to thank the many people at NAF EL Centro, California whose cooperation made successful completion of this report possible. We are grateful for and acknowledge the efforts and assistance of Western Division, Naval Facilities Engineering Command Branch Office (WESTNAVFACCOMBRO), San Diego. In particular the team acknowledges the outstanding efforts provided by the following people:

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- Roger G. Hillhouse, Public Works Engineering, NAF El Centro
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- Jacqueline R. Francis, Site Contamination Division, NEESA
- Debra A. Kiner, Site Contamination Division, NEESA
- Yvonne M. LeRoy, Environmental Office, NEESA

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CHAPTER 1. INTRODUCTION

1.1 PROGRAM BACKGROUND. Past hazardous waste disposal methods, though acceptable at the time, have often caused unexpected long-term problems by releasing hazardous pollutants into the soil and ground water. In response to a growing recognition to these problems, the U. S. Congress directed the U. S. Environmental Protection Agency (EPA) to develop a program, commonly referred to as "Superfund" to manage and control past disposal sites. This program is outlined in the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) of 1980 and Superfund Amendments and Reauthorization Act (SARA) of 1986.

1.1.1 DOD Program. Department of Defense (DOD) efforts in this area preceded the nationwide CERCLA program. In 1975, the U. S. Army developed a pilot program for DOD to investigate past disposal sites at military installations. In 1980, DOD named this program the Installation Restoration (IR) Program and instructed the services to comply with program guidelines.

1.1.2 Navy Program. The Navy IR Program identifies and investigates potentially hazardous disposal sites and contaminated areas caused by past hazardous substance storage, handling, or disposal practices at naval activities. These sites are then individually evaluated with respect to their threat to human health or to the environment. A Remedial Investigation verifies the presence of contamination and if necessary, characterizes the extent of contamination present at sites of concern and develops additional information regarding their migration pathways. A Feasibility Study evaluates alternative remedial actions for site clean up. A Remedial Action provides the required corrective measures to mitigate or eliminate confirmed problems.

1.2 AUTHORITY. The Chief of Naval Operations (CNO) initiated the Navy IR Program in OPNAVNOTE 6240 of 11 September 1980. This was superceded by OPNAVINST 5090.1 of 26 May 1983. The Naval Facilities Engineering Command (NAVFACENGCOM), manages the program within the existing structure of the Naval Environmental Protection Support Service (NEPSS), which is adminstered by the Naval Energy and Environmental Support Activity (NEESA). Western Division, Naval Facilities Engineering Command requested NEESA to perform a Preliminary Assessment/Site Inspection (PA/SI) at the Naval Air Facility El Centro, California in CO WESTNAVFACENGCOM San Diego letter Ser 1141I/244 of 19 August 1986.

1.3 SCOPE.

1.3.1 Past Operations. The Navy IR Program focuses on past hazardous substance storage, use and disposal practices on Navy property. Current operations are regularly surveyed for conformity to state and federal regulations and therefore are not included in the scope of the Navy IR Program. The PA/SI addresses non-hazardous disposal and storage areas only if they were hazardous waste disposal or storage areas in the past. Current operations are investigated solely to infer types and quantities of chemicals used and the disposal methods practiced in the past.

1.3.2 Results. If necessary, a PA/SI recommends a Remedial Investigation/ Feasibility Study (RI/FS) be administered by the Naval Facilities Engineering Command Engineering Field Division (EFD) under the Navy IR Program. All recommendations made under the Navy IR Program are consistent with the National Contigency Plan (NCP). Based on these recommendations, NAVFACENGCOM schedules an RI/FS for those sites determined by scientific and engineering judgment to be potential hazards to human health or the environment.

1.4 PRELIMINARY ASSESSMENT/SITE INSPECTION.

1.4.1 Records Search. The PA/SI begins with investigation of activity records followed by a records search at various government agencies including EFDs and the U. S. Geological Survey Offices. In this initial step, PA/SI team members review records to assimilate information about the activities past missions, industrial processes, waste disposal records, and known environmental contamination. Typical examples of records include activity master plans and histories, environmental impact statements, cadastral records and aerial photographs. Appendix A list agencies contacted during this study.

1.4.2 On-Site Survey. After the records search, the study team conducts an on-site survey to complete documentation of past operations and disposal practices for the sites identified as potentially contaminated. With the assistance of the activity point-of-contact, the team inspects the identified sites and surrounding areas, and interviews long-term employees and retirees. The on-site survey for NAF El Centro was conducted from 12 through 14 January 1987; information in this report is current as of those dates.

1.4.3 Remedial Investigation/Feasibility Study Criteria. An RI/FS is recommended for sites at which (1) sufficient evidence exists to indicate the presence of contamination, and (2) the contamination poses a potential threat to human health or the environment.

1.5 REMEDIAL INVESTIGATION/FEASIBILITY STUDY. Short-term analytical testing and monitoring is performed to determine whether specific toxic and hazardous materials, identified in the PA/SI, are present in concentrations considered to be hazardous. If required, longer-term analytical testing and monitoring, provides more detailed information concerning the horizontal and vertical extent of contaminant migration as well as hydrogeology. The design of the long-term analytical testing and monitoring depends on the results from the short-term analytical testing and monitoring. If sites require remedial actions or additional monitoring programs, a Feasibility Study recommends a specific remedial action or monitoring program and includes the necessary planning information for the work, such as design parameters and specifications.

1.6 PA/SI REPORT CONTENT. The significant findings and conclusions from the PA/SI are presented in Chapter 2. In addition, RI/FS recommendations as well as waste generation and disposal history, specific migration pathways and receptors, and site locations are included in Chapter 2. Chapter 3 presents general activity information including the base history and past missions.

Chapter 4 details the migration potential and biological receptors characterizing the area.

Appendix A identifies government agencies contacted during the records search; Appendix B describes the methods used to calculate contaminant quantities; Appendix C details testing parameters and corresponding EPA methods; Appendix D provides a list of acronyms and abbreviations used in this report; Appendix E contains PA/SI forms (EPA Form 2070-12 and EPA Form 2070-13) for each site identified; and Appendix F contains an additional boring log from the NAF fuel farm.

CHAPTER 2. SIGNIFICANT FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

2.1 INTRODUCTION. This chapter summarizes the PA/SI team's significant findings, conclusions and recommendations on potential contaminant migration pathways, the potential contaminant receptors, and characteristics of the past disposal and spill sites identified at NAF El Centro. Sixteen sites were identified during the PA/SI. A map of NAF El Centro showing the site locations is included as Figure 2-1. Fourteen of the sites are recommended for further work under the Navy IR Program.

2.2 POTENTIAL FOR CONTAMINANT MIGRATION. Contaminants at NAF El Centro may potentially migrate by the following pathways:

1) Surface water

2) Ground water

3) Wind

2.2.1 Surface Water. Surface water drainage in the vicinity of NAF El Centro is generally controlled by artificial drains such as the Rice and Elder Canals, which flow into the New River. All drains receive runoff from the irrigation of outleased land within the base boundaries, flow from shallow aquifers, and runoff from storm drainage channels. All surface drains in this area flow into the New River which eventually discharges into the Salton Sea.

2.2.2 Ground Water. Ground-water flow in unconfined aquifers is generally to the northwest, although irrigation runoff, surface drains and evapotranspiration may locally change flow patterns. Ground water is expected to travel no more than 100 feet per year in identified silty sand aquifers. This velocity may be lower in soils such as clays and silts and much higher in clean sands and gravels.

Ground-water sources in the area of NAF El Centro are presently classified as Class III (WESTNAVFACENGCOM, 1982a), which are not considered useable as domestic or irrigation water sources, due to high dissolved solids content.

2.2.3 Wind. Because of the arid climate at NAF El Centro, the potential exists for migration of contaminated dust. Sites with little or no ground cover and surface contaminants, such as asbestos, are potential sources of windblown contaminant migration.

2.2.4 Other Factors. Other factors affecting contaminant migration potential and environmental impact of contaminants include soil attenuation, degradation, diffusion, and chemical reaction. All of these factors can alter the concentrations of contaminants.

(b) (3) (A)

2.3 POTENTIAL CONTAMINANT RECEPTORS.

2.3.1 Surface Water Receptors. Surface water contaminants would discharge into the unlined drainage ditches found throughout NAF El Centro or the natural wash found at the northwest corner of the station. Both the ditches and the wash lead off-base and eventually to the New River. Potential receptors include the flora and fauna present throughout the New River floodplain and along the drainage ditches. Receptors include small animals, birds, and vegetation coexisting in these areas. During hunting seasons, small animals from this area are caught and consumed by humans.

2.3.2 Ground-Water Receptors. Potential receptors of ground-water contaminants include users of agricultural products grown in the vicinity of NAF El Centro as well as aquatic riverine habitats found in the New River. No wells are present in the Imperial Valley because the ground water is unsuitable for agricultural, industrial, and domestic use.

2.3.3 Wind Receptors. The potential exists for the physical contact of windblown contaminants with humans in areas containing surface contaminants and little or no ground cover.

2.3.4 Protected Species. Currently no rare, threatened, or endangered species exists in the vicinity of NAF El Centro.

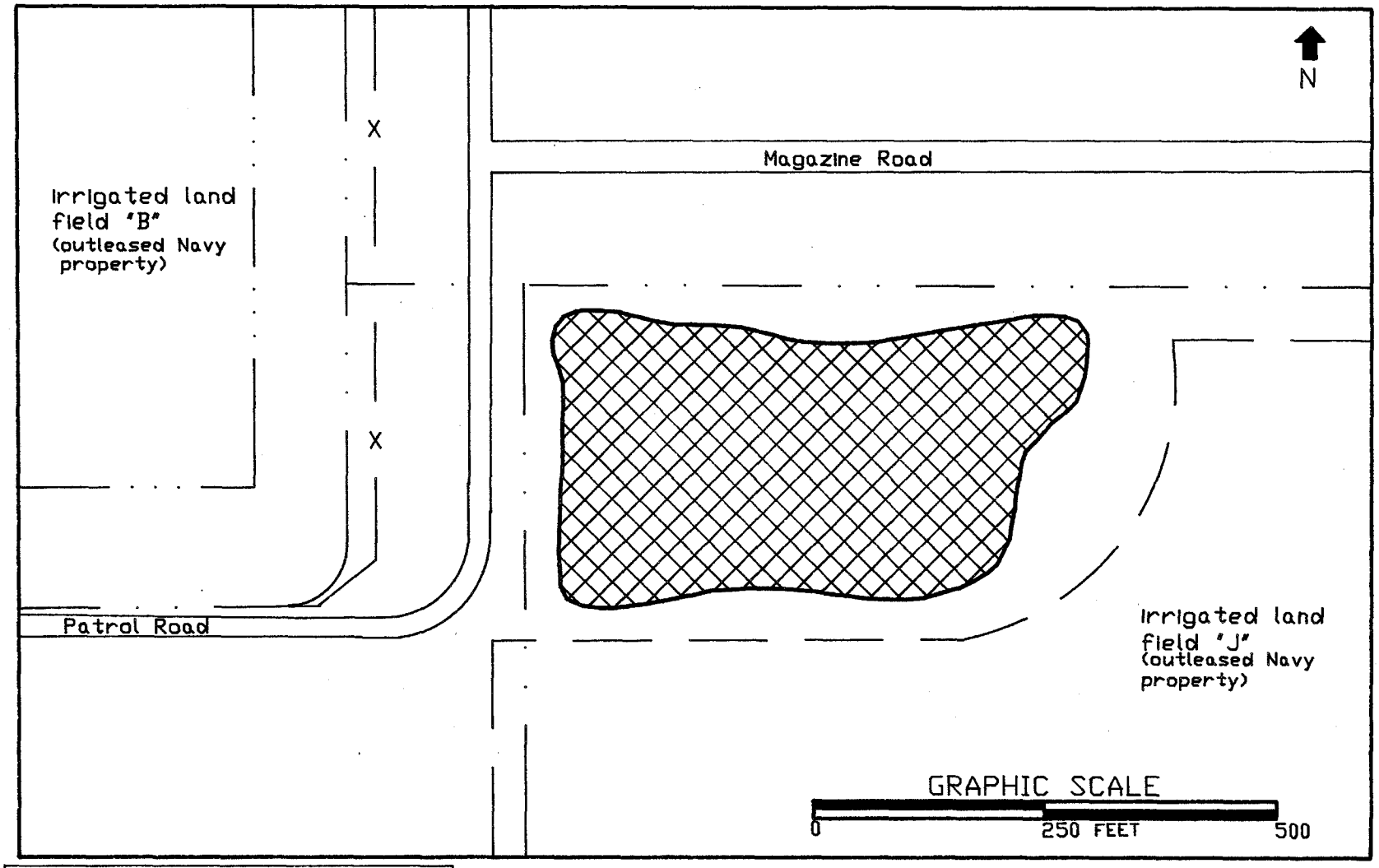
2.4 SITE SPECIFIC FINDINGS, CONCLUSIONS AND RECOMMENDATIONS.

2.4.1 Site 1 - Magazine Road Landfill.

2.4.1.1 Findings. Site 1, located at the intersection of Magazine and Patrol Roads in the northwest corner of the base, is the lowest elevation point on the base. Starting in 1964, this area was used as a borrow pit. In 1965, the 10 to 12 foot pit was designated for the disposal of burnable waste only. With the closure of the Patrol Road Landfill (Site 2) in 1965 however, all waste whether burnable or non-burnable was disposed of here. Burning was performed about once every month throughout the operation of the site. The site boundary extends along Magazine Road for about 600 feet and along Patrol Road for about 300 feet. The total landfill area is about four acres. This site was in operation from 1965 through 1983 when the base began using the Imperial County landfill. This area was the only base landfill for the period 1965 through 1983. Site 1 is shown in Figure 2-2.

Because of its low-lying area, surface runoff from the airfield drains to Site 1. Reportedly, strong odors emanate from this area during periods of heavy rain. Unlined drainage ditches run along the entire length of the northern and western borders of Site 1. These drainage ditches lead off-base and eventually into the New River.

Wastes disposed of in this landfill include: household rubbish, plating waste (which includes cadmium and arsenic), asbestos, water-bearing fuel, paint, solvents, spent 40mm cartridges, photographic chemicals, film, sandblast grit, demolition debris, parachutes, used hydraulic fluid, motor oil, paint thinners, pesticide containers, and batteries. Table 2-1 details the wastes potentially disposed of in this area.



(Base From: WESTNAVFACENGCOM, 1981)

-----EXPLANATION-----

- drainage ditch
- irrigation canal
- X fence
- dirt road
- site boundary

FIGURE 2-2

Site 1 - Magazine Road Landfill

PRELIMINARY ASSESSMENT/
SITE INSPECTION
NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

TABLE 2-1 Potential Contaminants Disposed of at Site 1, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY[a]	YEARS OF DISPOSAL
Household Rubbish[b]	1,000,000 cubic feet	1965 - 1983
Plating Waste (sludges and liquid containing cadmium and arsenic from case hardening)	30,000 cubic feet	1971 - 1979
Asbestos	5,000 cubic feet	1965 - 1980
Water-bearing Fuel:		
AVGAS (leaded)	8,000 gallons	1965 - 1983
JP-4 (jet fuel)	20,000 gallons	1965 - 1983
JP-5 (jet fuel)	4,000,000 gallons	1965 - 1983
Diesel Fuel (DF-2)	10,000 gallons	1965 - 1983
MOGAS Regular (leaded)	10,000 gallons	1965 - 1983
MOGAS Unleaded	10,000 gallons	1972 - 1983
Hydraulic Fluid (containing chromium, nickel, zinc)	20,000 gallons	1965 - 1983
Paint (containing chromium, lead, zinc)	5,000 gallons	1965 - 1983
Solvents:		
Tetrachloroethylene PD-680 Freon-113 Trichloroethylene	8,000 gallons	1965 - 1983
Methyl Ethyl Ketone	5,000 gallons	1965 - 1983
Spent 40mm Cartridges[c]	unknown	1965 - 1982
Photographic Chemicals[d] (cyanide/silver)	unknown	1965 - 1983
Sandblast Grit (containing chromium, lead, zinc)	90,000 pounds	1965 - 1983
Batteries	2,000 batteries	1965 - 1983
Pesticides (chlorinated rinse water/residual)	1,000 gallons	1965 - 1983
Motor Oil	10,000 gallons	1965 - 1983

[a]This landfill was burned monthly from 1965 through 1983, quantities shown are total disposed of before burning. Additional combustible liquids were used as necessary to aid in burning.

[b]includes parachutes, film, and demolition debris

[c]undetermined amount collected from Automatic Skeet Trap Range

[d]disposed of as empty containers and occasionally as expired liquids

During the on-site survey of January 1987, empty paint cans, film (developed), empty drums, scrap metal, sandblast grit, parachutes, batteries, and possibly asbestos were observed partially covered on the landfill surface.

2.4.1.2 Conclusions. Because Site 1 is located at the lowest elevation point on the base, the potential for contaminants to migrate through the ground water to cultivated fields or off base through surface runoff to the irrigation ditches is high. Surface asbestos contamination may potentially migrate by wind. We therefore recommend Site 1 for futher work under the Navy IR Program.

2.4.1.3 Recommendations. The following first-year sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 1. Figure 2-3 shows the recommended sampling locations.

Monitoring Wells:	4
Types of Samples:	Ground-water, Surface-fiber, Sediment, Soil, Background Soil
Number of Samples:	Ground water - 8 samples Surface-fiber - 1 sample 3 Sediment - 3 samples Soil - 24 samples Background Soil - 2 samples
Sampling Frequency:	Ground water - twice Surface-fiber, Sediment, Soil, and Background Soil - once
Testing Parameters[1]:	Ground water, Sediment, Soil, Background soil: purgeable organic carbon compounds, acid extractable organic compounds, pesticides/poly-chlorinated biphenyls (PCBs), cadmium, chromium, lead, mercury, nickel, silver, zinc, total petroleum hydrocarbons, and xylene Surface-fiber: asbestos Ground water: pH, water level, specific conductance
Remarks:	Wells should be drilled to a maximum depth of 25 feet and screened at least one foot above the highest depth of the ground-water table to the bottom of the well. Ground-water samples should be collected once during the summer and once during the winter. Sediment samples should be taken at a zero to six inch depth; one sample from each location for a total of three samples.

[1]testing parameters are detailed in Appendix C

(b) (3) (A)

[redacted]

Three soil samples should be taken from each soil boring and monitoring-well boring. These borings should be sampled at depths of visible contamination or at one, five, and 10 foot depths. The last sample should be taken above the water table if the ground-water level is less than 10 feet deep.

One surface-fiber sample should be taken from the landfill in a location where potential asbestos contamination is visible.

Two background soil samples should be taken (recommended locations are shown in Figure 2-1) and analyzed for EPA priority pollutants. The two background samples should be used as background for all soil sampling programs at NAF El Centro.

2.4.2 Site 2 - Patrol Road Landfill.

2.4.2.1 Findings. Site 2 is located at the northwest boundary of NAF El Centro along Patrol Road to the southwest of Building 495. The site boundary extends about 2,000 feet along Patrol Road and is about 750 feet wide as shown in Figure 2-4. The total landfill area is about 30 acres. A portion of this area, as shown in Figure 2-4, was a 15 to 20 foot deep natural wash. The wash was used as the base landfill. The rest of the area was used for the disposal of concrete, metal grating, asphalt runway expansion joints, and wood from runway refinishing and construction. This debris was piled on top of the ground surface. Site 2 was in operation from about 1946 until 1965 when landfill operations were switched to Site 1.

Site 2 is adjacent to irrigated land (outleased Navy property within NAF El Centro boundaries). Unlined drainage ditches run along the northern and southern boundaries with a connecting drainage ditch cutting through Site 2. These ditches run along the boundary of NAF El Centro until they merge with the Elder Canal (a lined irrigation canal) and drain off base to the New River.

Wastes disposed of in this landfill include: household rubbish, paint, solvents, photographic chemicals, asbestos, water-bearing fuel, mercury amalgam, batteries, empty drums, parachutes, spray cans, oil filters, sandblast grit, used hydraulic fluid, film, demolition debris, pesticide shop waste, spray paint filters, tires, asphalt, runway expansion joints, wood and battery acid. Table 2-2 lists the wastes potentially disposed of in this area.

During the on-site survey of January 1987, empty paint cans, concrete, asphalt, empty drums, developed film, parachutes, used rags, wood, scrap metal, and possibly asbestos were observed partially covered on the landfill surface.

2.4.2.2 Conclusions. Because of the large amounts of contaminants potentially disposed of in this landfill and the likelihood of off base contaminant migration by ground water, surface water, and wind, we recommend Site 2 for further work under the Navy IR Program.

(b) (3) (A)

TABLE 2-2 Potential Contaminants Disposed of at Site 2, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Household Rubbish	3,000,000 cubic feet	1946 - 1965
Paint (containing chromium, lead, zinc)	5,000 gallons	1946 - 1965
Solvents:		
Carbon Tetrachloride Tetrachloroethylene Freon - 113 Trichloroethylene	8,000 gallons	1946 - 1965
Methyl Ethyl Ketone	5,000 gallons	1946 - 1965
Photographic Chemicals[a] (containing silver and cyanide)	unknown	1946 - 1965
Asbestos	50,000 cubic feet	1946 - 1965
Water-bearing Fuel:		
AVGAS (leaded)	1,000,000 gallons	1946 - 1965
Jet Fuel (JP-4, JP-5)	3,000,000 gallons	1946 - 1965
Diesel Fuel (DF-2)	10,000 gallons	1946 - 1965
Regular MOGAS (leaded)	20,000 gallons	1946 - 1965
Hydraulic Fluid (containing chromium, lead, zinc)	20,000 gallons	1946 - 1965
Mercury Amalgam	80 pounds	1946 - 1965
Batteries	2,000 batteries	1946 - 1965
Sandblast Grit (containing chromium lead, zinc)	100,000 pounds	1946 - 1965
Pesticides (chlorinated)	1,000 gallons	1946 - 1965
Acid (battery acid containing lead)	2,000 gallons	1946 - 1965
Motor Oil	10,000 gallons	1946 - 1965
Demolition Debris[b]	unknown	1946 - 1979

[a]disposed of as empty containers and occasionally as expired liquids
[b]includes wood, expansion joints, asphalt, concrete, and metal grating piled on top of the soil covering the entire site boundary

2.4.2.3 Recommendations. The following first-year sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 2. Figure 2-5 shows the recommended sampling locations.

Monitoring Wells:	4
Types of Samples:	Ground-water, Surface water, Sediment, Soil, Surface-fiber
Number of Samples:	Ground water - 8 samples Surface water - 3 samples Sediment - 3 samples Soil - 30 samples Surface-fiber - 1 sample
Sampling Frequency:	Ground water - twice Surface water, Sediment, Soil, Surface-fiber - once
Testing Parameters:	Ground water, Surface water, Sediment, Soil: purgeable organic carbon compounds, acid extractable organic compounds, pesticides/PCBs, cadmium, chromium, lead, mercury, nickel, silver, zinc, total petroleum hydrocarbons, xylene Surface-fiber: asbestos Ground water: pH, specific conductance, water level
Remarks:	Wells should be drilled to a maximum depth of 25 feet and screened from at least one foot above the maximum height of the water table to the bottom of the well. Ground-water samples should be collected once in the summer and once in the winter. Surface water samples should be taken after a storm event, if possible. Sediment samples should be taken at a zero to six inch depth. One sample from each location, for a total of three samples. Three soil samples should be taken from each soil boring and monitoring-well boring. These borings should be sampled at depths of visible contamination or at one, five, and 10 foot depths. The last sample should be taken above the water table if the ground-water level is less than 10 feet deep. One surface-fiber sample should be taken from the landfill in a location where potential asbestos contamination is visible.

(b) (3) (A)

2.4.3 Site 3 - Sludge Burial Area.

2.4.3.1 Findings. Site 3 is located at the northwest corner of NAF El Centro, about 500 feet to the east of the Sewage Stabilization Ponds, (Site 10), just north of Patrol Road as shown in Figure 2-6. This area was used to bury the sewage sludge from one drying bed in the Sewage Treatment Plant (STP) in 1986.

A pit about 20 feet by 10 feet by five feet deep was excavated for the burial of the sludge. This area has been recently graded. The exact location of the pit could not be determined during the on-site survey. Grab samples of discharge water from previous years show elevated levels of silver and cyanide; up to 500 parts per billion (ppb) total cyanide and 800 ppb silver can be concentrated within the sludge (Fair,1966). Table 2-3 details the contaminants potentially disposed of at Site 3.

Table 2-3 Potential Contaminants Disposed of at Site 3, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEAR OF DISPOSAL
Sewage Sludge: (containing silver and cyanides)	800 cubic feet	1986

2.4.3.2 Conclusions. Because of the potential for silver and cyanide contamination, we recommend Site 3 for further work under the Navy IR Program.

2.4.3.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 3.

Types of samples: Soil

Number of samples: 4 samples

Sampling Frequency: once

Testing Parameters: Total cyanides, silver

Remarks: Figure 2-7 shows the recommended boring plan. Each boring should be drilled a maximum of seven feet. A sample should be taken at the visible sludge layer and one foot below the visible sludge layer. When no sludge layer is observed, no sample should be taken. Start with the first boring and continue with the boring plan until two sludge samples and two soil samples have been taken.

(b) (3) (A)

[redacted]

(b) (3) (A)

[redacted]

2.4.4 Site 4 - 4th Street Fire Fighting Training Area.

2.4.4.1 Findings. Site 4 is located just south of 4th Street about 200 feet northeast of the current fire fighting training area. Site 4 is an earthen bermed, unlined 15 foot diameter pit as seen in Figure 2-8. This area was used for fire fighting training during the years 1963 through 1975. No visible soil stains were observed in the area during the on-site survey of January 1987. Site 4 was used to burn confiscated drugs and drug paraphernalia after fire fighting exercises ceased operations in this area and prior to the operations at Site 12 (Section 2.4.12).

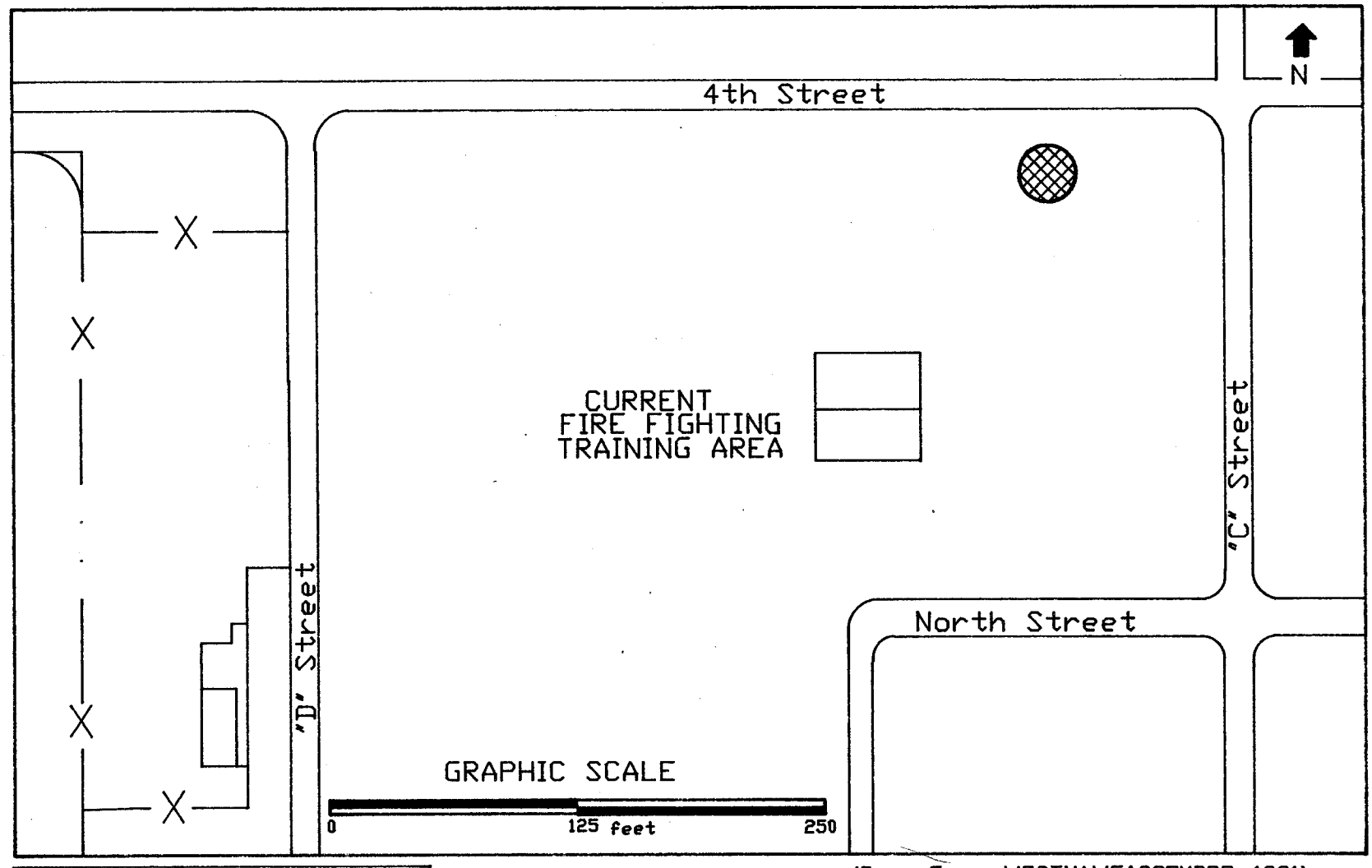
Fire fighting exercises were performed at this site every weekend for nine months of the year. July, August, and September are normally too hot for fire fighting exercises to be performed. The exercise consisted of pouring a layer of water-bearing fuel on top of a water layer and igniting it. The fire is then extinguished with water or Aqueous Film Forming Foam (AFFF). The fuel was always ignited over a layer of water at this pit.

Fuels used at this pit included: regular MOGAS (leaded), AVGAS (leaded), JP-4, JP-5, Diesel Fuel #2 (DF-2), and also used hydraulic fluid (containing chromium, nickel, and zinc). Table 2-4 lists the types and quantities of wastes used at Site 4.

TABLE 2-4 Potential Contaminants Used at Site 4, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Water-bearing Fuel:		
JP-5	200,000 gallons	1963 - 1975
JP-4	300 gallons	1963 - 1975
AVGAS (leaded)	500 gallons	1963 - 1975
MOGAS Regular (leaded)	1,000 gallons	1963 - 1975
Diesel Fuel #2 (DF-2)	700 gallons	1963 - 1975
Hydraulic Fluid (containing chromium, nickel, and zinc)	20 gallons	1963 - 1975

2.4.4.2 Conclusions. Because of the large quantity of fuels used in this area, Site 4 is recommended for further work under the Navy IR Program. The migration of contaminants to the Elder Canal is possible through ground-water migration. Soils are of low permeability, therefore, contaminants from Site 4 and the current fire fighting training area will be indistinguishable and should be investigated together.



(Base From: WESTNAVFACCOMBRD, 1981)

-----EXPLANATION-----

drainage ditch

fence

site boundary

FIGURE 2-8

Site 4 - 4th Street Fire Fighting Training Area

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NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

2.4.4.3 Recommendations. The following first-year sampling program is recomme ded to verify the presence of contaminants potentially used at Site 4. Figure 2-9 shows the recommended sampling locations.

Monitoring Wells:	3
Types of samples:	Ground-water, Soil
Number of samples:	Ground water - 6 samples Soil - 9 samples
Sampling Frequency:	Ground water - twice Soil - once
Testing Parameters:	All samples: purgeable organic carbon compounds, chromium, lead, nickel, zinc, total petroleum hydrocarbons, xylene Ground water: pH, specific conductance, water level
Remarks:	Wells should be drilled to a maximum of 25 feet and screened from at least one foot above the highest depth of the ground-water table to the bottom of the well. Ground-water samples should be collected once during the summer and once during the winter. Four inch wells should be used if free product recovery is anticipated. Three soil samples should be taken from each monitoring well boring. These samples should be taken at depths of visible contamination or at one, four, and eight foot depths. The last sample should be taken above the water table if the ground-water level is less than eight feet deep.

2.4.5 Site 5 - Fire Fighting Training Area East of Hangar #3.

2.4.5.1 Findings. Site 5 is about 600 feet to the east of Hangar #3 between Taxiway "E" and the intersection of Runways 3 and 30. Site 5 is a 50 foot diameter, unlined circular area with an earthen berm. This area was used for fire fighting training exercises from before 1958 until 1963. Site 5 is shown in Figure 2-10.

Ten fire fighting training exercises were performed in this area every weekend. Water-bearing fuel was poured into the bermed area as it was generated. There was no water layer beneath the fuel layer. Soils in this area are slightly permeable thus most of the contaminated fuel poured into the pit did not seep into the ground before it evaporated or was ignited.

(b) (3) (A)

[redacted]

(b) (3) (A)

[redacted]

Fuels used at this fire fighting training area include JP-4 and AVGAS (leaded). Table 2-5 lists the types and quantities of fuels used at Site 5.

TABLE 2-5 Potential Contaminants Used at Site 5, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Water-bearing Fuel:		
JP-4	80,000 gallons	1958 - 1963
AVGAS (leaded)	80,000 gallons	1958 - 1963

2.4.5.2 Conclusions. Because of the large amounts of fuels used in this area and the potential for lead contamination, Site 5 is recommended for further work under the Navy IR Program.

2.4.5.3 Recommendations. The following first-year sampling program is recommended to verify the presence of contaminants potentially used at Site 5. Figure 2-11 shows the recommended sampling locations.

Monitoring Wells: 3

Types of samples: Ground-water, Soil

Number of samples: Ground water - 6 samples
Soil - 6 samples

Sampling Frequency: Ground water - twice
Soil - once

Testing Parameters: All samples: purgeable organic carbon compounds, chromium, lead, nickel, zinc, total petroleum hydrocarbons, xylene

Ground water: pH, specific conductance, water level

Remarks: Wells should be drilled to a maximum of 25 feet and screened from at least one foot above the highest depth of the ground-water table to the bottom of the well. Ground-water samples should be collected once during the summer and once during the winter. Four inch wells should be used if free product recovery is anticipated.

(b) (3) (A)

[redacted]

Soil borings should be drilled to a depth of 15 feet. Three soil samples should be taken from both soil borings. Samples should be taken at depths of visible contamination or at one, four, and eight foot depths. The last sample should be taken above the water table if the ground-water level is less than eight feet deep.

2.4.6 Site 6 - Northwest Fire Fighting Training Area.

2.4.6.1 Findings. The exact location of Site 6 is unknown. The approximate location is within irrigated land field "C" about 750 feet to the east of the sewage treatment plant. Site 6 is about the same size as Site 5. This area was used for fire fighting training exercises from about 1946 through 1958. During the on-site survey of January 1987, no evidence of this fire fighting training area was visible. Old General Development Maps (WESTNAVFACCOMBRO, 1961) and aerial photographs (1953) helped to approximate the location of Site 6. The approximate location of Site 6 is shown on Figure 2-12.

Because the amount of fire fighting training practices required has not changed from 1958 until the present, we assumed it was the same during the operation of Site 6, see Section 2.4.5.1 for a description of fire fighting training exercises.

The only fuel reportedly used at Site 6 was AVGAS (leaded). Table 2-6 lists quantities and years of disposal of AVGAS at Site 6.

TABLE 2-6 Potential Contaminants Used at Site 6, Naval Air Facility, El Centro, California 8015 mod.

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Water-bearing fuel: Kerosine AVGAS (leaded)	300,000 gallons	1946 - 1958

2.4.6.2 Conclusions. Because of the large amount of AVGAS used in this area, its length of operation, and the potential for lead contamination, Site 6 is recommended for further work under the Navy IR Program. Contaminant migration is possible through the ground water to the drainage ditches and eventually the New River.

2.4.6.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially used at Site 6. Figure 2-13 shows the recommended sampling locations.

(b) (3) (A)

[redacted]

(b) (3) (A)

[redacted]

Types of samples: Soil

Number of samples: 18 samples

Sampling Frequency: once

Testing Parameters: All samples: purgeable organic carbon compounds, total petroleum hydrocarbons, xylene, lead

Remarks: Three soil samples should be taken from each soil boring. Samples should be taken at depths of visible contamination or at one, four, and seven foot depths. The last sample should be taken above the water table if the ground water is less than seven feet deep.

2.4.7 Site 7 - Abandoned Fuel Farm.

2.4.7.1 Findings. Site 7 is located about 500 feet north of 4th Street in between Runway 26 and Taxiway "A". Building 459 is about 750 feet to the southwest of the abandoned fuel farm as shown in Figure 2-14. This fuel farm was used prior to the expansion of Runway 26. The fuel farm consisted of five 50,000 gallon underground concrete storage tanks and six 25,000 gallon underground concrete storage tanks. In 1958 the fuel farm was relocated to the southeast corner of the base. The concrete tanks were crushed and filled with dirt. The fuel was removed from the tanks prior to crushing. Whether or not the tanks were leaking is not known.

The fuel farm had four truck fill stations. The underground storage tanks were filled by tankers. These tanks were filled until fuel flowed out the vents. Aircraft refueling trucks and small tankers brought fuel to aircraft refueling points and gas stations. Spillage often occurred at Site 7 during these transfers.

Types of fuels stored at this fuel farm were AVGAS (leaded), Regular MOGAS (leaded), Diesel Fuel, and JP-4. Table 2-7 details the wastes potentially disposed of at Site 7.

TABLE 2-7 Potential Contaminants Disposed of at Site 7, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Water-bearing Fuel:		
AVGAS (leaded)	10,000 gallons	1942 - 1958
JP-4	10,000 gallons	1942 - 1958
MOGAS Regular (leaded)	10,000 gallons	1942 - 1958
Diesel Fuel (DF-2)	10,000 gallons	1942 - 1958

(b) (3) (A)

[redacted]

2.4.7.2 Conclusions. Because of the frequent spillage that occured in this area and the potential for lead contamination, Site 7 is recommended for further work under the Navy IR Progam.

2.4.7.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 7. Figure 2-15 shows the recommended sampling locations.

Types of samples:	Soil
Number of samples:	12 samples
Sampling Frequency:	once
Testing Parameters:	All samples: purgeable organic carbon compounds, total petroleum hydrocarbons, xylene, lead
Remarks:	A geophysical survey may be performed to identify the crushed concrete tank locations. Three soil samples should be taken from each boring. These samples should be taken at depths of visible contamination or at one, five, and 10 foot depths. The last sample should be taken above the water table if the ground water is less than 10 feet deep.

2.4.8 Site 8 - Scrapyard.

2.4.8.1 Findings. Site 8 is located on Patrol Road directly west of Buildings 493 and 494. Buildings 495 is within the site boundaries. The scrapyard is bordered on the south and west by the Patrol Road Landfill (Site 2) as shown on Figure 2-16. Site 8 is a rectangular fenced-in area about 500 feet long and 250 feet wide. The total area covered by the scrapyard is about three acres. The scrapyard was constructed by the Defense Reutilization and Marketing Office (DRMO) in 1958 for the storage of sellable metals.

DRMO attempted to clear the scrapyard in 1982. They contracted the removal of material within the scrapyard for final closure, however the contractor removed only the profitable metals and then abandoned the remaining scrap. Those items the contractor did not remove are currently in the scrapyard.

Items stored at the scrapyard include: old refrigerators, water coolers, empty drums, tanks, pai t cans, film and film canisters, sand blast equipment, spent transformers (probably containing transformer fluid), and any other scrap material made from metal. In 1983, five empty transformers were removed from the scrapyard for off-base disposal. The fluid from these transformers probably leaked onto the soil within the site boundary. The on-site survey of January 1987 showed no visible evidence of oil-stained soil in the area. Table 2-8 lists the identified contaminants of concern potentially disposed of at Site 8.

(b) (3) (A)

(b) (3) (A)

[redacted]

TABLE 2-8 Potential Contaminants of Concern at Site 8, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Transformer Fluid (containing PCBs)	200 gallons	1958 - 1982
Paint (containing chromium, lead, and zinc)	Unknown[a]	1958 - 1982

[a]paint from old, discarded paint cans and spray paint cans

2.4.8.2 Conclusions. Because of the potential for PCB contamination of the soil within the scrapyard, Site 8 is recommended for further work under the Navy IR Program. Site 8 is flat with no ground cover therefore, creating a potential for windblown migration of contaminants. Contaminants may also migrate through ground water or surface water movement to unlined drainage ditches located near by then eventually draining to the New River.

2.4.8.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 8. Figure 2-17 shows the recommended sampling locations.

Types of samples: Soil

Number of samples: 30 samples

Sampling Frequency: once

Testing Parameters: All Samples: PCBs, hexavalent and total chromium, lead, zinc

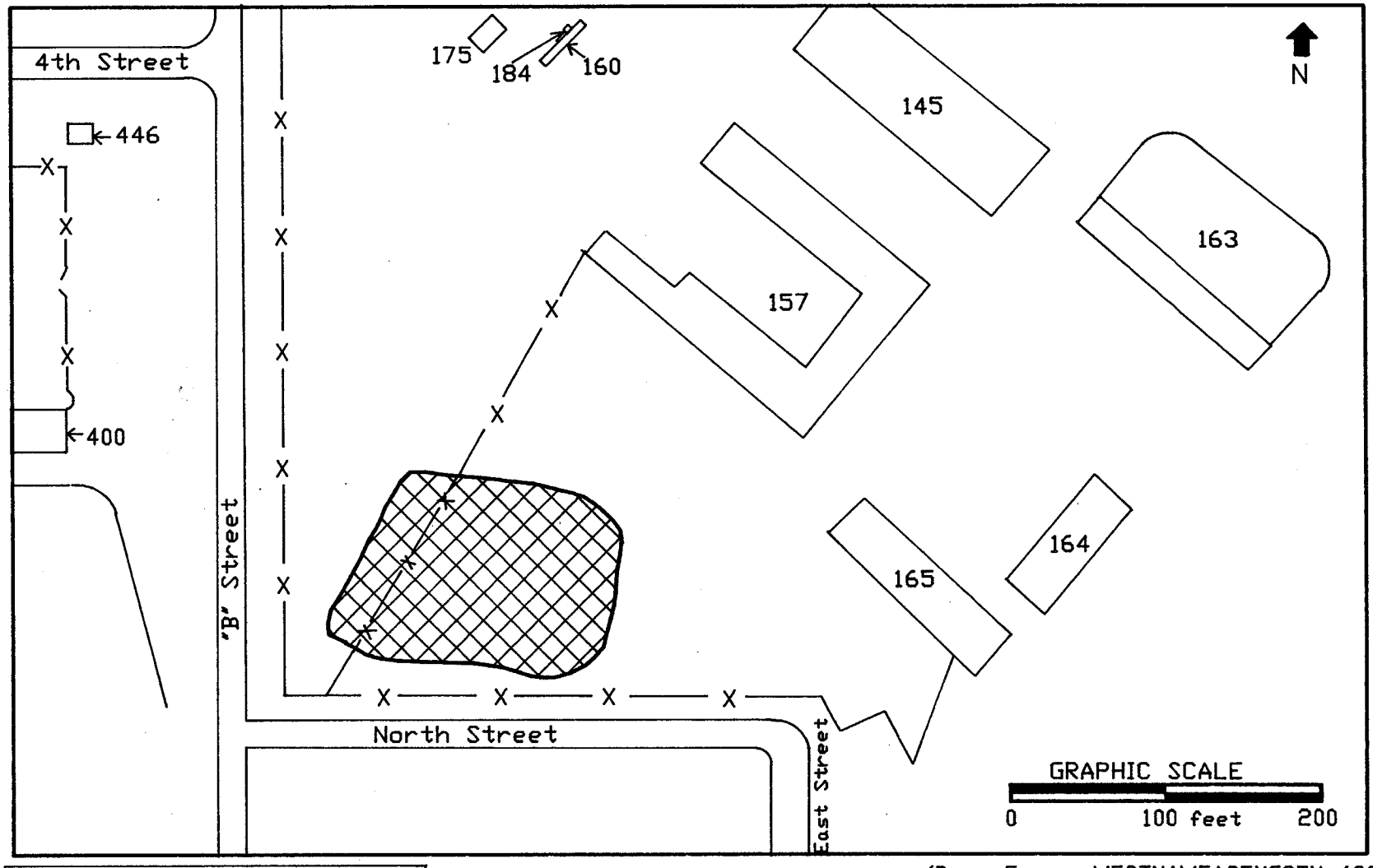
Remarks: Soil samples should be collected at depths of visible contamination or from 0 - 1.5 feet and 3.0 - 5.0 feet from each boring.

2.4.9 Site 9 - Transformer Storage Area

2.4.9.1 Findings. Site 9 is located to the east of "B" Street and to the north of North Street. Building 157 is about 100 feet to the northeast, as shown in Figure 2-18. Site 9 consists of a 150 foot by 150 foot area which is currently divided by a fence. The total area of the site is about 0.5 acre. This area was used to store transformers during the years 1963 through 1983. In 1983, Navy personnel drained, cleaned, and prepared over 100 transformers from this area for off-base disposal by a contractor. This area has been used as a materials/equipment storage area in the past and is the current site of the motor pool. The land surface is completely covered with gravel.

(b) (3) (A)

[redacted]



(Base From: WESTNAVFACENGCOM, 1981)

-----EXPLANATION-----

X — fence

site boundary

building

FIGURE 2-18

Site 9 - Transformer Storage Area

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NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

During the 20 years of operation, active and damaged transformers were stored in this area. This area was always unpaved. Several photographs, taken during the 1983 removal, show leaking and upturned transformers. Several reports confirmed that during several occasions, the soil in this area was saturated with oil. In 1983, some of the leaks were cleaned up by removing the soil and drumming it for off-base disposal, however, a large scale clean up has never taken place. The average size of transformers stored at Site 9 was 85 gallons. Over one half of the t ansformers used at NAF El Centro contained PCBs.

The contaminant of concern is transformer fluid containing PCBs. Table 2-9 lists the contaminants determined to exist at Site 9.

TABLE 2-9 Potential Contaminants Present at Site 9, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Transformer Fluid (containing PCBs)	500 gallons	1963 - 1983

2.4.9.2 Conclusions. Because of the potential for PCB contamination of the soil at the former transformer storage area, Site 9 is recommended for further work under the Navy IR Program. The effectiveness of the 1983 clean up has never been checked.

2.4.9.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially present at Site 9. Figure 2-19 shows the recommended sampling locations.

Types of samples: Soil

Number of samples: 35 samples

Sampling Frequency: once

Testing Parameters: All Samples: PCBs

Remarks: Two samples should be taken from each soil boring. These samples should be taken at depths of visible contamination or at 0 - 1.0 foot and 1.5 to 3.0 feet depths. The top layer of gravel should be removed. In addition, five borings (recommended locations shown on Figure 2-19) should also be sampled at a 3.5 - 5.0 foot depth.

(b) (3) (A)

[redacted]

2.4.10 Site 10 - Sewage Stabilization Ponds.

2.4.10.1 Findings. Site 10 is located in the extreme northwest corner of the base just north of the current sewage treatment plant (STP). Three unlined ponds comprise this area. The largest pond is about 500 feet long, 250 feet wide, and ten feet deep. The smaller two ponds are about 250 feet long, 100 feet wide, and 10 feet deep each, as shown in Figure 2-20. The total area of Site 10 is about four acres. This area was used prior to 1976 when the STP came on-line. These ponds are currently used as a back-up to the STP. For example, in May 1985, about 300 gallons of JP-5 killed the bacteria in the wastewater at the STP so the wastewater was diverted into one of the smaller ponds.

The stabilization ponds functioned as the only sewage treatment for the base until 1976. Sewage flowed into the ponds, the solids were given time to settle, and the effluent was sent to the New River. Sludge (solids) has never been removed from any of these ponds. Vegetation is abundant in each pond. Currently, all the ponds are dry.

Shops or areas that disposed waste to the sewer system are potential sources of contamination of these ponds. These waste sources include: the photographic shop, aircraft hangars and aprons, and the plating shop.

Table 2-10 lists the potential contaminants at Site 10.

2.4.10.2 Conclusions. Because of the potential for metals contamination of the soil, Site 10 is recommended for further work under the Navy IR Program.

2.4.10.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 10. Figure 2-21 shows the recommended sampling locations.

Types of samples:	Soil	
Number of samples:	20 samples	
Sampling Frequency:	once	
Testing Parameters:	All samples:	purgeable organic carbon compounds, arsenic, cadmium, chromium, lead, nickel, silver, zinc, xylene, total cyanides
Remarks:	Two soil samples should be taken from each soil boring. These samples should be taken at depths of visible contamination or at zero and three foot depths.	

(b) (3) (A)

[redacted]

TABLE 2-10 Potential Contaminants Disposed of at Site 10, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Water-bearing Fuels:		
JP-4	unknown[a]	1958 - 1976
JP-5	300 gallons[a]	1958 - 1985
AVGAS (leaded)	unknown[a]	1946 - 1976
Hydraulic fluid (containing chromium, lead, nickel, zinc)	40,000 gallons	1946 - 1976
Motor Oil	20,000 gallons	1946 - 1976
Ethylene Glycol	20,000 gallons	1946 - 1976
Trichloroethylene	5,000 gallons	1955 - 1972
Carbon Tetrachloride Tetrachloroethylene	5,000 gallons	1946 - 1953
PD-680 Freon-113	2,000 gallons	1971 - 1976
Plating Waste (containing cadmium and arsenic)	100 gallons	1971 - 1976
Photographic Solutions		
Black & White (silver)	200,000 gallons	1946 - 1976
Color (cyanide)	30,000 gallons	until 1976

[a]mainly from spills that reached the sewer system

2.4.11 Site 11 - Runway Burn Area.

2.4.11.1 Findings. Site 11 is located about 250 feet southwest of Runway 30 and 450 feet due northeast of Compass Rose as shown in Figure 2-22. Site 11 is a circular area about 200 feet in diameter. This area was used for aircraft fire fighting exercises during 1979 through 1980.

The remains of a crashed T-28 were periodically set ablaze with JP-5 and then extinguished as a fire fighting training exercise. The on-site survey showed no visible evidence of this area. Information obtained from aerial photographs and interviews identified the site location and operation. Table 2-11 lists the wastes potentially used at Site 11.

(b) (3) (A)

(b) (3) (A)

TABLE 2-11 Potential Contaminants Disposed of at Site 11, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
JP-5	Unknown	1979 - 1980

2.4.11.2 Conclusion. Site 11 is recommended for further work under the Navy IR Program to determine the extent, if any, of contamination in the soil.

2.4.11.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 11. Figure 2-23 shows the recommended sampling locations.

Types of samples: Soil

Number of samples: 4 samples

Sampling Frequency: once

Testing Parameters: All Samples: total petroleum hydrocarbons, benzene, toluene, xylene

Remarks: Two soil samples should be taken from each soil boring. These samples should be taken at depths of visible contamination or at one and three foot depths.

2.4.12 Site 12 - Open Burn Pit.

2.4.12.1 Findings. Site 12 is located along the eastern boundary of the base about 75 feet north of Patrol Road. Irrigated field "E" is about 200 feet to the north. The base boundary is about 200 feet to the east as shown in Figure 2-24. The pit is about 20 feet by 20 feet by 10 feet deep. This pit was used for burning from 1981 to 1986. A new burn pit has been excavated about 50 feet to the west of Site 12 which is currently being used for the same burning operation. The original pit (Site 12) has been filled and graded.

Burning was conducted about once per month at this pit, although burning was intermittent. Confiscated drugs and drug paraphernalia, ceramic pipes, cardboard, tin-coated steel cans, mason jars and wood are doused with water-bearing fuel and allowed to burn to completion. Table 2-12 lists the contaminants of concern used at Site 12.

Since the on-site survey of January 1987, the newly excavated pit 50 feet west of Site 12 has been closed. The burning of confiscated drugs no longer takes place at NAF El Centro.

(b) (3) (A)

[redacted]

(b) (3) (A)

[redacted]

TABLE 2-12 Potential Contaminants Used at Site 12, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Water-bearing Fuel: JP-5 (unleaded)	3000 gallons (50 gallons per burn)	1981 - 1986

2.4.12.2 Conclusions. Most of the material burned at this pit was combustible. Water-bearing fuel was not applied to the pit contents until the time of burning. Essentially, only JP-5 (unleaded) fuel was used. These factors lead to the conclusion, that any hazardous constituent used at Site 12 (JP-5) has been burned away or volatilized. Site 12 is therefore not recommended for further work under the Navy IR Program.

2.4.13 Site 13 - Old Incinerator.

2.4.13.1 Findings. Site 13 is located in the northeast corner of the base along Patrol Road. Building 197 is about 300 feet to the west as shown in Figure 2-25. The incinerator and surrounding ash burial area make up a 50 foot by 50 foot area. The incinerator was used starting in 1942 and ceased operations prior to 1953.

The old incinerator was used for the burning of paper only, probably classified material. The ash from the incinerator was buried in the immediate surrounding area. After ceasing operations as an incinerator, the structure was used to store ammunition for a short period of time. The incinerator was demolished in 1980. No hazardous materials were disposed of here.

2.4.13.2 Conclusions. Because no hazardous materials were ever disposed of here, Site 13 is not recommended for further work under the Navy IR Program.

2.4.14 Site 14 - Fuel Farm Tank Rinseate Disposal Area.

2.4.14.1 Findings. Site 14 is located in the southwest corner of the fuel farm area. The site boundary is about 300 feet southeast of Building 619, 300 feet southwest of Irrigated Field "P", and 15 feet from the base boundary. The site covers an area about 600 feet by 350 feet. The total area of the site is about five acres. This area was used from approximately 1960 through 1985 as a runoff area for rinseate water after cleaning the eight fuel storage tanks in the fuel farm. Site 14 is shown in Figure 2-26.

(b) (3) (A)

[redacted]

(b) (3) (A)

[redacted]

Cleaning the fuel storage tanks was performed by filling the tanks with water and letting them drain into the site. This area is low-lying so the rinseate would settle in this area until it evaporated or soaked into the soil. All the tanks were cleaned at the same time. Some of the tanks probably contained fuel product as well as sludge. Tanks were cleaned about every other year starting in 1960 until 1985. Contaminants potentially disposed of in this area are: JP-4, JP-5, AVGAS (leaded), Diesel Fuel #2, and MOGAS Regular (leaded) and Unleaded. Table 2-14 lists the contaminants potentially disposed of at Site 14.

TABLE 2-14 Potential Contaminants Disposed of at Site 14, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Water-bearing Fuel:		
JP-4	500,000 gallons	1960 - 1985
JP-5	500,000 gallons	1960 - 1985
AVGAS (leaded)	3,000 gallons	1960 - 1985
MOGAS - Regular (leaded)	5,000 gallons	1960 - 1985
- Unleaded	2,000 gallons	1960 - 1985
Diesel Fuel #2 (DF-2)	3,000 gallons	1960 - 1985

2.4.14.2 Conclusions. Because of the quantities of fuels disposed of at Site 14 and the possibility of contaminant migration off base by surface runoff to drainage ditches or through ground-water migration, Site 14 is recommended for further work under the Navy IR Program.

2.4.14.3 Recommendations. The following first-year sampling program is recommended to verify the presence of contaminants potentially disposed of at site 14. Figure 2-27 shows the recommended sampling locations.

Monitoring Wells: 1

Types of samples: Ground water, Soil

Number of samples: Ground water - 2 samples
Soil - 12 samples

Sampling Frequency: Ground water - twice
Soil - once

Testing Parameters: All samples: total petroleum hydrocarbons, benzene, toluene, xylene, lead

Ground water: pH, specific conductance, Water level

(b) (3) (A)

[redacted]

Remarks: The well should be drilled to a maximum depth of 25 feet and screened from at least one foot above the highest depth of the water table to the bottom of the well. Ground-water samples should be collected once during the summer and once during the winter. Four inch wells are recommended if fuel product recovery is anticipated. The ground-water monitoring program should be combined with Site 15 in order to collect the required hydrologic data for the fuel farm area.

Three soil samples should be collected from each soil boring and monitoring-well boring. These samples should be taken at depths of visible contamination or at one, three, and six foot depths. The last sample should be taken above the water table if the ground water is less than six feet deep.

2.4.15 Site 15 - Fuel Farm Filter Cleaning Area.

2.4.15.1 Findings. Site 15 is located in the northwest corner of the fuel farm area. The site boundary is about 50 feet northeast of Building 616 and 100 feet from Irrigated Field "P", as shown in Figure 2-28. The site covers an area about 250 feet long and 150 feet wide. This area received fuel during filter cleaning from about 1958 until 1981.

Every three years the fuel filters in the fuel farm are cleaned. During this operation, about 100 gallons of fuel is spilled onto the ground. Small sumps were constructed next to each filter. The sides of the sumps were made of concrete and each had a hole in the bottom. The spilled fuel entered the sump and was allowed to seep into the soil about two feet below the surface. Since 1981 these sumps have been filled in. During the on-site survey of January 1987, contaminated soils were visible in several two foot deep holes. Free product was observed in four 13 foot deep trenches. The location of these trenches are shown in Figure 2-28. Approximately five feet of product was observed in Trenches 1 and 2; six inches in Trench 3; and two inches in Trench 4. Soil samples taken in this area show 1200 parts per million (ppm) total petroleum hydrocarbons and 5.8 ppm lead (RGA, 1987).

Contaminants potentially present in this site include: JP-4, JP-5, AVGAS (leaded), MOGAS Regular (leaded) and Unleaded, and diesel fuel (DF-2). Table 2-15 lists the contaminants potentially present at Site 15.

2.4.15.2 Conclusion. Because of the amount of contaminants potentially spilled at this site and the physical evidence of soil contamination, Site 15 is recommended for further work under the Navy IR Program.

2.3.15.3 Recommendations. The following first-year sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 15. Figure 2-29 shows the recommended sampling locations.

(b) (3) (A)

[redacted]

TABLE 2-15 Potential Contaminants Disposed of at Site 15, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Fuel:		
JP-4	900 gallons	1958 - 1974
JP-5	900 gallons	1974 - 1981
AVGAS (leaded)	900 gallons	1958 - 1981
MOGAS - Regular (leaded)	900 gallons	1958 - 1981
- Unleaded	900 gallons	1974 - 1981
Diesel Fuel #2 (DF-2)	900 gallons	1958 - 1981

Monitoring Wells: 4

Types of samples: Ground-water, Soil

Number of samples: Ground water - 8 samples
Soil - 18 samples

Sampling Frequency: Ground water - twice
Soil - once

Testing Parameters: All samples: benzene, toluene, xylene, total petroleum hydrocarbons, lead

Ground water: pH, specific conductance, water level

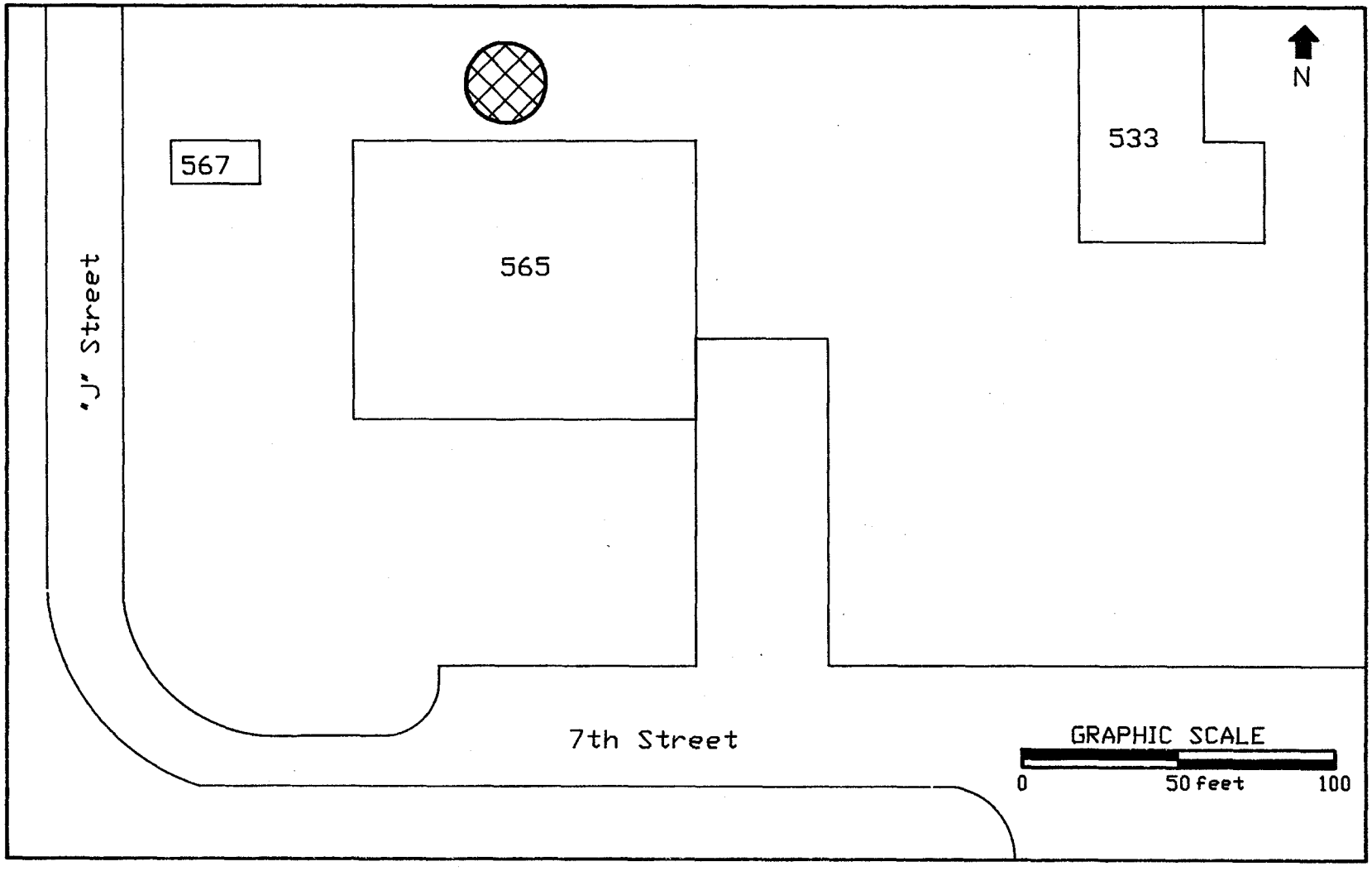
Remarks: Wells should be drilled to a maximum depth of 25 feet and screened from at least one foot above highest water table level to the bottom of the well. Ground-water samples should be taken once during the summer and once during the winter. Ground-water data can be combined with Site 14 to determine localized ground-water flow directions. Four inch wells should be used in anticipation of product recovery.

Three samples should be taken from each soil boring and monitoring-well boring. These samples should be taken at depths of visible contamination or at one, three, and six foot depths. The last sample should be taken above the water table if the ground water is less than six feet deep.

2.4.16 Site 16 - Potassium Ferricyanide Spill Area.

2.4.16.1 Findings. Site 16 is located directly to the north of building 565; the photo lab, and covers an area about 15 feet by 15 feet as shown in Figure 2-30. This one-time spill occured in 1981.

(b) (3) (A)



(Base From: WESTNAVFACENGCOM, 1981)

-----EXPLANATION-----

site boundary

building

FIGURE 2-30
Site 16 - Potassium Ferricyanide Spill Area

PRELIMINARY ASSESSMENT/
SITE INSPECTION
NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

Spent potassium ferricyanide, a bleach used in color photo-processing, was collected in a 500 liter (130 gallon) tank outside Building 565 which was sent to be recycled when full. In 1981 the tank ruptured and its contents spilled onto the ground. The site was reportedly cleaned-up in 1983 by removing the soil but, a bluish-green discoloration of the soil is still visible. Table 2-16 lists the potential contaminants disposed of at Site 16.

TABLE 2-16 Potential Contaminants Present at Site 16, Naval Air Facility, El Centro, California

WASTE TYPE	ESTIMATED QUANTITY	YEARS OF DISPOSAL
Potassium Ferricyanide	100 gallons	1983

2.4.16.2 Conclusions. Because of the amount of the spill and the visual evidence of contaminants remaining in the soil, we recommended Site 16 for further work under the Navy IR Program.

2.4.16.3 Recommendations. The following sampling program is recommended to verify the presence of contaminants potentially disposed of at Site 16. Figure 2-31 shows the recommended sampling locations.

Types of samples: Soil

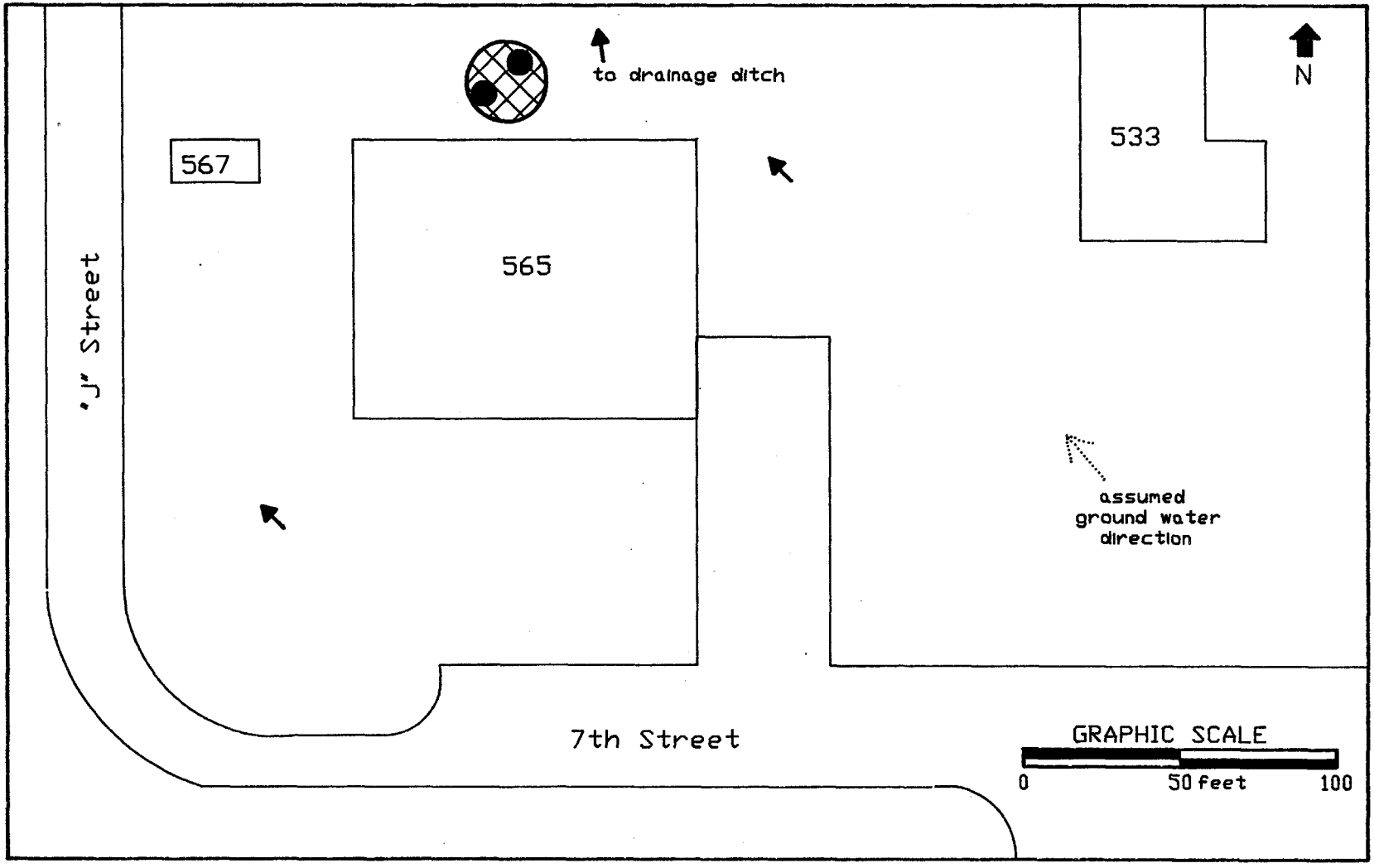
Number of samples: 6 samples

Sampling Frequency: once

Testing Parameters: All Samples: Total Cyanide

Remarks: Three soil samples should be taken from each soil boring. These samples should be taken at depths of visible contamination or at zero, three, and six foot depths.

2.5 SUMMARY OF RECOMMENDATIONS. Table 2-17 presents a summary of recommendations for all sites identified at NAF El Centro.



(Base From: WESTNAVFACENGCOM, 1981)

-----EXPLANATION-----

- site boundary
- building
- soil sample
- surface water flow direction

FIGURE 2-31
Recommended Sampling Locations for Site 16 - Potassium Ferricyanide Spill Area

PRELIMINARY ASSESSMENT/
SITE INSPECTION
NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

TABLE 2-17 Summary of Recommendations

SITE NAMES

Site 1 - Magazine Road Landfill
Site 2 - Patrol Road Landfill
Site 3 - Sludge Burial Area
Site 4 - 4th Street Fire Fighting Training Area
Site 5 - Fire Fighting Training Area East of Hangar #3
Site 6 - Northwest Fire Fighting Training Area
Site 7 - Abandoned Fuel Farm
Site 8 - Scrapyard
Site 9 - Transformer Storage Area
Site 10 - Sewage Stabilization Ponds
Site 11 - Runway Burn Area
Site 12 - Open Burn Pit
Site 13 - Old Incinerator
Site 14 - Fuel Farm Tank Rinseate Disposal Area
Site 15 - Fuel Farm Filter Cleaning Area
Site 16 - Potassium Ferricyanide Spill Area

Site Number	Number of Monitoring Wells	Number of Samples				Testing Parameters[a]
		Ground Water	Surface Water	Soil	Sediment	
1	4	8	0	27[b]	3	Purgeable Organics Acid Extractables Petroleum Hydrocarbons Xylene, Pesticides/PCBs, Cadmium, Chromiun, Lead, Mercury, Nickel, Silver, Zinc, Asbestos (Surface only)
2	4	8	3	31[c]	3	Purgeable Organics Acid Extractables Petroleum Hydrocarbons xylene, Cadmium, Chromium, Lead, Mercury, Nickel, Silver, Zinc, Asbestos (Surface only)
3	0	0	0	4	0	Total Cyanides, Silver

[a]Detailed description of testing parameters in Appendix C
[b]includes two background soil samples and one surface-fiber sample
[c]includes one surface sample

TABLE 2-17 Summary of Recommendations (continued)

Site Number	Number of Monitoring Wells	Number of Samples				Testing Parameters
		Ground Water	Surface Water	Soil	Sediment	
4	3	6	0	9	0	Purgeable Organics Chromium, Lead, Nickel, Zinc, Petroleum Hydrocarbons, Xylene
5	3	6	0	6	0	Purgeable Organics Petroleum Hydrocarbons Xylene, chromium, Lead, Nickel, Zinc
6	0	0	0	18	0	Purgeable Organics Petroluem Hydrocarbons Xylene, Lead
7	0	0	0	12	0	Purgeable Organics Petroleum Hydrocarbons Xylene, Lead
8	0	0	0	30	0	PCBs, Chromium, Lead, Zinc
9	0	0	0	35	0	PCBs
10	0	0	0	20	0	Purgeable Organics Arsenic, Cadmium, Lead, Chromium, Silver, Zinc, Xylene, Total Cyanides
11	0	0	0	4	0	Petroleum Hydrocarbons Benzene, Toluene, Xylene
12	NOT RECOMMENDED FOR FURTHER WORK					
13	NOT RECOMMENDED FOR FURTHER WORK					

TABLE 2-17 Summary of Recommendations (continued)

Site Number	Number of Monitoring Wells	Number of Samples				Testing Parameters
		Ground Water	Surface Water	Soil	Sediment	
14	1	2	0	12	0	Petroleum hydrocarbons Benzene, Toluene, Xylene, Lead
15	3	6	0	15	0	Petroleum hydrocarbons, Benzene, Toluene, Xylene, Lead
16	0	0	0	6	0	Total cyanides

Chapter 3. BACKGROUND

3.1 INTRODUCTION. The Naval Air Facility (NAF) El Centro is a fully operational shore activity headed by a commanding officer. Command is exercised by the Commander-in-Chief of the U. S. Pacific Fleet through Commander, Naval Air Force, U. S. Pacific Fleet and Commander, Fighter Airborne Early Warning Wing, Pacific. NAF El Centro is subject to the area coordination of the Commander, Naval Station, San Diego (WESTNAVFACENGCOM, 1982a).

3.1.1 Location. As shown on the location map, Figure 3-1, NAF El Centro is located in the southwestern corner of the United States, in the state of California, county of Imperial. The base is located in California's agriculturally rich Imperial Valley, approximately seven miles north of the Mexican border, and sixteen miles south of the Salton Sea. The city of San Diego is approximately 85 air miles to the west and the city of Yuma, Arizona is 60 miles to the east.

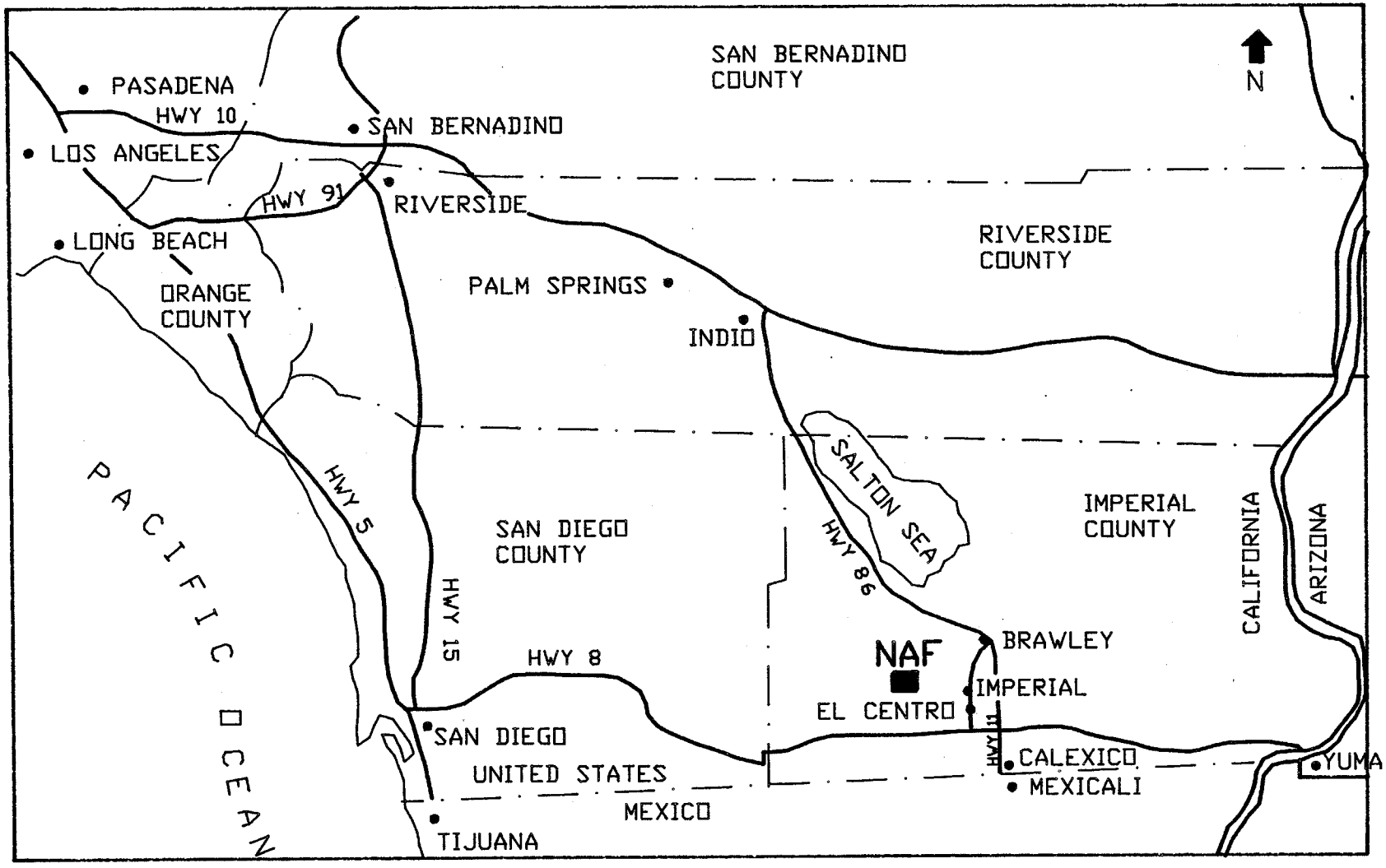
3.1.2 Mission. The mission of NAF El Centro is to maintain and operate facilities and provide services and material to support operations of aviation activities and of the operation forces of the Navy and other activities and units as designated by the Chief of Naval Operations. In support of the Command's mission, the following tasks and functions have been assigned: (1) Operations and Training, (2) Administration, (3) General Engineering Support and Mission Operations, (4) Personnel Support, (5) Medical and Dental Support, (6) Maintenance of Material, (7) Maintenance of Real Property and Utility Operations, and (8) Supply Operations.

3.2 HISTORY. Through the years, NAF El Centro has carried a number of titles: Naval Air Facility (NAF), Naval Auxillary Landing Field (NALF), Naval Air Station (NAS), Naval Auxillary Air Station (NAAS), and National Parachute Test Range (NPTR) (WESTNAVFACENGCOM, 1982a).

3.2.1 1942-1946. In 1942, the base was commissioned as a Marine Corps Air Station with duties involving the maintenance of air-to-ground targets and the maintenance of NAAS Holtville and NAAS Salton Sea. On May 1, 1946, the base was commissioned as Naval Air Station El Centro.

3.2.2 1947-1949. In November of 1947, the Naval Parachute Experimental Unit commenced operations at the Naval Air Station. This Unit was followed by the Navy Air Technical Training Unit in April of 1949 and the Fleet Air Gunnery Unit in July of 1949.

3.2.3 1949-1951. On October 31, 1949, the NAS was reduced to a NAAS with a mission of continuing support to the rotating fleet air squadrons and the Naval Parachute Unit. In 1950, with the start of the Korean War, the NAAS initiated support of Fleet aircraft for night carrier landing practices. In 1951, the 6511th Parachute Test Group, U. S. Air Force, already located on base, joined with the Naval Parachute Unit to form the Department of Defense Joint Air Force - Navy Parachute Test Facility.



GRAPHIC SCALE

0 18 miles 36

FIGURE 3-1

LOCATION OF NAF EL CENTRO, CALIFORNIA

PRELIMINARY ASSESSMENT/ SITE INSPECTION
NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

3.2.4 1951-1959. During the years 1951 through 1959, the NAAS engaged in highly technical research and development programs to reduce piloted aircraft escape problems; also, missile reentry solutions were greatly expanded. At the end of 1958, NAAS El Centro was directed to commence reduction to a NALF, to be accomplished by 1 July 1959.

3.2.5 1959-1963. During the years 1959 through 1962, the NALF continued its support of the Navy Parachute Test Facility. The support of Air Squardrons of the Fleet Carrier Groups increased with many day and night landings and many target practice requests. In 1962 the NALF was upgraded to the status of NAF El Centro, California.

3.2.6 1964-Present. In 1964, the U. S. Naval Aerospace Recovery Facility was designated and in July, 1973 it was combined with the Naval Air Facility to form the National Parachute Test Range. Six years later, in July 1979, the parachute testing function was transferred to NAS China Lake and El Centro became a Naval Air Facility again.

3.3 HISTORICAL RESOURCES. Archeological and geological evidence suggests man's presence in the Imperial Valley as far back as 45,000 years ago. Archeological findings in an area southwest of the Naval Air Facility, called the Yuha Basin, confirms man's existence in the area as far back as 21,500 years ago. Numerous other historial and archeological sites have been discovered and examined throughout the Imperial Valley. Although the station has never conducted an Executive Order 11593 (archeological) Survey, no sites are known to occur on or in the immediate area of the Naval Air Facility (WESTNAVFACENGCOM, 1982a).

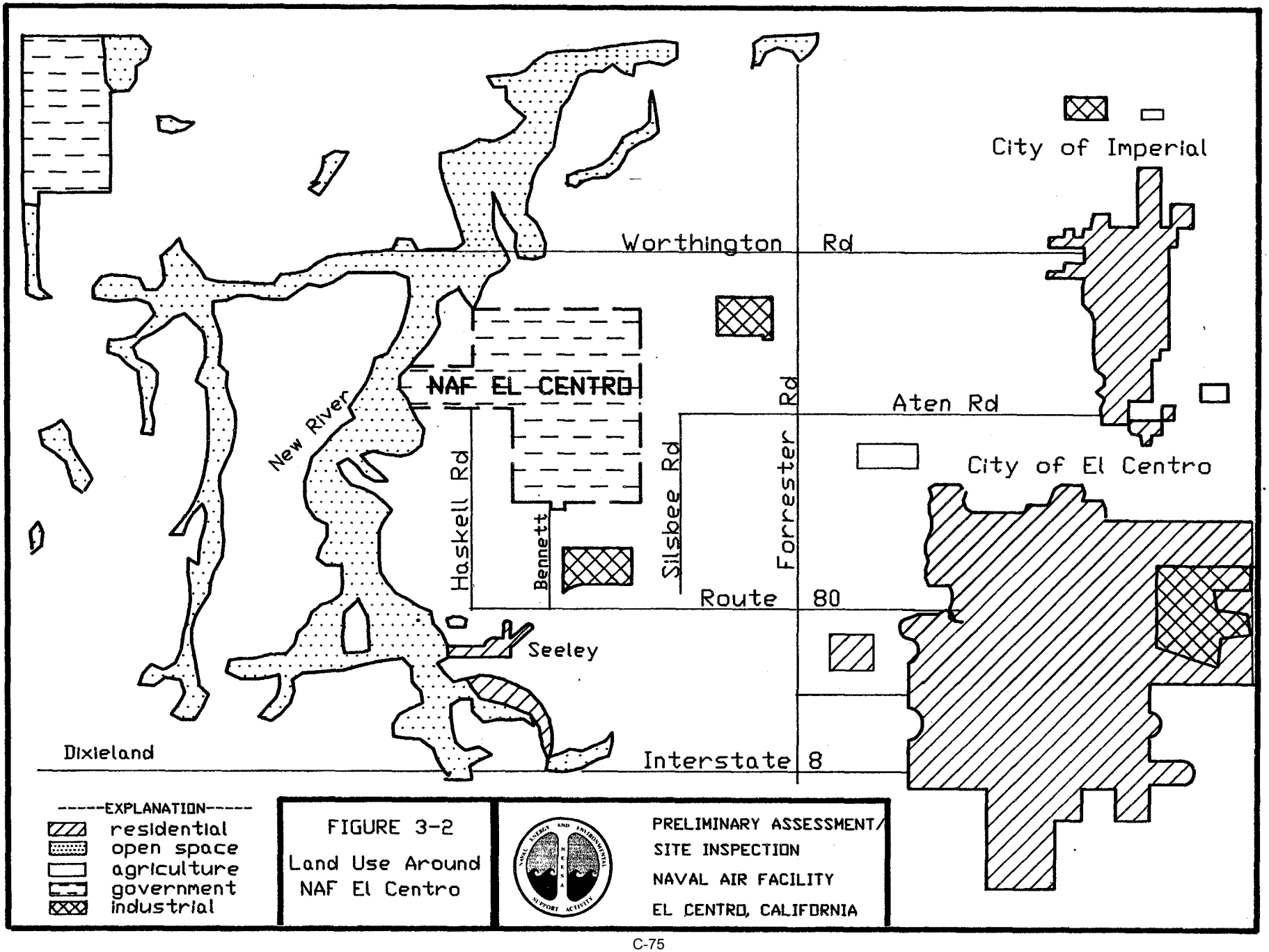
3.4 ADJACENT LAND USE.

3.4.1 Surrounding Area. Land use around NAF El Centro is primarily for agricultural purposes. Residential units in the area are usually farmhouses which serve as housing for individuals who work with the immediate surrounding farmland. The closest residential area is the community of Seeley. Seeley is situated about one mile to the south of NAF El Centro. The current population of Seeley is between 800 and 900 persons. Figure 3-2 illustrates the land use around NAF El Centro (WESTNAVFACENGCOM, 1982a).

3.4.2 Outlying Areas. Three active and one inactive weapons training areas are in the vicinity of NAF El Centro. NAF El Centro provides for the land and facilities maintenance of these ranges. The active ranges are: the Chocolate Mountains Impact Area, the Target 103A/Parachute Drop Area, and Targets 68 and 95. The Carrizo Impact Area is also nearby but is no longer in use. The Chocolate Mountains Impact Area and Targets 68 and 95 are under the operational control of MCAS Yuma, Arizona. The operations of Target 103A are managed by FACSFAC, San Diego, California.

The Chocolate Mountains Impact Area lies about 30 miles northeast of NAF El Centro. Target 68 is approximately 25 miles east and Target 95 is about 25 miles northeast of NAF El Centro. The 103A/Parachute Drop Area is located about 4 miles northwest of the base, while the Carrizo Impact Area lies 25 miles west of NAF El Centro, with its eastern boundary bordering the western boundary of the Target 103A Area.

These ranges are not within the scope of this report.


City of Imperial
Worthington Rd
NAF EL CENTRO
New River
Haskell Rd
Bennett
Silsbee Rd
Forrester Rd
Aten Rd
City of El Centro
Route 80
Seeley
Dixieland
Interstate 8
-----EXPLANATION-----
residential
open space
agriculture
government
industrial
FIGURE 3-2
Land Use Around
NAF El Centro
PRELIMINARY ASSESSMENT/
SITE INSPECTION
NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

3-4

CHAPTER 4. PHYSICAL AND BIOLOGICAL FEATURES

4.1 INTRODUCTION. This chapter details the physical features of NAF El Centro including: the climate, topography, geology, and overall migration potential of the contaminants determined to potentially exist at NAF El Centro; the surface water and ground-water qualities; and the possible biological receptors within the vicinity of NAF El Centro.

4.2 PHYSICAL FEATURES

4.2.1 Climate. NAF El Centro and vicinity has an arid climate. Daily summer temperatures average 92 degrees Fahrenheit (^{o}F) with high temperatures often reaching 115°F. Average winter temperatures range from daily lows near 30°F up to daily highs over 80°F (United States Department of Agriculture, 1981). The average monthly temperature for the Imperial Valley is shown on Figure 4-1.

Mean annual rainfall is approximately 2.4 inches. Most rainfall is gentle winter rains or intense summer storms. The average monthly precipitation is shown on Figure 4-2. Evapotranspiration from crops often exceeds six feet per year (United States Department of Agriculture, 1981).

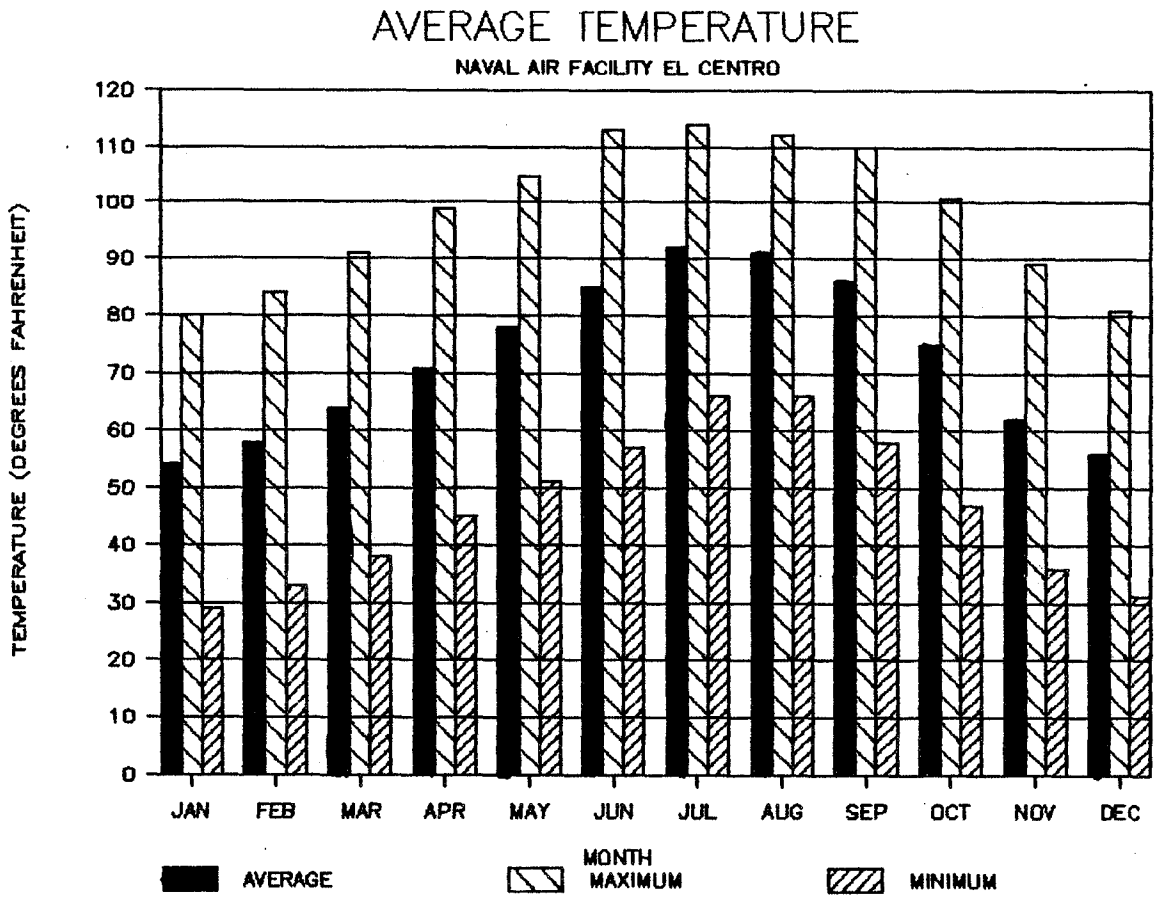
Prevailing winds are westerly in the winter and spring. Winds during the hot summer months are generally from the southeast. Wind speeds are calm to ten knots 78 percent of the time, 11 to 16 knots 12 percent of the time and 16 to 27 knots about eight percent of the time (WESTNAVFACENGCOM, 1981).

4.2.2 Topography and Surface Drainage. NAF El Centro is located near the center of the Imperial Valley. The area is nearly flat with the exception of bluffs adjacent to the New River which provide about 60 feet of vertical relief. Surface elevations on the facility range from 45 feet below mean sea level (MSL) in the southeast corner of the facility to 50 feet below MSL near the northwest corner of the facility. Figure 4-3 shows topography in the area of NAF El Centro.

Surface water drainage in the vicinity of NAF El Centro is generally controlled by artificial drains and irrigation canals such as the Rice Canal and Elder Canal. These drains and canals flow into the New River (United States Geological Survey, 1979). The New River flows generally northward discharging into the Salton Sea. Water from the Salton Sea is lost exclusively through evaporation.

4.2.3 Geology. The Imperial Valley is the northwesterly extension of the structural trough which form the Gulf of California. A low ridge formed by the Colorado River delta separates the Imperial Valley from the Gulf of California. The valley is bounded by the Peninsular Ranges to the west and the Chocolate Mountains to the east (Morton, 1977).

4.2.3.1 Bedrock Geology. the Imperial Valley is underlain by a 20,000 foot thick sequence of Tertiary and Quaternary non-marine sandstones, clays, and lacustrine deposits. The central portion of the valley is underlain by clay



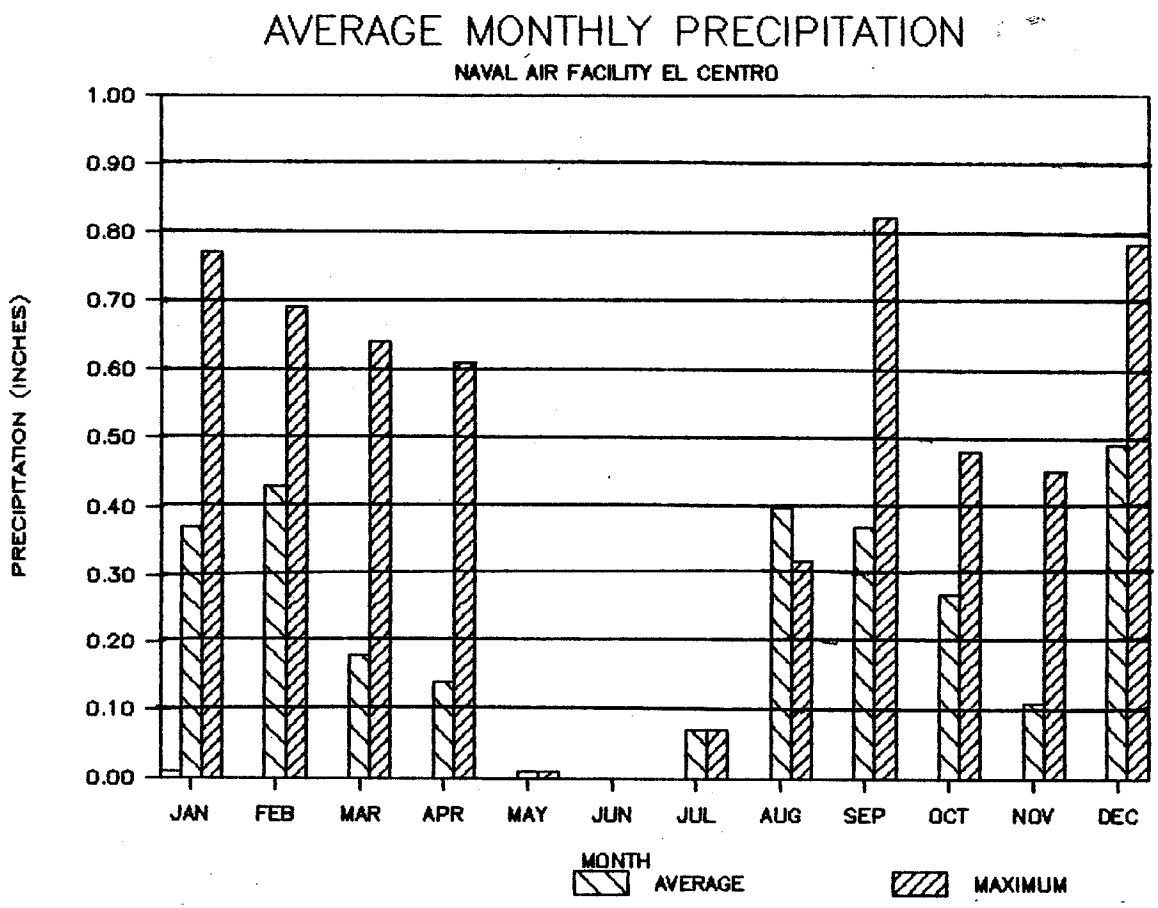
(FROM UNITED STATES DEPARTMENT OF AGRICULTURE, 1981)

FIGURE 4-1

AVERAGE MONTHLY TEMPERATURE

PRELIMINARY ASSESSMENT
SITE INSPECTION

NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA



(FROM UNITES STATES DEPARTMENT OF AGRICULTURE, 1981)

FIGURE 42

AVERAGE MONTHLY PRECIPITATION

PRELIMINARY ASSESSMENT
SITE INSPECTION

NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

(b) (3) (A)

[redacted]

and silt deposits from the prehistoric Lake Cahuilla. These deposits are generally less then 100 feet thick (Morton, 1977). Table 4-1 is a generalized geologic column for the Imperial Valley.

4.2.3.2 Structural Geology. The Imperial Valley, a northwesterly extension of the Gulf of California, is a rift valley. The east side of the valley is bounded by the San Andreas fault zone, and the west side of the valley is bounded by the Whittier-Elsinore fault system. Other major fault zones in the area include the Superstition Hills, Superstition Mountain, Imperial, Sand Hills, San Jacinto, and Laguna Salada faults. These faults trend to the northwest, with displacement being right lateral (Morton, 1977). The Superstition Mountain and Superstition Hills faults pass within two miles of the facility. Figure 4-4 shows surficial geology and area faults.

4.2.3.3 Geologic Hazards. NAF El Centro is located within the seismically active Imperial Valley. Active faults in the area have maximum credible earthquake magnitude up to 7.5 on the Richter Scale. During the 1979 earthquake, a portion of runway 26R/8L was damaged by liquification caused settlement (WESTNAVFACENGCOM, 1980.). Movement along smaller, unmapped faults could also cause significant damage to the facility.

4.2.3.4 Soils. Soils at NAF El Centro and vicnity generally consist of silty clays, clayey silts, silts, and silty sands. Soil associations identified by the United States Department of Agriculture include the Holtville silty clay, the Imperial silty clay, and the Glenbar silty clay loam. Table 4-2 is soil classifications and charteristics of soils identified at NAF El Centro. Figure 4-5 is a map of soil associations at NAF El Centro.

The Holtville silty clay is very deeply stratified soil. A typical soil profile consists of several feet of slowly permeable silty clay overlaying a very fine sandy silt or silty sand with moderate permeability (4.2×10^{-3} centimeter per second). The surficial clay layer generally has a high expansion potential.

In the area of NAF El Centro the Imperial and Glenbar associations are intermingled in an unpredictable pattern. For purposes of this report, these units are grouped into a single unit. Both soil types have a very deep profile and are composed of low permeability silty clays. Soil expansion potential is generally moderate to high (United States Department of Agriculture, 1981).

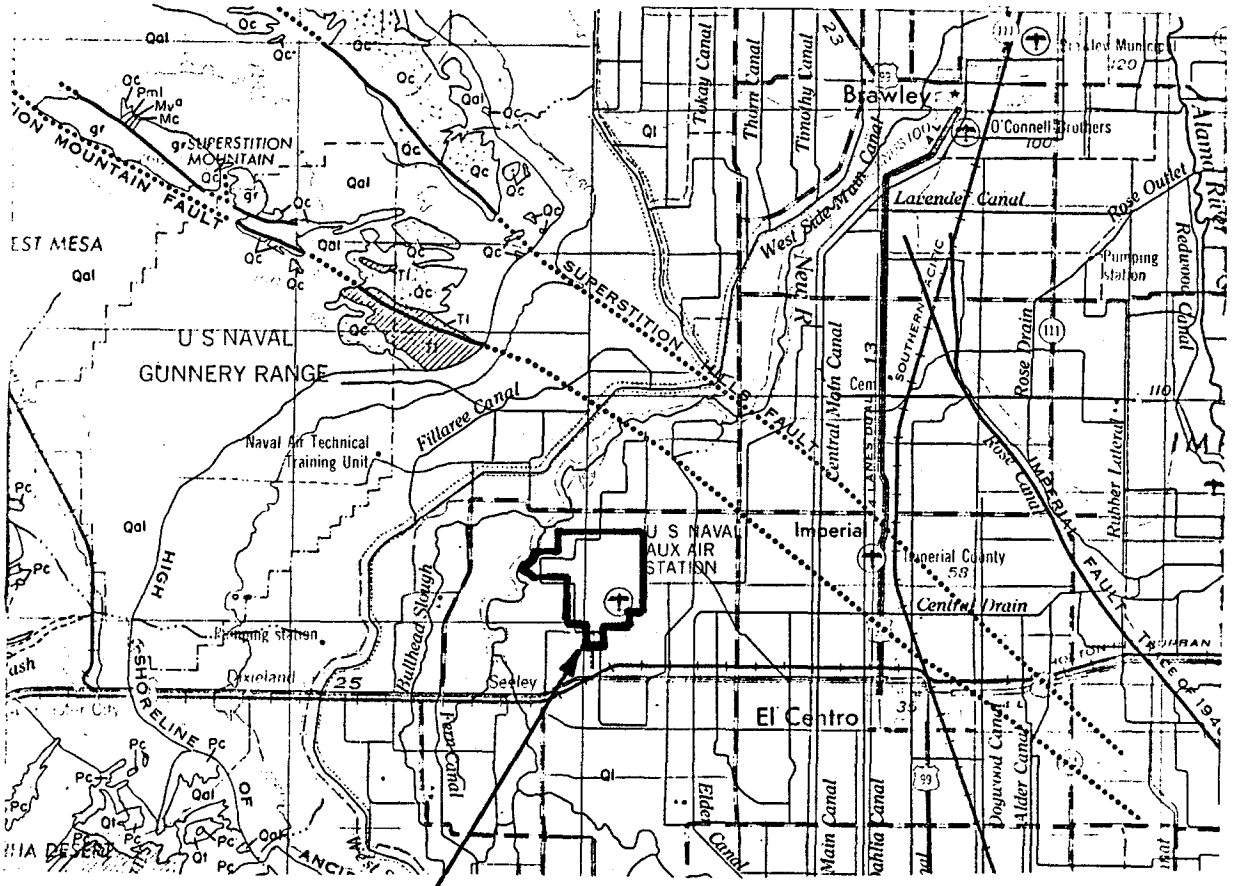
The badlands area is a very steep area that is dissected by tne New River. Soils were not classified by the United States Department of Agriculture (1981). This area has rapid surface runoff and a high potential for erosion.

Geotechnical investigations at several locations on NAF El Centro have classified soils at depths from 0 to 40 feet as silty clays (CL, CH), sandy silts (ML) or silty sand (SM). Reported moisture contents generally range from 16 to 35 percent. Dry densities range from 90 to 105 pounds per cubic foot (Lyons Engineers, 1985 and WESTNAVFACENGCOM, 1980b). Shallow, perched ground water was reported for both soil investigations. Figure 4-6 is a typical boring log from geotechnical investigations at the NAF El Centro. Appendix F contains an additional boring log taken during cathodic protection installation in the fuel farm during June 1987.

TABLE 4-1 Generalized Geologic Column For the Vicinity of Naval Air Facility El Centro, California

SYSTEM	GEOLOGIC Unit	LITHLOGIC CHARACTER
QUATERNARY		
Holocene	ALLUVIUM	UNCONSOLIDATED, CLAY, SILT AND GRAVEL.
	LAKE BEDS	TAN TO GRAY CLAY, SILT, SAND, AND GRAVEL
Pleistocene	BRAWLEY FORMATION	LIGHT GRAY CLAYS, SANDSTONE, AND PEBBLE GRAVELS, OF LUCUSTRINE ORIGIN.
	OCOTILLO FORMATION	GRAY PEBBLE CONGLOMERATE, NON-MARINE ORIGIN.
TERTIARY		
Pliocene	BORREGO FORMATION	GRAY CLAY AND INTEGRBEDDED SANDSTONE, LUCUSTRINE ORIGIN.
	CANEBRAKE CONGLOMERATE	GRANITIC DEBRIS
	PALM SPRINGS FORMATION	INTERBEDDED, LIGHT GRAY ARKOSIC SANDSTONE AND REDDISH CLAY
	IMPERIAL FORMATION	LIGHT YELLOW-GRAY CLAY, INTERBEDDED ARKOSIC SANDSTONE WITH OYSTER SHELL REEFS AND FOSSILIFEROUS CALCAROUS SANDSTONE.
Miocene	FISH CREEK	MASSIVE BEDS OF GYPSUM.
	ALVERSON ANDESITE	ANDESITE FLOWS AND INTERBEDDED TUFF, BRECCIA, AND NONMARINE SEDIMENTS.
	SPLIT MOUNTAIN FORMATION	GRAY CONGLOMERATE AND BROWN ARKOSIC SANDSTONE.
MESOZOIC	UNNAMED	PLUTONIC ROCKS OF INTERMEDIATE COMPOSITION AND PEGMATITE DIKES.

(after Morton, 1977)



EXPLANATION

NAF EL CENTRO

N

FAULT (DASHED WHERE APPROXIMATELY LOCATED DOTTED WHERE CONCEALED)

Ql QUATERNARY LAKE DEPOSITS

Qal QUATERNARY ALLUVIUM

Qt QUATERNARY NONMARINE TERRACE DEPOSITS

Qc PLEISTOCENE NONMARINE DEPOSITS

Pc PLIOCENE NONMARINE DEPOSITS

Pml PLIOCENE MARINE DEPOSITS

Tl TERTIARY LAKE DEPOSITS

gr PRECENOZOIC GRANITIC ROCKS

GRAPHIC SCALE

5 0 5

(FROM CALIFORNIA DIVISION OF MINES AND GEOLOGY, 1977)

FIGURE 4-4

SURFICIAL GEOLOGY

PRELIMINARY ASSESSMENT
SITE INSPECTION
NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

(b) (3) (A)

[redacted]

CLIENT: Francais Engineering

BORING No.: B-1

PROJECT: BOQ-Bldg. 270, NAF El Centro, CA

DATE: 12/3/85

LOCATION: East Side Bldg. 270 - Adjacent to sidewalk.

DEPTH	MOISTURE CONTENT (% of dry wt.)	DRY DENSITY (lbs./cu. ft.)	RELATIVE COMPACT (% Proctor)	BLOW COUNT	RECOVERY	BORING LOG	CLASSIFICATION	SOIL DESCRIPTION
0							CL	Silty Clay - Moist to very moist, plastic, medium stiff, reddish brown.
4	25	99	83	10				
				4			SM/ ML	Sandy Silt - saturated fine grained, med. dense to loose.
8	28	97		7			ML/ CL	Sandy Clay - very moist, plastic med. stiff, ferrous mottling.
12	32	90		4				
16	28	96		7			SM	Silty Sand - saturated, fine grained, med. dense.
20	24	98		9				
24	24	103		5			CL	Silty Clay - some fine sand lenses, reddish/ brown, moderately to highly plastic, very moist, horizontal laminations.
28								
32				10				
36	34	84		4				
40	28	97		11				
44								End of Boring

Water Table

Disturbed (Bag) Sample

Undisturbed Tube Sample. California 2½" & 3" O.D. Split Barrel driven with 140 lb. hammer dropped 30 inches.

BORING LOG

SEE FIGURE 4.5 FOR BORING LOCATION

(FROM LYON ENGINEERS, 1985)

FIGURE 4-6

TYPICAL BORING LOG

PRELIMINARY ASSESSMENT
SITE INSPECTION
NAVAL AIR FACILITY
EL CENTRO, CALIFORNIA

TABLE 4-2 Soil Classifications and Characteristics
Naval Air Facility, El Centro

Name	Typical Profile Thickness	USDA Texture	Liquid Limit	Plastic Limit	Permeability ($x\ 10^{-3}$) cm/sec	pH	Salinity Mmhos/cm
Holtville (HLT)	0-2 ft	Silty Clay [1](CH-CL)	40-65	20-35	.04-.14	7.4-8.4	2-8
	2-5 ft	Loamy Very Fine Sand (SM-ML)		NP-10	.42-4.2	7.4-8.4	2-8
Imperial (IMP)	0-5 ft	Silty Clay (CH)	50-70	25-45	.04-.14	7.9-8.4	4-8
Glenbar (Glb)	0-5 ft	Silty Clay loam (CL)	35-45	15-30	.14-.42	7.9-8.4	2-8

[1]Unified soil classification
after: United States Department of Agriculture, 1981

4.2.3.5 Hydrology. In the vicinity of NAF El Centro, ground-water data are limited. Therefore, estimates of ground-water movement are based on general assumptions and available data from geotechnical investigations.

Shallow aquifers in the vicinity of NAF El Centro generally consist of silts, clayey silts, sandy silts, and silty sands. Soil units identified in various geotechnical investigations appear to be fine grained recent alluvial deposits, and lake bed deposits from prehistoric Lake Cahuilla.

Estimates of hydraulic conductivity based on grain size analysis indicate conductivities on as low as $6x10^{-6}$ cm/sec for silty clays and as high as $4X10^{-2}$ cm/sec for poorly graded silty sands. Actual permeabilities will vary depending on degree of consolidation and soil grain shape. Table 4-3 gives permeability estimates from grain size distributions. The United States Department of Agriculture (1981) estimated hydraulic conductivity at a maximum of 4.2×10^{-3} cm/sec for Holtville silty sand (SM-ML).

Soil porosity may be estimated based on soil dry density, and soil specific gravity using:

Soil dry density was determined to be 96 pounds per cubic foot, at 16 feet in boring one, by Lyon Engineers(1985)). The particle mass density is assumed to be 165 pounds per cubic foot (2.65 grams per cubic centimeter). These values yield a total porosity of 0.42 (42 percent). Effective porosity is expected to be slightly less because not all pore spaces will be interconnected.

The hydraulic gradient is assumed to approximate the slope of the ground surface which averages one foot per 1,000 feet (0.001).

TABLE 4-3 Estimated Hydraulic Conductivity From Grain Size Distribution, Naval Air Facility, El Centro, California

Soil Description	Sample Depth Feet	Grain Size Distribution Size retained in millimeters 84 %	50%	16%	SIGMA PHI	Hydraulic Conductivity cm/sec	Reference Report
Silty Clay(CH)	3	0.001	0.004	0.7	4.7	$6.4X10^{-6}$	A
Silty Clay(CL)	5	0.001	0.01	1.0	5.0	$1.1X10^{-5}$	A
Silty Clay(CH)	6	0.001	0.003	0.03	2.5	$9.2X10^{-5}$	A
Silty Sand(SM)	8	0.01	0.07	0.10	1.7	$6.1X10^{-3}$	A
Sandy Clay(CL)	8	0.02	0.07	0.10	1.2	$1.2X10^{-2}$	A
Silty Sand(SM)	10	0.06	0.08	0.10	0.3	$3.8X10^{-2}$	A
Sandy Silt(ML)	21	0.04	0.08	0.12	0.8	$2.1X10^{-2}$	B
Sandy Silt(ML)	24	0.001	0.04	0.06	3.0	$6.4X10^{-4}$	B

Reference A: WESTNAVFACENGCOM, 1980b
Boring locations near west end of runway 26R/8L.
B: LYON ENGINEERS, 1985
Boring locations near Building 270.

$$P = 1 - \frac{pb}{ps}$$ (Freeze and Cherry, 1979)

Where: P = total porosity (dimensionless)
pb = bulk mass density (pounds per cubic foot)
ps = particle mass density (pounds per cubic foot)

The formula used for calculating hydraulic conductivity is:

$$K = 0.760*D*2.718^{-1.31*SIGMA\ PHI}$$ (DeWeist, and Davis, 1986)

Where: K = hydraulic conductivity (centimeters per second)
D = mean particle diameter (millimeters)
SIGMA PHI = logarithmic standard deviation of grain size distribution

The rate of ground water movement is calculated from Darcy's Law by:

$$V = \frac{KI}{P}$$ (Freeze and Cherry, 1979)

Where:

V	=	average linear velocity
K_{max}	=	maximum hydraulic conductivity
K_{min}	=	minimum hydraulic conductivity
I	=	hydraulic gradient
P	=	effective porosity (assumed to equal total porosity)

Values used to calculate a maximum and minimum flow velocities are:

K_{max}	=	110 feet/day (4.0×10^{-2} centimeters/second)
K_{min}	=	.02 feet/day (6.4×10^{-6} centimeters/second)
I	=	0.001 (1 foot/1,000 feet)
P	=	0.4 (40%)

These values give a maximum calculated ground-water velocity of 0.3 feet per day for silty sands and minimum velocity of 4.4×10^{-5} feet per day for silty clays. Therefore, ground water in the silty sand aquifer would be expected to travel no more than 100 feet per year. Ground-water flow velocities through silty clay aquatards may be as low as 0.02 feet per year based on the above calculations.

In the vicinity of NAF El Centro, perched ground-water levels were reported as shallow as three to five feet below land surface for the noted soil associations (United States Department of Agriculture, 1981). Available geotechnical investigations indicate perched ground-water levels from eight to 15 feet in depth. Recharge of shallow aquifers in the area of NAF El Centro comes from excessive irrigation water, and leakage from area canals and drains. During periods of high ground water, shallow aquifers may discharge into area drains and the New River. In additon, evapotranspiration may significantly lower shallow waters tables.

Ground-water flow in unconfined aquifers at NAF EL Centro is expected to be generally to the northwest, although irrigation, surface drains, and evapotranspiration may locally change flow patterns.

Information about confined aquifers in the vicinity of NAF El Centro is limited. The nearest known deep well is located about 15 miles east northeast of the facility. This well was completed to a depth of 399 feet. Chemical test results from the well indicate high total dissolved solids and high sodium content, yielding the water unsuitable for most uses. An artesian head pressure 10 feet above surface was reported (Morton, 1977).

4.2.4 Migration Potential. Pathways for migration of contaminants include surface water, ground water, and windblown materials.

4.2.4.1 Surface Water. Surface water drainage in the vicinity of NAF El Centro is generally controlled by artificial drains and irrigation canals such as the Rice Canal and Elder Canal, which flow into the New River. Both drains and canals receive irrigation runoff, flow from shallow aquifers, and runoff from storm drainage channels. All surface drains in this area flow into the New River which discharges into the Salton Sea.

4.2.4.2 Ground water. Ground-water flow in unconfined aquifers in the vicinity of NAF EL Centro is generally to the northwest, although irrigation, surface drains and evapotranspiration may locally change flow patterns. Ground water would be expected to travel no more than 100 feet per year. This velocity may be lower in soils such as clays and silts and much higher in clean sands and gravels.

Other factors affecting contaminant migration potential and environmental impact of contaminants include soil attenuation, degradation, diffusion, and chemical reaction. All of these factors can alter the concentrations of contaminants.

4.2.4.3 Windblown Materials. Insufficient data is available on prevailing wind direction and speed to fully determine the potential for windblown contaminants to migrate. Because of the arid climate at NAF El Centro, the potential for migration of contaminated dust should be considered significant for sites with no ground cover and surface contaminants such as asbestos (Site 1 and Site 2).

4.3 WATER SUPPLY AND QUALITY.

4.3.1 Water Supply. Domestic, industrial, and irrigation water supplies for the Imperial Valley are presently obtained from the Colorado River through a series of canals operated by the Imperial Irrigation District. Raw water for NAF El Centro is obtained from the Elder Canal near the southwest corner of the facility as shown on Figure 4.3. Treatment processes include settling, filtration, and chlorination. No backup water supply sources are available.

4.3.2 Ground-water Quality. Ground water in the area of NAF El Centro is presently classified as class III, which is not considered useable as domestic or irrigation water sources due to high dissolved solids content (WESTNAVFACENGCOM, 1982a). Ground water is not currently used for any purpose.

4.3.3 Surface Water Quality. Water quality within the New River is considered poor due to discharge of contaminated water from Mexico as well as various agricultural sources. Test results from the New River are shown in Table 4-4.

Water from area canals is considered usable for agricultrual and domestic proposes. Because both the Elder Canal and Elm Canal are concrete lined, in the area of NAF El Centro, the potential for contamination of water in the canal by ground-water is considered low.

Test results for tile drains in the area of NAF El Centro indicate a range of total dissolved solids from 3,000 to 10,500 parts per million. Selenium concentrations range from near 0 to 94 parts per billion.

TABLE 4-4 New River Water Quality, Naval Air Facility, El Centro, California

Analysis	Location			Units
	International Boundary	Near Sealy	Salten Sea	
Fecal Coliforn	460,000	180,000	4,700	MPN/100ml
Specific Conductance	7,280	6,710	5,600	umhos/cm
Lead	10	15	5	ug/l
Chromium	15	15	15	ug/l
Arsenic	14	14	10	ug/l

(from Gruenberg, 1984) Samples taken September 26-30, 1977

4.4 BIOLOGICAL FEATURES

4.4.1 Ecosystems. NAF El Centro is located in the southern desert portion of California where the Creosote Bush Scrub plant community dominates. The intense agriculture within the Imperial Valley has displaced much of the natural vegetation resulting in the loss of habitat of native birds and small animals. The rivers, canals and drainage channels in the area provide the primary source of refuge for wildlife. Protection of the riparian habitats is encouraged in the Imperial County General Plan.

4.4.1.1 Fauna. The bird species known or presumed to inhabit NAF El Centro or its outlying areas at some time during the year include: Gambel's quail (*Lophortyx gambelii*), mourning dove (*Zenaida macroura*), ground dove (*Columbina passerina*), starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), white-crowned sparrow (*Zonotrichia leucophrys*), and burrowing owl (*Athene cunicularia*). Other species that feed in agricultural areas nearby and may pass through NAF El Centro at certain times of the year are: cattle egret (*Bubulcus ibis*), California gull (*Larus californicus*), rock dove (*Columba livia*), horned lark (*Eremophila alpestris*), and song sparrow (*Melospiza melodia*). Other birds which may be found in the area include the whitewing dove (*Zenadia asiatica*), American coot (*Fulica americana*), roadrunner (*Geococcyx californianus*), common gallinule (*Gallinula chloropus*) and pheasant (Phasianidae).

Most of the small animals in the airfield area are rodents. Studies in similar locales found the Western harvest mouse (*Rheithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus gambeli*), and house mouse (*Mus musculus*) to be common within agricultural areas. Around irrigation canals, the house mouse and the roundtail ground squirrel (*Citellus tereticaudus*) were the most abundunt. Other small mammals found in the general area may include cottontail rabbit (*Oryctolagus cuniculus*), grey fox (*Urocyon cinereoargentaeus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), muskrat (*Ondatra zibethica*), beaver (*Castor canadensis*), badger (*Taxidea taxus*),

raccoon (Procyon lotor), common skunk (Mephitis), roundtail ground squirrels (Citellus tereticaudus), and antelope ground squirrels (Citellus harrisi).

Aquatic riverine habitats currently support carp (Cyprinus carpio), mullet (Crenimugil labrasus), and catfish (Ictalurus nebulosus). Poor water quality presently precludes the spawning and habitation of more desirable species (WESTNAVFACENGCOM, 1982).

4.3.1.2 Flora. The Imperial Valley once supported a variety of desert plants with creosote bush (Larrea divaricata) being the dominant species. Agricultural activity in the area has eliminated most of the native vegetation.

Vegetation found within NAF El Centro is primarily of three different class types: (1) Indigenous and introduced plant species including creosote bush occurs in the undeveloped areas such as the area between the runway and taxiway; (2) Domestic variety landscaping used to enhance community and housing facilites, in the facilities support area. And, (3) Agricultural vegetation grown on those areas of NAF El Centro outleased for that purpose.

The outlease unit consists of approximately 1325 acres, of which 792 acres are cultivatable and 533 acres are maintenance areas. Farmers are permitted to grow alfalfa and other locally adapted row and field crops which serve to control dust and weeds in this area. The unit is used for crop cultivation only, grazing of livestock is not permitted (WESTNAVFACENGCOM, 1982).

4.4.2 Protected Species: The Endangered Species Act of 1973 (Public Law 93-0205), as amended, provides that all federal agencies shall carry out programs for the conservation of listed endangered and threatened species. Federal agencies must ensure that actions authorized, funded, or carried out by them will not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitats as determined by the Secretary of the Interior (OPNAVINST 5090.1, 1983).

The list of endangered and threatened animal and plant species is published in the Federal Register 50 CFR 17.11-17.12. The offical State of California listing of endangered and rare animals is contained in California Administrative Code, Title 14, Section 670.5 (State of California, 1983). The California Native Plant Protection Act of 1978 assigns primary responsibility to the state Department of Fish and Game for determining California plants to be listed as endangered or rare. As of 20 November 1979, the State of California had listed 75 endangered and 40 rare plants. The Department of Fish and Game uses the California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California as their species-of-concern list (California Native Plant Society, 1980).

A species is endangered when its prospects of survival and reproduction are in immediate jeopardy. A species is threatened or rare when, although not immediately facing extinction, it is in such small numbers throughout its range that it may become endangered if its present environmental conditions deteriorate.

Consultation with the California Department of Fish and Game and Federal Bureau of Land Management indicated that no rare or endangered species of plants or animals were likely to be found at or near NAF El Centro. (WESTNAVFACENGCOM, 1982).

The range areas off base may be inhabited by one species of lizard which is currently a candidate species for inclusion on the State of California "threatened" species list. The flat tailed horned lizard (Phrynosoma m'calli) would be expected to be living in some of the range areas. The flat tailed horned lizard is restricted to sandy areas, and likes wind blown sand. Consultation with the California Department of Fish and Game indicated that it is unlikely that this species would be found at NAF El Centro.

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APPENDIX A

AGENCIES CONTACTED DURING THE RECORD SEARCH

Various Government agencies were contacted for information pertinent to the PA/SI effort. Agencies contacted include:

a. Naval Energy and Environmental Support Activity, Port Hueneme, California

b. Ordnance Environmental Support Office, Indian Head, Maryland

c. Western Division, Naval Facilities Engineering Command, San Diego, California

d. Naval Air Station, North Island, San Diego, California

e. United States Geological Survey, EROS Data Center, Sioux Falls, South Dakota

f. Nautical Ocean Services, NOAA, Rockville, Maryland

g. United States Department of Agriculture, ASCS, Salt Lake City, Utah

h. United States Geological Survey, Washington, D. C.

i. California Division of Mines and Geology, Sacramento, California

j. United States Department of Agriculture, Soil Conservation Service, Imperial County, California

k. California Department of Fish and Game, Imperial, California

l. Naval Air Facility, El Centro, California

APPENDIX B

CONTAMINANT QUANTITY CALCULATIONS

B.0 INTRODUCTION. In order to present estimated contaminant quantities within Chapter 2, certain assumptions were made. The following presents the assumptions made and method of each contaminant calculation on a site by site basis. Information from personnel and retiree interviews, environmental surveys, and activity records were also used in these calculations.

B.1 CONTAMINANT QUANTITY CALCULATIONS.

B.1.1 Site 1 - Magazine Road Landfill. The quantities of the contaminants listed in Table 2-1 were calculated as follows:

* Household rubbish - assuming a 50 percent fill for Site 1, household rubbish makes up half of the total volume of the borrow pit.

* Plating waste - based on cleaning the tank twice a year, twice the volume of the tank times the years of operation.

* Asbestos - the number of buildings demolished after 1965 times the average volume of asbestos used in the buildings, assuming full volume penetration of the asbestos and a 70% asbestos insulation mixture (Lorey, 1981).

* Water-bearing fuel - based on 20,000 gallons of contaminated fuel collected every month; 2,000 gallons used for fire fighting training/18,000 gallons disposed of in landfill.

* Paint - Maintenance procedures and duties have not significantly changed over the years of operation of this landfill from current procedures and duties, therefore the total paint waste generated is based on a generation rate of 20 gallons per month (WESTNAVFACENGCOM, 1983).

* Solvents - This quantity is based on the current generation rate of 400 gallons per year. Generation rates have remained consistent since 1972, only the type of solvent used has changed (WESTNAVFACENGCOM, 1972 and 1983).

* Sandblast grit - Based on a generation rate of 400 pounds per month (WESTNAVFACENGCOM, 1982).

* Batteries - The number of ground support vehicles has not changed significantly since 1963. The total quantity is therefore based on a generation rate of 80 batteries per year. Each battery contained about one gallon of acid containing lead.

* Pesticides - Only small amounts of pesticides were used at NAF El Centro. The current generation rate is less than five gallons of dilute pesticide rinse water per month. This generation rate is consistant with those expected over the years of operation of this landfill (WESTNAVFACENGCOM, 1982).

* Motor oil - Based on the current ground support and service station vehicle maintenance generatio ate of 160 g per 90 days, we can calculate total waste motor oil disposed of assuming this rate is consistent with the ates covering the years of operation of this landfill (WESTNAVFACENGCOM, 1983).

* Methyl ethyl ketone - The most common paint thinne used. Total is based on the current paint thinner generation rate of 20 gallons per month.

B.1.2 Site 2 - Patrol Road Landfill. All calculations are consistent with those found in Section B.1.1 (Site 1) with the following exceptions:

* AVGAS - used more frequently during this time period than currently used, AVGAS makes up a larger fraction of the total contaminated fuel

* Mercury Amalgam - based on a generation rate of two pounds per month (WESTNAVFACENGCOM, 1982)

* Acid - based on current generation rate of 35 gallons per six month period; consisted mainly of battery acid

B.1.3 Site 3 - Sludge Burial Area. The total quantity of sludge buried at Site 3 is based on the volume of one sludge drying bed at the current sewage treatment plant (STP).

B.1.4 Site 4 - 4th Street Fire Fighting Training Area. Generation rates of contaminated fuels have been approximately the same over the use of Site 4 as the current generation rates. Approximately 20,000 gallons of water-bearing fuel, consisting of JP-5, AVGAS Regular and Unleaded MOGAS, and Diesel Fuel #2 a e generated each month. In addition, used hydraulic fluid, collected from maintenance areas around the base and contaminated JP-4 from incoming Air Force aircraft are used at Site 4.

The volume fractions, from current inventory records, of fuels used at NAF El Centro are:

JP-5	0.9896
AVGAS	0.0020
MOGAS Regular	0.0013
Unleaded	0.0041
Diesel Fuel #2	0.0030

About 100 gallons of hydraulic fluid per month and approximately 2000 gallons of JP-4 per mont a e collected. The adjusted olume fractions (to include JP-4 and used hydraulic fluid) are:

JP-5	0.9883
JP-4	0.0012
AVGAS	0.0020
MOGAS Regular	0.0013
Unleaded	0.0041
Diesel Fuel #2	0.0030
Hydraulic Fluid (used)	0.0001

These volume fractions can be used to determine total amounts of fuels used at this site. They are based on current quarterly fuel consumptions.

B.1.5 Site 5 - Fire Fighting Training Area East of Hangar #3. Approximately equal quantities of JP-4 and AVGAS were used at Site 5. Each weekend ten burns were performed using ten drums of water-bearing fuel or about 500 gallons. This site was used at least six years.

B.1.6 Site 6 - Northwest Fire Fighting Training Area. Contaminant quantities were calculated assuming:

(1) The years of operation run from the stations inception in 1946 until 1958.

(2) Same amount of operations as the other three fire fighting training areas (including the current one).

(3) The pit was used 12 months per year as was Site 5.

These assumptions were used to calculate total quantities for Site 6.

B.1.7 Site 7 - Abandoned Fuel Farm. Because the only generation of waste (fuel) at this site occured from spillage or unrecovered tank sludge, contaminant quantities are difficult to estimate. However, interviews with long term and retired personnel indicate sufficient spillage of fuels (about two times each month) to warrant further investigation of this site. Each spill was estimated to be about 25 gallons.

B.1.8 Site 8 - Scrapyard. Contaminant quantities were calculated assuming:

(1) a maximum of five transformers were stored at Site 8

(2) average capacity of transformers at this facility is 85 gallons

(3) about half contained PCBs as is the case with transformers at NAF El Centro

(4) 85 gallons leaked into soil

B.1.9 Site 9 - Transformer Storage Area. Photographs depicting leaking transformers, highly stained areas, and up-turned transformers were studied. From these photographs, about one out of every ten transformers had a leak or spilled. The following assumptions also apply:

(1) average capacity of 85 gallons

(2) adequate storage time to totally drain if leaking

(3) about half the total number of transformers contained PCBs

B.1.10 Site 10 - Sewage Stabilization Ponds. The quantities of the contaminants listed in Table 2-10 were calculated as follows:

* Fuels - periodic spills were washed into the sanitary sewer; Exact quantities or number of spills can not be determined. A 300 gallon spill in 1985 of JP-5 is only known quantity.

* Hydraulic Fluid - based on a generation rate of 100 gallons per month.

* Motor Oil - based on a generation rate of 160 gallon per 90 day period.

* Ethylene Glycol - based on current generation rate of 55 gallons per month.

* Trichloroethylene (1954-1972), Carbon Tetrachloride (1946-1954), and Stoddard Solvent (1972-1976) - based on current generation rates of 400 gallons per year and adjusted for period of use (WESTNAVFACENGCOM, 1983).

* Photographic Solutions - based on peak generation rates of:
  1) Black and White developing solutions - 100 gallons per week
  2) Color Processing Solution - 70 gallons per month

* Plating waste - based on two cleanings of the plating tank per year. Includes sludge and liquid wastes.

B.1.11 Site 11 - Runway Burn Area. Information was not available as to the specifics of the operations here. Soil samples will be taken here to verify and quantify, on a sampling point specific basis, any soil contamination present.

B.1.12 Site 12 - Open Burn Pit. Combustible waste was sprayed with 50 gallons of water-bearing fuel once per month over the operational life of the pit.

B.1.13 Site 13 - Old Incinerator. Hazardous waste has never been disposed of at Site 13.

B.1.14 Site 14 - Fuel Farm Tank Rinseate Disposal Area. Contaminant quantities were calculated based on the following assumptions:

1) 5 percent of the total capacity of the storage tanks in the fuel farm represents the amount of product (total) and sludge left in the tanks.

2) Current usage rates were used except:

   a) JP-4 and JP-5 volume fractions changed over time but the total remained about constant

   b) Same principle as (a) applies to MOGAS Regular and Unleaded

B.1.15 Site 15 - Fuel Farm Filter Cleaning Area. Quantities for this site were estimated based on information from past/present fuel farm personnel interviews. 100 gallons of product was disposed of every three years for each filter.

B.1.16 Site 16 - Potassium Ferricyanide Spill Area. The contaminant quantity was determined using the following assumptions (personnel interviews):

1) The tank was full

2) The entire tank content was spilled

B.2 PRESENTATION OF QUANTITIES. All estimated quantities were rounded to the nearest number of one significant digit. Quantities represent total quantity disposed of. Burning and evaporation were not taken into account.

APPENDIX C

TESTING PARAMETERS AND EPA METHODS

C.0 INTRODUCTION. The following categories were used in Chapter 2 to identify a specific subgroup of EPA listed Priority Pollutants to be included in the analysis: Purgeable Organic Carbon Compounds (Purgeable Organics), Acid-extractable Organic Compounds (Acid Extractables), Pesticides/ Polychlorinated Biphenyls (PCBs), Metals, Asbestos, and Total Cyanides.

The following non-Priority Pollutant designations were used: Xylene and Total Petroleum Hydrocarbons.

C.1 PRIORITY POLLUTANTS. The following lists the specific Priority Pollutants for each category with their associated EPA Method Number.

PURGEABLE ORGANIC CARBON COMPOUNDS

Priority Pollutant	EPA Method Number
Acrolein	624
Acrylonitrile	624
Benzene	624
Toluene	624
Ethylbenzene	624
Carbon tetrachloride	624
Chlorobenzene	624
1,2-Dichloroethane	624
1,1,1-Trichloroethane	624
1,1-Dichloroethane	624
1,1-Dichloroethylene	624
1,1,2-Trichloroethane	624
1,1,2,2-Tetrachloroethane	624
Chloroethane	624
2-Chloroethyl vinyl ether	624
Chloroform	624
1,2-Dichloropropane	624
1,3-Dichloropropane	624
Methylene chloride	624
Methyl Chloride	624
Methyl Bromide	624
Bromoform	624
Dichlorobromomethane	624
Trichlorofluoromethane	624
Dichlorodifluoromethane	624
Chlorodibromomethane	624
Tetrachloroethylene	624
Trichloroethylene	624
Vinyl chloride	624
1,2-trans-Dichloroethylene	624
bis(Chloromethyl)ether	624

ACID-EXTRACTABLE CARBON COMPOUNDS

Priority Pollutant	EPA Met od Number
Phenol	625
2-Nitrophenol	625
4-Nitrophenol	625
2,4-Dinitrophenol	625
4,6-Dinitro-o-cresol	625
Pentachlorophenol	625
p-Chloro-m-cresol	625
2-Chlorophenol	625
2,4-Dichlorophenol	625
2,4,6-Trichlorophenol	625
2,4-Dimethylphenol	625

PESTICIDES/POLYCHLORINATED BIPHENYLS (PCBs)

Priority Pollutant	EPA Method Number
(alpha)-Endosulfan	625
(beta)-Endosulfan	625
Endosulfan sulfate	625
(alpha)-BHC	625
(beta)-BHC	625
(delta)-BHC	625
(gamma)-BHC	625
Aldrin	625
Dieldrin	625
4,4'-DDE	625
4,4'-DDD	625
4,4'-DDT	625
Endrin	625
Endrin aldehyde	625
Heptachlor	625
Heptachlor epoxide	608 (GC)
Chlordane	625
Toxaphene	625
Arochlor 1016	625
Arochlor 1221	625
Arochlor 1232	625
Arochlor 1242	625
Arochlor 1248	625
Arochlor 1254	625
Arochlor 1260	625
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	---

METALS[a]

Priority Pollutant	EPA Method Number
Arsenic	206
Cadmium	213
Chromium	218
Copper	220
Lead	239
Mercury	245
Silver	272
Zinc	289

MISCELLANEOUS

Priority Pollutant	EPA Method Number
Asbestos	7400 (NIOSH)
Total Cyanides	335.2

C.2 NON-PRIORITY POLLUTANTS. Only two non-priority pollutant analyses have been recommended. The analysis for xylene uses EPA Method 624. EPA Method 418.1 (GC) can be used to analyze for total petroleum hydrocarbons.

C.3 METHOD DESIGNATIONS. All methods mentioned above are GC/MS EPA Methods unless labelled otherwise.

[a]The appropriate submethod for metals can be determined after detection limits have been identified

APPENDIX D

ACRONYMS/ABBREVIATIONS

AFFF	Aqueous Film Forming Foam
AVGAS	Aviation Gasoline
CERCLA	Comprehensive Environmental Resource, Conservation and Liability Act
CFR	Code of Federal Register
cm/sec	Centimeters per second
CNO	Chief of Naval Operations
CO	Commanding Officer
DF-2	Diesel Fuel #2
DOD	Department of Defense
DRMO	Defense Reutilization and Marketing Office
EFD	Naval Facilities Engineering Command Engineering Field Division
EPA	Environmental Protection Agency
GC	Gas chromatography
IR	Installation Restoration
Mmhos/cm	Millimhos per centimeter
MS	Mass spectrometry
MSL	Mean sea level
MW	Monitoring well
NAAS	Naval Auxillary Air Station
NAF	Naval Air Facility
NALF	Naval Auxillary Landing Field
NAS	Naval Air Station
NAVFACENGCOM	Naval Facilities Engineering Command
NCP	National Contingency Plan
NEESA	Naval Energy and Environmental Support Activity
NEPSS	Naval Environmental Protection Support Services
NIOSH	National Institute for Occupational Safety and Health
NPTR	National Parachute Test Range
PA/SI	Preliminary Assessment/Site Inspection
PCB	Polychlorinated BiPhenols
pH	Measure of Hydrogen ion content
RI/FS	Remedial Investigation/Feasibility Study
SARA	Superfund Amendments and Reauthorization Act of 1986
STP	Sewage Treatment Plant
USDA	United States Department of Agriculture
WESTNAVFACENGCOM	Western Division, Naval Facilities Engineering Command

APPENDIX E

PRELIMINARY ASSESSMENT AND SITE INSPECTION FORMS

This appendix presents the necessary Preliminary Assessment Forms (EPA Form 2070-12) and Site Inspection Report Forms (EPA Form 2070-13) for each of the sixteen sites identified at Naval Air Facility, El Centro, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 1

MAGAZINE ROAD LANDFILL

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: CA | 02 SITE NUMBER: 106-01

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Site 1 - Magazine Road Landfill	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE: 324923. LONGITUDE: 1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road): From Interstate 8, go north on Bennet Road to the base gate. Continue north on "B" Street to Patrol Road. Turn west on Patrol Road and continue around the end of the airfield. Site 1 is located at the southeast corner of the intersection of Patrol Road and Magazine Road.

III. RESPONSIBLE PARTIES

01 OWNER (if known): U. S. Navy	02 STREET (Business, mailing, residential): NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner): Same as owner	08 STREET (Business, mailing, residential):

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01 / 12 / 87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S):

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1965 (BEGINNING YEAR) | 1983 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Household rubbish, plating waste, asbestos, water-bearing fuel, paint, solvent, spent 40mm cartridges, photographic chemicals, sandblast grit, motor oil, paint thinners, pesticide containers, batteries.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Site 1 is the lowest elevation on the base. Potential exists for contaminant migration through the ground water to cultivated fields or through the surface water to irrigation ditches. Potential for asbestos migration by wind.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 / 10 / 87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-01

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. The bottom of the landfill is probably below the water table.

01 X B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Site 1 is the lowest elevation on the base, so surface water tends to flow to the landfill. Contaminants may nigrate by means of nearby drainage ditches.

01 X C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Asbestos

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 X F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 4 (Acres) — 04 NARRATIVE DESCRIPTION

The soil surrounding the landfill may be contaminated.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-01

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- X A SOLID
- B. POWDER, FINES
- X C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS 37,000

NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- X H IGNITABLE
- X I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	30,000	cubic feet	metal sludges
OLW	OILY WASTE	4,000,000	gallons	JP-4,JP-5,diesel,MOGAS,motor oil
SOL	SOLVENTS	13,000	gallons	halogenated and non-halogenated
PSD	PESTICIDES	10,000	gallons	rinse water
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	5,000	cubic feet	asbestos
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	90,000	pounds	sand blasting grit

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SLU	Cadmium	7440439	in metal sludges		
SLU	Arsenic	7440382	in metal sludges		
OLW	JP-5		Landfill - burning		
OLW	JP-4		Landfill - burning		
OLW	Diesel Fuel #2		Landfill - burning		
OLW	Leaded Gasoline	8006619	Landfill - burning		
OLW	Unleaded MOGAS		Landfill - burning		
OLW	Aviation Gasoline		Landfill - burning		
SOL	Trichloroethylene	79-01-6	Landfill - burning		
SOL	Tetrachloroethylene	127184	Landfill - burning		
SOL	Methyl Ethyl Ketone		Landfill - burning		
IOC	Asbestos	1332214	Landfill		
IOC	Silver	7440224	in photo solutions		
IOC	Lead	7439921	in photo solutions		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, interviews

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EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-01

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☒ ALLEGED
04 NARRATIVE DESCRIPTION

Irrigated crops are grown nearby.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Same as Part II, Section VI

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 01

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 1 - Magazine Road Landfill	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
324923	1153950	☐ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION (BEGINNING YEAR / ENDING YEAR)
01 12 87	☐ ACTIVE ☒ INACTIVE	1965 / 1983 ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Name of firm)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	0800	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 10 87

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 01

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [ ] B. POWDER, FINES
- [X] C. SLUDGE
- [ ] D. OTHER _____ (Specify)
- [ ] E. SLURRY
- [X] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS 37,000
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [X] G. FLAMMABLE
- [X] H. IGNITABLE
- [X] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	30,000	cubic feet	metal sludges
OLW	OILY WASTE	4,000,000	gallons	JP-4,JP-5,diesel,MOGAS,motor oil
SOL	SOLVENTS	13,000	gallons	halogenated and non-halogenated
PSD	PESTICIDES	10,000	gallons	rinse water
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	5,000	cubic feet	asbestos
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	90,000	pounds	sand blasting grit

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SLU	Cadmium	7440439	in metal sludges		
SLU	Arsenic	7440382	in metal sludges		
OLW	JP-5		Landfill - burning		
OLW	JP-4		Landfill - burning		
OLW	Diesel Fuel #2		Landfill - burning		
OLW	Leaded Gasoline	8006619	Landfill - burning		
OLW	Unleaded MOGAS		Landfill - burning		
OLW	Aviation Gasoline		Landfill - burning		
SOL	Trichloroethylene	79-01-6	Landfill - burning		
SOL	Tetrachloroethylene	127184	Landfill - burning		
SOL	Methyl Ethyl Ketone		Landfill - burning		
IOC	Asbestos	1332214	Landfill		
IOC	Silver	7440224	in photo solutions		
IOC	Lead	7439921	in photo solutions		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 01

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. The bottom of the landfill is probably below the water table.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Site 1 is the lowest elevation on the base, so surface water tends to flow to the landfill. Contaminants may migrate by means of nearby drainage ditches.

01 ☒ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Asbestos

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 4 (Acres) — 04 NARRATIVE DESCRIPTION

The soil surrounding the landfill may be contaminated.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-01

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Irrigated crops are grown nearby.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-01

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☒ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	37,000	cubic yds
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☒ H. OTHER open burning (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE: 4 (Acres)

07 COMMENTS

Site 1 was the only base landfill from 1965 to 1983. Burning was conducted about once per month throughout the operation of the site.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The waste has been covered with soil

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 01

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1 (mi)

B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA

☐ YES ☒ NO

COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA

☐ YES ☒ NO

COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
drainage ditches	☐	< .1 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION .5 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

276 Buildings on NAF El Centro approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING .25 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 01

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	1 %	Northwest	1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. < .1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site 1 is the lowest elevation on NAF El Centro. The Salton Sea Wildlife Refuge is approximately 16 miles north of NAF El Centro.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 01

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 01

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 01

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME: U.S. Navy	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.): NAF El Centro	04 SIC CODE:
05 CITY: El Centro	06 STATE: CA
07 ZIP CODE: 92243-5001	
08 YEARS OF OPERATION: 1965-1983	09 NAME OF OWNER: U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

01 NAME:	02 D+B NUMBER:
03 STREET ADDRESS (P.O. Box, RFD #, etc.):	04 SIC CODE:
05 CITY:	06 STATE:
07 ZIP CODE:	
08 YEARS OF OPERATION:	09 NAME OF OWNER DURING THIS PERIOD:

10 NAME:	11 D+B NUMBER:
12 STREET ADDRESS (P.O. Box, RFD #, etc.):	13 SIC CODE:
14 CITY:	15 STATE:
16 ZIP CODE:	

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-01

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-01

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ S. CAPPING/COVERING — 02 DATE 1983 — 03 AGENCY U.S. Navy
04 DESCRIPTION
The landfill was covered with soil.

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-01

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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EPA	POTENTIAL HAZARDOUS WASTE SITE FINAL STRATEGY DETERMINATION	REGION IX	SITE NUMBER 106-01

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 1 - Magazine Road Landfill	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 2

PATROL ROAD LANDFILL

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-02

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 2 - Patrol Road Landfill	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road) From Interstate 8 go north on Bennett Road to the base gate. Continue north on "B" Street to Patrol Road. Go right on Patrol Road around the runway. Site 2 is parallel to the taxiway and lies between Patrol Road and the runway.

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/12/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S):

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1946 (BEGINNING YEAR) 1965 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Household rubbish, paint, solvents, photographic chemicals, asbestos, water-bearing fuels, hydraulic fluid, mercury amalgam, batteries, sandblast grit, pesticides, battery acid, motor oil, demolition debris.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Potential migration of contaminants by ground water, surface water to New River. Migration of asbestos by wind is possible. Possible receptors include small animals, birds and vegetation.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-02

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- X A SOLID
- B POWDER, FINES
- X C SLUDGE
- E SLURRY
- X F LIQUID
- G GAS
- D. OTHER _____ (Specify)

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS 350,000
- NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	4,000,000	gallons	JP-4, JP-5, diesel, AVGAS, MOGAS
SOL	SOLVENTS	13,000	gallons	MEK, CCl_4, $C_2H_2Cl_4$, TCE, Freon-113
PSD	PESTICIDES	1,000	gallons	chlorinated pesticides
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	50,000	cubic feet	asbestos
ACD	ACIDS	2,000	gallons	battery acid, also the battery
BAS	BASES			
MES	HEAVY METALS	100,000	pounds	sandblast grit

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	AVGAS		Landfill		
OLW	Jet fuel (JP-4 & JP-5)		Landfill		
OLW	Diesel fuel		Landfill		
OLW	Regular MOGAS		Landfill		
OLW	Hydraulic fluid		Landfill		
SOL	Methyl ethyl ketone		Landfill		
SOL	Trichloroethylene	79-01-6	Landfill		
SOL	Carbon Tetrachloride	56-23-5	Landfill		
SOL	Tetrachloroethylene	127-18-4	Landfill		
PSD	Chlorinated pesticides		Landfill		
IOC	Asbestos	1332-21-4	Landfill		
IOC	Mercury amalgam		Landfill		
IOC	Sandblast grit		Landfill		
ACD	Battery acid		Landfill		
IOC	Batteries		Landfill		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, engineering field division records, personnel interviews, site visits, aerial photographs, geological reports, base maps

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-02

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Ground water is shallow, approximately 8-12 feet below the bottom of the landfill. No digging was done to create this landfill.

01 X B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Waste was placed into a deep wash and covered.

01 X C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

A white substance believed to a asbestos was observed on the surface of the landfill.

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 X F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 30 (Acres) — 04 NARRATIVE DESCRIPTION

The surrounding soil where the material was buried may be contaminated. The debris scattered over the 30 acre site may have contaminated additional soil.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-02

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Irrigated crops are grown nearby.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Crops are grown hearby.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
Low potential since the receiving stream is the New River.

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION
The unlined drainage ditches and the Elder Canal run along the site boundary; which empty into the New River.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Same as Part II, Section VI

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-02

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Site 2 - Patrol Road Landfill	NAF El Centro				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
324923	1153950	☐ A. PRIVATE ☒ B. FEDERAL US Navy ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
01 12 87 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1946 (BEGINNING YEAR) 1965 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT		Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 10 87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-02

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [X] A. SOLID
- [ ] B. POWDER, FINES
- [X] C. SLUDGE
- [ ] D. OTHER _____ (Specify)
- [ ] E. SLURRY
- [X] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS 350,000
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- [X] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [X] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [X] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	4,000,000	gallons	JP-4, JP-5, diesel, AVGAS, MOGAS
SOL	SOLVENTS	13,000	gallons	MEK, CCl_4, $C_2H_2Cl_4$, TCE, Freon-113
PSD	PESTICIDES	1,000	gallons	chlorinated pesticides
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	50,000	cubic feet	asbestos
ACD	ACIDS	2,000	gallons	battery acid, also the battery
BAS	BASES			
MES	HEAVY METALS	100,000	pounds	sandblast grit

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	AVGAS		Landfill		
OLW	Jet fuel (JP-4 & JP-5)		Landfill		
OLW	Diesel fuel		Landfill		
OLW	Regular MOGAS		Landfill		
OLW	Hydraulic fluid		Landfill		
SOL	Methyl ethyl ketone		Landfill		
SOL	Trichloroethylene	79-01-6	Landfill		
SOL	Carbon Tetrachloride	56-23-5	Landfill		
SOL	Tetrachloroethylene	127-18-4	Landfill		
PSD	Chlorinated pesticides		Landfill		
IOC	Asbestos	1332-21-4	Landfill		
IOC	Mercury amalgam		Landfill		
IOC	Sandblast grit		Landfill		
ACD	Battery acid		Landfill		
IOC	Batteries		Landfill		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 02

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Ground water is shallow, approximately 8-12 feet below the bottom of the landfill. No digging was done to create this landfill.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Waste was placed into a deep wash and covered.

01 ☒ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

A white substance believed to a asbestos was observed on the surface of the land.

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 30 (Acres) — 04 NARRATIVE DESCRIPTION

The surrounding soil where the material was buried may be contaminated. The debris scattered over the 30 acre site may have contaminated additional soil.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 02

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 [X] J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Irrigated crops are grown nearby.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 [X] L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Crops are grown nearby.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 [X] N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Low potential since the receiving stream is the New River.

01 [X] O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — [X] POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

The unlined drainage ditches and the Elder Canal run along the site boundary; which empty into the New River.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 02

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☒ B. PILES	Unknown	
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	~~100,000~~	cubic yd
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

30 (Acres)

07 COMMENTS

A natural wash was used for landfilling operations. The 30 acres is the area which was used for above ground disposal.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☒ YES ☐ NO

02 COMMENTS

The waste disposed of on the surface is accessible by people on the base.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-02

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 0.75 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA
☐ YES ☒ NO
COMMENTS: The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA
☐ YES ☒ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
drainage ditch	☐	< 0.1 (mi)
Elder Canal	☐	< 0.1 (mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600	B. 1600	C. 1720
NO OF PERSONS	NO OF PERSONS	NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION _____ (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING _____ (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-02

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< 1 %	north	< 1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. _____ (mi)

14. DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The Salton Sea Wildlife Refuge is approximately 16 miles to the north. Landfilling was conducted in a naturally occuring wash. The was completely filled. Demolition debris was disposed of on the surface of the 30 acre site.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 02

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 02

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 02

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 02

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-02

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ S. CAPPING/COVERING — 02 DATE 1965 — 03 AGENCY U.S. Navy
04 DESCRIPTION The landfill portion of the site was covered with soil. The cap is shallow and incomplete.

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

On-site survey, activity records, personnel interviews.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-02

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity Records.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106-02

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 2 - Patrol Road Landfill	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State, Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 3

SLUDGE BURIAL AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-03

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 3 - Sludge Burial Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road) From Interstate 8 go north on Bennett Road to the base gate. Continue north on "B" Street. At Patrol Road head right around the runway. Site 3 is located at the northern boundary of the base, about 500 feet east of the sewage stabilization ponds.

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/12/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1986 (BEGINNING YEAR) | 1986 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

800 cubic feet of sewage sludge

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

The sludge may contain metals such as silver and cyanides.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-03

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- X C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS 90
NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	90	cubic yards	WWTP Sludge
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	Silver	7440-22-4	Burial in sludge		
IOC	Cyanide	57125	Burial in sludge		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, Interviews

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-03

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Ground water is shallow, approximately 8-12 feet deep. Sludge was buried at a depth of about 5 feet

01 [ ] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [ ] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: small (Acres) — 04 NARRATIVE DESCRIPTION

Sludge is buried in a pit approximately 20 feet X 10 feet X 5 feet deep.

01 [ ] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED. _____ — 04 NARRATIVE DESCRIPTION

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-03

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

Crops are grown nearby, however, metals are relatively immobile in silty clays such as are found at NAF El Centro

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

Crops are grown nearby.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, personnel interviews.

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-03

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 3 - Sludge Burial Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES — LATITUDE: 324923 — LONGITUDE: 1153950

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☒ B. FEDERAL US Navy ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
01/12/87 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1986 (BEGINNING YEAR) 1986 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1200	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 03

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS 90
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	90	cubic yards	WWTP Sludge
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	Silver	7440-22-4	Burial in sludge		
IOC	Cyanide	57125	Burial in sludge		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106- 03

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

Ground water is shallow, approximately 8-12 feet deep. Sludge was buried at a depth of about 5 feet

01 ☐ B. SURFACE WATER CONTAMINATION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL
02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: small (Acres)
04 NARRATIVE DESCRIPTION

Sludge is buried in a pit approximately 20 feet X 10 feet X 5 feet deep.

01 ☐ G. DRINKING WATER CONTAMINATION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-03

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

Crops are grown nearby, however, metals are relatively immobile in ailty clays such as are found at NAF El Centro

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

Crops are grown nearby.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES *(Spills, Runoff, Standing liquids, Leaking drums)* — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED

04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 03

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☒ A. NPDES	CA0104906			
☒ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☒ F. LANDFILL	800	cubic feet
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER ____ (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER ____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE: 0.05 (Acres)

07 COMMENTS

The treated sludge was disposed of in a pit 20 feet by 10 feet by 5 feet deep.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☒ B. MODERATE ☐ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

The silty clay soil present at this site would decrease the mobility of the metals potentially present.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The sludge was buried

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 03

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)	SURFACE	WELL	02 STATUS: ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☒	B. ☐	A. ☐	B. ☐	C. ☐	A. 2 (mi)
NON-COMMUNITY	C. ☐	D. ☐	D. ☐	E. ☐	F. ☐	B. (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	(gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS: The irrigation areas may recharge the upper Aquifer which is unused.	☐ YES ☒ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
drainage ditch	☐	< 0.1 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION 1.0 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.2 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-03

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< 1 %	north	< 1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

_____ (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The sludge burial pit is not visible from the surface. This area was recently graded prior to the PA/SI.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 03

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER Sludge		Analytical results in STP log.	

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity (Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

The analytical results printed in the PA/SI were obtained from the STP operator.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-03

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME U.S. Navy	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) NAF El Centro	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY El Centro	06 STATE CA	07 ZIP CODE 92243-5001	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable, list most recent first)		
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 03

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1986	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-03

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 03

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-03

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 03

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 3 - Sludge Burial Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State, Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 4

4TH STREET FIRE FIGHTING TRAINING AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-04

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 4 - 4th Street Fire Fighting Training Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial		

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road)
From Interstate 8 go north on Bennett Road to the base gate. Continue north on "B" Street to Patrol Road. Site 4 is on the left side of Patrol Road, midway between "C" and "D" Streets.

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/12/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1963 (BEGINNING YEAR) | 1975 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
JP-5, JP-4, Aviation gasoline, MOGAS (regular), Diesel fuel #2, used Hydraulic fluid.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Migration of contaminants is possible to the Elder Canal.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-04

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO OF DRUMS 3,700

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	200,000	gallons	Burned on top of a water layer.
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-5		Burned on water layer		
OLW	JP-4		Burned on water layer		
OLW	AVGAS		Burned on water layer		
OLW	MOGAS	8006619	Burned on water layer		
OLW	Hydraulic Fluid		Burned on water layer		
OLW	Diesel Fuel #2		Burned on water layer		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, Engineering Field Division records, Personnel Interviews, Site Visits, Aerial Photos, Geological Reports.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-04

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 X F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

The soil surrounding the site may be contaminated with the fuels used and lead.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-04

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

The ground water may flow into the Elder Canal, which flows into the New River (A poor quality water river)

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, Engineering Field Division Records, Interviews, Geological Reports, Site Visit

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 04

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 4 - 4th Street Fire Fighting Training Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
324923	1153950	☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION (BEGINNING YEAR / ENDING YEAR)
01,12,87	☐ ACTIVE ☒ INACTIVE	1963 / 1975 ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1400	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06,10,87 (MONTH DAY YEAR)

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REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 04

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS _____
- NO. OF DRUMS 3,700

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	200,000	gallons	Burned on top of a water layer.
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-5		Burned on water layer		
OLW	JP-4		Burned on water layer		
OLW	AVGAS		Burned on water layer		
OLW	MOGAS	8006619	Burned on water layer		
OLW	Hydraulic Fluid		Burned on water layer		
OLW	Diesel Fuel #2		Burned on water layer		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 04

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

The soil surrounding the site may be contaminated with the fuels used and lead.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106- 04

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

The ground water may flow into the Elder Canal, which flows into the New River (A poor quality water river)

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 04

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER Burn Pit (Specify)	200,000	gallon

04 TREATMENT (Check all that apply)

- ☒ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

0.004 (Acres)

07 COMMENTS

A small pit was used for fire fighter training. Water was placed in the pit, then a fuel layer was ignited on top.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

Waste is within soil at site

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 04

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1 (mi)

B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA

☐ YES ☒ NO

COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA

☐ YES ☒ NO

COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	_____ (mi)
	☐	_____ (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION _____ (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE

276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING _____ (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 04

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< 1 %	northwest	< 1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: _____

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Small circular area. Identical to surrounding unpaved areas. Sparsely vegetated.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 04

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 04

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER	08 NAME	09 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 04

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 04

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER	
U.S. Navy		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
NAF El Centro		
05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 04

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-04

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106-04

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 4 - 4th Street Fire Fighting Training Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

REPRODUCED AT GOVERNMENT EXPENSE

REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 5

FIRE FIGHTING TRAINING AREA EAST OF HANGAR #3

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-05

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Site 5 - Fire Fighting Training Area East of Hangar #3	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road): From Interstate 8 go north on Bennett Road to the base gate. Head north on "A" Street for about 3/4 of a mile. Hangar #3 is a large building on the right side of "A" Street. The training area is about 600 feet east of Hangar #3.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/12/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1958 (BEGINNING YEAR) | 1963 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

JP-4, Aviation gasoline (AVGAS)

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Possible lead contamination remaining at the site.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-05

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO OF DRUMS 3,000

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- X H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	160,000	Gallons	JP-4, AVGAS
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-4		Stored in an unlined		
OLW	AVGAS		pit until burned		
			weekly.		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Interviews, Activity records, Engineering Field Division Records, Aerial Photos, Geological Report.

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-05

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. It has been 25 years since the area was last used.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: small (Acres) — 04 NARRATIVE DESCRIPTION

Lead from fuels may remain in the silty clay soil.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-05

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

The only hazard remaining is possible lead contamination in soil.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, Engineering Field Division Records, Interviews, Geological Reports, Site visits

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-05

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 5 - Fire Fighting Training Area East of Hangar #3	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
324923	1153950	☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION
01,12,87	☐ ACTIVE ☒ INACTIVE	1958 (BEGINNING YEAR) 1963 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT		Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06,10,87

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-05

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS 3,000

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	160,000	gallons	JP-4, AVGAS
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-4		Stored in an unlined		
OLW	AVGAS		pit until burned		
			weekly.		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 05

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. It has been 25 years since the area was last used.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: small (Acres) — 04 NARRATIVE DESCRIPTION

Lead from fuels may remain in the silty clay soil.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-05

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

The only hazard remaining is possible lead contamination in soil.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 05

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☒ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☒ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER Burn pit (Specify)		

04 TREATMENT (Check all that apply)

- ☒ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

.045 (Acres)

07 COMMENTS

Site 5 was a fifty foot diameter unlined area surrounded by an earthern berm. Fuels were stored in this bermed area throughout the week until the fire training exercises were conducted on the weekend.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The contaminants potentially present have been in the soil for approximately 25 years.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-05

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING
☐ B. DRINKING (Other sources available)
COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available)
☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available)
☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA
☐ YES
☒ NO
COMMENTS: The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA
☐ YES
☒ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE
☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES
☒ C. COMMERCIAL, INDUSTRIAL
☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	_____ (mi)
	☐	_____ (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION < .1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING < .1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 05

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< 1 %	northwest	< 1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. .5 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site 5 is no longer visible from the surface.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 05

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 05

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME U.S. Navy		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) NAF El Centro		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY El Centro	06 STATE CA	07 ZIP CODE 92243-5001	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable, list most recent first)		
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 05

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1958-1963	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 05

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 05

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-05

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 05

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (*EN-335*); 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 5 - Fire Fighting Training Area East of Hangar #3	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
TOTAL ESTIMATED COST	$	

Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State, Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

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PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 6

NORTHWEST FIRE FIGHTING TRAINING AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-06

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 6 - Northwest Fire Fighting Training Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
32 49 23.	115 39 50.

10 DIRECTIONS TO SITE (Starting from nearest public road)
From Interstate 8 go north on Bennet Road to the base gate. Continue north on B Street to Patrol Road. Remain on Patrol Road to the sewage treatment plant. Site 6 is located about 750 feet east of the STP, within irrigated land field "C".

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/13/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1946 (BEGINNING YEAR) 1958 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Aviation gasoline (AVGAS)

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Potential for lead-contaminated soil in a cultivated field.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-06

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO OF DRUMS 5,500

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- H IGNITABLE
- X I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	300,000	Gallons	Aviation Gasoline
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	Aviation Gasoline		Stored in an unlined pit, burned weekly.		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Interviews, Activity records, Engineering Field Division Records, Aerial Photography, Base Maps, Geological Reports.

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-06

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. The site was last used in 1958.

01 [ ] B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: .045 (Acres)
02 [ ] OBSERVED (DATE _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Lead from the AVGAS may be present in the silty clay.

01 [ ] G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA | 02 SITE NUMBER: 106-06

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Crops are grown in this area.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Crops such as hay and alfalfa are grown in this area.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

The only hazard remaining 30 years after the pit's last use is lead in the soil and its potential to be found in the crops.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, Engineering Field Division Records, Interviews, Geological Reports, Site visits, Base maps, Aerial Photos

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 06

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 6 - Northwest Fire Fighting Training Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
324923	1153950	☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION (BEGINNING YEAR / ENDING YEAR)
01 13 87	☐ ACTIVE ☒ INACTIVE	1946 / 1958 ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ___ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ___ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR ___ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Name of firm)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT		Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 10 87

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 06

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS 5,500

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	300,000	gallons	Aviation Gasoline
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	Aviation Gasoline		Stored in an unlined pit, burned weekly.		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 06

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. The site was last used in 1958.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: .045 (Acres) — 04 NARRATIVE DESCRIPTION

Lead from the AVGAS may be present in the silty clay.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-06

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☒ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Crops are grown in this area.

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☒ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Crops such as hay and alfalfa are grown in this area.

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

The only hazard remaining 30 years after the pit last use in lead in the soil and its potential to be found in the crops.

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 06

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☒ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☒ A. SURFACE IMPOUNDMENT	300,000	gallons
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER Burn Pit (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

.045 (Acres)

07 COMMENTS

The waste AVGAS was stored in the unlined pit as it was generated throughout the week. The fire training exercises were conducted on weekends.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

Any remaining lead from the AVGAS would be in the sility clay soil of the site.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 06

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 2 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.	☐ YES ☒ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	_____ (mi)
	☐	_____ (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION .25 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING .25 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 06

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< 1 %	northwest	< 1% %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Site 6 is not visible from the surface.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 06

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 06

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 06

II. CURRENT OPERATOR (Provide if different from owner)			OPERATOR'S PARENT COMPANY (If applicable)		
01 NAME: U.S. Navy	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.): NAF El Centro	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY: El Centro	06 STATE: CA	07 ZIP CODE: 92243-5001	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION: 1946-1958	09 NAME OF OWNER: U.S. Navy				

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)			PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)		
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 06

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 06

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-06

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106-06

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 6 - Northwest Fire Fighting Training Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 7

ABANDONED FUEL FARM

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-07

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Site 7 - Abandoned Fuel Farm

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: NAF El Centro

03 CITY: El Centro

04 STATE: CA

05 ZIP CODE: 92243-5001

06 COUNTY: Imperial

07 COUNTY CODE: 025

08 CONG DIST: 38

09 COORDINATES LATITUDE: 324923.

LONGITUDE: 1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road)
From Interstate 8 go north on Bennet Road to the base gate. Continue north on B Street, then left on Patrol Road. The fuel farm is located north of Patrol Road, mostly between B and C Streets.

III. RESPONSIBLE PARTIES

01 OWNER (If known): U. S. Navy

02 STREET (Business, mailing, residential): NAF El Centro

03 CITY: El Centro

04 STATE: CA

05 ZIP CODE: 92243-5001

06 TELEPHONE NUMBER: (619) 339-2201

07 OPERATOR (If known and different from owner): Same as owner

08 STREET (Business, mailing, residential):

09 CITY:

10 STATE:

11 ZIP CODE:

12 TELEPHONE NUMBER: ( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/13/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)

CONTRACTOR NAME(S):

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1942 (BEGINNING YEAR) 1958 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
water bearing fuel: AVGAS, JP-4, MOGAS, Diesel fuel

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Possible lead contamination of the soil in the area.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Naval Energy and Environmental Support Activity

02 OF (Agency/Organization): U. S. Navy

03 TELEPHONE NUMBER: (805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT: Jeffrey L. Hendrix

05 AGENCY: Navy

06 ORGANIZATION: NEESA

07 TELEPHONE NUMBER: (805) 982-3449

08 DATE: 06/10/87 (MONTH DAY YEAR)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-07

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO OF DRUMS 800

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- X H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	40,000	Gallons	Due to Spillage & Sludge
SOL	SOLVENTS			left in abandoned tanks
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	AVGAS (Aviation gasoline)		Spillage		
OLW	JP-4 (jet fuel)		Spillage		
OLW	MOGAS	8006619	Spillage		
OLW	Diesel fuel		Spillage		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, Personnel Interviews, Engineering Field Division, Records, Aerial Photographs, Base Map, Geological Reports.

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REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-07

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. It has been 29 years since the last spillage.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 X F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) — X POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 8 (Acres) — 04 NARRATIVE DESCRIPTION

The fuel spills seeped into the soil. Sludge was disposed of in place.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-07

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids, leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The abandoned fuel farm is between the current taxiway and the runway.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, Engineering Field Division Records, Personnel Interviews, Geological Reports, Site Visits.

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 07

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 7 - Abandoned Fuel Farm	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES — LATITUDE: 32 49 23. LONGITUDE: 115 39 50.

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 01/13/87 (MONTH DAY YEAR)

02 SITE STATUS: ☐ ACTIVE ☒ INACTIVE

03 YEARS OF OPERATION: 1942 (BEGINNING YEAR) 1958 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Specify)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1000	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS 800

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	40,000	gallons	Due to Spillage & Sludge
SOL	SOLVENTS			left in abandoned tanks
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	AVGAS (Aviation gasoline)		Spillage		
OLW	JP-4 (jet fuel)		Spillage		
OLW	MOGAS	8006619	Spillage		
OLW	Diesel fuel		Spillage		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8-12 feet deep. It has been 29 years since the last spillage.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 8 (Acres) — 04 NARRATIVE DESCRIPTION

The fuel spills seeped into the soil. Sludge was disposed of in place.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☐ J DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M UNSTABLE CONTAINMENT OF WASTES *(Spills, Runoff, Standing liquids, Leaking drums)* — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The abandoned fuel farm is between the current taxiway and the runway.

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☒ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☒ E. TANK, BELOW GROUND	11	tanks
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER ___ (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER ___ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

8 (Acres)

07 COMMENTS

Site 7 - Abandoned fuel farm consisted of five 50,000 gallon underground concrete storage tanks and six 25,000 gallon underground concrete storage tanks. In 1958 the fuel was removed and the tanks were crushed and filled with dirt. During the site's operational history, spills often occured during regueling and fuel tansfers.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The site is located between a runway and a taxiway. It is not accessible.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-07

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS	ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☒	B. ☐		A. ☐	B. ☐	C. ☐	A. 1 (mi)
NON-COMMUNITY	C. ☐	D. ☐		D. ☐	E. ☐	F. ☐	B. (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	(gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.	☐ YES ☒ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	(mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION 1/8 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING 1/8 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 07

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	<1 %	very flat	< 1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The abandoned fuel farm is located between Taxiway "A" and Runway 26. The area is very flat.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME U.S. Navy	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) NAF El Centro	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY El Centro	06 STATE CA	07 ZIP CODE 92243-5001	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable, list most recent first)		
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1942-1958	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 07

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-07

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 07

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 7 - Abandoned Fuel Farm	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 8

SCRAPYARD

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-08

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 8 - Scrapyard	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road)

From Interstate 8 go north on Bennett Road to the base gate. Continue north on B Street, turn west onto Patrol Road. Drive around the airfield, Site 8 is located near to and parallel to Building 493.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)

☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES DATE 01/13/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION 1958 (BEGINNING YEAR) 1982 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Possible PCB and waste paint contamination of soil.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Migration of ground water or surface water may lead to nearby unlined drainage ditches and eventually to the New River.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-08

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	200	Gallons	Transformer fluid
IOC	INORGANIC CHEMICALS	unknown		Paint
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	PCBs	1336363	Leakage from transformers		
IOC	Paint		Leakage		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, personnel interviews, engineering field division records, aerial photographs, base maps, geologic reports.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE CA	02 SITE NUMBER 106-08

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8 to 12 feet deep.

01 [X] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Unlined drainage ditches run nearby Site 8.

01 [X] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE: _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

The site is flat with no ground cover.

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL — 02 [ ] OBSERVED (DATE: _____) — [X] POTENTIAL — [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: 3 (Acres) — 04 NARRATIVE DESCRIPTION

Any leaks which may have occured would have gone to the soil.

01 [ ] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-08

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Any PCBs or metals in the soil would have a low migration potential due to the clayey-silty soil.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See page REF-1 of the Preliminary Assessment/ Site Inspection Report.

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REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 08

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 8 - Scrapyard	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
32 49 23.	115 39 50.

10 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION (BEGINNING YEAR / ENDING YEAR)
01 13 87	☐ ACTIVE ☒ INACTIVE	1958 / 1982 ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Name of firm)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1200	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 10 87

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-08

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	200	gallons	Transformer fluid
IOC	INORGANIC CHEMICALS	unknown		Paint
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	PCBs	1336363	Leakage from transformers		
TOC	Paint		Leakage		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-08

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water is shallow, approximately 8 to 12 feet deep.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Unlined drainage ditches run nearby Site 8.

01 ☒ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The site is flat with no ground cover.

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 3 (Acres) — 04 NARRATIVE DESCRIPTION

Any leaks which may have occured would have gone to the soil.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106- 08

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ K. DAMAGE TO FAUNA
04 NARRATIVE DESCRIPTION (Include name(s) of species)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ L. CONTAMINATION OF FOOD CHAIN
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums)
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING
04 NARRATIVE DESCRIPTION
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Any PCBs or metals in the soil would have a low migration potential due to the clayey-silty soil.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 08

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER Scrapyard (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☒ A. BUILDINGS ON SITE

06 AREA OF SITE: 3 (Acres)

07 COMMENTS

Approximately five transformers may have leaked their contents onto the soil.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE: ☐ YES ☒ NO

02 COMMENTS

The scrapyard is fenced.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 08

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as appropriate)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	(gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.	☐ YES ☒ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
drainage ditches	☐	20 ft
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION 40 ft

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING _____ (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-08

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< 1 %	very flat	< 1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. < .1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The area is very flat. Site 2, the Patrol Road Landfill is located to the south and west of the scrapyard.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-08

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 08

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME U.S. Navy		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.) NAF El Centro		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY El Centro	06 STATE CA	07 ZIP CODE 92243-5001	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME		02 D+B NUMBER	08 NAME		09 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	10 STREET ADDRESS (P.O. Box, RFD #, etc.)		11 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable, list most recent first)		
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME		02 D+B NUMBER	01 NAME		02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)		04 SIC CODE
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 08

II. CURRENT OPERATOR (Provide if different from owner)			OPERATOR'S PARENT COMPANY (If applicable)		
01 NAME: U.S. Navy	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.): NAF El Centro	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY: El Centro	06 STATE: CA	07 ZIP CODE: 92243-5001	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION: 1958-1982	09 NAME OF OWNER: U.S. Navy				

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)			PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)		
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				
01 NAME	02 D+B NUMBER		10 NAME	11 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD				

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 08

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 08

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☒ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY Navy
04 DESCRIPTION
The scrapyard is fenced.

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Site inspection.

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-08

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 08

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 8 - Scrapyard	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 9

TRANSFORMER STORAGE AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-09

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 9 - Transformer Storage Yard	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
32 49 23.	115 39 50.

10 DIRECTIONS TO SITE (Starting from nearest public road) From Interstate 8, go north on Bennett Road to the base gate. Continue north on B Street, then turn west on North Street. Site 9 is west of B Street and north of North Street, approximately 100 feet southeast of Building 157.

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/13/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1963 (BEGINNING YEAR) 1983 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Transformer fluid possibly containing PCBs.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Photographs from 1983 show leaking transformers stored at this site. The area is unpaved and is currently used for motor pool activities. In 1983 some of soil was drummed and removed off base. No follow-up sampling was done.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-0[illegible]

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO OF DRUMS 10

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	500	Gallons	Transformer fluid containing [illegible]
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OCC	Polychlorinated biphenyls	1336363	Spills onto soil		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, site inspection.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-09

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

The ground water at NAF El Centro is shallow, approximately 8-12 feet deep. The soil is clayey, and it is unlikely that the ground water was affected.

01 [ ] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [ ] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [X] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

This area is currently used for motor pool activities.

01 [X] F. CONTAMINATION OF SOIL — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: 5 (Acres) — 04 NARRATIVE DESCRIPTION

Transformer leaks were observed in 1983 photographs. Though some soil was removed, no follow-up sampling was conducted.

01 [ ] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [X] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Motor pool personnel work in this area.

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-09

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, site inspection, photographs.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 09

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 9 - Former Transformer Storage Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
32 49 23.	115 39 50.

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION (BEGINNING YEAR / ENDING YEAR)
01 13 87	☐ ACTIVE ☒ INACTIVE	1963 / 1983 ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR ___ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ___ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR ___ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT		Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 10 87

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 09

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS 10

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	500	gallons	Transformer fluid containing PCB
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRA
OCC	Polychlorinated biphenyls	1336363	Spills onto soil		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-09

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water at NAF El Centro is shallow, approximately 8-12 feet deep. The soil is clayey, and it is unlikely that the ground water was affected.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

This area is currently used for motor pool activities.

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: .5 (Acres) — 04 NARRATIVE DESCRIPTION

Transformer leaks were observed in 1983 photographs. Though some soil was removed, no follow-up sampling was conducted.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Motor pool personnel work in this area.

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 09

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 09

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER ~~Spill Area~~ (Specify)	500 gal	

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

0.5 (Acres)

07 COMMENTS

Transformers were stored in this area during its 20 years of operation. Several photographs taken in 1983 show leaking and upturned transformers.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☒ YES ☐ NO

02 COMMENTS

This area is used by motor pool personnel and covered with gravel.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-09

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA
☐ YES
☒ NO
COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA
☐ YES
☒ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	_____ (mi)
	☐	_____ (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION
150 ft

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING
150 ft

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106- 09

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< 1 %	very flat	< 1 %

09 FLOOD POTENTIAL
SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)
ESTUARINE: A. _____ (mi)
OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)
16 (mi)
ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY
DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. 1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is very flat. The former storage area is covered with gravel.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 09

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Samples of the fluid were collected from the transformers before tehy were removed from the Transformer Storage Yard.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 09

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-09

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1963-1983	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 09

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 09

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-09

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 09

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (*EN-335*); 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 9 - Transformer Storage Yard	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action(*s*) and agency(*ies*) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

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6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

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(con't)

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PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 10

SEWAGE STABILIZATION PONDS

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-10

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): site 10 - Sewage Stabilization Ponds

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: NAF El Centro

03 CITY: El Centro
04 STATE: CA
05 ZIP CODE: 92243-5001
06 COUNTY: Imperial
07 COUNTY CODE: 025
08 CONG. DIST: 38

09 COORDINATES LATITUDE: 32 49 23.
LONGITUDE: 115 39 50.

10 DIRECTIONS TO SITE (Starting from nearest public road): From Interstate 8 go north on Bennett Road to base gate. Continue north on "B" Street, turn west on Patrol Road. Continue on Patrol Road around the runway to the northwest corner of the base. Site 10 is located at the sewage treatment plant.

III. RESPONSIBLE PARTIES

01 OWNER (If known): U. S. Navy
02 STREET (Business, mailing, residential): NAF El Centro
03 CITY: El Centro
04 STATE: CA
05 ZIP CODE: 92243-5001
06 TELEPHONE NUMBER: (619) 339-2201

07 OPERATOR (If known and different from owner): Same as owner
08 STREET (Business, mailing, residential):
09 CITY:
10 STATE:
11 ZIP CODE:
12 TELEPHONE NUMBER: ( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/13/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S):

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1942 (BEGINNING YEAR) 1976 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Arsenic, cadmium, lead, chromium, nickel, silver and zinc from metal plating and photography shop. Fuels such as JP-5.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Metal contamination in the remaining bottom sludges of the stabilization ponds.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT: Naval Energy and Environmental Support Activity
02 OF (Agency/Organization): U. S. Navy
03 TELEPHONE NUMBER: (805) 982-4502
04 PERSON RESPONSIBLE FOR ASSESSMENT: Jeffrey L. Hendrix
05 AGENCY: Navy
06 ORGANIZATION: NEESA
07 TELEPHONE NUMBER: (805) 982-3449
08 DATE: 06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-10

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- X C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS unknown
NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown		Sewage sludge
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	unknown		JP-5 fuel
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	unknown		contained in sludges

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SLU	Sludges with metals		Treatment of waste water		
MES	Arsenic		Contained in Sludge	7440382	
MES	Cadmium		Contained in Sludge	7440439	
MES	Lead		Contained in Sludge	7439921	
MES	Chromium		Contained in Sludge	7439921	
MES	Nickel		Contained in Sludge	7440020	
MES	Silver		Contained in Sludge	7440-22-4	
MES	Zinc		Contained in Sludge	7440666	
OCC	Xylene		JP-5 spill	11330207	

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, interviews.

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-10

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
02 [ ] OBSERVED (DATE _____) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____
04 NARRATIVE DESCRIPTION

The ground water at NAF El Centro is shallow, approximately 8 to 12 feet deep.

01 [X] B. SURFACE WATER CONTAMINATION
02 [ ] OBSERVED (DATE _____) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____
04 NARRATIVE DESCRIPTION

Unlikely since the ponds are large enough to contain most runoff which may reach the ponds. Any effluent which may come from the ponds would flow toward the New River.

01 [ ] C. CONTAMINATION OF AIR
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____
04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 [ ] E. DIRECT CONTACT
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL
02 [ ] OBSERVED (DATE _____) [X] POTENTIAL [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: 4 (Acres)
04 NARRATIVE DESCRIPTION

The soil which was used to construct the ponds may be contaminated with metals.

01 [ ] G. DRINKING WATER CONTAMINATION
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 [ ] H. WORKER EXPOSURE/INJURY
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY
02 [ ] OBSERVED (DATE _____) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____
04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-10

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids, leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

When the ponds were used as the main source of sewage treatment, metals and fuels may have entered the ponds.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The photographic shop, aircraft hangars and aprons, and the plating shops discharged waste water to the sewage system.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Same as Part II, Section VI

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-10

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 10- Sewage Stabilization Ponds	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES: LATITUDE 32 49 23. LONGITUDE 115 39 50.

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☐ B. FEDERAL ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 01/13/87 (MONTH DAY YEAR)

02 SITE STATUS: ☐ ACTIVE ☐ INACTIVE

03 YEARS OF OPERATION: 1942 (BEGINNING YEAR) 1976 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR ___ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR ___ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR ___ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1600	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 10

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☐ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS unknown
NO. OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE	unknown		Sewage sludge
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS	unknown		JP-5 fuel
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	unknown		contained in sludges

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRA
SLU	Sludges with metals		Treatment of waste water		
MES	Arsenic		Contained in Sludge	7440382	
MES	Cadmium		Contained in Sludge	7440439	
MES	Lead		Contained in Sludge	7439921	
MES	Chromium		Contained in Sludge	7439921	
MES	Nickel		Contained in Sludge	7440020	
MES	Silver		Contained in Sludge	7440-22-4	
MES	Zinc		Contained in Sludge	7440666	
OCC	Xylene		JP-5 spill	11330207	

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 10

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water at NAF El Centro is shallow, approximately 8 to 12 feet deep.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Unlikely since the ponds are large enough to contain most runoff which may reach the ponds. Any effluent which may come from the ponds would flow toward the New River.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) — 04 NARRATIVE DESCRIPTION

The soil which was used to construct the ponds may be contaminated with metals.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 10

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

When the ponds were used as the main source of sewage treatment, metals and fuels may have entered the ponds.

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The photographic shop, aircraft hangars and aprons, and the plating shops discharged waste water to the sewage system.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 10

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☒ A. NPDES	CA 0104906			Issuing Agnecy - Ca.
☒ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☒ A. SURFACE IMPOUNDMENT	1 million	gallons
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER ___ (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER ___ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

4 (Acres)

07 COMMENTS

Prior to 1976, three ponds were utilized as sewage stabilization ponds. Since 1976, these ponds have served only as the emergency back-up for the current sewage facilities. The sludges have never been removed from the ponds. Ponds are dry.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

The ponds are unlined.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The sewage facilities are fenced.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-10

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS	ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☒	B. ☐		A. ☐	B. ☐	C. ☐	A. 2 (mi)
NON-COMMUNITY	C. ☐	D. ☐		D. ☐	E. ☐	F. ☐	B. (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	(gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.	☐ YES ☒ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	(mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION 1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING 1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 10

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	0 %	flat	1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. _____ (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The ponds are made unlined and have earthen berms. The area is flat. The ponds are dry.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 10

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activi
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 10

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 10

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1942-1976	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 10

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER	
U.S. Navy		
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
NAF El Centro		
05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
05 CITY / 06 STATE	07 ZIP CODE	05 CITY / 06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 10

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-10

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 10

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 10 - Sewage Stabilization Ponds	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIV
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action wi be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY TI DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & y*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructio for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

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2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 11

RUNWAY BURN AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-11

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 11 - Runway Burn Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road) From Interstate 8 go north on Bennett Road to base gate. Continue north on "A" Street then turn east on 8th Street. About one half mile on 8th Street is Building 514. Site 11 is about 2000 feet north of 8th Street at this point

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: / / (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: / / (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/13/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1979 (BEGINNING YEAR) 1980 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Aviation gasoline (AVGAS)

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Possible lead contamination of the soil.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-11

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO OF DRUMS unknown

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	unknown		Lead from gasoline may be pre

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
MES	Lead	7439921	AVGAS was burned for fire fighting training		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, aerial photographs.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-11

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[X] POTENTIAL [ ] ALLEGED

Unlikely. The soil is clayey. It has been 40 years since the site was last used. The site was only used for 1 year.

01 [ ] B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[ ] POTENTIAL [ ] ALLEGED

01 [ ] C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[ ] POTENTIAL [ ] ALLEGED

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[ ] POTENTIAL [ ] ALLEGED

01 [ ] E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[ ] POTENTIAL [ ] ALLEGED

01 [X] F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: 0.7 (Acres)
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[X] POTENTIAL [ ] ALLEGED

Lead present in AVGAS may be in the soil.

01 [ ] G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[ ] POTENTIAL [ ] ALLEGED

01 [ ] H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[ ] POTENTIAL [ ] ALLEGED

01 [ ] I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE _____)
04 NARRATIVE DESCRIPTION
[ ] POTENTIAL [ ] ALLEGED

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The site was used for one year. A wrecked airplane would be set ablaze with AVGAS and the fire fighter trainees would extinguish the flame. Most of the fuel would be burned, however, any residual would have reached the soil.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, aerial photographs.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 11

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 11 - Runway Burn Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
324923.—	1153950.—	☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION (MONTH DAY YEAR)	02 SITE STATUS	03 YEARS OF OPERATION (BEGINNING YEAR / ENDING YEAR)
01/13/87	☐ ACTIVE ☒ INACTIVE	1979 / 1980 — UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1800	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE (MONTH DAY YEAR)
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87

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REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS unknown

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS	unknown		Lead from gasline maybe present

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASUR CONCENTR
MES	Lead	7439921	AVGAS was burned for fire fighting training		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

Unlikely. The soil is clayey. It has been 40 years since the site was last used. The site was only used for 1 year.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: 0.7 (Acres) — 04 NARRATIVE DESCRIPTION

Lead present in AVGAS may be in the soil

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. HAZARDOUS CONDITIONS AND INCIDENTS *(Continued)*

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION *(Include name(s) of species)*

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES *(Spills, Runoff, Standing liquids, Leaking drums)* — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The site was used for one year. A wrecked airplane would be set ablaze with AVGAS and the fire fighter trainees would extinguish the flame. Most of the fuel would be burned, however, any residual would have reached the soil.

V. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

Personnel interviews, see References 1 through 17

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER Burn Area (Specify)	Unknown	

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

0.7 (Acres)

07 COMMENTS

A wrecked airplane would be set ablaze with AVGAS, then extinguished as a fire fighting training exercise.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

Since the site was used for only one year in 1946, the only contaminant potentially present would be lead. The lead would be in the soil.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 11

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. _____ (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA
☐ YES
☒ NO
COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA
☐ YES
☒ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	_____ (mi)
	☐	_____ (mi)
	☐	_____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION 1.5 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING 0.5 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 11

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	<1 %	flat	<1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. 1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The site is within the runway area and is flat.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1946-1947	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-11

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-11

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE

FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 11

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 11 - Runway Burn Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY: EPA	STATE	LOCAL	PRIV.
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action wi be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY T DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & y*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 12

OPEN BURN PIT

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 12 - Open Burn Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road) From Interstate 8 go north on Bennett Road to the base gate. Continue north on A Street, then turn east on 8th Street turn north on E Street, then east on Patrol Road. Go north on Patrol Road past the end of the runways. Site 12 is located north of Patrol Road at the point where the road head east (is south of Irrigated Field "E")

III. RESPONSIBLE PARTIES

01 OWNER (If known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/14/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1981 (BEGINNING YEAR) 1986 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Non hazardous materials ignited using JP-5. Fifty gallons of JP-5 were used per burn.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

None

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO OF DRUMS 50

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- X H IGNITABLE
- X HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	3,000	Gallons	50 gallons were used per bur
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-5		used to ignite waste.		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, personnel intervies.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-12

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 X A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

The ground water is generally shallow, 8 to 12 feet, at NAF El Centro. The small quantity of fuel used at each burn probably did not reach even the shallow ground water..

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: small (Acres)
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

A 20 foot X 20 foot pit. Small quantities of fuel were used to ignite confiscated material.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-12

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff, standing liquids, leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The JP-5 was used to burn non-hazardous material. The JP-5 which did not burn would have volatilize. This site poses no environmental threat.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Same as Part II, Section VI.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 12 - Open Burn Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES — LATITUDE: 32 49 23. LONGITUDE: 115 39 50.

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 01/14/87 (MONTH DAY YEAR)

02 SITE STATUS: ☐ ACTIVE ☒ INACTIVE

03 YEARS OF OPERATION: 1981 (BEGINNING YEAR) | 1986 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Name of firm)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	0800	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 10 87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-12

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS 50

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☐ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	3,000	gallons	50 gallons were used for burn
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTR
OLW	JP-5		used to ignite waste.		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-12

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

The ground water is generally shallow, 8 to 12 feet, at NAF El Centro. The small quantity of fuel used at each burn probably did not reach even the shallow ground water.

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: small (Acres) — 04 NARRATIVE DESCRIPTION

A 20 foot X 20 foot pit. Small quantities of fuel were used to ignite confiscated material.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The JP-5 was used to burn non-hazardous material. The JP-5 which did not burn would have volatilize. This site poses no environmental threat.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

MMEC-2405-4445 0005
25 June 2019
REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☐ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER ~~Burn pit~~ (Specify)	3,000	gal

04 TREATMENT (Check all that apply)

- ☒ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

<.1 (Acres)

07 COMMENTS

A 20 foot by 20 foot by 10 foot deep pit was used about once per month to burn confiscated drugs and associated paraphernalia.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The burn pit has been covered with soil.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☒	B. ☐	A. ☐	B. ☐	C. ☐	A. 2.5 (mi)
NON-COMMUNITY	C. ☐	D. ☐	D. ☐	E. ☐	F. ☐	B. ____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.	☐ YES ☒ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
drainage ditches	☐	<.1 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION .5 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING .5 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< .1 %	flat	< .1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE A. _____ (mi)

OTHER B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. < .1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Crops are grown near this site. The area is flat.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 12

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 12

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-12

II. CURRENT OPERATOR (Provide if different from owner) | **OPERATOR'S PARENT COMPANY** (If applicable)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER
U.S. Navy			

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE
NAF El Centro			

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE
El Centro	CA	92243-5001			

08 YEARS OF OPERATION	09 NAME OF OWNER
1981-1986	U.S. Navy

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner) | **PREVIOUS OPERATORS' PARENT COMPANIES** (If applicable)

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

01 NAME	02 D+B NUMBER	10 NAME	11 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	14 CITY	15 STATE	16 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 12

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 12

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE 1986 — 03 AGENCY Navy
04 DESCRIPTION
The pit was covered with soil.

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, actiivity visit.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-12

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY/ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE

FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106-12

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 12 - Open Burn Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIVATE
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action w be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State, Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT FORM

SITE 13

OLD INCINERATOR

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE: CA | 02 SITE NUMBER: 106-13

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Site 13 - Old Incinerator	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE: 324923.__ LONGITUDE: 1153950.__

10 DIRECTIONS TO SITE (Starting from nearest public road): From Interstate 8, head north on Bennett Road to the base gate. Continue north on A Street, turn east on 8th Street. At E Street turn north, and follow Patrol Road around the Airfield. Site 13 is close to the northeast corner of the base 300 feet east of Building 197.

III. RESPONSIBLE PARTIES

01 OWNER (If known): U. S. Navy	02 STREET (Business, mailing, residential): NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner): Same as owner	08 STREET (Business, mailing, residential):

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/14/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
BEGINNING YEAR: 1942 | ENDING YEAR: before 1953 ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Paper only was burned in this incinerator

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

None

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☒ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/10/87 (MONTH DAY YEAR)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-13

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- X A. SOLID
- B. POWDER, FINES
- C. SLUDGE
- D. OTHER _____ (Specify)
- E. SLURRY
- F. LIQUID
- G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS unknown

CUBIC YARDS _____

NO OF DRUMS _____

03 WASTE CHARACTERISTICS (Check all that apply)

- A. TOXIC
- B. CORROSIVE
- C. RADIOACTIVE
- D. PERSISTENT
- E. SOLUBLE
- F. INFECTIOUS
- G. FLAMMABLE
- H. IGNITABLE
- I. HIGHLY VOLATILE
- J. EXPLOSIVE
- K. REACTIVE
- L. INCOMPATIBLE
- X M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATI
	None				

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, activity visit.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-13

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: small (Acres)
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

The ash from burning paper was buried in the immediate surrounding area of the incinerator. No hazardous consitituents would be expected.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED _____
02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-13

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids, leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

The ash was produced by the burning of paper only (probably classifed material). No hazardous wastes are present.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, activity records.

No Site Inspection necessary.

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PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 14

FUEL FARM TANK RINSEATE DISPOSAL AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-14

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site): Site 14 Fuel Farm Tank Rinseate Disposal Area

02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER: NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE: 324923. LONGITUDE: 1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road): From Interstate 8 go north on Bennett Road to the gate. Continue north on A Street, turn east on 8th Street. The fuel farm is located at the end of 8th Street in the southeast corner of the base.

III. RESPONSIBLE PARTIES

01 OWNER (If known): U. S. Navy

02 STREET (Business, mailing, residential): NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner): Same as owner

08 STREET (Business, mailing, residential):

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01/14/87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION: 1960 (BEGINNING YEAR) 1985 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Rinseate from tanks containing JP-4, JP-5, AVGAS, Diesel Fuel #2 and MOGAS leaded and unleaded were disposed of to the soil surface.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Contaminants may migrate via surface water or ground water.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06/20/87 (MONTH DAY YEAR)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-14

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- X C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS 20,000

03 WASTE CHARACTERISTICS (Check all that apply)

- A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- X H IGNITABLE
- X I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			Small quantities
OLW	OILY WASTE	1,000,000	Gallons	
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-4		Tank Rinseate to soil	Dilute	
OLW	JP-5		Tank Rinseate to soil	Dilute	
OLW	AVGAS (Aviation GAsoline)		Tank Rinseate to soil	Dilute	
OLW	MOGAS - regular		Tank Rinseate to soil	Dilute	
OLW	MOGAS - unleaded		Tank Rinseate to soil	Dilute	
OLW	Diesel Fuel #2		Tank Rinseate to soil	Dilute	

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, activity records,

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-14

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [X] OBSERVED (DATE 6-16-87) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Diesel & JP-fuel was observed in a hole dug near this area.

01 [X] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Drainage ditches near this area could be affected during wet periods.

01 [ ] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL — 02 [X] OBSERVED (DATE 6-16-87) — [ ] POTENTIAL — [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: 5 (Acres) — 04 NARRATIVE DESCRIPTION

Contaminated soil is visible in the holes which showed the JP and diesel fuel/

01 [ ] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-14

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids, leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Fuel was observed in the soil and the shallow groundwater.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Same as Part II, Section VI.

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 14

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 14 - Fuel Farm Tank Rinseate Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE	10 TYPE OF OWNERSHIP (Check one)
32 49 23.	115 39 50.	☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION	02 SITE STATUS	03 YEARS OF OPERATION
01/14/87 (MONTH DAY YEAR)	☐ ACTIVE ☒ INACTIVE	1960 (BEGINNING YEAR) 1985 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm)
☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Name of firm)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1200	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 20 87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-14

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☒ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____
CUBIC YARDS _____
NO. OF DRUMS 20,000

03 WASTE CHARACTERISTICS (Check all that apply)

- ☐ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			small quantities
OLW	OILY WASTE	1,000,000	gallons	
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-4		Tank Rinseate to soil	Dilute	
OLW	JP-5		Tank Rinseate to soil	Dilute	
OLW	AVGAS (Aviation Gasoline)		Tank Rinseate to soil	Dilute	
OLW	MOGAS - regular		Tank Rinseate to soil	Dilute	
OLW	MOGAS - unleaded		Tank Rinseate to soil	Dilute	
OLW	Diesel Fuel #2		Tank Rinseate to soil	Dilute	

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 14

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Diesel & JP-fuel was observed in a hole dug near this area.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☒ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Drainage ditches near this area could be affected during wet periods.

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☒ OBSERVED (DATE: 6-16-87) — ☐ POTENTIAL — ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

Contaminated soil is visible in the holes which showed the JP and diesel fuel.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) — ☐ POTENTIAL — ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-14

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Fuel was observed in the soil and the shallow groundwater.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 14

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☒ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER Rinse Area (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

5 (Acres)

07 COMMENTS

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

The rinseate was sent to a low lying area where it evaporated or soaked into the soil.

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The fuel farm is fenced.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 14

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1.5 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA
☐ YES
☒ NO
COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA
☐ YES
☒ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
drainage diteches	☐	<.1 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION <.1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING <.1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 14

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	1 %	southwest	1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A. _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. .1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

The fuel farm is fenced. Crops are grown to the south and west of the rinseate disposal area.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 14

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Diesel fuel and JP fuel have been encountered in holes dug in this area at a depth of 8 to 12 feet.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 14

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME U.S. Navy	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) NAF El Centro	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY El Centro	06 STATE CA	07 ZIP CODE 92243-5001	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable, list most recent first)		
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 14

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1960-1985	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 14

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 14

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-14

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☒ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

The fuel farm area was inspected by the Imperial County Department of Health and the Colorado River Basin Region of the California Regional Water Quality Control Board in June, 1987/

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Imperial County Department of Health and the Colorado River Basin Region of the California Regional Water Quality Control Board.

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 14

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 14 - Fuel Farm Tank Rinseate Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIV
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action wi be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY TH DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & y*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo, day, & yr)	3. ACTION END DATE (mo, day, & yr)	4. ACTION AGENCY (EPA, State, Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo, day, & yr)	3. ACTION END DATE (mo, day, & yr)	4. ACTION AGENCY (EPA, State Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION; INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 15

FUEL FARM FILTER CLEANING AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-15

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 15 - Fuel Farm Filter Cleaning Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road) From Interstate 8 go north on Bennett Road to the base gate. Continue north on A Street, turn east on 8th Street The Fuel Farm is located at the end of 8th Street, in the southeast corner of the base.

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (if known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: ___/___/___ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 01 / 14 / 87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)
CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)
☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
1958 (BEGINNING YEAR) | 1981 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Fuel which spill during fuel filter cleaning. Fuels include JP-4, JP-5, AVGAS, MOGAS Regular & Unleaded, Diesel fuel #2

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 / 20 / 87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-15

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO. OF DRUMS 60

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- X G FLAMMABLE
- X H IGNITABLE
- X I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	3000	Gallons	allowed to seep into soil.
SOL	SOLVENTS			
PSO	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-4		Spilled to soil		
OLW	JP-5		Spilled to soil		
OLW	AVGAS		Spilled to soil		
OLW	MOGAS - Regular		Spilled to soil		
OLW	MOGAS - Unleaded		Spilled to soil		
OLW	Diesel Fuel #2		Spilled to soil		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBE
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, activity records.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-15

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [X] OBSERVED (DATE 6-16-87) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

JP fuel was observed in a 12 foot deep hole which was dug in this area.

01 [X] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [X] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

Drainage ditches near this area could be affected during wet periods.

01 [ ] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] E. DIRECT CONTACT — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ — 04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL — 02 [X] OBSERVED (DATE 6-16-87) — [ ] POTENTIAL — [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED. _____ (Acres) — 04 NARRATIVE DESCRIPTION

Contaminated soil is visible in the hole where the JP fuel is visible.

01 [ ] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED. _____ — 04 NARRATIVE DESCRIPTION

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE _____) — [ ] POTENTIAL — [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ — 04 NARRATIVE DESCRIPTION

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-1

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

A 12 foot deep hole was dug in the immediate area of Site 15. JP fuel seeped into the hole, and the soil was visibly contaminated

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Same as Part II, Section VI.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106- 15

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER				
Site 15 - Fuel Farm Filter-Cleaning Area	NAF El Centro				
03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES — LATITUDE: 32 49 23.__ LONGITUDE: 115 95 0.__

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 01 14 87 (MONTH DAY YEAR)

02 SITE STATUS: ☐ ACTIVE ☒ INACTIVE

03 YEARS OF OPERATION: 1958 (BEGINNING YEAR) 1981 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Name of firm)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449
09 OTHER INSPECTORS	**10 TITLE**	**11 ORGANIZATION**	**12 TELEPHONE NO.**
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1400	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 20 87 (MONTH DAY YEAR)

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 15

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS _____
- NO. OF DRUMS 60

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☒ G. FLAMMABLE
- ☒ H. IGNITABLE
- ☒ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	3,000	gallons	Allowed to seep into soil
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASUR CONCENTRA
OLW	JP-4		Spilled to soil		
OLW	JP-5		Spilled to soil		
OLW	AVGAS		Spilled to soil		
OLW	MOGAS		Spilled to soil		
OLW	MOGAS		Spilled to soil		
OLW	Diesel Fuel #2		Spilled to soil		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 15

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☒ A. GROUNDWATER CONTAMINATION — 02 ☒ OBSERVED (DATE: 6-26-87) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

JP fuel was observed in a 12 foot deep hole which was dug in this area.

01 ☒ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

Drainage ditches near this area could be affected during wet periods/

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☒ OBSERVED (DATE: 6-16-87) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: _____ (Acres) 04 NARRATIVE DESCRIPTION

Contaminated soil is visible in the hole where the JP fuel is visible.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 15

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

A 12 foot deep hole was dug in the immediate area of Site 15. JP fuel seeped into the hole, and the soil was visibly contaminated.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

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REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 15

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☒ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☐ D. TANK, ABOVE GROUND		
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☒ I. OTHER Spill Area (Specify)	3,000	gal

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER _____ (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

0.1 (Acres)

07 COMMENTS

Every five years, the filters at the fuel farm are cleaned. During cleaning approximately 100 gallons of fuel are spilled with each filter. There are five filters.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☐ YES ☒ NO

02 COMMENTS

The fuel farm is fenced.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 15

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)

	SURFACE	WELL
COMMUNITY	A. ☒	B. ☐
NON-COMMUNITY	C. ☐	D. ☐

02 STATUS

ENDANGERED	AFFECTED	MONITORED
A. ☐	B. ☐	C. ☐
D. ☐	E. ☐	F. ☐

03 DISTANCE TO SITE

A. 1.5 (mi)
B. _____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	_____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including usage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA
☐ YES
☒ NO
COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.

11 DISCHARGE AREA
☐ YES
☒ NO
COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
drainage ditches	☐	.1 (mi)
	☐	(mi)
	☐	(mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION .1 (mi)

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING .1 (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106- 15

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	< .1 %	southwest	< .1 %

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. _____ (mi)

OTHER: B. _____ (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS; NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A _____ (mi)	B. 16 (mi)	C. _____ (mi)	D. < .1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Crops are grown nearby. The fuel farm is fenced.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-15

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

Diesel fuel and JP fuel were observed in holes dug in this area at a depth of 8 to 12 feet. Soil stains were visible.

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 15

II. CURRENT OWNER(S)			PARENT COMPANY (If applicable)		
01 NAME U.S. Navy	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.) NAF El Centro	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY El Centro	06 STATE CA	07 ZIP CODE 92243-5001	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE
01 NAME	02 D+B NUMBER		08 NAME	09 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)			IV. REALTY OWNER(S) (If applicable, list most recent first)		
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE
01 NAME	02 D+B NUMBER		01 NAME	02 D+B NUMBER	
03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE		03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	
05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-15

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1958-1981	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first; provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-15

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 15

II PAST RESPONSE ACTIVITIES *(Continued)*

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

01 ☐ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE _____ — 03 AGENCY _____
04 DESCRIPTION

III. SOURCES OF INFORMATION *(Cite specific references, e.g., state files, sample analysis, reports)*

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-15

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☒ YES ☐ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

The fuel farm was inspected by the Imperial County Department of Health and the Colorado River Basin Region of the California Regional Water Quality Control Board in June, 1987.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Imperial County Department of Health and the Colorado River Basin Region of the California Regional Water Qualtiy Control Board.

EPA FORM 2070-13 (7-81)

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EPA

POTENTIAL HAZARDOUS WASTE SITE

FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106- 15

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force *(EN-335)*; 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 15 - Fuel Farm Filter-Cleaning Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action*(s)* and agency*(ies)* that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIV
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action will be determined from the results of the RI. RI recommendations are given in Chapter 2 of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY THE DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & yr.)*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructions for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State, Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE (mo,day,&yr)	3. ACTION END DATE (mo,day,&yr)	4. ACTION AGENCY (EPA, State Private Party)	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

EPA Form T2070-5 (10-79) REVERSE

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REFERENCES FOR PA/SI FORMS

1. California Division of Mines and Geology, 1977. "Geologic Map of California San Diego-El Centro Sheet," California Division of Mines and Geology, Sacramento, California

2. Davis, Stanley N., and DeWiest, Roger J. M, 1966. Hydrogeology. John Wiley and Sons Inc., New York.

3. Department of Water Resources, 1986. "Selenium Sampling in Colorado River Basin Region," California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

4. Fair, Gordon M., et. al., 1966. Water and Wastewater Engineering. John Wileyand Sons, Inc., New York.

5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

6. Gruenberg, P., 1984. Report on Preliminary Study of Fate of Selected Pollutants Discharged from Mexicali, Mexico, to the New River. California Regional Water Quality Control Board, Colorado River Basin Region, Palm Desert, California.

7. Lory, E. E., et. al., 1981. Management Procedure For Assessment of Friable Asbestos Insulating Material, TR-833. Civil Engineering Laboratory, Port Hueneme, California.

8. Lyon Engineers, Inc, 1985. "Soils Engineering Report, Bachelor Officers Quarters-Building 270, Naval Air Facility El Centro, CA." Western Division Naval Facilities Engineering Command, San Bruno, California.

9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

10. Naval Energy and Environmental Support Activity (NEESA), 1986. "Hazardous Waste Annual Report CY85," Naval Air Facility, El Centro, California.

11. RGA Engineering Corporation, 1987. "Subsurface Investigation Repairs to Pavement at Fuel Farm, Naval Air Facility." Tucson, Arizona.

12. United States Department of Agriculture, 1981. "Soil Survey of Imperial County California, Imperial Valley Area." Soil Conservation Service.

13. United States Geological Survey, 1979. "Seeley Quadrangle, California, Imperial County, 7.5 minute Series." United States Geological Survey Denver, Colorado.

(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

16. WESTNAVFACENGCOM, 1982b. "Soil Investigation at West End of Runway 8L-26R Naval Air Facility, El Centro, CA." Western Division, Naval Facilities Engineering Command, San Bruno, California.

17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

PRELIMINARY ASSESSMENT/SITE INSPECTION FORMS

SITE 16

POTASSIUM FERRICYANIDE SPILL AREA

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-16

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 16-Potassium,Ferricyanide Spill Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
324923.	1153950.

10 DIRECTIONS TO SITE (Starting from nearest public road)

From Insterstate 8 go north on Bennett Road to the base gate. Continue north on A Street, turn east on 8th Street. At J Street turn south, the spill occured behind Building 565, the Photo Lab

III. RESPONSIBLE PARTIES

01 OWNER (if known)	02 STREET (Business, mailing, residential)
U. S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	CA	92243-5001	(619) 339-2201

07 OPERATOR (If known and different from owner)	08 STREET (Business, mailing, residential)
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)

☐ A. PRIVATE ☒ B. FEDERAL: U. S. Navy (Agency name) ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL

☐ F. OTHER: _____ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)

☐ A. RCRA 3001 DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION

☒ YES DATE 01 / 14 / 87 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)

☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: Naval Energy and Environmental Support Activity (Specify)

CONTRACTOR NAME(S): _____

02 SITE STATUS (Check one)

☐ A. ACTIVE ☒ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION

1983 (BEGINNING YEAR) 1983 (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

A 100 gallon spill of spent potassium ferricyanide bleach from photograph development spilled to the soil in 1983. Some bluish-green stained soil is visible.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)

☐ A. HIGH (Inspection required promptly) ☒ B. MEDIUM (Inspection required) ☐ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Naval Energy and Environmental Support Activity	U. S. Navy	(805) 982-4502

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06 / 10 / 87 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-16

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- A SOLID
- B POWDER, FINES
- C SLUDGE
- D. OTHER _____ (Specify)
- E SLURRY
- X F LIQUID
- G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS _____

CUBIC YARDS _____

NO OF DRUMS 2

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- B CORROSIVE
- C RADIOACTIVE
- X D PERSISTENT
- E SOLUBLE
- F INFECTIOUS
- G FLAMMABLE
- H IGNITABLE
- I HIGHLY VOLATILE
- J EXPLOSIVE
- K REACTIVE
- L INCOMPATIBLE
- M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	100	Gallons	Potassium Ferricyanide Blea spill.
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
IOC	Potassium Ferricyanide	13746662	Spilled		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, personnel interviews.

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-16

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

Would not expect ground water contamination

01 ☐ B. SURFACE WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE/EXPLOSIVE CONDITIONS — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 AREA POTENTIALLY AFFECTED: small (Acres) 04 NARRATIVE DESCRIPTION

A bluishe-green stain is visible.

01 ☐ G. DRINKING WATER CONTAMINATION — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED _____ 04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 WORKERS POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE/INJURY — 02 ☐ OBSERVED (DATE _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-16

II. HAZARDOUS CONDITIONS AND INCIDENTS (continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids, leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Some of the soil was cleaned up and removed in 1983 but some stained soil is visible.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Same as Part II, Section VI.

EPA FORM 2070-12 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 1 - SITE LOCATION AND INSPECTION INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-16

II. SITE NAME AND LOCATION

01 SITE NAME (Legal, common, or descriptive name of site)	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 16 - Potassium Ferricyanide Spill Area	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
El Centro	CA	92243-5001	Imperial	025	38

09 COORDINATES: LATITUDE 32 49 23.__ LONGITUDE 115 39 50.__

10 TYPE OF OWNERSHIP (Check one): ☐ A. PRIVATE ☒ B. FEDERAL US NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL ☐ F. OTHER _____ ☐ G. UNKNOWN

III. INSPECTION INFORMATION

01 DATE OF INSPECTION: 01,14,87 (MONTH DAY YEAR)

02 SITE STATUS: ☐ ACTIVE ☐ INACTIVE

03 YEARS OF OPERATION: 1983 (BEGINNING YEAR) 1983 (ENDING YEAR) ___ UNKNOWN

04 AGENCY PERFORMING INSPECTION (Check all that apply): ☐ A. EPA ☐ B. EPA CONTRACTOR _____ (Name of firm) ☐ C. MUNICIPAL ☐ D. MUNICIPAL CONTRACTOR _____ (Name of firm) ☐ E. STATE ☐ F. STATE CONTRACTOR _____ (Name of firm) ☒ G. OTHER Naval Energy & Environmental Support Activity (NEESA) (Name of firm)

05 CHIEF INSPECTOR	06 TITLE	07 ORGANIZATION	08 TELEPHONE NO.
Jeffrey L. Hendrix	Environmental Engineer	NEESA	(805) 982-3449

09 OTHER INSPECTORS	10 TITLE	11 ORGANIZATION	12 TELEPHONE NO.
Ronald E. Tickle	Environmental Engineer	NEESA	(805) 982-4502
Stephen E. Eikenberry	Hydrogeologist	NEESA	(805) 982-4067
			( )
			( )
			( )

13 SITE REPRESENTATIVES INTERVIEWED	14 TITLE	15 ADDRESS	16 TELEPHONE NO
Not Applicable			( )
			( )
			( )
			( )
			( )
			( )

17 ACCESS GAINED BY (Check one)	18 TIME OF INSPECTION	19 WEATHER CONDITIONS
☒ PERMISSION ☐ WARRANT	1600	Sunny and warm, zero cloud cover, dry

IV. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NO
Naval Energy and Environmental Support Activity (NEESA)	U.S. Navy	(805) 982-3449

04 PERSON RESPONSIBLE FOR SITE INSPECTION FORM	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NO.	08 DATE
Jeffrey L. Hendrix	Navy	NEESA	(805) 982-3449	06,10,87 (MONTH DAY YEAR)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-16

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- ☐ A. SOLID
- ☐ B. POWDER, FINES
- ☐ C. SLUDGE
- ☐ D. OTHER _____ (Specify)
- ☐ E. SLURRY
- ☒ F. LIQUID
- ☐ G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS _____
- NO. OF DRUMS 2

03 WASTE CHARACTERISTICS (Check all that apply)

- ☒ A. TOXIC
- ☐ B. CORROSIVE
- ☐ C. RADIOACTIVE
- ☒ D. PERSISTENT
- ☐ E. SOLUBLE
- ☐ F. INFECTIOUS
- ☐ G. FLAMMABLE
- ☐ H. IGNITABLE
- ☐ I. HIGHLY VOLATILE
- ☐ J. EXPLOSIVE
- ☐ K. REACTIVE
- ☐ L. INCOMPATIBLE
- ☐ M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS	100	gallons	Potassium Ferricyanide Bleach
ACD	ACIDS			spill.
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASUR CONCENTRA
IOC	Potassium Ferricyanide	I3746662	Spilled		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, activity records, see References 10 and 14

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106- 16

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 ☐ A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Would not expect ground water contamination

01 ☐ B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ D. FIRE EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: small (Acres)
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

A bluishe-green stain is visible.

01 ☐ G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ I. POPULATION EXPOSURE INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

EPA FORM 2070-13 (7-81)

REPRODUCED AT GOVERNMENT EXPENSE

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-16

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills, Runoff, Standing liquids, Leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

Some of the soil was cleaned up and removed in 1983 but some stained soil is visible.

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews, see References 1 through 17

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EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION
PART 4 - PERMIT AND DESCRIPTIVE INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-

II. PERMIT INFORMATION

01 TYPE OF PERMIT ISSUED (Check all that apply)	02 PERMIT NUMBER	03 DATE ISSUED	04 EXPIRATION DATE	05 COMMENTS
☐ A. NPDES				
☒ B. UIC	N60042			Navy UIC
☐ C. AIR				
☐ D. RCRA				
☐ E. RCRA INTERIM STATUS				
☐ F. SPCC PLAN				
☐ G. STATE (Specify)				
☐ H. LOCAL (Specify)				
☐ I. OTHER (Specify)				
☐ J. NONE				

III. SITE DESCRIPTION

01 STORAGE/DISPOSAL (Check all that apply)	02 AMOUNT	03 UNIT OF MEASURE
☐ A. SURFACE IMPOUNDMENT		
☐ B. PILES		
☐ C. DRUMS, ABOVE GROUND		
☒ D. TANK, ABOVE GROUND	100	gallon
☐ E. TANK, BELOW GROUND		
☐ F. LANDFILL		
☐ G. LANDFARM		
☐ H. OPEN DUMP		
☐ I. OTHER (Specify)		

04 TREATMENT (Check all that apply)

- ☐ A. INCENERATION
- ☐ B. UNDERGROUND INJECTION
- ☐ C. CHEMICAL/PHYSICAL
- ☐ D. BIOLOGICAL
- ☐ E. WASTE OIL PROCESSING
- ☐ F. SOLVENT RECOVERY
- ☐ G. OTHER RECYCLING/RECOVERY
- ☐ H. OTHER (Specify)

05 OTHER

- ☐ A. BUILDINGS ON SITE

06 AREA OF SITE

<.1 (Acres)

07 COMMENTS

A one time spill of spent potassium ferricyanide bleach occured in 1983. Approximately 100 gallons was spilled to the soil. Most of the soil was excavated and removed, but some small areas of stained soil are visible.

IV. CONTAINMENT

01 CONTAINMENT OF WASTES (Check one)

☐ A. ADEQUATE, SECURE ☐ B. MODERATE ☒ C. INADEQUATE, POOR ☐ D. INSECURE, UNSOUND, DANGEROUS

02 DESCRIPTION OF DRUMS, DIKING, LINERS, BARRIERS, ETC.

None

V. ACCESSIBILITY

01 WASTE EASILY ACCESSIBLE. ☒ YES ☐ NO

02 COMMENTS

Is present in the surface soil.

VI. SOURCES OF INFORMATION (Cite specific references, e.g. state files, sample analysis, reports)

Personnel interviews, see References 10 and 14

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-16

II. DRINKING WATER SUPPLY

01 TYPE OF DRINKING SUPPLY (Check as applicable)	SURFACE	WELL	02 STATUS ENDANGERED	AFFECTED	MONITORED	03 DISTANCE TO SITE
COMMUNITY	A. ☒	B. ☐	A. ☐	B. ☐	C. ☐	A. .75 (mi)
NON-COMMUNITY	C. ☐	D. ☐	D. ☐	E. ☐	F. ☐	B. ____ (mi)

III. GROUNDWATER

01 GROUNDWATER USE IN VICINITY (Check one)

☐ A. ONLY SOURCE FOR DRINKING ☐ B. DRINKING (Other sources available) COMMERCIAL, INDUSTRIAL, IRRIGATION (No other water sources available) ☐ C. COMMERCIAL, INDUSTRIAL, IRRIGATION (Limited other sources available) ☒ D. NOT USED, UNUSEABLE

02 POPULATION SERVED BY GROUND WATER 0

03 DISTANCE TO NEAREST DRINKING WATER WELL > 10 (mi)

04 DEPTH TO GROUNDWATER	05 DIRECTION OF GROUNDWATER FLOW	06 DEPTH TO AQUIFER OF CONCERN	07 POTENTIAL YIELD OF AQUIFER	08 SOLE SOURCE AQUIFER
8-12 (ft)	Generally Northwest	N/A (ft)	____ (gpd)	☐ YES ☒ NO

09 DESCRIPTION OF WELLS (Including useage, depth, and location relative to population and buildings)

No wells are located within Imperial County.

10 RECHARGE AREA		11 DISCHARGE AREA	
☐ YES ☒ NO	COMMENTS The irrigation areas may recharge the upper Aquifer which is unused.	☐ YES ☒ NO	COMMENTS

IV. SURFACE WATER

01 SURFACE WATER USE (Check one)

☒ A. RESERVOIR, RECREATION DRINKING WATER SOURCE ☒ B. IRRIGATION, ECONOMICALLY IMPORTANT RESOURCES ☒ C. COMMERCIAL, INDUSTRIAL ☐ D. NOT CURRENTLY USED

02 AFFECTED/POTENTIALLY AFFECTED BODIES OF WATER

NAME:	AFFECTED	DISTANCE TO SITE
None	☐	____ (mi)
	☐	____ (mi)
	☐	____ (mi)

V. DEMOGRAPHIC AND PROPERTY INFORMATION

01 TOTAL POPULATION WITHIN

ONE (1) MILE OF SITE	TWO (2) MILES OF SITE	THREE (3) MILES OF SITE
A. 600 NO OF PERSONS	B. 1600 NO OF PERSONS	C. 1720 NO OF PERSONS

02 DISTANCE TO NEAREST POPULATION 20 ft (mi)
1 worked in photo shop

03 NUMBER OF BUILDINGS WITHIN TWO (2) MILES OF SITE
276 Buildings on NAF El Centro
approximately 300 buildings in Seeley.

04 DISTANCE TO NEAREST OFF-SITE BUILDING 20 ft (mi)

05 POPULATION WITHIN VICINITY OF SITE (Provide narrative description of nature of population within vicinity of site, e.g., rural, village, densely populated urban area)

There are approximately 600 permanent civilians, officers, and enlisted men at NAF El Centro. The town is seeley with a population of between 800 to 900 is approximately one mile to the south of the base boundary. The rest of the area within three miles of NAF El Centro is agricultural.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 5 - WATER, DEMOGRAPHIC, AND ENVIRONMENTAL DATA

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-16

VI. ENVIRONMENTAL INFORMATION

01 PERMEABILITY OF UNSATURATED ZONE (Check one)

☐ A. $10^{-6} - 10^{-8}$ cm/sec ☐ B. $10^{-4} - 10^{-6}$ cm/sec ☒ C. $10^{-4} - 10^{-3}$ cm/sec ☐ D. GREATER THAN 10^{-3} cm/sec

02 PERMEABILITY OF BEDROCK (Check one)

☐ A. IMPERMEABLE (Less than 10^{-6} cm/sec) ☐ B. RELATIVELY IMPERMEABLE ($10^{-4} - 10^{-6}$ cm/sec) ☐ C. RELATIVELY PERMEABLE ($10^{-2} - 10^{-4}$ cm/sec) ☐ D. VERY PERMEABLE (Greater than 10^{-2} cm/sec)

03 DEPTH TO BEDROCK	04 DEPTH OF CONTAMINATED SOIL ZONE	05 SOIL pH
> 220 (ft)	(ft)	

06 NET PRECIPITATION	07 ONE YEAR 24 HOUR RAINFALL	08 SLOPE: SITE SLOPE	DIRECTION OF SITE SLOPE	TERRAIN AVERAGE SLOPE
-70 (in)	1 (in)	%		%

09 FLOOD POTENTIAL

SITE IS IN > 100 YEAR FLOODPLAIN

10 ☐ SITE IS ON BARRIER ISLAND, COASTAL HIGH HAZARD AREA, RIVERINE FLOODWAY

11 DISTANCE TO WETLANDS (5 acre minimum)

ESTUARINE: A. (mi) OTHER: B. (mi)

12 DISTANCE TO CRITICAL HABITAT (of endangered species)

16 (mi)

ENDANGERED SPECIES: Salton Sea Refuge

13 LAND USE IN VICINITY

DISTANCE TO:

COMMERCIAL/INDUSTRIAL	RESIDENTIAL AREAS, NATIONAL/STATE PARKS, FORESTS, OR WILDLIFE RESERVES	AGRICULTURAL LANDS: PRIME AG LAND	AGRICULTURAL LANDS: AG LAND
A (mi)	B. 16 (mi)	C. (mi)	D. 1 (mi)

14 DESCRIPTION OF SITE IN RELATION TO SURROUNDING TOPOGRAPHY

Some small areas bluish green stained soil are present.

VII. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See References 1, 2, 3, 5, 6, 8, 9, 11, 12, 13, 15, and 16

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 6 - SAMPLE AND FIELD INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-16

II. SAMPLES TAKEN

SAMPLE TYPE	01 NUMBER OF SAMPLES TAKEN	02 SAMPLES SENT TO	03 ESTIMATED DATE RESULTS AVAILABLE
GROUNDWATER			
SURFACE WATER			
WASTE			
AIR			
RUNOFF			
SPILL			
SOIL			
VEGETATION			
OTHER			

III. FIELD MEASUREMENTS TAKEN

01 TYPE	02 COMMENTS

IV. PHOTOGRAPHS AND MAPS

01 TYPE ☒ GROUND ☒ AERIAL

02 IN CUSTODY OF Naval Energy & Environmental Support Activity
(Name of organization or individual)

03 MAPS ☒ YES ☐ NO

04 LOCATION OF MAPS Naval Energy and Environmental Support Activity

V. OTHER FIELD DATA COLLECTED (Provide narrative description)

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Activity records, see References 13 and 17

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 7 - OWNER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-16

II. CURRENT OWNER(S)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

PARENT COMPANY (If applicable)

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

08 NAME	09 D+B NUMBER

10 STREET ADDRESS (P.O. Box, RFD #, etc.)	11 SIC CODE

12 CITY	13 STATE	14 ZIP CODE

III. PREVIOUS OWNER(S) (List most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

IV. REALTY OWNER(S) (If applicable, list most recent first)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 8 - OPERATOR INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-16

II. CURRENT OPERATOR (Provide if different from owner)

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

08 YEARS OF OPERATION	09 NAME OF OWNER
1983	U.S. Navy

OPERATOR'S PARENT COMPANY (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

III. PREVIOUS OPERATOR(S) (List most recent first, provide only if different from owner)

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

PREVIOUS OPERATORS' PARENT COMPANIES (If applicable)

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE

08 YEARS OF OPERATION	09 NAME OF OWNER DURING THIS PERIOD

10 NAME	11 D+B NUMBER

12 STREET ADDRESS (P.O. Box, RFD #, etc.)	13 SIC CODE

14 CITY	15 STATE	16 ZIP CODE

IV. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 9 - GENERATOR/TRANSPORTER INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-16

II. ON-SITE GENERATOR

01 NAME	02 D+B NUMBER
U.S. Navy	

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE
NAF El Centro	

05 CITY	06 STATE	07 ZIP CODE
El Centro	CA	92243-5001

III. OFF-SITE GENERATOR(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

IV. TRANSPORTER(S)

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

01 NAME	02 D+B NUMBER	01 NAME	02 D+B NUMBER

03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE	03 STREET ADDRESS (P.O. Box, RFD #, etc.)	04 SIC CODE

05 CITY	06 STATE	07 ZIP CODE	05 CITY	06 STATE	07 ZIP CODE

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

See Reference 15

EPA FORM 2070-13 (7-81)

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 10 - PAST RESPONSE ACTIVITIES

I. IDENTIFICATION
01 STATE: CA | 02 SITE NUMBER: 106- 16

II PAST RESPONSE ACTIVITIES (Continued)

01 ☐ R. BARRIER WALLS CONSTRUCTED — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ S. CAPPING/COVERING — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ T. BULK TANKAGE REPAIRED — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ U. GROUT CURTAIN CONSTRUCTED — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ V. BOTTOM SEALED — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ W. GAS CONTROL — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ X. FIRE CONTROL — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ Y. LEACHATE TREATMENT — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ Z. AREA EVACUATED — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ 1. ACCESS TO SITE RESTRICTED — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☐ 2. POPULATION RELOCATED — 02 DATE ____ — 03 AGENCY ____
04 DESCRIPTION

01 ☒ 3. OTHER REMEDIAL ACTIVITIES — 02 DATE 1983 — 03 AGENCY Navy
04 DESCRIPTION

Most of the contaminated soil was excavated and removed in 1983. No follow-up sampling was conducted.

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel interviews.

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POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT
PART 11 - ENFORCEMENT INFORMATION

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER
CA	106-16

II. ENFORCEMENT INFORMATION

01 PAST REGULATORY ENFORCEMENT ACTION ☐ YES ☒ NO

02 DESCRIPTION OF FEDERAL, STATE, LOCAL REGULATORY/ENFORCEMENT ACTION

III. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

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POTENTIAL HAZARDOUS WASTE SITE
FINAL STRATEGY DETERMINATION

REGION	SITE NUMBER
IX	106-16

File this form in the regional Hazardous Waste Log File and submit a copy to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW, Washington, DC 20460.

I. SITE IDENTIFICATION

A. SITE NAME	B. STREET	
Site 16 - Potassium Ferricyanide Spill Area	NAF El Centro	
C. CITY	**D. STATE**	**E. ZIP CODE**
El Centro	CA	92243-5001

II. FINAL DETERMINATION

Indicate the recommended action(s) and agency(ies) that should be involved by marking 'X' in the appropriate boxes.

RECOMMENDATION	MARK 'X'	ACTION AGENCY			
		EPA	STATE	LOCAL	PRIV
A. NO ACTION NEEDED					
B. REMEDIAL ACTION NEEDED, BUT NO RESOURCES AVAILABLE *(If yes, complete Section III.)*					
C. REMEDIAL ACTION *(If yes, complete Section IV.)*					
D. ENFORCEMENT ACTION *(If yes, specify in Part E whether the case will be primarily managed by the EPA or the State and what type of enforcement action is anticipated.)*					

E. RATIONALE FOR FINAL STRATEGY DETERMINATION

The Preliminary Assessment/Site Inspection has been completed at this site. This site has been recommended for a Remedial Investigation (RI). The RI will verify and characterize the extent of contamination, if any. The need for a Remedial Action wi be determined from the results of the RI. RI recommendations are given in Chapter of this report.

F. IF A CASE DEVELOPMENT PLAN HAS BEEN PREPARED, SPECIFY THE DATE PREPARED *(mo., day, & yr.)*	G. IF AN ENFORCEMENT CASE HAS BEEN FILED, SPECIFY T DATE FILED *(mo., day, & yr.)*

H. PREPARER INFORMATION

1. NAME	2. TELEPHONE NUMBER	3. DATE *(mo., day, & y*

III. REMEDIAL ACTIONS TO BE TAKEN WHEN RESOURCES BECOME AVAILABLE

List all remedial actions, such as excavation, removal, etc. to be taken as soon as resources become available. See instructio for a list of Key Words for each of the actions to be used in the spaces below. Provide an estimate of the approximate cost of the remedy.

A. REMEDIAL ACTION	B. ESTIMATED COST	C. REMARKS
	$	
	$	
	$	
	$	
	$	
	$	
	$	
	$	
D. TOTAL ESTIMATED COST	$	

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Continued From Front

IV. REMEDIAL ACTIONS

A. SHORT TERM/EMERGENCY ACTIONS *(On Site and Off-Site)*: List all emergency actions taken or planned to bring the site under immediate control, e.g., restrict access, provide alternate water supply, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State, Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION. INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

B. LONG TERM STRATEGY *(On Site and Off-Site)*: List all long term solutions, e.g., excavation, removal, ground water monitoring wells, etc. See instructions for a list of Key Words for each of the actions to be used in the spaces below.

1. ACTION	2. ACTION START DATE *(mo,day,&yr)*	3. ACTION END DATE *(mo,day,&yr)*	4. ACTION AGENCY *(EPA, State Private Party)*	5. COST	6. SPECIFY 311 OR OTHER ACTION: INDICATE THE MAGNITUDE OF THE WORK REQUIRED.
				$	
				$	
				$	
				$	
				$	
				$	

C. MANHOURS AND COST BY ACTION AGENCY

1. ACTION AGENCY	2. TOTAL MAN-HOURS FOR REMEDIAL ACTIVITIES	3. TOTAL COST FOR REMEDIAL ACTIVITIES
a. EPA		$
b. STATE		$
c. PRIVATE PARTIES		$
d. OTHER *(specify)*:		$

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REFERENCES FOR PA/SI FORMS

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5. Freeze, Allan R., and Cherry John A, 1979. Groundwater. Pentice-Hall Inc, Engelwood Cliffs, New Jersey.

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9. Morton, Paul K, 1977. "Geology and Mineral Recources of Imperial County California." California Division of Mines and Geology, Sacaramento, CA.

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(con't)

14. WESTNAVFACENGCOM, 1972, 1981, 1982, 1983. "Navy Environmental Protection Data Base Reconnaissance - Activity Survey." Western Division, Naval Facilities Engineering Command, San Diego, California.

15. WESTNAVFACENGCOM, 1982a. Master Plan, Naval Air Facility El Centro California, Western Division, Naval Facilities Engineering Command, San Bruno, California.

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17. WESTNAVFACENGCOM, 1981. "General Development Map." Western Division Naval Facilities Engineering Command, San Bruno, California.

APPENDIX F

ADDITIONAL SOIL BORING LOG

F.0 INTRODUCTION. This appendix contains an additional soil boring from June 1987 when cathodic protection of fuel farm tanks was installed at NAF El Centro.

F.1 DRILL LOG INFORMATION. A single boring was logged to a depth of 220 feet. The well was drilled using a Gardner Denver 1500 rotary wash rig. Rotary was fluids consisting of native soils mixed with water. Bentonite was not added to the drilling fluid.

Disturbed samples of cutting were obtained at 10 foot intervals. Field logs were prepared by a Civil Engineer based on samples obtained and drilling observations. Ground-water level was not measured. No laboratory classification tests were performed. Boring logs are presented as Figures F-1 and F-2. The approximate location of the boring is shown on Figure F-3.

The logged boring was drilled during construction of Special Project 84-C-0275, Cathodic Protection System at Fuel Farm, NAF El Centro. As built drawings should be consulted for details of anode completion procedures.

Hole No. 1

DRILLING LOG	DIVISION NEESA	INSTALLATION NAF El Centro	SHEET 1 OF 1 SHEETS

1. PROJECT: Preliminary Assessment/Site Inspection
2. LOCATION (Coordinates or Station):
3. DRILLING AGENCY:
4. HOLE NO. (As shown on drawing title and file number): Deep Hole #1
5. NAME OF DRILLER: Mongean Engineers
6. DIRECTION OF HOLE: ☒ VERTICAL ☐ INCLINED ____ DEG. FROM VERT.
7. THICKNESS OF OVERBURDEN: N/A
8. DEPTH DRILLED INTO ROCK: N/A
9. TOTAL DEPTH OF HOLE:
10. SIZE AND TYPE OF BIT:
11. DATUM FOR ELEVATION SHOWN (TBM or MSL): MSL
12. MANUFACTURER'S DESIGNATION OF DRILL: Gardner Denver 1500
13. TOTAL NO. OF OVER-BURDEN SAMPLES TAKEN: DISTURBED 18; UNDISTURBED
14. TOTAL NUMBER CORE BOXES: N/A
15. ELEVATION GROUND WATER: not measured
16. DATE HOLE: STARTED 6/24/87; COMPLETED 6/24/87
17. ELEVATION TOP OF HOLE: -43 ± 3 feet
18. TOTAL CORE RECOVERY FOR BORING: N/A %
19. SIGNATURE OF INSPECTOR:

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
			brown, Silty Clay		ML/CL	12 inch PVC casing set to 25 feet. Casing not grouted. Arrived on site as casing was set in place. Log for first 25 feet based on available drill cuttings
-53	10					
-63	20			D		
-73	30			D		
-83	40		Silty Sand, brown Fine sand	D	SM	
-93	50		clay Sandy, brown Fine sand	D	CL	
-103	60			D		
-113	70			D		
-123	80					
-133	90			D		
-143	100			D		

ENG FORM 1836 MAR 71 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) PROJECT HOLE NO.

FIGURE F-1 Soil Boring

DRILLING LOG (Cont Sheet) ELEVATION TOP OF HOLE -43±3 feet Hole No. 1

PROJECT Preliminary Assessment /Site I INSTALLATION NAF El Centro SHEET 1 OF 2 SHEETS

ELEVATION a	DEPTH b	LEGEND c	CLASSIFICATION OF MATERIALS (Description) d	% CORE RECOVERY e	BOX OR SAMPLE NO. f	REMARKS (Drilling time, water loss, depth of weathering, etc., if significant) g
	100					
-153	110			D		
-163	120		Silty Clay	D		
-173	130		brown, medium to fine sand, possible seams of sand	D	ML/CL	
-183	140			D		
-193	150			D		Driller reported 2-3 foot soft layer
-203	160		Silty sand, brown fine sand	D	SM	
-213	170					
-223	180		Sand, brown to tan fine to medium Unknown clay or silt content	D	SP/SM	Few soil clods after 180 feet
-233	190			D		
-243	200			D		Drilling fluid seeping into the formation
-253	210			D		Mud tank refilled 3 times in 20 feet logging discontinued at 220 feet
-263	220					Completed at 2:06-2

ENG FORM 1836-A PROJECT HOLE NO.

FIGURE F-2 Soil Boring (con't)

(b) (3) (A)

[redacted]

History and Use of Per- and Polyfluoroalkyl Substances (PFAS)

1 Introduction

The unique physical and chemical properties of per- and polyfluoroalkyl substances (PFAS) impart oil and water repellency, temperature resistance, and friction reduction to a wide range of products used by consumers and industry. For example, PFAS, have been used in coatings for textiles, paper products, and cookware and to formulate some firefighting foams, and have a range of applications in the aerospace, photographic imaging, semiconductor, automotive, construction, electronics, and aviation industries (KEMI 2015; USEPA 2017b). USEPA has compiled a web-based resource for PFAS information. The information includes topics such as Policy and Guidance, Chemistry and Behavior, Occurrence, Toxicology, Site Characterization and Remediation Technologies (USEPA 2017h).

The scientific community is rapidly recognizing and evolving its understanding of the environmental and health impacts associated with the release of PFAS. Certain PFAS, most notably some of the perfluoroalkyl acids (PFAAs), such as perfluorooctanoate (PFOA) and perfluorooctane sulfonate (PFOS), are mobile, persistent, and bioaccumulative, and are not known to degrade in the environment (USEPA 2003b; ATSDR 2015; NTP 2016; Concawe 2016).

ITRC has developed a series of six fact sheets to summarize the latest science and emerging technologies regarding PFAS. The purpose of this fact sheet is to:

- provide an overview of the discovery and development of PFAS and the subsequent detection of PFAS in the environment
- describe emerging concerns of potential adverse human health effects, and efforts to reduce use or replace with alternate formulations, or both
- identify the major sources of PFAS in the environment, as well as other sources of PFAS to the environment that may be of interest

Understanding the manufacturing history of PFAS, as well as past and current uses, allows for the identification of potential environmental sources of PFAS, possible release mechanisms, and associated pathway-receptor relationships.

2 Discovery and Manufacturing History

PFAS are a complex family of more than 3,000 manmade fluorinated organic chemicals (Wang et al. 2017) that have been produced since the mid-20th century, although not all of these may be currently in use or production. Table 2-1 provides a general timeline of initial synthesis and commercial production of some of the more well-known PFAS, along with some of the more frequently associated products.

PFAS are produced using several different processes. Two major processes have been used to manufacture fluorosurfactants (includes PFAAs) and side-chain fluorinated polymers: electrochemical fluorination (ECF) and telomerization (KEMI 2015). ECF was licensed by 3M in the 1940s (Banks, Smart, and Tatlow 1994), and used by 3M until 2001. ECF produces a mixture of even- and odd- numbered carbon chain lengths of approximately 70% linear and 30% branched substances (Concawe 2016). Telomerization was developed in the 1970s (Benskin 2011), and yields mainly even numbered, straight carbon chain isomers (Kissa 2001; Parsons et al. 2008).

Table 2-1. Discovery and manufacturing history of select PFAS

PFAS[1]	Development Time Period							
	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s
PTFE	Invented	Non-Stick Coatings			Waterproof Fabrics			
PFOS		Initial Production	Stain & Water Resistant Products	Firefighting foam				U.S. Reduction of PFOS, PFOA, PFNA (and other select PFAS[2])
PFOA		Initial Production		Protective Coatings				
PFNA					Initial Production	Architectural Resins		
Fluoro-telomers					Initial Production	Firefighting Foams		Predominant form of firefighting foam
Dominant Process[3]		Electrochemical Fluorination (ECF)						Fluoro-telomerization (shorter chain ECF)
Pre-Invention of Chemistry /			Initial Chemical Synthesis / Production			Commercial Products Introduced and Used		

Notes:
1. This table includes fluoropolymers, PFAAs, and fluorotelomers. PTFE (polytetrafluoroethylene) is a fluoropolymer. PFOS, PFOA, and PFNA (perfluorononanoic acid) are PFAAs.
2. Refer to Section 3.4.
3. The dominant manufacturing process is shown in the table; note, however, that ECF and fluorotelomerization have both been, and continue to be, used for the production of select PFAS.

Sources: Prevedouros et al. 2006; Concawe 2016; Chemours 2017; Gore-Tex 2017; US Naval Research Academy 2017

3 Health and Environmental Investigations

3.1 Initial Studies

Studies that found some PFAS in the blood of occupationally exposed workers in the 1970s and reported detections in the blood of the general human population in the 1990s (Buck et al. 2011) led to increased awareness of PFAAs in the environment, associated human exposure, and the potential for health effects. PFAAs (such as PFOS and PFOA) are found in the blood and serum of most people whether exposed in the workplace or not. This is attributed to widespread use, ability to bind to blood proteins and long half-lives in humans (Kannan et al. 2004; Karrman et al. 2006; Olsen et al. 2003). Laboratory studies using animals and epidemiological studies of human populations show that exposure to some PFAS may be associated with a wide range of adverse human health effects (USEPA 2016b, c; ATSDR 2017).

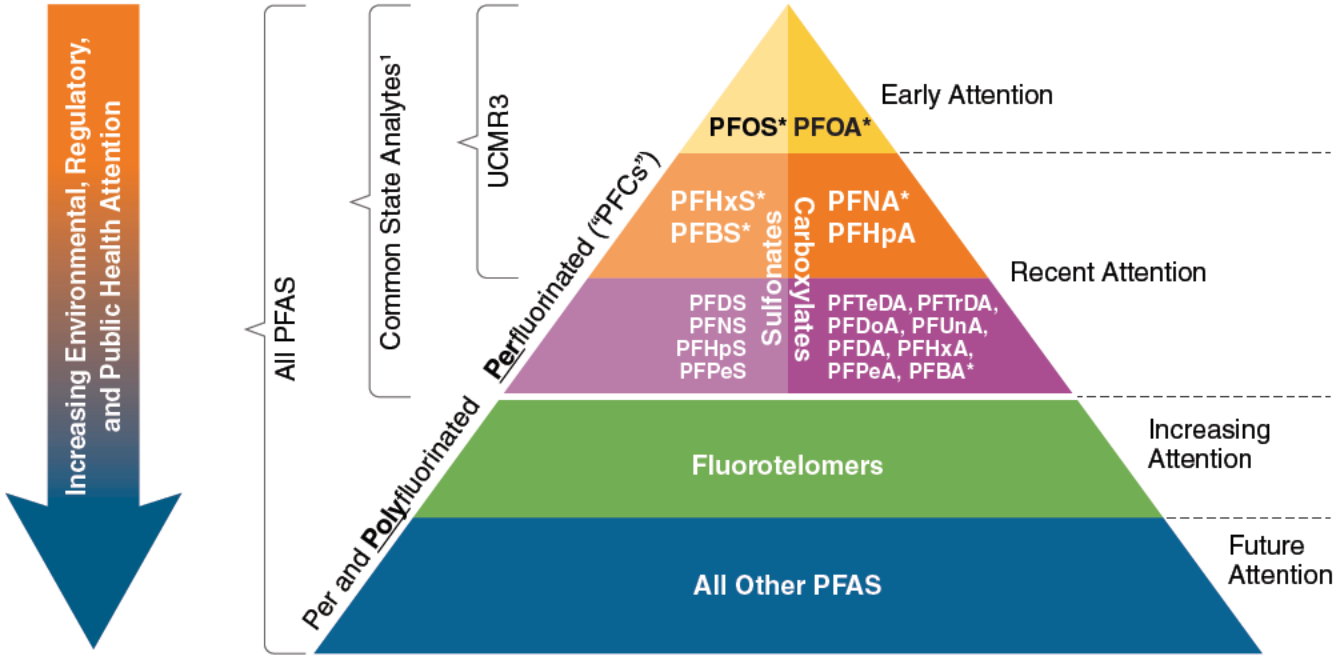
Although some PFAS have been manufactured for more than 50 years, PFAS were not widely documented in environmental samples until the early 2000s. Early detection at low reporting limits was hindered due to analytical capability challenges arising from the unique surface-active properties of PFAS (Giesy and Kannan 2001; 3M 2000). Many manuscripts have since been published showing widespread distribution of certain PFAS, such as PFAAs, in various matrices including sediments, surface and groundwater, wildlife, and human blood (whole, plasma, and serum) (Kannan et al. 2004; Yamashita et al. 2005; Higgins et al. 2005; Rankin et al. 2016). Some PFAS (such as PFAAs) are found in many places throughout the globe, even in areas well beyond where they were initially used or manufactured (Houde et al. 2011).

3.2 Emerging Awareness

The awareness and emphasis on various PFAS have evolved. Early focus was on the longer-chain (see Section 3.4), perfluoroalkyl acids (PFAAs). In 2016, USEPA issued a Lifetime Health Advisory (LHA) for two of the most widely detected PFAAs, PFOA and PFOS. Set at 70 nanograms per liter (ng/L, equivalent to parts per trillion [ppt]), the LHA applies for each PFAA, as well as in combination, in drinking water (USEPA 2016d).

Six additional PFAAs have recently gained attention after their inclusion in the USEPA Unregulated Contaminant Monitoring Rule (UCMR). The third round of monitoring, or UCMR3, was promulgated in 2012 for tracking chemicals suspected to be present in drinking water, but do not have health-based standards set by the Safe Drinking Water Act. A summary of the occurrence data is included in the *Regulations, Guidance, and Advisories Fact Sheet*.

Many state regulatory agencies now request or require an expanded list of perfluoroalkyl substances (short and long chain), and fluorotelomers and polyfluoroalkyl substances are also receiving increased attention. This progression is illustrated in Figure 3-1.



*Common regulatory criteria or health advisories
¹Sum of informal poll (NJ, NH, MN)

Thematic and not proportional.
Bottom of triangle indicates additional number of compounds; not a greater quantity by mass, concentration, or frequency of detection.

Figure 3-1. Emerging awareness and emphasis on PFAS occurrence in the environment
(Source: J. Hale, Kleinfelder, used with permission)

3.3 Stockholm Convention on Persistent Organic Pollutants

The Stockholm Convention on Persistent Organic Pollutants (POPs) is a United Nations treaty signed in 2001 aimed at reducing or eliminating the production, use, and release of key POPs. POPs are defined as synthetic, organic compounds that, to varying degrees, resist photolytic, biological, and chemical degradation (KEMI 2004 and 2005; USEPA 2017k).

In 2009, *Annex B of the Stockholm Convention* was amended to include PFOS, because it is persistent in the environment and is not known to degrade at any environmental condition. At this time, the U.S. has not ratified the amendment (KEMI 2017). According to the Stockholm Convention website, PFOA and PFHxS (perfluorohexane sulfonic acid) are currently proposed for listing.

3.4 Phase-out of Long-Chain PFAS

Due to industry and regulatory concerns about the potential health and environmental impacts, there has been a reduction in the manufacture and use of long-chain PFAAs. Long-chain PFAAs include perfluorinated carboxylates (PFCAs) with eight or more fully fluorinated carbons (for example, PFOA) and perfluorinated sulfonates (PFSAs) with six or more fully fluorinated carbons (for example, PFHxS and PFOS), their salts, and precursor compounds capable of forming long-chain PFAAs (USEPA 2009a; Buck et al. 2011; OECD 2013; Wang et al. 2015).

- In May 2000, 3M, the principal worldwide manufacturer and sole U.S. manufacturer of PFOS, announced a voluntary phase-out of perfluorooctanyl chemistries, which included PFOS, PFHxS, PFOA, and related precursors. 3M reportedly completed most of the phase-out by the end of 2002, with the remaining phase-out completed by 2008 (USEPA 2003b; USEPA 2017e; 3M 2017b).
- USEPA issued Significant New Use Rules (SNURs) under the Toxic Substances Control Act (TSCA) to restrict any future use or production of 183 PFAS, which include 88 of the PFOS-related chemicals phased-out by 3M. However, the SNURs allowed for continued, low-volume use of some of these PFAS in the photographic/imaging, semiconductor, etching, metal plating, and aviation industries. Also, due to the long shelf-life of PFOS-based fire-fighting foams, they may still be stored and in use at various facilities (see Section 4.2) (USEPA 2007). SNURs for some long-chain PFCAs and PFSAs have been proposed (USEPA 2015b).
- In January 2006, USEPA initiated the PFOA Stewardship Program (USEPA 2006b). The eight major manufacturing companies committed to reducing PFOA, other longer-chain PFCAs (such as perfluorononanoic acid [PFNA] and perfluoroundecanoic acid [PFUnA]), and related precursors (for example, 8:2 fluorotelomer alcohol [FTOH]) that could be converted to these PFCAs from their global facility emissions and product content. USEPA indicates all eight companies successfully satisfied the program goals, meeting a 95% reduction by 2010, and elimination by 2015 (USEPA 2017e). Even though the program goals were met, materials imported to the United States may contain these PFCAs and related precursors.

PFAS are manufactured globally. Recently increased production of PFOA and related PFAS in China, India, and Russia have potentially offset the global reduction anticipated with the U.S. phase-out (OECD 2015b). PFAS manufacture began in China in the 1980s (World Bank 2017a, b), and PFOS production in China increased with the long-chain PFAA phase-out in the United States (Concawe 2016). In 2016, PFOS and its derivatives were still being produced in Germany, Italy, and China (Witteveen+Bos and TTE 2016), but by early 2017, China was the only known producer of PFOS. China has ratified the Stockholm Convention on POPs and a grant from Global Environment Facility (GEF) was approved in 2017 to support the reduction of PFOS in China (World Bank 2017a).

3.5 Replacement Chemistry

Manufacturers have been developing replacement technologies, including reformulating or substituting longer-chain substances with shorter-chain perfluoroalkyl or polyfluorinated substances that include, but are not limited to, compounds produced with ECF and fluorotelomerization, such as: FTOH, perfluorobutane sulfonyl fluoride (PBSF)-based derivatives (for example, perfluorobutane sulfonate [PFBS] in lieu of PFOS), polyfluoroethers (for example, GenX and ADONA used in the manufacture of fluoropolymers) and other types of PFAS (Hori et al. 2006; OECD 2007; Herzke, Olson, and Posner 2012; Wang et al. 2013; Wang et al. 2015; Holmquist et al. 2016).

Many long-chain PFAS alternatives are structurally similar to their predecessors and manufactured by the same companies (Concawe 2016; Wang et al. 2015). However, it is not yet clear if some of these chemicals can achieve the same performance effectiveness of some of their predecessors. For example, a 2015 study concluded that there are no non-fluorinated alternatives that provide equivalent technical performance in textiles (Danish EPA 2015).

Several studies suggest some of the replacement PFAS may or may not be less hazardous than the long-chain predecessors, although publicly available information on most replacement chemicals is limited (Wang et al. 2015; RIVM 2016). Documentation regarding the USEPA's review of hundreds of "shorter chain-length PFAS telomeric" substitutes for long-chain PFAS is available under the TSCA New Chemicals Program (OECD 2013; USEPA 2017g). Other documentation regarding replacement chemistries is available from the FluoroCouncil (2017).

Information on environmental contamination by replacement PFAS is limited, and most are not detected by standard analytical methods (Wang et al. 2013). Treatment processes used to remove these chemicals from waste streams may not be as effective as with longer-chain PFAS (Sun et al. 2016).

4 Major Sources of PFAS in the Environment

PFAS are used in many industrial and consumer applications. Major sources may have released PFAS into the environment and impacted drinking water supplies in many areas of the United States (Environmental Working Group and Northeastern University Social Science Environmental Health Research Institute 2017).

4.1 Production and Manufacturing Facilities

Both in the United States and abroad, primary manufacturing facilities produce PFAS and secondary manufacturing facilities use PFAS to produce goods. Due to the solubility and persistence of many PFAS, environmental release mechanisms associated with these facilities include air emission and dispersion, spills, and disposal of manufacturing wastes and wastewater. Potential impacts to air, soil, surface water, stormwater, and groundwater are present not only at release areas but potentially over the surrounding area (Shin et al. 2011). Table 4-1 summarizes potential major sources of PFAS releases to the environment based on the manufacturing sector. Manufacturing of commercial products and consumer goods summarized in Section 5 may also be environmental sources but are not included in this table.

Table 4-1. Potential major manufacturing sources of PFAS releases to the environment

Sector	Example Uses	References
Textiles & Leather	Factory- or consumer-applied coating to repel water, oil, and stains. Applications include protective clothing and outerwear, umbrellas, tents, sails, architectural materials, carpets, and upholstery.	Rao and Baker 1994; Hekster, Laane, and de Voogt 2003; Brooke, Footitt, and Nwaogu 2004; Poulsen et al. 2005; Prevedouros et al. 2006; Walters and Santillo 2006; Trudel et al. 2008; Guo et al. 2009; USEPA 2009a; Ahrens 2011; Buck et al. 2011; UNEP 2011; Herzke, Olsson, and Posner 2012; Patagonia 2015; Kotthoff et al. 2015; ATSDR 2015
Paper Products	Surface coatings to repel grease and moisture. Uses include non-food paper packaging (for example, cardboard, carbonless forms, masking papers) and food-contact materials (for example, pizza boxes, fast food wrappers, microwave popcorn bags, baking papers, pet food bags).	Rao and Baker 1994; Kissa 2001; Hekster, Laane, and de Voogt 2003; Poulsen et al. 2005; Trudel et al. 2008; Buck et al. 2011; UNEP 2011; Kotthoff et al. 2015; Schaider et al. 2017
Metal Plating & Etching	Corrosion prevention, mechanical wear reduction, aesthetic enhancement, surfactant, wetting agent/fume suppressant for chrome, copper, nickel and tin electroplating, and post-plating cleaner.	USEPA 1996; USEPA 1998; Kissa 2001; Prevedouros et al. 2006; USEPA 2009b; UNEP 2011; OSHA 2013; KEMI 2015; Danish EPA 2015
Wire Manufacturing	Coating and insulation.	Kissa 2001; van der Putte et al. 2010; ASTSWMO 2015
Industrial Surfactants, Resins, Molds, Plastics	Manufacture of plastics and fluoropolymers, rubber, and compression mold release coatings; plumbing fluxing agents; fluoroplastic coatings, composite resins, and flame retardant for polycarbonate.	Kissa 2001; Renner 2001; Poulsen et al. 2005; Fricke and Lahl 2005; Prevedouros et al. 2006; Skutlarek, Exner, and Farber 2006; van der Putte et al. 2010; Buck et al. 2011; Herzke, Olsson, and Posner 2012; Kotthoff et al. 2015; Miteni 2016; Chemours 2017
Photolithography, Semiconductor Industry	Photoresists, top anti-reflective coatings, bottom anti-reflective coatings, and etchants, with other uses including surfactants, wetting agents, and photo-acid generation.	SIA 2008; Choi et al. 2005; Rolland et al. 2004; Brooke, Footitt, and Nwaogu 2004; van der Putte et al. 2010; UNEP 2011; Herzke, Olsson, and Posner 2012

4.2 Class B Fluorine-Containing Firefighting Foams

Class B fluorine-containing firefighting foams (firefighting foam) for extinguishing flammable liquid fires include aqueous film forming foam (AFFF), fluoroprotein (FP), and film forming fluoroprotein foam (FFFP) (Concawe 2016). These foams have been stored and used for fire suppression, fire training, and flammable vapor suppression at hundreds of military installations and civilian airports (Hu et al. 2016), as well as at petroleum refineries and storage facilities, and chemical manufacturing plants throughout the United States. Additionally, local fire departments in communities have used and maintained quantities of firefighting foam in their inventories. Despite the phase-out of longer-chain PFAAs, these products still have long-chain PFAA constituents in firefighting foam due to the long shelf-life of these products. Facilities that manufactured firefighting foams are also potential sources.

Firefighting foams are a complex mixture of both known and unidentified PFAS of differing molecular structures present in varying proportions. Foams were produced to meet firefighting specifications, rather than formulated to contain a specified mixture of PFAS. These types of firefighting foams have been in use since the 1960s. The United States Naval Research Laboratory began research on the development of firefighting foams in the 1960s, which led to advancements in performance and increased safety (U.S. Naval Research Laboratory 2017). Fluorotelomer foams have been in use since the 1970s and became the predominant foam after 2001 when long-chain ECF-based foams were discontinued.

Firefighting foams are released into the environment through a variety of practices and mechanisms (Anderson et al. 2016; Hale 2016):

- low volume releases of foam concentrate during storage, transfer or equipment calibration
- moderate volume discharge of foam solution for apparatus testing
- occasional, high-volume, broadcast discharge of foam solution for firefighting and fire suppression/prevention
- periodic, high volume, broadcast discharge for fire training
- leaks from foam distribution piping between storage and pumping locations

Firefighting foam is applied by mixing foam concentrate and water to make foam solution. When applied to a fire, the foam solution is aerated at the nozzle, yielding finished foam. Thousands of gallons of foam solution may be applied during a given event. Figure 4-1 illustrates the use of firefighting foam, how it may be released to the environment, and potentially affected media.

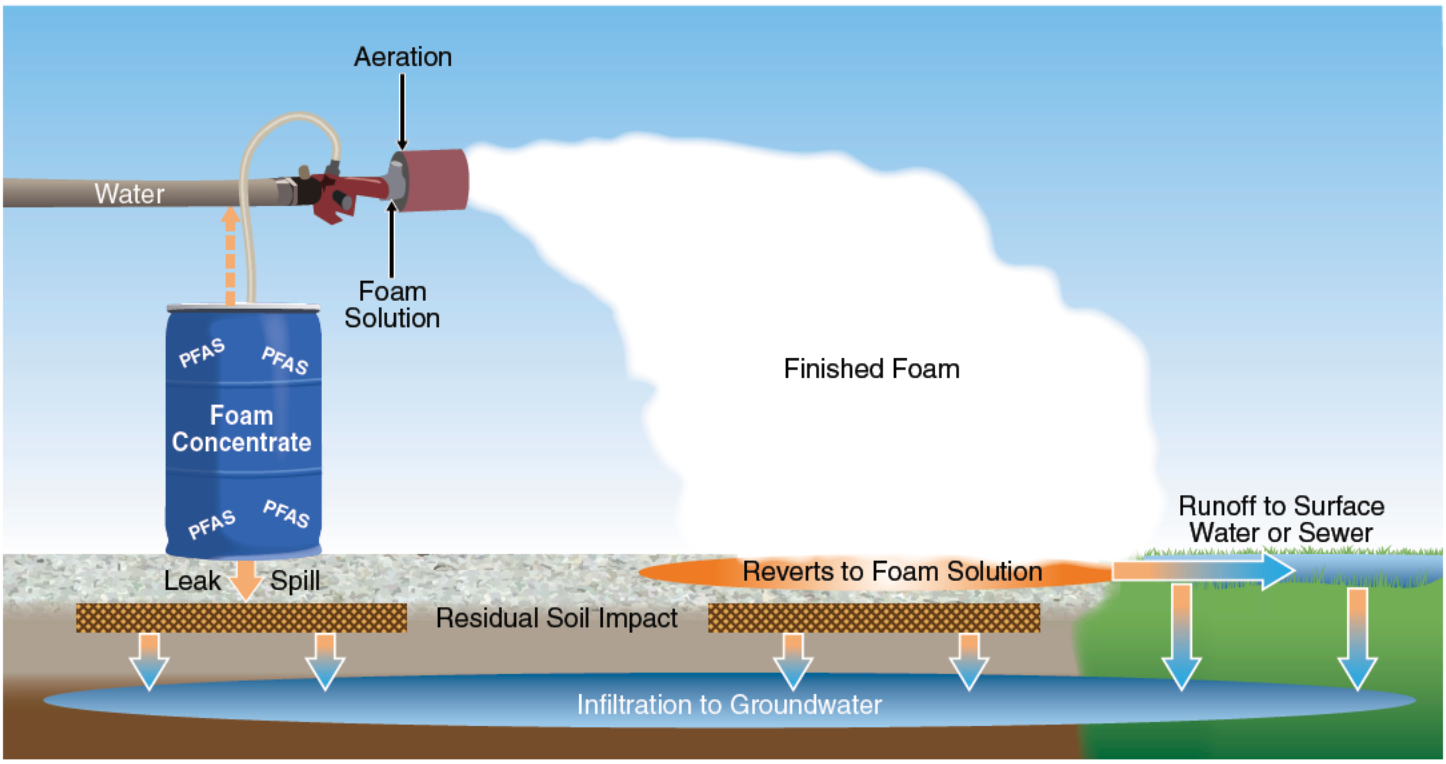


Figure 4-1. Release of firefighting foam
(Source: Adapted from figure by J. Hale, Kleinfelder, used with permission)

The U.S. Department of Defense (USDOD) has undertaken an evaluation of potential firefighting foam contamination at its facilities nationwide (Anderson et al. 2016). Similar efforts have been undertaken by some states. For example, the Minnesota Pollution Control Agency (MPCA) conducted a state-wide survey of firefighting foam use at training sites. Working with the State Fire Chief Association, the MPCA identified more than two dozen locations where Class B foams were likely used in firefighting training (Antea Group 2011).

4.3 Waste Disposal

Disposal of wastes generated during primary PFAS production and secondary manufacturing using PFAS can be sources of PFAS environmental contamination. As PFAS manufacturing processes change with time, the resulting type and composition of waste streams also change. Given that PFAS production and use began several decades before the enactment of federal and state regulations governing waste disposal (for example, Resource Conservation and Recovery Act [RCRA] in 1976 [USEPA 2017d]), environmental impacts, including impacted drinking water supplies, from disposal of legacy PFAS industrial waste have been documented (Shin et al. 2011; MPCA 2017).

Leachate from some municipal solid waste landfills has been shown to be a source of PFAS release to the environment, with the presence of some PFAS reportedly due to the disposal of consumer goods treated with hydrophobic, stain-resistant coatings (Busch et al. 2010; Eggen, Moeder, and Arukwe 2010). PFAS composition and concentration in leachates vary depending on waste age, climate, and waste composition (Allred et al. 2015; Lang et al. 2017).

The evolution of waste reduction and landfill technology has provided significant protection to human health and the environment (Hickman 1999). Leachate collection systems are essential to providing systematic transport of leachate to a central location for recirculation, treatment, or offsite treatment (Arabi and Lugowski 2015). Leachate treatment by wastewater treatment plants (WWTPs) is common prior to discharge to surface water, or distribution for agricultural or commercial use (Lang 2016). Standard WWTP technologies may do little to reduce or remove PFAS and discharge of landfill leachate treated at WWTPs represents a secondary source of certain PFAS release to the environment (Ahrens et al. 2015; CRC Care 2017).

4.4 Wastewater Treatment

Consumer and industrial use of PFAS-containing materials, including disposal of landfill leachate and firefighting foam, results in the discharge of PFAS to WWTPs. WWTPs, particularly those that receive industrial wastewater, are possible sources of PFAS release. (Lin, Panchangam, and Lo 2009; Ahrens et al. 2009).

4.4.1 WWTP Operations

Conventional sewage treatment methods do not efficiently remove PFAAs (Ahrens et al. 2011; Schultz et al. 2006). Evaluation of full-scale WWTPs has indicated that conventional primary (sedimentation and clarification) and secondary (aerobic biodegradation of organic matter) treatment processes, can result in changes in PFAS concentrations and classes (for example, an increase in the concentrations of PFAAs in effluent, presumably from degradation of precursor PFAS) (Schultz et al. 2006).

Some PFAS are frequently detected in WWTP effluent (for example, PFOA and PFBS), with concentrations of some PFAS ranging up to hundreds of ng/L; effluents are believed to be major point sources of these chemicals in surface water (Ahrens 2011). Hu et al. (2016) demonstrated that the presence of WWTPs in an area was predictive of the presence of PFOS and PFOA in drinking water. PFOS and PFOA are two of the most frequently detected PFAS in wastewater. (Hamid and Li 2016). Using WWTP effluent-impacted surface water as a source of tap water can, in turn, recycle the PFAS back to the WWTP, recirculating PFAS in the water cycle (Hamid and Li 2016).

At some WWTPs, studies have shown concentrations of PFAS in ambient air to be 1.5 to 15 times greater than reference sites (Ahrens et al. 2011). PFAS distribution (primarily PFAAs and FTOH, with higher concentrations of FTOH) changes based on the specific PFAS sources in the effluent and the type of treatment methods employed at the WWTP. Lagoon systems contain a greater fraction of PFAAs.

4.4.2 Biosolids

PFAS (measured as PFCAs and PFSAs) have been found in domestic sewage sludge (Higgins et al. 2005). USEPA states that more than half of the sludge produced in the United States is applied to agricultural land as biosolids, therefore biosolids application can be a source of PFAS to the environment (USEPA 2017n). The most abundant PFAS found in biosolids (PFOS and PFOA) are the same as in WWTP effluent; however, biosolids may also contain other long-chain PFAS (Hamid and Li 2016). Application of biosolids as a soil amendment can result in a transfer of PFAS to soil

(Sepulvado et al. 2011). These PFAS can then be available for uptake by plants and soil organisms. There are indications that PFAAs can enter the food chain through the use of biosolids-amended soil (Lindstrom et al. 2011; Blaine et al. 2013; Blaine et al. 2014; Navarro et al. 2017). Further studies show that PFAS concentrations can be elevated in surface and groundwater in the vicinity of agricultural fields that received PFAS contaminated biosolids for an extended period of time (Washington et al. 2010).

5 Other Sources of PFAS – Use of Commercial and Consumer Products

PFAS are widely used in consumer products and household applications, with a diverse mixture of PFAS found in daily use in varying concentrations (Clara et al. 2008; Trier, Granby, and Christensen 2011; Fujii, Harada, and Koizumi 2013; OECD 2013; ATSDR 2015; Kotthoff et al. 2015; KEMI 2015; USEPA 2016b, c).

Environmental releases associated with the use of commercial and consumer products are primarily related to management of solid waste (for example, disposal of used items in a municipal solid waste [MSW] landfill), and wastewater disposal (for example, discharge to WWTPs, private septic systems, or other subsurface disposal systems).

As increased environmental sampling for PFAS occurs, it is likely that additional sources may emerge. Studies have shown that physical degradation of some consumer products (such as PFAS-treated paper, textiles, and carpets) may be a source of PFAS in house dust (Bjorklund, Thuresson, and de Wit 2009). Additionally, studies have also shown that professional ski wax technicians may have significant inhalation exposures to PFAS (Nilsson et al. 2013) and snowmelt and surface waters near ski areas may have measurable PFAS impacts (Kwok et al. 2013).

Commercial and Consumer Products Containing PFAS:

- paper and packaging
- clothing and carpets
- outdoor textiles and sporting equipment
- ski and snowboard waxes
- non-stick cookware
- cleaning agents and fabric softeners
- polishes and waxes, and latex paints
- pesticides and herbicides
- hydraulic fluids
- windshield wipers
- paints, varnishes, dyes, and inks
- adhesives
- medical products
- personal care products (for example, shampoo, hair conditioners, sunscreen, cosmetics, toothpaste, dental floss)

6 References and Acronyms

The references cited in this fact sheet, and the other ITRC PFAS fact sheets, are included in one combined list that is available on the ITRC web site. The combined acronyms list is also available on the ITRC web site.

Per- and Polyfluoroalkyl Substances (PFAS) Team Contacts

Robert Mueller • New Jersey Department of Environmental Protection
609-984-3910 • Bob.Mueller@dep.nj.gov

Virginia Yingling • Minnesota Department of Health
651-343-2890 • virginia.yingling@state.mn.us

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ITRC
50 F St. NW, Suite 350
Washington, DC 20001
itrcweb.org

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MMEC-2405-4445-0005 C-451 25 June 2019

PERFLUOROOCTANE SULFONATE (PFOS)

Dossier prepared in support for a nomination of PFOS to the UN-ECE LRTAP Protocol and the Stockholm Convention

The dossier is prepared by the Swedish Chemicals Inspectorate (KemI)
and the Swedish EPA, Sweden

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EXECUTIVE SUMMARY

Introduction

Perfluorooctane sulfonate (PFOS) is fully fluorinated anion, which is used as such in some applications or incorporated into larger polymers. Due to its surface-active properties it is used in a wide variety of applications. PFOS can be formed by degradation from a large group of related substances, referred to as PFOS-related substances. PFOS and 96 PFOS-related substances are part of the nomination. All these substances are members of a large family of perfluoroalkylated substances (PFAS), in which the substitutes to PFOS also can be found.

POP characteristics of PFOS

The conclusions of the POP characteristics of PFOS according to the UN-ECE criteria are presented in the table below.

Table 1. POP characteristics of according to the UN-ECE POP criteria.

Criterion	Meets the criterion (Yes/No)	Remark
Potential for Long-Range Atmospheric Transport	Yes	Vapour pressure = 3,31 x 10^{-4} Pa Atmospheric half life > 2 days (estimated value based on photolytic half life > 3,7 years)
Toxicity	Yes	Sub-chronic exposure: Mortality in monkeys at 4,5 mg/kg bw/day. Reproductive toxicity: mortality in pups at 1,6 mg/kg bw/day. Acute toxicity to fish: LC_{50} = 4,7 mg/L
Persistence	Yes	Extremely persistent. No degradation recorded in chemical or biological tests
Bioaccumulation	Yes	Found in highly elevated concentrations in top predators. Calculated hypothetical BMF = 22 - 160. BCF in fish = 2796 - 3100.

PFOS meets the criteria for POPs characteristics as outlined in executive body decision 1998/2.

According to available data, PFOS meets the criteria for the potential for long-range atmospheric transport. This is evident through monitoring data showing highly elevated levels of PFOS in various parts of the northern hemisphere. It is especially evident in the Arctic biota, far from anthropogenic sources. PFOS also fulfils the specific criteria for vapour pressure and atmospheric half-life.

PFOS fulfils the criteria for toxicity. It has demonstrated toxicity towards mammals in sub-chronic repeated dose studies at low concentrations as well as reproductive toxicity with mortality of pups occurring shortly after birth, probably caused by inhibition of lung maturation. PFOS is toxic to aquatic organisms with mysid shrimp being the most sensitive organism.

PFOS is extremely persistent. It has not showed any degradation in tests of hydrolysation, photolysation or biodegradation in any environmental condition tested. The only known condition whereby PFOS is degraded is through high temperature incineration.

With regard to bioaccumulation potential, PFOS meets the criterion through highly elevated concentrations that has been found in top predators such as the polar bear, seal, bald eagle and mink. Based on the concentrations found in their prey, high BMFs have been estimated. BCF values in fish, although (rather) high do not in themselves meet the specific criteria.

PFOS in the environment

PFOS and PFOS-related substances are released to the environment at their manufacture, during their use in industrial and consumer applications and from disposal after their use. Elevated concentrations of PFOS have been found in sewage effluents and leakage water from landfills. These findings display pathways of PFOS and its related substances to the environment. PFOS have been detected in a large variety of biota in locations all around the globe, as well as in water in the open oceans. Most notable and alarming is the high concentrations of PFOS that have been found in Arctic animals, far from anthropogenic sources.

Due to their intrinsic properties, PFOS and its related substances are used in a wide variety of applications, often at concentrations lower than is required for product information. Also, the rate and the extent of the formation of PFOS from its related chemicals are largely unknown, and it is therefore very difficult to estimate the releases of PFOS to the environment.

Uses

In year 2000, 3M decided to voluntarily phase out the production of PFOS, which has resulted in a significant reduction in the use of PFOS related substances. The current sectors where PFOS and its related substances are used are:

- In existing fire fighting foam stock
- Photographic industry
- Photolithography and semiconductors,
- Hydraulic fluids and metal plating

Historically, PFOS and its related substances have been used in applications such as fire fighting foams, carpets, leather/apparel, textiles/upholstery, paper and packaging, coatings and coating additives, industrial and household cleaning products and pesticides and insecticides.

INTRODUCTION

Perfluorooctane sulphonate (hereafter referred to as PFOS) is a fully fluorinated anion that belongs to a large group of perfluorinated substances (PFAS). Also included amongst PFAS are PFOS-related substances, which can be degraded to PFOS.

PFOS has been on the global agenda since year 2000 when 3M (the major global producer of PFOS) announced that the company would voluntarily phase out its production. Since then, a number of activities in different forums have been undertaken.

The environmental protection agency (EPA) in USA have introduced Significant New Use Rules (SNUR), requiring companies to inform EPA before manufacturing or importing listed PFOS related substances. There are two SNURs, listing 88 substances.

A hazard assessment of PFOS, done by OECD in 2002, concluded that the presence and the persistence of PFOS in the environment, as well as its toxicity and bioaccumulation potential, indicate a cause of concern for the environment and human health.

At present, an environmental risk assessment is prepared by the UK-Environment Agency, and discussed by the EU member states under the umbrella of the existing substances regulation (ESR DIR 793/93). A PFOS risk reduction strategy is currently being prepared by the Department for Environment, Food and Rural Affairs (Defra, UK), which may also form a basis for EU risk reduction measures.

This dossier on PFOS mainly builds on information that has been gathered by the United Kingdom, i.e., in the hazard assessment report prepared by the UK and the USA for the OECD, and in the UK risk reduction strategy. Some recent information from the open scientific literature is also included.

PART I. RISK PROFILE

A. Chemical identity

Chemical name: Perfluorooctane Sulfonate (PFOS)
Molecular formula: $C_8F_{17}SO_3$
Structural formula:

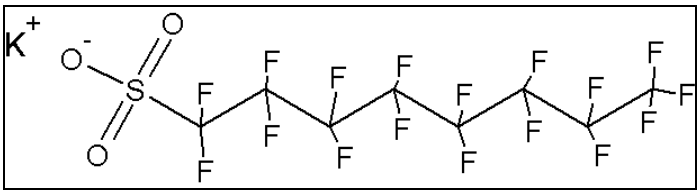

Figure 1. Structural formula of PFOS shown as its potassium salt

Synonyms:
1-Octanesulfonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro;
1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulfonic acid;
1-Octanesulfonic acid, heptadecafluoro-;
1-Perfluorooctanesulfonic acid;
Heptadecafluoro-1-octanesulfonic acid;
Perfluoro-n-octanesulfonic acid;
Perfluoroctanesulfonic acid;
Perfluoroctylsulfonic acid

PFOS is a fully fluorinated anion, which is commonly used as a salt or incorporated into larger polymers. PFOS and its closely related compounds, which contain PFOS impurities or can give rise to PFOS, are members of the large family of perfluoroalkyl sulphonate substances (PFAS). The schematic structure of PFAS is given in Figure 2.

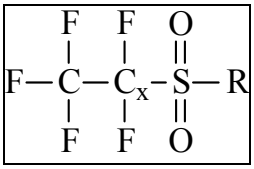

Figure 2. Schematic structure of PFAS.
R is equal to any given functional group such as OH, NH_2, etc.
For PFOS-related substances, x = 7.

PFOS is not listed as a substance on EINECS and has no classification. The acid form of PFOS is not classified on Annex I of Directive 67/548/EEC, and neither are any of the usual salts (potassium, ammonium, and lithium).

Perfluorinated substances with long carbon chains, including PFOS, are both lipid-repellent and water-repellent. Therefore, the PFOS-related substances are used as surface-active agents in different applications. The extreme persistence of these substances make them suitable for high temperature applications and for applications in contact with strong acids or bases. It is the very strong carbon-fluorine bindings that cause the persistence of perfluorinated substances.

The physical and chemical properties of the potassium salt of PFOS are listed in Table 2.

Table 2. Physical and chemical properties of PFOS potassium salt. (Data from OECD, 2002, unless otherwise noted).

Property	Value
Appearance at normal temperature and pressure	White powder
Molecular weight	538 g/mol
Vapour Pressure	$3{,}31 \times 10^{-4}$ Pa
Water solubility in pure water	519 mg/L (20 ± 0,5ºC) 680 mg/L (24 - 25ºC)
Melting point	> 400 ºC
Boiling point	Not measurable
Log K_{OW}	Not measurable
Air-water partition coefficient	$< 2 \times 10^{-6}$ (3M, 2003)
Henry's Law Constant	$3{,}05 \times 10^{-9}$ atm m^3/mol pure water

PFOS can be formed (by environmental microbial degradation or by metabolism inside larger living organisms) from PFOS-related substances, i.e., molecules containing the PFOS-moiety depicted in Figure 2. The majority of PFOS related substances are polymers of high molecular weights in which PFOS is only a fraction of the polymer and final product (OECD, 2002). PFOS-related substances have been defined somewhat differently in different contexts and there are currently a number of lists of PFOS-related substances (Table 3). The lists contain varying numbers of PFOS-related substances that are thought to have the potential to break down to PFOS. The lists overlap to varying extent and it is therefore not clearly evident which substances that are believed to be precursors to PFOS.

Table 3. Number of PFOS-related substances as proposed by UK – DEFRA, US – EPA, OECD and OSPAR

Source	Number of PFOS-related substances
UK – DEFRA (2004)	96
US - EPA (2002)	88
OECD (2002)	172 (22 classes of PFAS)
OSPAR (2002)	48

Since a large number of substances may give rise to PFOS and thus contribute to the contamination problem, the most recent grouping of 96 PFOS-related substances, by DEFRA, UK, is proposed in this nomination. These substances are listed in *annex 1*.

B POP Characteristics

1. Potential for long-range transboundary atmospheric transport

The potassium salt of PFOS has a measured vapour pressure of 3,31 x 10^{-4} Pa (OECD, 2002). Due to this vapour pressure and a low air-water partition coefficient (< $2x10^{-6}$), PFOS itself is not expected to volatilise significantly. It is therefore assumed to be transported in the atmosphere predominantly bound to particles, because of its surface-active properties, rather than in a gaseous state.

Note that some of the PFOS-related substances have a considerably higher vapour pressure than PFOS itself, and are as a result more likely to be volatile. This may allow a wider transport of PFOS-related substances through air than is possible for PFOS itself. Examples of these are EtFOSE alcohol, MeFOSE alcohol, MeFOSA, EtFOSA, and FOSA. These precursors to PFOS could evaporate into the atmosphere. Once in the atmosphere they can remain in gas phase, condense on particles present in the atmosphere and be carried or settle out with them, or be washed out with rain (3M, 2000).

The atmospheric half-life of PFOS is expected to be greater than two days. This has not been specifically tested but the statement is based on the fact that PFOS has exhibited extreme resistance to degradation in all tests performed. The indirect photolytic half-life of PFOS at 25°C has been estimated to be more than 3.7 years (OECD, 2002).

PFOS has through monitoring data been found in a wide range of biota in the Northern Hemisphere such as the Canadian Arctic, Sweden, the US and the Netherlands. In a study by Martin et al (2004), the levels of PFOS was measured in liver samples from biota in the Canadian Arctic and was found in the vast majority of the species examined (all except the black guillemot). The presence of PFOS in Arctic biota, far from anthropogenic sources, demonstrates the properties of PFOS for long-range transport. The mechanisms of this transport are not known, but it cannot be excluded that it is due to volatile PFOS-related substances that have been degraded to PFOS.

Conclusion

PFOS meets the criteria for the potential for long-range atmospheric transport. This is evident through monitoring data showing highly elevated levels of PFOS in various parts of the northern hemisphere. It is especially evident in the Arctic biota, far from anthropogenic sources. PFOS also fulfils the specific criteria for vapour pressure and atmospheric half-life.

2. Toxicity and Ecotoxicity

Toxicity

Evidence of the toxicity of PFOS is available from acute, sub-chronic and chronic exposures to rats, sub-chronic exposures to monkeys, and a two-generation study on rats. Results are available from reproductive and teratogenicity studies on rats and rabbits. Details of these studies are not included here, they can be found in the assessment made by OECD (2002). The most relevant for this notification are:

- A 90-day study on rhesus monkeys exposed to PFOS potassium salt via gavage at the doses 0; 0,5; 1,5 and 4,5 mg/kg bw/day. At 4,5 mg/kg bw/day all monkeys (4) died or were sacrificed in moribound condition. No deaths were observed at 0,5 or 1.5 mg/kg bw/day, but there were signs of gastrointestinal toxicity. NOAEL could not be established since the lowest dose was a LOAEL. The results of this test show that PFOS fulfils the EU criteria for classification as Toxic, with the risk phrase R48.

- A 90-day oral repeated dose toxicity study in rats that were fed diets containing 0, 30, 100, 300, 1000 and 3000 ppm of PFOS potassium salt. All rats died when fed diets containing 300 ppm PFOS and above (equivalent to 18 mg/kg bw/day and above). At 100 ppm (6 mg/kg bw/day), 50% (5/10) of the animals died. All rats receiving diets containing 30 ppm PFOS (2.0 mg/kg/day) survived until the end of the study, but small changes in body and organ weights were reported. Since the lowest dose tested was a LOAEL, a NOAEL could not be established. Also in rats, classification for chronic toxicity (R 48 according to EU criteria) is warranted.

- A two-generation reproductive toxicity study on rats that were fed PFOS potassium salt via gavage at the doses 0,1; 0,4; 1,6; and 3,2 mg/kg bw/day. At the doses 1,6 and 3,2 mg/kg bw/day a significant reduction in the viability of the F1 generation was observed. In the 1,6 mg/kg bw/day group, 34% (86/254) of the F1 pups died within four days after birth. In the 3,2 mg/kg bw/day group, 45% (71/156), of the F1 pups died within one day after delivery. None of these pups survived beyond day 4.

  Maternal toxicity at 1,6 and 3,2 mg/kg bw/day was manifested as reduced food consumption, body weight gain, and terminal bodyweight. Localised alopecia was also observed at 3,2 mg/kg bw/day. LOAEL in this study was 0,4 mg/kg bw/day based on significant reductions in pup weight gain in the F1 generation animals. The NOAEL was 0,1 mg/kg bw/day.

  A study by Grasty et al. (2003) concluded that exposure to PFOS late in gestation is sufficient to induce 100% pup mortality and that the causative factor may be inhibition of lung maturation.

Ecotoxicity
Environmental toxicity data for PFOS is predominantly found for aquatic organisms such as fish, invertebrates and algae.

PFOS has shown moderate acute toxicity to fish. The lowest observed LC_{50} (96h) was estimated to 4,7 mg/l in a study where Fathead minnow (*Pimephales promelas*) were exposed to the lithium salt of PFOS. The lowest NOEC, 0,3 mg/l, has been observed in *Pimephales promelas* at prolonged exposure (42d) and was based on mortality (OECD, 2002). By this toxicity to fish PFOS fulfils the EU criteria for the classifications R 51 with the risk phrase ”toxic to aquatic organisms” and R 53 ” May cause long-term adverse effects in the aquatic environment.

The lowest LC_{50} (96h) for aquatic invertebrates has been observed in the Mysid shrimp (*Mysidopsis bahia)* and was estimated to 3,6 mg/l. The lowest NOEC-value has been observed in *Mysidopsis bahia* at 0,25 mg/l (OECD, 2002).

The most sensitive algae appear to be the green algae *Pseudokirchnerilla subcapitata* with a IC_{50} (96h, cell density) of 48,2 mg/L. The lowest NOEC-value for algae was determined in the same study for *Pseudokirchnerilla subcapitata*, 5,3 mg/L (Boudreau et al., 2003).

Conclusions
PFOS fulfils the criteria for toxicity. It has demonstrated toxicity towards mammals in sub-chronic repeated dose studies at low concentrations (a few mg/kg bw/day) and displayed reproductive toxicity with mortality of pups occurring shortly after birth, probably caused by inhibition of lung maturation.

PFOS is toxic to aquatic organisms with the lowest NOEC (0.25 mg/L) observed in mysid shrimp.

3. Persistence

PFOS is extremely persistent. It does not hydrolyse, photolyse or biodegrade in any environmental condition tested (OECD 2002).

A study on the hydrolysis of PFOS in water has been performed following US-EPA OPPTS protocol 835.2210. The study was conducted at pH varying from 1.5 – 11.0 and at a temperature of 50°C, to facilitate hydrolysis, but did not indicate any degradation of PFOS. The half-life of PFOS was set to be greater than 41 years.

A study on the photolysis of PFOS in water following US-EPA OPPTS protocol 835.5270 has been conducted. No evidence of direct or indirect photolysis was observed under any of the conditions tested. The indirect photolytic half-life of PFOS at 25°C was calculated to more than 3.7 years.

Biodegradation of PFOS has been evaluated in a variety of tests. Aerobic biodegradation of PFOS has been tested in activated sewage sludge, sediment cultures and soil cultures in several studies. Anaerobic biodegradation has been

tested in sewage sludge. Neither of the studies demonstrated any signs of biodegradation.

The only known condition whereby PFOS is degraded is through high temperature incineration (3M, 2003).

Conclusion
PFOS has not showed any signs biodegradation in any tests, and therefore fulfils the criteria for persistence.

4. Bioaccumulation

Tests on the bioconcentration of PFOS in fish have been performed, but the bioaccumulation in mammals has not been studied.

It should be noted that PFOS does not accumulate in fat tissue, which is typical of many persistent organic pollutants. This is a consequence of the fact that PFOS is both hydrophobic and lipophobic. Instead, PFOS binds to proteins in the blood and the liver (3M, 2003).

In a study following OECD protocol 305, the bioaccumulation of PFOS in bluegill sunfish (*Lepomis macrochirus*) have been tested. The kinetic bioconcentration factor (BCFK) for whole-fish was there determined to 2796 (OECD, 2002).

In another study on Rainbow trout (*Oncorhynchus mykiss*), a bioconcentration factor (BCF) in liver and plasma was estimated to 2900 and 3100 respectively (Martin, *et al*., 2003).

When strictly looking at the BCF-values, it is clear that these values are below the BCF-criteria, but in this particular case, the BCF may not adequately represent the bioaccumulation potential of the substance. Thus, monitoring data from top predators at various locations show highly elevated levels of PFOS and demonstrates substantial bioaccumulating and biomagnifying (BMF) properties of PFOS. It is notable that the concentrations of PFOS found in livers of arctic polar bears exceeds the concentrations of all other known individual organohalogens (Martin et al., 2004). Based on the concentration of PFOS in predators (e.g., the polar bear) in relation to the concentration in their principal food (e.g., seals) hypothetical BMF-values can be calculated. Such data are reported in Table 4. It should be noted that there are uncertainties in these comparisons. Even if either liver or blood concentrations are compared in two species, species-differences in specific protein binding in that particular compartment may affect the concentration in the organ without having affected the whole-body concentration of the substance.

Table 4. Measured concentrations of PFOS in biota from various locations. Calculated BMF is shown where applicable.

Species and Location	Concentrations of PFOS	Reference
• Polar Bear, Canadian Arctic	- Concentrations of PFOS in liver (1700 – 4000 ng/g) exceeding all other individual organohalogens. - BMF > 160 based on concentrations in Arctic seals.	Martin et al., 2004.
• Arctic fox	- Very high concentrations of PFOS in liver (6.1 - 1400 ng/g)	Martin et al., 2004.
• Mink, US	- Very high concentrations of PFOS in liver (40 - 4870 ng/g). - BMF = 22 based on data from fish in the same area.	3M, 2003. Giesy and Kannan, 2001.
• Bald Eagle, US	- Very high concentrations of PFOS in plasma (1 – 2570 ng/g).	Kannan and Giesy, 2001.
• Dolphin, US	- Very high concentrations of PFOS in liver (10 – 1520 ng/g).	3M, 2003.
• Seal in the Bothnian Sea, Finland	- Very high concentrations of PFOS in liver (30 – 1100 ng/g). - BMF > 60 based on data from salmon in the same area.	Kannan et al., 2002.

Conclusions

PFOS fulfils the criteria for bioaccumulation based on the extremely high concentrations that have been measured in top predators at various locations such as the Arctic, the US and Sweden.

Part II. SUMMARY REPORT

A. Extent of release to the environment

1 Production

Three different production processes can be used to produce fluorinated substances:

1. Direct fluorination, electro-chemical fluorination, ECF
$C_8H_{17}SO_2Cl + 18\ HF \rightarrow C_8F_{17}SO_2F + HCl$ + by products
This method was used by 3 M and is called 'Simons Electro Chemical Fluorination'. (The major product categories and applications for perfluorooctylsulphonates is shown in *annex 2*)

2. Telomerisation
$C_2F_5I + 3\ C_2F_4 \rightarrow C_8F_{17}I \rightarrow C_8F_{17}$-tensides.
This method is used by Du Pont and it gives a more well-defined product containing fewer isomers.

3. Oligomerisation
This method gives branched carbon chains and fewer isomers.

On 16 May 2000, 3M (the major global producer of PFOS based in the United States) announced that the company would phase-out the use of PFOS voluntarily from 2001 onwards. The 3M global production was in year 2000 approximately 3,700 metric tonnes. In the beginning of 2003 the production ceased completely.

The US Environmental Protection Agency (US EPA) compiled a list of non-US companies, which are believed to supply PFOS related substances to the global market. Of these (and excluding the plant of 3M in Belgium), six plants are located in Europe, six are located in Asia (of which four are in Japan) and one in Latin America (OECD, 2002)

It has been suggested that, at the end of the last decade, there were a total of six companies manufacturing PFAS by the ECF process with a total global capacity of 4,650 metric tonnes per year. (UK Stage 4 Final Report)

2 Uses

3M´s voluntary phase out of PFOS production has led to a significant reduction in the use of PFOS related substances. This is due not only to the limited availability of these substances (3M had at the time the greatest production capacity of PFOS related substances in the world), but also to action within the relevant industry sectors to decrease companies´ dependence on these substances.

The historical use of PFOS related substances in the following applications has been confirmed either in the UK (the first six) or the EU (the remaining two)

- Fire fighting foams
- Carpets
- Leather/apparel
- Textiles/upholstery
- Paper and packaging
- Coatings and coating additives
- Industrial and household cleaning products
- Pesticides and insecticides

In the UK study, detailed information has been received from the following sectors that currently use PFOS related substances:

- Use of existing fire fighting foam stock
- Photographic industry
- Photolithography and semiconductors
- Hydraulic fluids
- Metal plating

The table below outlines the estimated current demand for PFOS related substances in these applications in the EU. (UK Stage 4 Final Report)

Estimated Current Demand for PFOS Related Substances in the EU	
Industry Sector	Quantity (kg/year)
Photographic industry	1,500
Photolithographic and semi-conductors	500
Hydraulic fluids	730
Metal plating	2,500

Uses for PFOS can be shown in more detail in the table in *annex 3*.

2.1 Textile, Carpet and Leather Protection

PFOS related substances have been used to provide soil, oil and water resistance to textiles, apparels, home furnishings and upholstery, carpets, and leather products. They were used because they were able to modify the surface properties of these materials to provide repellence and resistance.

When applied to a material's surface, the perfluorocarbon chain tends to be oriented away from the surface, lowering the surface energy of the material, thereby creating a protective barrier.

Since 3M´s withdrawal from the market, PFOS related substances are no longer used for these applications. (UK Stage 4 Final Report)

2.2 Metal Plating

The main uses of PFOS related substances in metal plating are for chromium plating, and anodising and acid pickling.

PFOS related substances lower the surface tension of the plating solution so that mist containing chromic acid from the plating activity is trapped in solution and is not released to air. Before the introduction of PFOS based applications to control the emissions of hexavalent chromium, mist was controlled through extraction. Hexavalent chromium is a known carcinogen. (UK Stage 4 Final Report)

2.3 Paper and Packaging Protection

PFOS related substances have been used in the packaging and paper industries in both food packaging and commercial applications to impart grease, oil and water resistance to paper, paperboard and packaging substrates. According to 3M, fluorochemicals were used for both food contact applications (plates, food containers, bags and wraps) and non-food applications (folding cartons, containers and carbonless forms and masking papers). Since 3M´s withdrawal from the market, PFOS related substances are no longer used for these applications. (UK Stage 4 Final Report)

2.4 Fire Fighting Foams

Water is vital and effective in extinguish a majority of fires. However, when fighting fires involving flammable liquids (Class B), water tends to sink below the burning fuel due to its specific gravity and, thus, has a little effect in extinguishes the fires (and in some cases could even result in the flammable liquid spilling out of its contained area). Fire fighting foams were therefore developed for use on flammable liquids fires and have proven to be one of the most important and effective tools for dealing with such fires. Fire fighting foams are produced by a combination of foam concentrate (the form in which it is stored) and water, which is then aspirated with air to form the finished foam. The resulting foam forms a low-density blanket that extinguishes fires from flammable liquids.

The fire fighting foams can be grouped in two main categories:

- Fluorine containing foam types (some of them consists of PFOS related substances)
- Fluorine-free foam types

Since the announcement of the voluntary cessation of production of PFOS related substances by 3M, the presence of PFOS in fire fighting foams has gradually decreased. (UK Stage 4 Final Report)

2.5 Industrial and Household Cleaning Products (Surfactants)

3M PFOS based products were sold in the past to a variety of formulators to improve the wetting of water based products marketed as alkaline cleaners, floor

polishes (to improve wetting and levelling), denture cleansers and shampoos. Several of these products (alkaline cleaners, floor polishes, shampoos) were marketed to consumers; some products were also sold to janitorial and commercial services. A number of the alkaline cleaners were spray-applied.

With regard to the UK cleaning products industry, the responses received to-date does not indicate the use of PFOS related substances in Industrial and household cleaning products. Based on information provided in product registers, the Swedish National Chemicals Inspectorate (KemI) has indicated that PFOS related substances are still being used in Sweden for both industrial and household use. (UK Stage 4 Final Report)

2.6 Coatings and Coating Additives

3M indicates that prior to the voluntary phase out of PFOS production, the company would sell fluorochemical polymer coatings and coating additives which were used undiluted or diluted with water or butyl acetate to impart soil or water repellence to surfaces (including printing circuit boards and photographic film). These polymers contained fluorocarbon residuals at a concentration of 4% or less. Other application where aqueous coatings used to protect tile, marble and concrete. It is unclear which of these products were actually based on PFOS related substances.

A survey in UK among members to the British Coatings Federation (BCF) showed that the use of PFOS related substances for these purposes is very limited. (UK Stage 4 Final Report)

2.7 Photographic Industry

PFOS based chemicals are used for the following purposes in mixtures in coatings applied to photographic films, papers, and printing plates:

- Surfactants
- Electrostatic charge control agents;
- Friction control agents;
- Dirt repellent agents; and
- Adhesion control agents

According to the European Photographic Chemicals Industry Sector Group of CEFIC (EPCI), PFOS coating aids have a combination of surface-active properties that are unique and not found with any other type of coating aid. Only small quantities of PFOS materials are required to function as coating aids in imaging media. This property is important because the required addition of non-photoactive materials to coatings in significant quantities diminish the ability of the imaging material to form the sharpest images. In short, thinner coatings make clearer, sharper images. (UK Stage 4 Final Report)

2.8 Photolithography and Semiconductors

Photoresist

Semiconductor manufacturing comprises up to 500 steps, of which there are four fundamental physical processes:

- Implant
- Deposition
- Etch
- Photolithography

Photolithography is the most important step towards the successful implementation of each of the other steps and, indeed, the overall process. It shapes and isolates the junctions and transistors; it defines the metallic interconnects; it delineates the electrical paths that form the transistors; and joins them together. Photolithography reportedly represents 150 of the total of 500 steps mentioned above (UK Stage 4 Final Report).

Photolithography is also integral to the miniaturisation of semiconductors: Miniaturisation makes integrated circuits smaller, cheaper, faster and better, which is critical to continuing the electronic revolution (ESIA, 2003), and to EU manufacturers remaining competitive in the global market.

Miniaturisation refers to the ability to reduce objects, as well as the gap between objects. The ability to effect this separation is proportional to the wavelength of light that is used to pattern the separation. This relationship between separation, i.e. optical resolution, and wavelength is well established. To improve resolution, the semiconductor industry has shortened the wavelength that it uses in photolithography four times since 1980, from 436nm through 365nm and 248nm to 193nm. The latter wavelength is just entering use. A fifth wavelength, 157nm, is expected to be introduced in 2004-5. This shortening of wavelength, however, comes at a price; the composition of the photoresist must be adjusted to appropriately respond to whichever wavelength for the exposure. The role of the photoresist is to record the exposure pattern, known as the aerial image, produced by the photolithography equipment
(UK Stage 4 Final Report).

The introduction of imaging at 248 nm changed the way in which the acidity of an exposed, positive photoresist is altered. The shorter wavelength uses a mechanism called *chemical amplification* (to make the process more efficient).

Chemical amplification depends on a catalyst to chemically amplify the effect of the exposing light. The catalyst-precursor is called a photo-acid generator (PAG). A PAG is decomposed by light into and acid and the acid catalyses another reaction, which also produces and acid. This chain reaction continues to produce acid and to lead to the positive photoresist being chemically transformed in the areas that have been exposed.

The catalytic process is most effective when the photo acid produced from the PAG is a strong Bronsted acid. The first generations of 248 nm resist were

formulated without PFOS in the PAG. PFOS PAG was included in formulations to improve performance.

Antireflective Coatings
A number of resist suppliers sell antireflective coatings (ARC), subdivided into Top (TARC) and Bottom (BARC) coatings and used in combination with deep ultra violet (DUV) photoresist. The process involves placing a thin, top coating on the resist to reduce reflective light, in much the same way and for the same purposes that eyeglasses and camera lenses are coated. TARC depends on good coating properties, water solubility, and an extreme refractive index. PFOS is present in TARC at a total of about 3% by weight.

2.9 Hydraulic Fluids for the Aviation Industry

Hydraulic fluids were initially used in aircraft to apply brake pressure. As larger and faster aircraft were designed, greater use of hydraulic fluids became necessary. An increase in the number of hydraulic fluid fires in the 1940s necessitated work towards developing fire resistant fluids. The first of these fluids was developed around 1948, when fire resistant hydraulic fluids based on phosphate ester chemistry were developed. The development of this phosphate ester technology is said to have been instrumental in achieving a step change in aircraft safety, with the virtual elimination of hydraulic fluid fires in commercial aircraft.

Technological advances in the aviation industry required continuous modifications to the hydraulic fluids to meet the specifications of the aircraft manufacturers. For instance, servo valves containing phosphate ester-based fluids were found to experience corrosion on the high pressure side of the valve metering edge. It was found that certain additives (such as the perfluorinated anionic surfactants) could alter the electrical potential at the metal surface and prevent its electrochemical oxidation.

As a result, hydraulic fluids based on phosphate ester technology and incorporating additives based on perfluorinated anions are used in all commercial aircraft, and in many military and general aviation aircraft throughout the world, as well as by every airframe manufacturer.

In the past, structural/mechanical parts in aircraft hydraulic systems (e.g. pumps and valves) have been reported to exhibit a marked decrease in strength and an alteration in the geometry of the parts. Valves were also found to experience corrosion on the high pressure side of the valve metering edge, causing internal valve leakage, which resulted in decreased pressure and premature valve failure.

Valves control the flow of hydraulic fluid to actuate moving parts of the aircraft such as wing flaps, ailerons, the rudder and landing gear. These valves often contain passages or orifices having clearances of the order of a few thousands of an inch or less through which the hydraulic fluid must pass. Erosion increases the size of the passage and can reduce below tolerable limits the ability of the valve to serve as a precise control device. Corrosion in valves can thus result in

the faulty operation of aircraft, excessive leakage of fluids or even hazardous conditions.

In the case of pumps, erosion can result in a decrease in the efficiency of operation and damage, which necessitate a premature overhaul of mechanical parts (with both cost and time implications). This is in addition to increased risks to the environment resulting from the premature draining of the contaminated fluids from the system, filter clogging and filter replacement.

It was discovered that the localised corrosion (referred to as erosion) was a result of a unique combination of factors including:

- A very high fluid velocity at the upstream edge of the valve metering edge
- The slight ionic character of phosphate esters
- The steel metallurgy of the slide and sleeve construction

Tests showed that perfluorinated anionic surfactants (such as PFOS) could inhibit erosion (and control damage) of mechanical parts of hydraulic systems that are used in all aircraft. These perfluorinated anions act by altering the electrical potential at the metal surface, thereby preventing the electrochemical oxidation of the metal surface under high fluid flow conditions. (UK Stage 4 Final Report)

2.10 Other uses

There is information on other historical or current PFOS applications such as in Pesticides, medical applications, mining and oil surfactants, flame retardants and in adhesives. These applications represent a minor part of known PFOS applications and are therefore not further elaborated in this dossier.

3. Emissions and pathways to the environment

There is to date very limited information regarding the emissions and pathways of PFOS to the environment. The occurrence of PFOS in the environment is a result of anthropogenic manufacturing and use, since PFOS is not a naturally occurring substance.

Releases of PFOS and its related substances are likely to occur during their whole life cycle. They can be released at their production, at their assembly into a commercial product, during the distribution and industrial or consumer use as well as from landfills after the use of the products (3M, 2000).

Manufacturing processes constitute a major source for PFOS to the local environment. During these processes volatile PFOS-related substances may be released to the atmosphere. PFOS and PFOS-related substances could also be released via sewage effluents (3M, 2000). High local emissions are supported by one study that has showed extremely high concentrations of PFOS in wood mice collected in the immediate vicinity to 3M's fluorochemical plant in Antwerpen, Belgium (Hoff et al., 2004).

Fire training areas have also revealed to constitute a source of PFOS-emissions due to the presence of PFOS in fire-fighting foams. High levels of PFOS have been detected in neighbouring wetlands of such an area in Sweden (Swedish EPA, 2004) as well as elevated groundwater levels in the US close to a fire-training area (Moody et al., 2003).

One route for PFOS and PFOS-related substances to the environment seem to be through sewage treatment plants (STPs) and landfills, where elevated concentrations have been observed compared to background concentrations.

Once released from STPs, PFOS will partially adsorb to sediment and organic matter and bioaccumulate in living organisms. A substantial amount of PFOS will also end up in agricultural soil, due to the application of sewage sludge. The primary compartments for PFOS are therefore believed to be water, sediment and soil (RIKZ, 2002).

Dispersion of PFOS in the environment is thought to occur through transport in surface water, transport in air (volatile PFOS-related substances), adsorption to particles (in water, sediment or air) and through living organisms (3M, 2003).

One major obstacle when trying to estimate the releases of PFOS to the environment is that PFOS can be formed through degradation of PFOS-related substances. The rate and the extent of that formation is presently not known. In a study on Swedish STPs, higher concentrations of PFOS were found in the effluents compared to incoming sewage water, which could indicate that a formation of PFOS through PFOS-related substances has occurred (Posner and Järnberg, 2004).

B. Environmental levels and bioavailability

Levels of PFOS have been measured in various environmental matrices in countries such as Sweden, the US and the Netherlands.

Measured environmental levels

A screening study have been made assigned by the Swedish EPA and performed by ITM, Institute of Applied Environmental Research, on the levels of PFOS in the Swedish environment (Swedish EPA, 2004). The results showed highly elevated levels of PFOS in a wetland in the vicinity of a fire drill area with a declining gradient out in the adjacent bay (2.2 – 0.2µg/L). Elevated levels were also detected outside STPs and landfills. Effluents from STPs contained levels of PFOS up to 0.020 µg/L and leakage water from landfills between 0.038 – 0.152 µg/L.

The occurrence of PFOS and other PFAS in open ocean waters such as the Atlantic and the Pacific Ocean have been investigated. The results showed that PFOS is present in central to western Pacific Ocean on concentrations ranging from 15 – 56 pg/L, and were comparable to the concentrations in the mid-Atlantic ocean. These values appear to be the background values for remote marine waters far from local sources (Taniyasu et al., 2004).

Studies in the US have identified the presence of PFOS in surface water and sediment downstream of a production facility, as well as in wastewater treatment plant effluent, sewage sludge and landfill leachate at a number of urban centres in the US (3M Multi City study, reviewed in OECD (2002) and 3M (2003)). Four of the cities (Decatur (AL), Mobile, Columbus (GA), Pensacola) were cities that have manufacturing or industrial use of fluorochemicals; two of the cities (Cleveland (TN), Port St. Lucie) were control cities that do not have significant fluorochemical activities. The ranges of PFOS levels in these cities are provided in Table 5.

Table 5. Environmental Levels of PFOS in Six US Urban Centres in the US (from OECD, 2002)

Medium	Range of PFOS levels (µg/L or µg/kg)
Municipal wastewater treatment plant effluent	0.041 - 5.29
Municipal wastewater treatment plant sludge	0.2 - 3,120 (dry weight)
Drinking water	ND - 0.063
Sediment	ND - 53.1 (dry weight)
Surface water	ND - 0.138
'Quiet' water	ND - 2.93

Note: ND: not detected

The control cities' samples generally inhabited the lower end of the above ranges, except for the municipal wastewater treatment plant effluent and sludge findings for one of the control cities (Cleveland), which were intermediate in their ranges, and the 'quiet' water samples at control city (Port St. Lucie), which were the highest.

Samples of effluent from fifteen representative industrial branches have been analysed for PFOS (Hohenblum et al, 2003). The industry branches were printing (1 site), electronics (3), leather, metals, paper (6), photographic and textiles (2). The PFOS levels found ranged from zero to 2.5 µg/L (2.5 µg/L for leather, 0.120 µg/l for metal, 0.140-1.2 µg/l at four paper sites, 1.2 µg/l for photographic, not found in textiles or electronic).

Groundwater from below an air force base in Michigan, US, has been sampled (Moody et al, 2003). Fire fighting foams containing PFOS had been used there in training exercises from the 1950s to 1993 when the base was decommissioned. The groundwater was found to contain PFOS, at levels from 4 to 110 µg/l.

Environmental levels in biota

PFOS and related fluorochemicals have been traced in animals in a number of studies in a variety of locations around the globe. Generally the highest concentrations are found in top predators in food chains containing fish.

Martin et al (2004) measured the levels of PFOS in liver samples from biota in the Canadian Arctic. PFOS was found in the vast majority of the samples and

higher levels were found in animals at the top of the food chain. The highest levels were found in polar bear, with a mean level of 3.100 ng/g from seven animals (maximum value > 4.000 ng/g). These levels PFOS in the liver exceeds the levels of all other known individual organohalogens. High levels of PFOS were also found in the arctic fox. The sulphonamide FOSA, that is a precursor to PFOS, was also found in most of the samples. The concentration of FOSA was higher than that of PFOS in fish, but not in mammals. This could indicate that FOSA has been metabolised to PFOS in mammals and the high concentrations may be the result of both direct exposure to PFOS and metabolism from FOSA.

Kannan and Giesy (2002) have summarised results of analyses on archived samples. The tissues analysed came from marine mammals, birds, fish, reptiles and amphibians from around the worlds, including the Arctic and Antarctic Oceans. Samples collected in the 1990s were used. Around 1.700 samples were analysed, with concentrations in liver, egg yolk, muscle or blood plasma determined. The detection limit varied from 1 to 35 ppb wet weight. A summary of the results is in Table 6.

Table 6. Maximum concentrations of PFOS in various species as well as frequency of detection. Based on Kannan and Giesy (2002)

Species	Maximum concentration ng/g wwt	Frequency of detection
Marine mammals	1520	77%
Mink and otter	4900	100%
Birds	2570	60%
Fish	1000	38%

PFOS was detectable in most of the samples, including those from remote marine locations, at concentrations >1 ng/g. The authors compared the results from remote areas with those from more industrial locations. They comment that PFOS is widely distributed in remote regions, including the Polar Regions, but that the levels found in more urban and industrial areas (e.g. the Baltic, Great Lakes) are several times higher. The tissues of fish-eating birds in Canada, Italy, Japan and Korea all contained detectable levels of PFOS, suggesting that they are exposed through the fish they consume.

A summary of a number of studies is given in Table 7.

Table 7. Monitored Levels of PFOS in Animals (data from selected studies, based on OECD, 2002)

Description	Ref	Reported Highest Concentrations (Max, Mean)	Location of Concentrations
Global monitoring survey of marine mammals (Florida, California, Alaska, northern Baltic Sea, Mediterranean Sea, Arctic, Sable Island (Canada))	A	Bottlenose dolphin (liver, n = 26): Max: 1520 ng/g wet wt. Mean: 420 ng/g wet wt.	Florida
		Ringed seal (liver, n = 81): Max: 1100 ng/g wet wt. Mean: 240 ng/g wet wt.	Northern Baltic Sea
Survey of mammals, birds and fish in the Canadian Arctic	B	Polar bear (liver, n = 7): Max: > 4000 ng/g wet wt. Mean: 3100 ng/g wet wt.	Canadian Arctic
		Arctic fox (liver, n = 10): Max: 1400 ng/g wet wt. Mean: 250 ng/g wet wt.	
Survey of fish (US, Europe, North Pacific Ocean, Antarctic)	C	Fish (muscle, n = 172): Max: 923 ng/g wet wt. Mean. 40 ng/g wet wt.	Belgian estuary
		Carp (muscle, n = 10): Max: 296 ng/g wet wt. Mean: 120 ng/g wet wt.	US Great Lakes
Survey of fish-eating birds (US, Baltic Sea, Mediterranean Sea, Japanese coast, Korean coast)	D	Bald eagle (plasma, n = 42): Max: 2570 ng/mL Mean: 520 ng/mL	Midwest US
Survey of mink and river otter in the US	E	Mink (liver, n = 77): Max: 4870 ng/g wet wt. Mean: 1220 ng/g wet wt.	US
		River otter (liver, n = 5): Max: 994 ng/g wet wt. Mean: 330 ng/g wet wt.	US
Survey of oysters in the US (Chesapeake Bay & Gulf of Mexico)	F	Oyster (Whole body, n =77) Max: 100 ng/g wet wt. Mean: 60 ng/g wet wt.	US
Fish samples upstream and downstream of 3M facility in Decatur, Alabama, US	G	Fish (whole body): Mean (upstream): 59.1 µg/kg wet wt. Mean (downstream): 1,332 µg/kg wet wt.	Decatur, US
Swedish urban and background fish samples	H	Perch: 3 - 8 ng/g (urban sites in the vicinity of municipal STPs); 20-44 ng/g in Lake Mälaren and near Stockholm	Sweden (Lake Mälaren)

Sources: A: 3M (2003), B: Martin et al (2004); C: Giesy and Kannan (2001c) in 3M (2003); D: Giesy and Kannan (2001b) in 3M (2003); E: Giesy and Kannan (2001d) in 3M (2003); F: Giesy and Kannan (2001e) in 3M (2003); G: Giesy and Newsted (2001) in OECD (2002); H: Holmström et al (2003).

Concentrations of PFOS in guillemot (*Uria aalge*) eggs from Stora Karlsö in the Baltic Sea have been measured retrospectively from 1968 to 2003 in a study by the Institute of Applied Environmental Research assigned by the Swedish EPA. The results shown in Figure 2 displays a trend of increasing concentrations since 1968 (17 – 623 ng/g).

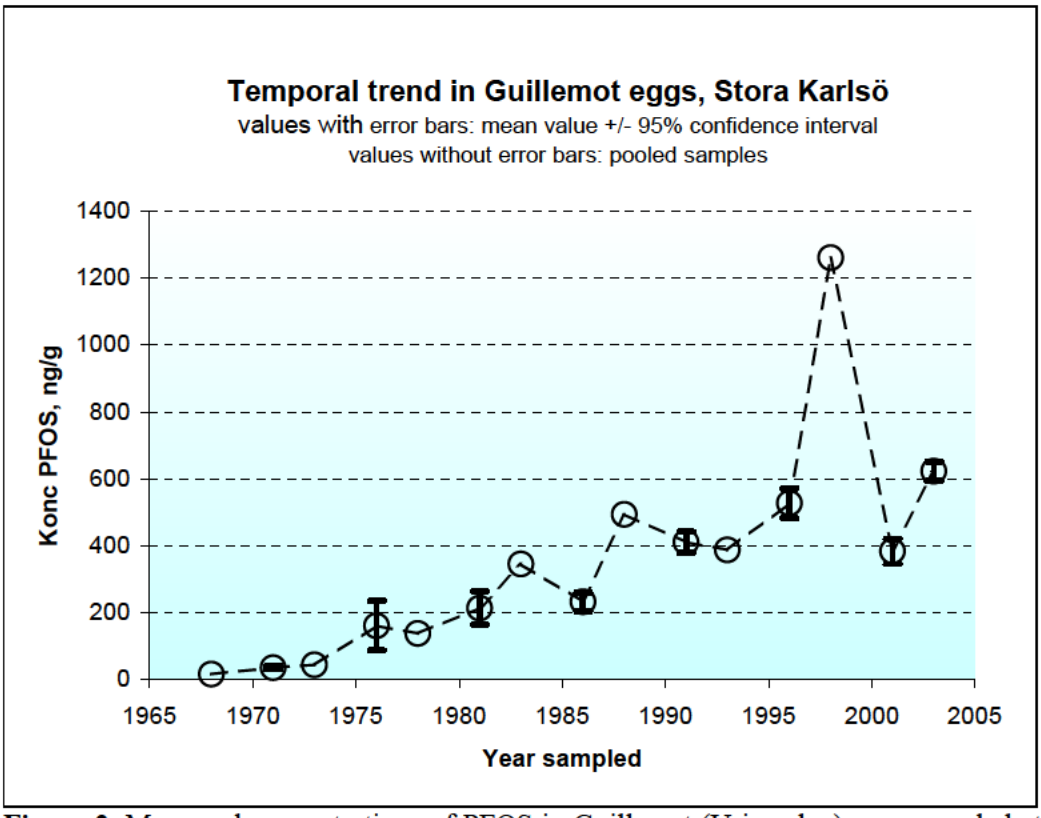

Figure 2. Measured concentrations of PFOS in Guillemot (Uria aalge) eggs sampled at Stora Karlsö in the Baltic Sea between the years 1968 – 2003. The graph is taken from the report "Screening av perfluorerade ämnen" by the Swedish EPA, Environmental Assessment Department (2004).

Bioavailability

Studies on fish have shown that PFOS has bioconcentrating properties. In studies on bluegill sunfish (*Lepomis macrochirus*) and rainbow trout (*Oncorhynchus mykiss*) bioconcentration factors (BCFs) have been estimated to 2796 (whole fish) as well as 2900 (liver) and 3100 (plasma) respectively. The major route of uptake is believed to be through the gills (Martin et al., 2003)

Since PFOS is believed to be released to the environment mainly through water from STPs one major route for PFOS into food chains could be through fish. PFOS have shown a high oral uptake (95%) within 24 hours in the gastro-intestinal (GI) tract in studies on rats (OECD, 2002). Taken together, this could constitute the basis of the highly elevated levels that have been observed in top predators in food chains containing fish.

This could also be confirmed by two separate studies on the Swedish population where the levels of PFOS in whole blood was higher (27.2 ppb, 3.0 – 67, n = 10) in females with a high consumption of fish (Berglund, 2004) compared to samples from females in the general population (17.8 ppb, 4.6 – 33, n = 26) (Kärrman et al., 2004).

In humans, the highest concentrations of PFOS have been detected in workers at 3M's manufacturing plant for perfluorochemicals in Decatur, US, where the levels in serum in the last measurement (2000) ranged between 0.06 – 10.06 ppm (OECD, 2002).

C Socio-economic factors

1 National and International Regulation

1.1 Voluntary Phase Out of Production by 3M

As discussed above the main producer of PFOS compounds voluntarily decided to phase-out the production in 2000. Production ceased completely by the beginning of 2003. Although it is recognised that 3M was the largest global producer of PFOS, other producers do exist.

1.2 EU

There is currently no legislation on the use of PFOS related substances in the EU that is related with their (potential) environmental and/or human health effects.

It should however be noted that some legislation which generally applies to the release of substances to the environment may be relevant to the release of PFOS to the environment (for instance, the IPPC Directive 96/61/EC includes fluorine and its compounds in the indicative list of the main polluting substances to be taken into account if they are relevant for fixing emission limit values (Annex III to the Directive)). (UK Stage 4 Final Report)

1.3 USA

Following the announcement by 3M in May 2000 to phase out the production of PFOS, the US EPA proposed a significant new use rule (SNUR) under section 5(a)(2) of the TSCA for 88 PFOS related substances on October 2000 (US EPA, 2000).

A SNUR is not a ban. It requires companies to file a notice (a SNUN) with US EPA 90 days before beginning the new manufacture or import of listed PFOS chemicals. The US EPA could grant, deny or impose restrictions on the intended use. The required notice is intended to provide the US EPA with the opportunity to evaluate any intended new use and associated activities and if necessary, to prohibit or limit that activity before it occurs. (UK Stage 4 Final Report)

1.4 OECD

PFOS and related substances have been on the agenda within OECD since year 2000. At the 34th Joint Meeting of the Chemicals Committee and the Working Party on Chemicals, Pesticides and Biotechnology (5-8 November 2002) it was agreed that OECD countries with production of these substances (Italy, Japan, Switzerland and UK) should ask their industry if they were planning to phase-out the production of PFOS. The result of this investigation was then reported to the 35th Joint Meeting in June 2003. It was also agreed that there will be continuous reporting on the production and use and exposure of PFOS related substances to the Joint Meeting every second year. To facilitate this exchange of information an electronic Clearing House on PFOS and related substances has been established. (UK Stage 4 Final Report)

1.5 OSPAR Convention

At a ministerial meeting of the Contracting Parties to the OSPAR Convention in Sintra in 1998, it was agreed that man-made hazardous substances should not occur in the marine environment and that naturally occurring hazardous substances should not exceed natural background concentrations. To this end, it was agreed to make every endeavour to cease all discharges, emissions and losses of hazardous substances that could reach the marine environment by the year 2020 (UK Stage 4 Final Report)

Within the framework of the above strategy on hazardous substances, perfluorinated compounds have been under consideration by OSPAR. A considerable amount of data has been generated that show that PFOS meets the OSPAR selection criteria as a hazardous substance. Following a number of earlier meetings of the Hazardous Substances Committee at the Hague on PFOS, the UK and Sweden in April 2003 presented a proposal on the best way to proceed with the prioritisation of PFOS type substances and how to establish fact sheets for produced and marketed substances. (UK Stage 4 Final Report)

2. Alternatives / Substitutes

A significant proportion of previous users of PFOS related substances have moved to other fluorochemical products (fluorinated telomers). Fluorinated telomers cannot degrade to PFOS but under certain circumstances may degrade to perfluorooctanoic acid (PFOA). It is important to note that, while there is little information currently available to assess the environmental and health impacts of fluorinated telomers, extensive work is currently on-going in the US and other countries where there is some concern over the fate and behaviour of these substances. Until these and other studies are concluded, it will not be possible to draw any firm conclusion concerning the environmental/human health advantages of telomers over the PFOS related substances that they have substituted. The US EPA released a Preliminary Risk Assessment on the developmental toxicity of PFOA in April 2003, and is currently working to develop information on the sources and pathways leading to environmental and human exposure to PFOA in the environment (UK Stage 4 Final Report)

2.1 Metal Plating Applications

PFOS related substances are used in the following applications:

- Decorative chromium plating
- Hard chromium plating

Information received indicates the there are currently no known alternative chemical mist suppressants to PFOS related substance for these applications; previous generations of chemical mist suppressants having failed due to excessive pitting of coatings and rapid breakdown during electrolysis.

However, information received from a number of industry and regulatory authorities indicates that the substitution of Cr (VI) with the less hazardous Cr (III) in decorative plating application would eliminate the need for the use of PFOS related substances in this application. Such substitution has potentially significant cost savings, health and safety and environmental benefits for the metal plating sector.

For hard chromium platers, the direct substitution of Cr (VI) is not currently a viable option as Cr (III) is not suitable for the deposition of thick chromium layers, as used in hard chrome applications. Substitutes such as the nickel-tungsten-silicon carbide composites are still in the research phase, although there exist the possibility of other substitutes such as electroless nickel coating in specific applications. These alternatives need to be explored in more detail.
(UK Stage 4 Final Report)

2.2 Fire Fighting Foams

A number of alternatives to the use of PFOS based fluorosurfactants in fire fighting foams are now available/under development. These alternatives include:

- Non-PFOS based fluorosurfactants
- Silicone based surfactants
- Hydrocarbon based surfactants
- Fluorine-free fire fighting foams
- Other developing fire fighting foam technologies that avoid use of fluorine

In UK, most of the fluorocarbon surfactants currently marketed are produced using the telomerisation process (see production) based on C_6 telomer fluorocarbon surfactants.

As a result of many years of continuous development, telomer based fluorosurfactants have been indicated as providing an equal and comparable performance to the PFOS based fire fighting foams and are reported to be highly reliable.

These telomer based fire-fighting foams are not likely to be a source of PFOA in the environment because they predominantly contain the C_6 fluorosurfactants.

Fluorine-free foams are a relative new technology (compared with the fluorosurfactant technology), particularly fluorine free foams for use on Class B fires. These newly developed foams for use on Class B fires do not contain any fluorosurfactants (UK Stage 4 Final Report).

2.3 Photographic Industry

Efforts to substitute PFOS related substances have resulted in a reduction of 83% in the total amount of PFOS related substances used in imaging products since 2000. This has involved the elimination of the following uses of PFOS related substances as:

- Defoamer used in the production of processing chemicals for films, papers, and printing plates
- Photo acid generators in photolithographic processing solutions used in the manufacture of printing plates
- Surfactants in photolithographic processing solutions used in the manufacture of printing plates

However, while work is ongoing to identify substitutes, there are currently no alternatives to PFOS related substances in the following applications:

- Surfactants for mixtures used in coatings applied to films, papers, and printing plates
- Electrostatic charge control agents for mixtures used in coatings applied to films, papers, and printing plates
- Friction control and dirt repellent agent for mixtures used in coatings applied to films papers, and printing plates
- Adhesion control agents for mixtures used in coatings

The market for photography products, although in decline following the rapid uptake of digital technology, still represents an important EU market with essential applications across a number of sectors (including defence and healthcare) (UK Stage 4 Final Report).

2.4 Photolithography and Semiconductors

PFOS based material are reported as being critical in two applications within the photolithography process: photoresist and anti-reflective coatings (ARC´s).

Photoresist

The operation of PFOS based PAGS is critical to the semiconductor industry in the photolithography process.
In limited cases, resist suppliers can formulate chemically amplified resist without PFOS PAG. This is the case with photoresist designed for 248 nm wavelength.

It should be noted that the semiconductor industry continues to make many products with 436nm and 365nm photolithography for which further miniaturisation is no longer cost effective. These products do not require PFOS PAG (ESIA, 2003)

The semiconductor industry is just beginning to introduce 193nm photolithography. It is expected to be the photolithography technology that drives the next round of miniaturization, the so-called 100nm technology node, in 2003-4. Photolithography with 157nm is still in development. However, formulation for 193nm and 157nm wavelength is currently not feasible without PFOS PAG. This is because of the technical difficulties encountered in designing the chemical sensitivity to photo acids used in 248nm resists into 193nm and 157nm resist. The chemical sensitivities used in the 248nm resist make the resist absorb light too strongly to be used at the lower wavelength. (UK Stage 4 Final Report)

Anti-reflective Coatings

For anti-reflective coatings used in combination with deep ultra violet (DUV) photoresists, EISA indicates that there is no alternative available which fulfils the critical technical requirements necessary (UK Stage 4 Final Report).

For uses of PFOS related substances in top (TARC) and bottom (BARC) resist coatings, suppliers are said to be working on polymeric replacements. However, high fluorine content and polymeric nature are relatively incompatible properties. The semiconductors industry indicates that replacement could take up to five years, if it can be done at all (UK Stage 4 Final Report)

2.5 Hydraulic Fluids

According to information received from one of the major producers of hydraulic fluids, there are no alternatives to the PFOS substances currently being used in aircraft systems. There is also no known alternative chemistry that will provide adequately protection to aircraft.

According to this manufacturer, there have been attempts over the last 30 years to find acceptable alternatives to PFOS, and efforts have been accelerated since 3M announced its withdrawal from the market. The company estimates that they have screened up to 2,500 formulations looking for the best erosion resistance additive package. There are currently no promising leads for a substitute for the PFOS related substances now in use, and there are no assurance that an acceptable alternative will ever be identified.

To date, alkali metal salts of perfluoroalkyl sulfonic acids are the only available additives that have been found to provide effective erosion resistance for hydraulic fluids marketed for aircraft use. The incorporation of small amounts of these perfluorinated anionic surfactants into fire resistant phosphate esters based hydraulic fluids improves the ability to inhibit erosion of metal parts without adversely affecting the other properties of the fluid, such as viscosity, oxidative and thermal stability, corrosion resistance to the metal parts, and lubrication qualities for hydraulic system parts (UK Stage 4 Final Report).

3 Emission Control Techniques

Executive Body Decision 1998/2 indicates that this section could consider process changes, control technologies, operating practices and other pollution

prevention techniques which may be used to reduce emissions; along with comment on their applicability and effectiveness.

In the UK Stage 4 final report, the following measures that could be applied to reduce or eliminate the emissions of PFOS to the environment are identified:

- Process controls are applicable to the chromium plating industry, where these process changes are associated with the use of improved extraction and enclosure methods in hard chromium (VI) plating and a shift to chromium (III) processes in decorative plating.

- Emission controls are applicable to all existing and professional uses, and in some industry sectors sophisticated environmental emission control is already applied.

- Conditions on use might include the use of fire fighting foams in contained situations with accompanying fire water collection, treatment and disposal requirements and the use of containment and disposal technologies in aircraft maintenance.

However, due to the end use of PFOS related substances in articles, emission control techniques cannot eliminate the diffuse sources, which are considerable.

4 Cost and Benefits of Control

In general, the benefits of identifying alternatives of substitutes for persistent organic pollutants, or of identifying process changes that decrease their use, include:

- Lower emission to the environment
- Lower worker exposure to the substance
- Products that do not contain the substance will not release the substance either during their use or during subsequent recycling or disposal

Generally, costs of alternatives or substitutes will include research and development and actual costs associated with use of substitutes. These costs are sometimes hard to distinguish from normal costs related to product development.

Some examples of calculated costs
The annualised costs per company, in the *Metal Plating industry*, of adopting improved ventilation extraction/tank enclosure have been calculated as being of order of £3,400 per year (15 years at discount rate of 3.5%)

Decorative platers are likely to switch to the use of Cr (III) to avoid these costs and take up the potential net financial benefits from moving to the Cr (III) process.

As indicated, efforts to replace PFOS related substances in *Photographic Industry* have resulted in a reduction of 83% in the total amount of PFOS related

substances used in imaging products since 2000. The costs of achieving this 83% reduction across the EU since 2000 have been estimated as £12-24 million. (UK Stage 4 Final Report)

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ANNEX 1

UK Draft List of Compounds Potentially Degrading to PFOS in the Environment

Table A1.1: Draft List of Compounds Potentially Degrading to PFOS in the Environment

Ref No.	CAS Number	PFOS related substance
1	307-35-7	1-Octanesulphonyl fluoride, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
2	376-14-7	2-Propenoic acid, 2-methyl-, 2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl ester
3	383-07-3	2-Propenoic acid, 2-[butyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl ester
4	423-82-5	2-Propenoic acid, 2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl ester
5	423-86-9	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-2-propenyl-
6	754-91-6	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
7	1652-63-7	1-Propanaminium, 3-[[(heptadecafluorooctyl)sulphonyl]amino]-*N*,*N*,*N*-trimethyl-, iodide
8	1691-99-2	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(2-hydroxyethyl)-
9	1763-23-1	1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
10	1869-77-8	Glycine, *N*-ethyl-*N*-[(heptadecafluorooctyl)sulphonyl]-, ethyl ester
11	2250-98-8	1-Octanesulphonamide, *N*,*N*',*N*''- [phosphinylidynetris(oxy-2,1-ethanediyl)]tris[*N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
12	2263-09-4	1-Octanesulphonamide, *N*-butyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(2-hydroxyethyl)-
13	2795-39-3	1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, potassium salt
14	2991-50-6	Glycine, *N*-ethyl-*N*-[(heptadecafluorooctyl)sulphonyl]-
15	2991-51-7	Glycine, *N*-ethyl-*N*-[(heptadecafluorooctyl)sulphonyl]-, potassium salt
16	3820-83-5	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-[2-(phosphonooxy)ethyl]-
17	3871-50-9	Glycine, *N*-ethyl-*N*-[(heptadecafluorooctyl)sulphonyl]-, sodium salt
18	4151-50-2	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
19	13417-01-1	1-Octanesulphonamide, *N*-[3-(dimethylamino)propyl]-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
20	14650-24-9	2-Propenoic acid, 2-methyl-, 2- [[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl ester
21	24448-09-7	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(2-hydroxyethyl)-*N*-methyl-
22	24924-36-5	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-2-propenyl-
23	25268-77-3	2-Propenoic acid, 2-[[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl ester

Table A1.1: Draft List of Compounds Potentially Degrading to PFOS in the Environment		
Ref No.	**CAS Number**	**PFOS related substance**
24	29081-56-9	1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, ammonium salt
25	29117-08-6	Poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl]-.omega.-hydroxy-
26	29457-72-5	1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, lithium salt
27	30295-51-3	1-Octanesulphonamide, N-[3-(dimethyloxidoamino)propyl]-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-
28	30381-98-7	1-Octanesulphonamide, *N*,*N*'-[phosphinicobis(oxy-2,1-ethanediyl)]bis[*N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, ammonium salt
29	31506-32-8	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-methyl-
30	38006-74-5	1-Propanaminium, 3-[[(heptadecafluorooctyl)sulphonyl]amino]-*N*,*N*',*N*''-trimethyl-, chloride
31	50598-29-3	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(phenylmethyl)-
32	52550-45-5	Poly(oxy-1,2-ethanediyl), α-[2-[[(heptadecafluorooctyl)sulphonyl]propylamino]ethyl]-ω -hydroxy-
33	56773-42-3	Ethanaminium, *N,N',N''*-triethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulphonic acid (1:1)
34	57589-85-2	Benzoic acid, 2,3,4,5-tetrachloro-6-[[[3- [[(heptadecafluorooctyl)sulphonyl]oxy]phenyl]amino]carbonyl]-, monopotassium salt
35	58920-31-3	2-Propenoic acid, 4-[[(heptadecafluorooctyl)sulphonyl]methylamino]butyl ester
36	61577-14-8	2-Propenoic acid, 2-methyl-, 4-[[(heptadecafluorooctyl)sulphonyl]methylamino]butyl ester
37	61660-12-6	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-[3-(trimethoxysilyl)propyl]-
38	67939-42-8	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-[3-(trichlorosilyl)propyl]-
39	67969-69-1	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-[2-(phosphonooxy)ethyl]-, diammonium salt
40	67939-88-2	1-Octanesulphonamide, *N*-[3-(dimethylamino)propyl]- 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, monohydrochloride
41	68081-83-4	Carbamic acid, (4-methyl-1,3-phenylene)bis-, bis[2-[ethyl[(perfluoro-C4-8-alkyl)sulphonyl]amino]ethyl] ester
42	68298-11-3	1-Propanaminium, 3-[[(heptadecafluorooctyl)sulphonyl](3-sulphopropyl)amino]-*N*-(2-hydroxyethyl)-*N*,*N*-dimethyl-, hydroxide, inner salt
43	68329-56-6	2-Propenoic acid, eicosyl ester, polymer with 2-[[(heptadecafluorooctyl)sulphonyl] methylamino]ethyl 2-propenoate, hexadecyl 2-propenoate, 2-[methyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(undecafluoropentyl)sulphonyl]amino]ethyl 2-propenoate and octadecyl 2-propenoate
44	68239-73-6	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(4-hydroxybutyl)-*N*-methyl-
45	68310-75-8	1-Propanaminium, 3-[[(heptadecafluorooctyl)sulphonyl]amino]-*N,N',N''*-trimethyl-, iodide, ammonium salt
46	68541-80-0	2-Propenoic acid, polymer with 2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate and octadecyl 2-propenoate

Table A1.1: Draft List of Compounds Potentially Degrading to PFOS in the Environment

Ref No.	CAS Number	PFOS related substance
47	68555-90-8	2-Propenoic acid, butyl ester,polymer with 2-[[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl 2-propenoate, 2-[methyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-propenoate and 2-[methyl[(undecafluoropentyl)sulphonyl]amino]ethyl 2-propenoate
48	68555-91-9	2-Propenoic acid, 2-methyl-, 2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl ester, polymer with 2-[ethyl[(nonafluorobutyl)sulphonyl]amino] ethyl 2-methyl-2-propenoate, 2-[ethyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2- [ethyl[(undecafluoropentyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate and octadecyl 2-methyl-2-propenoate
49	68555-92-0	2-Propenoic acid, 2-methyl-, 2-[[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl ester, polymer with 2- [methyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2- [methyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2- [methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2- [methyl[(undecafluoropentyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate and octadecyl 2-methyl-2-propenoate
50	68608-14-0	Sulphonamides, C4-8-alkane, perfluoro, *N*-ethyl-*N*-(hydroxyethyl), reaction products with 1,1'-methylenebis[4-isocyanatobenzene]
51	68649-26-3	1-Octanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(2-hydroxyethyl)-, reaction products with *N*-ethyl-1,1,2,2,3,3,4,4,4-nonafluoro-*N*-(2-hydroxyethyl)-1-butanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-*N*-(2-hydroxyethyl)- 1-heptanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,6-tridecafluoro-*N*-(2-hydroxyethyl)-1-hexanesulphonamide, *N*-ethyl-1,1,2,2,3,3,4,4,5,5,5-undecafluoro-*N*-(2-hydroxyethyl)-1-pentanesulphonamide, polymethylenepolyphenyleneisocyanate and stearyl alc.
52	68867-60-7	2-Propenoic acid, 2-[[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl ester, polymer with 2-[methyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-propenoate, 2- [methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(undecafluoropentyl)sulphonyl]amino]ethyl 2-propenoate and.alpha.-(1-oxo-2-propenyl)-.omega.-methoxypoly(oxy-1,2-ethanediyl)
53	68877-32-7	2-Propenoic acid, 2-methyl-, 2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl ester, polymer with 2-[ethyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(tridecafluoro-hexyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(undecafluoro-pentyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate and 2-methyl-1,3-butadiene
54	68891-96-3	Chromium, diaquatetrachloro[mu.-[*N*-ethyl-*N*- [(heptadecafluorooctyl)sulphonyl] glycinato- kappa.O:.kappa.O']]-.mu.-hydroxybis(2-methylpropanol)di-
55	68909-15-9	2-Propenoic acid, eicosyl ester, polymers with branched octylacrylate, 2- [[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl acrylate, 2-[methyl [(nonafluorobutyl)sulphonyl]amino]ethyl acrylate, 2- [methyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl acrylate, 2-[methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl acrylate, 2- [methyl[(undecafluoropentyl)sulphonyl]amino]ethyl acrylate, polyethylene glycol acrylate Me ether and stearyl acrylate
56	68958-61-2	Poly(oxy-1,2-ethanediyl), .alpha.-[2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl]-.omega.-methoxy-
57	70225-14-8	1-Octanesulphonic acid, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-, compd. with 2,2'-iminobis[ethanol] (1:1)
58	70776-36-2	2-Propenoic acid, 2-methyl-, octadecyl ester, polymer with 1,1-dichloroethene, 2-[[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl 2-propenoate, *N*-(hydroxymethyl)-2-propenamide, 2-[methyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-propenoate and 2-[methyl[(undecafluoropentyl)sulphonyl]amino]ethyl 2-propenoate
59	71463-78-0	Phosphonic acid, [3-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]propyl]-
60	71463-80-4	Phosphonic acid, [3-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]propyl]-, diethyl ester

Table A1.1: Draft List of Compounds Potentially Degrading to PFOS in the Environment		
Ref No.	**CAS Number**	**PFOS related substance**
61	71487-20-2	2-Propenoic acid, 2-methyl-, methyl ester, polymer with ethenylbenzene, 2-[[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl 2-propenoate, 2-[methyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-propenoate, 2- [methyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-propenoate, 2-[methyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-propenoate, 2- [methyl[(undecafluoropentyl)sulphonyl]amino]ethyl 2-propenoate and 2-propenoic acid
62	91081-99-1	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-(hydroxyethyl)-*N*-methyl, reaction products with epichlorohydrin, adipates (esters)
63	92265-81-1	Ethanaminium, *N*,*N*,*N*-trimethyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]-, chloride, polymer with 2-ethoxyethyl 2-propenoate, 2-[[(heptadecafluorooctyl)sulphonyl] methylamino]ethyl 2-propenoate and oxiranylmethyl 2-methyl-2-propenoate
64	94133-90-1	1-Propanesulphonic acid, 3-[[3-(dimethylamino)propyl][(heptadecafluorooctyl) sulphonyl]amino]-2-hydroxy-, monosodium salt
65	94313-84-5	Carbamic acid, [5-[[[2-[[(heptadecafluorooctyl)sulphonyl]methylamino]ethoxy]carbonyl]amino]-2-methylphenyl]-, 9-octadecenyl ester, (Z)-
66	98999-57-6	Sulphonamides, C_{7-8}-alkane, perfluoro, *N*-methyl-*N*-[2-[(1-oxo-2-propenyl)oxy]ethyl], polymers with 2-ethoxyethyl acrylate, glycidyl methacrylate and *N*,*N*,*N*-trimethyl-2-[(2-methyl-1-oxo-2-propenyl)oxy]ethanaminium chloride
67	127133-66-8	2-Propenoic acid, 2-methyl-, polymers with Bu methacrylate, lauryl methacrylate and 2-[methyl[(perfluoro-C_{4-8}-alkyl)sulphonyl]amino]ethyl methacrylate
68	129813-71-4	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-methyl-*N*-(oxiranylmethyl)
69	148240-78-2	Fatty acids, C_{18}-unsatd., trimers, 2-[[heptadecafluorooctyl)sulphonyl]methylamino]ethyl esters
70	148684-79-1	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-(hydroxyethyl)-*N*-methyl, reaction products with 1,6-diisocyanatohexane homopolymer and ethylene glycol
71	160901-25-7	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-ethyl-*N*-(hydroxyethyl), reaction products with 2-ethyl-1-hexanol and polymethylenepolyphenylene isocyanate
72	178094-69-4	1-Octanesulphonamide, *N*-[3-(dimethyloxidoamino)propyl]-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-,potassium salt
73	178535-22-3	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-ethyl-*N*-(hydroxyethyl)-, polymers with 1,1'-methylenebis[4-isocyanatobenzene] and polymethylenepolyphenylene isocyanate, 2-ethylhexyl esters, Me Et ketone oxime-blocked
74	182700-90-9	1-Octanesulphonamide, 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-methyl-, reaction products with benzene-chlorine-sulphur chloride (S_2Cl_2) reaction products chlorides
75	L-92-0151 (US Pre-manufacture notice)	2-Propenoic acid, 2-methyl-, butyl ester, polymer with 2-[ethyl[(heptadecafluorooctyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(nonafluorobutyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2- [ethyl[(pentadecafluoroheptyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate, 2-[ethyl[(tridecafluorohexyl)sulphonyl]amino]ethyl 2-methyl-2-propenoate and 2-propenoic acid
76	P-94-2205 (US Pre-manufacture notice)	Polymethylenepolyphenylene isocyanate and bis(4-NCO-phenyl)methane reaction products with 2-ethyl-1-hexanol, 2-butanone, oxime, *N*-ethyl-*N*-(2-hydroxyethyl)-1-C_4-C_8 perfluoroalkanesulphonamide
77	192662-29-6	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-[3-(dimethylamino)propyl], reaction products with acrylic acid
78	251099-16-8	1-Decanaminium, *N*-decyl-*N*,*N*-dimethyl-, salt with 1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-1-octanesulphonic acid (1:1)
79	306973-46-6	Fatty acids, linseed-oil, dimers, 2- [[(heptadecafluorooctyl)sulphonyl]methylamino]ethyl esters
80	306973-47-7	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-(hydroxyethyl)-*N*-methyl, reaction products with 12-hydroxystearic acid and 2,4-TDI, ammonium salts

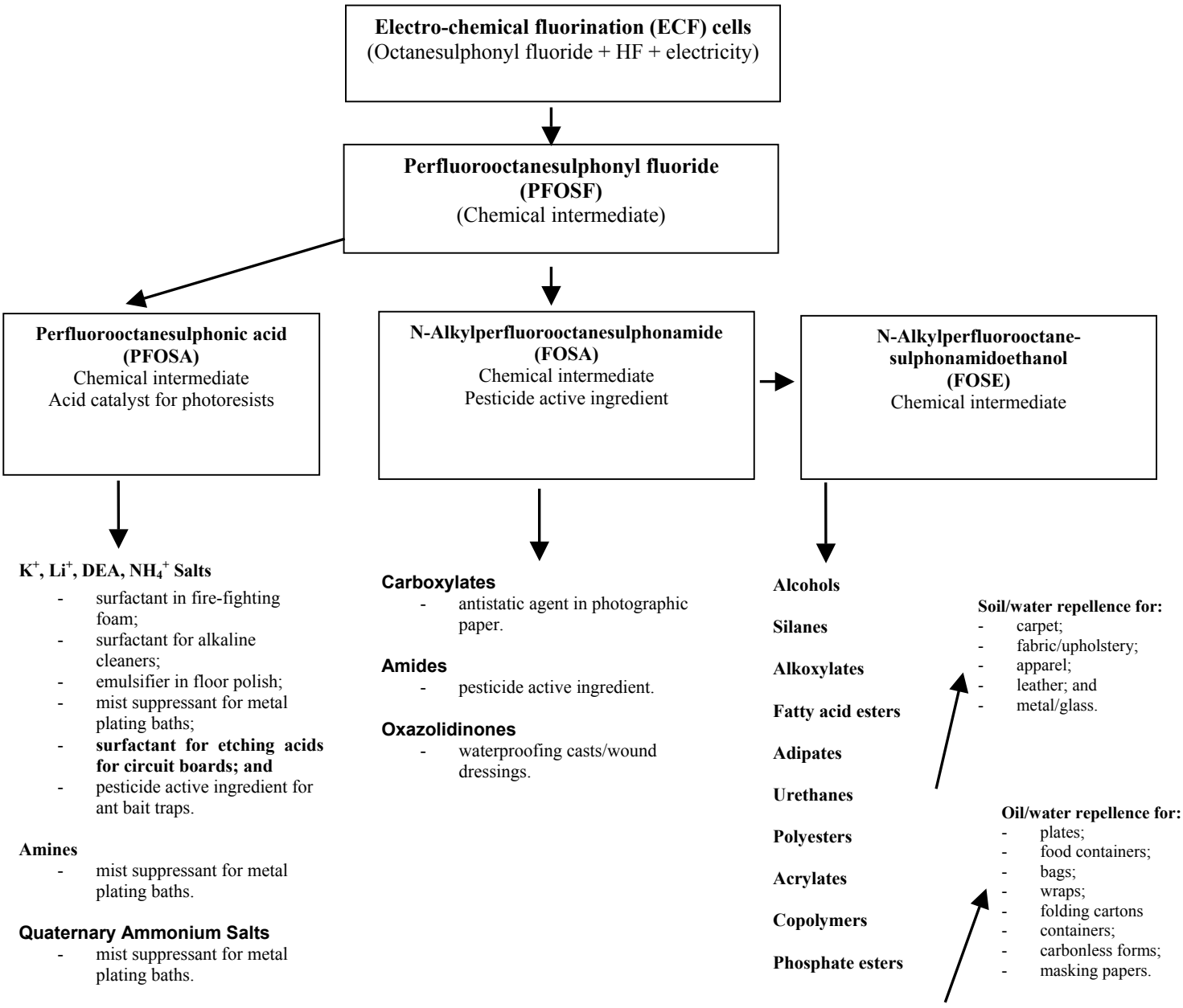
Table A1.1: Draft List of Compounds Potentially Degrading to PFOS in the Environment

Ref No.	CAS Number	PFOS related substance
81	306974-19-6	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*-methyl-*N*-[(3-octadecyl-2-oxo-5-oxazolidinyl)methyl]
82	306974-28-7	Siloxanes and Silicones, di-Me, mono[3-[(2-methyl-1-oxo-2-propenyl)oxy]propylgroup] -terminated, polymers with 2-[methyl[(perfluoro-C4-8-alkyl)sulphonyl]amino]ethyl acrylate and stearyl methacrylate
83	306974-45-8	Sulphonic acids, C_{6-8}-alkane, perfluoro, compounds with polyethylene-polypropylene glycol bis(2-aminopropyl) ether
84	306974-63-0	Fatty acids, C_{18}-unsatd.,dimers, 2-[methyl[(perfluoro-C_{4-8}-alkyl)sulphonyl]amino] ethyl esters
85	306975-56-4	Propanoic acid, 3-hydroxy-2- (hydroxymethyl)-2-methyl-, polymer with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol and *N*,*N'*,2-tris(6-isocyanatohexyl)imidodicarbonic diamide, reaction products with *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(2-hydroxyethyl)-1-octanesulphonamide and *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-*N*-(2-hydroxyethyl)-1-heptanesulphonamide, compounds with triethylamine
86	306975-57-5	Propanoic acid, 3-hydroxy-2-(hydroxymethyl)-2-methyl-, polymer with 1,1'-methylenebis[4- isocyanatobenzene] and 1,2,3-propanetriol, reaction products with *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluoro-*N*-(2-hydroxyethyl)-1-octanesulphonamide and *N*-ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,7-pentadecafluoro-*N*-(2-hydroxyethyl)-1-heptanesulphonamide, compounds with morpholine
87	306975-62-2	2-Propenoic acid, 2-methyl-, dodecyl ester, polymers with 2- [methyl[(perfluoro-C_{4-8}-alkyl)sulphonyl]amino]ethyl acrylate and vinylidene chloride
88	306975-84-8	Poly(oxy-1,2-ethanediyl), .alpha.-hydro-.omega.-hydroxy-, polymer with 1,6-diisocyanatohexane, *N*-(hydroxyethyl)-*N*-methyl perfluoro C_{4-8}-alkane sulphonamides-blocked
89	306975-85-9	2-Propenoic acid, 2-methyl-, dodecyl ester, polymers with *N*-(hydroxymethyl)-2-propenamide, 2-[methyl[(perfluoro-C_{4-8}-alkyl)sulphonyl]amino]ethyl methacrylate, stearyl methacrylate and vinylidene chloride
90	306976-25-0	1-Hexadecanaminium, *N*,*N*-dimethyl-*N*-[2-[(2-methyl-1-oxo-2-propenyl)oxy]ethyl]-, bromide, polymers with Bu acrylate, Bu methacrylate and 2-[methyl[(perfluoro-C_{4-8}-alkyl)sulphonyl]amino]ethyl acrylate
91	306976-55-6	2-Propenoic acid, 2-methyl-, 2-methylpropyl ester, polymer with 2,4-diisocyanato-1-methylbenzene, 2-ethyl-2-(hydroxymethyl)-1,3-propanediol and 2-propenoic acid, *N*-ethyl-*N*-(hydroxyethyl)perfluoro-C_{4-8}-alkanesulphonamides-blocked
92	306977-58-2	2-Propenoic acid, 2-methyl-, 3-(trimethoxysilyl)propyl ester, polymers with acrylic acid, 2-[methyl[(perfluoro-C_{4-8}-alkyl)sulphonyl]amino]ethyl acrylate and propylene glycol monoacrylate, hydrolysed, compounds with 2,2'-(methylimino)bis[ethanol]
93	306978-04-1	2-Propenoic acid, butyl ester, polymers with acrylamide, 2-[methyl[(perfluoro-C_{4-8}-alkyl)sulphonyl]amino]ethyl acrylate and vinylidene chloride
94	306978-65-4	Hexane, 1,6-diisocyanato-, homopolymer, *N*-(hydroxyethyl)-*N*-methyl perfluoro-C_{4-8}-alkane sulphonamides- and stearyl alc.-blocked
95	306979-40-8	Poly(oxy-1,2-ethanediyl), .alpha.-[2-(methylamino)ethyl]-.omega.-[(1,1,3,3-tetramethylbutyl)phenoxy]-, *N*-[(perfluoro-C_{4-8}-alkyl)sulphonyl]
96	306980-27-8	Sulphonamides, C_{4-8}-alkane, perfluoro, *N*,*N'*-[1,6-hexanediylbis[(2-oxo-3,5-oxazolidinediyl)methylene]]bis[*N*-methyl-

Sources: US EPA (2002a); US EPA (2002b); Environment Agency (2001); Consultation with Environment Canada (note that RPA reviewed a confidential draft list of PFOS precursors that was provided by Environment Canada. This was developed from the 182 PFAS that were listed in a June 2000 survey to Canadian industry (Environment Canada, 2000). The draft list will be available as an appendix in the draft screening assessment report on PFOS and its Precursors that the Departments of Environment and Health Canada will release for public comment in early 2004 (Windle, 2003)).

Annex 2:

Major Product Categories and Applications for Perfluorooctylsulphonates (OECD, 2002)



Annex 3

Overview of Uses for PFOS and PFOS Related Substances (UK Stage 4 final report)

Group	Uses/Applications	End Product	Substances Used (if known)
Surface Treatment Applications	Treatment	Apparel/Textile	FOSE alcohols FOSE silanes FOSE alkoxylates FOSE fatty acid esters FOSE adipates FOSE urethanes FOSE acrylates FOSE polyesters FOSE copolymers
		Fabric/upholstery	
		Carpets	
		Automotive interiors	
	Treatment of metal and glass	Metal/glass	
	Leather treatment (water/oil/solvent repellence)	Leather	As above including PFOSA amphoterics
	Mist suppressant Corrosion inhibitors	Metal plating baths	PFOSA K^+, Li^+, DEA and NH_4^+ salts
Paper Applications Protection	Water/oil grease/solvent repellence	Plates and food containers	FOSE acrylates FOSE copolymers FOSE phosphate esters
		Bags and wraps	
		Folding cartons	
		Containers	
		Carbonless forms	
		Masking papers	
Performance Chemical Applications	Surfactants	Surfactant in fire fighting foams	PFOSA K^+, Li^+, DEA and NH_4^+ salts
		Surfactant in alkaline cleaners	
		Mine and oil well surfactants	
	Cleaning agents	Denture cleaners	
		Shampoos	
		Carpet spot cleaners	
		Mould release agents	
	Waxes and polishes	Emulsifier in wax and floor polishes	PFOSA K^+, Li^+, DEA and NH_4^+ salts
	Coatings	Coating additives	
	Photography	Antistatic agents; Surfactants for paper, films, photographic plates;	FOSA carboxylates
	Photolithography	Coatings for semiconductors anti-reflective coatings	
	Pesticides/insecticides	Pesticides active ingredient	FOSA amides
		Active ingredient for ant bait traps	PFOSA amines
	Chemical synthesis	Chemical intermediates	PFOSF, PFOSA, FOSA, FOSE
	Medical applications	Waterproofing casts/wound dressings	FOSA oxazolidones
	Hydraulic fluids	Hydraulic agents	

Sources: Danish EPA, 2002; OECD, 2002; Consultation
Notes: PFOSA: Perfluorooctanesulphonic acid; FOSA: N-Alkylperfuorooctanesulphoneamide; FOSE: N-Alkylperfluorooctanesulphonamidoethanol; PFOSF: Perfluorooctanesulphonyl fluoride; DEA: Diehanolamine

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A Report Prepared for:
Engineering Field Division, Southwest (0223)
Naval Facilities Engineering Division
1220 Pacific Highway
San Diego, California 92132

15

Final Preliminary Assessment (PA) Site 17 Fire Fighting Training Area

Engineering Services for Remedial Investigations/Feasibility Studies (RI/FS) for the Naval Air Facility, El Centro, California

Contract No. N8711-88-D-5053

Delivery Order No. 001

Prepared by:
ERC Environmental and Energy Services Co.
5510 Morehouse Drive
San Diego, California 92121
(619) 458-9044

February 23, 1990

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Final Preliminary Assessment (PA) Site 17 Fire Fighting Training Area

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Naval Air Facility, El Centro, California

February 23, 1990

Robert B. Horner, REHS, REA
Project Manager

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SECTION 1
INTRODUCTION

This report, prepared by ERC Environmental and Energy Services Company (ERCE), presents the results of a Potential Hazardous Waste Site Preliminary Assessment (PA) of the fire fighting training area (Site 17) at the Naval Air Facility, El Centro, California (NAF El Centro). The PA was conducted by ERCE in accordance with Delivery Order No. 001, Contract No. N68711-88-D-5053.

1.1 PURPOSE

The purpose of this assessment as stated in the EPA's *Preliminary Assessment Guidance Document* (Appendix C) was to analyze existing information to determine if a release of hazardous substances may be serious enough to require additional investigation or action.

This document meets three principal objectives as described below:

1. Evaluates the need for site-specific emergency response;

2. Compiles information necessary to develop preliminary and projected Hazard Ranking System (HRS) scores; and

3. Sets priorities for conducting Site Inspections (SIs).

The PA is the first phase in determining whether "a site is releasing or has the potential to release hazardous substances, pollutants, or contaminants into the environment and whether it requires response action that is authorized by CERCLA".

1.2 SCOPE

The scope of the assessment conducted at Site 17 NAF El Centro was based on the EPA's *Preliminary Assessment Guidance Document.*

Specifically, it states "the PA must be sufficient to determine whether further action is warranted to collect the requisite data to develop preliminary and projected HRS scores,

document the data adequately, substantiate the recommendation made in the PA report, and prioritize the site for future action". In general, the PA consists of the following elements:

1. Review of existing information;
2. Site reconnaissance;
3. EPA Form 2070-12 preparation (Appendix A);
4. Report preparation; and
5. Documentation.

SECTION 2
SITE LOCATION

NAF El Centro is located west of the town of El Centro and north of Interstate 8, approximately 1 mile north east of the town of Seeley as shown on Figure 2-1. It is bound to the west by the Elder Canal and to the east by the Elm Canal.

The facility is located at coordinates 32 49 23° latitude and 115 39 50° longitude. It lies within Sections 25 and 26 of Township 15 South, Range 12 East and Sections 19 and 30 of Township 15 South, Range 13 East.

Site 17, the fire fighting training area, is located in the western portion of NAF El Centro in the northeast quarter of Section 36. It is south of 4th Street, between "D" and "C" Streets. Figure 2-2 depicts the location of Site 17 within the facility.

(b) (3) (A)

[redacted]

(b) (3) (A)

[redacted]

SECTION 3
PHYSICAL INSPECTION

The purpose of this task was to look for visual evidence of environmental contamination. The physical inspection was focused on the site and the immediately adjacent property. The general appearance of the site was noted and the types of materials present on the site as well as the adjacent property were observed and are documented in this section. The inspection was performed by ERCE personnel on December 12, 1989. The following represents the physical site conditions on that date.

3.1 PROJECT SITE

Site 17, the fire fighting pit, is rectangular in shape and measures 57 by 112 feet. The sides of the pit are created by earthen berms roughly 1-foot tall. In addition, similar berms form a walkway to the center of the pit where lies a horizontal tank in simulation of an aircraft. A plot plan of the pit is depicted on Figure 3-1.

The fire fighting pit contained no liquids at the time of the visual inspection. However, the soils within the pit were darkly stained with what appeared to be petroleum hydrocarbons. A noticable odor of fuel hydrocarbons was also detected in the pit area. Cartridges from the facility's fuel farm were observed scattered randomly within the pit. Photographs of Site 17 are provided on Figure 3-2.

No vegetation was observed within or immediately surrounding Site 17.

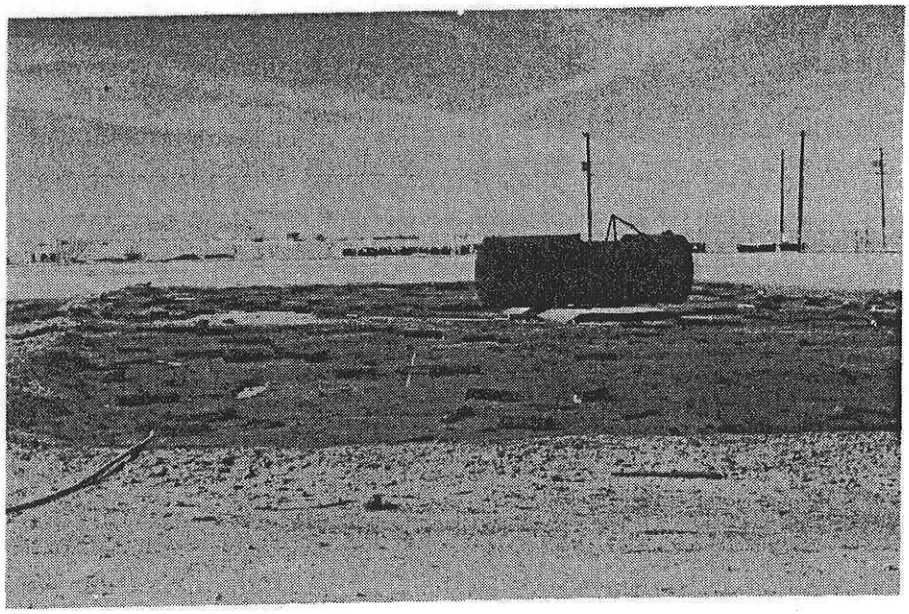
The fire fighting pit was closed on February 5, 1990.

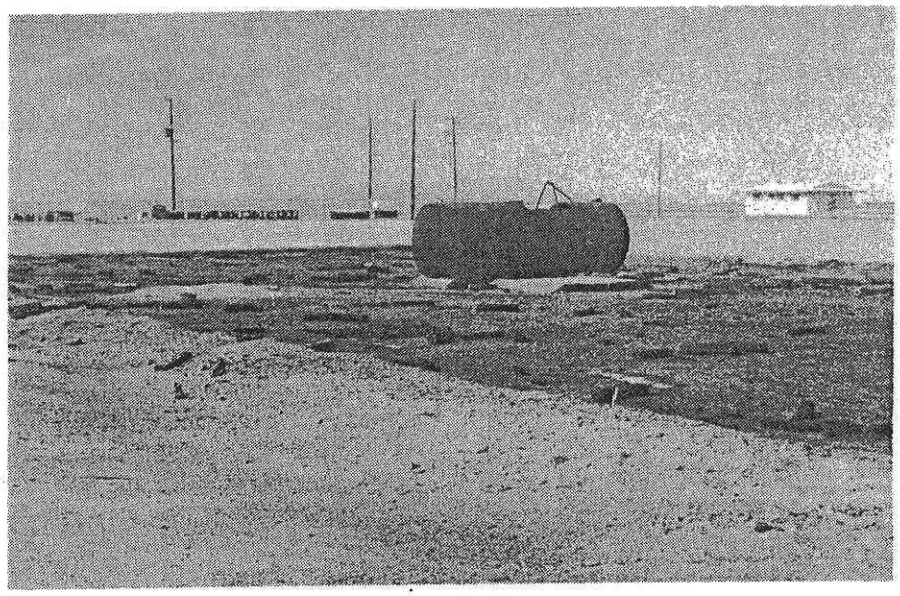
3.2 ADJACENT PROPERTY

The fire fighting pit lies within a cleared, graded area adjacent to Site 4, the historic fire fighting pit. An empty tank was noted north of the fire fighting pit. This tank was reported by fire fighting personnel to have never been used. The closest building to Site 17 is over 300 feet away.

(b) (3) (A)

[redacted]





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Photographs of Site 17
NAF El Centro

FIGURE
3-2

SECTION 4
SITE HISTORY

4.1 HISTORICAL LAND USE OF PROJECT AREA

Prior to establishment of the NAF El Centro in 1942, the land within the facility was used for agricultural purposes. A 1940 U.S.G.S. 15' Brawley Quadrangle topographic map reveals the presence of widely scattered buildings within Section 36 that appear to have been associated with local farms (Appendix B) . The Elder Canal, which borders the western boundary of the facility, was also depicted on the 1940 map. It is known that cotton was grown in the general area in the early part of the century, following establishment of the town of Seeley in 1912 (Henderson 1968). However, there has been no determination at this time as to the nature of the crops grown more recently within the project area, prior to construction of the facility.

Aerial photographs taken between 1945 and 1980 reveal changes that have taken place on Site 17 and the immediate vicinity since that time. Based on the photographs, copies of which are provided in Appendix B, there is no evidence of buildings or other features having been at the exact location of Site 17 between 1945 and 1979. Throughout those years there were buildings to the east, south, and west of the site. A circular feature of undetermined use that appears to be west of Site 17 is depicted on a late 1960s oblique aerial photograph. The feature is not apparent on 1970s photographs, however, it is again evident on a 1979 aerial photograph (U.S. Department of Agriculture) and on a 1980 aerial photograph. Site 17, the fire fighting area, is first evident on a 1980 aerial photograph. No indications of additional use were revealed on topographic maps reviewed for this survey.

4.2 WASTE MANAGEMENT PRACTICES

Information regarding Site 17 waste management practices was not available from documents such as activity records or engineering field division records. Facility personnel were therefore interviewed in an effort to obtain as much data as possible. Based on discussions with Mr. Fred Rivera, Environmental Coordinator for NAF El Centro, Ms. Camela Bryan of EFD Southwest, and Fire Chief Goodspeed of the NAF El Centro Fire Department, the following information was compiled.

The fire fighting pit was built in 1980 and has been used for training sessions approximately once every month since inception. The original fire pit was twice the size of the current pit. Based on interviews and aerial photographs the original fire pit was approximately 120 feet square.

Water-bearing fuel used to ignite the fires is stored in a 1,000-gallon mobile tank located adjacent to the fire pit. The tank, however, was reportedly undergoing repairs during the ERCE site reconnaissance and could not be inspected by field personnel.

According to navy personnel, each fire fighting session apparently involves several fires and maneuvers. Each fire requires several 100 gallons of fuel to ignite. The majority of the 1,000-gallon tank is reportedly used per session.

Primarily JP5 is used to ignite the fires. Reports indicate, however, that JP4, MOGAS, AVGAS, diesel fuel, stove oil, and hydraulic fluid are also disposed of in the fire fighting training area. Potential contaminants used at Site 17, their estimated quantities, and years of disposal are provided on Table 4-1.

Approximately 25 gallons of Aqueous Film Forming Foam (AFFF) is used per session to extinguish the fires. According to the Material Safety Data Sheet, AFFF contains the following ingredients:

- water (77%);
- butyl carbitol (14%);
- urea (6%);
- fluorosaliphape surfactants (<5%); and
- organic surfactants (<5%).

None of these compounds are listed hazardous wastes in Title 22 of the California Code of Regulations. However, individual toxicities or other inherent properties of the material could cause characterization as a hazardous material and/or waste.

Table 4-1

POTENTIAL CONTAMINANTS USED AT SITE 17, NAF EL CENTRO

Waste Type	Estimated Quantity (gallons)	Years of Disposal
Water-bearing Fuel:		
JP-4	Unknown	1980
JP-5	120,000*	1980-1990
AVGAS (leaded)	Unknown	1980-1990
MOGAS Regular	Unknown	1980-1990
Diesel Fuel #2 (DF-2)	Unknown	1980-1990
Stove Oil	Unknown	1980-1990
Hydraulic Fluid (containing chromium, nickel, and zinc)	Unknown	1980-1990

Source: Department of Public Works, NAF El Centro.

$$* \frac{1000 \text{ gallons JP-5}}{\text{month}} \times \frac{12 \text{ months}}{\text{year}} \times 10 \text{ years} = 120{,}000 \text{ gallons JP-5}$$

SECTION 5
GEOLOGY AND HYDROGEOLOGY

5.1 REGIONAL GEOLOGY

5.1.1 Stratigraphy

El Centro is located in Imperial Valley, a broad, flat, alluviated area that lies partly below sea level. Imperial Valley, named because the structural trough of the Gulf of California is here filled by the combined fan and delta deposits of the Colorado River is within the Colorado Delta Region. The present apex of the deltaic cone is at the eastern edge of the trough near Yuma, Arizona.

A generalized stratigraphic section of the Colorado Delta Region is presented in Figure 5-1. The alluvium in the El Centro area consists of roughly 300 feet of Upper Pleistocene-age lacustrine deposits from the ancient Lake Coahila.

Underlying the alluvial sequence is the 2000-foot thick Brawley formation which consists of light gray lacustrine clays, buff sandstones and pebble conglomerates. In turn, the Borrego formation lies unconformably beneath the Brawley formation. The 600-foot thick Borrego formation consists of interbedded lacustrine, light gray claystone, and minor buff sandstones. The claystone contains a lacustrine fauna of minute mollusks, ostracods and the foraminifera (Dibblee,1954).

The Borrego Formation overlies the Palm Spring formation, which is a 7000-foot thick series of arkosic sandstones and red clays of terrestrial origin. Fragments of silicified wood are common throughout the formation.The Imperial formation underlies the Palm Spring formation. The Imperial formation is composed of gray, yellow-weathering claystone, interbedded buff sandstone and dark, calcareous oyster-shell reefs, and a basal calcareous or sandy bed that contains numerous mollusks and some corals. The claystone contains foraminifera, ostracods, and diatoms. The Imperial formation averages 2800 feet in thickness and lies on the Alverson lava. Both the Palm Spring formation and the Imperial formation grade westward into the Canebrake conglomerate, which is the pebble and cobble conglomerate facies of the Palm Spring and Imperial formations.

THICKNESS	GEOLOGIC UNIT	AGE
0 - 300'	ALLUVIUM , LAKE COAHILA BEDS	Recent
0 - 2000'	BRAWLEY FORMATION Light gray lacustrine clays; buff sandstone, pebble conglomerate	Pleistocene
0 - 6000'	BORREGO FORMATION Lacustrine claystone, interbedded sparse sandstone	
0 - 7000'	PALM SPRING FORMATION, Sandstones, claystone; brackish marine in part	?
0 - 9000'	CANEBRAKE CONGLOMERATE, Pebble and Cobble Conglomerate	Pliocene
0 - 3900'	IMPERIAL FORMATION, Marine Sandstone, Siltstone, Claystone	
0 - 700'	ALVERSON ANDESITE, Dark Brown Andesite	
0 - 2700'	SPLIT MOUNTAIN FORMATION Granitic Conglomerate, Sandstone, Breccia	Miocene
0 - ?	GRANITIC INTRUSIVES, SCHIST, GNEISS	Pre-Tertiary

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Generalized Stratigraphic Column of the Colorado Delta Region
(modified from Dibblee, T.W., 1954)

FIGURE 5-1

The Alverson lava, underlying the Imperial formation, is a dark brown andesite which is approximately 550-feet thick and of probable Miocene age. This unit overlies the Split Mountain formation. The Split Mountain formation is about 2700-feet thick and is composed of basal red and gray granitic fanglomerate, sandstone, and dioritic breccia. The Split Mountain formation lies upon the pre-tertiary basement rocks consisting of schist, limestone, gneiss, and granitic intrusives.

5.1.2 Structure

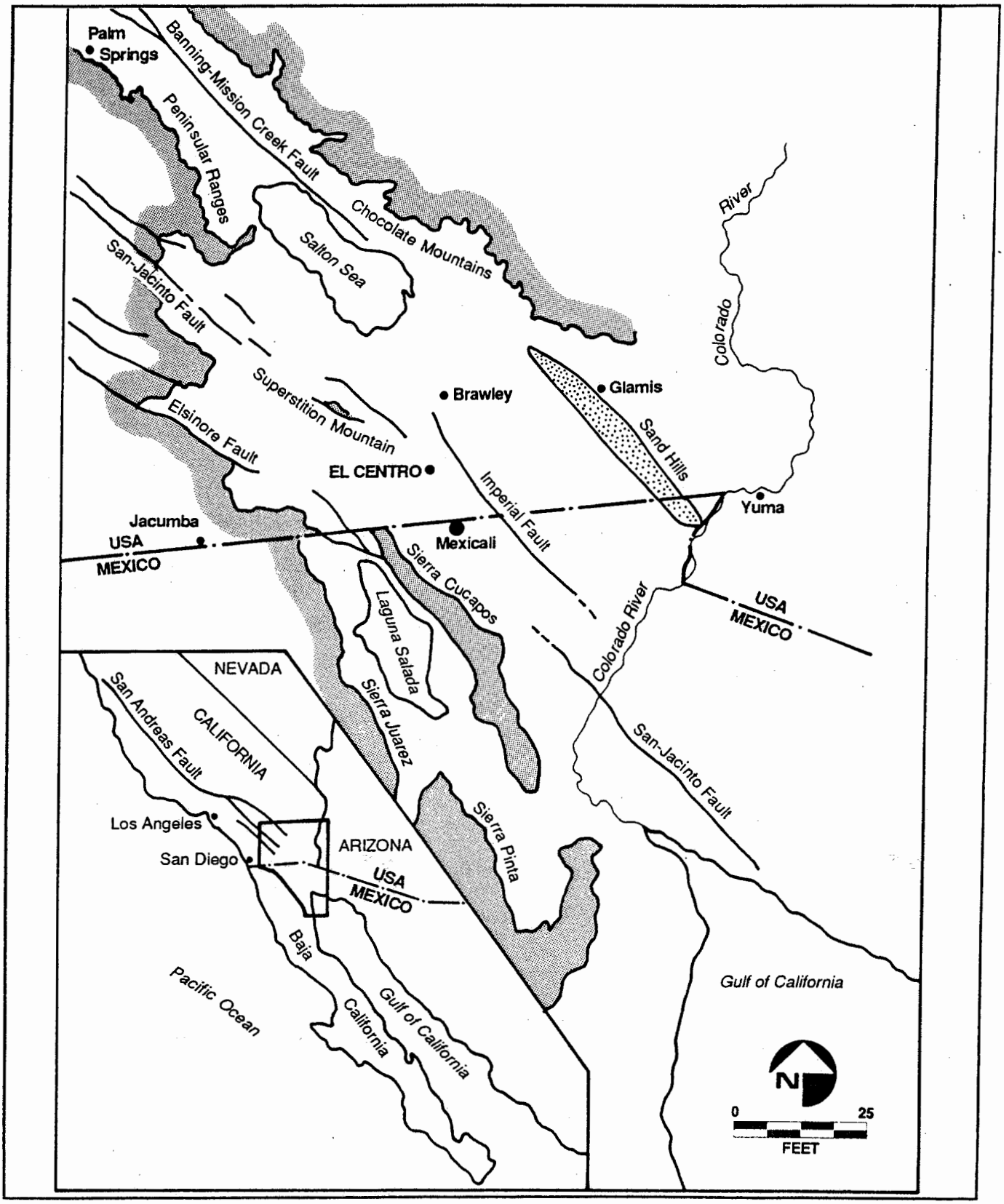
El Centro is located in the Colorado Delta Region which lies within the San Andreas fault zone. The principal surface expressions are the Banning-Mission Creek, the Imperial, the San Jacinto, and the Elsinore-Laguna Salada faults (Figure 5-2).

The Banning-Mission Creek Fault is the most obvious active break in the northern part of the Colorado Delta Region. There is evidence of right-lateral displacement along this fault in the Indio Hills area (Dibblee, 1954). No known surface expression of this fault exists south of the Salton Sea. There is much speculation on the possible continuation of this break further southeast. This is stimulated by the linear trend of the Sand Hills along the extended trace of the fault (Kovach,1962).

The Imperial fault is marked by a 40-mile line of right-lateral displacement created in a 1940 earthquake. A maximum slip of 20 feet was measured near the international border (Kovach,1962).

The San Jacinto is the straightest and most throughgoing fault in the San Andreas system in southeastern California. A history of right-lateral displacement is indicated by prominent stream offsets along the fault where it crosses the Peninsular Ranges. Other evidences of activity along this fault include numerous hot springs as well as earthquake epicenters.

The Elsinore fault forms the southwest margin of the San Andreas system in this region. The Laguna Salada fault appears to be the southern continuation of the Elsinore fault. Vertical displacements along the Elsinore fault are locally great. A great amount of right-lateral movement is indicated by tight, drag folds.



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Colorado Delta Region Showing Locations of the Major Fault Locations (modified from Kovach, R.L. 1962)

FIGURE **5-2**

The strain pattern in the Colorado Delta Region is clearly defined. The primary strain features are the north-west trending high-angle faults. Movement along these faults is right-lateral, with relative displacements of the northeast blocks and vertical movements are only local.

5.2 REGIONAL HYDROGEOLOGY

The project site is in the Imperial Valley Planning area of the Colorado River Basin Region. Its easterly and westerly boundaries are contiguous with those of the Imperial Valley. Its northerly boundary is along the Salton Sea and its southerly boundary follows the International Border with Mexico.

5.2.1 Surface Water

Surface waters drain toward the Salton Sea. The New and Alano Rivers convey surface runoff and agricultural irrigation drainage water from farmlands in the Imperial Valley. The average annual precipitation ranges from less than three inches over most of the Planning area to about eight inches in the Coyote Mountains on the western border. Colorado River water is the predominant water supply and is used for irrigation, industrial, and domestic purposes.

5.2.2 Ground Water

Ground water is stored in the Pleistocene sediments in the valley floor, the mesas in the west, and the East Mesa and sand hills on the east. The fine-grained lake sediments in most of the Imperial Valley inhibit ground-water movement.

Few wells have been drilled in these lake sediments because the yield is poor and the water is saline. The few wells in the valley are for domestic use only.

5.3 SITE GEOLOGY

To date, no lithologic data collected from Site 17 have been located by ERCE. However, lithologic data collected during conduct of borings at Site 15 (Woodward-Clyde, Feb. 16, 1989) located approximately 1.5 miles southeast of Site 17 may be utilized to assess local stratigraphy.

A total of twelve borings were conducted to a maximum depth of 15 feet at Site 15. The lithology at the site is apparently relatively homogeneous, generally varying from slightly plastic to plastic, reddish brown silty clay to clay. Under the United Soil Classification System (USCS) these soils would be classified as CL and CH, respectively. Nonplastic fines, ML under USCS classification, are also present in moderate amounts.

5.4 SITE HYDROGEOLOGY

5.4.1 Surface Water

The Elder Canal borders the NAF El Centro to the west, 500 feet from Site 17. The Elm Canal borders the facility to the east and is over 7000 feet from Site 17. Both canals are channelized within reinforced concrete channels and drain north to the New River.

5.4.2 Ground Water

Soil borings conducted by Woodward-Clyde at Site 15 (1989) suggest the presence of a shallow water table at Site 17. Ground water was encountered at Site 15 within 10 to 15 feet of ground surface. The general low topographic relief of the area suggests that a shallow water table probably exists under Site 17. Ground-water flow directions are probably to the west-northwest, or generally subparallel to topographic gradients and towards the New River.

SECTION 6
FINDINGS AND RECOMMENDATIONS

6.1 FINDINGS

Site 17, the fire fighting training area, is located within the NAF El Centro, south of 4th Street between "C" and "D" Streets. It is an earthen bermed pit, measuring 112 by 57 feet. The fire fighting pit was reported to have been approximately twice this size, 120 feet square, until roughly one year ago. Visual inspection revealed darkly stained soil and fuel cartridges within the pit.

The fire fighting training pit was constructed in 1980 and has been used an average of once a month since that time. Fire fighting exercises begin by placing a layer of water-bearing fuel on a layer of water and igniting it. Approximately 1,000 gallons of fuel are used during each exercise. Primarily JP-5 is used, but personnel interviews indicate that JP-4, MOGAS, AVGAS, diesel fuel, stove oil, and hydraulic fluid were probably disposed of in the fire fighting pit.

The historical survey revealed that prior to the establishment of the NAF El Centro in 1942, the land within the facility was used for agricultural purposes. Site 17 itself does not appear to have been used for any particular purpose prior to its construction in 1980.

Study of the regional geology at NAF El Centro indicated it to be located in the Imperial Valley. This is a broad, flat, alluviated area that lies partly below sea level. The alluvium in the El Centro area consists of roughly 300 feet of Lake Coahila deposits from the upper Pleistocene. Structurally the site is located in the Colorado Delta Region which lies within the San Andreas fault zone.

Hydrogeologically the project site is located in the Imperial Valley Planning area of the Colorado River Basin Region. Surface waters drain toward the Salton Sea. The New and Alano Rivers convey surface runoff and agricultural irrigation drainage water from farmlands in the Imperial Valley. The average annual precipitation is less than three inches over most of the Planning area. Colorado river water is the predominant water supply and is used for irrigation, industrial, and domestic purposes. Ground water is stored in the Pleistocene sediments in the valley floor. The fine grained lake sediments in most of the

Imperial Valley inhibit ground-water movement. Few wells have been drilled in these lake sediments because the yield is poor and the water is saline.

The lithology at the project site is apparently relatively homogeneous, generally varying from slightly plastic to plastic reddish brown silty clay to clay. Nonplastic fines are also present in moderate amounts. Ground water is thought to be present within 10 to 15 feet of ground surface. Ground-water flow directions are probably to the north-northwest, or generally subparallel to topographic gradients and toward the New River. Surface water consists primarily of the Elder Canal, 500 feet to the west of Site 17. It is channelized and drains north to the New River.

6.2 RECOMMENDATIONS

Based on the results of the foregoing PA, ERCE believes there is a potential for soil and ground-water contamination as a result of fire fighting exercises at Site 17. Although the Elder Canal is channelized, there is also a potential for ground-water migration to impact the canal which drains to the New River. Thus, ERCE recommends a SI be scheduled for Site 17.

APPENDIX A

PRELIMINARY ASSESSMENT, EPA FORM 2070-12

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-17

II. SITE NAME AND LOCATION

01 SITE NAME	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Site 17 - Fire Fighting Training	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG. DIST
El Centro	Ca	92243-5001	Imperial	025	38

09 COORDINATES LATITUDE	LONGITUDE
32 49 23	115 39 50

10 DIRECTIONS TO SITE

Interstate 8 to Drew Road exit. Go north to Evan Hewes Hwy. east. Follow this to Bennett Road north to the base gate. Continue north to 4th Street. Site 17 is south of 4th Street between "C" and "D" Streets.

III. RESPONSIBLE PARTIES

01 OWNER	02 STREET
U.S. Navy	NAF El Centro

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
El Centro	Ca	92243-5001	(619 339-2201

07 OPERATOR	08 STREET
Same as owner	

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP
☐ A. PRIVATE ☒ B. FEDERAL U.S. NAVY ☐ C. STATE ☐ D. COUNTY ☐ E. MUNICIPAL
☐ F. OTHER: ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE
☐ A. RCRA 3001 DATE RECEIVED: MONTH DAY YEAR ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED: MONTH DAY YEAR ☒ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 12 / 12 89 (MONTH DAY YEAR)
☐ NO

BY
☐ A. EPA ☐ B. EPA CONTRACTOR ☐ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☒ F. OTHER: ERC Environmental & Energy Services Company
CONTRACTOR NAME(S):

02 SITE STATUS	03 YEARS OF OPERATION
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN	1980 (BEGINNING YEAR) / (ENDING YEAR) ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED

Primarily JP-5 was disposed of, but also JP-4, leaded gas, diesel, stove oil, hydraulic fluid and AVGAS.

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION

Potential migrations of contaminants to the Elder Canal and to ground water

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION
☐ A. HIGH ☒ B. MEDIUM ☐ C. LOW ☐ D. NONE

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)	03 TELEPHONE NUMBER
Fred Rivera	Navy, Environmental Coordinator.	(619) 339-2201

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Robert Horner	ERCE	Hazardous Materials Div.	(619 458-9044	1- 4-89 (MONTH DAY YEAR)

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER
CA	106-17

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- _ A SOLID
- _ B POWDER FINES
- _ C SLUDGE
- _ D OTHER _____ (Specify)
- _ E SLURRY
- X F LIQUID
- _ G GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

- TONS _____
- CUBIC YARDS _____
- NO OF DRUMS 2800

03 WASTE CHARACTERISTICS (Check all that apply)

- X A TOXIC
- X B CORROSIVE
- _ C RADIOACTIVE
- X D PERSISTENT
- X E SOLUBLE
- _ F INFECTIOUS
- _ G FLAMMABLE
- _ H IGNITABLE
- _ I HIGHLY VOLATILE
- _ J EXPLOSIVE
- _ K REACTIVE
- _ L INCOMPATIBLE
- _ M NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE	120,000	gallons	Fuels
SOL	SOLVENTS			
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
OLW	JP-5		Burned on water layer		
OLW	JP-4		Burned on water layer		
OLW	leaded gasoline	8006619	Burned on water layer		
OLW	diesel fuel		Burned on water layer		
OLW	stove oil		Burned on water layer		
OLW	hydraulic fluid		Burned on water layer		
OLW	AVGAS		Burned on water layer		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel Interviews, Site Visit, Aerial Photographs, Topographic Maps, Geological Maps, Geological Reports, NEESA Reports.

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-17

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Shallow groundwater exists at approximately 12 feet deep.

01 [X] B. SURFACE WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

Migration to the Elder Canal which flows into the New River is possible.

01 [ ] C. CONTAMINATION OF AIR
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] E. DIRECT CONTACT
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL
03 AREA POTENTIALLY AFFECTED: < 1 (Acres)
02 [ ] OBSERVED (DATE: _____) [X] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

The soil within the firepit and the surrounding area appears to have been impacted with petroleum hydrocarbons.

01 [ ] G. DRINKING WATER CONTAMINATION
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] H. WORKER EXPOSURE/INJURY
03 WORKERS POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY
03 POPULATION POTENTIALLY AFFECTED: _____
02 [ ] OBSERVED (DATE: _____) [ ] POTENTIAL [ ] ALLEGED
04 NARRATIVE DESCRIPTION

EPA FORM 2070-12 (7-81)

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE: CA
02 SITE NUMBER: 106-17

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
03 POPULATION POTENTIALLY AFFECTED: _____ 04 NARRATIVE DESCRIPTION

01 ☒ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: _____) ☒ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

Migration to the Elder Canal which flows into the New River is possible.

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: _____) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: _____

IV. COMMENTS

V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Personnel Interviews, Site Visit, Aerial Photographs, Topographic Maps, Geological Reports, NEESA Reports.

EPA FORM 2070-12 (7-81)

APPENDIX C

REFERENCES

REFERENCES

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AR_N60042_000594
NAF EL CENTRO
SSIC NO. 5090.3.A

DEPARTMENT OF THE NAVY
Naval Facilities Engineering Command Southwest
1220 Pacific Highway, San Diego, California 92132-5190

REPORT

PRELIMINARY ENVIRONMENTAL ASSESSMENT OF TIFFANY ROAD DEBRIS AREA NAVAL AIR FACILITY, EL CENTRO EL CENTRO, CALIFORNIA

June 13, 2006
Revision 1

Prepared By:

GENERAL DYNAMICS
Information Technology

3430 Camino del Rio North
San Diego, CA 92108

REPORT

PRELIMINARY ENVIRONMENTAL ASSESSMENT OF TIFFANY ROAD DEBRIS AREA NAVAL AIR FACILITY, EL CENTRO EL CENTRO, CALIFORNIA

June 13, 2006
Revision 1

Prepared for:

NAVFAC SW
Naval Air Facility, El Centro

Prepared By:

GENERAL DYNAMICS
Information Technology

3430 Camino Del Rio North
San Diego, California 92108

Prepared by:

David M. Bloom, CEG 2221
Project Manager

Approved by:

Timothy W. Shields
Program Manager

GENERAL DYNAMICS
Information Technology

June 14, 2006

Ms. Angie Lind, Code ROPDE.AL
Remedial Project Manager (MCAS Yuma/NAF El Centro)
Naval Facilities Engineering Command Southwest
1220 Pacific Highway
San Diego, California 92132-5190

Subject: Report, Preliminary Environmental Assessment of Tiffany Road Debris Area, Naval Air Facility, El Centro, El Centro, California

Dear Ms. Lind:

General Dynamics Information Technologies is pleased to submit the attached report referenced above.

Please do not hesitate to call either David Bloom at (619) 221-5298 or me at (619) 881-2449 with any questions you may have regarding this submittal.

Sincerely,

Karen G. Collins

Karen Collins
Program Manager

cc: Mr. Bob Fischer, IR Site Manager, NAFEC
Dr. Jim Leather, SPAWAR Systems Center – San Diego
Mr. Tim Shields, Program Manager
Mr. Dave Bloom, Project Manager

3430 Camino Del Rio North
San Diego, California 92108
Tel: 619 881 8989
Fax: 619 521 2093
www.gdit.com

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Dr. Jim Leather	SPAWAR Systems Center	SPAWAR, Env Division	1
Mr. David Bloom	Project Manager	SPAWAR Code 2375	1
Mr. Timothy Shields	Program Manager	GDIT San Diego	1

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Appendix A Work Plan
Appendix B Anteon XRF Standard Operating Procedure
Appendix C Analytical Laboratory Report

1.0 INTRODUCTION

The SPAWAR Triad team prepared this report of an initial evaluation of the history, nature, and areal extent of surface debris at the northwest corner of Naval Air Facility, El Centro (NAFEC) along a ravine west of Tiffany Road (Figure 1). This work was performed in general accordance with the methods and procedures described in a work plan titled, "Final Draft, Work Plan, Preliminary Environmental Assessment of Tiffany Road Debris Area, Naval Air Facility, El Centro, El Centro, California," dated February 7, 2006, prepared by Anteon (provided as Appendix A), at the request of Naval Facilities Engineering Command Southwest (NAVFAC SW) to support NAFEC Environmental Department.

The primary purpose of the assessment was to provide NAVFAC SW with sufficient information to evaluate the site for eligibility for the Installation Restoration Program.

Site Name:	Tiffany Road Debris Site
Site Address:	Tiffany Road, approximately 1 mile south of Worthington Road Naval Air Facility El Centro El Centro, California
Property Owner:	U.S. Navy, and adjacent private parcels
Contact:	Ms. Angela Lind, NAVFAC SW
Mailing Address:	1220 Pacific Highway, San Diego, CA 92132
Phone:	619-532-4228
24-hour Emergency Contact:	NAFEC Officer of the Day

1.1 Background and Description

Debris piles and burn dump materials are present on the west side of Tiffany Road, outside the NAFEC fence-line, partly within NAFEC property (Figure 2). Base environmental personnel performed a field check to document the presence of debris in 2004. The debris and burn materials are located on the flat area west of Tiffany Road and extend west into a ravine, which is a tributary of the New River. Burn materials exposed at the surface are located at the edge of the flat area and extend down steeply approximately 20 to 25 feet to the bottom of the vegetated ravine (Figure A, right). Near the top of the bluff, the bluff face drops vertically in places up to approximately 10 feet. Native soil is observed in part of the bluff face, and burn debris appears to be limited in depth (Figure B). About ¼ acre of burn materials are exposed at the surface in this area. In October 2005, project manager David M. Bloom performed a brief reconnaissance to observe the site and collect surface samples to evaluate the suitability of using a portable x-ray fluorescence (XRF) analyzer to screen soil for metals. Observations and results were provided in the work plan.

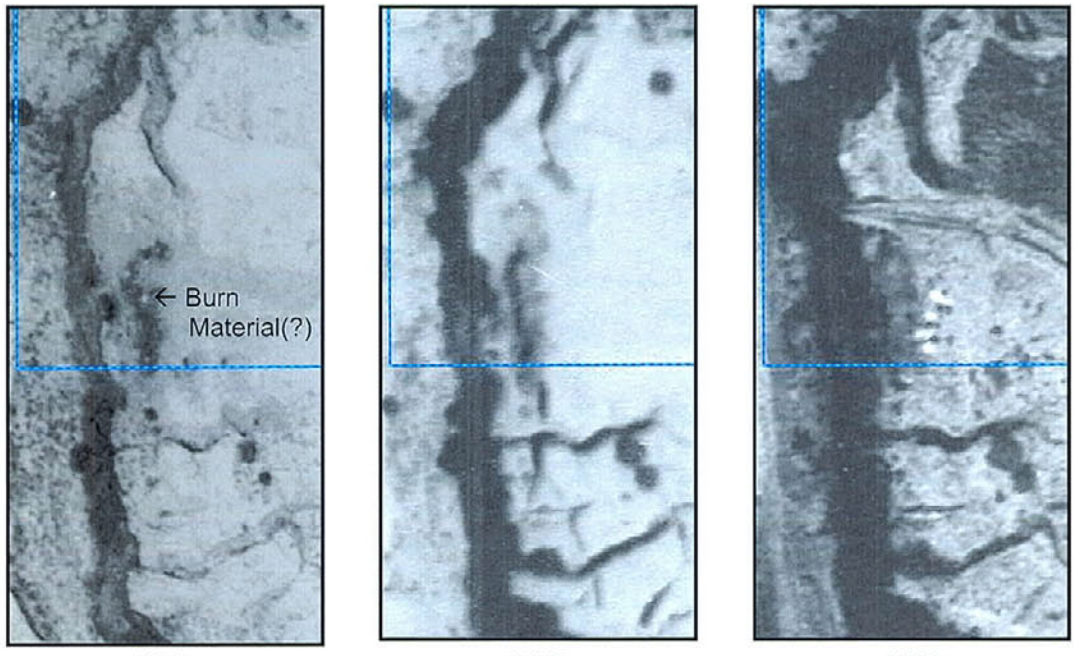
Figure A: Burn debris in ravine.

Figure B: Fused glass and burn material on top of native soil bluff near sample S-01.

Adjacent to the north of the burn materials and west of Tiffany Road and the old sewage treatment ponds, are several hundred small piles of construction demolition debris (Figure C). These piles cover an area of roughly 2 to 3 acres, and appear to consist almost entirely of concrete and asphalt. As much as 2 percent of the material may be other construction debris, including drywall, wood, metal, landscaping cuttings, etc. A few piles of municipal refuse appear

Figure C: Asphalt and concrete debris piles.

to have been placed recently. The likely source of the recent material are local residents who found the municipal landfill, located to the north, closed and used this area as a convenient dump site for their refuse. Most of the demolition debris is located on the relatively flat unpaved surface between Tiffany Road and the tributary; however, some concrete and asphalt was observed on slopes of the adjacent ravines. Based on recent observations and historical aerial photographs dated 1950, 1965, and 1980 (Figure D, below), the demolition debris appears to be several decades old and of similar age. In dirt patches between and adjacent to some piles, evidence of burn material was observed. It is unknown the extent of burn material due to the presence of the broken asphalt and concrete that obscures the soil surface.



1950 1965 1980

Figure D: Historical aerial photographs of the Tiffany Road area. Blue line indicates Navy property boundary; Navy property to northeast. See Figures 3, 4, and 5 for enlarged coverage.

According to retired Environmental Manager for NAFEC, Mr. Fred Rivera, the Navy used the area for disposal of demolition debris and burning of domestic solid waste in this area in approximately the 1960s and 1970s. He added that these activities were similar to and took place at similar times as the disposal activities at the Patrol Road Landfill, NAFEC Installation Restoration (IR) Site 2. Bechtel National, Inc., prepared a Remedial Investigation Report which documents the results of the IR Site 2 investigation (Bechtel, 2003). Mr. Rivera said that the constituents of potential concern at IR Site 2 should be expected in the Tiffany Road Debris Area. He also showed areas where refuse disposal and burning had taken place that are currently obscured by erosion and deposition of sediment, burial under the demolition and debris, and hidden by vegetation.

1.2 Geology, Hydrology and Surface Water

Imperial Valley in this area is structural basin containing up to 20,000 feet of sediment. The near surface sediments are characterized by fine-grained strata (mostly silt and clay) deposited in Pleistocene Lake Cahuilla. Groundwater in the Tiffany Road area is expected to be shallow, approximately 15 to 30 feet below ground surface, based on water levels of nearby wells. Typically water quality is unacceptable for drinking water purposes due to high total dissolved solids (TDS). Although the California Regional Water Quality Control Board (RWQCB) Colorado River Basin Region has designated potential beneficial use of groundwater in the Imperial Hydrologic Unit (RWQCB, 2005), the beneficial uses of groundwater in this Hydrologic Unit are limited to specific areas. In a letter dated June 30, 1998, the RWQCB stated the groundwater in the upper aquifer beneath NAF El Centro has no known beneficial uses.

The Tiffany Road area is located on a tributary of the New River, approximately ¼ mile from the New River. The New River consists primarily of irrigation return flows from the Mexicali and Imperial Valleys, and flows north to the Salton Sea. New River water quality is generally poor.

1.3 Data Quality Objectives and Conceptual Site Model

A conceptual site model and data quality objectives were developed as part of the work plan for this project. Refer to the work plan for data quality objectives. The conceptual site model changed slightly during the course of this assessment. The conceptual site model is based largely on observations of present surface conditions, review of historical aerial photography, interviews with knowledgeable persons, and analytical test results.

Sources	Exposure Pathways	Receptors
Primary sources are: • Buried and exposed burn ash waste and debris; • Domestic and municipal refuse from Navy activities, including demolition.	Soil: • Direct exposure from surface soil • Exposure from wind blown dust • Subsurface exposure by local collectors digging burn site for bottles, etc.	Current: • Local residents and trash scavengers • Ecological receptors may include burrowing animals and birds.
Secondary sources include: • Soil contaminated by burn ash and/or municipal refuse.	Groundwater and Surface Water: • Unknown	Future receptors: • Local residents and trash scavengers • Potential ecological receptors • Potential commercial / industrial workers

2.0 SOIL SAMPLING

Field personnel deployed on February 23, March 8, and April 13, 2006, during which surface soil was screened in situ using the portable XRF analyzer and 23 soil samples were collected from selected locations (Figure 2). Field screening and soil sampling methods are described in the work plan (Anteon, 2006). Table 1 provides a summary of sampling locations, soil description, and lead results.

2.1 Field Methods

The 23 soil samples were collected from the surface in the burn area, in accordance with the sampling plan. The samples were collected from the immediate surface to depths of up to 0.2 foot in areas noted to have: 1) a high degree of discoloration, staining, and presence of burn ash; (2) a moderate to low effect from burning indicating boundary of burn site, and (3) no apparent effects of burning and waste disposal. Location coordinates were recorded using a portable global positioning system (GPS) receiver.

Soil sample designations were made using consecutive numbers following the prefix "S-" and cross-referenced to location identification. For example, the sample designated S-01 is a soil sample collected from location number 1 and is cross-referenced to a geographic coordinate.

Soil samples were collected in accordance with the procedures described in the work plan (Anteon, 2006). The samples were collected by scraping 10 to 20 grams of soil into a recloseable plastic bag using disposable tools, or more frequently by hand using a clean set of Nitrile gloves. Disposable sampling equipment was used so no decontamination fluids were generated.

After sample collection, the plastic bags were labeled and returned unchilled to SSC-San Diego for test screening for PAHs using immunoassay techniques. Following field and laboratory screening, selected samples were pack for shipment and transported to the laboratory under standard chain of custody (COC) protocol. COC forms are provided in Appendix C.

2.2 Analytical Methods

The analytical methods for this investigation were selected to include potential contaminants that may be present in soils associated with typical burn sites. Following field and SPAWAR screening for metals using the XRF and total PAHs using immunoassay, selected samples were submitted to a fixed-base laboratory and analyzed for:

- Title 22 metals (except mercury) by EPA test method 6010B, and
- PAHs by EPA test method 8270C SIM.

A copy of the laboratory data report is provided in Appendix C.

2.3 Investigation-Derived Waste Management and Disposal

No liquid waste was generated during this investigation. Non-hazardous solid waste such as personal protective equipment and plastic bags used for sampling were bagged and disposed of as solid waste with other trash generated at NAFEC.

3.0 SOIL SAMPLING RESULTS

3.1 Site Observations

The 23 soil samples were described during sampling. Location and physical descriptions of each soil sample were recorded in on field data sheets. Being surface samples, no logs were produced. Locations of the samples are shown on Figure 6.

In general, relatively clean soil was observed on the flat area above and east of the ravine. A portion of the area had recently been graded as part of outfall improvements of the waste water treatment plant. Toward the edge of the ravine, evidence of burned solid waste was observed, including fused glass, scorched metal, gray and black soil, and other blackened objects of uncertain origin. Numerous glass, ceramic, and metal containers were observed, including bottles, cups, dinner plates, and beverage cans. These items were especially numerous on the slope of the ravine and at the base of ravine. Thick growth of reeds precluded a visual evaluation of the extent of burn material more than about 20 feet west into the reeds. Sample S-18 was collected as far as possible into the reeds (without cutting down the vegetation) and it appeared discolored and showed elevated lead levels. Based on the historical aerial imagery, burned waste residue and elevated lead levels may extend to the drainage channel.

3.2 Field Screening Results

All 23 soil samples were screened for metals in the field using a portable XRF analyzer (Table 1). Fifteen of the samples were screened for total PAHs (sum of the 16 EPA priority pollutant PAHs) using immunoassay techniques in the SPAWAR environmental laboratory, Bayside Point Loma, San Diego, California. Sample S-06 contained a high concentration of total PAHs and was submitted to Columbia Analytical Services, Inc., in Redding, California, for analytical testing of individual PAHs using EPA test method 8270C SIM. Five samples (S-04, S-07, S-18, S-20, and S-21) were also submitted to Columbia for metals testing using EPA test method 6010B.

Given the heterogeneities inherent in soil samples that have not been ground, mixed, and homogenized, the results of the five samples analyzed in the laboratory show good correlation to the results obtained in the field using the portable XRF analyzer (Figure 7).

3.3 Fixed-Base Laboratory Results

Five samples were selected for Title 22 metals testing and one sample was selected for PAH testing by Columbia Analytical Services, Inc., a fixed-base analytical laboratory. Table 1 shows which samples were tested for which analytical suites. Metals results for the soil samples are summarized in Table 2. The PAH results are presented in the laboratory report, which is provided in Appendix C.

3.3.1 Title 22 Metals

The five samples tested for metals analysis were selected based on the results of field screening using the portable XRF analyzer (Table 1). The selected samples provide a range of lead concentrations (low, medium, and high) shown by the XRF results for comparison:

Samples	XRF screening results
S-20 and S-21	Low concentration
S-04 and S-07	Medium concentration
S-18	High concentration

This analysis suite, analyzed using by EPA test method 6010B, includes the following 16 metals:

Antimony	Arsenic	Barium	Beryllium
Cadmium	Chromium	Cobalt	Copper
Lead	Molybdenum	Nickel	Selenium
Silver	*Thallium*	Vanadium	Zinc

All of the metals were detected at least once except for thallium.

Lead is the metal of concern, with concentrations exceeding 1,000 mg/kg where burn material is observed. Samples S-07 and S-18, both with analytical results of 1,700 mg/kg and XRF results of 1,090 and 6,500 mg/kg , respectively, and the good correlation between XRF lead concentrations with analytical laboratory testing suggests that elevated lead is ubiquitous in soil discolored with burn material. Variability between the two methods is indicative of the level heterogeneity within samples. Other potential metals of concern, for example copper and zinc, correlate with lead concentrations. However, their concentration ranges are relatively low compared to typical screening levels such as the EPA Region 9 Preliminary Remediation Goals residential or industrial risk scenarios. Lead spatial distribution strongly correlates with the discolored soil and burn material, as depicted on Figure 6.

3.3.2 Polynuclear Aromatic Hydrocarbons (PAHs)

A sample containing a typically high concentration of total PAHs screened using immunoassay techniques was tested for PAHs using EPA test method 8270C SIMThis analysis includes the following 16 compounds. Analytes that were reported detected in the sample are shown in roman type, and those reported "not detected" in italics:

Naphthalene	*Acenaphthylene*	Acenaphthene
Fluorene	Phenanthrene	*Anthracene*
Fluoranthene	Pyrene	Benz(a)anthracene
Chrysene	Benz(b)fluoranthene	*Benzo(k)fluoranthene*
Benzo(a)pyrene	*Indeno(1,2,3-cd)pyrene*	*Dibenz(a,h)anthracene*
Benzo(g,h,i)perylene		

PAH soil concentrations indicated relatively low levels of these constituents in this sample. None of the PAHs detected in sample S-6 exceeded their respective EPA Region 9 Preliminary Remediation Goal for a residential risk scenario. The screening for total PAHs indicates that these results are consistent with a low level of PAHs present in the site vicinity regardless of the presence of burn material or clean soil. Total PAHs showed no distinct spatial pattern, nor did total PAHs correlate with lead concentrations (Table 1).

Discolored soil shows generally moderate to high levels of lead. Total PAHs generally showed relatively low concentrations. The highest total PAH concentration of 2.8 mg/kg in S-09 appears to be an outlier when compared to the cluster of concentrations shown by the other 14 results. No

correlation was observed between discolored soil or lead concentrations with PAHs. PAHs appear to be unimportant risk drivers at the site.

3.3 Soil Results Summary

The results of the XRF screening and corroborated by fixed-base laboratory testing indicate that potentially hazardous levels of lead exist in surface soil at the top of the slope, on the slope, base of the slope, and into the ravine in the Tiffany Road area. The hazardous levels of lead are also present in the debris area and side ravine to the north. The presence of additional burn material and its concomitant hazardous levels of lead underneath the adjacent concrete and asphalt debris piles cannot be ruled out. PAHs concentrations are relatively low and the immunoassay results indicate a poor correlatation with lead concentrations and show little variation whether burn material is present in the soil or not.

4.0 Data Evaluation And Usability

This section presents the various elements associated with the assessment of laboratory data generated in connection with soil collected in February through April 2006, at the Tiffany Road debris area.

The data were internally verified and validated to assure that they met the data quality objectives for the project and to assess data usability issues, if any, that may prevent their inclusion in the decision-making process.

Data verification included proofreading and editing hard copy data reports to assure that data correctly represented the analytical measurement, identifying any nontechnical errors in the data package for correction (e.g., typographical errors), and verifying that the sample identifiers on laboratory reports (hard copy) matched those on the chain-of-custody record.

Data that did not meet the applicable validation criteria were flagged with the following data qualifiers:

U – Indicates the compound or analyte was analyzed for but not detected at or above the associated detection limit.

J – The associated value is an estimated quantity and associated value is less than method reporting limit, but is greater than or equal to the method detection limit.

UJ – Indicates the compound or analyte was analyzed for but was not detected. The associated detection limit is an estimated value.

R – The data are unusable.

4.1 Data Validation Results

The fixed-base laboratory data package was reviewed by the Anteon Quality Assurance Manager to assess the precision and performance of the laboratory analytical process and the effect of assigned validation qualifiers to the project decision as a result of this data review. Adherence to field protocols was also reviewed for an overall assessment of data usability. The results of any

significant findings through internal data validation and data evaluation processes are summarized below.

4.1.1 Polynuclear Aromatic Hydrocarbons - PAHs (EPA test method 8270C SIM)

One soil sample was analyzed for PAHs. All laboratory QC parameters were within the validation criteria. Although technical holding times for PAHs were exceeded, it does not effect the quality of data, because sample was collected from the surface. All PAH results should be regarded with caution and are flagged with an estimated "J" because of non-standard sample storage and holding time exceedance.

4.1.2 Title 22 Metals (EPA 6010/7471A)

Five soil samples were analyzed for metals. All laboratory QC parameters were within the validation criteria. All metals results should be regarded with caution and are flagged with an estimated "J" because of non-standard sample storage.

4.2 Data Usability

Laboratory QC measurement data were assessed for conformance with generally accepted QA standards. The data presented herein is considered valid and usable within the limitations described above.

5.0 CONCLUSIONS

This study shows that two areas north and south of the outfall for the waste water treatment plant have been affected by hazardous waste levels of lead from historical waste disposal that included burning. The approximate area of affected soil is 1/3 acre. The western extent of contamination is unknown because this area was inaccessible due to thick vegetation associated with a drainage channel that is a tributary of the New River.

This study was limited to surface soil. As such, depth of burn material is unknown. Typically, burn sites are shallow, and based on observations of shallow depths of debris in the bluff, typical shallow debris depths should be expected, with variations due to local topographic relief.

Other metals, such as copper and zinc, correlate well with concentrations of lead. However, their concentration ranges are relatively low compared to typical screening levels such as the EPA Region 9 Preliminary Remediation Goals residential or industrial risk scenarios. Likewise, PAHs appear to be present in relatively low concentrations that do not exceed their respective EPA Region 9 Preliminary Remediation Goal, and their values correlate poorly with lead and do not vary either in the presence or absence of burn material.

Currently, the affected soil is largely located on Navy property, outside the NAFEC facility fence. Thus, direct human contact by unauthorized persons could occur. Hazardous material can also contact ecological receptors directly or when potentially transported in the drainage channel during rainfall events.

6.0 RECOMMENDATIONS

It is recommended that the area of elevated lead, the burn area, be secured to reduce the probability that unauthorized persons could contact hazardous materials. It is also recommended that systematic assessment of the Tiffany Road debris area continue so that the spatial and vertical boundaries of the burn site are defined, including assessment of surface soil to the stream channel and to the north, and excavation to measure depth of burn material.

7.0 REFERENCES

Anteon, 2006, Final Draft, Work Plan, Preliminary Environmental Assessment of Tiffany Road Debris Area, Naval Air Facility, El Centro, El Centro, California, February 7.

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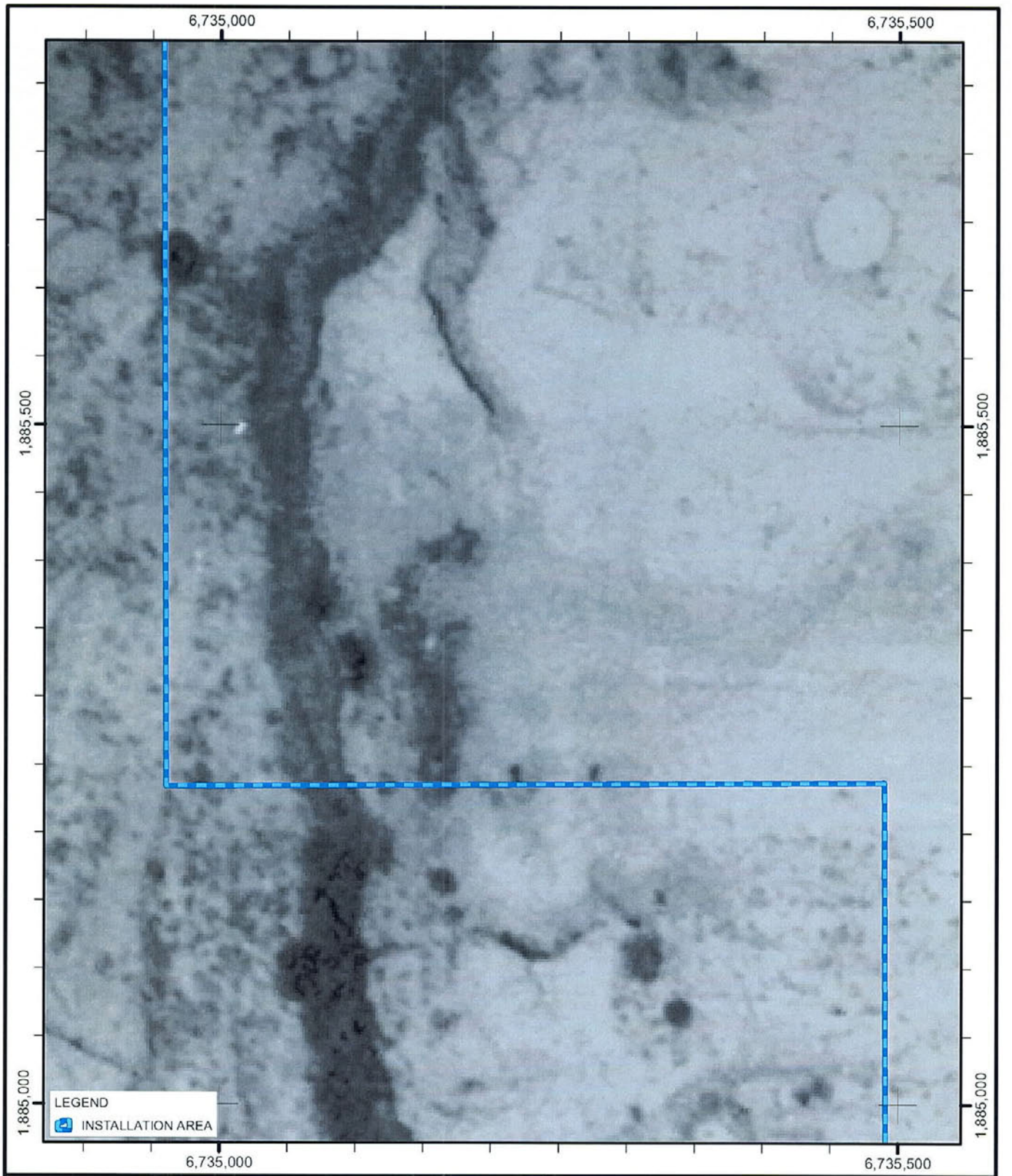
FIGURES

(b) (3) (A)

[redacted]

(b) (3) (A)

[redacted]



N

0 50 100 150 200

FEET

MAP PROJECTION: NAD 83 CALIFORNIA
STATE PLANE ZONE 6, SURVEY FEET

SOURCE: NAFEC AERIAL PHOTO, DATED 27 MAR 1950.

1950 AERIAL PHOTOGRAPH TIFFANY ROAD DEBRIS AREA

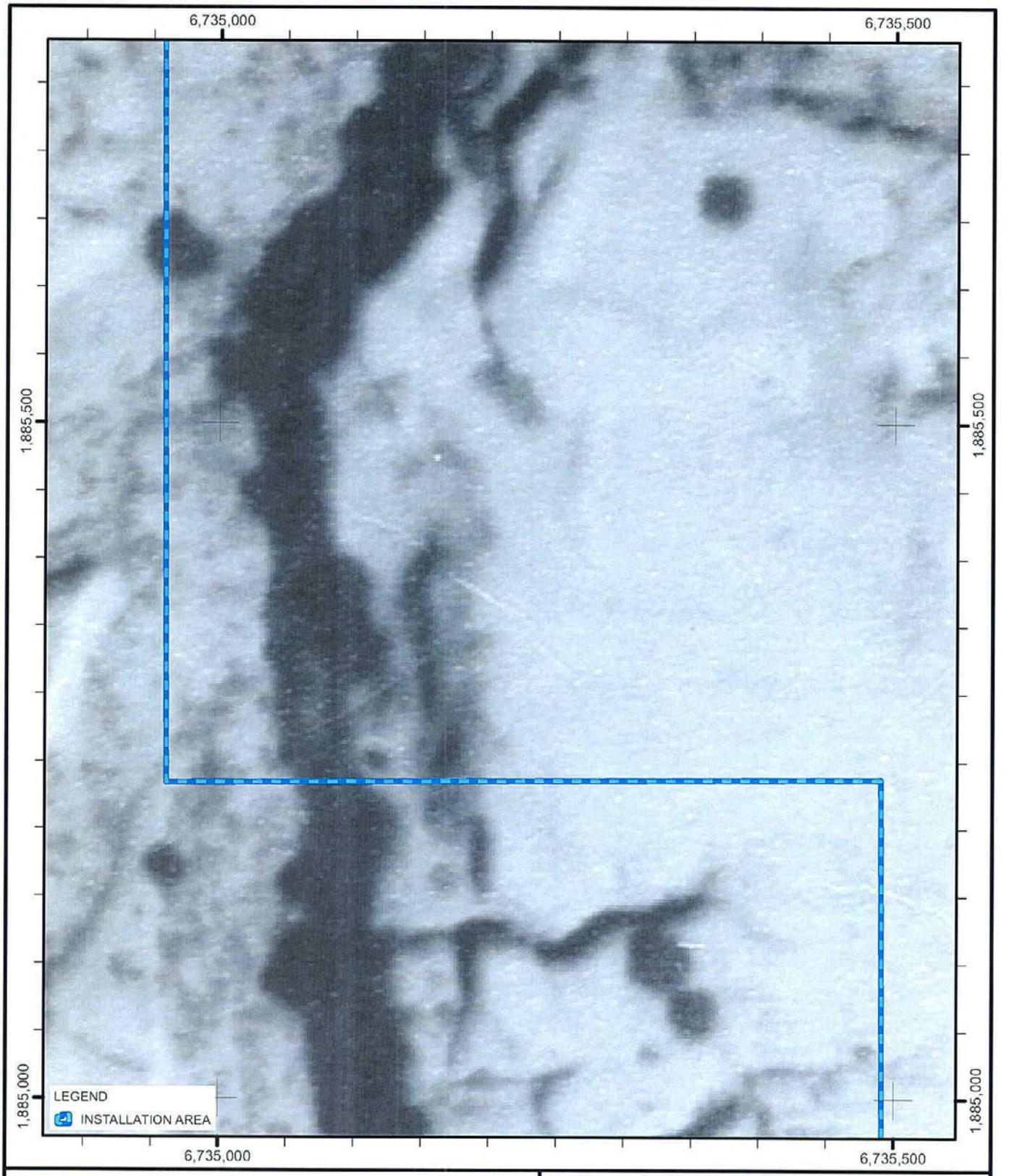
NAVAL AIR FACILITY EL CENTRO, CA

SPAWAR

SPAWAR SYSTEMS CENTER
TRIAD TEAM/CODE 2375
ENVIRONMENTAL DEPARTMENT

DATE: JUN 13, 2006
FILE: TiffanyRd-Fig5.mxd

FIGURE: 3



N

0 50 100 150 200

FEET

MAP PROJECTION: NAD 83 CALIFORNIA
STATE PLANE ZONE 6, SURVEY FEET

SOURCE: NAFEC AERIAL PHOTO, DATED 11 OCT 1965.

1965 AERIAL PHOTOGRAPH
TIFFANY ROAD DEBRIS AREA

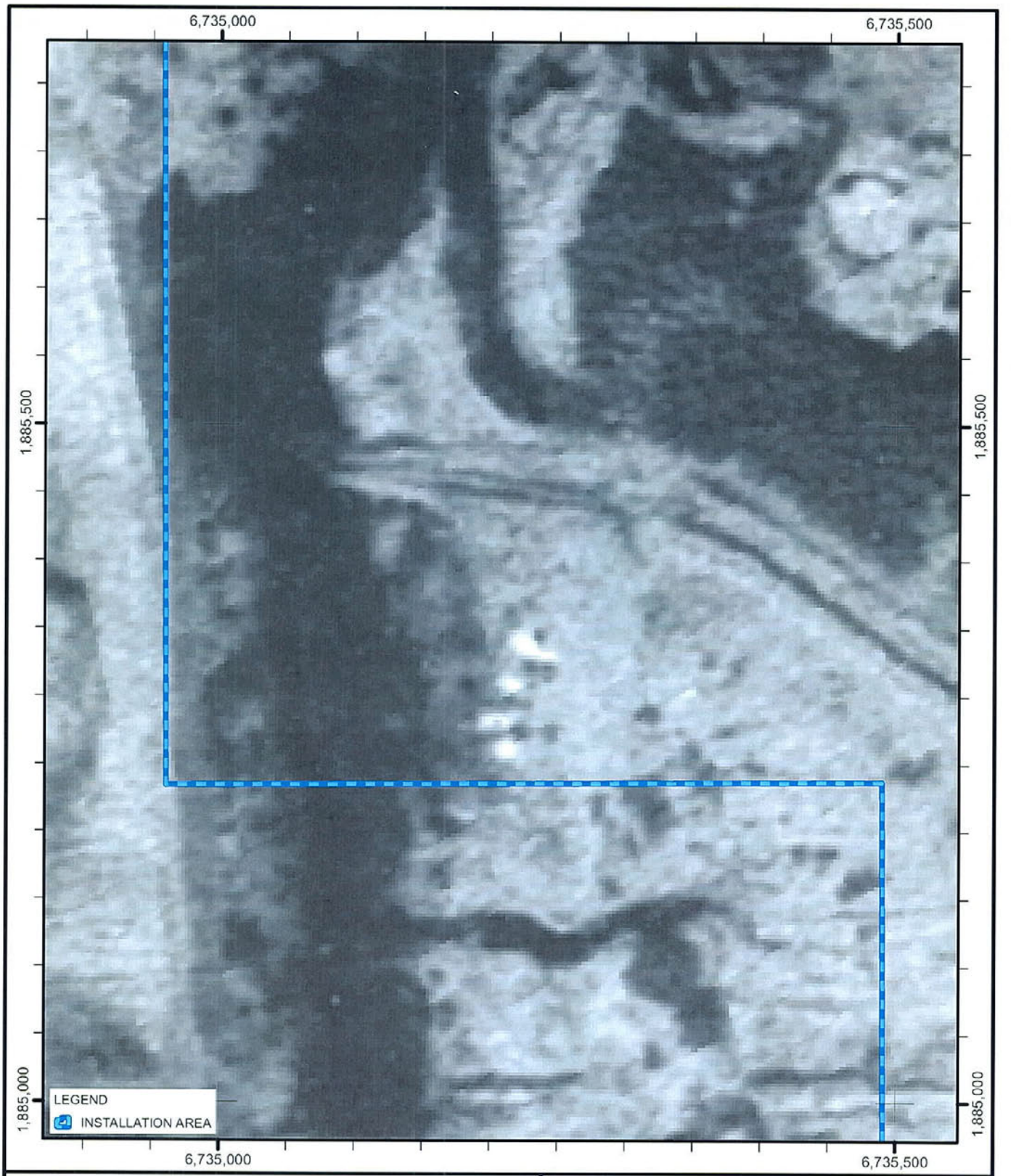
NAVAL AIR FACILITY
EL CENTRO, CA

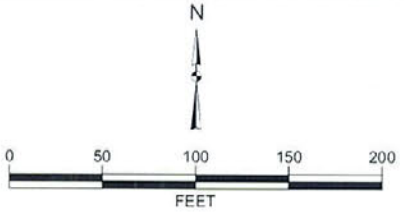
SPAWAR

SPAWAR SYSTEMS CENTER
TRIAD TEAM/CODE 2375
ENVIRONMENTAL DEPARTMENT

DATE: JUN 13, 2006
FILE: TiffanyRd-Fig5 .mxd

FIGURE: 4





MAP PROJECTION: NAD 83 CALIFORNIA
STATE PLANE ZONE 6, SURVEY FEET

SOURCE: NAFEC AERIAL PHOTO, DATED 29 SEP 1980.

1980 AERIAL PHOTOGRAPH
TIFFANY ROAD DEBRIS AREA

NAVAL AIR FACILITY
EL CENTRO, CA

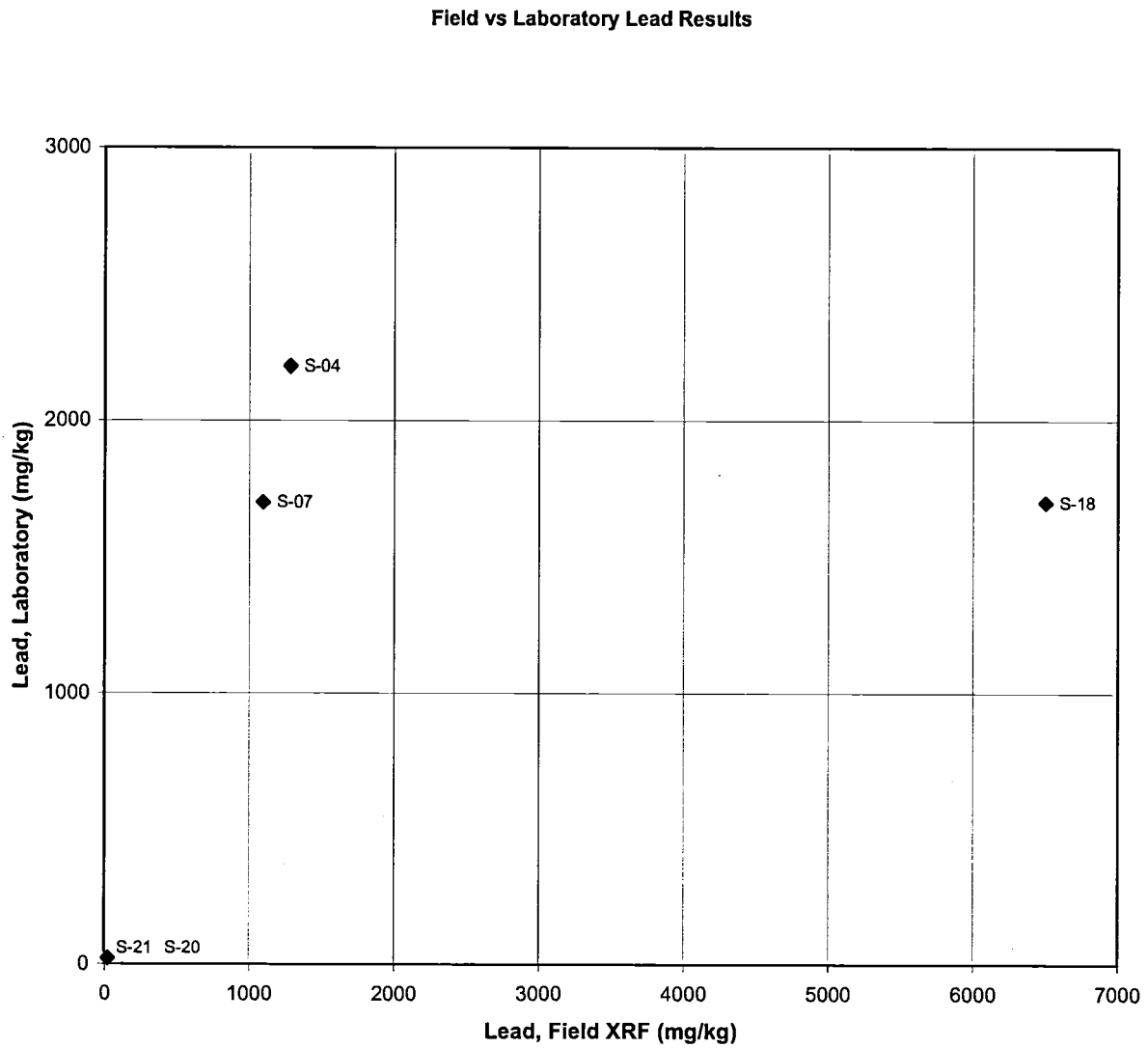
SPAWAR
SPAWAR SYSTEMS CENTER
TRIAD TEAM/CODE 2375
ENVIRONMENTAL DEPARTMENT

DATE: JUN 13, 2006
FILE: TiffanyRd-Fig5.mxd

FIGURE: 5

(b) (3) (A)

[redacted]



Abbreviations:
mg/kg = milligrams per kilogram
XRF = X-ray Fluorescence

Notes:
Chart depicts the five samples in which results from both the field portable XRF analyzer and fixed-base laboratory lead were obtained.

Non-detect results using the portable XRF are shown as 20 mg/kg.

LEAD SOIL SAMPLE RESULTS

TIFFANY ROAD DEBRIS AREA
NAVAL AIR FACILITY
EL CENTRO, CA

SPAWAR SYSTEMS CENTER
TRIAD TEAM/CODE 2375
ENVIRONMENTAL DEPARTMENT
BAYSIDE POINT LOMA, SAN DIEGO, CALIF.

DATE: 13-Jun-2006
FILE: XRF_TiffNAFEC.xls

FIGURE: 7

TABLES

Table 1 - Summary of Soil Sample Results
Tiffany Road Debris Area, NAFEC

Sample ID	Date Collected	Location Description	Soil Description	Lead (mg/kg) XRF	Lead (mg/kg) Lab	Total PAH (µg/kg)
S-01	2/23/2006	Top of bluff, east of burn debris	Clean soil	80	--	832
S-02	2/23/2006	Middle of slope	Burn debris	1,810	--	979
S-03	2/23/2006	Near toe of slope	Burn debris	2,390	--	844
S-04	2/23/2006	Near bottom of slope	Burn debris	1,280	2,200	905
S-05	2/23/2006	Lower third of slope	Burn debris	1,780	--	849
S-06	2/23/2006	Top of slope	Mixed soil, burn debris	760	--	1,059*
S-07	2/23/2006	Top of bluff, near slope	Soil and burn debris	1,090	1,700	749
S-08	2/23/2006	Top of bluff, north of burn debris	Clean soil	80	--	840
S-09	2/23/2006	Top of bluff, west of small ravine	Burn debris	4,710	--	2,766
S-10	2/23/2006	Top of bluff, north of burn debris	Clean soil	<20	--	840
S-11	3/8/2006	Below top of bluff	Burn debris	310	--	963
S-12	3/8/2006	Near bottom of slope	Burn debris	1,190	--	884
S-13	3/8/2006	Bottom of slope, south of burn	Clean soil	30	--	779
S-14	3/8/2006	Middle of slope	Burn debris	1,580	--	1,112
S-15	3/8/2006	Bottom of small ravine	Burn debris	3,270	--	845
S-16	4/13/2006	Top of slope, east of burn debris	Clean soil	50	--	--
S-17	4/13/2006	Reeds, bottom of slope	Soil	70	--	--
S-18	4/13/2006	20 ft into reeds, west of slope	Burn debris	6,500	1,700	--
S-19	4/13/2006	Top of bluff, north of burn debris	Soil	150	--	--
S-20	4/13/2006	Top of bluff	Clean soil	<20	21	--
S-21	4/13/2006	Top of bluff, at break in slope	Clean soil	<20	21	--
S-22	4/13/2006	Top of bluff, east of small ravine	Clean soil	<20	--	--
S-23	4/13/2006	Top of bluff, debris pile	Asphalt debris	<20	--	--

Notes:
XRF = X-ray fluorescence, using a field portable unit
Lab = Lead (and 15 other Title 22 metals) analyzed by Columbia Analytical Services using EPA test method 6010E
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
-- = not analyzed
<20 = approximate detection limit of 20 mg/kg estimated for portable XRF unit
Total PAH = Total polynuclear aromatic hydrocarbons (16 EPA priority pollutants) by SPAWAR Code 2375 using immunoassay methods
* = sample analyzed for PAHs by Columbia Analytical Services using EPA test method 8270C SIM

Table 2 - Summary of Metals Analytical Results for Soil Samples
Tiffany Road Debris Area, NAFEC

Sample ID	Date Collected	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc
S-04	2/23/2006	10.0	17.0	480	0.75 J	20.0	72.0	11.0	1400	2200	3.5	35.0	5.7 J	6.2	ND U	26.0	2400
S-07	2/23/2006	27.0	10.0	1400	0.53 J	39.0	56.0	9.9	1200	1700	6.2	35.0	6.4 J	11.0	ND U	23.0	3300
S-18	4/13/2006	30.0 J	34.0 J	600	ND U	11.0	59.0	15.0 J	1200	1700	47.0	60.0	37.0 J	11.0 J	ND U	23.0	1500
S-20	4/13/2006	2.0 J	5.9 J	340	0.98 J	0.77 J	15.0	8.2	23.0	21.0	1.3 J	18.0	5.5 J	0.45 J	ND U	26.0	67.0
S-21	4/13/2006	ND U	8.8	260	0.97	0.61 J	15.0	8.6	24.0	21.0	ND U	19.0	9.9 J	0.31 J	ND U	27.0	66.0

Notes:
Analytical testing performed by Columbia Analytical Services using EPA test method 6010B. Results reported in milligrams per kilogram.
All results should be considered estimated due to non-standard sample storage.
B = Analyte found in associated blank as well as the sample, indicating possible blank contamination.
U = Not detected
J = Estimated (less than method reporting limit, but greater than or equal to the method detection limit)

APPENDIX A

WORK PLAN

DEPARTMENT OF THE NAVY
Naval Facilities Engineering Command Southwest
1220 Pacific Highway, San Diego, California 92132-5190

FINAL DRAFT
WORK PLAN

PRELIMINARY ENVIRONMENTAL ASSESSMENT OF TIFFANY ROAD DEBRIS AREA NAVAL AIR FACILITY, EL CENTRO EL CENTRO, CALIFORNIA

November 29, 2005
Revised February 7, 2006

Prepared By:

Anteon
3430 Camino del Rio North
San Diego, CA 92108

FINAL DRAFT
WORK PLAN

PRELIMINARY ENVIRONMENTAL ASSESSMENT OF TIFFANY ROAD DEBRIS AREA NAVAL AIR FACILITY, EL CENTRO EL CENTRO, CALIFORNIA

November 29, 2005
Revised February 7, 2006

Prepared for:

NAVFAC SW
Naval Air Facility, El Centro

Prepared By:

Anteon
3430 Camino del Rio North
San Diego, CA 92108

Prepared by:

David M. Bloom, CEG 2221
Project Manager

Approved by:

Tim Shields
Program Manager

Anteon corporation

February 7, 2006

Ms. Angie Lind, Code ROPDE.AL
Remedial Project Manager (MCAS Yuma/NAF El Centro)
Naval Facilities Engineering Command Southwest
1220 Pacific Highway
San Diego, CA 92132-5190

Subject: Final Draft Work Plan, Preliminary Environmental Assessment
Tiffany Road Debris Area, Naval Air Facility, El Centro
El Centro, California

Dear Ms. Lind:

Anteon Corporation is pleased to submit the attached Final Draft Work Plan, Preliminary Environmental Assessment of Tiffany Road Debris Area, Naval Air Facility, El Centro, El Centro California.

Please do not hesitate to call either David Bloom at (619) 221-5298 or me at (619) 881-8970 with any questions you may have regarding this submittal.

Sincerely,

Timothy Shields
Program Manager

cc: Mr. Robert Fischer, Environmental Protection Specialist
Dr. Jim Leather, SPAWAR Systems Center
Mr. John Patskan, Project Manager
Mr. Dave Bloom, Project Manager

3430 Camino Del Rio North ▲ San Diego, CA 92108 ▲ 619-881-8989 fax: 619-521-0180

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Mr. Robert Fischer	Environmental Protection Specialist	NAF El Centro	1
Dr. Jim Leather	SPAWAR Systems Center	SPAWAR, Env Division	1
Mr. John Patskan	Project Manager	NAVFAC Southwest	1
Mr. David Bloom	Program Manager	Anteon	1

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FIGURES

Figure 1 Regional Map
Figure 2 Site Map

APPENDIX

Appendix A October 2005 Reconnaissance Observations and XRF Results

1.0 INTRODUCTION

The SPAWAR Anteon Triad team plans to evaluate the history, nature, and areal extent of surface debris at the northwest corner of Naval Air Facility, El Centro (NAFEC) along a ravine west of Tiffany Road (Figure 1). This work plan was prepared at the request of Naval Facilities Engineering Command Southwest (NAVFAC SW) to determine if the subject site is a candidate for the Installation Restoration Program.

Site Name:	Tiffany Road Debris Site
Site Address:	Tiffany Road, approximately 1 mile south of Worthington Road Naval Air Facility El Centro El Centro, California
Property Owner:	U.S. Navy, and adjacent private parcels
Contact:	Ms. Angela Lind, NAVFAC SW
Mailing Address:	1220 Pacific Highway, San Diego, CA 92132
Phone:	619-532-4228
24-hour Emergency Contact:	NAFEC Officer of the Day

The purpose of this work plan is to describe the scope of services and level of data needed, the data quality objectives, and the standard practices and methods for providing that data. The results of this assessment will be provided to NAVFAC SW so that the Navy's Remedial Project Manager has sufficient information to evaluate the site for eligibility for the Installation Restoration Program.

1.1 Background and Description

Debris piles and burn dump materials are present on the west side of Tiffany Road, outside the fenceline of NAFEC, partly within NAFEC property line (Figure 2). Base environmental personnel performed a field reconnaissance to document the presence of debris in 2004. The debris and burn materials are located on the flat area west of Tiffany Road and extend west to the edge of a ravine, which is a tributary of the New River. Burn materials exposed at the surface are located at the edge of the flat area and extend down to the bottom of the vegetated ravine. About one-quarter acre of burn materials are exposed at the surface in this area. In October 2005, Anteon project manger David M. Bloom performed a brief reconnaissance to observe the site and collect surface samples to evaluate the suitability of using a portable x-ray fluorescence (XRF) analyzer to screen soil for metals. Observations and results are provided in Appendix A.

Adjacent to the north of the burn materials and west of Tiffany Road and the old sewage treatment ponds, are several hundred small piles of construction demolition debris. These piles cover an area of roughly 2 to 3 acres, and appear to consist almost entirely of concrete and asphalt. As much as 2 percent of the material may be other construction debris such as drywall, wood, metal, landscaping cuttings, etc. A few piles of municipal refuse appear to have been placed recently. The likely source of the recent material are local residents who found the municipal landfill, located to the north, closed and found this area convenient to dump their refuse. Most of the demolition debris is located on the relatively flat unpaved surface between Tiffany Road and the tributary; however, some concrete and asphalt was observed on slopes of the adjacent ravines. Based on recent observations and historical aerial photographs, the demolition debris appears to be several decades old and of similar age. In dirt patches between and adjacent to the piles, evidence of burn material was observed. It is unknown the extent of burn material due to the presence of piles of broken asphalt and concrete which obscure the soil surface.

According to retired Environmental Manager for NAFEC, Mr. Fred Rivera, the Navy used the area for disposal of demolition debris and burning of domestic solid waste in this area in approximately the 1960s and 1970s. He added that these activities were similar to and took place at similar times as the disposal activities at the Patrol Road Landfill, NAFEC Installation Restoration (IR) Site 2. Bechtel National, Inc., prepared a Remedial Investigation Report which documents the results of the IR Site 2 investigation (Bechtel, 2003). Mr. Rivera said that the constituents of potential concern at IR Site 2 should be expected in the Tiffany Road Debris Area. He also showed areas where refuse disposal and burning had taken place that are currently obscured by erosion and deposition of sediment, burial under the demolition and debris, and hidden by vegetation.

1.2 Geology, Hydrology and Surface Water

Imperial Valley in this area is structural basin containing up to 20,000 feet of sediment. The near surface sediments are characterized by fine-grained strata (mostly silt and clay) deposited in Pleistocene Lake Cahuilla. Groundwater in the Tiffany Road area is expected to be shallow, approximately 15 to 30 feet below ground surface, based on water levels of nearby wells. Typically water quality is unacceptable for drinking water purposes due to high total dissolved solids (TDS).

Although the California Regional Water Quality Control Board (RWQCB) Colorado River Basin Region has designated potential beneficial use of groundwater in the Imperial Hydrologic Unit (RWQCB, 2005), the beneficial uses of groundwater in this Hydrologic Unit are limited to specific areas. In a letter dated June 30, 1998, the RWQCB stated the groundwater in the upper aquifer beneath NAF El Centro has no known beneficial uses.

The Tiffany Road area is located on a tributary of the New River, approximately ¼ mile from the New River. The New River consists primarily of irrigation return flows from the Mexicali and Imperial Valleys, and flows north to the Salton Sea. New River water quality has been described as poor.

1.3 Conceptual Site Model:

Sources	Exposure Pathways	Receptors
Primary sources are: • Buried and exposed burn ash waste and debris; • Domestic and municipal refuse from Navy activities, including demolition.	Soil: • Direct exposure from surface soil • Exposure from wind blown dust • Subsurface exposure by local collectors digging burn site for bottles, etc.	Current: • Local residents and trash scavengers • Ecological receptors may include burrowing animals and birds.
Secondary sources include: • Soil contaminated by burn ash and/or municipal refuse.	Groundwater and Surface Water: • Unknownl	Future receptors: • Local residents and trash scavengers • Potential ecological receptors • Potential commercial / industrial workers

There are little quantitative data for the conceptual site model. The conceptual site model is based largely on observations of present surface conditions, review of historical aerial photography, and interviews with knowledgeable persons.

1.4 Data Quality Objectives

The objective at this initial screening of the Tiffany Road Debris Site is to provide sufficient information regarding the size and nature of the potential hazards to allow the Navy Remedial Project Manager to assess eligibility for the Installation Restoration Program. As such, this screening level assessment seeks to obtain sufficient data to complete an Installation Addition Request for the Normalization of Environmental Data Systems/Defense Site Environmental Restoration Tracking System (NORM/DSERTS). It is beyond the scope of this assessment to evaluate surface or groundwater.

STEP 1: State the problem

The presence of debris, including burn ash from municipal waste disposal, creates a potential risk to human health and the environment as a continuing source of hazardous materials and waste to soil. The nature and extent of the contaminants have not been characterized. There are no existing analytical data to evaluate the soil conditions at the site.

STEP 2: Identify the decisions

Based on Step 1, perform historical research and personnel interviews to evaluate the quantities and types of materials disposed at the site. Perform surface sampling in areas of burn ash to evaluate the nature of the contamination.

- What is the areal extent of debris and burn ash?
- Is the soil contaminated?
- What constituents in the soil have hazardous (e.g., toxic) properties?
- If the soil is contaminated, is it at concentrations that threaten human health and the environment?
- Can real-time field testing methods be use to evaluate constituents of potential concern in soil?
- If field screening methods are used, confirmation soil samples will be collected and sent to a State-certified analytical laboratory for testing. Three or more samples will be used for confirmation. One should be at a high concentration, another at a moderate concentration, and one at "background" as indicated by the field screening.

STEP 3: Identify the inputs to the decisions.

- Quantities and types of materials disposed of at the site will be researched from historical information and personnel interviews.
- Areal extents of debris and burn ash will be estimated from site observation and historical aerial photography.
- Data from portable XRF to evaluate surface soil for metals.
- Potential use of data from immunoassay techniques to evaluate soil for polynuclear aromatic hydrocarbons (PAHs), and total petroleum hydrocarbons as diesel (TPH-diesel).
- Laboratory analysis of selected soil samples for typical municipal solid waste site and burn site constituents, such as: Title 22 metals, PAHs, and TPH-diesel.

STEP 4: Define Study Boundaries

The Tiffany Road Debris Site includes:

- the obvious burn ash in the slope into the vegetated ravine west of Tiffany Road, and north of the Tiffany Road crossing of that same ravine;
- the graded soil area immediately east of the obvious burn ash;

- the faintly visible burn material north of the obvious burn ash, which appears to be partially buried by piles of asphalt and concrete demolition debris;
- the pile of demolition debris mentioned above;
- unexplored areas west of the obvious burn ash where it is obscured by dense vegetation at the bottom of the ravine, and additional traces of burn ash on the west side of the ravine.

The vertical boundaries are unknown and beyond the scope of this screening level assessment. Our current understanding of the site suggests that burial of waste would have occurred in existing topographic lows such as existing depressions, gullies, and ravines.

STEP 5: Develop decision rules.

- Research extent historical records and aerial photographs to assess extent and timing of solid waste disposal and refuse burning. If evidence for solid waste disposal is documented, record the location(s) and date(s) of these activities and refine the study area.
- Use historical records and personnel interviews to evaluate composition of waste materials disposed of or burned at the site. If evidence for type of solid waste is revealed, record the type(s) of solid waste, when it was disposed, and whether or not it was burned.
- Use portable XRF methods to evaluate surface soil for metals. Use immunoassay techniques and/or analytical laboratory techniques to evaluate soil for PAH and TPH-diesel, as appropriate. Test selected soil samples by certified analytical laboratory techniques for five or more soil samples. If a soil sample analytical test shows a Title 22 metal, PAH, or TPH-diesel concentration greater than its respective California total threshold limit concentration (TTLC) or naturally occurring background concentration for the evaluation of hazardous waste, then the soil tested will be presumed hazardous.
- If soil sampling indicates soil contamination is more extensive than can be feasibly evaluated during this screening, the locations of contamination will be noted.

STEP 6: Specify Tolerable Limits on Errors.

Since this investigation primarily focuses on providing initial site information, such as its areal extent, soil samples will be collected based on judgmental sampling (source is known). Thus, sample numbers and quantitative limits on decision errors are <u>not</u> applicable. The evaluation of qualitative limits on decision errors for this investigation are as follows:

- Possible Error: Concluding that contamination is present when in fact it is not.
  - ***Associated Consequence:*** Unnecessarily extending assessment area.
  - ***Associated Uncertainty:*** Low. Sufficient number of confirmatory samples will be tested to limit "false positive" assessment areas.
- Possible Error: Concluding that contaminants are not present when they are in fact present.
  - ***Associated Consequences:*** Inadequate assessment of contaminant distribution.

- ***Associated Uncertainty:*** Moderate. There is uncertainty in the areal distribution of contaminated soil and burn ash. Confirmatory laboratory analytical data will reduce "false negative" assessment areas.

STEP 7: Optimize Sampling Design

Soil sample locations are based upon prior observations of burn material at the surface, to be refined by more detailed evaluation of surface conditions, supplemented by historical records research, personnel interviews, knowledge of site geology, hydrogeology, and knowledge of nearby areas of similar waste disposal.

2.0 WORK DESCRIPTION

Perform field activities after conducting the historical analysis which may modify the locations of proposed sample locations and laboratory analysis.

2.1 Pre-Field Activities

- Conduct historical research.
  - Review site records, maps, and plans.
  - Review historical aerial photography.
  - Conduct interviews with knowledgeable personnel.
  - Modify sampling plan accordingly.
- Prepare site-specific Health and Safety Plan.

2.2 Field Sampling Plan

The field program is based on evaluating the soil for burn ash residue. Perform field activities after conducting the historical analysis which may modify the locations of proposed sample locations and laboratory analysis. The field team members will observe the area for suspected burn ash, and collect surface soil samples, in (1) areas of highest degree of discoloration, staining, and presence of burn ash; (2) areas of moderate to low effect from burning indicating boundary of burn site, and (3) areas that appear free of the effects of burning and waste disposal.

Collect surface soil samples.

- Use XRF and other in-situ field screening techniques, as appropriate, to test for Title 22 metals, PAHs, and TPH-diesel. To meet the DQOs, estimate 20 *in situ* samples of which five will be tested by the analytical laboratory.

2.3 Post-Field Activities

Prepare final report summarizing all activities performed at site, and include an appendix with all pertinent documentation generated during work activities at site. The final report will provide a recommendation for further action if contamination is present.

3.0 PROJECT MANAGEMENT

Key personnel responsible for project implementation and quality control are noted below.

Project Points of Contact

NAME AND ADDRESS	AFFILIATION	RESPONSIBILITY	PHONE/FAX
Ms. Angie Lind NAVFAC SW 1230 Pacific Hwy. San Diego, CA 92132	NAVFAC SW	Remedial Project Manager	Phone: (619) 532-4228 FAX: (619) 532-1195 E-mail: angela.lind@navy.mil Alternate phone: 619-726-5668
David Bloom SSC San Diego, Code 2375 Building 68, Room 112	Anteon	Triad Project Manager	Phone: (619) 571-3470 FAX: (619) 521-0180 E-mail: dbloom@spawar.navy.mil Alternate phone: 619-221-5298
Dr. Jim Leather SSC San Diego, Code 2375 Building 112	SPAWAR	Triad Technical Manager	Phone: (619) 533-6240 FAX: (619) 533-6305 E-mail: leather@spawar.navy.mil
Bob Fischer NAF El Centro	NAVFAC SW / NAF El Centro	Environmental Specialist	Phone: (760) 339-2284 FAX: (760) 522-8924 Email: robert.d.fischer@navy.mil

4.0 PROJECT SCHEDULE

Historical research is scheduled following approval of this work plan. Field work is planned to commence within two weeks of conclusion of pre-field activities. Field work itself is anticipated to take approximately one to two days. Up to five soil samples are planned for laboratory analysis during this project. Receipt of laboratory analytical reports may be expected one month after submittal of samples. The actual number of samples tested will vary depending on actual site conditions and the modified conceptual site model. A single report will be prepared which presents the results of the historical research and the analytical data obtained during fieldwork. The final report will be generated within 90 days following receipt of the final analytical laboratory reports.

5.0 REFERENCES

Bechtel Environmental, Inc., 2004, Final Remedial Investigation Report for IR Site 2, Patrol Road Landfill, Naval Air Facility El Centro, El Centro, California, CTO-0024/0114, April.

California Regional Water Quality Control Board – Colorado River Basin Region (7), 1998, Beneficial Use Designation: letter dated June 30.

California Regional Water Quality Control Board – Colorado River Basin Region (7), 2005, Water Quality Control Plan, Colorado River Basin - Region 7, Includes Amendments Adopted by the Regional Board through October 2005.

United States Environmental Protection Agency, 1994, EPA Requirements for Quality Assurance Project Plans for Environmental Data operations, EPA QA/R-5, Draft Interim Final, August 1994.

United States Environmental Protection Agency, 1994, Guidance for the Data Quality Objectives Process, EPA QA/G-4, Final, September 1994.

United States Environmental Protection Agency, 1994, Guidance for the Data Quality Assessment, EPA QA/G-9, External Working Draft, March 27, 1995.

APPENDIX B

ANTEON XRF STANDARD OPERATING PROCEDURE

Anteon corporation

3430 Camino del Rio North
San Diego, CA 92018
www.anteon.com

STANDARD OPERATING PROCEDURE

TITLE: **FIELD X-RAY FLUORESCENCE SPECTROMETRY**

SOP NUMBER: **T-003**

REVISION NUMBER: **0**

REVISION DATE: **MAY 23, 2006**

Prepared by: _____ _____
David Bloom *Date*

Reviewed by: _____ _____
Project Manager *Date*

Approved By: _____ _____
Project Manager *Date*

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ANTEON
STANDARD OPERATING PROCEDURE

FIELD X-RAY FLUORESCENCE SPECTROMETRY

1.0 PURPOSE

Field Portable X-ray Fluorescence (XRF) Spectrometry is used to provide rapid screening data for metals in soil samples. This technique can yield semi-quantitative concentration values for most metals to detection limits of approximately 10 to 50 parts per million, at a rate of up to about 15 samples per hour. As a screening tool, portable XRF can aid in rapidly assessing extents of metals contaminated soil, and estimating the effectiveness of, for example, removal of metals contaminated soil by excavation. The purpose of this Standard Operating Procedure (SOP) is to provide direction on proper techniques of field portable XRF spectrometry. This SOP complements, and does not replace, site-specific Sampling and Analysis Plans (SAP) or Work Plans and implementation of quality assurance/quality control (QA/QC) measures.

2.0 BACKGROUND

Field Portable X-ray Fluorescence (XRF) Spectrometry is used to screen for metals of interest. This technique measures the fluorescence spectrum of x-rays that occur when atoms are excited by a radiation source. The energy of the emitted x-rays reveal the identity of the metals in the sample, and the intensity of emitted x-rays is related to their concentrations (Swift, 1995). Rapid, multi-element analysis can be performed by XRF. An XRF spectrometer can analyze a wide range of elements (i.e., sulfur through uranium), with a wide dynamic range, from parts per million to percent levels, encompassing typical element levels found in soils and sediments. Portable XRF units provide near real time measurements with minimal sample handling, allowing for extensive, semi-quantitative analysis on site. Several examples can be found in literature in which portable XRF has been used for the analysis of soils and sediments. Sediments in a Norwegian fjord (Skei et al., 1972), San Diego Bay (Stallard et al., 1995), and a large number of sites (Kirtay et al., 1997, 1998) have been screened for heavy metals content by XRF. Field portable XRF has been certified by the USEPA as a field screening method for metals in soils (EPA SW-846 Method 6200).

XRF technologies operate on the concept of energy dispersive x-ray fluorescence spectrometry, a nondestructive qualitative and quantitative analytical technique. Most field portable XRF units use sealed radioisotope sources to irradiate samples with x-rays. Laboratory-grade XRF technologies generally use an x-ray tube to irradiate the samples with x-rays, and both the field portable and laboratory-grade technologies produce x-rays of known energies. By exposing a sample to an x-ray excitation source

having energy close to, but greater than, the binding energy of the inner shell electrons of the metals, an inner shell electron is discharged. Electrons cascading in from outer electron shells fill the electron vacancies that result. Electrons in outer shells have higher energy states than inner shell electrons; therefore, to fill the vacancies, the outer shell electrons give off energy in the x-ray spectrum as they cascade down into the inner shell vacancies. There are three electron shells generally involved in the emission of x-rays during the XRF analysis of environmental samples: K, M, and L shell electrons. The emission of x-rays is termed x-ray fluorescence. Each metal gives off x-rays of specific energy levels. The specific type or energy of the emitted x-ray is unique to a given metal and is called a "characteristic" x-ray. By measuring the different energies of x-rays emitted by a sample exposed to an x-ray source, it is possible to identify and quantify the metals composition of a sample (Bertin 1975, Russ 1984).

An EPA Method (Method 6200) for the determination of metals in soils and sediments by Field-Portable X-ray Fluorescence Spectrometry has been prepared by the USEPA (EPA, 1998). This method outlines the capabilities of the portable instrument relative to detailed standard chemical analyses and evaluates instrument response for sediments with different characteristics including moisture content, mineralogy, and modes and sources of contamination.

General Design Criteria:

- Source to provide x-rays
- Sample presentation device
- Detector that converts x-ray generated photons emitted from the sample into measurable electronic signals
- Data processing to include an emission or fluorescence energy analyzer

3.0 APPLICABILITY

Field Portable XRF techniques are applicable for sites at which the soil action levels for metals of concern exceed the detection limits of the XRF unit, which typically range from 10 to 50 parts per million. For example, if lead in soil is the risk driver at a site for which the cleanup level is 150 milligrams per kilogram (mg/kg), and the detection limit for lead in soil is found to be 40 mg/kg, the field portable XRF technique may be applicable.

Interferences between metals can occur, for example between copper and zinc. An evaluation of potential interferences should be performed for applicability of this technique. For example, EPA documents EPA/540/R-06/001 through /008 at http://www.epa.gov/ORD/NRMRL/pubs/ provide technical information on eight models of portable XRF units.

Uncertainties and interferences using the portable XRF technique may be mitigated by sending a subset of split samples to an analytical laboratory for confirmation.

4.0 DEFINITIONS

Analyte - A chemical component of a sample to be determined or measured.

Analytical (or Testing) Method - A specification for sample preparation and instrumentation procedures or steps that must be performed to estimate the quantity of analyte in a sample.

Heterogeneous – "Dissimilar." In the case of soil heterogeneity refers to soil or geologic units whose properties, such as density, proportion of clay, or bulk chemistry, change across different parts of the unit or sample.

Homogeneous – "Similar." In the case of soil homogeneity refers to soil or geologic units whose properties are the same across the unit or sample.

X-ray Fluorescence (XRF) Spectrometry - The irradiate a sample with X-rays to and measure the resulting fluorescence to identify and quantitate the specific elements in that sample.

5.0 REFERENCES

U.S. Environmental Protection Agency, "Method 6200. Field Portable X-ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment." Office of Solid Waste and Emergency Response. Washington, D.C., 1996.

Swift, R.P., "Evaluation of a field-portable X-ray fluorescence spectrometry method for use in remedial activities," Spectroscopy. 10, 31-35, 1995.

County of San Diego, Department of Environmental Health, Land & Water Quality Division, Site Assessment and Mitigation Program (SD DEH). Site Assessment and Mitigation Manual. Updated annually.

6.0 APPARATUS AND MATERIALS

The Project Manager and Field Technician shall plan for screening by portable XRF by assessing, selecting, and assembling the types of equipment, instruments, and supplies

necessary to perform the scope of work. Prior to mobilizing, assemble, charge, calibrate (if applicable), and test instruments. Perform instrument calibration per manufacturer's operating manual. Apparatus and materials that may be required include the following:

- Field portable XRF spectrometer in reinforced, padded carrying case.
- Rechargeable battery with spare and charger.
- Data logger if not built into the XRF unit.
- Standards to perform daily initial and final field calibrations.
- Resealable plastic sample bags
- Sample labels.
- Marking pens.
- Sample jars, ice (double bagged), and laboratory paperwork (chain-of-custody forms; sample labels, and custody seals).
- Coolers and sample packing supplies (absorbing packing material, plastic bags, etc.).
- Approved plans and background documents – Approved SAP or Work Plan, Quality Assurance Project Plan (as appropriate), and site map.
- Site Health and Safety Plan and required equipment.
- Site Access/ Permission documentation for site entry.
- Field logbook and field forms.
- Tool box equipped with soil sampling tools, as needed.

7.0 PROCEDURE

This procedure addresses the specific activities to be performed to accomplish field portable XRF.

7.1 Preparation for Portable XRF Screening

7.1.1 Review of SAP or Work Plan

To prepare for portable XRF screening, review the following information with the Project Manager:

- Access requirements (e.g., permission of owner, locked gates, road conditions).
- Identification number(s) of the locations(s) to be tested.

- Testing locations.
- Required field logbook entries, any supporting documentation.
- Amount of material and sampling containers needed for sample splits sent to analytical laboratory.

Record field information and data obtained during screening in a field logbook. Record soil sample location, description of soil per USCS, time of XRF measurement, and readings of elements of concern, using field form, as provided in Attachment 1.

7.2 Daily Initial Calibration

Before using the XRF each day, perform an initial calibration using NIST standard soil samples which contain known concentrations of metals of concern. Choose at least three standards with one each at concentrations a little lower and a little higher than expected at the site.

1. Power-up the device until warm.
2. Check the software: Make sure the datalogger is set. Select soil screening mode.
3. Make sure the standards are unclumped and well mixed.
4. Measure the metal concentrations in each of the standards. Record the results on the Daily Field Calibration Form (attached).

7.3 Screening Data Collection

Collect a representative sample of soil for XRF screening. It is usually better to collect soil from several individual spots within a 2- to 4-foot radius and combine them in a mixed sample so that heterogeneities are reduced.

1. Using clean sampling tools place 5 to 10* grams of soil in a plastic bag.
2. Mix the soil well. Stir soil and shake the bag for 30 to 60 seconds.
3. Place the X-ray emitter/detector gently against the bag.
4. Take a reading for approximately 60 seconds, until the error term stabilizes.
5. Store the reading in the datalogger and record the results on the field form.
6. Label the bag with sample identification information.

*The amount of soil needed to confirm field XRF results by analytical laboratory testing for metals is approximately 5 grams. However, the quantity needed by specific labs vary and should be confirmed with the project laboratory. Approximately 10 to 20 percent of the XRF results should be confirmed by analytical testing. The samples sent to the lab should include samples that show low, medium, and high concentrations of the metals of interest. A better calibration curve can be drawn the greater the range in concentrations.

Usually decontamination is not applicable because the XRF readings are taken though a plastic bag, protecting the instrument from direct contact with contaminants. To keep the XRF unit clean it may be useful for the sampling team to dedicate one technician to prepare the sample and another technician to operate the XRF unit.

7.4 Daily Final Calibration

At the end of each day, perform a final calibration using the same NIST standard soil samples the same way as used for the initial calibration, Section 7.2. Power down the unit, and recharge the batteries.

7.5 Analytical Laboratory Confirmation Samples

Evaluate the soil sample results at the end of the sampling program, or at appropriate intervals. Approximately 10 to 20 percent of the XRF results should be confirmed by analytical testing. Select samples based on the XRF reading, identifying the a set of low, medium, and high concentration samples for laboratory testing. For example, if 50 XRF screening results are taken, choose at least five samples for laboratory testing. One each of the samples should be among the lowest and highest concentrations of the main metal of interest. Additional samples may be selected if the metals of interest correlate poorly with each other. One sample should have about average concentration readings. From these samples a calibration curve will be drawn.

8.0 DOCUMENTATION

Document all procedures and equipment used for the field portable XRF program in the field logbook or Sample Collection form. Record all applicable field data including:

- Equipment calibration.
- Equipment decontamination, if performed.
- Equipment and software configuration for sampling.

- Location of sampling points.
- Sample identifiers, and soil description.
- Concentration of metals and their respective error terms. X-ray time, in seconds.
- Times for all measurements, including start and end time for pump operation, purging and water-quality measurements, sampling, and stabilization of water-quality indicator parameters.

9.0 ATTACHMENTS

1. Field XRF Data Collection Form
2. EPA Method 6200. Field Portable X-ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soil and Sediment.

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STANDARD OPERATING PROCEDURE

FIELD X-RAY FLUORESCENCE SPECTROMETRY

ATTACHMENT 1

FIELD XRF DATA COLLECTION FORM

APPENDIX B

FORM EXAMPLES

Field XRF Data Collection Form

Date: _____ **Project:** _____

Field Tech: _____ **Site:** _____

XRF Model: _____

Initial Daily Calibration

	Time (hhmm)	NIST Standard (ID)	Interval (seconds)	Lead ppm	Copper ppm	Zinc ppm	Iron ppm	Other: _____ ppm	Other: _____ ppm
1									
2									
3									
4									
5									

XRF Field Readings

	Time (hhmm)	Sample ID (ID)	Interval (seconds)	Lead (ppm)	Copper (ppm)	Zinc (ppm)	Iron (ppm)	Other: _____ (ppm)	Other: _____ (ppm)
1									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
2									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
3									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
4									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
5									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
6									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
7									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
8									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
9									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
10									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	
11									
	GPS:	Northing: _____			Easting: _____			Vertical: _____	

Final Daily Calibration

	Time (hhmm)	NIST Standard (ID)	Interval (seconds)	Lead (ppm)	Copper (ppm)	Zinc (ppm)	Iron (ppm)	Other: _____ (ppm)	Other: _____ (ppm)
1									
2									
3									
4									
5									

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STANDARD OPERATING PROCEDURE

FIELD X-RAY FLUORESCENCE SPECTROMETRY

ATTACHMENT 2

EPA METHOD 6200.
FIELD PORTABLE X-RAY FLUORESCENCE SPECTROMETRY FOR THE DETERMINATION OF ELEMENTAL CONCENTRATIONS IN SOIL AND SEDIMENT

METHOD 6200

FIELD PORTABLE X-RAY FLUORESCENCE SPECTROMETRY FOR THE DETERMINATION OF ELEMENTAL CONCENTRATIONS IN SOIL AND SEDIMENT

1.0 SCOPE AND APPLICATION

1.1 This method is applicable to the in situ and intrusive analysis of the 26 analytes listed in Table 1 for soil and sediment samples. Some common elements are not listed in Table 1 because they are considered "light" elements that cannot be detected by field portable x-ray fluorescence (FPXRF). They are: lithium, beryllium, sodium, magnesium, aluminum, silicon, and phosphorus. Most of the analytes listed in Table 1 are of environmental concern, while a few others have interference effects or change the elemental composition of the matrix, affecting quantitation of the analytes of interest. Generally elements of atomic number 16 or greater can be detected and quantitated by FPXRF.

1.2 Detection limits depend on several factors, the analyte of interest, the type of detector used, the type of excitation source, the strength of the excitation source, count times used to irradiate the sample, physical matrix effects, chemical matrix effects, and interelement spectral interferences. General instrument detection limits for analytes of interest in environmental applications are shown in Table 1. These detection limits apply to a clean matrix of quartz sand (silicon dioxide) free of interelement spectral interferences using long (600-second) count times. These detection limits are given for guidance only and will vary depending on the sample matrix, which instrument is used, and operating conditions. A discussion of field performance-based detection limits is presented in Section 13.4 of this method. The clean matrix and field performance-based detection limits should be used for general planning purposes, and a third detection limit discussed, based on the standard deviation around single measurements, should be used in assessing data quality. This detection limit is discussed in Sections 9.7 and 11.3.

1.3 Use of this method is restricted to personnel either trained and knowledgeable in the operation of an XRF instrument or under the supervision of a trained and knowledgeable individual. This method is a screening method to be used with confirmatory analysis using EPA-approved methods. This method's main strength is as a rapid field screening procedure. The method detection limits (MDL) of FPXRF are above the toxicity characteristic regulatory level for most RCRA analytes. If the precision, accuracy, and detection limits of FPXRF meet the data quality objectives (DQOs) of your project, then XRF is a fast, powerful, cost effective technology for site characterization.

2.0 SUMMARY OF METHOD

2.1 The FPXRF technologies described in this method use sealed radioisotope sources to irradiate samples with x-rays. X-ray tubes are used to irradiate samples in the laboratory and are beginning to be incorporated into field portable instruments. When a sample is irradiated with x-rays, the source x-rays may undergo either scattering or absorption by sample atoms. This later process is known as the photoelectric effect. When an atom absorbs the source x-rays, the incident radiation dislodges electrons from the innermost shells of the atom, creating vacancies. The electron vacancies are filled by electrons cascading in from outer electron shells. Electrons in outer shells have higher energy states than inner shell electrons, and the outer shell electrons give off energy as they cascade down into the inner shell vacancies. This rearrangement of electrons results in emission of x-rays characteristic of the given atom. The emission of x-rays, in this manner, is termed x-ray fluorescence.

Three electron shells are generally involved in emission of x-rays during FPXRF analysis of environmental samples: the K, L, and M shells. A typical emission pattern, also called an emission spectrum, for a given metal has multiple intensity peaks generated from the emission of K, L, or M shell electrons. The most commonly measured x-ray emissions are from the K and L shells; only metals with an atomic number greater than 57 have measurable M shell emissions.

Each characteristic x-ray line is defined with the letter K, L, or M, which signifies which shell had the original vacancy and by a subscript alpha (α) or beta (β), which indicates the higher shell from which electrons fell to fill the vacancy and produce the x-ray. For example, a K_α line is produced by a vacancy in the K shell filled by an L shell electron, whereas a K_β line is produced by a vacancy in the K shell filled by an M shell electron. The K_α transition is on average 6 to 7 times more probable than the K_β transition; therefore, the K_α line is approximately 7 times more intense than the K_β line for a given element, making the K_α line the choice for quantitation purposes.

The K lines for a given element are the most energetic lines and are the preferred lines for analysis. For a given atom, the x-rays emitted from L transitions are always less energetic than those emitted from K transitions. Unlike the K lines, the main L emission lines (L_α and L_β) for an element are of nearly equal intensity. The choice of one or the other depends on what interfering element lines might be present. The L emission lines are useful for analyses involving elements of atomic number (Z) 58 (cerium) through 92 (uranium).

An x-ray source can excite characteristic x-rays from an element only if the source energy is greater than the absorption edge energy for the particular line group of the element, that is, the K absorption edge, L absorption edge, or M absorption edge energy. The absorption edge energy is somewhat greater than the corresponding line energy. Actually, the K absorption edge energy is approximately the sum of the K, L, and M line energies of the particular element, and the L absorption edge energy is approximately the sum of the L and M line energies. FPXRF is more sensitive to an element with an absorption edge energy close to but less than the excitation energy of the source. For example, when using a cadmium-109 source, which has an excitation energy of 22.1 kiloelectron volts (keV), FPXRF would exhibit better sensitivity for zirconium which has a K line energy of 15.7 keV than to chromium, which has a K line energy of 5.41 keV.

2.2 Under this method, inorganic analytes of interest are identified and quantitated using a field portable energy-dispersive x-ray fluorescence spectrometer. Radiation from one or more radioisotope sources or an electrically excited x-ray tube is used to generate characteristic x-ray emissions from elements in a sample. Up to three sources may be used to irradiate a sample. Each source emits a specific set of primary x-rays that excite a corresponding range of elements in a sample. When more than one source can excite the element of interest, the source is selected according to its excitation efficiency for the element of interest.

For measurement, the sample is positioned in front of the probe window. This can be done in two manners using FPXRF instruments: in situ or intrusive. If operated in the in situ mode, the probe window is placed in direct contact with the soil surface to be analyzed. When an FPXRF instrument is operated in the intrusive mode, a soil or sediment sample must be collected, prepared, and placed in a sample cup. The sample cup is then placed on top of the window inside a protective cover for analysis.

Sample analysis is then initiated by exposing the sample to primary radiation from the source. Fluorescent and backscattered x-rays from the sample enter through the detector window and are converted into electric pulses in the detector. The detector in FPXRF instruments is usually either a solid-state detector or a gas-filled proportional counter. Within the detector, energies of the characteristic x-rays are converted into a train of electric pulses, the amplitudes of which are linearly

proportional to the energy of the x-rays. An electronic multichannel analyzer (MCA) measures the pulse amplitudes, which is the basis of qualitative x-ray analysis. The number of counts at a given energy per unit of time is representative of the element concentration in a sample and is the basis for quantitative analysis. Most FPXRF instruments are menu-driven from software built into the units or from personal computers (PC).

The measurement time of each source is user-selectable. Shorter source measurement times (30 seconds) are generally used for initial screening and hot spot delineation, and longer measurement times (up to 300 seconds) are typically used to meet higher precision and accuracy requirements.

FPXRF instruments can be calibrated using the following methods: internally using fundamental parameters determined by the manufacturer, empirically based on site-specific calibration standards (SSCS), or based on Compton peak ratios. The Compton peak is produced by backscattering of the source radiation. Some FPXRF instruments can be calibrated using multiple methods.

3.0 DEFINITIONS

3.1 FPXRF: Field portable x-ray fluorescence.

3.2 MCA: Multichannel analyzer for measuring pulse amplitude.

3.3 SSCS: Site specific calibration standard.

3.4 FP: Fundamental parameter.

3.5 ROI: Region of interest.

3.6 SRM: Standard reference material. A standard containing certified amounts of metals in soil or sediment.

3.7 eV: Electron Volt. A unit of energy equivalent to the amount of energy gained by an electron passing through a potential difference of one volt.

3.8 Refer to Chapter One and Chapter Three for additional definitions.

4.0 INTERFERENCES

4.1 The total method error for FPXRF analysis is defined as the square root of the sum of squares of both instrument precision and user- or application-related error. Generally, instrument precision is the least significant source of error in FPXRF analysis. User- or application-related error is generally more significant and varies with each site and method used. Some sources of interference can be minimized or controlled by the instrument operator, but others cannot. Common sources of user- or application-related error are discussed below.

4.2 Physical matrix effects result from variations in the physical character of the sample. These variations may include such parameters as particle size, uniformity, homogeneity, and surface condition. For example, if any analyte exists in the form of very fine particles in a coarser-grained matrix, the analyte's concentration measured by the FPXRF will vary depending on how fine particles are distributed within the coarser-grained matrix. If the fine particles "settle" to the bottom of the sample cup, the analyte concentration measurement will be higher than if the fine particles are not

mixed in well and stay on top of the coarser-grained particles in the sample cup. One way to reduce such error is to grind and sieve all soil samples to a uniform particle size thus reducing sample-to-sample particle size variability. Homogeneity is always a concern when dealing with soil samples. Every effort should be made to thoroughly mix and homogenize soil samples before analysis. Field studies have shown heterogeneity of the sample generally has the largest impact on comparability with confirmatory samples.

4.3 Moisture content may affect the accuracy of analysis of soil and sediment sample analyses. When the moisture content is between 5 and 20 percent, the overall error from moisture may be minimal. However, moisture content may be a major source of error when analyzing samples of surface soil or sediment that are saturated with water. This error can be minimized by drying the samples in a convection or toaster oven. Microwave drying is not recommended because field studies have shown that microwave drying can increase variability between FPXRF data and confirmatory analysis and because metal fragments in the sample can cause arcing to occur in a microwave.

4.4 Inconsistent positioning of samples in front of the probe window is a potential source of error because the x-ray signal decreases as the distance from the radioactive source increases. This error is minimized by maintaining the same distance between the window and each sample. For the best results, the window of the probe should be in direct contact with the sample, which means that the sample should be flat and smooth to provide a good contact surface.

4.5 Chemical matrix effects result from differences in the concentrations of interfering elements. These effects occur as either spectral interferences (peak overlaps) or as x-ray absorption and enhancement phenomena. Both effects are common in soils contaminated with heavy metals. As examples of absorption and enhancement effects; iron (Fe) tends to absorb copper (Cu) x-rays, reducing the intensity of the Cu measured by the detector, while chromium (Cr) will be enhanced at the expense of Fe because the absorption edge of Cr is slightly lower in energy than the fluorescent peak of iron. The effects can be corrected mathematically through the use of fundamental parameter (FP) coefficients. The effects also can be compensated for using SSCS, which contain all the elements present on site that can interfere with one another.

4.6 When present in a sample, certain x-ray lines from different elements can be very close in energy and, therefore, can cause interference by producing a severely overlapped spectrum. The degree to which a detector can resolve the two different peaks depends on the energy resolution of the detector. If the energy difference between the two peaks in electron volts is less than the resolution of the detector in electron volts, then the detector will not be able to fully resolve the peaks.

The most common spectrum overlaps involve the K_β line of element Z-1 with the K_α line of element Z. This is called the K_α/K_β interference. Because the K_α:K_β intensity ratio for a given element usually is about 7:1, the interfering element, Z-1, must be present at large concentrations to cause a problem. Two examples of this type of spectral interference involve the presence of large concentrations of vanadium (V) when attempting to measure Cr or the presence of large concentrations of Fe when attempting to measure cobalt (Co). The V K_α and K_β energies are 4.95 and 5.43 keV, respectively, and the Cr K_α energy is 5.41 keV. The Fe K_α and K_β energies are 6.40 and 7.06 keV, respectively, and the Co K_α energy is 6.92 keV. The difference between the V K_β and Cr K_α energies is 20 eV, and the difference between the Fe K_β and the Co K_α energies is 140 eV. The resolution of the highest-resolution detectors in FPXRF instruments is 170 eV. Therefore, large amounts of V and Fe will interfere with quantitation of Cr or Co, respectively. The presence of Fe is a frequent problem because it is often found in soils at tens of thousands of parts per million (ppm).

4.7 Other interferences can arise from K/L, K/M, and L/M line overlaps, although these overlaps are less common. Examples of such overlap involve arsenic (As) K_α/lead (Pb) L_α and sulfur (S) K_α/Pb M_α. In the As/Pb case, Pb can be measured from the Pb L_β line, and As can be measured from either the As K_α or the As K_β line; in this way the interference can be corrected. If the As K_β line is used, sensitivity will be decreased by a factor of two to five times because it is a less intense line than the As K_α line. If the As K_α line is used in the presence of Pb, mathematical corrections within the instrument software can be used to subtract out the Pb interference. However, because of the limits of mathematical corrections, As concentrations cannot be efficiently calculated for samples with Pb:As ratios of 10:1 or more. This high ratio of Pb to As may result in no As being reported regardless of the actual concentration present.

No instrument can fully compensate for this interference. It is important for an operator to understand this limitation of FPXRF instruments and consult with the manufacturer of the FPXRF instrument to evaluate options to minimize this limitation. The operator's decision will be based on action levels for metals in soil established for the site, matrix effects, capabilities of the instrument, data quality objectives, and the ratio of lead to arsenic known to be present at the site. If a site is encountered that contains lead at concentrations greater than ten times the concentration of arsenic it is advisable that all critical soil samples be sent off site for confirmatory analysis by an EPA-approved method.

4.8 If SSCS are used to calibrate an FPXRF instrument, the samples collected must be representative of the site under investigation. Representative soil sampling ensures that a sample or group of samples accurately reflects the concentrations of the contaminants of concern at a given time and location. Analytical results for representative samples reflect variations in the presence and concentration ranges of contaminants throughout a site. Variables affecting sample representativeness include differences in soil type, contaminant concentration variability, sample collection and preparation variability, and analytical variability, all of which should be minimized as much as possible.

4.9 Soil physical and chemical effects may be corrected using SSCS that have been analyzed by inductively coupled plasma (ICP) or atomic absorption (AA) methods. However, a major source of error can be introduced if these samples are not representative of the site or if the analytical error is large. Another concern is the type of digestion procedure used to prepare the soil samples for the reference analysis. Analytical results for the confirmatory method will vary depending on whether a partial digestion procedure, such as SW-846 Method 3050, or a total digestion procedure, such as Method 3052 is used. It is known that depending on the nature of the soil or sediment, Method 3050 will achieve differing extraction efficiencies for different analytes of interest. The confirmatory method should meet the project data quality objectives.

XRF measures the total concentration of an element; therefore, to achieve the greatest comparability of this method with the reference method (reduced bias), a total digestion procedure should be used for sample preparation. However, in the study used to generate the performance data for this method, the confirmatory method used was Method 3050, and the FPXRF data compared very well with regression correlation coefficients (r^2 often exceeding 0.95, except for barium and chromium. See Table 9 in Section 17.0). The critical factor is that the digestion procedure and analytical reference method used should meet the data quality objectives (DQOs) of the project and match the method used for confirmation analysis.

4.10 Ambient temperature changes can affect the gain of the amplifiers producing instrument drift. Gain or drift is primarily a function of the electronics (amplifier or preamplifier) and not the detector as most instrument detectors are cooled to a constant temperature. Most FPXRF instruments have a built-in automatic gain control. If the automatic gain control is allowed to make

periodic adjustments, the instrument will compensate for the influence of temperature changes on its energy scale. If the FPXRF instrument has an automatic gain control function, the operator will not have to adjust the instrument's gain unless an error message appears. If an error message appears, the operator should follow the manufacturer's procedures for troubleshooting the problem. Often, this involves performing a new energy calibration. The performance of an energy calibration check to assess drift is a quality control measure discussed in Section 9.2.

If the operator is instructed by the manufacturer to manually conduct a gain check because of increasing or decreasing ambient temperature, it is standard to perform a gain check after every 10 to 20 sample measurements or once an hour whichever is more frequent. It is also suggested that a gain check be performed if the temperature fluctuates more than 10 to 20°F. The operator should follow the manufacturer's recommendations for gain check frequency.

5.0 SAFETY

5.1 Proper training for the safe operation of the instrument and radiation training should be completed by the analyst prior to analysis. Radiation safety for each specific instrument can be found in the operators manual. Protective shielding should never be removed by the analyst or any personnel other than the manufacturer. The analyst should be aware of the local state and national regulations that pertain to the use of radiation-producing equipment and radioactive materials with which compliance is required. Licenses for radioactive materials are of two types; (1) general license which is usually provided by the manufacturer for receiving, acquiring, owning, possessing, using, and transferring radioactive material incorporated in a device or equipment, and (2) specific license which is issued to named persons for the operation of radioactive instruments as required by local state agencies. There should be a person appointed within the organization that is solely responsible for properly instructing all personnel, maintaining inspection records, and monitoring x-ray equipment at regular intervals. A copy of the radioactive material licenses and leak tests should be present with the instrument at all times and available to local and national authorities upon request. X-ray tubes do not require radioactive material licenses or leak tests, but do require approvals and licenses which vary from state to state. In addition, fail-safe x-ray warning lights should be illuminated whenever an x-ray tube is energized. Provisions listed above concerning radiation safety regulations, shielding, training, and responsible personnel apply to x-ray tubes just as to radioactive sources. In addition, a log of the times and operating conditions should be kept whenever an x-ray tube is energized. Finally, an additional hazard present with x-ray tubes is the danger of electric shock from the high voltage supply. The danger of electric shock is as substantial as the danger from radiation but is often overlooked because of its familiarity.

5.2 Radiation monitoring equipment should be used with the handling of the instrument. The operator and the surrounding environment should be monitored continually for analyst exposure to radiation. Thermal luminescent detectors (TLD) in the form of badges and rings are used to monitor operator radiation exposure. The TLDs should be worn in the area of most frequent exposure. The maximum permissible whole-body dose from occupational exposure is 5 Roentgen Equivalent Man (REM) per year. Possible exposure pathways for radiation to enter the body are ingestion, inhaling, and absorption. The best precaution to prevent radiation exposure is distance and shielding.

5.3 Refer to Chapter Three for guidance on some proper safety protocols.

6.0 EQUIPMENT AND SUPPLIES

6.1 <u>FPXRF Spectrometer</u>: An FPXRF spectrometer consists of four major components: (1) a source that provides x-rays; (2) a sample presentation device; (3) a detector that converts x-

ray-generated photons emitted from the sample into measurable electronic signals; and (4) a data processing unit that contains an emission or fluorescence energy analyzer, such as an MCA, that processes the signals into an x-ray energy spectrum from which elemental concentrations in the sample may be calculated, and a data display and storage system. These components and additional, optional items, are discussed below.

6.1.1 Excitation Sources: Most FPXRF instruments use sealed radioisotope sources to produce x-rays in order to irradiate samples. The FPXRF instrument may contain between one and three radioisotope sources. Common radioisotope sources used for analysis for metals in soils are iron (Fe)-55, cadmium (Cd)-109, americium (Am)-241, and curium (Cm)-244. These sources may be contained in a probe along with a window and the detector; the probe is connected to a data reduction and handling system by means of a flexible cable. Alternatively, the sources, window, and detector may be included in the same unit as the data reduction and handling system.

The relative strength of the radioisotope sources is measured in units of millicuries (mCi). All other components of the FPXRF system being equal, the stronger the source, the greater the sensitivity and precision of a given instrument. Radioisotope sources undergo constant decay. In fact, it is this decay process that emits the primary x-rays used to excite samples for FPXRF analysis. The decay of radioisotopes is measured in "half-lives." The half-life of a radioisotope is defined as the length of time required to reduce the radioisotopes strength or activity by half. Developers of FPXRF technologies recommend source replacement at regular intervals based on the source's half-life. The characteristic x-rays emitted from each of the different sources have energies capable of exciting a certain range of analytes in a sample. Table 2 summarizes the characteristics of four common radioisotope sources.

X-ray tubes have higher radiation output, no intrinsic lifetime limit, produce constant output over their lifetime, and do not have the disposal problems of radioactive sources but are just now appearing in FPXRF instruments An electrically-excited x-ray tube operates by bombarding an anode with electrons accelerated by a high voltage. The electrons gain an energy in electron volts equal to the accelerating voltage and can excite atomic transitions in the anode, which then produces characteristic x-rays. These characteristic x-rays are emitted through a window which contains the vacuum required for the electron acceleration. An important difference between x-ray tubes and radioactive sources is that the electrons which bombard the anode also produce a continuum of x-rays across a broad range of energies in addition to the characteristic x-rays. This continuum is weak compared to the characteristic x-rays but can provide substantial excitation since it covers a broad energy range. It has the undesired property of producing background in the spectrum near the analyte x-ray lines when it is scattered by the sample. For this reason a filter is often used between the x-ray tube and the sample to suppress the continuum radiation while passing the characteristic x-rays from the anode. This filter is sometimes incorporated into the window of the x-ray tube. The choice of accelerating voltage is governed by the anode material, since the electrons must have sufficient energy to excite the anode, which requires a voltage greater than the absorption edge of the anode material. The anode is most efficiently excited by voltages 2 to 2.5 times the edge energy (most x-rays per unit power to the tube), although voltages as low as 1.5 times the absorption edge energy will work. The characteristic x-rays emitted by the anode are capable of exciting a range of elements in the sample just as with a radioactive source. Table 3 gives the recommended operating voltages and the sample elements excited for some common anodes.

6.1.2 Sample Presentation Device: FPXRF instruments can be operated in two modes: in situ and intrusive. If operated in the in situ mode, the probe window is placed in direct contact with the soil surface to be analyzed. When an FPXRF instrument is operated in the intrusive mode, a soil or sediment sample must be collected, prepared, and placed in a sample cup. For most FPXRF instruments operated in the intrusive mode, the probe is rotated so that the window faces upward. A protective sample cover is placed over the window, and the sample cup is placed on top of the window inside the protective sample cover for analysis.

6.1.3 Detectors: The detectors in the FPXRF instruments can be either solid-state detectors or gas-filled, proportional counter detectors. Common solid-state detectors include mercuric iodide (HgI_2), silicon pin diode and lithium-drifted silicon Si(Li). The HgI_2 detector is operated at a moderately subambient temperature controlled by a low power thermoelectric cooler. The silicon pin diode detector also is cooled via the thermoelectric Peltier effect. The Si(Li) detector must be cooled to at least -90 °C either with liquid nitrogen or by thermoelectric cooling via the Peltier effect. Instruments with a Si(Li) detector have an internal liquid nitrogen dewar with a capacity of 0.5 to 1.0 liter. Proportional counter detectors are rugged and lightweight, which are important features of a field portable detector. However, the resolution of a proportional counter detector is not as good as that of a solid-state detector. The energy resolution of a detector for characteristic x-rays is usually expressed in terms of full width at half-maximum (FWHM) height of the manganese K_α peak at 5.89 keV. The typical resolutions of the above mentioned detectors are as follows: HgI_2-270 eV; silicon pin diode-250 eV; Si(Li)–170 eV; and gas-filled, proportional counter-750 eV.

During operation of a solid-state detector, an x-ray photon strikes a biased, solid-state crystal and loses energy in the crystal by producing electron-hole pairs. The electric charge produced is collected and provides a current pulse that is directly proportional to the energy of the x-ray photon absorbed by the crystal of the detector. A gas-filled, proportional counter detector is an ionization chamber filled with a mixture of noble and other gases. An x-ray photon entering the chamber ionizes the gas atoms. The electric charge produced is collected and provides an electric signal that is directly proportional to the energy of the x-ray photon absorbed by the gas in the detector.

6.1.4 Data Processing Units: The key component in the data processing unit of an FPXRF instrument is the MCA. The MCA receives pulses from the detector and sorts them by their amptitudes (energy level). The MCA counts pulses per second to determine the height of the peak in a spectrum, which is indicative of the target analyte's concentration. The spectrum of element peaks are built on the MCA. The MCAs in FPXRF instruments have from 256 to 2,048 channels. The concentrations of target analytes are usually shown in parts per million on a liquid crystal display (LCD) in the instrument. FPXRF instruments can store both spectra and from 100 to 500 sets of numerical analytical results. Most FPXRF instruments are menu-driven from software built into the units or from PCs. Once the data–storage memory of an FPXRF unit is full, data can be downloaded by means of an RS-232 port and cable to a PC.

6.2 Spare battery chargers.

6.3 Polyethylene sample cups: 31 millimeters (mm) to 40 mm in diameter with collar, or equivalent (appropriate for FPXRF instrument).

6.4 X-ray window film: Mylar™, Kapton™, Spectrolene™, polypropylene, or equivalent; 2.5 to 6.0 micrometers (µm) thick.

6.5 Mortar and pestle: glass, agate, or aluminum oxide; for grinding soil and sediment samples.

6.6 Containers: glass or plastic to store samples.

6.7 Sieves: 60-mesh (0.25 mm), stainless-steel, Nylon, or equivalent for preparing soil and sediment samples.

6.8 Trowels: for smoothing soil surfaces and collecting soil samples.

6.9 Plastic bags: used for collection and homogenization of soil samples.

6.10 Drying oven: standard convection or toaster oven, for soil and sediment samples that require drying.

7.0 REAGENTS AND STANDARDS

7.1 Pure Element Standards: Each pure, single-element standard is intended to produce strong characteristic x-ray peaks of the element of interest only. Other elements present must not contribute to the fluorescence spectrum. A set of pure element standards for commonly sought analytes is supplied by the instrument manufacturer, if required for the instrument; not all instruments require the pure element standards. The standards are used to set the region of interest (ROI) for each element. They also can be used as energy calibration and resolution check samples.

7.2 Site-specific Calibration Standards: Instruments that employ fundamental parameters (FP) or similar mathematical models in minimizing matrix effects may not require SSCS. If the FP calibration model is to be optimized or if empirical calibration is necessary, then SSCSs must be collected, prepared, and analyzed.

7.2.1 The SSCS must be representative of the matrix to be analyzed by FPXRF. These samples must be well homogenized. A minimum of ten samples spanning the concentration ranges of the analytes of interest and of the interfering elements must be obtained from the site. A sample size of 4 to 8 ounces is recommended, and standard glass sampling jars should be used.

7.2.2 Each sample should be oven-dried for 2 to 4 hours at a temperature of less than 150°C. If mercury is to be analyzed, a separate sample portion must remain undried, as heating may volatilize the mercury. When the sample is dry, all large, organic debris and nonrepresentative material, such as twigs, leaves, roots, insects, asphalt, and rock should be removed. The sample should be ground with a mortar and pestle and passed through a 60-mesh sieve. Only the coarse rock fraction should remain on the screen.

7.2.3 The sample should be homogenized by using a riffle splitter or by placing 150 to 200 grams of the dried, sieved sample on a piece of kraft or butcher paper about 1.5 by 1.5 feet in size. Each corner of the paper should be lifted alternately, rolling the soil over on itself and toward the opposite corner. The soil should be rolled on itself 20 times. Approximately 5 grams of the sample should then be removed and placed in a sample cup for FPXRF analysis. The rest of the prepared sample should be sent off site for ICP or AA analysis. The method use for confirmatory analysis should meet the data quality objectives of the project.

7.3 Blank Samples: The blank samples should be from a "clean" quartz or silicon dioxide matrix that is free of any analytes at concentrations above the method detection limits. These

samples are used to monitor for cross-contamination and laboratory-induced contaminants or interferences.

7.4 Standard Reference Materials: Standard reference materials (SRM) are standards containing certified amounts of metals in soil or sediment. These standards are used for accuracy and performance checks of FPXRF analyses. SRMs can be obtained from the National Institute of Standards and Technology (NIST), the U.S. Geological Survey (USGS), the Canadian National Research Council, and the national bureau of standards in foreign nations. Pertinent NIST SRMs for FPXRF analysis include 2704, Buffalo River Sediment; 2709, San Joaquin Soil; and 2710 and 2711, Montana Soil. These SRMs contain soil or sediment from actual sites that has been analyzed using independent inorganic analytical methods by many different laboratories.

8.0 SAMPLE COLLECTION, PRESERVATION, AND STORAGE

Sample handling and preservation procedures used in FPXRF analyses should follow the guidelines in Chapter Three, Inorganic Analytes.

9.0 QUALITY CONTROL

9.1 Refer to Chapter One for additional guidance on quality assurance protocols. All field data sheets and quality control data should be maintained for reference or inspection.

9.2 Energy Calibration Check: To determine whether an FPXRF instrument is operating within resolution and stability tolerances, an energy calibration check should be run. The energy calibration check determines whether the characteristic x-ray lines are shifting, which would indicate drift within the instrument. As discussed in Section 4.10, this check also serves as a gain check in the event that ambient temperatures are fluctuating greatly (> 10 to 20°F).

The energy calibration check should be run at a frequency consistent with manufacturers recommendations. Generally, this would be at the beginning of each working day, after the batteries are changed or the instrument is shut off, at the end of each working day, and at any other time when the instrument operator believes that drift is occurring during analysis. A pure element such as iron, manganese, copper, or lead is often used for the energy calibration check. A manufacturer-recommended count time per source should be used for the check.

9.2.1 The instrument manufacturer's manual specifies the channel or kiloelectron volt level at which a pure element peak should appear and the expected intensity of the peak. The intensity and channel number of the pure element as measured using the radioactive source should be checked and compared to the manufacturer's recommendation. If the energy calibration check does not meet the manufacturer's criteria, then the pure element sample should be repositioned and reanalyzed. If the criteria are still not met, then an energy calibration should be performed as described in the manufacturer's manual. With some FPXRF instruments, once a spectrum is acquired from the energy calibration check, the peak can be optimized and realigned to the manufacturer's specifications using their software.

9.3 Blank Samples: Two types of blank samples should be analyzed for FPXRF analysis: instrument blanks and method blanks. An instrument blank is used to verify that no contamination exists in the spectrometer or on the probe window.

9.3.1 The instrument blank can be silicon dioxide, a Teflon block, a quartz block, "clean" sand, or lithium carbonate. This instrument blank should be analyzed on each working day before and after analyses are conducted and once per every twenty samples. An

instrument blank should also be analyzed whenever contamination is suspected by the analyst. The frequency of analysis will vary with the data quality objectives of the project. A manufacturer-recommended count time per source should be used for the blank analysis. No element concentrations above the method detection limits should be found in the instrument blank. If concentrations exceed these limits, then the probe window and the check sample should be checked for contamination. If contamination is not a problem, then the instrument must be "zeroed" by following the manufacturer's instructions.

9.3.2 A method blank is used to monitor for laboratory-induced contaminants or interferences. The method blank can be "clean" silica sand or lithium carbonate that undergoes the same preparation procedure as the samples. A method blank must be analyzed at least daily. The frequency of analysis will depend on the data quality objectives of the project. To be acceptable, a method blank must not contain any analyte at a concentration above its method detection limit. If an analyte's concentration exceeds its method detection limit, the cause of the problem must be identified, and all samples analyzed with the method blank must be reanalyzed.

9.4 Calibration Verification Checks: A calibration verification check sample is used to check the accuracy of the instrument and to assess the stability and consistency of the analysis for the analytes of interest. A check sample should be analyzed at the beginning of each working day, during active sample analyses, and at the end of each working day. The frequency of calibration checks during active analysis will depend on the data quality objectives of the project. The check sample should be a well characterized soil sample from the site that is representative of site samples in terms of particle size and degree of homogeneity and that contains contaminants at concentrations near the action levels. If a site-specific sample is not available, then an NIST or other SRM that contains the analytes of interest can be used to verify the accuracy of the instrument. The measured value for each target analyte should be within ±20 percent (%D) of the true value for the calibration verification check to be acceptable. If a measured value falls outside this range, then the check sample should be reanalyzed. If the value continues to fall outside the acceptance range, the instrument should be recalibrated, and the batch of samples analyzed before the unacceptable calibration verification check must be reanalyzed.

9.5 Precision Measurements: The precision of the method is monitored by analyzing a sample with low, moderate, or high concentrations of target analytes. The frequency of precision measurements will depend on the data quality objectives for the data. A minimum of one precision sample should be run per day. Each precision sample should be analyzed 7 times in replicate. It is recommended that precision measurements be obtained for samples with varying concentration ranges to assess the effect of concentration on method precision. Determining method precision for analytes at concentrations near the site action levels can be extremely important if the FPXRF results are to be used in an enforcement action; therefore, selection of at least one sample with target analyte concentrations at or near the site action levels or levels of concern is recommended. A precision sample is analyzed by the instrument for the same field analysis time as used for other project samples. The relative standard deviation (RSD) of the sample mean is used to assess method precision. For FPXRF data to be considered adequately precise, the RSD should not be greater than 20 percent with the exception of chromium. RSD values for chromium should not be greater than 30 percent.

The equation for calculating RSD is as follows:

$$RSD = (SD/\text{Mean Concentration}) \times 100$$

where:

RSD	=	Relative standard deviation for the precision measurement for the analyte
SD	=	Standard deviation of the concentration for the analyte
Mean Concentration	=	Mean concentration for the analyte

The precision or reproducibility of a measurement will improve with increasing count time, however, increasing the count time by a factor of 4 will provide only 2 times better precision, so there is a point of diminishing return. Increasing the count time also improves the detection limit, but decreases sample throughput.

9.6 Detection Limits: Results for replicate analyses of a low-concentration sample, SSCS, or SRM can be used to generate an average site-specific method detection and quantitation limits. In this case, the method detection limit is defined as 3 times the standard deviation of the results for the low-concentration samples and the method quantitation limit is defined as 10 times the standard deviation of the same results. Another means of determining method detection and quantitation limits involves use of counting statistics. In FPXRF analysis, the standard deviation from counting statistics is defined as $SD = (N)^{1/2}$, where SD is the standard deviation for a target analyte peak and N is the net counts for the peak of the analyte of interest (i.e., gross counts minus background under the peak). Three times this standard deviation would be the method detection limit and 10 times this standard deviation would be the method quantitation limit. If both of the above mentioned approaches are used to calculate method detection limits, the larger of the standard deviations should be used to provide the more conservative detection limits.

This SD based detection limit criteria must be used by the operator to evaluate each measurement for its useability. A measurement above the average calculated or manufacturer's detection limit, but smaller than three times its associated SD, should not be used as a quantitative measurement. Conversely, if the measurement is below the average calculated or manufacturer's detection limit, but greater than three times its associated SD. It should be coded as an estimated value.

9.7 Confirmatory Samples: The comparability of the FPXRF analysis is determined by submitting FPXRF-analyzed samples for analysis at a laboratory. The method of confirmatory analysis must meet the project and XRF measurement data quality objectives. The confirmatory samples must be splits of the well homogenized sample material. In some cases the prepared sample cups can be submitted. A minimum of 1 sample for each 20 FPXRF-analyzed samples should be submitted for confirmatory analysis. This frequency will depend on data quality objectives. The confirmatory analyses can also be used to verify the quality of the FPXRF data. The confirmatory samples should be selected from the lower, middle, and upper range of concentrations measured by the FPXRF. They should also include samples with analyte concentrations at or near the site action levels. The results of the confirmatory analysis and FPXRF analyses should be evaluated with a least squares linear regression analysis. If the measured concentrations span more than one order of magnitude, the data should be log-transformed to standardize variance which is proportional to the magnitude of measurement. The correlation coefficient (r^2) for the results should be 0.7 or greater for the FPXRF data to be considered screening level data. If the r^2 is 0.9 or greater and inferential statistics indicate the FPXRF data and the confirmatory data are statistically equivalent at a 99 percent confidence level, the data could potentially meet definitive level data criteria.

10.0 CALIBRATION AND STANDARDIZATION

10.1 Instrument Calibration: Instrument calibration procedures vary among FPXRF instruments. Users of this method should follow the calibration procedures outlined in the operator's manual for each specific FPXRF instrument. Generally, however, three types of calibration procedures exist for FPXRF instruments: FP calibration, empirical calibration, and the Compton peak ratio or normalization method. These three types of calibration are discussed below.

10.2 Fundamental Parameters Calibration: FP calibration procedures are extremely variable. An FP calibration provides the analyst with a "standardless" calibration. The advantages of FP calibrations over empirical calibrations include the following:

- No previously collected site-specific samples are required, although site-specific samples with confirmed and validated analytical results for all elements present could be used.

- Cost is reduced because fewer confirmatory laboratory results or calibration standards are required.

However, the analyst should be aware of the limitations imposed on FP calibration by particle size and matrix effects. These limitations can be minimized by adhering to the preparation procedure described in Section 7.2. The two FP calibration processes discussed below are based on an effective energy FP routine and a back scatter with FP (BFP) routine. Each FPXRF FP calibration process is based on a different iterative algorithmic method. The calibration procedure for each routine is explained in detail in the manufacturer's user manual for each FPXRF instrument; in addition, training courses are offered for each instrument.

10.2.1 Effective Energy FP Calibration: The effective energy FP calibration is performed by the manufacturer before an instrument is sent to the analyst. Although SSCS can be used, the calibration relies on pure element standards or SRMs such as those obtained from NIST for the FP calibration. The effective energy routine relies on the spectrometer response to pure elements and FP iterative algorithms to compensate for various matrix effects.

Alpha coefficients are calculated using a variation of the Sherman equation, which calculates theoretical intensities from the measurement of pure element samples. These coefficients indicate the quantitative effect of each matrix element on an analyte's measured x-ray intensity. Next, the Lachance Traill algorithm is solved as a set of simultaneous equations based on the theoretical intensities. The alpha coefficients are then downloaded into the specific instrument.

The working effective energy FP calibration curve must be verified before sample analysis begins on each working day, after every 20 samples are analyzed, and at the end of sampling. This verification is performed by analyzing either an NIST SRM or an SSCS that is representative of the site-specific samples. This SRM or SSCS serves as a calibration check. A manufacturer-recommended count time per source should be used for the calibration check. The analyst must then adjust the y-intercept and slope of the calibration curve to best fit the known concentrations of target analytes in the SRM or SSCS.

A percent difference (%D) is then calculated for each target analyte. The %D should be within ±20 percent of the certified value for each analyte. If the %D falls outside this acceptance range, then the calibration curve should be adjusted by varying the slope of the

line or the y-intercept value for the analyte. The SRM or SSCS is reanalyzed until the %D falls within ±20 percent. The group of 20 samples analyzed before an out-of-control calibration check should be reanalyzed.

The equation to calibrate %D is as follows:

$$\%D = ((C_s - C_k) / C_k) \times 100$$

where:

%D = Percent difference
C_k = Certified concentration of standard sample
C_s = Measured concentration of standard sample

10.2.2 BFP Calibration: BFP calibration relies on the ability of the liquid nitrogen-cooled, Si(Li) solid-state detector to separate the coherent (Compton) and incoherent (Rayleigh) backscatter peaks of primary radiation. These peak intensities are known to be a function of sample composition, and the ratio of the Compton to Rayleigh peak is a function of the mass absorption of the sample. The calibration procedure is explained in detail in the instrument manufacturer's manual. Following is a general description of the BFP calibration procedure.

The concentrations of all detected and quantified elements are entered into the computer software system. Certified element results for an NIST SRM or confirmed and validated results for an SSCS can be used. In addition, the concentrations of oxygen and silicon must be entered; these two concentrations are not found in standard metals analyses. The manufacturer provides silicon and oxygen concentrations for typical soil types. Pure element standards are then analyzed using a manufacturer-recommended count time per source. The results are used to calculate correction factors in order to adjust for spectrum overlap of elements.

The working BFP calibration curve must be verified before sample analysis begins on each working day, after every 20 samples are analyzed, and at the end of the analysis. This verification is performed by analyzing either an NIST SRM or an SSCS that is representative of the site-specific samples. This SRM or SSCS serves as a calibration check. The standard sample is analyzed using a manufacturer-recommended count time per source to check the calibration curve. The analyst must then adjust the y-intercept and slope of the calibration curve to best fit the known concentrations of target analytes in the SRM or SSCS.

A %D is then calculated for each target analyte. The %D should fall within ±20 percent of the certified value for each analyte. If the %D falls outside this acceptance range, then the calibration curve should be adjusted by varying the slope of the line the y-intercept value for the analyte. The standard sample is reanalyzed until the %D falls within ±20 percent. The group of 20 samples analyzed before an out-of-control calibration check should be reanalyzed.

10.3 Empirical Calibration: An empirical calibration can be performed with SSCS, site-typical standards, or standards prepared from metal oxides. A discussion of SSCS is included in Section 7.2; if no previously characterized samples exist for a specific site, site-typical standards can be used. Site-typical standards may be selected from commercially available characterized soils or from SSCS prepared for another site. The site-typical standards should closely approximate the site's soil matrix with respect to particle size distribution, mineralogy, and contaminant analytes. If neither SSCS nor site-typical standards are available, it is possible to make gravimetric standards

by adding metal oxides to a "clean" sand or silicon dioxide matrix that simulates soil. Metal oxides can be purchased from various chemical vendors. If standards are made on site, a balance capable of weighing items to at least two decimal places is required. Concentrated ICP or AA standard solutions can also be used to make standards. These solutions are available in concentrations of 10,000 parts per million, thus only small volumes have to be added to the soil.

An empirical calibration using SSCS involves analysis of SSCS by the FPXRF instrument and by a conventional analytical method such as ICP or AA. A total acid digestion procedure should be used by the laboratory for sample preparation. Generally, a minimum of 10 and a maximum of 30 well characterized SSCS, site-typical standards, or prepared metal oxide standards are required to perform an adequate empirical calibration. The number of required standards depends on the number of analytes of interest and interfering elements. Theoretically, an empirical calibration with SSCS should provide the most accurate data for a site because the calibration compensates for site-specific matrix effects.

The first step in an empirical calibration is to analyze the pure element standards for the elements of interest. This enables the instrument to set channel limits for each element for spectral deconvolution. Next the SSCS, site-typical standards, or prepared metal oxide standards are analyzed using a count time of 200 seconds per source or a count time recommended by the manufacturer. This will produce a spectrum and net intensity of each analyte in each standard. The analyte concentrations for each standard are then entered into the instrument software; these concentrations are those obtained from the laboratory, the certified results, or the gravimetrically determined concentrations of the prepared standards. This gives the instrument analyte values to regress against corresponding intensities during the modeling stage. The regression equation correlates the concentrations of an analyte with its net intensity.

The calibration equation is developed using a least squares fit regression analysis. After the regression terms to be used in the equation are defined, a mathematical equation can be developed to calculate the analyte concentration in an unknown sample. In some FPXRF instruments, the software of the instrument calculates the regression equation. The software uses calculated intercept and slope values to form a multiterm equation. In conjunction with the software in the instrument, the operator can adjust the multiterm equation to minimize interelement interferences and optimize the intensity calibration curve.

It is possible to define up to six linear or nonlinear terms in the regression equation. Terms can be added and deleted to optimize the equation. The goal is to produce an equation with the smallest regression error and the highest correlation coefficient. These values are automatically computed by the software as the regression terms are added, deleted, or modified. It is also possible to delete data points from the regression line if these points are significant outliers or if they are heavily weighing the data. Once the regression equation has been selected for an analyte, the equation can be entered into the software for quantitation of analytes in subsequent samples. For an empirical calibration to be acceptable, the regression equation for a specific analyte should have a correlation coefficient of 0.98 or greater or meet the DQOs of the project.

In an empirical calibration, one must apply the DQOs of the project and ascertain critical or action levels for the analytes of interest. It is within these concentration ranges or around these action levels that the FPXRF instrument should be calibrated most accurately. It may not be possible to develop a good regression equation over several orders of analyte concentration.

10.4 Compton Normalization Method: The Compton normalization method is based on analysis of a single, certified standard and normalization for the Compton peak. The Compton peak is produced from incoherent backscattering of x-ray radiation from the excitation source and is present in the spectrum of every sample. The Compton peak intensity changes with differing matrices. Generally, matrices dominated by lighter elements produce a larger Compton peak, and those dominated by heavier elements produce a smaller Compton peak. Normalizing to the Compton peak can reduce problems with varying matrix effects among samples. Compton normalization is similar to the use of internal standards in organics analysis. The Compton normalization method may not be effective when analyte concentrations exceed a few percent.

The certified standard used for this type of calibration could be an NIST SRM such as 2710 or 2711. The SRM must be a matrix similar to the samples and must contain the analytes of interests at concentrations near those expected in the samples. First, a response factor has to be determined for each analyte. This factor is calculated by dividing the net peak intensity by the analyte concentration. The net peak intensity is gross intensity corrected for baseline interference. Concentrations of analytes in samples are then determined by multiplying the baseline corrected analyte signal intensity by the normalization factor and by the response factor. The normalization factor is the quotient of the baseline corrected Compton K_α peak intensity of the SRM divided by that of the samples. Depending on the FPXRF instrument used, these calculations may be done manually or by the instrument software.

11.0 PROCEDURE

11.1 Operation of the various FPXRF instruments will vary according to the manufacturers' protocols. Before operating any FPXRF instrument, one should consult the manufacturer's manual. Most manufacturers recommend that their instruments be allowed to warm up for 15 to 30 minutes before analysis of samples. This will help alleviate drift or energy calibration problems later on in analysis.

11.2 Each FPXRF instrument should be operated according to the manufacturer's recommendations. There are two modes in which FPXRF instruments can be operated: in situ and intrusive. The in situ mode involves analysis of an undisturbed soil sediment or sample. Intrusive analysis involves collection and preparation of a soil or sediment sample before analysis. Some FPXRF instruments can operate in both modes of analysis, while others are designed to operate in only one mode. The two modes of analysis are discussed below.

11.3 For in situ analysis, one requirement is that any large or nonrepresentative debris be removed from the soil surface before analysis. This debris includes rocks, pebbles, leaves, vegetation, roots, and concrete. Another requirement is that the soil surface be as smooth as possible so that the probe window will have good contact with the surface. This may require some leveling of the surface with a stainless-steel trowel. During the study conducted to provide data for this method, this modest amount of sample preparation was found to take less than 5 minutes per sample location. The last requirement is that the soil or sediment not be saturated with water. Manufacturers state that their FPXRF instruments will perform adequately for soils with moisture contents of 5 to 20 percent but will not perform well for saturated soils, especially if ponded water exists on the surface. Another recommended technique for *in situ* analysis is to tamp the soil to increase soil density and compactness for better repeatability and representativeness. This condition is especially important for heavy element analysis, such as barium. Source count times for in situ analysis usually range from 30 to 120 seconds, but source count times will vary among instruments and depending on required detection limits.

11.4 For intrusive analysis of surface or sediment, it is recommended that a sample be collected from a 4- by 4-inch square that is 1 inch deep. This will produce a soil sample of approximately 375 grams or 250 cm^3, which is enough soil to fill an 8-ounce jar. The sample should be homogenized, dried, and ground before analysis. The sample can be homogenized before or after drying. The homogenization technique to be used after drying is discussed in Section 4.2. If the sample is homogenized before drying, it should be thoroughly mixed in a beaker or similar container, or if the sample is moist and has a high clay content, it can be kneaded in a plastic bag. One way to monitor homogenization when the sample is kneaded in a plastic bag is to add sodium fluorescein dye to the sample. After the moist sample has been homogenized, it is examined under an ultraviolet light to assess the distribution of sodium fluorescein throughout the sample. If the fluorescent dye is evenly distributed in the sample, homogenization is considered complete; if the dye is not evenly distributed, mixing should continue until the sample has been thoroughly homogenized. During the study conducted to provide data for this method, the homogenization procedure using the fluorescein dye required 3 to 5 minutes per sample. As demonstrated in Sections 13.5 and 13.7, homogenization has the greatest impact on the reduction of sampling variability. It produces little or no contamination. Often, it can be used without the more labor intensive steps of drying, grinding, and sieving given in Sections 11.5 and 11.6. Of course, to achieve the best data quality possible all four steps must be followed.

11.5 Once the soil or sediment sample has been homogenized, it should be dried. This can be accomplished with a toaster oven or convection oven. A small aliquot of the sample (20 to 50 grams) is placed in a suitable container for drying. The sample should be dried for 2 to 4 hours in the convection or toaster oven at a temperature not greater than 150°C. Microwave drying is not a recommended procedure. Field studies have shown that microwave drying can increase variability between the FPXRF data and confirmatory analysis. High levels of metals in a sample can cause arcing in the microwave oven, and sometimes slag forms in the sample. Microwave oven drying can also melt plastic containers used to hold the sample.

11.6 The homogenized dried sample material should be ground with a mortar and pestle and passed through a 60-mesh sieve to achieve a uniform particle size. Sample grinding should continue until at least 90 percent of the original sample passes through the sieve. The grinding step normally takes an average of 10 minutes per sample. An aliquot of the sieved sample should then be placed in a 31.0-mm polyethylene sample cup (or equivalent) for analysis. The sample cup should be one-half to three-quarters full at a minimum. The sample cup should be covered with a 2.5 µm Mylar (or equivalent) film for analysis. The rest of the soil sample should be placed in a jar, labeled, and archived for possible confirmation analysis. All equipment including the mortar, pestle, and sieves must be thoroughly cleaned so that any cross-contamination is below the MDLs of the procedure or DQOs of the analysis.

12.0 DATA ANALYSIS AND CALCULATIONS

Most FPXRF instruments have software capable of storing all analytical results and spectra. The results are displayed in parts per million and can be downloaded to a PC, which can provide a hard copy printout. Individual measurements that are smaller than three times their associated SD should not be used for quantitation.

13.0 METHOD PERFORMANCE

13.1 This section discusses four performance factors, field-based method detection limits, precision, accuracy, and comparability to EPA-approved methods. The numbers presented in Tables 4 through 9 were generated from data obtained from six FPXRF instruments. The soil samples analyzed by the six FPXRF instruments were collected from two sites in the United States.

The soil samples contained several of the target analytes at concentrations ranging from nondetect to tens of thousands of mg/kg.

13.2 The six FPXRF instruments included the TN 9000 and TN Lead Analyzer manufactured by TN Spectrace; the X-MET 920 with a SiLi detector and X-MET 920 with a gas-filled proportional detector manufactured by Metorex, Inc.; the XL Spectrum Analyzer manufactured by Niton; and the MAP Spectrum Analyzer manufactured by Scitec. The TN 9000 and TN Lead Analyzer both have a HgI_2 detector. The TN 9000 utilized an Fe-55, Cd-109, and Am-241 source. The TN Lead Analyzer had only a Cd-109 source. The X-Met 920 with the SiLi detector had a Cd-109 and Am-241 source. The X-MET 920 with the gas-filled proportional detector had only a Cd-109 source. The XL Spectrum Analyzer utilized a silicon pin-diode detector and a Cd-109 source. The MAP Spectrum Analyzer utilized a solid-state silicon detector and a Cd-109 source.

13.3 All data presented in Tables 4 through 9 were generated using the following calibrations and source count times. The TN 9000 and TN Lead Analyzer were calibrated using fundamental parameters using NIST SRM 2710 as a calibration check sample. The TN 9000 was operated using 100, 60, and 60 second count times for the Cd-109, Fe-55, and Am-241 sources, respectively. The TN Lead analyzer was operated using a 60 second count time for the Cd-109 source. The X-MET 920 with the Si(Li) detector was calibrated using fundamental parameters and one well characterized site-specific soil standard as a calibration check. It used 140 and 100 second count times for the Cd-109 and Am-241 sources, respectively. The X-MET 920 with the gas-filled proportional detector was calibrated empirically using between 10 and 20 well characterized site-specific soil standards. It used 120 second times for the Cd-109 source. The XL Spectrum Analyzer utilized NIST SRM 2710 for calibration and the Compton peak normalization procedure for quantitation based on 60 second count times for the Cd-109 source. The MAP Spectrum Analyzer was internally calibrated by the manufacturer. The calibration was checked using a well-characterized site-specific soil standard. It used 240 second times for the Cd-109 source.

13.4 Field-Based Method Detection Limits: The field-based method detection limits are presented in Table 4. The field-based method detection limits were determined by collecting ten replicate measurements on site-specific soil samples with metals concentrations 2 to 5 times the expected method detection limits. Based on these ten replicate measurements, a standard deviation on the replicate analysis was calculated. The method detection limits presented in Table 4 are defined as 3 times the standard deviation for each analyte.

The field-based method detection limits were generated by using the count times discussed earlier in this section. All the field-based method detection limits were calculated for soil samples that had been dried and ground and placed in a sample cup with the exception of the MAP Spectrum Analyzer. This instrument can only be operated in the in situ mode, meaning the samples were moist and not ground.

Some of the analytes such as cadmium, mercury, silver, selenium, and thorium were not detected or only detected at very low concentrations such that a field-based method detection limit could not be determined. These analytes are not presented in Table 4. Other analytes such as calcium, iron, potassium, and titanium were only found at high concentrations (thousands of mg/kg) so that reasonable method detection limits could not be calculated. These analytes also are not presented in Table 4.

13.5 Precision Measurements: The precision data is presented in Table 5. Each of the six FPXRF instruments performed 10 replicate measurements on 12 soil samples that had analyte concentrations ranging from nondetects to thousands of mg/kg. Each of the 12 soil samples underwent 4 different preparation techniques from in situ (no preparation) to dried and ground in a

sample cup. Therefore, there were 48 precision data points for five of the instruments and 24 precision points for the MAP Spectrum Analyzer. The replicate measurements were taken using the source count times discussed at the beginning of this section.

For each detectable analyte in each precision sample a mean concentration, standard deviation, and RSD was calculated for each analyte. The data presented in Table 5 is an average RSD for the precision samples that had analyte concentrations at 5 to 10 times the MDL for that analyte for each instrument. Some analytes such as mercury, selenium, silver, and thorium were not detected in any of the precision samples so these analytes are not listed in Table 5. Some analytes such as cadmium, nickel, and tin were only detected at concentrations near the MDLs so that an RSD value calculated at 5 to 10 times the MDL was not possible.

One FPXRF instrument collected replicate measurements on an additional nine soil samples to provide a better assessment of the effect of sample preparation on precision. Table 6 shows these results. The additional nine soil samples were comprised of three from each texture and had analyte concentrations ranging from near the detection limit of the FPXRF analyzer to thousands of mg/kg. The FPXRF analyzer only collected replicate measurements from three of the preparation methods; no measurements were collected from the *in situ* homogenized samples. The FPXRF analyzer conducted five replicate measurements of the in situ field samples by taking measurements at five different points within the 4-inch by 4-inch sample square. Ten replicate measurements were collected for both the intrusive undried and unground and intrusive dried and ground samples contained in cups. The cups were shaken between each replicate measurement.

Table 6 shows that the precision dramatically improved from the in situ to the intrusive measurements. In general there was a slight improvement in precision when the sample was dried and ground. Two factors caused the precision for the in situ measurements to be poorer. The major factor is soil heterogeneity. By moving the probe within the 4-inch by 4-inch square, measurements of different soil samples were actually taking place within the square. Table 6 illustrates the dominant effect of soil heterogeneity. It overwhelmed instrument precision when the FPXRF analyzer was used in this mode. The second factor that caused the RSD values to be higher for the in situ measurements is the fact that only five versus ten replicates were taken. A lesser number of measurements caused the standard deviation to be larger which in turn elevated the RSD values.

13.6 Accuracy Measurements: Five of the FPXRF instruments (not including the MAP Spectrum Analyzer) analyzed 18 SRMs using the source count times and calibration methods given at the beginning of this section. The 18 SRMs included 9 soil SRMs, 4 stream or river sediment SRMs, 2 sludge SRMs, and 3 ash SRMs. Each of the SRMs contained known concentrations of certain target analytes. A percent recovery was calculated for each analyte in each SRM for each FPXRF instrument. Table 7 presents a summary of this data. With the exception of cadmium, chromium, and nickel, the values presented in Table 7 were generated from the 13 soil and sediment SRMs only. The 2 sludge and 3 ash SRMs were included for cadmium, chromium, and nickel because of the low or nondetectable concentrations of these three analytes in the soil and sediment SRMs.

Only 12 analytes are presented in Table 7. These are the analytes that are of environmental concern and provided a significant number of detections in the SRMs for an accuracy assessment. No data is presented for the X-MET 920 with the gas-filled proportional detector. This FPXRF instrument was calibrated empirically using site-specific soil samples. The percent recovery values from this instrument were very sporadic and the data did not lend itself to presentation in Table 7.

Table 8 provides a more detailed summary of accuracy data for one FPXRF instrument (TN 9000) for the 9 soil SRMs and 4 sediment SRMs. Table 8 shows the certified value, measured

value, and percent recovery for five analytes. These analytes were chosen because they are of environmental concern and were most prevalently certified for in the SRM and detected by the FPXRF instrument. The first nine SRMs are soil and the last 4 SRMs are sediment. Percent recoveries for the four NIST SRMs were often between 90 and 110 percent for all analytes.

13.7 Comparability: Comparability refers to the confidence with which one data set can be compared to another. In this case, FPXRF data generated from a large study of six FPXRF instruments was compared to SW-846 Methods 3050 and 6010 which are the standard soil extraction for metals and analysis by inductively coupled plasma. An evaluation of comparability was conducted by using linear regression analysis. Three factors were determined using the linear regression. These factors were the y-intercept, the slope of the line, and the coefficient of determination (r^2).

As part of the comparability assessment, the effects of soil type and preparation methods were studied. Three soil types (textures) and four preparation methods were examined during the study. The preparation methods evaluated the cumulative effect of particle size, moisture, and homogenization on comparability. Due to the large volume of data produced during this study, linear regression data for six analytes from only one FPXRF instrument is presented in Table 9. Similar trends in the data were seen for all instruments.

Table 9 shows the regression parameters for the whole data set, broken out by soil type, and by preparation method. The soil types are as follows: soil 1--sand; soil 2--loam; and soil 3--silty clay. The preparation methods are as follows: preparation 1--in situ in the field; preparation 2--in situ, sample collected and homogenized; preparation 3--intrusive, with sample in a sample cup but sample still wet and not ground; and preparation 4--sample dried, ground, passed through a 40-mesh sieve, and placed in sample cup.

For arsenic, copper, lead, and zinc, the comparability to the confirmatory laboratory was excellent with r^2 values ranging from 0.80 to 0.99 for all six FPXRF instruments. The slopes of the regression lines for arsenic, copper, lead, and zinc, were generally between 0.90 and 1.00 indicating the data would need to be corrected very little or not at all to match the confirmatory laboratory data. The r^2 values and slopes of the regression lines for barium and chromium were not as good as for the other for analytes, indicating the data would have to be corrected to match the confirmatory laboratory.

Table 9 demonstrates that there was little effect of soil type on the regression parameters for any of the six analytes. The only exceptions were for barium in soil 1 and copper in soil 3. In both of these cases, however, it is actually a concentration effect and not a soil effect causing the poorer comparability. All barium and copper concentrations in soil 1 and 3, respectively, were less than 350 mg/kg.

Table 9 shows there was a preparation effect on the regression parameters for all six analytes. With the exception of chromium, the regression parameters were primarily improved going from preparation 1 to preparation 2. In this step, the sample was removed from the soil surface, all large debris was removed, and the sample was thoroughly homogenized. The additional two preparation methods did little to improve the regression parameters. This data indicates that homogenization is the most critical factor when comparing the results. It is essential that the sample sent to the confirmatory laboratory match the FPXRF sample as closely as possible.

Section 11.0 of this method discusses the time necessary for each of the sample preparation techniques. Based on the data quality objectives for the project, an analyst must decide if it is worth the extra time required to dry and grind the sample for small improvements in comparability.

Homogenization requires 3 to 5 minutes. Drying the sample requires one to two hours. Grinding and sieving requires another 10 to 15 minutes per sample. Lastly, when grinding and sieving is conducted, time must be allotted to decontaminate the mortars, pestles, and sieves. Drying and grinding the samples and decontamination procedures will often dictate that an extra person be on site so that the analyst can keep up with the sample collection crew. The cost of requiring an extra person on site to prepare samples must be balanced with the gain in data quality and sample throughput.

13.8 The following documents may provide additional guidance and insight on this method and technique:

13.8.1 Hewitt, A.D. 1994. "Screening for Metals by X-ray Fluorescence Spectrometry/Response Factor/Compton K_α Peak Normalization Analysis." *American Environmental Laboratory.* Pages 24-32.

13.8.2 Piorek, S., and J.R. Pasmore. 1993. "Standardless, In Situ Analysis of Metallic Contaminants in the Natural Environment With a PC-Based, High Resolution Portable X-Ray Analyzer." *Third International Symposium on Field Screening Methods for Hazardous Waste and Toxic Chemicals.* Las Vegas, Nevada. February 24-26, 1993. Volume 2, Pages 1135-1151.

14.0 POLLUTION PREVENTION

14.1 Pollution prevention encompasses any technique that reduces or eliminates the quantity and/or toxicity of waste at the point of generation. Numerous opportunities for pollution prevention exist in laboratory operation. The EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice. Whenever feasible, laboratory personnel should use pollution prevention techniques to address their waste generation. When wastes cannot be feasibly reduced at the source, the Agency recommends recycling as the next best option.

14.2 For information about pollution prevention that may be applicable to laboratories and research institutions consult *Less is Better: Laboratory Chemical management for Waste Reduction* available from the American Chemical Society's Department of Government Relations and Science Policy, 1155 16th Street N.W., Washington D.C. 20036, (202) 872-4477.

15.0 WASTE MANAGEMENT

The Environmental Protection Agency requires that laboratory waste management practices be conducted consistent with all applicable rules and regulations. The Agency urges laboratories to protect the air, water, and land by minimizing and controlling all releases from hoods and bench operations, complying with the letter and spirit of any sewer discharge permits and regulations, and by complying with all solid and hazardous waste regulations, particularly the hazardous waste identification rules and land disposal restrictions. For further information on waste management, consult *The Waste Management Manual for Laboratory Personnel* available from the American Chemical Society at the address listed in Sec. 14.2.

16.0 REFERENCES

1. Metorex. X-MET 920 User's Manual.

2. Spectrace Instruments. 1994. Energy Dispersive X-ray Fluorescence Spectrometry: An Introduction.

3. TN Spectrace. Spectrace 9000 Field Portable/Benchtop XRF Training and Applications Manual.

4. Unpublished SITE data, recieved from PRC Environment Management, Inc.

17.0 TABLES, DIAGRAMS, FLOWCHARTS, AND VALIDATION DATA

The pages to follow contain Tables 1 through 9 and a method procedure flow diagram.

TABLE 1
INTERFERENCE FREE DETECTION LIMITS

Analyte	Chemical Abstract Series Number	Detection Limit in Quartz Sand (milligrams per kilogram)
Antimony (Sb)	7440-36-0	40
Arsenic (As)	7440-38-0	40
Barium (Ba)	7440-39-3	20
Cadmium (Cd)	7440-43-9	100
Calcium (Ca)	7440-70-2	70
Chromium (Cr)	7440-47-3	150
Cobalt (Co)	7440-48-4	60
Copper (Cu)	7440-50-8	50
Iron (Fe)	7439-89-6	60
Lead (Pb)	7439-92-1	20
Manganese (Mn)	7439-96-5	70
Mercury (Hg)	7439-97-6	30
Molybdenum (Mo)	7439-93-7	10
Nickel (Ni)	7440-02-0	50
Potassium (K)	7440-09-7	200
Rubidium (Rb)	7440-17-7	10
Selenium (Se)	7782-49-2	40
Silver (Ag)	7440-22-4	70
Strontium (Sr)	7440-24-6	10
Thallium (Tl)	7440-28-0	20
Thorium (Th)	7440-29-1	10
Tin (Sn)	7440-31-5	60
Titanium (Ti)	7440-32-6	50
Vanadium (V)	7440-62-2	50
Zinc (Zn)	7440-66-6	50
Zirconium (Zr)	7440-67-7	10

Source: References 1, 2, and 3

TABLE 2
SUMMARY OF RADIOISOTOPE SOURCE CHARACTERISTICS

Source	Activity (mCi)	Half-Life (Years)	Excitation Energy (keV)	Elemental Analysis Range	
Fe-55	20-50	2.7	5.9	Sulfur to Chromium Molybdenum to Barium	K Lines L Lines
Cd-109	5-30	1.3	22.1 and 87.9	Calcium to Rhodium Tantalum to Lead Barium to Uranium	K Lines K Lines L Lines
Am-241	5-30	458	26.4 and 59.6	Copper to Thulium Tungsten to Uranium	K Lines L Lines
Cm-244	60-100	17.8	14.2	Titanium to Selenium Lanthanum to Lead	K Lines L Lines

Source: Reference 1, 2, and 3

TABLE 3
SUMMARY OF X-RAY TUBE SOURCE CHARACTERISTICS

Anode Material	Recommended Voltage Range (kV)	K-alpha Emission (keV)	Elemental Analysis Range	
Cu	18-22	8.04	Potassium to Cobalt Silver to Gadolinium	K Lines L Lines
Mo	40-50	17.4	Cobalt to Yttrium Europium to Radon	K Lines L Lines
Ag	50-65	22.1	Zinc to Technicium Ytterbium to Neptunium	K Lines L Lines

Source: Reference 4

Notes: The sample elements excited are chosen by taking as the lower limit the same ratio of excitation line energy to element absorption edge as in Table 2 (approximately 0.45) and the requirement that the excitation line energy be above the element absorption edge as the upper limit (L2 edges used for L lines). K-beta excitation lines were ignored.

TABLE 4
FIELD-BASED METHOD DETECTION LIMITS (mg/kg)[a]

Analyte	Instrument					
	TN 9000	TN Lead Analyzer	X-MET 920 (SiLi Detector)	X-MET 920 (Gas-Filled Detector)	XL Spectrum Analyzer	MAP Spectrum Analyzer
Antimony	55	NR	NR	NR	NR	NR
Arsenic	60	50	55	50	110	225
Barium	60	NR	30	400	NR	NR
Chromium	200	460	210	110	900	NR
Cobalt	330	NR	NR	NR	NR	NR
Copper	85	115	75	100	125	525
Lead	45	40	45	100	75	165
Manganese	240	340	NR	NR	NR	NR
Molybdenum	25	NR	NR	NR	30	NR
Nickel	100	NR	NA	NA	NA	NR
Rubidium	30	NR	NR	NR	45	NR
Strontium	35	NR	NR	NR	40	NR
Tin	85	NR	NR	NR	NR	NR
Zinc	80	95	70	NA	110	NA
Zirconium	40	NR	NR	NR	25	NR

Source: Reference 4

[a] MDLs are related to the total number of counts taken. See Section 13.3 for count times used to generate this table.
NR Not reported.
NA Not applicable; analyte was reported but was not at high enough concentrations for method detection limit to be determined.

TABLE 5
PRECISION

Analyte	Average Relative Standard Deviation for Each Instrument at 5 to 10 Times the MDL					
	TN 9000	TN Lead Analyzer	X-MET 920 (SiLi Detector)	X-MET 920 (Gas-Filled Detector)	XL Spectrum Analyzer	MAP Spectrum Analyzer
Antimony	6.54	NR	NR	NR	NR	NR
Arsenic	5.33	4.11	3.23	1.91	12.47	6.68
Barium	4.02	NR	3.31	5.91	NR	NR
Cadmium	29.84[a]	NR	24.80[a]	NR	NR	NR
Calcium	2.16	NR	NR	NR	NR	NR
Chromium	22.25	25.78	22.72	3.91	30.25	NR
Cobalt	33.90	NR	NR	NR	NR	NR
Copper	7.03	9.11	8.49	9.12	12.77	14.86
Iron	1.78	1.67	1.55	NR	2.30	NR
Lead	6.45	5.93	5.05	7.56	6.97	12.16
Manganese	27.04	24.75	NR	NR	NR	NR
Molybdenum	6.95	NR	NR	NR	12.60	NR
Nickel	30.85[a]	NR	24.92[a]	20.92[a]	NA	NR
Potassium	3.90	NR	NR	NR	NR	NR
Rubidium	13.06	NR	NR	NR	32.69[a]	NR
Strontium	4.28	NR	NR	NR	8.86	NR
Tin	24.32[a]	NR	NR	NR	NR	NR
Titanium	4.87	NR	NR	NR	NR	NR
Zinc	7.27	7.48	4.26	2.28	10.95	0.83
Zirconium	3.58	NR	NR	NR	6.49	NR

Source: Reference 4

[a] These values are biased high because the concentration of these analytes in the soil samples was near the detection limit for that particular FPXRF instrument.
NR Not reported.
NA Not applicable; analyte was reported but was below the method detection limit.

TABLE 6
PRECISION AS AFFECTED BY SAMPLE PREPARATION

Analyte	Average Relative Standard Deviation for Each Preparation Method		
	In Situ-Field	Intrusive-Undried and Unground	Intrusive-Dried and Ground
Antimony	30.1	15.0	14.4
Arsenic	22.5	5.36	3.76
Barium	17.3	3.38	2.90
Cadmium[a]	41.2	30.8	28.3
Calcium	17.5	1.68	1.24
Chromium	17.6	28.5	21.9
Cobalt	28.4	31.1	28.4
Copper	26.4	10.2	7.90
Iron	10.3	1.67	1.57
Lead	25.1	8.55	6.03
Manganese	40.5	12.3	13.0
Mercury	ND	ND	ND
Molybdenum	21.6	20.1	19.2
Nickel[a]	29.8	20.4	18.2
Potassium	18.6	3.04	2.57
Rubidium	29.8	16.2	18.9
Selenium	ND	20.2	19.5
Silver[a]	31.9	31.0	29.2
Strontium	15.2	3.38	3.98
Thallium	39.0	16.0	19.5
Thorium	NR	NR	NR
Tin	ND	14.1	15.3
Titanium	13.3	4.15	3.74
Vanadium	NR	NR	NR
Zinc	26.6	13.3	11.1
Zirconium	20.2	5.63	5.18

Source: Reference 4

[a] These values may be biased high because the concentration of these analytes in the soil samples was near the detection limit.
ND Not detected.
NR Not reported.

TABLE 7
ACCURACY

Analyte	Instrument															
	TN 9000				TN Lead Analyzer				X-MET 920 (SiLi Detector)				XL Spectrum Analyzer			
	n	Range of % Rec.	Mean % Rec.	SD	n	Range of % Rec.	Mean % Rec.	SD	n	Range of % Rec.	Mean % Rec	SD	n	Range of % Rec.	Mean % Rec.	SD
Sb	2	100-149	124.3	NA	--	--	--	--	--	--	--	--	--	--	--	--
As	5	68-115	92.8	17.3	5	44-105	83.4	23.2	4	9.7-91	47.7	39.7	5	38-535	189.8	206
Ba	9	98-198	135.3	36.9	--	--	--	--	9	18-848	168.2	262	--	--	--	--
Cd	2	99-129	114.3	NA	--	--	--	--	6	81-202	110.5	45.7	--	--	--	--
Cr	2	99-178	138.4	NA	--	--	--	--	7	22-273	143.1	93.8	3	98-625	279.2	300
Cu	8	61-140	95.0	28.8	6	38-107	79.1	27.0	11	10-210	111.8	72.1	8	95-480	203.0	147
Fe	6	78-155	103.7	26.1	6	89-159	102.3	28.6	6	48-94	80.4	16.2	6	26-187	108.6	52.9
Pb	11	66-138	98.9	19.2	11	68-131	97.4	18.4	12	23-94	72.7	20.9	13	80-234	107.3	39.9
Mn	4	81-104	93.1	9.70	3	92-152	113.1	33.8	--	--	--	--	--	--	--	--
Ni	3	99-122	109.8	12.0	--	--	--	--	--	--	--	--	3	57-123	87.5	33.5
Sr	8	110-178	132.6	23.8	--	--	--	--	--	--	--	--	7	86-209	125.1	39.5
Zn	11	41-130	94.3	24.0	10	81-133	100.0	19.7	12	46-181	106.6	34.7	11	31-199	94.6	42.5

Source: Reference 4

n Number of samples that contained a certified value for the analyte and produced a detectable concentration from the FPXRF instrument.
SD Standard deviation.
NA Not applicable; only two data points, therefore, a SD was not calculated.
%Rec. Percent recovery.
-- No data.

TABLE 8
ACCURACY FOR TN 9000[a]

Standard Reference Material	Arsenic			Barium			Copper			Lead			Zinc		
	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.	Cert. Conc.	Meas. Conc.	%Rec.
RTC CRM-021	24.8	ND	NA	586	1135	193.5	4792	2908	60.7	144742	149947	103.6	546	224	40.9
RTC CRM-020	397	429	92.5	22.3	ND	NA	753	583	77.4	5195	3444	66.3	3022	3916	129.6
BCR CRM 143R	--	--	--	--	--	--	131	105	80.5	180	206	114.8	1055	1043	99.0
BCR CRM 141	--	--	--	--	--	--	32.6	ND	NA	29.4	ND	NA	81.3	ND	NA
USGS GXR-2	25.0	ND	NA	2240	2946	131.5	76.0	106	140.2	690	742	107.6	530	596	112.4
USGS GXR-6	330	294	88.9	1300	2581	198.5	66.0	ND	NA	101	80.9	80.1	118	ND	NA
NIST 2711	105	104	99.3	726	801	110.3	114	ND	NA	1162	1172	100.9	350	333	94.9
NIST 2710	626	722	115.4	707	782	110.6	2950	2834	96.1	5532	5420	98.0	6952	6476	93.2
NIST 2709	17.7	ND	NA	968	950	98.1	34.6	ND	NA	18.9	ND	NA	106	98.5	93.0
NIST 2704	23.4	ND	NA	414	443	107.0	98.6	105	106.2	161	167	103.5	438	427	97.4
CNRC PACS-1	211	143	67.7	--	772	NA	452	302	66.9	404	332	82.3	824	611	74.2
SARM-51	--	--	--	335	466	139.1	268	373	139.2	5200	7199	138.4	2200	2676	121.6
SARM-52	--	--	--	410	527	128.5	219	193	88.1	1200	1107	92.2	264	215	81.4

Source: Reference 4

[a] All concentrations in milligrams per kilogram.
%Rec. Percent recovery.
ND Not detected.
NA Not applicable.
-- No data.

TABLE 9
REGRESSION PARAMETERS FOR COMPARABILITY[1]

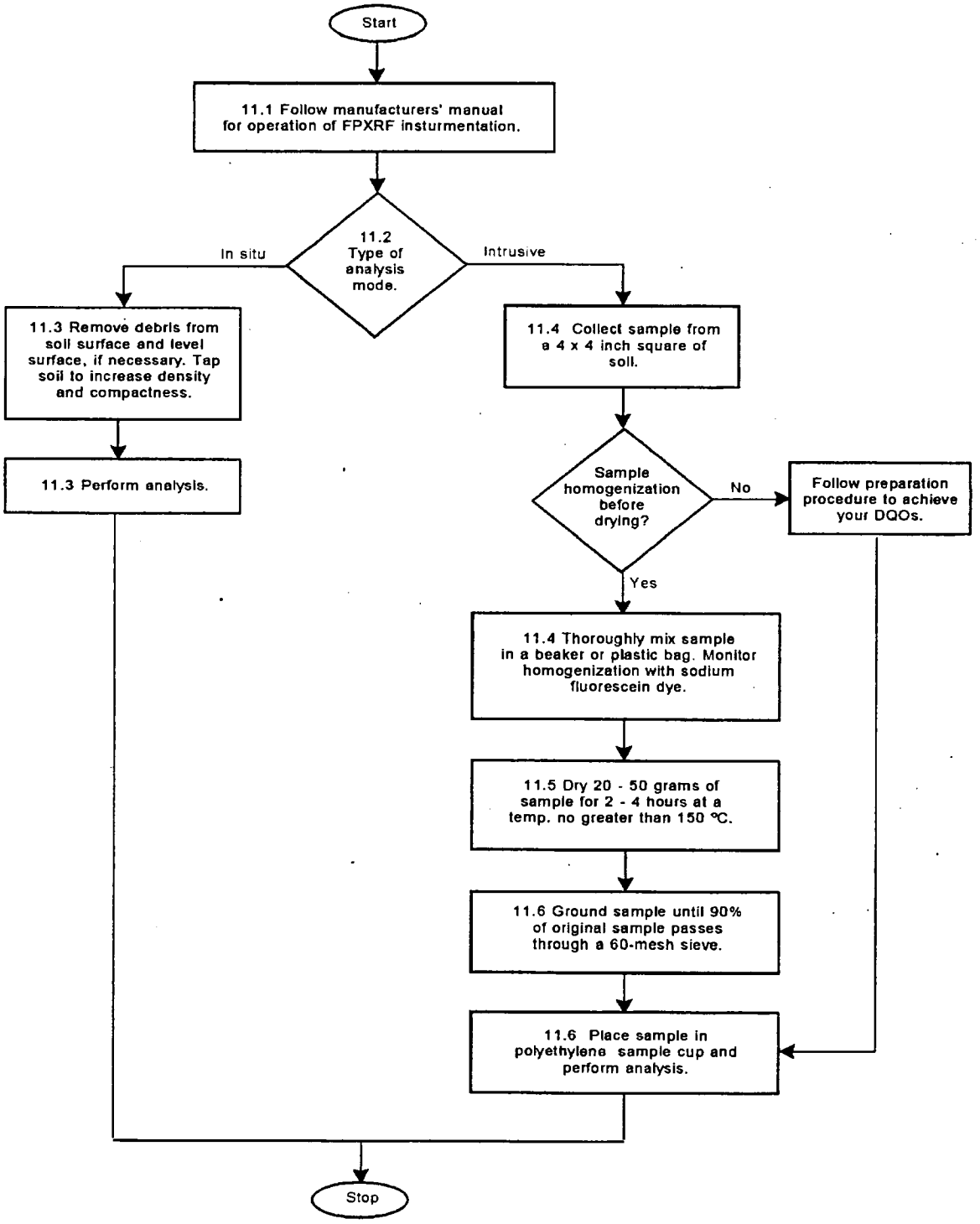
	Arsenic				Barium				Copper			
	n	r^2	Int.	Slope	n	r^2	Int.	Slope	n	r^2	Int.	Slope
All Data	824	0.94	1.62	0.94	1255	0.71	60.3	0.54	984	0.93	2.19	0.93
Soil 1	368	0.96	1.41	0.95	393	0.05	42.6	0.11	385	0.94	1.26	0.99
Soil 2	453	0.94	1.51	0.96	462	0.56	30.2	0.66	463	0.92	2.09	0.95
Soil 3	—	—	—	—	400	0.85	44.7	0.59	136	0.46	16.60	0.57
Prep 1	207	0.87	2.69	0.85	312	0.64	53.7	0.55	256	0.87	3.89	0.87
Prep 2	208	0.97	1.38	0.95	315	0.67	64.6	0.52	246	0.96	2.04	0.93
Prep 3	204	0.96	1.20	0.99	315	0.78	64.6	0.53	236	0.97	1.45	0.99
Prep 4	205	0.96	1.45	0.98	313	0.81	58.9	0.55	246	0.96	1.99	0.96

	Lead				Zinc				Chromium			
	n	r^2	Int.	Slope	n	r^2	Int.	Slope	n	r^2	Int.	Slope
All Data	1205	0.92	1.66	0.95	1103	0.89	1.86	0.95	280	0.70	64.6	0.42
Soil 1	357	0.94	1.41	0.96	329	0.93	1.78	0.93	—	—	—	—
Soil 2	451	0.93	1.62	0.97	423	0.85	2.57	0.90	—	—	—	—
Soil 3	397	0.90	2.40	0.90	351	0.90	1.70	0.98	186	0.66	38.9	0.50
Prep 1	305	0.80	2.88	0.86	286	0.79	3.16	0.87	105	0.80	66.1	0.43
Prep 2	298	0.97	1.41	0.96	272	0.95	1.86	0.93	77	0.51	81.3	0.36
Prep 3	302	0.98	1.26	0.99	274	0.93	1.32	1.00	49	0.73	53.7	0.45
Prep 4	300	0.96	1.38	1.00	271	0.94	1.41	1.01	49	0.75	31.6	0.56

Source: Reference 4

[1] Log-transformed data
n Number of data points
r^2 Coefficient of determination
Int. Y-intercept
— No applicable data

FIELD PORTABLE X-RAY FLUORESCENCE SPECTROMETRY FOR THE DETERMINATION OF ELEMENTAL CONCENTRATIONS IN SOIL AND SEDIMENT



APPENDIX C

LABORATORY ANALYTICAL REPORT

5090 Caterpillar Road Redding, California 96003 (530) 244-5227 (530) 244-4109 fax

Columbia Analytical Services INC.
An Employee - Owned Company

June 05, 2006

Service Request No: D0600466

Hamide Kayaci
Anteon Corporation
3430 Camino Del Rio North
San Diego, CA 92108

RE: Tiffany Road

Dear Hamide:

Enclosed are the results of the sample(s) submitted to our laboratory on May 15, 2006. For your reference, these analyses have been assigned our service request number D0600466.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please call if you have any questions. My extension is . You may also contact me via email at . EWilson@canoga.caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Ed Wilson
Project Chemist

NELAP Accredited ACIL Seal of Excellence Award 100% Recycled

Current CAS Redding Accreditation Programs

Federal and National Programs

- U.S Air Force, Air Force Center for Environmental Excellence (AFCEE)
  Approved laboratory for Wastewater and Hazardous Waste
- U.S. Army Corps of Engineers – MRD, HTRW Mandatory Center of Expertise
  Validated for Wastewater and Hazardous Waste
- Department of the Navy, Naval Facilities Engineering Service Center (NFESC)
  Approved laboratory for Wastewater and Hazardous Waste

State and Local Programs

- State of Alaska, Department of Environmental Conservation
  Approved Laboratory for Contaminated Sites
  Lab ID UST-001
- State of Arizona, Department of Health Services, Office of Laboratory Licensure
  Approved Laboratory for Drinking Water, Wastewater, and Hazardous Waste
  Lab ID AZ0604
- State of California, Department of Health Services, National Environmental Laboratory Accreditation Program **(NELAP)**
  Approved Laboratory for Drinking Water, Wastewater and Hazardous Waste
  Lab ID 01105CA
  - Los Angeles County Sanitation District
    Approved Laboratory for Wastewater
    Lab ID 10243
- State of California, Department of Health Services, Environmental Laboratory Accreditation Program (ELAP)
  Approved Laboratory for Microbiology of Drinking Water and Wastewater
  Lab ID 2635
- State of Florida, Department of Health, Bureau of Laboratories **(NELAP)**
  Approved Environmental Testing Laboratory for Wastewater and Hazardous Waste
  Lab ID E87203
- State of Kansas, Department of Health and Environment **(NELAP)**
  Approved Laboratory for Hazardous Waste
  Lab ID E-10323
- State of Massachusetts, Department of Environmental Protection
  Approved laboratory for Drinking Water and Wastewater
  Lab ID M-CA025
- State of Oklahoma, Department of Environmental Quality
  Approved Laboratory for General Water Quality/Sludge Testing
  Lab ID 9952
- State of Oregon, Environmental Laboratory Accreditation Program **(ORELAP)**
  Approved Laboratory for Drinking Water, Wastewater, and Hazardous Waste
  Lab ID CA200004
- State of Utah, Department of Health, Bureau of Laboratory Improvement **(NELAP)**
  Approved Laboratory for Wastewater and Hazardous Waste
  Lab ID QUAL1
- State of Washington, Department of Ecology
  Approved Laboratory for Wastewater and Hazardous Waste
  Lab ID C1234
- State of Wisconsin, Department of Natural Resources
  Approved Laboratory for Wastewater and Hazardous Waste
  Lab ID 999767340

Organic Department Qualifiers

Organic Sample ID Qualifiers

A This qualifier indicates that a TIC is a suspected aldol-condensation product

B Used when the analyte is found in the associated blank as well as the sample, indicating possible blank contamination. The data user should evaluate these compounds and their amounts carefully.

C The "C" flag indicates the presence of this compound has been confirmed by the GC/MS analysis.

D This qualifier is used for all the compounds identified in an analysis at a secondary dilution factor. "D" qualifiers are used only for the samples reported at more than one dilution factor.

E This flag indicates that the value reported exceeds the linear calibration range for that compound. Therefore, the sample should be reanalyzed at the appropriate dilution. The "E" qualified amount is an estimated concentration, and the results of the dilution will be reported on a separate Form I.

I The qualifier indicates that the reporting limit to the "I" qualifier has been raised. It is used when the chromatographic interference prohibits detection of a compound at a level below the concentration expressed on the Form I.

J Indicates an estimated value. It is used when the data indicates the presence of a target compound below the reporting limit or the presence of a Tentatively Identified Compound (TIC).

N This qualifier indicates presumptive evidence of a compound. This flag is only used for Tentatively Identified Compounds (TIC), where the identification is based on a mass spectral library research. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the "N" qualifier is not used.

P This qualifier is used for target analytes when there is a greater than 40% difference for detected concentrations between the two columns or detectors. The concentration value is reported on Form I and flagged with a "P".

U Indicates the compound was analyzed for but not detected. The number adjacent to the "U" qualifier indicates the reporting limit for that compound. The reporting limit can vary from sample to sample depending on dilution factors or percent moisture adjustments when indicated.

Z Indicates an estimated value between the method detection limit and zero.

Organic Sample ID Qualifiers

These qualifiers may be appended to the Lab Sample ID and/or the Client Sample ID for organic analysis.

DL Diluted reanalysis. Indicates that the results were determined in an analysis of a secondary dilution of a sample or extract. A digit to indicate multiple dilutions of the sample or extract may follow the "DL" suffix. The results of more than one diluted reanalysis may be reported.

MS Matrix spike (may be followed by a digit to indicate multiple matrix spikes within a sample set).

MSD Matrix spike duplicate (may be followed by a digit as noted above in the MS explanation).

R Reanalysis. The extract was reanalyzed without re-extraction. The "R" is not used if the sample was also re-extracted. If followed by a digit, indicates multiple reanalysis of the sample at the same dilution.

RE Re-extraction analysis. The sample was re-extracted and reanalyzed. May be followed by a digit to indicate multiple re-extracted analysis of the same sample at the same dilution.

Data Qualifiers for Metals and Wet Chemistry Analyses

B or **J**-- The reported value obtained was less than the MRL/CRDL, but greater than or equal to the MDL/IDL.

U -- The value was less than the MDL/IDL or was not detected.

E -- The reported value is estimate because of interference.

N -- Spiked sample recovery not within control limits.

ND -- Not detected at or above the MRL/CRDL.

* -- Duplicate analysis not within control limits.

Client: Anteon Corporation
Project: Tiffany Road

Service Request: D0600466

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
D0600466-001	S-4	02/23/06	14:51
D0600466-002	S-6	02/23/06	15:09
D0600466-003	S-7	02/23/06	15:15
D0600466-004	S-18	04/13/06	12:22
D0600466-005	S-20	04/13/06	13:05
D0600466-006	S-21	04/13/06	13:12

CASE NARRATIVE

COLUMBIA ANALYTICAL SERVICES, INC.

Client:	Anteon Corporation	**Service Request No.:**	D0600466
Project:	Tiffany Road	**Date Received:**	May 15, 2006
Sample Matrix:	Soil		

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier II data deliverables.

Sample Receipt

Six soil samples were received for analysis at Columbia Analytical Services on May 15, 2006.

No discrepancies were noted upon initial sample inspection. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

General Chemistry Parameters

Samples reported are from a re-digested and re-analyzed batch of samples. Form I's previously provided were from a batch in which the LCS failed. All QC in the re-digested sample passed. Sample S-18 required dilution due to the presence of elevated levels of target and non-target analytes. The reporting limits are adjusted to reflect the dilution.

Polynuclear Aromatic Hydrocarbons by EPA Method 8270C-SIM

Holding Time Exceptions:
Sample S-6 was received past the recommended holding time. The extraction was performed as soon as possible after receipt by the laboratory. The data is flagged to indicate the holding time violation.

Elevated Method Reporting Limits:
The Method Reporting Limit (MRL) for all analytes for sample S-6 was elevated due to less than optimal sample mass available for extraction.

Approved by: _____ **Date:** 6/5/06

CHAIN OF CUSTODY DOCUMENTATION

Columbia Analytical Services
5090 C[illegible]lar Rd.
Redding, CA 96003
Phone: (530) 244-5227
Fax: (530) 244-4109

Client **Anteon**

3430 Camino del Rio North, San Diego, CA 92108

Project Manager David Bloom

CHAIN of CUSTO[redacted]

Project NAFEC Tiffany Road

Telephone No. *619-221-5298*

Fax No. *619-221-5299*

Special Detection Limit/Reporting

Sample I.D.	Lab Sample No.	No. of Containers	Matrix: Soil	Matrix: Water	Matrix: Air	Matrix: Other	Prsv.: Yes	Prsv.: No	Sampling Date	Sampling Time	6010B for Metals, Title 22	PAH by GC/MS SIM - 8270C SIM	HOLD (see remarks)	Turn Around Time (business days)
S-4	1	1	✓					✓	23Feb06	1451	✓			10
S-6	2	1	✓					✓	23Feb06	1509		✓		10
S-7	3	1	✓					✓	23Feb06	1515	✓			10
S-18	4	1	✓					✓	13Apr06	1222	✓			10
S-20	5	1	✓					✓	13Apr06	1305	✓			10
S-21	6	1	✓					✓	13Apr06	1312	✓			10

Special QA/QC

Sub'd COC Attch'd:

REMARKS

Sample Received Intact: Yes No

Temperature received: Ice No ice

Relinq. by sampler (Sign & Print Name)	Date	Time	Received by (Sign & Print Name)
David M Bloom David M. Bloom	5/12/06	1220	UNPham PHAM CAS 5/15/06 0925
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory — Date — Time

Lab Work No.

Columbia Analytical Services inc.
An Employee-Owned Company

5090 Caterpillar Road
Redding, CA 96003
Phone: (530) 244-5262

[redacted]

COOLER RECEIPT FORM

Project/Client: Tiffany Road/Anteon Batch No: [redacted]

1. Cooler(s)/Sample(s) received on: 05/15/06 Shipped via: FedEx
   Shipping Bill # (s): 850397930450 # of Coolers/Packages 1
2. Radiological Screening by: NCP (Acceptable) Rejected
3. Custody seals on outside of cooler: YES (NO) N/A
   If yes, where? Front____ Rear____ Lt Side____ Rt Side____
   Seals intact: YES NO

COOLER/SAMPLE PROCESSING

4. Sample Processing/Tagging by: NCPham
5. Cooler(s)/Sample(s) Temp's: Ambient ____ ____ ____ ____
   (or)
   Temp. Blank (if included): ____ ____ ____ ____ ____
6. Type of packing material (circle): Ice Blue Ice Bubble Wrap Bubble Bags Zip Locks Webbing
   Other: envelope
7. Custody papers properly filled out (ink, signed, dated, released, etc.)? (YES) NO
8. Containers arrived in good condition (not broken, leaking, etc.)? (YES) NO
9. Samples received with adequate holding time remaining to conduct analysis? ~~YES~~ NCP (NO)
10. Container labels complete (i.e. analysis, preservation, date/time, etc.)? (YES) NO
11. Container labels and tags agree with custody papers? (YES) NO
12. Correct types of containers used for the tests indicated? (YES) NO
    a.) Adequate sample received? If not, note on Exception Report. (YES) NO
13. Containers supplied by: CAS (Other)
14. Preserved containers received with the appropriate preservative? YES NO (N/A)
    pH:____ (or) See pH log.
15. VOA vials free of air bubbles? YES NO (N/A)
16. Trip Blank preparation date: ____ CAS Other (N/A)
17. Volatile Soil samples: Encores or Plugs in Vials
    Freezer or GC/MS Date:____ Time:____ (N/A)

See Exception Report for discrepancies.

Rev. 8/18/2004/ds

Columbia Analytical Services INC.
An Employee - Owned Company
5090 Caterpillar Road
Redding, CA 96003
530-244-5227
FAX 530-244-4109

BATCH: D06000466
CLIENT: Anteon
PROJECT: Tiffany Road

SAMPLE RECEIPT EXCEPTION REPORT

Issue Type Legend		
	1) Holding Time	SMO Technician / Date: NCPham 05/15/06
	2) Temperature	Project Chemist / Date:
	3) COC/Label	Client Contact(s):
	4) Container	
	5) Other	

Item #	Issue Type	DESCRIPTION
1	1	S-6 collected 02/23/06 and received 05/15/06; missed 14 day extraction holding time for 8270SIM.

Corrective Actions Taken	
1	

Metals

COLUMBIA ANALYTICAL SERVICES/REDDING

Analytical Report

Client: Anteon Corporation
Project: Tiffany Road
Sar Matrix: Soil

Service Request: D0600466
Date Collected: 02/23/2006
Date Received: 05/15/2006

Trace Metals

Sample Name: S-4
Lab Code: D0600466-001
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MDL	PQL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	TOTAL	SW6010	0.99	8.9	1	05/24/2006	05/26/2006	10.0	
Arsenic	TOTAL	SW6010	2.8	8.9	1	05/24/2006	05/26/2006	17.0	
Barium	TOTAL	SW6010	0.50	0.99	1	05/24/2006	05/26/2006	480	
Beryllium	TOTAL	SW6010	0.10	0.99	1	05/24/2006	05/26/2006	0.75	B
Cadmium	TOTAL	SW6010	0.10	0.99	1	05/24/2006	05/26/2006	20.0	
Chromium	TOTAL	SW6010	0.30	2.0	1	05/24/2006	05/26/2006	72.0	
Cobalt	TOTAL	SW6010	0.40	3.0	1	05/24/2006	05/26/2006	11.0	
Copper	TOTAL	SW6010	0.20	2.0	1	05/24/2006	05/26/2006	1400	
Lead	TOTAL	SW6010	2.2	9.9	1	05/24/2006	05/26/2006	2200	
Molybdenum	TOTAL	SW6010	0.50	3.0	1	05/24/2006	05/26/2006	3.5	
Nickel	TOTAL	SW6010	0.89	4.0	1	05/24/2006	05/26/2006	35.0	
Selenium	TOTAL	SW6010	3.6	20.0	1	05/24/2006	05/26/2006	5.7	B
Silver	TOTAL	SW6010	0.30	2.0	1	05/24/2006	05/26/2006	6.2	
Tha n	TOTAL	SW6010	2.0	9.9	1	05/24/2006	05/26/2006	ND	U
Vai m	TOTAL	SW6010	0.20	2.0	1	05/24/2006	05/26/2006	26.0	
Zinc	TOTAL	SW6010	0.59	4.0	1	05/24/2006	05/26/2006	2400	

COLUMBIA ANALYTICAL SERVICES/REDDING

Analytical Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Collected: 02/23/2006
Date Received: 05/15/2006

Trace Metals

Sample Name: S-7
Lab Code: D0600466-003
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MDL	PQL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	TOTAL	SW6010	1.0	9.2	1	05/24/2006	05/26/2006	27.0	
Arsenic	TOTAL	SW6010	2.9	9.2	1	05/24/2006	05/26/2006	10.0	
Barium	TOTAL	SW6010	0.51	1.0	1	05/24/2006	05/26/2006	1400	
Beryllium	TOTAL	SW6010	0.10	1.0	1	05/24/2006	05/26/2006	0.53	B
Cadmium	TOTAL	SW6010	0.10	1.0	1	05/24/2006	05/26/2006	39.0	
Chromium	TOTAL	SW6010	0.31	2.0	1	05/24/2006	05/26/2006	56.0	
Cobalt	TOTAL	SW6010	0.41	3.1	1	05/24/2006	05/26/2006	9.9	
Copper	TOTAL	SW6010	0.20	2.0	1	05/24/2006	05/26/2006	1200	
Lead	TOTAL	SW6010	2.2	10.0	1	05/24/2006	05/26/2006	1700	
Molybdenum	TOTAL	SW6010	0.51	3.1	1	05/24/2006	05/26/2006	6.2	
Nickel	TOTAL	SW6010	0.92	4.1	1	05/24/2006	05/26/2006	35.0	
Selenium	TOTAL	SW6010	3.7	20.0	1	05/24/2006	05/26/2006	6.4	B
Silver	TOTAL	SW6010	0.31	2.0	1	05/24/2006	05/26/2006	11.0	
Thallium	TOTAL	SW6010	2.0	10.0	1	05/24/2006	05/26/2006	ND	U
Vanadium	TOTAL	SW6010	0.20	2.0	1	05/24/2006	05/26/2006	23.0	
Zinc	TOTAL	SW6010	0.61	4.1	1	05/24/2006	05/26/2006	3300	

COLUMBIA ANALYTICAL SERVICES/REDDING

Analytical Report

Client: Anteon Corporation
Project: Tiffany Road
Sar Matrix: Soil

Service Request: D0600466
Date Collected: 04/13/2006
Date Received: 05/15/2006

Trace Metals

Sample Name: S-18
Lab Code: D0600466-004
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MDL	PQL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	TOTAL	SW6010	9.9	89.0	10	05/24/2006	05/26/2006	30.0	B
Arsenic	TOTAL	SW6010	28.0	89.0	10	05/24/2006	05/26/2006	34.0	B
Barium	TOTAL	SW6010	5.0	9.9	10	05/24/2006	05/26/2006	600	
Beryllium	TOTAL	SW6010	0.99	9.9	10	05/24/2006	05/26/2006	ND	U
Cadmium	TOTAL	SW6010	0.99	9.9	10	05/24/2006	05/26/2006	11.0	
Chromium	TOTAL	SW6010	3.0	20.0	10	05/24/2006	05/26/2006	59.0	
Cobalt	TOTAL	SW6010	4.0	30.0	10	05/24/2006	05/26/2006	15.0	B
Copper	TOTAL	SW6010	2.0	20.0	10	05/24/2006	05/26/2006	1200	
Lead	TOTAL	SW6010	22.0	99.0	10	05/24/2006	05/26/2006	1700	
Molybdenum	TOTAL	SW6010	5.0	30.0	10	05/24/2006	05/26/2006	47.0	
Nickel	TOTAL	SW6010	8.9	40.0	10	05/24/2006	05/26/2006	60.0	
Selenium	TOTAL	SW6010	36.0	200	10	05/24/2006	05/26/2006	37.0	B
Silver	TOTAL	SW6010	3.0	20.0	10	05/24/2006	05/26/2006	11.0	B
Tha[illegible]	TOTAL	SW6010	20.0	99.0	10	05/24/2006	05/26/2006	ND	U
Van[illegible]m	TOTAL	SW6010	2.0	20.0	10	05/24/2006	05/26/2006	23.0	
Zinc	TOTAL	SW6010	5.9	40.0	10	05/24/2006	05/26/2006	1500	

COLUMBIA ANALYTICAL SERVICES/REDDING

Analytical Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Collected: 04/13/2006
Date Received: 05/15/2006

Trace Metals

Sample Name: S-20
Lab Code: D0600466-005
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MDL	PQL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	TOTAL	SW6010	1.0	9.4	1	05/24/2006	05/26/2006	2.0	B
Arsenic	TOTAL	SW6010	2.9	9.4	1	05/24/2006	05/26/2006	5.9	B
Barium	TOTAL	SW6010	0.52	1.0	1	05/24/2006	05/26/2006	340	
Beryllium	TOTAL	SW6010	0.10	1.0	1	05/24/2006	05/26/2006	0.98	B
Cadmium	TOTAL	SW6010	0.10	1.0	1	05/24/2006	05/26/2006	0.77	B
Chromium	TOTAL	SW6010	0.31	2.1	1	05/24/2006	05/26/2006	15.0	
Cobalt	TOTAL	SW6010	0.42	3.1	1	05/24/2006	05/26/2006	8.2	
Copper	TOTAL	SW6010	0.21	2.1	1	05/24/2006	05/26/2006	23.0	
Lead	TOTAL	SW6010	2.3	10.0	1	05/24/2006	05/26/2006	21.0	
Molybdenum	TOTAL	SW6010	0.52	3.1	1	05/24/2006	05/26/2006	1.3	B
Nickel	TOTAL	SW6010	0.94	4.2	1	05/24/2006	05/26/2006	18.0	
Selenium	TOTAL	SW6010	3.8	21.0	1	05/24/2006	05/26/2006	5.5	B
Silver	TOTAL	SW6010	0.31	2.1	1	05/24/2006	05/26/2006	0.45	B
Thallium	TOTAL	SW6010	2.1	10.0	1	05/24/2006	05/26/2006	ND	U
Vanadium	TOTAL	SW6010	0.21	2.1	1	05/24/2006	05/26/2006	26.0	
Zinc	TOTAL	SW6010	0.63	4.2	1	05/24/2006	05/26/2006	67.0	

COLUMBIA ANALYTICAL SERVICES/REDDING

Analytical Report

Client: Anteon Corporation
Project: Tiffany Road
Sar Matrix: Soil

Service Request: D0600466
Date Collected: 04/13/2006
Date Received: 05/15/2006

Trace Metals

Sample Name: S-21
Lab Code: D0600466-006
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MDL	PQL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	TOTAL	SW6010	0.96	8.7	1	05/24/2006	05/26/2006	ND	U
Arsenic	TOTAL	SW6010	2.7	8.7	1	05/24/2006	05/26/2006	8.8	
Barium	TOTAL	SW6010	0.48	0.96	1	05/24/2006	05/26/2006	260	
Beryllium	TOTAL	SW6010	0.10	0.96	1	05/24/2006	05/26/2006	0.97	
Cadmium	TOTAL	SW6010	0.10	0.96	1	05/24/2006	05/26/2006	0.61	B
Chromium	TOTAL	SW6010	0.29	1.9	1	05/24/2006	05/26/2006	15.0	
Cobalt	TOTAL	SW6010	0.38	2.9	1	05/24/2006	05/26/2006	8.6	
Copper	TOTAL	SW6010	0.19	1.9	1	05/24/2006	05/26/2006	24.0	
Lead	TOTAL	SW6010	2.1	9.6	1	05/24/2006	05/26/2006	21.0	
Molybdenum	TOTAL	SW6010	0.48	2.9	1	05/24/2006	05/26/2006	ND	U
Nickel	TOTAL	SW6010	0.87	3.8	1	05/24/2006	05/26/2006	19.0	
Selenium	TOTAL	SW6010	3.5	19.0	1	05/24/2006	05/26/2006	9.9	B
Silver	TOTAL	SW6010	0.29	1.9	1	05/24/2006	05/26/2006	0.31	B
Tha[illegible]	TOTAL	SW6010	1.9	9.6	1	05/24/2006	05/26/2006	ND	U
Va[illegible]m	TOTAL	SW6010	0.19	1.9	1	05/24/2006	05/26/2006	27.0	
Zinc	TOTAL	SW6010	0.58	3.8	1	05/24/2006	05/26/2006	66.0	

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QA Report

Client:	Anteon Corporation	**Service Request:**	D0600466
Project:	Tiffany Road	**Date Collected:**	NA
Sample Matrix:	Soil	**Date Received:**	NA

Trace Metals

Sample Name: Method Blank
Lab Code: PBS-0524
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	MDL	PQL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
Antimony	TOTAL	SW6010	1.0	9.0	1	05/24/2006	05/26/2006	ND	U
Arsenic	TOTAL	SW6010	2.8	9.0	1	05/24/2006	05/26/2006	ND	U
Barium	TOTAL	SW6010	0.5	1.0	1	05/24/2006	05/26/2006	ND	U
Beryllium	TOTAL	SW6010	0.1	1.0	1	05/24/2006	05/26/2006	ND	U
Cadmium	TOTAL	SW6010	0.1	1.0	1	05/24/2006	05/26/2006	ND	U
Chromium	TOTAL	SW6010	0.3	2.0	1	05/24/2006	05/26/2006	ND	U
Cobalt	TOTAL	SW6010	0.4	3.0	1	05/24/2006	05/26/2006	ND	U
Copper	TOTAL	SW6010	0.2	2.0	1	05/24/2006	05/26/2006	ND	U
Lead	TOTAL	SW6010	2.2	10.0	1	05/24/2006	05/26/2006	ND	U
Molybdenum	TOTAL	SW6010	0.5	3.0	1	05/24/2006	05/26/2006	ND	U
Nickel	TOTAL	SW6010	0.9	4.0	1	05/24/2006	05/26/2006	ND	U
Selenium	TOTAL	SW6010	3.6	20.0	1	05/24/2006	05/26/2006	ND	U
Silver	TOTAL	SW6010	0.3	2.0	1	05/24/2006	05/26/2006	ND	U
Thallium	TOTAL	SW6010	2.0	10.0	1	05/24/2006	05/26/2006	ND	U
Vanadium	TOTAL	SW6010	0.2	2.0	1	05/24/2006	05/26/2006	ND	U
Zinc	TOTAL	SW6010	0.6	4.0	1	05/24/2006	05/26/2006	ND	U

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QC Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Extracted: 05/24/2006
Date Analyzed: 05/26/2006

Trace Metals

LCS Sample Name: Lab Control Sample
Lab Code: LCSS-0524
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	PQL	Spike Level	Spike Result	Spike % Rec	CAS Acceptance Limits	Result Notes
Antimony	TOTAL	SW6010	9.0	86.2	71.6	83	10-223	
Arsenic	TOTAL	SW6010	9.0	146.0	158.0	108	80-121	
Barium	TOTAL	SW6010	1.0	351.0	389.0	111	82-118	
Beryllium	TOTAL	SW6010	1.0	62.2	70.0	113	82-118	
Cadmium	TOTAL	SW6010	1.0	91.9	97.9	107	82-119	
Chromium	TOTAL	SW6010	2.0	176.0	191.0	109	78-122	
Cobalt	TOTAL	SW6010	3.0	58.5	64.9	111	82-118	
Copper	TOTAL	SW6010	2.0	70.0	75.0	107	82-118	
Lead	TOTAL	SW6010	10.0	68.1	72.7	107	81-119	
Molybdenum	TOTAL	SW6010	3.0	26.5	28.6	108	79-121	
Nickel	TOTAL	SW6010	4.0	84.0	91.0	108	82-119	
Selenium	TOTAL	SW6010	20.0	73.0	79.0	108	76-124	
Silver	TOTAL	SW6010	2.0	93.0	91.4	98	61-139	
Thallium	TOTAL	SW6010	10.0	77.8	85.2	110	76-124	
Vanadium	TOTAL	SW6010	2.0	148.0	152.0	103	75-125	
Zinc	TOTAL	SW6010	4.0	402.0	424.0	105	79-121	

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QC Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Extracted: 05/24/2006
Date Analyzed: 05/26/2006

Trace Metals

LCS Sample Name: Lab Control Sample
Lab Code: LCSDS-0524
Test Notes:

Units: mg/Kg (ppm)
Basis: Wet

Analyte	Prep Method	Analysis Method	PQL	Spike Level	Spike Result	Spike % Rec	CAS Acceptance Limits	Result Notes
Antimony	TOTAL	SW6010	9.0	86.2	78.9	92	10-223	
Arsenic	TOTAL	SW6010	9.0	146.0	162.0	111	80-121	
Barium	TOTAL	SW6010	1.0	351.0	396.0	113	82-118	
Beryllium	TOTAL	SW6010	1.0	62.2	72.0	116	82-118	
Cadmium	TOTAL	SW6010	1.0	91.9	99.2	108	82-119	
Chromium	TOTAL	SW6010	2.0	176.0	196.0	111	78-122	
Cobalt	TOTAL	SW6010	3.0	58.5	66.2	113	82-118	
Copper	TOTAL	SW6010	2.0	70.0	76.7	110	82-118	
Lead	TOTAL	SW6010	10.0	68.1	73.4	108	81-119	
Molybdenum	TOTAL	SW6010	3.0	26.5	29.5	111	79-121	
Nickel	TOTAL	SW6010	4.0	84.0	95.1	113	82-119	
Selenium	TOTAL	SW6010	20.0	73.0	84.6	116	76-124	
Silver	TOTAL	SW6010	2.0	93.0	93.0	100	61-139	
Thallium	TOTAL	SW6010	10.0	77.8	87.0	112	76-124	
Vanadium	TOTAL	SW6010	2.0	148.0	154.0	104	75-125	
Zinc	TOTAL	SW6010	4.0	402.0	437.0	109	79-121	

GC/MS SEMIVOLATILE ORGANICS (SIM)

COLUMBIA ANALYTICAL SERVICES/REDDING

Client: Anteon Corporation
Project: Tiffany Road

Service Request: D0600466

Cover Page - Analysis Data Package
Semi-Volatile Organic Compounds

Sample Name	Lab Code	Date Collected	Date Received
S-6	D0600466-002	02/23/2006	05/15/2006

I certify this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the case narrative. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Wida Ang
Name: WIDA ANG
Date: 6/3/06
Title: Organic Manager

COLUMBIA ANALYTICAL SERVICES/REDDING

Analytical Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Collected: 02/23/2006
Date Received: 05/15/2006

Semi-Volatile Organic Compounds

Sample Name: S-6
Lab Code: D0600466-002
Extraction SW3550
Analysis Method: SW8270-SIM

Units: ug/Kg (ppb
Basis: Wet
Level: LOW

Analyte	Result	Q	MDL	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**6.0**	J	1.2	14	1	05/23/2006	05/31/2006	Z0523SA1	
Acenaphthylene	ND	U	1.1	14	1	05/23/2006	05/31/2006	Z0523SA1	
Acenaphthene	**1.8**	J	0.81	14	1	05/23/2006	05/31/2006	Z0523SA1	
Fluorene	**4.0**	J	1.4	14	1	05/23/2006	05/31/2006	Z0523SA1	
Phenanthrene	**25**		0.98	14	1	05/23/2006	05/31/2006	Z0523SA1	
Anthracene	ND	U	0.92	14	1	05/23/2006	05/31/2006	Z0523SA1	
Fluoranthene	**6.9**	J	0.78	14	1	05/23/2006	05/31/2006	Z0523SA1	
Pyrene	**4.6**	J	0.67	14	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(a)anthracene	**1.4**	J	0.64	14	1	05/23/2006	05/31/2006	Z0523SA1	
Chrysene	**4.3**	J	0.75	14	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(b)fluoranthene	**3.1**	J	0.92	14	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(k)fluoranthene	ND	U	0.78	14	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(a)pyrene	**1.1**	J	0.84	14	1	05/23/2006	05/31/2006	Z0523SA1	
Indeno(1,2,3-cd)pyrene	ND	U	2.4	14	1	05/23/2006	05/31/2006	Z0523SA1	
Dibenzo(a,h)anthracene	ND	U	1.1	14	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(g,h,i)perylene	ND	U	1.0	14	1	05/23/2006	05/31/2006	Z0523SA1	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluoranthene-d10	86	55-133	05/31/2006	
Fluorene-d10	95	54-128	05/31/2006	
Terphenyl-d14 - SS	100	38-124	05/31/2006	

Comments: _____

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QC Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Collected: NA
Date Received: NA

Semi-Volatile Organic Compounds

Sample Name: Method Blank
Lab Code: Z0523SA1
Extraction SW3550
Analysis Method: SW8270-SIM

Units: ug/Kg (ppb
Basis: Wet
Level: LOW

Analyte	Result	Q	MDL	MRL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	ND	U	0.45	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Acenaphthylene	ND	U	0.40	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Acenaphthene	ND	U	0.29	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Fluorene	ND	U	0.52	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Phenanthrene	ND	U	0.35	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Anthracene	ND	U	0.33	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Fluoranthene	ND	U	0.28	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Pyrene	ND	U	0.24	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(a)anthracene	ND	U	0.23	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Chrysene	ND	U	0.27	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(b)fluoranthene	ND	U	0.33	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(k)fluoranthene	ND	U	0.28	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Benzo(a)pyrene	ND	U	0.30	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
Indeno(1,2,3-cd)pyrene	ND	U	0.85	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
enzo(a,h)anthracene	ND	U	0.38	5.0	1	05/23/2006	05/31/2006	Z0523SA1	
zo(g,h,i)perylene	ND	U	0.37	5.0	1	05/23/2006	05/31/2006	Z0523SA1	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluoranthene-d10	89	55-133	05/31/2006	
Fluorene-d10	91	54-128	05/31/2006	
Terphenyl-d14 - SS	111	38-124	05/31/2006	

Comments: _____

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QC Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466

Surrogate Recovery Summary
Semi-Volatile Organic Compounds

Prep Method: SW3550
Analysis Method: SW8270-SIM

Units: Percent

Sample Name	Lab Code	Q	S1	S2	S3
Method Blank	Z0523SA1		89	91	111
Laboratory Control Sample	Z0523SA1LCS		81	90	97
Laboratory Control Sample Duplicate	Z0523SA1LCSD		87	93	100
S-6	D0600466-002		86	95	100

Surrogate Recovery Control Limits (%)

S1:	Fluoranthene-d10	55-133
S2:	Fluorene-d10	54-128
S3:	Terphenyl-d14 - SS	38-124

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QC Report

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Collected: NA
Date Received: NA
Date Extracted: 05/23/2006
Date Analyzed: 05/31/2006

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary
Semi-Volatile Organic Compounds

LCS Sample Lab Control Sample
Lab Code: Z0523SA1LCS
Test Notes:

DMS Sample Lab Control Sample Duplicate
Units: ug/Kg (ppb

Analyte	Prep Method	Analysis Method	PQL	Spike Level	Spike Result LCS	Spike Result LCSD	Spike % Rec LCS	Spike % Rec LCSD	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Naphthalene	SW3550	SW8270-SI	5.0	66.7	45.0	46.6	68	70	63-100	3	
Acenaphthylene	SW3550	SW8270-SI	5.0	66.7	48.1	48.7	72	73	63-104	1	
Acenaphthene	SW3550	SW8270-SI	5.0	66.7	46.8	47.3	70	71	64-100	1	
Fluorene	SW3550	SW8270-SI	5.0	66.7	47.4	49.0	71	73	66-106	3	
Phenanthrene	SW3550	SW8270-SI	5.0	66.7	50.3	52.0	75	78	60-103	3	
Anthracene	SW3550	SW8270-SI	5.0	66.7	50.2	52.5	75	79	54-110	4	
Fluoranthene	SW3550	SW8270-SI	5.0	66.7	48.8	51.9	73	78	63-114	6	
Pyrene	SW3550	SW8270-SI	5.0	66.7	50.8	51.6	76	77	49-104	2	
Benzo(a)anthracene	SW3550	SW8270-SI	5.0	66.7	54.6	55.0	82	82	63-113	1	
Chrysene	SW3550	SW8270-SI	5.0	66.7	49.0	50.8	74	76	64-106	4	
Benzo(b)fluoranthene	SW3550	SW8270-SI	5.0	66.7	52.3	57.0	78	85	55-115	9	
Benzo(k)fluoranthene	SW3550	SW8270-SI	5.0	66.7	49.2	53.4	74	80	56-115	8	
Benzo(a)pyrene	SW3550	SW8270-SI	5.0	66.7	50.6	52.6	76	79	53-117	4	
Indeno(1,2,3-cd)pyrene	SW3550	SW8270-SI	5.0	66.7	56.8	55.2	85	83	49-129	3	
Dibenzo(a,h)anthracene	SW3550	SW8270-SI	5.0	66.7	61.6	58.0	92	87	52-130	6	
Benzo(g,h,i)perylene	SW3550	SW8270-SI	5.0	66.7	56.1	53.2	84	80	45-130	5	

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QC Results

Client: Anteon Corporation
Project: Tiffany Road
Sample Matrix: Soil

Service Request: D0600466
Date Extracted: 05/23/2006

Extraction Prep Log
Semi-Volatile Organic Compounds

Extaction Method: SW3550
Analysis Method: SW8270-SIM

Extraction Lot: Z0523SA1

Sample Name	Lab Code	Date Collected	Date Received	Sample Amount	Final Volume	% Solids	Note
Method Blank	Z0523SA1	NA	NA	30.00 G	1000	NA	
Laboratory Control Sample	Z0523SA1LCS	NA	NA	30.00 G	1000	NA	
Laboratory Control Sample Duplicate	Z0523SA1LCSD	NA	NA	30.00 G	1000	NA	
S-6	D0600466-002	02/23/2006	05/15/2006	10.75 G	1000	NA	*

Results flagged with an asterisk (*) indicate the holding time was exceeded for the analysis

COLUMBIA ANALYTICAL SERVICES/REDDING

QA/QC Report

Client: Anteon Corporation
Project: Tiffany Road

Service Request: D0600466

Holding Time Summary
Semi-Volatile Organic Compounds

Analysis Method: SW8270-SIM

Field Sample ID	Date Collected	Date Received	1st Date Prepared	Max. Holding Time 1	1st Time Held	2nd Date Prepared	Max. Holding Time 2	2nd Time Held	Date Analyzed	Max. Holding Time A	Time Held Anal.	Q
S-6	02/23/2006	05/15/2006	05/23/2006	14	89	N/A	N/A	N/A	05/31/2006	40	8	*

Comments:

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Appendix D:
Research Checklist

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Preliminary Assessment Research Log

Preliminary Assessment Report for Base-wide Investigation
of Per- and Polyfluoroalkyl Substances
Contract No. N62473-16-D-2405, TO N6247318F4445
Naval Air Station El Centro California

Just POC/Personnel Interviews	Yes	No (include reason)
Did installation POC complete PFC General Information Questionnaire?	X	
Was additional contact personnel provided by POC (i.e. Fire chief, longtime base employee). If yes, provide names and contact information (position/rank, phone number, e-mail address) below.	X	
Contact Information:	*Fire Chief Oropeza, 760-339-2251*	
Contact Information:	*Kris Haugh, (760) 339-2673*	
Was an Interview Log completed for each person contacted?	X	

Administrative Record Research	Yes	No (include reason)
Searched the Administrative Record for documents pertaining to the installation?	X	
Searched the following key words: AFFF, electroplating, wastewater treatment/sludge area (ponds), firefighting training area, landfill, oil/water separators, vehicle wash station, drum or soil storage, fire suppression systems, airfield, crash, and fire.	X	
List additional words searched in online AR:		
Reviewed the Environmental Baseline Survey?		Reviewed 1987 Preliminary Assessment
Located and reviewed Environmental Impact Statements and/or Environmental Assessments?	X	
Were Real Property Records (as-built drawings) located?	X	Provided 2014 Master Plan
Were installation maps with building functions located?	X	
Located and reviewed additional reports requested from or suggested by POC?	X	
Located historic aerial surveys (1970 - present)?	X	EDR

Online Research	Yes	No (include reason)
Internet search for installation and any of the following key words: crash, fire, as-build, master plan, real property, AFFF, and/or PFAS?	X	
List additional words searched in Index:	*"accident," "emergency," 'response," "mishap," "aqueous film-forming foam," "perfluorooctan sulfonate (PFOS)," "perfluorooctanoic acid (PFOA)," and "El Centro*	
Performed a site search on GeoTracker and GeoTracker GAMA?	X	
Performed a site search on EnviroStor?	X	
Performed a Water Purveyor and Water Supply Well search?	X	
List sites searched::	*USGS,*	
Searched the following websites:		
Environmental Protection Agency	X	
Aviation Safety Network	X	
City and City Fire Department		On Base Fire Department
Agency for Toxic Substances and Disease Registry	X	
Department of Toxic Substance Control Hazardous Waste Tracking	X	

Signature: Gabriela Staehle Date: 7/13/2018

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