Note to Reader:

The U.S. Navy's facility at Pearl Harbor, Hawaii is regulated under the Clean Water Act as a direct discharge that is controlled by an NPDES permit (No. HI0110086) and 40 CFR Part 122. The pretreatment requirements at 40 CFR Part 403 do not apply because the Navy does not discharge to a publicly owned treatment works. Nevertheless, many of the industrial operations at the Pearl Harbor facility are similar to those covered by the pretreatment program and this inspection report is provided on this pretreatment web site for the convenience of the reader.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

July 28, 2006

In Reply Refer To: WTR-7

RADM Michael C. Vitale
Commander Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Re: April 10-13, 2006 Clean Water Act Inspection

Dear RADM Vitale:

Enclosed is the July 28, 2006 report for our April 10-13 comprehensive inspection of the Fort Kam Wastewater Treatment Facility and its service area industrial wastewater sources. Please submit a short response to the findings in Sections 3 through 7 of this report to EPA and Hawaii DOH, by **September 30, 2006**. The main findings are summarized below:

1 Over the past decade, the Navy has made significant capital and operational improvements in the handling of all wastewaters both domestic and non-domestic, in particular, through better controlled delivery methods, expanded capacity, and upgraded treatment capabilities. Discharge now is of much higher quality because Fort Kam provides tertiary treatment and nutrient removal, because incompatible wastewaters are effectively segregated for pretreatment through the Industrial Wastewater Treatment Complex and the Bilge Oily Wastewater Treatment System, and because of the deep-water ocean outfall.

2 The sewer use permit program for non-domestic wastewaters is highly effective. All program inspectors, environmental staff, and shop operators were fully knowledgeable.

3 The only shortcomings of note involved coordination of the sampling and reporting, a few storm sewer connections in areas of industrial activity, and sulfides in the BOWTS effluent. Also NPDES permit sampling requirements for Fort Kam and the internal outfalls can and should be adjusted to match the technical needs.

Congratulations on a job well-done. We appreciate the helpfulness of the staff from each of the commands extended to us during this inspection. We remain available to the Navy, the Air Force, and the State of Hawaii to assist in any way. Please do not hesitate to call me at (415) 972-3572, or Greg V. Arthur of my staff at (415) 972-3504, or e-mail arthur.greg@epa.gov.

Sincerely,

Original signed by:
Alexis Strauss

Alexis Strauss, Director
Water Division

cc: Mike Tsuji, Hawaii DOH

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION 9

CLEAN WATER ACT COMPLIANCE OFFICE

NPDES COMPLIANCE EVALUATION INSPECTION

REPORT No. 1

NPDES Permittee:	United States Navy - Navy Region Hawaii for the Fort Kamehameha Wastewater Treatment Facility Outfall (NPDES Permit HI 0110086)
Facility No.1:	Pearl Harbor Naval Complex • Naval Facilities Engineering Command Hawaii • Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility • Naval Station Pearl Harbor • Fleet and Industrial Supply Center Pearl Harbor
Facility No.2	Hickam Air Force Base • United States Air Force 15th Airlift Wing • Hawaii Air National Guard • Logistics Readiness Squadron

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Inspected Facilities

Sewerage Works:	NAVFAC Fort Kamehameha Wastewater Treatment Facility NAVSTA Pierside Ships Services
Service Area Sources: (Naval Complex)	NAVFAC Bldg 1492 - Industrial Wastewater Treatment Complex NAVFAC Bldg 1910 - Bilge Oily Wastewater Treatment System NAVFAC Utilities Bldg 149 - Power Plant PHNSY Dry Docks #1 through #4 PHNSY Bldg 214 - Electronics Weapons Shop PHNSY Bldg 1670 - Services Shops PHNSY Bldg 315 - Radiography Laboratory PHNSY Bldg 1456 - Pipe and Hose Shop PHNSY Bldg 3B - Valve and Pipe Fittings Testing Shop PHNSY Bldg 5 - Propeller Shop PHNSY Bldg 67 - Inside Machine Shop PHNSY Bldg 72 - Sheet Metal Fabrication Shop

Service Area Sources: (Naval Complex - cont)	PHNSY Bldg 1770 - Intermediate Maintenance Facility PHNSY Bldg 1725 - Corrosion Control Shops PHNSY Bldg 155 - Structural Shops FISC Bldg 1326 - Fuel Reclamation Plant
Service Area Sources: (Hickam AFB)	HIANG Bldg 11222 - Engine Test Cell Facility HIANG Bldg 11672 - Alternate Stand-by Wash Rack HIANG Bldg 3400 - Maintenance Hanger HIANG Bldg 3407 - Indoor Wash Rack HIANG Bldg 3386 - Armament Support Shop HIANG Bldg 3424 - Ground Support Wash Rack 15th Airlift Wing Bldg 2025 - Outdoor Wash Rack 15th Airlift Wing Bldg 2030 - Maintenance Hanger 15th Airlift Wing Bldg 2125 - Fuel Control Center

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Dates of Inspection:	Apr 10, 2006 - Entrance Interview - Fort Kam Wastewater Treatment Facility - Bldg 1492 Industrial Wastewater Treatment Complex - Bldg 1920 Bilge Oily Wastewater Treatment System - PHNSY Dry Docks Apr 11, 2006 - Hickam Air Force Base Service Area Sources - Pearl Harbor Naval Shipyard Service Area Sources Apr 12, 2006 - Pearl Harbor Naval Shipyard Service Area Sources - NAVFAC Bldg 149 Power Plant - FISC Fuel Reclamation Plant - NAVSTA Pierside Ship Services Apr 13, 2006 - Close-out Interview

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Inspection Participants:

US EPA:	Greg V. Arthur, CWA Compliance Office, (415) 972-3504
Hawaii DOH:	None
Naval Complex:	Paul Carter, NAVFAC Utilities Plant Mgr, (808) 448-5248 Orrin Wong, NAVFAC Envr Compliance, (808) 471-1171 x366 Rodney Due, NAVFAC Wastewater Div Director, (808) 471-0963 Preston Iha, NAVFAC Envr Engr, (808) 471-9703 Alton Kanno, NAVFAC EP Coordinator, (808) 448-5372 Harold Haga, NAVFAC EP Specialist, (808) 471-4187 Byron Bae, NAVFAC EP Specialist, (808) 448-5373 Julie Murioka, Navy Region, Envr Engr, (808) 473-4137 x226 Dennis Chang, NAVFAC Bldg 1424, Envr Engr, (808) 347-2640 Vernon Kam, NAVFAC Bldg 1910, EP Specialist (808) 471-7253

Inspection Participants:

Naval Complex: (continued)	Lenora Mau, PHNSY Envr Engr, (808) 473-8000 x4465 Christie Chun, PHNSY Envr Engr, (808) 473-8000 x4468 Glenn Atta, PHNSY Envr Engr, (808) 473-8000 x4460 Charlotte Mukai, PHNSY Q/A Lab Div Head, (808) 473-8000 x3975 Bob Lucia, PHNSY Bldg 214, Zone Manager (808) 368-0389 Bling Quintana, PHNSY Bldg 1670, Painter, (808) 473-8000 x3411 Richard Carey, PHNSY Bldg 315, Supervisor, (808) 474-3313 Edward Saballa, PHNSY Bldg 5, Work Leader, (808) 474-6280 Allen Tupina, PHNSY Bldg 67, Supervisor, (808) 473-3901 MR2 T. Chaney, PHNSY Bldg 67, Mechanic, (808) 473-8000 x4321 Butch Hudson, PHNSY Bldg 155, Mechanic, (808) 473-8000 x4416 Derrick Singchow, PHNSY Bldg 72, Suprvisor, (808) 473-8000 x3845 Craig Wilson, PHNSY Bldg 1770, Supervisor, (808) 473-8000 x3710 Donald Lopes, PHNSY Bldg 1725, Supervisor, (808) 473-0887 Tammy Rodriguez, NAVFAC Bldg 149, Supervisor, (808) 473-0494 Fred McKissack, Navy Region, Envr Specialist, (808) 473-4131 x223 Ralph Wakumoto, Navy Region, Division Head, (808) 473-4137 x238 Mark Garrett, FISC Bldg 1326, Fuel Deputy Director, (808) 479-3350
Hickam AFB:	Ron Lanier, 15th CES/CEV, Envr Flight Chief, (808) 448-0209 Lou Chiffl, Construction Integration, (808) 449-7264 Capt. I. Beltran, HIANG, (808) 448-7025 Henry Rimas, 15th CES/CEV, Envr Engr, (808) 449-1584 x242 Rodney Due, NAVFAC Wastewater Div Director, (808) 471-0963 Alton Kanno, NAVFAC EP Coordinator, (808) 448-5372 Byron Bae, NAVFAC EP Specialist, (808) 448-5373 Craig Gorsuch, Boose Allen, Contractor, (808) 449-1584 x239 MSGT Elwin Kaneshiro, HIANG Bldg 11666, (808) 448-7048 SGT Nefi Martinez, HIANG Bldg 11672 NDI Tech, (808) 448-7222 John Puu, 15th Airlift, Bldg 2016 Supervisor, (808) 448-1873 MSGT David Rosario, Bldg 2030 NDI Supervisor, (808) 448-2250 Frank Webb, Bldg 2030 Production Suprindentent, (808) 449-6708 Gary Suan, Bldg 2030 AGE Flight Chief, (808) 448-2212 Ernest Brooks, Bldg 2125 Fuels Op Supervisor, (808) 449-2707 Edward Tote, Bldg 2125 Fuel Control Supr, (808) 449-2509 MSGT Baldwin Ojeiro, Bldg 3386 Armament NCC, (808) 448-7762 TSGT Charles Kaga, Bldg 3424 Mechanic, (808) 448-7726

Report Prepared By:	Greg V. Arthur, Environmental Engineer, USEPA Region 9 July 25, 2006

Table of Contents

1.0 Scope and Purpose

On April 10-13, 2006, EPA conducted an NPDES compliance evaluation inspection of the Pearl Harbor military installations. The purpose of this inspection was to ensure compliance with the NPDES permits and the Federal regulations covering the discharge of domestic and non-domestic wastewaters into waters of the United States from the Fort Kamehameha wastewater treatment facility (Fort Kam), and the Pearl Harbor Naval Shipyard (PHNSY) dry docks, as well as the non-domestic discharges from service area sources into the Fort Kam sewer system, and sludge disposal from Fort Kam.

This is the first of three reports. This report covers the findings pertaining to Fort Kam and the sewer service area sources within the Naval Complex. The second report will cover the findings pertaining to the sewer service area sources within Hickam Air Force Base (Hickam). The third report will cover the findings pertaining to the direct discharge of wastewaters from the Pearl Harbor Naval Shipyard dry docks to the ocean.

This NPDES compliance evaluation inspection of the Pearl Harbor military installations consisted of the following:

- The on-site inspection of the Fort Kam wastewater treatment facility;
- On-site inspections of the PHNSY dry docks;
- On-site inspections of the 15 industrial activities qualifying as Federal categorical sources and specifically regulated by the Fort Kam NPDES permit at internal outfalls;
- On-site inspections of 15 other selected industrial activities;
- Close-out briefings with staff from Navy Region Hawaii, NAVFAC Hawaii, PHNSY, and Hickam AFB;
- Review of Navy Region Hawaii instructions 11345.5 and 11345.2C for the industrial wastewater sewer discharge permit system program and the applicable limits;
- Review of 2004-2005 influent, effluent and sludge data for Fort Kam;
- Review of 2004-2005 effluent data for the PHNSY dry docks;
- Review of 2004-2005 effluent data for the permitted internal outfalls;
- Review of the 2004 and 2005 Navy Region annual reports on industrial wastewaters.

The inspection participants are listed on the title page. Arthur conducted the inspections on April 10 through 12 and the final close-out briefing on April 13.

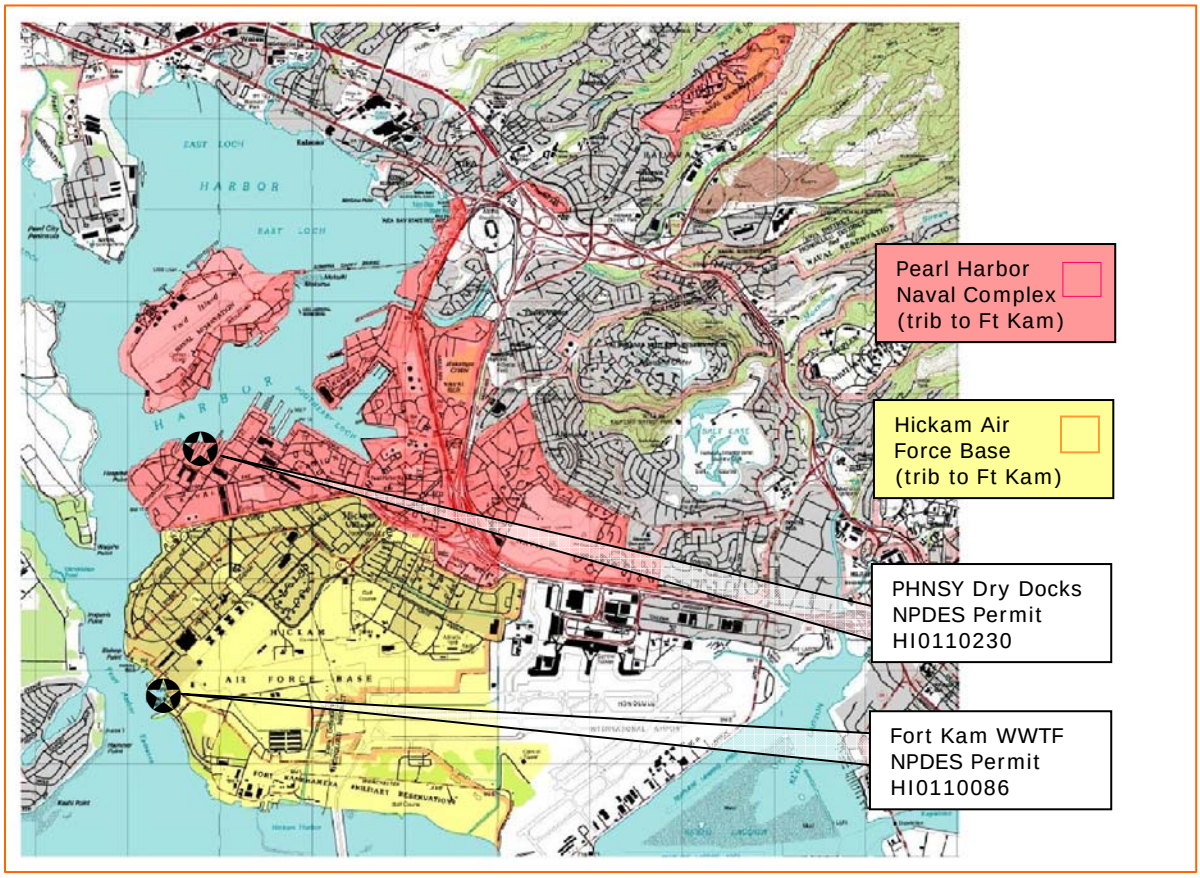
1.1 Background

In June 1996, EPA issued an inspection report that documented the findings of a comprehensive NPDES permit issuance evaluation of the Pearl Harbor military installations. Following the inspection report and after extensive consultations with the Navy, HDOH issued a revised Ft Kam NPDES permit on December 31, 2001, the PHNSY NPDES permit on January 15, 2002, and the final Fort Kam permit modifications on December 23, 2004. This inspection report covers the scope and mirrors the format of the earlier report, with added compliance determinations with the current NPDES permits and modifications. As a result, these three reports together cover Fort Kam, the non-domestic sources into its service area, and the

discharges of non-domestic wastewaters from the shipyard dry docks to the waterways. They do not cover the discharge of storm water run-off into and from a storm sewer system authorized under another NPDES permit.

1.2 Description of the Facilities

The military installations comprise the Pearl Harbor Naval Complex and the Hickam Air Force Base, which together generate and collect domestic and non-domestic wastewater for discharge to the Pacific Ocean under the authority of two NPDES permits issued for Fort Kam and the Pearl Harbor Naval Shipyard dry docks. ***See*** Appendix 1 for a list of industrial operations by building number.



1.3 Pearl Harbor Naval Complex And the Fort Kam Wastewater Treatment Facility

The Pearl Harbor Naval Complex supports the Pacific fleet by providing ships berthing and repair as well as fleet supply, housing and other support services, including sewer service and domestic sewage treatment at Fort Kam. The Commander of the Navy Region Hawaii provides overall command and coordination. The Pearl Harbor Naval Complex involves a number of other commands. The Pearl Harbor Naval Shipyard (PHNSY) and Intermediate Maintenance Facility (IMF) operates dry docks, industrial fabrication shops, piers, and

maintenance shops for use in ship repair. The Naval Station Pearl Harbor (NAVSTA), which absorbed the Submarine Base Pearl Harbor (SUBASE), homeports surface ships and submarines, operates piers and repair shops, and provides other support activities. The Navy Facilities Engineering Command (NAVFAC) Hawaii operates the utilities, ships wastewater collection, the domestic sewers, Fort Kam, bilge oily wastewater and industrial wastewater treatment plants, hazardous waste handling, and a program to control non-domestic discharges to the sewers. The Fleet Industrial Supply Center (FISC) Pearl Harbor operates loading and fueling piers, warehouses, tank farms, a fuel recovery plant, and hazardous material storage. The Defense Reutilization and Marketing Office (DRMO) operates a materials reuse scrap yard.

Operations have remained essentially unchanged since the previous NPDES permit issuance report by EPA in 1996. The one substantial change involves the former SUBASE, now part of NAVSTA, which no longer homeports and operates a floating dry dock, the USS Competent. Many of the operations began before the 1940's although some sources started-up after 1982. The Pearl Harbor Naval Complex does not rework aircraft, manufacture printed circuit boards, or refine oil.

1.4 Hickam Air Force Base

Hickam operates military flight operations, maintenance hangers, aircraft wash racks, and non-destructive testing, photo, and x-ray labs. Hickam also serves as the home base of a number of aircraft. The 15th Airlift Wing is the host department with its tenants including a C-17 transport aircraft squadron, the Hawaii Air National Guard (HIANG) 154th Wing, and a Logistics Readiness Squadron, along with many others. No aircraft rework, printed circuit board manufacturing or electroplating is done on-site. HIANG performs light aircraft maintenance in the hangers. Hickam began operations by the 1940's. A more detailed description can be found in the second report specifically pertaining to Hickam Air Force Base.

1.5 Pearl Harbor Naval Shipyard Dry Docks

The Pearl Harbor Naval Shipyard owns and operates four dry docks designated as Dry Dock Nos. 1 through 4. Caisson vessels are flooded to seal off dry dock entrances and sections after ships are floated in. The caisson vessels are refloated to allow sea water back in to refloat the ships after repair activities have been completed. A more detailed description can be found in the third report specifically pertaining to the PHNSY Dry Docks.

1.6 Facility SIC Code

The Pearl Harbor Naval Complex is assigned the SIC code for national security (SIC 9711). The Fort Kam wastewater treatment facility is assigned the SIC code for sewage treatment plants (SIC 4952).

2.0 Pearly Harbor Naval Complex Wastewater Sources Delivery, Handling, Treatment, Discharge and Disposal

Since 2000, the Navy has made significant improvements in the handling of all wastewaters, in particular through better-controlled delivery methods, upgraded and expanded treatment capability, and a new deep-water ocean outfall. ***See*** Appendix 3 for an overview schematic of wastewater handling at the Naval Complex.

The Pearl Harbor Naval Complex comprises numerous industrial activities, commercial establishments, and domestic housing, operating under multiple command structures. Nearly all non-domestic industrial activities still operate in old installations some of which date back to the 1920's. As a result, the Naval Complex has hundreds of sources of non-domestic wastewaters scattered through out the facility, as well as numerous entry points into the domestic sewer system and, in a few cases, into the storm sewers leading to the surrounding waterways. However, many wastewaters are prior tested to determine the method of delivery and handling through one of the five established wastewater pollution control points.

(1) NAVFAC Fort Kam Wastewater Treatment Facility and Ocean Outfall,
(2) NAVFAC Bldg 1910 Bilge Oily Wastewater Treatment System,
(3) NAVFAC Bldg 1424 Industrial Wastewater Treatment Complex
(4) FISC Bldg 1403 Fuel Reclamation Plant, and
(5) DRMO hazardous waste collection for off-site disposal.

2.1 Fort Kam Wastewater Treatment Facility (NPDES Permitted Wastewater Discharge to the Pacific Ocean)

Fort Kam is a domestic tertiary wastewater treatment plant, upgraded in 1999 to a dry-weather design capacity of 13.0 mgd, and operated by NAVFAC. The service area comprises the Naval Complex and Hickam which together in 2005 had an estimated population of 40,000 and hosted 173 non-domestic sources internally regulated by the Navy. Fort Kam receives domestic sewage, commercial-related wastewaters from restaurants and stores, and industrial wastewaters generally from controlled sources, much like any municipality with an approved pretreatment program. Unlike a municipality, Fort Kam also receives ships sanitary, bilge water, and oily wastewaters, specifically associated with ships services, ships repair, and aircraft services. ***See*** Appendix 4 for a schematic of the wastewater collection and treatment at Fort Kam.

Influent and Delivery - Nearly all domestic and non-domestic wastewaters, including ships sanitary, arrive by sewer trunkline into the Fort Kam headworks. NAVFAC also collects food-related grease and some miscellaneous wastewaters (not septage) from Navy sources for delivery by tanker truck into an on-site dump station which consists of two 15,000 gallons storage tanks and hard-plumbed lines to the headworks or the anaerobic digesters for grease.

Treatment Capability - Treatment involves headworks screening, primary sedimentation, activated sludge aeration, nitrification, anoxic-zone denitrification, secondary clarification, traveling-bridge sand filtration, ultraviolet disinfection, anaerobic sludge digestion, sludge

centrifuge dewatering, and a deep-water ocean outfall. The wet-weather design capacity matches the 24 mgd design capacity for UV disinfection. Treatment capability has greatly improved with five notable design improvements since 2000. First, the dry-weather design capacity has doubled. Second, the biodegradation now includes nitrification and denitrification. Third, the secondary clarifiers are now followed by sand filtration with the capacity to handle peak wet-weather flows. Fourth, effluent clarity from the sand filtration allows the use of ultraviolet disinfection which prevents the formation of chlorination by-products. Fifth, the effluent no longer discharges through a shallow-water outfall into the mouth of Pearl Harbor but extends in a 2.5 mile deep-water outfall into the Pacific Ocean. ***See*** Sections 2.3, 2.4 and 2.6 for the other improvements upstream in the collection system.

Residuals - Headworks screenings and around half of the dewatered digested sludge are disposed in the City and County of Honolulu landfill. NAVFAC is allowed by the State of Hawaii to compost the remaining dewatered digester sludge.

Odor Control - Fort Kam now employs two sets of biotowers for sulfide destruction and biological odor reduction at the headworks and primary sedimentation basins and at the sludge centrifuge. Each biotower set consists of stackable enclosed pallets with lime, fertilizer, compost, bark, ceramic gravel, and clay, through which collected fumes are drawn.

Photo: Ft Kam - Odor Control Biotowers
Taken By: Greg V. Arthur
Date: 04/10/06

Photo: Ft Kam - Tanker Truck Dump Station
Taken By: Greg V. Arthur
Date: 04/10/06

NPDES Sample Points - The NPDES permit requires influent sampling just upstream of the headworks and effluent sampling after UV disinfection. Sludge samples are of dewatered digester sludge. For the purposes of this inspection report, the sample points are designated in this report as NPDES-110086I, NPDES-110086E, and NPDES-110086S, respectively.

2.2 COMNAVREG Hawaii Instructions (Navy Regulation of Discharges into the Fort Kam Sewers)

The Commander of the Navy Region Hawaii issued COMNAVREG Instructions 11345.2D and 11345.5A establishing a sewer discharge permit system and wastewater discharge

limitations for industrial wastewaters into the Fort Kam sewer service area. Under the authority of the COMNAVREG Instructions NAVFAC issues industrial wastewater discharge certificates to each source establishing the specific terms allowing discharge of industrial wastewater into the domestic sewers, much like a permit issued by a municipal pretreatment program . NAVFAC issues the certificates but the certificate holders such as PHNSY Code 106 (Environmental Compliance) are responsible for inspections and sampling. Hickam and some other commands returned the implementation responsibilities to NAVFAC under contract.

The NPDES permit for Fort Kam requires the Navy to implement the COMNAVREG Instructions. In particular, Section F2.a(6) of the NPDES permit requires the Navy to prohibit non-domestic discharges into the Fort Kam sewers in concentrations exceeding the COMNAVREG Instruction. Section F2.b(1) prohibits any source from discharging non-domestic wastewaters into the Fort Kam sewers without first obtaining an industrial wastewater discharge certificate from NAVFAC. ***See*** Appendix 2 for a list of the Industrial Wastewater Discharge Certificates and Section 3.7 for the wastewater discharge limitations.

2.3 NAVFAC Bilge Oily Wastewater Treatment System (Oily Wastewater Control and Discharge to the Fort Kam Sewers)

NAVFAC constructed a centralized oily wastewater treatment system in 2000 to replace two smaller units each with less capability. The Bldg 1910 Bilge Oily Wastewater Treatment System (BOWTS) has a peak design capacity 500,000 gpd. It serves as the control point for all oily wastewaters generated by Naval Complex sources including ships bilge and fuel reclamation tailwaters. On average the Bldg 1910 BOWTS accepts 15,000 gpd of oily wastewater but has accepted as much as 80,000 gallons in a single day, far less than capacity, for cumulative annual averages of over 5 million gallons. ***See*** Appendix 6 for a schematic of the oily wastewater collection, treatment and reclamation at the Naval Complex. Also ***see*** Section 2.5 of this report for a description of the Bldg 1403 FISC Fuel Reclamation Plant.

Influent and Delivery – Oily wastewaters arrive at the Bldg 1910 BOWTS either by dedicated bilge sewer line, tanker truck, or by barge to a bilge sewer line connection. Ships bilge account for most of the oily wastewaters handled by the Bldg 1910 BOWTS. The bilge sewer piping and connections at the piers are painted yellow and black to distinguish them from the other ships services provided pierside. Tailwaters from the Bldg 1403 FISC Fuel Reclamation including drainage from the petroleum oil reserve are delivered by dedicated pipeline. All other oily wastewaters are delivered by tanker truck to an on-site pump station.

Quality Requirements - NAVFAC accepts bilge from US ships for treatment after the ship commander or duty engineer signs to certify the quality of the wastewater based on previous wastewater testing. The same requirements do not apply to foreign ships berthed at Pearl Harbor. NAVFAC is required to accept the bilge from foreign ships without prior approval.

Treatment Capability – The Bldg 1910 BOWTS consists of a large influent equalization tank and two parallel treatment units. Equalization involves a 1.8 million gallon oil storage tank internally partitioned into thirds. The compartments fill one at a time in sequence with

floating oils skimmed to an unused compartment. Skimmed oils are delivered by tanker truck to the Bldg 1403 FISC Fuel Reclamation Plant for fuel recovery. Decant then proceeds through two 200 gpm capacity treatment units. Treatment Units A and B are identical in configuration, providing peroxide oxidation of sulfides, API separation, de-emulsification, caustic-and-polymer-aided flocculation, and induced air flotation removal of coalesced oil.

Photo: BOWTS - NAVFAC Tanker Truck
Taken By: Greg V. Arthur
Date: 04/10/06

Photo: BOWTS - Treatment Unit B
Taken By: Greg V. Arthur
Date: 04/10/06

Residuals - Froth from the induced air flotation units undergoes dewatering through sludge decant holding and a filter press with the press slurry hauled off-site by DRMO as hazardous.

Certificate Sample Points – A NAVFAC Certificate establishes two compliance sample points for the Bldg 1910 BOWTS discharges to the Fort Kam domestic sewers. These certificate sample points are sited at the treatment train ends for Treatment Units A and B. For the purposes of this inspection, these certificate sample points are designated in this report as IWD-1910A and IWD-1910B. The sample results for IWD-1910A and IWD-1910B are reported together as if collected from one sample point because they together are representative of the discharge from the Bldg 1910 BOWTS to the Fort Kam domestic sewers.

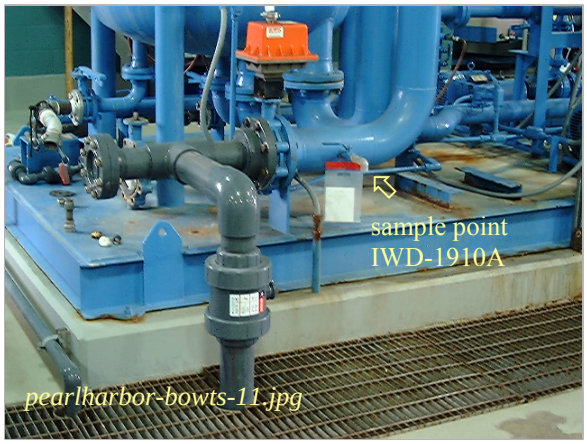


Photo: BOWTS - Sample point IWD-1910A
Taken By: Greg V. Arthur
Date: 04/10/06

Photo: BOWTS - Sample point IWD-1910B
Taken By: Greg V. Arthur
Date: 04/10/06

2.4 NAVFAC Industrial Wastewater Treatment Complex (Industrial Wastewater Control and Discharge to the Fort Kam Sewers)

NAVFAC handles treatable industrial wastewaters in the Bldg 1424 Industrial Wastewater Treatment Complex (IWTC), which in 1998, replaced an old smaller unit with far less capacity and capability. The Bldg 1424 IWTC functions as the control point for all cost-efficiently treatable but not strictly oil-bearing industrial wastewaters generated by Naval Complex sources. It has the capability to accept for batch treatment as much as 30,000 gallons at once and can impound another 40,000 gallons for treatment later, but it is only used at less than 10% capacity. In 2005, the Bldg 1424 IWTC handled only 440,000 gallons of industrial wastewater for the whole year. Untreatable or costly-to-treat industrial wastewaters are handled through hazardous waste collection for off-site disposal. Strictly oily wastewaters are handled through the Bldg 1910 BOWTS. ***See*** Appendix 5 for a schematic of the Bldg 1424 IWTC.

Influent and Delivery – All wastewaters arrive at the Bldg 1424 IWTC by tanker truck or by trucked delivery of drums to a receiving bay. In 2005, over 95% of the wastewaters were collected from the ships themselves in repair. The remainder consists of heavily contaminated deliveries from the hose and pipe shop, brush plating, the fire fighting school, and the two main hazardous waste collection sites. NAVFAC directs the incoming deliveries from the receiving bay into the proper point of treatment with all transfers tracked by a SCADA system. ***See*** Appendix 5 for a breakdown of deliveries to the Bldg 1424 IWTC.

Treatment Capability – The Bldg 1424 IWTC provides batch metals removals, oil removal, and organics destruction. It consists of five 5,000 gallon batch reactor tanks, a sixth 5,000 gallon holding tank feeding an oil/water separator, four 10,000 gallon stand-by holding tanks, a fifth 10,000 gallon holding tank feeding reactor tank decant through a final sand filter for discharge to the Fort Kam sewers, and residuals handling equipment. NAVFAC conducts jar tests of incoming deliveries to determine the necessary reactions and reaction end points.

Photo: IWTC - Receiving Bay
Taken By: Greg V. Arthur
Date: 04/10/06

Photo: IWTC - Jar Test Station
Taken By: Greg V. Arthur
Date: 04/10/06

Reactor Tanks #5, #6, #7, and #8 each can provide metals hydroxide precipitation, ferrous sulfate coagulation, hypochlorite dechelation of metals, polymer flocculation, and settling,

depending on the wastewater characteristics. A fifth batch reactor Tank #30 can provide UV/peroxide oxidation of organic-laden wastewaters but is sparingly used because of the exothermic release of heat. The batch holding Tank #9 and following oil/water separator provides oil removal in conjunction with the removal of inorganics. Each of reactor tank is outfitted with pH and ORP metering to measure reaction end-points. The Bldg 1424 IWTC also includes an unused reverse osmosis and ultrafiltration system.

Photo: IWTC - Treatment Reactor Tanks
Taken By: Greg V. Arthur
Date: 04/10/06

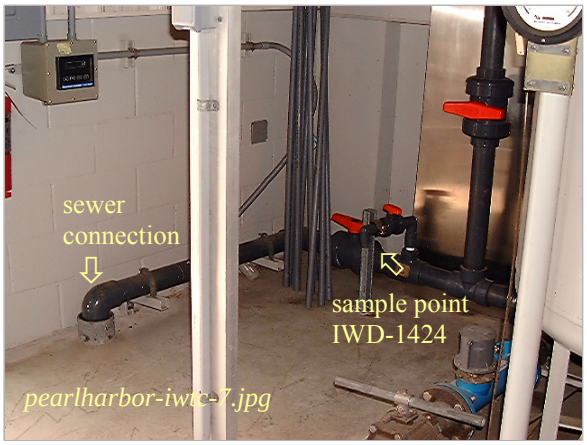


Photo: IWTC - Sample point IWD-1424
Taken By: Greg V. Arthur
Date: 04/10/06

Certificate Sample Point – A NAVFAC Certificate establishes a compliance sample point for the Bldg 1424 IWTC discharges to the Fort Kam domestic sewers. This certificate sample point is after final sand filtration. For the purposes of this inspection, this certificate sample point is designated in this report and illustrated on the Appendix 5 schematic as IWD-1424.

Residuals - Reactor tank residuals are transferred to two 2,000 gallon sludge holding tanks, Tank #11 for inorganic sludges, and Tank #12 for oily sludges. The sludges are then fed through two diatomaceous earth-coated filter presses for dewatering. Press filtrate returns to the receiving bay. DRMO hauls filter press cake off-site as hazardous. Removed free oils fill another holding Tank #10 for off-hauling to the Bldg 1403 FISC Fuel Reclamation Plant.

2.5 FISC Fuel Reclamation Plant (Used Oil Handling to BOWTS and Off-site Oil Refining)

The Bldg 1403 FISC Fuel Reclamation Plant serves as the control point for recovered oils and used oils collected throughout the Naval Complex. Handling is limited to decanting. Wastewater conditioning was discontinued in 2001 with a military contract let to reinstall by 2006. ***See*** Appendix 6 for a schematic of the Bldg 1403 FISC Fuel Reclamation Plant.

Influent and Delivery - Used oils collected throughout the Naval Complex are delivered by truck or tanker truck into Tank B-1, one of two 450,000 gallon oil storage tanks. Ground water seepage from the spill containment around the underground petroleum reserves also drains through a dedicated pipeline to Tank B-1.

Treatment Capability - Current treatment consists only of oil decanting from the influent holding Tank B-1. Fuel decant from Tank B-1 is transferred to Tank B-2 for testing and resale to the Tesoro Refinery as fuel stock. Prior to 2001, the water fraction from the fuel decanting was further conditioned through a caustic-aided oil/water separation, polymer de-emulsification, flocculation, and dissolved air flotation, for discharge to the Fort Kam domestic sewers. These water fraction conditioning steps will resume after new a dissolved air flotation unit is installed later this year.

Certificate Sample Point - NAVFAC has not issued a certificate for the Bldg 1403 FISC Fuel Reclamation Plating because the water fraction discharges to the Bldg 1910 BOWTS for further treatment. NAVFAC will issue a certificate upon installation of the new dissolved air flotation unit. For the purposes of this inspection, the expected certificate sample point is designated in this report and illustrated on the Appendix 6 schematic as IWD-1403.

Storm Water - FISC operates a fuel tank farm immediately upslope from the Bldg 1403 FISC Fuel Reclamation Plant. The storm water drainage captured within the secondary spill containment berms is released through a pipeline constructed through the fuel reclamation plant. The storm water pipeline discharges to a storm sewer connection and does not connect with the fuel reclamation plant. The final valves from the secondary spill containment berms are in a normally locked in a closed position but not tagged out. FISC releases storm water drainage after visual observation verifies no detectible sheen.

2.6 Pierside Ships Services Sources (Ships Sanitary to the Fort Kam Sewers / Bilge to the BOWTS)

NAVFAC provides four pierside ships services to the ships berthed at the Pearl Harbor Naval Complex: (1) potable water, (2) CHT ships sanitary wastewater disposal referred to as collecting holding transfer, (3) oily bilge water disposal, and (4) salt water fire fighting water. Each of these services stub-out at intervals along the piers for connection by hose to the ships. The size and color of the fittings for each of the four services are different, blue for potable water, gold for ships sanitary, yellow and black for bilge, and red for fire.

Photo: Pierside - Bilge Oily Wastewater Sewer
Taken By: Julie Murioka, Navy Region
Date: 04/12/06

Photo: Pierside - CHT Ships Sanitary Sewer
Taken By: Julie Murioka, Navy Region
Date: 04/12/06

The CHT ships sanitary sewer leads through numerous lift stations by force main to the Fort Kam domestic sewer system. The oily bilge water sewer leads through five lift stations to the Bldg 1910 BOWTS. The ships contact NAVFAC Ships Services for potable water, CHT ships sanitary sewer, and fire fighting water. NAVFAC must first approve the connection to the oily bilge water sewer. NAVFAC does not issue certificates for the ships bilge waters but does institute the procedures establishing approval of each connection to the bilge water sewer. ***See*** Section 2.3 of this report, Quality Requirements subsection, for the procedures.

2.7 Naval Complex Non-Domestic Wastewater Sources (Direct and Indirect Internal Discharges into the Fort Kam Sewers)

Fifty-one (51) sources discharge process-related industrial wastewaters directly to the Fort Kam domestic sewer system, forty-eight (48) under the requirements of separate NAVFAC certificates. Treated wastewaters from the Bldg 1910 BOWTS and the Bldg 1424 IWTC constitute the principal industrial wastewater discharges from the Naval Complex into the Fort Kam sewer system. Although the other Naval Complex industrial discharges are for the most part untreated, many of them are controlled through hold-and-test methods, and all are periodically tested for compliance. ***See*** Appendix 2 for the list of the Naval Complex industrial wastewaters discharging to the sewers under NAVFAC certificates. ***See*** Section 2.8 for descriptions of the Naval Complex industrial wastewater sources.

Categorical Discharges – Fifteen (15) discharges to the sewers are or should be regulated under the Fort Kam NPDES permit as categorical industrial wastewater sources subject to the metal finishing regulations in 40 CFR 433. In addition to the treated discharges from the Bldg 1424 IWTC, the categorical industrial wastewater discharges to the sewers consist of untreated contact wastewaters such as hydrotest and hydroblast waters. The NPDES permit assigns internal NPDES outfall numbers to the compliance sampling point for these discharges. ***See*** Section 3.3 of this report for the applicability of the metal finishing rule.

Categorical Discharges to the Sewers	Outfall#	Controls In-Place	Cert #
Dry Docks (hydroblast tailwaters)	013i	hold-and-test	none
Bldg 1424 IWTC (treated wastewaters)	014i	batch treat-release	1622-91
Bldg 1670 Tank 3 (hose flush)	010iA	holding	1423-15
Bldg 1670 Tank 1 (teflon clean/sign shop)	010iB	hold-and-test	1421-15
Bldg 214 (transducer hydrotest)	005iA	none	1148-15
Bldg 214 (cable mold release washdown)	005iB	batch release	1155-15
Bldg 1770 Antenna Shop (hydrotest)	012iA	none	1653-15
Bldg 1770 Insulation Shop (hydrotest)	012iB	none	1652-15
Bldg 1770 Valve Shop (hydrotest)	012iC	none	1651-15
Bldg 1725 Al Flame Spray (blowdown)	011i	batch release	1568-108
Bldg 1456 Cleanliness Certs (hose flush)	008i	none	1119-15
Bldg 155 (water-jet cutting)	004i	filtration	1297-15
Bldg 3B Small Parts and Hoses (hydrotest)	none	none	none
Bldg 5 Prop Shop (spent heat treat quench)	none	batch release	1139-15
Bldg 1910 BOWTS (treated oily waters)	none	dual treatment trains	1623-07

Non-Categorical Discharges – Thirty-seven (36) industrial wastewater discharges to the sewers from Navy sources are regulated solely by NAVFAC certificates. A few are trucked-in from military properties outside of the Fort Kam sewer service area. The non-categorical industrial wastewaters discharged to the sewers without treatment consist generally of untreated non-contact wastewaters such as photo developer tailwaters, non-contact cooling waters, laboratory sink washdown, and ion exchange demineralizer brine regenerant. Selected non-categorical industrial discharges to the Fort Kam sewers are listed below:

Non-Cat Industrial Discharges to the Sewers	Controls In-Place	Cert #
Bldg 315 Radiography (NDI x-ray developer)	silver recovery	1150-15
Bldg 5 Prop Shop (non-contact cooling)	holding	1139-15
Bldg 5 Prop Shop (heat treat cooling)	none	none
Bldg 72 Sheet Metal (weld non-contact cooling)	none	1307-15
Bldg 72 Sheet Metal (photo developer/engraving)	none	1306-15
Bldg 149 (IX regen/cooling tower blowdown)	hold-and-pH test	1004-91
Bldg 1770 Sewage Pump (disinfection soak)	batch release	1650-15

Industrial Wastewaters to Water Pollution Control Points - Many industrial wastewaters are collected for delivery to one of the water pollution control points either for pretreatment before discharging to the Fort Kam sewers or for off-site disposal. These high-strength wastewaters all discharge without NAVFAC certificates since they do not directly enter the Fort Kam sewer system although they may indirectly contribute to the discharges from the water pollution control points to the sewers. Some of the significant Naval Complex industrial wastewaters handled through delivery to the water pollution control points are listed below:

Industrial Wastewaters to Pollution Control Points	Controls In-Place	ControlPts
Bldg 5 Prop Shop (oil quench spents/drainage)	batch delivery	FISC
Bldg 5 Prop Shop (powder coat wet-booth spents)	batch delivery	HazWaste
Bldg 1456 Hose Clean (braze/alk/steam/acid clean)	holding	IWTC
Bldg 67 Brush Plate (alk/deox/etch/plate/anodize)	holding	IWTC
Bldg 67 Machine Shop (machine shop tramp oil)	coolant recycle unit	FISC
Bldg 67 Machine Shop (alodine/ultrasonic/drainage)	holding	HazWaste
Bldg 155 Plasma Cutting (spent catchment water)	batch delivery	IWTC
Bldg 72 Engraving (photo fixant spents)	batch delivery	HazWaste
Bldg 1770 Wet Sanding (blowdown/grit)	holding	HazWaste
Bldg 1403 FISC Fuel Reclaim (water fraction)	holding	BOWTS
Bldg 229 Hazardous Waste (treatable fraction)	batch delivery	IWTC
Bldg 1663 Hazardous Waste (treatable fraction)	batch delivery	IWTC
Bldg 1430 Fire Fighting School (drainage)	holding	IWTC
Dry Docks (mixed/haz/off-spec wastes)	holding	HazWaste

Commercial Wastewaters – Sixty-eight (68) other non-domestic wastewaters from Naval Complex commercial sources discharge to the Fort Kam sewers under NAVFAC certificates. These consists primarily of food preparation sources, swimming pools, gas stations and motor pool facilities, car washes, and laundries.

2.8 Process Descriptions of the Industrial Wastewater Sources

PHNSY Dry Docks - Dry dock operations involve hull depainting, painting, and internal and external ships repair. The dry docks discharge one categorical industrial wastewater, hydroblast tailwaters, to the domestic sewers under the Fort Kam NPDES permit through what is defined as internal NPDES Outfall 013i. The hydroblast tailwaters are collected to holding tanks for testing by PHNSY Code 106 and delivery by truck to Fort Kam. The dry docks also generate a number of other contact and non-contact wastewaters. Non-contact (with ships repair work) wastewaters, such as caisson leakage, ground water seepage, pump test waters, and single-pass cooling water, as well as certain contact wastewaters, such as hull rinse prior to initial repair work, discharge directly through dock sumps to the Pacific Ocean under a separate permit, NPDES HI0110230. Bilge waters are collected to container tanks for delivery to the Bldg 1910 BOWTS for oily wastewater treatment. Mixed (radioactive), hazardous, and off-spec hydroblast tailwaters are collected for off-site treatment or handling. A more detailed description can be found in the inspection report specifically pertaining to the PHNSY Dry Docks.

Bldg 3B New Valve and Pipefittings Shops - The Bldg 3B operations primarily involve shops storage and supply warehousing. The operations also include small parts assembly and hydrotesting. Hydrotesting spents discharge without treatment or testing to a work sink connection to the domestic sewer, and would qualify as categorical. For the purposes of this inspection report, the compliance sampling point is designated as IWD-3B. NAVFAC has not issued a certificate for this discharge and the Fort Kam NPDES permit does not identify it as categorical.

Bldg 5 Propeller Shop - The Bldg 5 operations involve hammer forging, stamping, press forming, heat treatment annealing, and powder coating. The operations generate non-contact cooling waters from the forge presses, single-pass non-contact cooling water from rail bending, water and oil quench spents following annealing and heat treatment, non-contact cooling water from the heat treatment furnace, and wet-curtain booth spents from powder coating. Two of the non-contact cooling waters and the heat treatment water quench spents discharge to the Fort Kam sewers without treatment under a NAVFAC certificate. The other non-contact cooling water discharges to the sewers without a NAVFAC certificate. The heat treatment water spents qualify as a categorical industrial discharge. The powder coating wet-curtain spents and oil quench spents would also qualify as categorical if they discharged to the sewers. The destination of a floor drain next to the oil quench could not be determined.

Bldg 67 Inside Machine Shop - The Bldg 67 operations involve machining, milling, sawing, grinding, lathe work, CNC milling, breaking, alodine metal finishing, and the brush plating of steel, copper, or brass parts. The brush plating itself involves acid etching, acid copper strike plating, hard nickel plating, anodizing, alkaline cleaning, deoxidation, desmut, and alkaline copper plating. The metal finishing steps are performed on a long sloping work table that drains along with a proximity work sink to a sump and 5,000 gallon tank, the contents of which are delivered to the Bldg 1424 IWTC. The metal finishing solutions are applied to parts in small pans and the parts and spents rinsed onto the work table. Metal finishing also involves alodining of clean-wiped or ultrasonic cleaned parts. Machining involves both neat oil and water-based coolants. Spent water-based coolants are collected by

skid-mounted tank for recovery and recycling. The collected spent water-based coolants are delivered to an on-site recycling unit that provides circulating two-stage skimming and holding. The recovered tramp oil is off-hauled for reuse through the Bldg 1403 FISC Fuel Reclamation Plant and the Bldg 1910 BOWTS. The skimmed water-based coolant returns to the machine shop. The machine shop is underlain by floor drains that are now blanked to the sewers. Captured floor drainage in the floor drain trenches are pumped out for delivery to the Bldg 1663 hazardous waste handling facility.

Photos: Bldg 67 - Brushplating Table and Sink Discharge to the 5,000 gal Holding Tank
Taken By: Christie Chun, PHNSY
Date: 04/12/06

Bldg 72 Sheet Metal Fabrication - The Bldg 72 operations include sheet metal bending, breaking, welding, stamping, and cutting, as well as an engraving sign shop. Sign engraving involves the photo resist engraving, thiourea/benzoic acid sealing, and photo developing. Non-contact cooling water from spot welding machines discharges without treatment to the Fort Kam sewers. Photo developer rinse, engraving sink drainage, and sealing rinse from the engraving sign shop discharges without treatment to the sewers through a second connection. The destination of the floor drains could not be determined during this inspection.

Bldg 149 Utilities Power Plant - The Bldg 149 operations comprise the production for shipyard use of salt water, low-pressure air, high-pressure air, and DI water, as well as the operation of a peaker electrical plant. The operations generate cooling tower overflow and ion exchange regenerant backwash for discharge to the Fort Kam sewers. The ion exchange regenerant circulates through a 12,000 gallon holding tank and pH metering. Adjustment of the pH occurs only through the mixing of acidic and alkaline ion exchange regenerant.

Bldg 155 Structural Shops - The Bldg 155 operations include CNC water-jet cutting and plasma plate cutting of plate metal. Wastewaters from both operations would qualify as categorical. The water-jet cutting table overflows to a sump through a paper filter for discharge to the domestic sewers. For the purposes of this inspection report, the compliance sampling point is designated as IWD-155. The Fort Kam NPDES permit also defines this

discharge point as internal NPDES Outfall 004i. The plasma plate cutting table spent catchment water is hauled off-site to the Bldg 1424 IWTC for treatment.

Bldg 214 Electronics Weapons Shop - The Bldg 214 operations involve transducer repair, fabrication and testing. Hydrotest tailwaters from pressure testing and washdown from an outdoor washrack used to clean mold release from new cable qualify as categorical. These wastewaters discharge to the For Kam sewers without treatment. Spent hydrotest waters are drained to the sewer through sampling point IWD-214A after each use. The shop notifies PHNSY Code 106 when draining is expected so that it can be tested quarterly. Cable mold release washdown, collected in 200 gallon troughs, are drained to the sewer without treatment through IWD-214B. The shop notifies PHNSY when draining is expected so that the first discharge of the quarter can be tested. The Fort Kam NPDES permit defines these discharge points as internal NPDES Outfalls 005iA and 005iB. Other floor drains exist in the Bldg 214 that lead to the storm sewers.

Photo: Bldg 214 - Internal Storm Water Drain
Taken By: Christie Chun, PHNSY
Date: 04/11/06

Photo: Bldg 1670 - Tank 1 Discharge to Sewer
Taken By: Christie Chun, PHNSY
Date: 04/12/06

Bldg 315 Radiography Lab - The Bldg 315 operations include NDI testing. Two x-ray photo developer rinses, one of which is treated through a silver recovery canister, discharge to the sewers through two connections. The other NDI testing involves bench-scale dye penetrant and magnaflux testing which do not generate wastewater.

Bldg 1424 IWTC - The Bldg 1424 IWTC discharges categorical industrial wastewaters to the domestic sewers under the Fort Kam NPDES permit through internal NPDES Outfall 014i. This discharge point is designated as IWD-1424 for the purposes of this inspection. ***See*** Section 2.4 of this report. Also ***see*** Appendix 5.

Bldg 1456 Pipe and Hose Shop - The Bldg 1456 operations involve the repair and fabrication of hoses, pipe assembly fabrication, and the cleaning of hoses and pipe assemblies. All wastewaters would qualify as categorical although not all of them discharge to the domestic sewers. Extra cleaning of hoses and pipe assemblies to "steam plant cleanliness" certification generates a washdown that discharges without treatment or testing through two floor drains to the domestic sewers. For the purposes of this inspection report, the compliance

sample point is designated as IWD-1456. The Fort Kam NPDES permit also defines this discharge point as internal NPDES Outfall 008i. In addition, the steam cleaning of hoses, brazing soak, alkaline cleaning, and the soon-to-be-replaced acid cleaning shop generates contaminated wastewaters that accumulate into a 10,000 gallon tank for delivery to the Bldg 1424 IWTC for treatment.

Bldg 1670 Shipboard Services Shop - Bldg 1670 operations involve hose fabrication and repair, teflon application, and a sign shop. Teflon application and quench tailwaters and hose hydrotesting with bleach-chlorinated charge water qualify as categorical. Teflon quench waters are not changed out. All other industrial wastewaters from Bldg 1670 are captured into two holding tanks for discharge to the domestic sewers. Tank 1 accumulates teflon equipment cleaning, teflon work sink drainage, and the sign shop photo developer rinse, for testing by PHNSY Code 106 prior to discharge to the sewer. Tank 1 discharges around 5,000 gallons once per year. Tank 3 accumulates hose hydrotest flush waters for discharge to the sewers without testing. For the purposes of this inspection report, the compliance sample points for Tank 3 and Tank 1 are designated as IWD-1670A and IWD-1670B. The Fort Kam NPDES permit also defines the Tank 3 and Tank 1 discharge points as internal NPDES Outfalls 010iA and 010iB, respectively. ***See*** the photo of Tank 1 above on page 20.

Bldg 1725 Corrosion Control - The Bldg 1725 operations include dry-booth painting, grit blasting dry-booth depainting, mechanical preparation, aluminum flame spray metalizing, dry-booth powder coating and oven curing. Other than the blowdown from the aluminum flame spraying booth, these operations only generate debris for off-hauling. Blowdown from an aluminum flame spray wet-curtain booth qualifies as the only Bldg 1725 categorical industrial wastewater discharging to the domestic sewers. The blowdown when it is generated is discharged without treatment or prior testing. The Fort Kam NPDES permit defines this discharge point as internal NPDES Outfall 011iA.

Bldg 1770 Intermediate Maintenance Facility - Bldg 1770 operations include antenna repair (hydrotesting), the application of rubberized plastic insulation (alcohol prep, sand blast, hot plastic dip, plastic strip, hot curing, hydrotesting), wet-sanding, welding, inside machine shop, small hose fabrication, valve and pump repair (assembly, disassembly, sewage pump bleach soak disinfection, valve/pump hydrotesting). Of these operations, wet-sanding and hydrotest tailwaters qualify as categorical. The wet-sanding tailwaters do not discharge to the sewers but rather are treated through a centrifuge for recycling with the blowdown hauled off-site as hazardous to the Bldg 1663 PHNSY Hazardous Waste Facility. Categorical wastewaters in Bldg 1770 from hydrotesting discharge to the domestic sewers without treatment or prior testing. The Fort Kam NPDES permit defines these discharge points as internal NPDES Outfalls 012iA, 012iB, and 012iC.

Bldg 1910 BOWTS and Bldg 1403 FISC Fuel Reclamation - The Bldg 1403 wastewaters qualify as categorical if the used oils delivered for recovery include spents collected from the categorically regulated operations such as machining, heat treat quench, cleaning, and sheet metal fabrication. In that case, the Bldg 1910 BOWTS discharge currently would qualify as categorical, since the water fraction from Bldg 1403 is delivered to the Bldg 1910 BOWTS for treatment. In the future, if some used oils come from categorically regulated operations,

the discharges to the sewers from Bldg 1403 expected upon installation of the new DAF unit would qualify as categorical. ***See*** Sections 2.3 and 2.5 of this report. Also ***see*** Appendix 5.

2.9 Photo Documentation

Arthur took seventeen (17) photographs during this inspection of Fort Kam, Bldg 1424 IWTC, Bldg 1910 BOWTS, and of selected water pollution controls at Hickam. PHNSY Code 106 personnel took nine (9) photographs of the selected water pollution controls at the dry docks and other selected PHNSY facilities. Navy Region Hawaii personnel took another seven (7) photographs of the pierside utility services. The PHNSY and Navy Region provided digital files of their photographs after obtaining Navy authorization for public release. The photo file names are those used by EPA to store the digital photo files and do not reflect the file names used by the Navy.

Photo Log	#	Photo File Names
Fort Kam	5	*pearlharbor-ftkam-1.jpg, -2.jpg, -3.jpg, -4.jpg, -5.jpg*
IWTC	4	*pearlharbor-iwtc-6.jpg, -7.jpg, -8.jpg, -9.jpg*
BOWTS	4	*pearlharbor-bowts-10.jpg, -11.jpg, -12.jpg, -13.jpg*
Hickam	4	*hickam-b2025-1.jpg, -b2025-2.jpg, -b2030-3.jpg, b3407-4.jpg*
Dry Docks	4	*pearlharbor-drydocks-14.jpg, -15.jpg, -16.jpg, -17.jpg*
PHNSY	5	*pearlharbor-phnsy-18.jpg, -19.jpg, -20.jpg, -21.jpg, -22.jpg*
Pierside	7	*pearlharbor-pierww-23.jpg, -pierww-24.jpg, -pierww-25.jpg, pearlharbor-pierbilge-26.jpg, -pierbilge-27.jpg, pearlharbor-pierwater-28.jpg, -pierwater-29.jpg*

3.0 NPDES Permit Requirements

The NPDES permit must apply Federal BAT/NSPS standards to all regulated sources including the sewage treatment plant and internal industrial activities, as well as apply the Hawaii water quality standards to the discharge to the ocean.

Summary

The NPDES permit for the Fort Kam wastewater treatment facility properly applies Hawaii water quality standards to the ocean outfall discharge from Fort Kam. The NPDES permit also properly applies Federal best-available-technology (BAT) and new source performance (NSPS) standards to Fort Kam and the internal industrial activities. The NPDES permit applies Federal categorical standards to the internal sources discharging to the Fort Kam sewers because dilution from domestic sewage would result in adjusted ocean outfall standards below detection limits. The NPDES permit also requires the implementation by the Navy Region of an industrial wastewater sewer discharge permit system throughout the Fort Kam sewer service area as the expression of BAT/NSPS to the numerous other non-domestic sources. Most of the categorically regulated sources are identified in the NPDES permit. Nearly all of the non-domestic sources also are identified within the Navy Region's industrial wastewater sewer discharge permit system. The application of Federal BAT/NSPS standards and Hawaii water quality standards was determined through visual inspection.

Requirements

- The Federal metal finishing standards apply to the Bldg 1910 BOWTS discharge, and will apply to the Bldg 1403 Fuel Reclaim upon discharge, since used oils from regulated operations such as machining contribute to the discharges from these points to the sewers.
- The Federal standards for existing source metal finishing must be applied to the Bldg 3B hydrotest tail water and the Bldg 5 spent heat treat quench.
- Adjusted Federal standards for both new and existing source metal finishing must be applied to the Bldg 1424 IWTC treated discharge since the facility handles wastewaters generated and delivered from new and existing metal finishing operations.
- The monitoring requirements for the categorically regulated waters, determined through sampling to be uncontaminated, can be reduced to once per year.

Recommendations

- The NPDES permit should list USAF Hickam Air Force Base as a co-permittee, since the COMNAVREG Hawaii Instructions do not include formal enforcement procedures.
- The Fort Kam influent should be monitored for metals, pesticides, toxic organics, pH, EC, and oil & grease.

3.1 Fort Kam Wastewater Treatment Facility

Effluent Discharge - The NPDES permit sets effluent limits for conventional pollutants, nutrients, and biotoxicity that apply to the ocean outfall discharge from Fort Kam. The NPDES permit, as modified in December 2004 to account for the new deep ocean outfall, no longer sets effluent limits for metals, pesticides, and other toxic pollutants, but adds limits for nutrients. The NPDES permit never set influent limits.

NPDES Permit Limits (as modified 12/23/04)	Ocean Outfall No.001 (30d-avg)	(7d-avg)	(d-max)	(instant)	($\mu_{12/yr\text{-}geo}$)	($\mu_{5/mo\text{-}geo}$)
BOD (mg/l)	30	45	-	-	-	-
TSS (mg/l)	30	45	-	-	-	-
Oil & Grease (mg/l)	-	-	10	-	-	-
Residual-Cl (mg/l)	-	-	0.83	-	-	-
Total Nitrogen as N (mg/l)	-	-	-	-	16.65	-
Ammonia as N(mg/l)	-	-	-	-	0.39	-
Total Phosphorus (mg/l)	-	-	-	-	2.22	-
BOD Load (lbs/day)	3300	4900	-	-	-	-
TSS Load (lbs/day)	3300	4900	-	-	-	-
Settleable Solids (ml/l)	1	-	2	-	-	-
Enterococcus Bact (#/100ml)	-	-	-	-	-	35
Chronic Toxicity (TU)	-	-	111	-	-	-
pH (s.u.)	-	-	-	6.0-9.0	-	-
Monitoring Only Required	• copper • selenium • 4,4-DDD • 2,3,7,8-TCDD • TTOs • EC (influent)		• lead • silver • dieldrin • PAHs • nitrate+nitrite • O&G (influent)		• mercury • cyanide • tributyltin • PCBs	

Receiving Waters - The NPDES permit also sets receiving water limits for nutrients, salinity, chlorophyll a, turbidity, dissolved oxygen, temperature, and pH that apply either near the outfall at the edge of the zone-of-initial-dilution or out at the edge of the zone-of-mixing.

NPDES Permit Limits (as modified 12/23/04)	Zone-of-Initial-Dilution (geo-μ)	(90th%)	(98th%)	Zone-of Mixing (geo-μ)	(10th%)	(2nd%)
Total Nitrogen as N (μg/l)	150	250	350	-	-	-
Ammonia as N(μg/l)	3.5	8.5	15.0	-	-	-
Nitrate+Nitrite as N (μg/l)	-	-	-	5	14	25
Total Phosphorus (μg/l)	20	40	60	-	-	-
Chlorophyll a (μg/l)	0.30	0.90	1.75	-	-	-
Turbidity (NTU)	0.50	1.25	2.0	-	-	-
pH (s.u.)	ΔpH <0.5 from 8.1 s.u.			-		
Dissolved Oxygen (%sat)	not less than 75% saturation			-		
Temperature (°C)	ΔTemp <1°C from ambient			-		
Salinity (g/l)	Δ Sal <10% from ambient			-		

Sludge - The NPDES permit refers to Federal sludge regulations in 40 CFR 503 and 40 CFR 258 that apply to the disposal of sewage treatment plant sludges through land application and composting, landfill disposal, or surface monofill disposal. The State of Hawaii allows NAVFAC to dispose the Fort Kam sludge through Navy composting after receipt of sample results confirming low PCBs concentrations. Until confirmation, usually through the first half of each month, NAVFAC disposes sludge to a City and County of Honolulu landfill.

Sludge Disposal Limits mg/kg – dry weight	Landfill Disposal 503.13 Table 1	Land Application 503.13 Table 3	Monofill Disposal 503.23 Table 1
Arsenic	75	41	73
Cadmium	85	39	-
Copper	4300	1500	-
Chromium	-	-	600
Lead	840	300	-
Mercury	57	17	-
Molybdenum	75	-	-
Nickel	420	420	420
Selenium	100	100	-
Zinc	7500	2800	-

3.2 Industrial Wastewater Sewer Discharge Permit System Program

The NPDES permit requires the Navy Region Hawaii to implement a sewer discharge permit system that functions in a similar way, with one notable exception, to the pretreatment programs operated in municipalities. Sections F(1), F(2) and F(3) of the NPDES permit establishes the following requirements:

- All non-domestic discharges to the sewers must be authorized by a NAVFAC certificate.
- NAVFAC must inspect and ensure compliance before issuing any certificate.
- No non-domestic discharges to the storm sewers or other tributaries to surface waters.
- NAVFAC inspections of each certificate source at least once per year.
- Navy Region must submit an annual report.

In essence this means that NAVFAC must (1) maintain and update an inventory of industrial wastewater sources into the Fort Kam sewers, (2) implement the facility-wide the hold-and-test procedures to direct wastewaters requiring treatment to the control points as a condition of obtaining the certificates, (3) eliminate any non-domestic wastewater discharges to the storm sewers, (4) conduct annual inspections of each certificate source, and (5) submit an annual report. These requirements do not cause the Navy Region Hawaii to implement some sort of enforcement program since conceivably every source is under Navy control. This is not exactly the case, since these requirements apply to the entire Fort Kam sewer service area past the boundaries of the Naval Complex. As a result, since these requirements (without enforcement provisions) also apply to Hickam, it would be better to include the United States Air Force on the NPDES permit as a co-permittee.

Section F(2) the NPDES permit also required the Navy Region Hawaii to evaluate whether the COMNAVREG Hawaii Instructions are sufficient to control non-domestic wastewater discharges into the Fort Kam sewers. This report does not include a review of NAVFAC's self-evaluation which was due at the end of June 2005.

3.3 Classification of Industrial Wastewaters by Federal Point Source Category

The Pearl Harbor Naval Complex qualifies as a metal finisher subject to the Federal standards for existing sources in 40 CFR 433.13/14 and for new sources in 40 CFR 433.16. These Federal point source standards apply to 15 wastewater discharges into the sewers that together account for just a small portion of the Fort Kam influent, in order to maintain BPT/BAT/NSPS for the entire facility. The standards themselves apply to the identified internal discharges. All other flows are domestic, or non-domestic but non-categorical, or not directed to the sewers. The NPDES permit correctly classified the Naval Complex as subject to metal finishing standards but did not apply the standards to all regulated sources, nor adjust them to account for both new and existing sources.

New or Existing Sources - A process constructed at an existing source metal finisher after August 31, 1982 is a new source (1) if it entirely replaces a process which caused a discharge from an existing source or (2) if it is substantially independent of the existing sources on-site, 40 CFR 122.29(b). This means new source standards apply to the original installation of new metal finishing lines, rebuilt or moved lines, or existing lines converted to do new operations. This also means the new source standards do not apply to the piecemeal replacement of tanks for maintenance in otherwise intact metal finishing lines but rather apply when a change in configuration provides the opportunity to install the treatment for new sources.

Facility Definition - The Pearl Harbor Naval Complex functions are performed in a number of installations that, because they are contiguous, are considered as one facility. The definition of "facility" comes from the Federal Clean Water Act regulations which define a "source" as not just a building under one command, but as a building, structure, facility, or installation from which there is or may be a discharge of pollutants, 40 CFR 122.2. The metal finishing regulations further refer to the regulated entity as a plant, user, industrial facility, or source, 40 CFR 433.10(a) and 433.14. Taken together a "facility" is defined by common function on a contiguous piece of property. The Pearl Harbor Naval Complex, defined as one facility for purposes of the Clean Water Act, does not extend to Hickam, or to the ships berthed in port, or to other non-contiguous military installations.

3.4 BAT/BPT Existing Source Metal Finishing Standards

The BAT/BPT standards for existing source metal finishing in 40 CFR 433 apply to the 12 existing source metal finishing operations at the Naval Complex listed below.

40 CFR 433.14	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	CNa	TTO
d-max (mg/l)	0.69	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
mo-avg (mg/l)	0.26	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

Outfall #	Existing Source Metal Finishing	433.10(a) Qualifying Operation
013i	Dry Docks (hydroblast tailwaters)	sand blast, paint strp, paint, weld
future	Bldg 1403 FISC Fuel Reclaim (treated ww)	(used oil) machining, heat treat
014i	Bldg 1424 IWTC (treated wastewaters)	plating, etch, anodize, cleaning
010iA	Bldg 1670 Tank 3 (hose flush)	cleaning
010iB	Bldg 1670 Tank 1 (teflon clean/sign shop)	cleaning, painting, sand blast
005iA	Bldg 214 (transducer hydrotest)	testing, calibration
005iB	Bldg 214 (cable mold release washdown)	cleaning
011i	Bldg 1725 Al Flame Spray (blowdown)	flame spraying
008i	Bldg 1456 Cleanliness Certs (hose flush)	cleaning, brazing
004i	Bldg 155 (water-jet cutting)	abrasive jet machining
none	Bldg 3B Small Parts and Hoses (hydrotest)	testing, calibration
none	Bldg 5 Prop Shop (spent heat treat quench)	heat treating
none	Bldg 1910 BOWTS (treated oily waters)	(used oil) machining, heat treat

Standards - The BAT/BPT standards for existing source metal finishing advance limits for metals, cyanide, toxic organics, oil & grease, suspended solids, and pH, for discharges to waters of the United States. The NPDES permit applies the standards to the internal outfalls for just metals, cyanide, and toxic organics, leaving out the standards for oil & grease, pH, and suspended solids, in the same way that pretreatment standards are applied to existing source industrial users of publicly-owned treatment works. This is appropriate because the internal wastewater discharges are further treated by Fort Kam for oil & grease and suspended solids, and regulated for pH. The BAT/BPT standards above for existing source metal finishing from 40 CFR 433.14 are listed in Section A.1(c) of the Fort Kam NPDES permit.

Applicability - Under 40 CFR 433.10(a), the metal finishing standards "... apply to plants that perform ..." the core operations of electroplating, electroless plating, etching, anodizing, chemical coating, or printed circuit board manufacturing and they extend to other on-site operations, such as cleaning, machining, grinding, sand blasting, welding, soldering, solvent degreasing, painting, paint stripping, assembly, calibration, and testing, associated with metal finishing and specifically listed in 40 CFR 433.10(a). If any of the core operations are performed, the metal finishing standards apply to discharges from any of the core or associated operations. As a result, since the Naval Complex performs copper and nickel plating in Bldg 67, alodining in Bldg 67 (a form of chemical coating), deoxidation, acid etching, and desmut in Bldg 67, and acid cleaning in Bldg 1456 once upgraded (all forms of chemical etching), the metal finishing standards for existing sources apply to the discharges listed above.

Applicability at the Treatment Units - ***See*** Section 3.6 of this report for the application of the categorical standards to the combined waste streams handled by the internal treatment units, Bldg 1424 IWTC, Bldg 1910 BOWTS, and Bldg 1403 FISC.

Basis of the Standards - The existing source metal finishing standards were based on a model pretreatment unit that comprises metals precipitation, settling, sludge removal, source control of toxic organics, and if necessary, cyanide destruction and chromium reduction. The best-available-technology standards were set where metal finishers with model treatment operated at a long-term average and variability that achieved a compliance rate of 99% (1 in 100 chance of violation).

Adjustments – The treatment units receive combined waste streams from regulated and unregulated sources. ***See*** Section 3.6 of this report. Otherwise, no adjustments are necessary to account for multiple Federal categories or unregulated flows. Under 40 CFR 433.12(c), the cyanide standards default without adjustment when there are no cyanide bearing flows.

3.5 NSPS New Source Metal Finishing Standards

The NSPS standards for existing source metal finishing in 40 CFR 433 apply to the four new source metal finishing operations at the Naval Complex listed below.

40 CFR 433.14	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	CNa	TTO
d-max (mg/l)	0.11	2.77	3.38	0.69	3.98	0.43	2.61	1.20	0.86	2.13
Mo-avg (mg/l)	0.07	1.71	2.07	0.43	2.38	0.24	1.48	0.65	0.32	-

Outfall #	New Source Metal Finishing	433.10(a) Qualifying Operation
014i	Bldg 1424 IWTC (treated wastewaters)	plating, etch, anodize, cleaning
future	Bldg 1456 (acid cleaning)	etch, cleaning
012iA	Bldg 1770 Antenna Shop (hydrotest)	testing, calibration
012iB	Bldg 1770 Insulation Shop (hydrotest)	testing, calibration
012iC	Bldg 1770 Valve Shop (hydrotest)	testing, calibration

The NSPS standards for new source metal finishing advance limits for metals, cyanide, toxic organics, oil & grease, suspended solids, and pH, for discharges to waters of the United States. Lower cadmium limits are the only difference between the new and existing source standards. The NPDES permit applies the new standards to the internal outfalls for just metals, cyanide, and toxic organics, also leaving out the standards for oil & grease, pH, and suspended solids. The NSPS standards above for new source metal finishing from 40 CFR 433.16 are listed in Section A.1(d) of the Fort Kam NPDES permit.

Applicability - Under 40 CFR 433.10(a), since the Naval Complex performs brush copper and nickel plating in Bldg 67, alodining in Bldg 67 (a form of chemical coating), deoxidation, acid etching, desmut in Bldg 67, and eventually acid cleaning in Bldg 1456 once upgraded (all forms of chemical etching), the metal finishing standards for new sources apply to the discharges listed above.

Applicability at the Treatment Units - The new source metal finishing standards apply to waste streams generated by new sources such as Bldg 1770 and in the future Bldg 1456 acid cleaning shop and delivered to the Bldg 1424 IWTC. ***See*** Section 3.6 of this report for the application of the categorical standards to the internal treatment units.

Basis of the Standards - The new source metal finishing standards were based on a model pretreatment unit that comprises metals precipitation, settling, sludge removal, source control of toxic organics, closed-loop zero discharge of cadmium, and if necessary, cyanide destruction and chromium reduction. The new source performance standards were set where metal finishers with model treatment operated at a long-term average and variability that achieved a compliance rate of 99% (1 in 100 chance of violation).

Adjustments - The treatment units receive combined waste streams from regulated and unregulated sources and from new and existing source metal finishing operations. ***See*** Section 3.6 of this report. No adjustments are necessary to account for multiple Federal categories or unregulated flows at any other internal outfalls. Under 40 CFR 433.12(c), the cyanide standards default without adjustment when there are no cyanide bearing flows.

3.6 Federal Standards Applied to the Treatment Units

Each of the three internal treatment units receive and handle combined waste streams. The Federal standards applied to combined waste streams are adjusted to account for multiple Federal categories and dilution waters.

Federal Standards (mg/l)	Bldg 1424 IWTC (d-max)	Bldg 1424 IWTC (mo-avg)	Bldg 1910 BOWTS (d-max)	Bldg 1910 BOWTS (mo-avg)	Bldg 1403 FISC (d-max)	Bldg 1403 FISC (mo-avg)
cadmium	0.54	0.21	0.69	0.26	0.69	0.26
chromium	2.77	1.71	2.77	1.71	2.77	1.71
copper	3.38	2.07	3.38	2.07	3.38	2.07
lead	0.69	0.43	0.69	0.43	0.69	0.43
nickel	3.98	2.38	3.98	2.38	3.98	2.38
silver	0.43	0.24	0.43	0.24	0.43	0.24
zinc	2.61	1.48	2.61	1.48	2.62	1.48
total cyanide	1.20	0.65	1.20	0.65	1.20	0.65
amenable cyanide	0.86	0.32	-	-	-	-
total toxic organics	2.13	2.13	2.13	-	2.13	-
Flows Total	439750 gal/yr (2005)		15000 gpd (2005)		unknown (future)	
433 Existing	9900 gal/yr		unknown		unknown	
433 New	3450 gal/yr		0 gpd		0 gal/yr	
Dilution	0 gal/yr		0 gpd		0 gal/yr	
Unregulated	426400 gal/yr		$Q_{total} - Q_{433exist}$		$Q_{total} - Q_{433exist}$	

The Federal standards applied to combined waste streams are adjusted using the combined waste stream formula:

$$C_{total} = \frac{(C_{433exist}\, Q_{433exist}) + (C_{433new}\, Q_{433new})}{(Q_{433exist} + Q_{433new})} \times \frac{Q_{total} - Q_{dilution}}{Q_{total}}$$

C – concentration
Q – flow

Bldg 1424 IWTC - The IWTC receives wastewaters from existing source metal finishing operations, from the new source metal finishing operations in Bldg 1770 (and Bldg 1456 in the future), as well as from sources such as the berthed ships that are considered unregulated under the Federal standards. As a result, the Federal standards for the Bldg 1424 IWTC falls between the standards for existing and new source metal finishing for cadmium but are otherwise unadjusted because no dilution waters are involved.

Bldg 1910 BOWTS and Bldg 1403 FISC - The BOWTS receives unregulated waste streams and fuel reclamation plant tailwaters which are composed of unregulated wastewaters and wastewaters generated by existing source metal finishing operations such the Bldg 67

machine shop. As a result, the Federal standards for the Bldg 1910 BOWTS (and Bldg 1403 upon discharge start-up) also remain unadjusted because the discharge does not involve dilution waters or wastewaters from new source metal finishing operations.

3.7 Non-Categorical Industrial Wastewater Sources

Sections F(1), F(2)a, and F(2)c of the NPDES permit require the implementation of a COMNAVREG Hawaii Instruction that expresses the limitations on non-domestic discharges necessary to protect the sewers, treatment plants and receiving waters from adverse impacts. In particular, the COMNAVREG Hawaii Instruction prohibits discharges that can cause the pass-through of pollutants into the receiving waters, the operational interference of the treatment works, the contamination of the sewage sludge, sewer worker health and safety risks, fire or explosive risks, and corrosive damage to the sewers. As a result, the internal limits applied to Naval Complex and Hickam non-domestic sources mirror the national prohibitions in 40 CFR 403.5 that apply nationwide to all non-domestic sewer discharges.

COMNAVREG Hawaii Instruction 11345.2D					
pollutants	(d-max)	(mo-av)	pollutants	(d-max)	(mo-av)
temperature (°F)	150°F	120°F	arsenic (mg/l)	0.5	0.1
pH (s.u.)	5.5-9.5	-	barium (mg/l)	50	25
chlorine demand (mg/l)	50	20	beryllium (mg/l)	0.2	0.1
sulfides (mg/l)	5.0	0.5	cadmium (mg/l)	0.69	0.26
BOD (mg/l)	600	200	total chrome (mg/l)	2.77	1.71
TSS (mg/l)	600	300	hex chromium (mg/l)	0.50	0.25
TOC (mg/l)	1200	600	copper (mg/l)	3.38	2.07
oil&grease (mg/l)	150	75	lead (mg/l)	0.69	0.43
oil&grease-petro (mg/l)	50	25	mercury (mg/l)	0.05	0.01
MBAS surfactants (mg/l)	30	15	nickel (mg/l)	3.98	2.38
total cyanide (mg/l)	1.20	0.65	selenium (mg/l)	0.9	0.2
chlorides (mg/l)	8000	5000	silver (mg/l)	0.43	0.24
sulfates (mg/l)	1000	600	thallium (mg/l)	0.5	0.1
fluoride (mg/l)	5	2	tin (mg/l)	10	2
strong oxid agents (mg/l)	0.50	0.25	zinc (mg/l)	2.61	1.48
strong redx agents (mg/l)	5.0	1.0	orgnc solvents (mg/l)	2.5	1.0
formaldehyde (mg/l)	5.0	1.0	TTOs (mg/l)	1.37	-
selected narrative prohibitions	no adverse discoloration no gasoline, fuel oil, flammable or explosive liquids no toxic, noxious, malodorous, poisonous substances no aqueous fire fighting foam				

3.8 Point(s) of Compliance

Sewage Treatment Standards - Federal secondary sewage treatment standards and Hawaii water quality standards apply end-of-process-after-treatment to the ocean outfall effluent

discharge point, designated in this report by NPDES permit number (NPDES-110086E). The NPDES permit also sets zone-of-initial-dilution and zone-of-mixing limits for nutrients, turbidity, dissolved oxygen, salinity, temperature, and pH that apply at the receiving water sampling locations.

Federal Metal Finishing Standards - Federal categorical standards apply end-of-process-after-treatment to all Federally-regulated discharges. They cannot be applied to combined wastewaters when the domestic fraction results in a proportional downward adjustment in the standards below pollutant detection limits. As a result, at the Naval Complex, the Federal standards cannot be applied to the overall discharge from Fort Kam to the ocean. Instead, the internal discharge points to the Fort Kam sewers are the suitable compliance sampling points representative of the day-to-day discharge of Federally-regulated wastewaters. The internal discharge points are designated in this report by building number.

NAVFAC Certificate Limits - The internal COMNAVREG Hawaii Instruction limits apply end-of-pipe to all non-domestic wastewater sources into the Fort Kam sewers.

3.9 Compliance Sampling

The NPDES permit as modified on December 23, 2004 to account for the installation and use of the deep water ocean outfall sets the following monitoring requirements:

NPDES Permit Discharge Points	conven-tionals	pH	bacteria	nutrients	biotox	metals CN	TTOs
Fort Kam Outfall	1/day	1/day	5/mon	1/mon	1/mon	1/year	1/year
Fort Kam Influent	4/year	-				-	-
Receiving Waters	2/year	2/year		2/year			
Bldg 1424 IWTC						4/year	4/year
Bldg 1910 BOWTS						-	-
Bldg 3B hydrotest						-	-
Bldg 5 quench						-	-
Bldg 155 water-jet						4/year	4/year
Bldg 214A hydrotest						4/year	4/year
Bldg 214B washrack						4/year	4/year
Bldg 1456 flush						4/year	4/year
Bldg 1670A Tank 3						4/year	4/year
Bldg 1670B Tank 1						4/year	4/year
Bldg 1725 Al-flame						4/year	4/year
Bldg 1770A antenna						4/year	4/year
Bldg 1770B insulat'n						4/year	4/year
Bldg 1770C valve						4/year	4/year
DryDocks hydroblst						4/year	4/year

Outfall and Receiving Waters - The compliance sampling for the Fort Kam ocean outfall and the receiving waters is appropriate since the treated wastewaters now discharge through a deep ocean outfall and there were no recorded NPDES permit violations in 2004-2005.

Influent - The Fort Kam influent is not monitored for the trace and toxic pollutants that are incompatible with the sewage treatment plant operations. Influent monitoring provides the best measure of the control of incompatible pollutants from non-domestic and domestic sources, and as such, should be done often enough to provide trend and early warning notice of uncontrolled or unidentified pollutant loadings.

Streamlining - Under 40 CFR 122.44(i) and 122.44(a)(2), some of the categorical sources could be monitored as infrequently as once per year. These include the categorical sources or uncontaminated wastewaters, with no recorded NPDES permit violations in 2004-2006, that are controlled through hold-and-test procedures prior to discharge in order to determine whether to discharge to the Fort Kam sewers or to delivery for further treatment. ***See*** Section 7.0 of this report for the likely qualifying reductions in monitoring.

Treatment Units - The treatment units provide the control of incompatible pollutants from non-domestic sources at the Naval Complex. As a result, discharges from Bldg 1424 IWTC, Bldg 1910 BOWTS and Bldg 1403 FISC to the Fort Kam sewers should be monitored often (at least monthly) to provide an assurance and demonstration of treatment efficiency.

4.0 Wastewater Treatment Plant Performance

Fort Kam must meet effluent limits for conventional pollutants, nutrients, oil and grease, bacteria, and chronic biotoxicity. [NPDES Permit §A(1)]

The receiving waters near the must meet zone-of-initial-dilution and zone-of-mixing limits for nutrients, pH, dissolved oxygen, and other indicators of ambient conditions. [§C(2,3)]

Non-domestic wastewaters may not result in unpermitted releases, hazardous or explosive conditions with the sewers, or operational interferences in the collection system. [§F(1)]

Fort Kam sewage sludges must meet the Federal sludge standards in 40 CFR 503. [§E(1)]

Summary

Fort Kam has the capacity and capability to handle the domestic wastewaters from Pearl Harbor and Hickam. Fort Kam has consistently complied with all NPDES permit effluent and sludge limits over the past two years. The effluent is of significantly higher quality now that Fort Kam provides tertiary treatment and nitrification/denitrification, and because toxics-bearing and oily wastewaters are controlled through BAT-equivalent pretreatment units. Furthermore, the discharge of high quality effluent through the deep-water ocean outfall would be expected to further prevent instances of toxicity, nutrient-induced biomass blooms, or adverse changes in the ambient conditions in the receiving waters. ***See*** Appendix 7 – Tables 7.1 through 7.4 for wastewater and sludge summaries.

Requirements

- None.

Recommendations

- Bilge wastewaters from foreign ships could be tested prior to acceptance if they were first collected into barges and then transferred to the oily wastewater sewer system.

4.1 NPDES Permit Effluent Limits

Fort Kam has consistently complied with all NPDES permit effluent limits for the past two years. The effluent quality is of significantly higher quality now that Fort Kam provides tertiary treatment and nitrification/denitrification. The BOD/TSS concentrations and loadings are an order of magnitude below the NPDES permit limits. Concentrations of nutrients, ammonia, and oil and grease, as well as pH measurements all meet the NPDES permit limits and so are not expected to cause the receiving waters to exceed the zone-of-initial-dilution and zone-of-mixing limits. Nearly every daily pH measurement is between 7.0 and 7.5 s.u., and nearly every daily oil and grease concentration is below the <0.50 mg/l detection limit. All 12-month geometric means for nutrients and ammonia concentrations also meet limits.

Conventional Pollutants - Fort Kam produces high-quality tertiary-treated wastewaters. As a result, it consistently complies with its NPDES permit limits for conventional pollutants. The effluent average and calculated 99th% peaks are less than 3 and 4 mg/l BOD and 2 and 6 mg/l TSS even though high-strength oily wastewaters and ships sanitary constitute a signify-cant fraction of the Fort Kam influent. Because of infiltration/inflow and ships sanitary, the Fort Kam influent arrives weaker than typical domestic sewage (150-200 mg/l BOD/TSS), with influent average and calculated 99th% peaks of 60 and 80 mg/l BOD and 91 and 174 mg/l TSS. Nevertheless, because of the high-level of wastewater treatment provided, the Fort Kam BOD and TSS removals rates average 96% and 97%, well above 85%.

Oil and Grease - There were only a handful of instances of the effluent oil and grease found in the daily samples over the past two years at levels above the detection limits. In fact, influent oil and grease concentrations arrive at the WWTF at concentrations already under the 10 mg/l effluent NPDES permit limit, falling within a range of 2.6 and 9.2 mg/l. These are definitive indications of the effectiveness of the oily wastewater handling methods now employed at the Naval Complex. ***See*** Sections 2.3, 2.5, and 6.2 of this report.

Ammonia Toxicity - The NPDES permit sets both effluent limits and receiving water limits for total ammonia. Ammonia toxicity is a function of the ammonium ion fraction which increases in response to increases in pH and, to a lesser degree, in temperature. Because of effective nitrification, the WWTF complies with its 12-month geometric-mean limit for ammonia. Spikes in ammonia toxicity in the receiving waters would not be expected because nearly every pH measurement consistently falls between 7.0 and 7.5 with a median of 7.2.

Nutrients - The NPDES permit sets both effluent limits and receiving water limits for total nitrogen and phosphorus. Because of effective denitrification, the WWTF complies with its 12-month geometric-mean limit for total nitrogen. The WWTF also complies with its total phosphorus limit in all likelihood because of low levels of influent phosphorus. As a result, nutrient levels in the receiving water above the NPDES permit limits would not be expected.

Toxicity - Chronic biotoxicity tests have all fallen with limits. As a result, toxicity effects are not expected in the receiving waters.

Toxic Metals - The NPDES permit no longer sets effluent limits for toxic metals now that the deep-water ocean outfall is in operation. In 2004, all effluent concentrations of toxic metals were below the NPDES permit limits in effect then. Influent toxic metals concentrations appear to be consistent with municipal sewer districts effectively operating approved pre-treatment programs, although the sampling detection limits are too high to tell for some of the metals (*selenium, cadmium, chromium, lead, nickel, silver*). This is a good indication of the effectiveness of the industrial wastewater handling through the Bldg 1424 IWTC control point, hold-and-test procedures, and the industrial wastewater certificate program.

Toxic Organics and Pesticides - The NPDES permit also no longer sets effluent limits for toxic organics and pesticides (*444-DDD, dieldrin, dioxin, volatile organics, semi-volatile organics, butyltins (tri-, tetra-, di-, mono-), PCBs, pesticides*). All samples for these toxics in the effluent have been below their detection limits.

4.2 Prevention of Sewerage Works Interference

The NPDES permit requires the Navy Region to publish an annual report that among other things lists spill and upset events. According to the 2004 and 2005 annual reports, there have been no reported spills of wastewater from the three Fort Kam sewer collection systems, for domestic sewage, ships sanitary, and oily bilge wastewater sewer. There are structural and operational reasons for the prevention of interferences.

Oily Wastewaters - Even though there are numerous high-strength oily wastewaters, the well-designed controls on their delivery and the effectiveness of oily wastewater treatment have prevented the occurrence of petroleum-related sewer obstructions and treatment plant interferences. The delivery lift stations are now on SCADA systems. Used oils and other high-oil content wastewaters are delivered by truck to the Bldg 1910 BOWTS or the Bldg 1403 FISC Fuel Reclaim. The various pierside connections are segregated and immediately distinguishable from each other thereby better preventing cross contamination. The Bldg 1910 BOWTS has the equalization capacity to operate consistently. NAVFAC procedures require certification of bilge water quality by most ships command prior to acceptance into the Fort Kam sewers. The only uncontrolled oily wastewaters accepted into the Fort Kam sewers are bilges from foreign ships. NAVFAC would have the opportunity to test for incompatible pollutants such as radionucleids and PCBs prior to acceptance, if bilge wastewaters from foreign ships first were collected into the barges.

High-Strength Wastewaters - Sampling shows that the Fort Kam wastewater treatment facility receives weak-strength wastewaters with average and calculated 99% peak influent BODs of 60 and 90 mg/l. Sampling also shows that the incoming sewage has higher salinity levels than typical for municipalities, but consistent levels with average and calculated 99% peak electrical conductivities of roughly 17,000 and 21,000 µmohs/cm. Ships wastewaters and sea water infiltration account for the salinity but the countervailing controls on their delivery and consistent operations of the treatment works prevent interferences.

UV Disinfection - Redundant sand filtration capacity prevents the passage of cloudy treated wastewaters that would interfere with the operation of the UV disinfection units.

4.3 Compliance with Sludge Disposal Limits

Fort Kam sludges consistently comply with the Federal ceiling sludge limits for disposal as landfill cover in Table 1 of 40 CFR 503.13, and after composting, the more stringent Federal clean sludge limits suitable for any reuse in Table 3 of 40 CFR 503.13. The average copper contents of un-composted sludges exceed the 1,500 mg/kg-dry weight Table 3, however, after composting, the maximum copper content was 575 mg/kg. Both standards apply since half of the sludge is disposed to the City and County landfill and half is to a Navy composting operation. NAVFAC self-monitors un-composted sludges for PCBs each month in order to verify that the contents are below 1.0 mg/kg before composting. NAVFAC self-monitors the un-composted sludges for priority pollutants twice per year and the composted sludges upon land application. ***See*** Section 7.1 for proposed modifications in the NPDES permit sampling for sludge.

5.0 Industrial Wastewater Permit System Program Requirements

The Navy Region Hawaii must implement an industrial wastewater permit system that does at least the following [NPDES Permit §F(1,2,3)]:

- maintain and update an inventory of industrial wastewater sources to the Fort Kam sewers,
- issue certificates to all non-domestic discharges into the Fort Kam sewers,
- implement procedures to direct all wastewaters requiring treatment to the wastewater treatment control points as a condition of obtaining the certificates,
- eliminate any non-domestic wastewater discharges to the storm sewers,
- eliminate all non-certificate industrial wastewater discharges to the Fort Kam sewers,
- conduct annual inspections of each certificate source, and
- submit an annual report.

Summary

NAVFAC operates a very effective and thorough sewer use permit program for non-domestic wastewaters discharges from industrial and commercial sources to the Fort Kam sewers. NAVFAC inspectors, shop operators, and the environmental staffs of the various commands were all fully knowledgeable of the industrial wastewater sources, wastewater control procedures, and the applicable requirements. There were only a few shortcomings.

Requirements

- Connections to the storm sewers in areas of industrial activities must be sealed.

- Non-certificate industrial wastewater sources must either be sealed or issued a certificate.

Recommendations

- The Naval Complex should be surveyed in order to find and seal-off any remaining connections to the storm sewers in areas of industrial activity.

- The annual reports should include summary data regarding treatment, hauling and sludge.

- The Bldg 1403 FISC Fuel Reclamation Plant should install a built-in diversion valve and line from the upper tank farm storm water line to the oily wastewater sewer connection.

5.1 Inventory of Industrial Wastewater Sources

EPA found nearly all industrial wastewater sources into the Fort Kam sewers from the Naval Complex and Hickam to be operating under NAVFAC issued certificates. The 2005 Navy Region Hawaii annual report listed 173 wastewater sources operating under certificate -- 48 industrial and 68 commercial Naval Complex wastewater sources, 18 industrial and 36 commercial Hickam wastewater sources, and 3 industrial off-site sources. EPA found only a few non-certificate sources of industrial wastewaters, some of which require certificates, and

some of which require closure. Those specifically requiring closure include any open sewer connection from industrial activities to the storm sewers (*Bldg 214 weapons shop*). Others requiring closure or permitting under certificate include those found during this inspection (*Bldg 5 air cover non-contact cooling, Bldg 5 oil quench drain, Bldg 3B hydrotest, Bldg 1770 pump disinfection, Hickam Bldg 3400 dye pen*) and a possible future diversion from the storm water line for the FISC upper tank farm to the oily wastewater sewers. The installation of a built-in diversion from the storm water line to the Fort Kam sewers would provide positive control of contaminated oily wastewaters away from discharge into the storm sewers.

5.2 Permit System Implementation

The industrial wastewater permit system is well implemented and very effective in bringing about the BAT/NSPS control of the non-domestic wastewater sources into the Fort Kam sewers. The EPA inspector observed the following:

- NAVFAC certificates were visible and posted at nearly all industrial wastewater sources inspected by EPA during this inspection. The small handful of sources found without NAVFAC certificates were those that were not identified in the inventory.

- The NAVFAC inspectors had thorough knowledge of all industrial wastewater sources including those not under certificate. The inspectors were also immediately recognized by all shop personnel responsible for the operation of the sources.

- NAVFAC inspectors inspected the non-domestic wastewater sources at least once per year and in many cases as often as once per month. The major commands (PHNSY, Hickam, FISC) also sample and inspect many of their own industrial wastewater sources and report the findings to NAVFAC. See Section 7.2 of this report.

- The major commands (PHNSY, Hickam, FISC), as well as NAVFAC Environmental all had environmental staff in-place that also had full knowledge of the industrial wastewater sources, the applicable requirements, and past sampling results.

- All industrial wastewater sources except one were found to be effectively controlled through prior water quality characterization, hold-and-test procedures, or treatment equivalent to or exceeding BAT. The exception was the Bldg 214A hydrotest discharge.

5.3 Annual Reporting

The annual reports submitted by the Navy Region Hawaii to the State fully provide the information required by the NPDES permit -- inventory list, results of inspections/sampling, and revoked certificates. The annual report should also include additional summary data regarding (1) the volumes and sources of wastewaters treated by the Bldg 1424 IWTC, Bldg 1910 BOWTS, and Bldg 1403 FISC Fuel Reclaim, (2) the volumes and sources of wastewaters hauled off-site as hazardous, (3) the volume of reclaimed oil, (4) the volume of sludge disposed to landfill, and (5) the volume of sludge composted on-site.

6.0 Compliance with Standards at Internal Outfalls

Categorical industrial sources must comply with the Federal categorical standards that apply to their process wastewater discharges. [NPDES Permit §A(1c) and §A(1d)]

Non-domestic sources must comply with the COMNAVREG Hawaii Instruction wastewater discharge limits. [NPDES Permit §F(2a)(6)]

Bypassing of treatment necessary to comply at non-domestic sources and dilution as a substitute for treatment at categorical sources is prohibited. [NPDES Permit §A(1c) and §A(1d)]

Summary

The discharges of industrial wastewaters from the NPDES permitted internal outfalls to the Fort Kam sewers are handled in three ways. Contaminated wastewaters are treated through the Bldg 1424 IWTC or the Bldg 1910 BOWTS before discharging to the sewers. Potentially contaminated wastewaters such as hydroblast are captured for testing prior to discharge. The rest discharge uncontrolled. The controls (treatment and hold-and-test) are universally well-designed and operated, for the most part exceeding best-available-technology. As a result, the controlled wastewater discharges would be expected to consistently comply with both Federal standards and COMNAVREG limits although there were scattered violations attributable to shortcomings in Bldg 1424 IWTC operations and Bldg 1910 BOWTS design. Uncontrolled discharges generally consist of hydrotest waters and would not be expected to contain pollutant levels much above detection limits. However, there was a violation of the toxic organics standards at one of the uncontrolled hydrotest discharges. ***See*** Appendix 8, Tables 8.1 through 8.13, for the self-monitoring results for the internal outfalls.

Requirements

- The Bldg 1910 BOWTS must be upgraded to comply with the sulfide limits or NAVFAC should establish new technically-based limits based on actual sewer system impacts.

Recommendations

- NAVFAC should identify the source of cadmium found once in the Bldg 1424 IWTC discharge at elevated levels.
- The Bldg 1910 BOWTS metals precipitation step should be operated in the pH ranges conducive to zinc removal.
- NAVFAC should consider adding a preliminary sulfide oxidation step upstream of the Bldg 1910 BOWTS in the incoming equalization tank or in the collection system.
- NAVFAC and PHNSY should establish procedures to prevent the introduction of toxic organics into pressure hydrotest waters.

6.1 Bldg 1424 Industrial Wastewater Treatment Complex

The Bldg 1424 IWTC is designed and operated with the procedures and controls necessary to achieve consistent compliance with the best-available-technology ("BAT") standards. In particular, strict delivery and acceptance controls, jar testing, batch treatment, excess treatment capacity, varied treatment capability, and batch discharge after testing institutes a level of control that is able to result in 100% compliance with both Federal metal finishing standards and the COMNAVREG Hawaii Instruction wastewater discharge limits.

However, since 2002, not all samples collected from the Bldg 1424 IWTC complied with standards. Twelve of 14 (86%) samples complied with the Federal standards however. The other two samples exceeded standards in each instance by orders of magnitude. One sample had a cadmium concentration 65 times the Federal standards. The other sample had copper, lead, nickel, and zinc concentrations between 30 and 280 times their Federal standards. These sampling violations appear to be the result of a failure by personnel to follow the operating procedures, since the facility design and operating procedures exceed BAT. Increased NPDES permit monitoring, NAVFAC internal monitoring, documentation, and reporting would result in increased accountability by personnel. ***See*** Section 2.4 of this report for a description of the design and operation of the IWTC. ***See*** Section 7.2 of this report for self-monitoring requirements. Appendix 8, Table 8.1, for a summary of the sampling results for the Bldg 1424 IWTC discharge to the Fort Kam sewers.

6.2 Bldg 1910 Bilge Oily Wastewater Treatment System

Oils, Metals, Cyanide and Organics - The Bldg 1910 BOWTS is designed and operated with the procedures and controls necessary to achieve consistent compliance with the best-available-technology ("BAT") standards for metals and cyanide and the COMNAVREG Hawaii limits for oil & grease, surfactants, metals, cyanide, total organic carbon. In particular, extensive influent equalization, parallel treatment trains, delivery and acceptance controls for most bilge and oily wastewaters, and multiple methods of oil removal all result in the effective removal of oils and the pollutants entrained in the oils. Thirty-five of 36 (97%) of samples complied with all standards for metals, cyanide, oil and grease, and organics. The lone violation was for zinc. The removal of dissolved zinc through metals precipitation requires the close control of pH near 9.2. ***See*** Section 2.3 and 2.5 of this report for a description of the design and operation of the Bldg 1910 BOWTS and upstream Bldg 1403 FISC Fuel Reclamation Plant. ***See*** Appendix 8, Table 8.2, for a summary of the sampling results for the Bldg 1910 BOWTS discharges to the Fort Kam sewers.

Sulfides - Only 25 of 45 (56%) of the samples complied with the COMNAVREG Hawaii limits for sulfides. Chemical oxidation could begin in the equalization tank or further upstream in the incoming deliveries and pipelines. Chemical oxidation could also be instituted in the line downstream from the Bldg 1910 BOWTS to Fort Kam in order to prevent the formation of adverse effects under septic conditions from the release of sulfides as sulfuric acid fumes. Finally, if septic conditions cannot form, then the internal COMNAVREG limits for sulfides could be recalculated to reflect the actual conditions in the line from the BOWTS to Fort Kam and to specifically apply to just that line.

6.3 PHNSY Dry Docks Hydroblast

The capture and testing of hydroblast wastewater prior to delivery into the Fort Kam sewer system ensures consistent compliance with all Federal standards and COMNAVREG limits. All samples registered below detection limits and well below standards for cadmium, lead, chromium, nickel, silver, zinc, cyanide, and toxic organics. A single sample for copper was above detection limits but well below standards. ***See*** Appendix 8, Table 8.3, for a summary of the sampling results for the drydock hydroblast discharges to the Fort Kam sewers.

6.4 Bldg 214A Pressure Hydrotest

Pressure hydrotest wastewaters discharge after each charge without control or treatment. As a result, compliance with Federal standards entirely relies on operator procedures. Sampling indicates consistent low levels of zinc above detection limits but below the standards and an intermittent significant presence of toxic organics (*4,6-dinitro-2-methylphenol, toluene, bromoform*). The toluene concentration in one sample violated the Federal standards and COMNAVREG limits for total toxic organics. In another, the methylphenol concentrations were significantly over detection limits but below standards. NAVFAC and PHNSY should identify any sources of toxic organics in these hydrotest waters and establish procedures to control their introduction into the pressure test. All samples for the other metals and cyanide were below detection limits. ***See*** Appendix 8, Table 8.4, for a summary of the sampling results for these hydrotest discharges to the Fort Kam sewers.

6.5 Bldg 214B Cable Mold Release Washrack

Mold release washrack wastewaters discharge without control or treatment. Sampling indicates consistent compliance with Federal standards and COMNAVREG limits. There were consistent low levels of zinc above detection limits but below the standards and an occasional low level of toxic organics (*n-nitrosodimethylamine*) above detection limits but below the standards. All samples of the other metals and cyanide were below detection limits. ***See*** Appendix 8, Table 8.5, for a summary of the sampling results for the cable mold release discharges to the Fort Kam sewers.

6.6 Bldg 155 Water-Jet Cutting

Water-jet cutting table tailwaters discharge without control through a low-efficiency filter. Sampling indicates consistent compliance with Federal standards and COMNAVREG limits with intermittent low levels of the stock metals involved in cutting (*chromium, copper, nickel, zinc*) and of toxic organics (*diethylphthalate*). All samples of the other metals and cyanide were below detection limits. ***See*** Appendix 8, Table 8.6, for a summary of the sampling results for the water-jet cutting discharges to the Fort Kam sewers.

6.7 Bldg 1456 Steam Plant Cleanliness Hose Flush

The steam plant cleanliness certification hose flush discharges without control or treatment. Sampling indicates consistent compliance with Federal standards and COMNAVREG limits. All samples except one were below the detection limits. In one sample for toxic organics, bromoform was detected but below the quantifiable level. ***See*** Appendix 8, Table 8.7, for a summary of the sampling results for the steam plant certification hose flush discharges to the Fort Kam sewers.

6.8 Bldg 1670A Tank 3 Hose Hydrotest Room

Hydrotest flushing waters discharge to a holding tank for testing prior to discharge to the sewers. Sampling indicates consistent compliance with the Federal standards and the COMNAVREG limits. There were consistent low levels of copper, zinc and toxic organics above their detection limits but below standards. All samples of the other metals and cyanide were below detection limits. ***See*** Appendix 8, Table 8.8, for a summary of the sampling results for the hose hydrotest flush discharges to the Fort Kam sewers.

6.9 Bldg 1670B Tank 1 Teflon/Sign Shop

Teflon equipment washdown and sign shop photo developer rinse discharge to a holding tank for testing prior to discharge to the sewers. Sampling indicates consistent compliance with the Federal standards and the COMNAVREG limits. There were low levels of copper, zinc and toxic organics above their detection limits but below standards. All samples of the other metals and cyanide were below detection limits. ***See*** Appendix 8, Table 8.9, for a summary of the sampling results for the hose hydrotest flush discharges to the Fort Kam sewers.

6.10 Bldg 1725 Aluminum Flame Spray

There were no discharges of aluminum flame spray scrubber blowdown reported in 2004 or 2005. The blowdown can be tested prior to discharge since it is captured in the holding basin of the scrubber.

6.11 Bldg 1770A/B/C Hydrotest Waters

All three hydrotest waters from the antenna shop, insulation shop, and valve shop discharge without control or treatment. Sampling indicates consistent compliance with Federal standards and COMNAVREG limits at all three discharge points to the Fort Kam sewers. There were low levels above detection limits but below standards of toxic organics (*dibromochloromethane, bromodichloromethane, bromoform*) from the antenna shop, toxic organics (*dibromochloromethane, bromodichloromethane, chloroform, bromoform*) and some metals (*copper, lead, zinc*) from the insulation shop, and toxic organics and some metals (*copper, nickel*) from the valve shop. All other samples of the metals and cyanide

were below the detection limits. ***See*** Appendix 8, Tables 8.11, 8.12, and 8.13, for a summary of the sampling results for the hydrotest discharges to the Fort Kam sewers from the antenna shop, insulation shop, and valve shop.

6.12 Unregulated Sources

There is no sample record for the discharges of Bldg 3B hydrotest waters or Bldg 5 heat treat quench since they were not identified in the NPDES permit as categorical.

6.13 Dilution as a Substitute for Treatment

The NPDES permit prohibits "dilution as a substitute for treatment" in order to prevent compromising BAT model treatment with dilute waste streams. In particular, this prohibition applies when sample results for a diluted waste stream are below the Federal standards and the apparent compliance is used to justify discharge without treatment. There are two conditions that need to be established in order to make a determination of non-compliance with this prohibition. First, some or all of the Federally-regulated wastewaters must discharge without undergoing BAT model treatment or its equivalent. Second, there must be some form of excess water usage within a Federally-regulated process.

None of the Naval Complex internal outfalls meet the first condition of non-compliance since all Federally-regulated waters either undergo treatment equivalent to or better than BAT, discharge only upon testing, or do not need model treatment in order to comply with the Federal standards. Moreover, there is also no evidence that any of the Naval Complex internal outfalls meet the second condition either.

6.14 Bypass Provision

The NPDES permit prohibits the bypassing of any on-site treatment necessary to comply with standards unless the bypass was unavoidable to prevent the loss of life, injury, or property damage, and there were no feasible alternatives. This provision explicitly prohibits bypasses that are the result of a short-sighted lack of back-up equipment for normal downtimes or preventive maintenance. It also explicitly prohibits bypasses that could be prevented through wastewater retention or the procurement of auxiliary equipment. It specifically allows bypasses that do not result in violations of the standards as long as there is prior notice and approval from the State.

There is no evidence at the internal outfalls of any bypassing treatment or any hold-and-test systems. Both the Bldg 1424 IWTC and the Bldg 1910 BOWTS have excess treatment capacity to handle peak loads and scheduled maintenance. The hold-and-test discharge points are locked in closed position. The other internal outfall discharges do not need model treatment in order to comply with the Federal standards.

7.0 Compliance with NPDES Permit Monitoring Requirements

Fort Kam influent, effluent, receiving waters, and sludge must be self-monitored variously for conventionals, nutrients, toxicity, and toxics. [NPDES Permit §A(1), B(1), C(1), E(1)]

Discharges from categorical sources to the Fort Kam sewers must be self-monitored quarterly for the Federally regulated pollutants. [NPDES Permit §A(1c) and §A(1d)].

Samples must be representative of the sampling day's operations and of the conditions occurring during the reporting period. 40 CFR 403.12(g) and 403.12(h).

Summary

The sample record for the self-monitoring of the various Pearl Harbor Naval Complex discharges is representative over the sampling days as well as over the reporting periods. However the sample records for some internal outfalls were not complete.

Requirements

- Navy Region Hawaii must ensure that all samples required by the NPDES permit are collected and reported at the required schedule frequencies.

Recommendations

- Navy Region Hawaii should coordinate the collection and reporting of all NPDES permit required self-monitoring.
- The NPDES permit should be modified to require self-monitoring of the Fort Kam influent for oil & grease, pH and EC monthly, and toxic metals and organics yearly.
- The NPDES permit should be modified to require quarterly self-monitoring of the Fort Kam sludge in order to allow most sludge to be composted after PCB testing.
- The NPDES permit should be modified to require self-monitoring of every batch discharge from the Bldg 1424 IWTC for pH, ORP, oil & grease, and toxic metals.
- The NPDES permit should be modified to require annual self-monitoring of the internal outfalls of controlled sources for the pollutants without potential to exceed standards and of uncontrolled sources for the pollutants always found below detection limits.

7.1 Fort Kam WWTF Self-Monitoring

NAVFAC successfully self-monitored for all regulated pollutants at the scheduled frequencies as required by the NPDES permit. The samples were collected from the appropriate effluent, influent, sludge, and receiving water sample points, and are all representative of the

sampling period and reporting period. As a result, all samples are usable for the determination of compliance. However, the NPDES permit should be modified or reissued to increase the self-monitoring of the influent to provide indicator and pollutant trend data since toxic pollutants and oily wastewaters are incompatible with the treatment plant design. Sludge monitoring for PCBs also could be reduced in order to allow most sludges to be disposed through composting after PCB testing results prove negative.

Fort Kam WWTF	Proposed NPDES Self-Monitoring Requirements				
	daily	monthly	quarterly	six-months	yearly
Outfall	BOD TSS pH OG SetSolid res-Cl	Nutrients Biotox			Cu Pb Hg Se Ag TTOs PAHs PCBs CN Pesticides
Influent	pH BOD TSS Flow	EC OG			Cu Pb Hg Se Ag TTOs PCBs PAHs CN Pesticides
Sludge			PCBs %Solids	PriorityPollutants Dioxin	
Receiving Waters				Nutrients DO Temp Salinity Turbidity pH Chlorophyll-a	
red – increase **black** – no change **green** - reduction					

7.2 Internal Outfall Self-Monitoring

The NPDES permit requires all internal outfalls to be self-monitored quarterly. Navy Region Hawaii did not report results for 39 of 96 (40%) potential quarterly sampling events in 2004-2005 at the 12 NPDES internal outfalls. Nineteen of the 39 non-reported quarterly sampling events were the legitimate result of no discharge from the source into the Fort Kam sewers during the quarter. However, the other 20 non-reported quarterly sampling results were reported as missed samples, some from Friday or second-shift operations, some from missing analytical results, and others without explanation. Navy Region Hawaii is best positioned to provide overall coordination of the collection and analysis of self-monitoring sample results among the various commands in order to ensure that all sample results From Pearl Harbor Naval Complex and Hickam Air Force Base are obtained and reported. The COMNAVREG Instruction could be modified with specific time schedules and procedures for obtaining all sampling results on-time.

Bldg 1424 IWTC – The IWTC is the primary control point for high- and low-strength metals-bearing wastewaters from numerous Naval Complex sources including uncontrolled sources such as non-oily ships wastes. Achieving compliance in each treated batch depends on proper operation of the chemical treatment steps. As a result, since there have been instances of faulty operations resulting in violations of the standards, it is appropriate to require self-monitoring of each batch for pH, ORP, metals and oil & grease. At the very least, the pH and ORP indicating achievement of the reaction end points for each batch should be recorded and reported for supervisory approval prior to discharge. The volume discharged, date and time of discharge, treatment steps performed, wastewater sources, and name of the operator should all be documented for each batch.

Bldg 1910 BOWTS – The BOWTS is the primary control point for oily wastewaters including uncontrolled bilges from ships. Monthly sampling from both treatment trains for

metals, oil & grease, and sulfides remains appropriate. Daily self-monitoring for pH and flow should be included in order to provide an appropriate daily measure of control. Total toxic organics could be self-monitored just once per year since TTOs are expected to account for little if any of the oil & grease (TPHs) measurements. Low concentrations, in most cases near or below the detection limits, found for other metals, cyanide, surfactants and organic carbon content means that they all also can be self-monitored just once per year. In addition, the detection limit for most mercury samples exceeds the COMNAVREG limits.

Controlled Categorical Sources – These hold-and-test source are those which are internally tested prior to discharge in order to determine whether to deliver for further treat, haul off-site, or discharge to the Fort Kam sewers. The NPDES permit could be modified to reduce self-monitoring to once per year at the internal outfalls of controlled sources for those pollutants without a potential to exceed standards. Otherwise, the self-monitoring requirements would remain quarterly.

Uncontrolled Categorical Sources – These sources discharge without treatment or testing prior to discharge. The NPDES permit could be modified to reduce self-monitoring to once per year at the internal outfalls of uncontrolled sources for the pollutants always found below detection limits. Again otherwise, self-monitoring would remain quarterly.

Internal Outfalls	Proposed NPDES Self-Monitoring Requirements			
	day/batch	monthly	quarterly	yearly
Bldg 1910	pH Flow	Cd Cr Cu Pb Ni Ag Zn OG Se S=		As Ba Be Hg W CN TOC TTO MBAS
Bldg 1424	pH Flow EC OG Cd Cr Cu Pb Ni Zn		CN TTO	
Bldg 3B			Cd Cr Cu Pb Ni Ag Zn TTO pH	CN
Bldg 5			Cd Cr Cu Pb Ni Ag Zn TTO pH	CN
Bldg 155			Cu Cr Ni Zn TTO pH	Cd Pb Ag CN
Bldg 214A			Zn TTO pH	Cd Cr Cu Pb Ni Ag CN
Bldg 214B			Zn TTO pH	Cd Cr Cu Pb Ni Ag CN
Bldg 1456				Cd Cr Cu Pb Ni Ag Zn CN TTO pH
Bldg 1670A				Cd Cr Cu Pb Ni Ag Zn CN TTO pH
Bldg 1670B				Cd Cr Cu Pb Ni Ag Zn CN TTO pH
Bldg 1725			Cd Cr Cu Pb Ni Ag Zn TTO pH	CN
Bldg 1770A			TTO pH	Cd Cr Cu Pb Ni Ag Zn CN
Bldg 1770B			Cu Pb Ni Zn TTO pH	Cd Cr Ag CN
Bldg 1770C			Cu Ni TTO pH	Cd Cr Pb Ag Zn CN
DDHydrblst				Cd Cr Cu Pb Ni Ag Zn CN TTO pH
red – increase **black** – no change **green** – reduction				

Appendix 1
Pearl Harbor Naval Complex and Hickam Air Force Base
Industrial Activities by Command and Bldg Number

PHNSY Pearl Harbor Naval Shipyard	• **PHNSY Dry Dock #1** • **PHNSY Dry Dock #2** (hydroblast, sand-steel shot blast, ships • **PHNSY Dry Dock #3** overhaul, painting, sanitizing flush, cooling) • **PHNSY Dry Dock #4** • Bldg 1E – Photo lab • **Bldg 3B** – Valve and Pipe Fittings (test/hydroblast, supply warehouse) • **Bldg 5** – Propeller Shop (forge, stamp, annealing, quench, powder coat) • Bldg 12 – Boat/pattern Shop • Bldg 58 – Fork-lift Maintenance • **Bldg 67** – Inside Machine Shop (machining, brush plating) • **Bldg 72** – Sheet Metal Fabrication Shop (sheet metal fab/sign engraving) • **Bldg 149** – NAVFAC Power Plant (high/low pressure air, DI water, peaker electrical plant, salt water) • Bldg 154 – Carpenters Shop • **Bldg 155** – Structural Shops (plate metal fab, plasma/water jet-cutting) • **Bldg 214** – Electronics Weapons Shop (electronics assembly/repair/test) • **Bldg 315** – Radiography Lab (x-ray, NDI testing) • Bldg 394 – Battery Shop (acid fill, equipment washdown) • Bldg 1163 – Hazardous Waste Storage • Bldg 1236 – Steel Plate Storage • Bldg 1384 – Mixed Waste Storage • **Bldg 1424** – NAVFAC Batch Industrial Wastewater Treatment Complex • Bldg 1430 – Fire Fighting School • **Bldg 1443** – Quality Assurance Lab (metallurgical lab, NDI testing) • **Bldg 1456** – Pipe and Hose Shop (hose repair/fab, pipe fab, steam clean) • Bldg 1663 – PHNSY Hazardous Waste • **Bldg 1670** – Shipboard Services (silkscreen, teflon room, sign shop, ships sanitary disinfection, hose hydroblast) • **Bldg 1725** – Corrosion Control (painting, powder coat, flame spray) • **Bldg 1770** – Intermediate Maintenance Facility (hydrotest, rubber and plastics shop, sanding, machining, pump repair, welding) • **Bldg 1910** – NAVFAC Bilge Oily Wastewater Treatment System • PHNSY Piers B-1 to B-21 • DRMO scrapyard
NAVSTA Naval Station Pearl Harbor	• Bldg 3 – Small Boat Repair (Ford Island) • Bldg 35 – NAVFAC Transportation Compound • Bldg 148 – Boiler/Heat Exchanger Repair • Bldg 229 – FISC/NAVFAC Hazardous Waste Consolidation • Bldg 250 – Motor Pool • Bldg 352 – Joint Intelligence Center (photo lab) • Bldg 1631 – Engine/Turbine/Ordnance
BOLD designates EPA walk-through during this inspection	

Appendix 1 (continued) Pearl Harbor Naval Complex and Hickam Air Force Base Industrial Activities by Command and Bldg Number	
NAVSTA Naval Station Pearl Harbor	• Bldg 445 – Carpenters Shop • Bldg 472 – NAVSTA Tugboat Engine Repair Shop • Bldg 645 – Motor Pool • Bldg 682 – Periscope Repair (hydrotest) • Bldg 1257 – NAVSTA Auto Hobby Shop • Bldg 1341 – Photo Lab • Bldg 1588 – Small Boat Repair • NAVSTA Piers S-1 to S-13, S-20, S-21 • **NAVSTA Piers** S-14 to S-19, F-1 to F-13, B-22 to B-26, M-1 to M-4 • Naval IMF Piers Y-2, Y-3
FISC Fleet Industrial Supply Center	• Bldg 59 – Fuel Pump Station • Bldg 427 – Fuel Testing Lab • Bldg 449 – Material Handling Equipment (closed-loop steam clean) • Bldg 550 – Navy Publication and Printing Service (print shop) • **Bldg 1403** – Fuel Reclamation Plant • Bldg 1747 – Flammable Hazardous Materials Storage • Bldg 1759 – Maintenance Shop (machine shop, scrap yard) • FISC Fuel Tank Farm @ Makalapa Gate • **FISC Upper Fuel Tank Farm** • FISC Loading Dock Piers K-3 to K-12 • FISC Fueling Piers H-1 to H-4
HICKAM Hickam Air Force Base	• **Bldg 1055** – 15th Airlift Wing Maintenance Hanger • Bldg 1072 – LRS Base Support Equipment (washrack) • Bldg 2006 – LRS Motor Pool (washrack) • Bldg 2010 – LRS Motor Pool (washrack) • **Bldg 2025** – 15th Airlift Wing Washrack Complex • **Bldg 2030** – 15th Airlift Wing Maintenance (NDI testing, alk clean, Aerospace Ground Equipment steam clean, washrack) • **Bldg 2125** – 15th Airlift Wing Fuel Control Center (washrack) • **Bldg 3386** – HIANG Armament Support (solvent degrease, assembly, paint) • **Bldg 3400** – HIANG Maintenance Hanger (NDI testing, washdown) • **Bldg 3407** – HIANG Maintenance Hanger (indoor washrack) • **Bldg 3424** – HIANG Ground Support (outdoor washrack) • **Bldg 11666** – HIANG Engine Test Cell • **Bldg 11672** – HIANG Alternate Stand-by Washrack
BOLD designates EPA walk-through during this inspection	

Appendix 2
NAVFAC Certificate Holders in 2005
Industrial Wastewaters Discharged into the Fort Kam Sewer Service Area

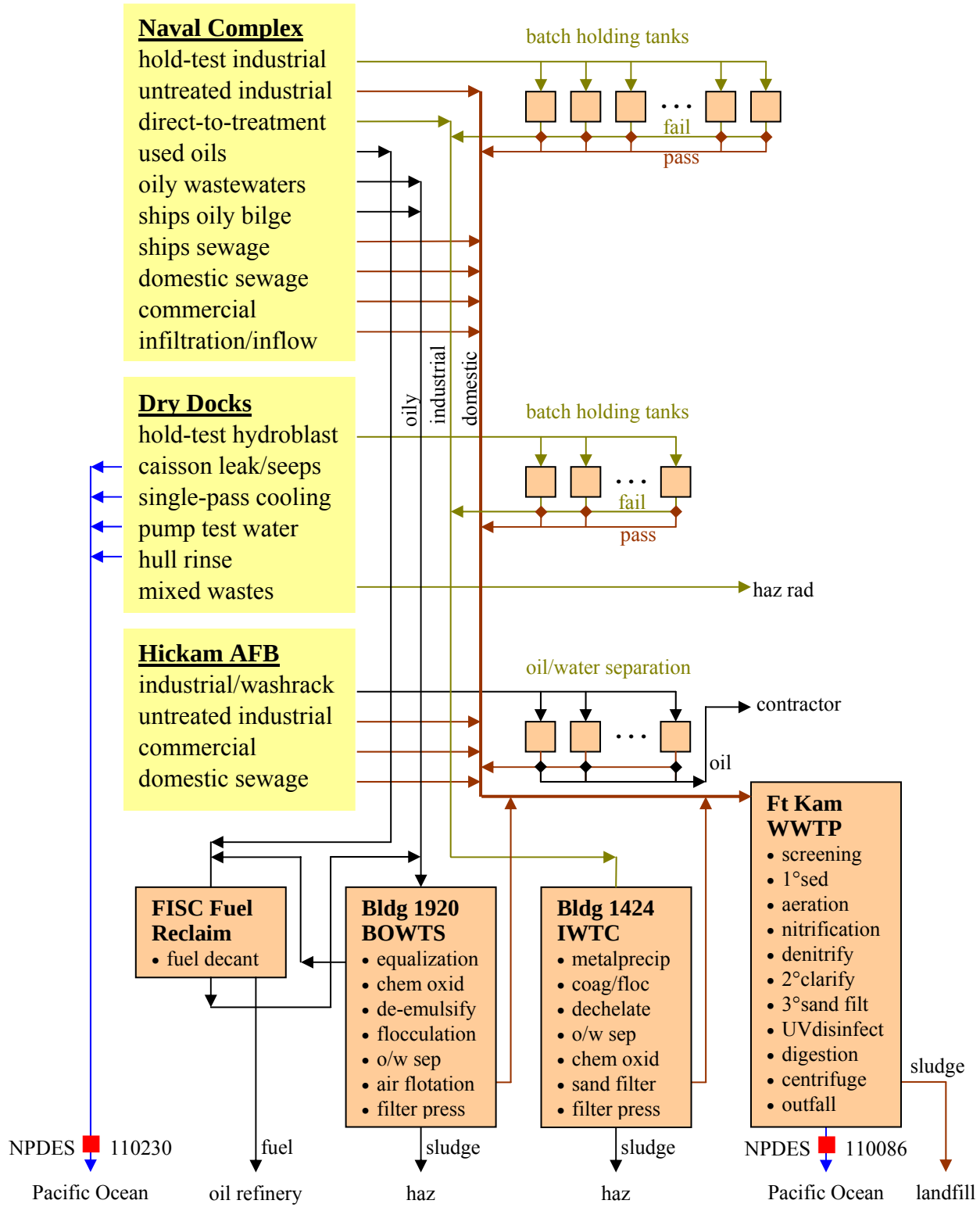
Command	Cert #	Certificate Holder	wastewater type
PHNSY Pearl Harbor Naval Shipyard	1676-110	Bldg 1 Fleet Imaging Photo Lab	photo developer rinse
	1139-15	Bldg 5 Prop & Forge Shop	cooling / quench
	1640-15	Bldg 9 Submarine Ultrapure Water	IX brines
	1573-15	Bldg 68 Hydroblast Testing	testing washdown
	1306-15	Bldg 72 Sheet Metal Fab Shop	sign shop rinse/drainage
	1307-15	Bldg 72 Sheet Metal Fab Shop	non-contact cooling
	1004-91	Bldg 149 NAVFAC Power Plant	IX brines / cool blowdown
	1297-15	Bldg 155 Structural Shop	water-jet cutting overflow
	1410-91	Bldg 166 Electric Shop	hydrotest spent
	1475-91	Bldg 177 Port Boiler Washrack	washdown
	1148-15	Bldg 214A Electronics Shop	hydrotest spent
	1155-15	Bldg 214B Electronics Shop	mold release wash down
	1594-07	Bldg 220 Marine Envr Lab	sink washdown
	1150-15	Bldg 315 Radiographic Lab	x-ray tailwaters
	1635-15	Bldg 1274 Carbon and Resin	rinse
	1622-91	Bldg 1424 NAVFAC IWTC	treated industrial wwaste
	1001-33	Bldg 1430 Fire Fighting School	oily tailwater / washdown
	1152-15	Bldg 1443 Q/A Lab	analytical lab tailwaters
	1119-15	Bldg 1456 Pipe Shop	hose flush
	1421-15	Bldg 1670B Services Shop	sign shop/teflon washdown
	1423-15	Bldg 1670A Services Shop	hose flush
	1568-108	Bldg 1725 Corrosion Control	water curtain blowdown
	1509-15	Bldg 1766 Control Industrial	washdown
	1650-15	Bldg 1770 IMF Hydraulic Shop	pump disinfection soak
	1651-15	Bldg 1770C IMF Valve Shop	hydrotest spent
	1652-15	Bldg 1770B IMF Insulation Shop	hydrotest spent
	1653-15	Bldg 1770A IMF Antenna Shop	hydrotest spent
	1654-15	Bldg 1770 IMF Dive Locker	washdown
	1623-07	Bldg 1910 NAVFAC BOWTS	treated oily wastewater
NAVSTA Naval Station Pearl Harbor	1461-33	Bldg 26 Boiler Feed Shop	hydrotest spent
	1552-09	Bldg 26 Distill Lab	lab tailwaters
	1033-09	Bldg 26 Sub Training	cooling tower blowdown
	1032-09	Bldg 39 Sub Training	cooling tower blowdown
	1541-15	Bldg 464 Damage Control Facility	hydrotest spent
	1476-09	Bldg 465 Fire Fighting School	washdown
	1574-91	Bldg 641 Compressed Air Plant	cooling tower blowdown
	1613-89	Bldg 651 Mooringline Wash Area	washdown
	1633-11	Bldg 1341 Cooling Tower	cooling tower blowdown
	1010-91	Bldg 1553 Ship Services	cleaning washdown
	1411-07	Pier X-17 Toolroom	washdown

BOLD designates NPDES permit regulated categorical industrial wastewater discharges

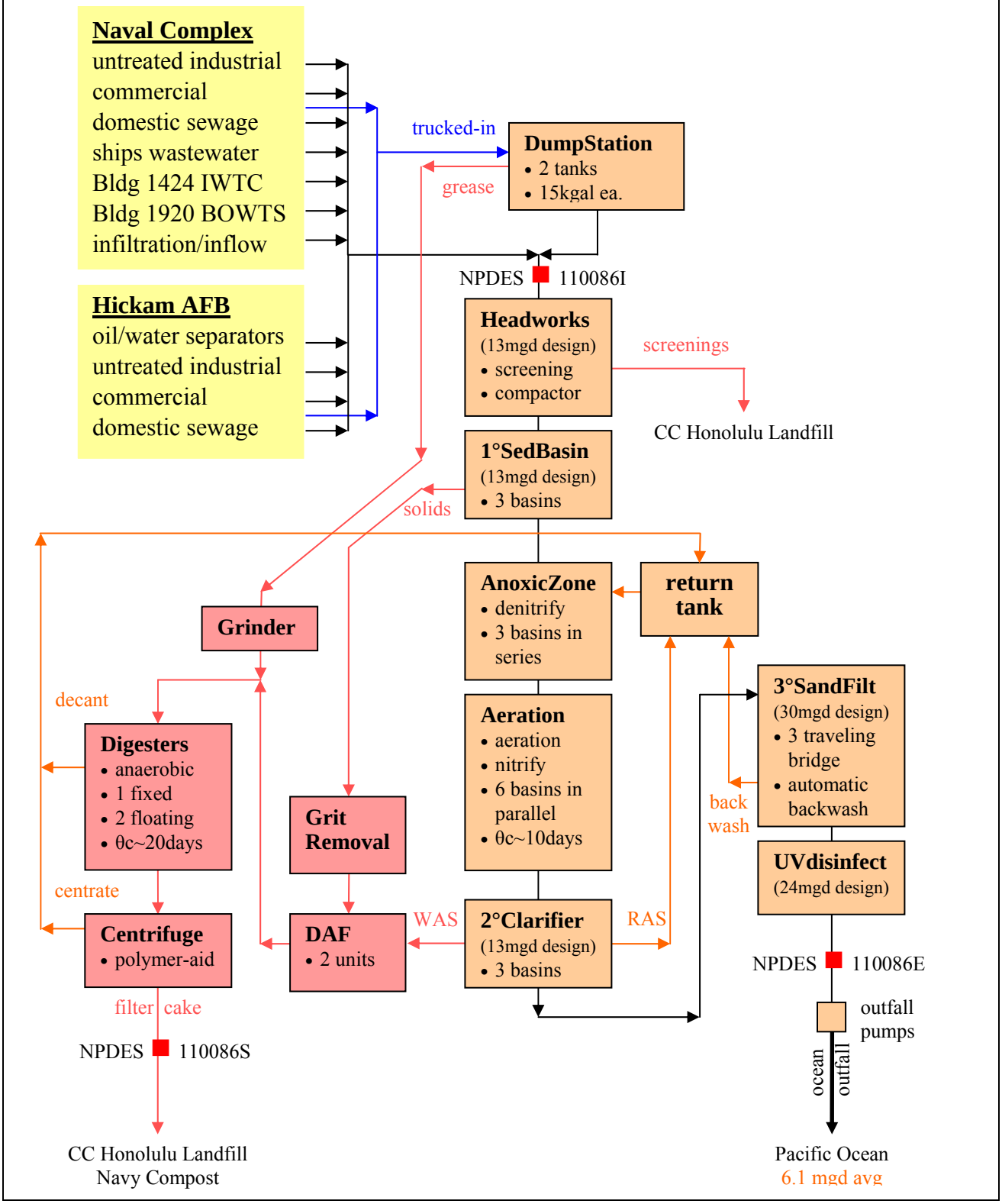
Appendix 2 (continued)
NAVFAC Certificate Holders in 2005
Industrial Wastewaters Discharged into the Fort Kam Sewer Service Area

Command	Cert #	Certificate Holder	wastewater type / activity
FISC Fleet Industrial Supply Center	1441-14 1115-67 1019-91 1595-14 1442-14	Bldg 475 Warehouse Bldg 550 Publications and Printing Bldg 1403 Fuel Reclamation Plant Bldg 1685 Fuels Laboratory Bldg 1747 Haz Storage Facility	cooling tower blowdown photo/x-ray tailwaters reclaim o/w sep waters sink washdown washdown
HICKAM Hickam Air Force Base	1404-44 1436-40 1428-40 1544-40 1545-40 1546-40 1547-40 1473-40 1541-40 1671-40 1434-40 1455-104 1296-104 1453-104 None 1588-104 1608-104 1295-104	Bldg 45 CILHI Lab Bldg 1203 Paint Shop Bldg 1055 Hanger - Battery Shop Bldg 1055 Hanger - Rubber Shop Bldg 1055 Hanger - Structural Bldg 1055 Hanger - Structural Bldg 1055 Hanger - Metals Tech Bldg 2025 Outdoor Washrack Bldg 2030A Maint Hanger Bldg 2030B Maint Hanger Bldg 2125 Fuel Control Center Bldg 3386 HIANG Armament Bldg 3400A HIANG Maint Hanger Bldg 3400B HIANG Maint Hanger Bldg 3400C HIANG Maint Hanger Bldg 3404 HIANG Equipment Bldg 3407 HIANG Indoor Wshrck Bldg 11672 HIANG Hanger	photo/x-ray developer rinse washdown washdown sink washdown sink washdown sink washdown cooling blowdown washdown o/w sep waters steam clean o/w sep waters dye pen washdown o/w sep waters drainage o/w sep waters x-ray tailwaters washdown o/w sep waters dye pen washdown sink washdown steam clean o/w sep waters washrack o/w sep waters
Off-Site Sources	1657-15 1634-98 1587-78	Wheeler – Cooling Tower Bishop Point – Boatwash Facility Aiea – VTU Scrubber Unit	non-contact cooling water washdown scrubber blowdown

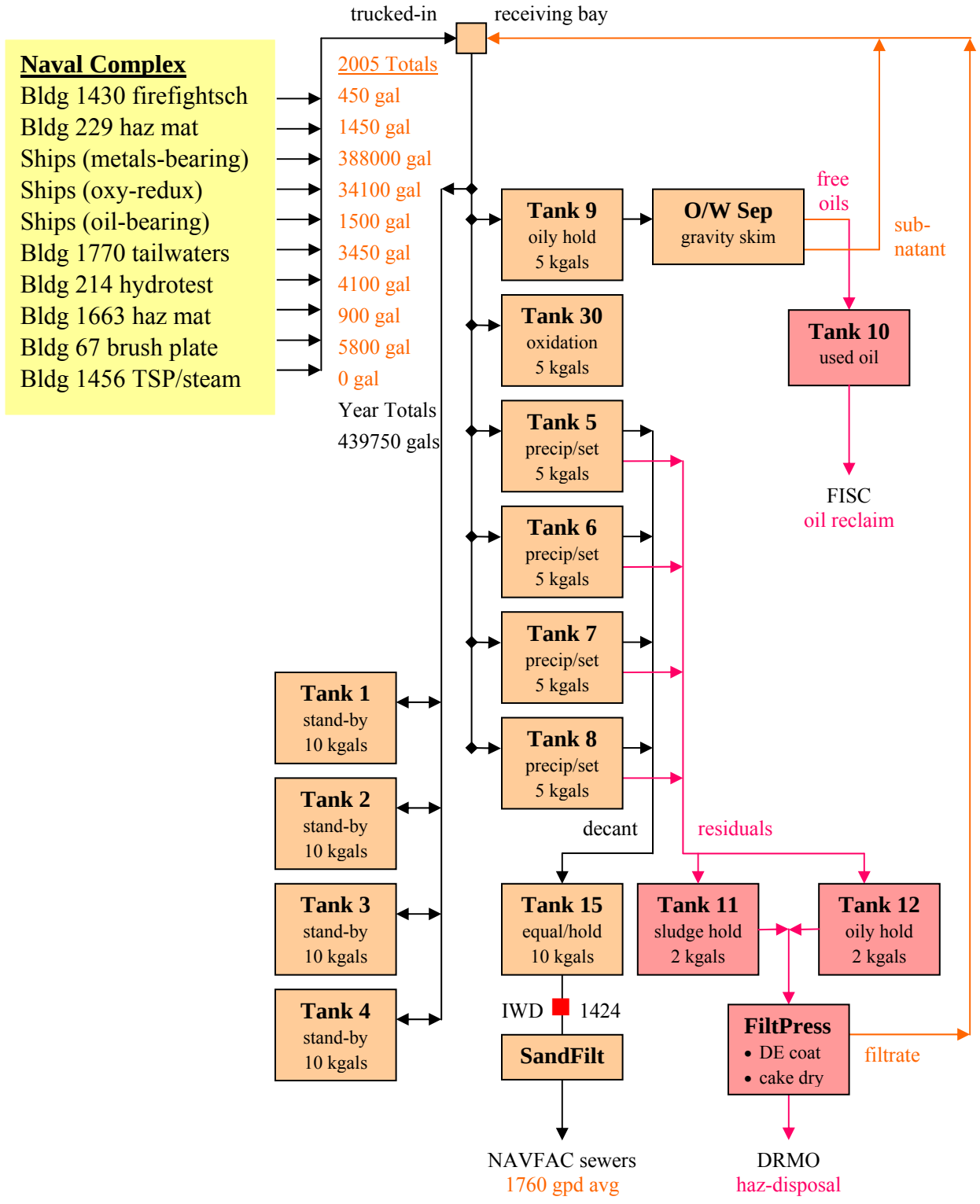
Appendix 3
Pearl Harbor Naval Complex and Hickam Air Force Base
Schematic Overview of Wastewater Handling



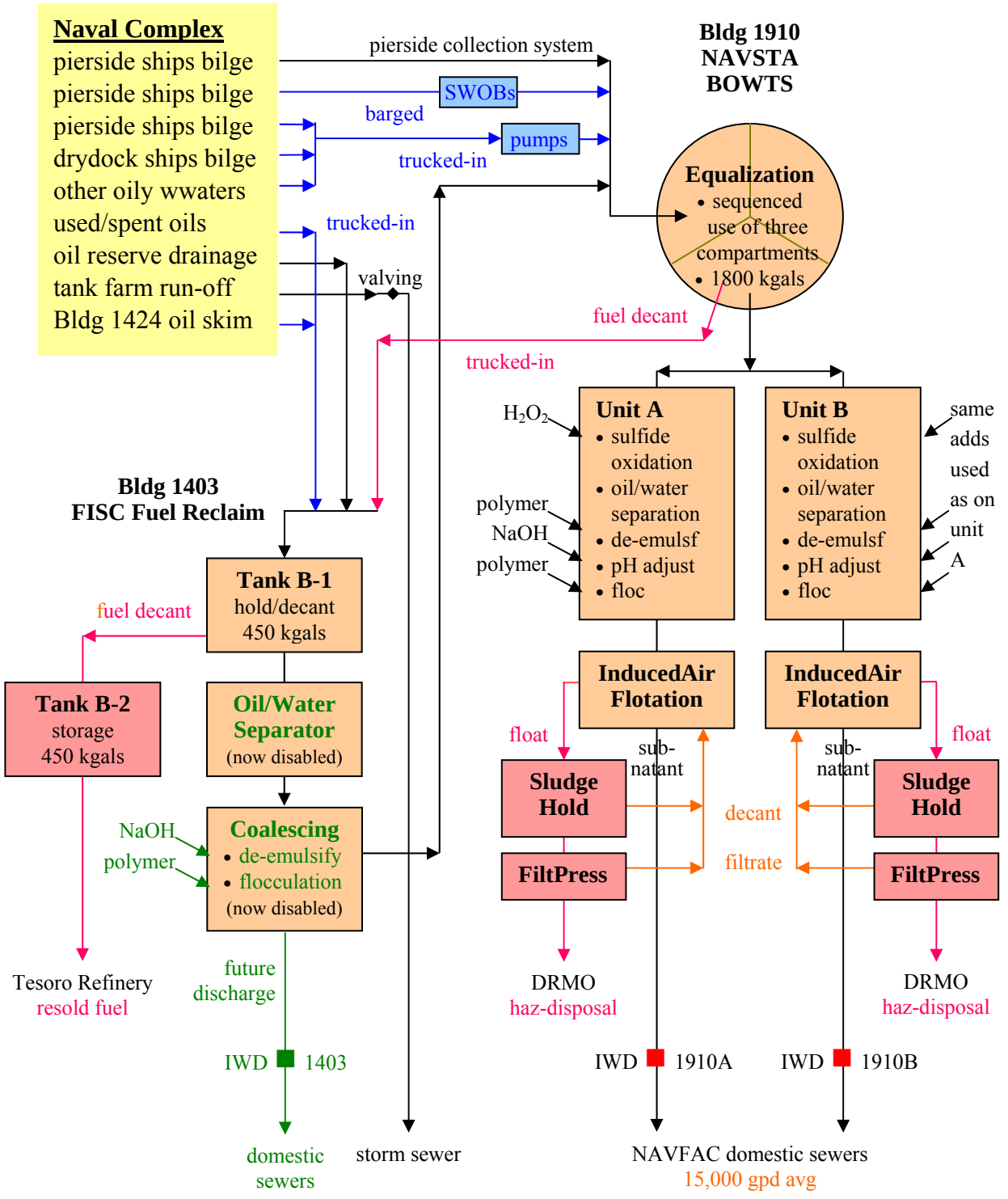
Appendix 4
Fort Kam Wastewater Treatment Facility
Schematic of the Wastewater Collection and Treatment



Appendix 5
NAVFAC Bldg 1424 Batch Industrial Wastewater Treatment Complex
Schematic of Industrial Wastewater Handling



Appendix 6
Pearl Harbor Naval Complex
Schematic of Oily Wastewater Handling



Appendix 7
Wastewater Treatment Plant Performance
Table 7.1 – Fort Kam Effluent Sampling Results for Non-Toxics and Indicators

pollutants (Jan 2004 – Dec 2005)	effluent sample statistics						viols	sample events
	mean	min	5th%	95th%	99th%	max		
BOD daily-max (mg/l)	2.13	<2.0	1.20	3.05	3.44	7.0	-	729
BOD 7d-avg (mg/l)	2.13	<2.0	1.46	2.80	3.08	4.6	0	104
BOD 30d-avg (mg/l)	2.13	<2.0	1.63	2.63	2.84	3.4	0	24
TSS daily-max (mg/l)	2.62	0.2	1.42	5.01	5.99	20.0	-	731
TSS 7d-avg (mg/l)	2.62	1.4	1.50	3.74	4.21	4.5	0	104
TSS 30d-avg (mg/l)	2.61	1.8	1.74	3.47	3.83	3.6	0	24
Total Nitrogen (mg/l)	8.21	3.40	-	-	15.96	15.0	-	23
Ammonia (mg/l as N)	1.52	0.02	-	-	8.51	12.0	-	23
Nitrate (mg/l as N)	4.78	0.81	-	-	10.65	8.91	0	23
Total Phosphrs (mg/l)	1.40	0.40	-	-	3.25	2.60	0	23
Oil & Grease (mg/l)	<0.50	<0.50	-	-	<0.50	2.80	0	702
Chronic Toxicity (TU)	<111	-	-	-	<111	<111	0	24
Total-N geo-mean (mg/l)	-	6.859	-	-	-	8.277	0	2
NH3-N geo-mean (mg/l)	-	0.081	-	-	-	0.294	0	2
Total-P geo-mean (mg/l)	-	<2.22	-	-	-	<2.22	0	2
pH min (s.u.)	median 7.21			7.03	7.00	6.95	-	731
pH max (s.u.)				7.41	7.57	7.75	-	731

Appendix 7
Wastewater Treatment Plant Performance
Table 7.2 – Fort Kam Influent Sampling Results for Non-Toxics and Indicators

pollutants (Jan 2004 – Dec 2005)	influent sample statistics						viols	samp events
	mean	min	5th%	95th%	99th%	max		
Flow (mgd)	6.08	2.9	3.35	11.62	13.90	16.0	-	731
BOD daily-max (mg/l)	59.5	20	38.2	80.9	89.7	100	-	731
TSS daily-max (mg/l)	91.3	27	62.1	149.7	173.8	470	-	731
Oil & Grease (mg/l)	6.7	2.6	-	-	15.6	9.2	-	8
EC (µmos/cm)	17412	14700	-	-	21226	19231	-	8

Appendix 7 – Table 3
Wastewater Treatment Plant Performance
Table 7.3 - Fort Kam Sewage Sludge Sampling Results

pollutants (dry-weight basis) (Jan 2004 – Dec 2005)	sewage sludge sample statistics				compost max	viols	samp events
	mean	min	99th%	max			
Percent Solids (%)	17.9%	17.0%	-	18.6%	-	-	3
TotalPetroHcarbons (mg/kg)	27800	3900	-	32400	-	-	3
Arsenic (mg/kg)	8.6	<6.1	-	12.8	-	0/4	4
Cadmium (mg/kg)	2.8	<3.0	6.4	4.6	-	0/4	4
Chromium (mg/kg)	85.7	81.3	94.8	90.5	-	0/4	4
Copper (mg/kg)	1510.0	1350.0	1861.3	1710.0	575.5	0/4	4
Lead (mg/kg)	62.6	56.7	75.4	69.6	-	0/4	4
Mercury (mg/kg)	1.1	0.5	2.9	1.9	-	0/4	4
Molybdenum (mg/kg)	28.2	21.3	39.4	32.6	-	0/4	4
Nickel (mg/kg)	119.3	101.0	160.8	143.0	-	0/4	4
Silver (mg/kg)	11.3	6.8	22.4	17.8	-	-	4
Zinc (mg/kg)	927.3	904.0	1210.3	1030.0	-	0/4	4
VOAs / Semi-VOAs (mg/kg)	38.2	8.9	115.9	82.2	-	-	4
Pesticides (mg/kg)	0.4	0.1	1.3	0.8	-	-	3
PCBs (mg/kg)	1.6	0.8	3.8	3.0	-	-	4

Appendix 7
Wastewater Treatment Plant Performance
Table 7.4 – Fort Kam Influent and Effluent Sampling Results for Toxics

pollutants (Jan 2004 – Dec 2005)	influent sample statistics			effluent sample statistics			viols	inf/eff sampls
	mean	99th%			99th%	max		
Cadmium (µg/l)	<10	-	<10	<5	-	<5	-	4 / 13
Chromium (µg/l)	<10	-	<10	<5	-	<5	-	4 / 13
Copper (µg/l)	42.0	64.9	51	8.6	40.5	51	-	4 / 13
Lead (µg/l)	<20	-	<20	<10	-	<10	-	4 / 13
Mercury (µg/l)	<0.1	-	<0.1	<0.1	-	<0.1	-	4 / 13
Nickel (µg/l)	<10	-	<10	<10	-	<10	-	4 / 13
Selenium (µg/l)	<60	-	<60	<50	-	<50	-	4 / 13
Silver (µg/l)	<10	-	<10	<10	-	<10	-	4 / 13
Zinc (µg/l)	38.5	9.95	50	7.8	29.1	35	-	4 / 13
Total Cyanide (µg/l)	<20	-	<20	<20	-	<20	-	4 / 4
444-DDD (µg/l)	-	-	-	<0.02	-	<0.02	-	4 / 6
Dieldrin (µg/l)	-	-	-	<0.01	-	<0.01	-	0 / 6
Dioxin (µg/l)	-	-	-	<0.003	-	<0.003	-	0 / 2
624 VOAs (µg/l)	-	-	-	<1.0	-	<1.0	-	0 / 2
625 Semi-VOAs (µg/l)	-	-	-	<2.0	-	<2.0	-	0 / 2
Butyltins (µg/l)	-	-	-	<0.002	-	<0.002	-	0 / 2
608 PCBs (µg/l)	-	-	-	<0.10	-	<0.10	-	0 / 2
Pesticides (µg/l)	-	-	-	<0.10	-	<0.10	-	0 / 2

Appendix 8
Pearl Harbor Naval Complex Internal Outfall Performance
Table 8.1 – Bldg 1424 Industrial Wastewater Treatment Complex (NPDES Outfall 014i)

pollutants (Jan 2002– Dec 2005)	effluent sample statistics				minus outliers *		viols rate	sample count
	mean	min	99th%	max**	mean	99th%		
cadmium (µg/l)	1220	<2	11740	16900	14	109	**1/14**	14
chromium (µg/l)	84	<2	799	1150	84	799	0/14	14
copper (µg/l)	41860	30	403400	581000	383	1640	**1/14**	14
lead (µg/l)	405	<12	3829	5510	13	36	**1/14**	14
nickel (µg/l)	30180	<10	292300	421000	117	590	**1/14**	14
silver (µg/l)	5	<8	26	35	5	26	0/14	14
zinc (µg/l)	3323	<50	31010	44600	148	596	**1/14**	14
total cyanide (µg/l)	<20	<20	<20	<20	<20	<20	0/14	14
total tox organics (µg/l)	29	2	192	270	29	192	0/14	14
pH (s.u.)	median (unk)			ns	ns	ns	-	0

* Outlier events on 12/18/02 for cadmium and 09/14/04 for copper, lead, nickel, and zinc
** Quarterly sampling required - sample record is missing the 4th quarter 2004 results

Appendix 8
Pearl Harbor Naval Complex Internal Outfall Performance
Table 8.2 – Bldg 1910 Bilge Oily Wastewater Treatment System (NPDES Outfall)

pollutants (Jan 2004 – Jan 2006)	effluent sample statistics				# non-detects		viols rate	sample count
	mean	min	99th%	max	dl-max	< stds		
arsenic (µg/l)	<200	<200	<200	<200	<200	0/36	0/36	36
barium (µg/l)	48	<20	83	95	<64	0/36	0/36	36
beryllium (µg/l)	<10	<10	<10	<10	<10	0/36	0/36	36
cadmium (µg/l)	<40	<10	<40	<40	<40	0/36	0/36	36
chromium (µg/l)	14	<10	29	22	<40	0/36	0/36	36
copper (µg/l)	140	30	404	500	<137	0/36	0/36	36
lead (µg/l)	29	<20	119	184	<400	0/36	0/36	36
mercury (µg/l)	<100	<2	<100	<100	<100	**32/36**	0/4	36
nickel (µg/l)	166	<40	417	445	<40	0/36	0/36	36
selenium (µg/l)	27	<88	81	120	<400	0/36	0/36	36
silver (µg/l)	<10	<10	<10	<30	<30	0/36	0/36	36
zinc (µg/l)	628	15	3724	8020	<750	0/36	**1/36**	36
total cyanide (µg/l)	15	<20	103	180	<100	0/36	0/36	36
sulfides (mg/l)	19.3	<1.0	79.0	100.0	<1.0	0/36	**20/45**	45
tin (mg/l)	<1	<1	<1	<1	<1	0/36	0/36	36
organic carbon (mg/l)	42.0	26.3	86.4	145	<50	0/36	0/36	36
oil & grease - petro (mg/l)	14.7	0.8	32.1	30	<5	0/36	0/36	36
MBAS surfactants (mg/l)	7.1	2.5	14.1	15	-	0/36	0/24	24
suspended solids (mg/l)	29.6	9.2	69.3	59	-	-	-	7
pH min (s.u.)	median – 8.0			7.0	-	-	0/47	47
pH max (s.u.)				9.2	-	-	0/47	47

Appendix 8
Table 8.3 – PHNSY Dry Docks Hydroblast (NPDES Outfall 013i)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
2005 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 3rd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
02/14/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
10/20/04	<0.07	<0.1	0.16	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
07/26/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
2004 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
2004 1st Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
stat mean	<0.07	<0.10	0.076	<0.10	<0.10	<0.10	<0.10	<0.65	<0.01
stat 99th%	<0.07	<0.10	0.246	<0.10	<0.10	<0.10	<0.10	<0.65	<0.01

Appendix 8
Table 8.4 – Bldg 214A Pressure Hydrotest (NPDES Outfall 005iA)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
10/26/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.37	<0.65	<0.01
2005 3rd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
04/25/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	<0.65	<0.01
03/01/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.24	<0.65	0.202
10/25/04	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.10	<0.65	0.004
07/26/04	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.65	<0.01
2004 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
01/13/04	<0.1	<0.1	0.10	<0.1	<0.1	<0.1	0.59	<0.65	**2.67**
stat mean	<0.07	<0.10	0.031	<0.10	<0.10	<0.10	0.265	<0.65	0.482
stat 99th%	<0.07	<0.10	0.110	<0.10	<0.10	<0.10	0.700	<0.65	2.986

Appendix 8
Table 8.5 – Bldg 214B Cable Mold Release Washrack (NPDES Outfall 005iB)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
2005 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 3rd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
04/25/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.14	<0.65	<0.01
01/10/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.65	<0.01
11/16/04	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	0.74	<0.65	0.044
08/02/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.15	<0.65	<0.01
05/19/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.20	<0.65	<0.01
01/13/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.11	<0.65	<0.01
stat mean	<0.07	<0.10	<0.10	<0.10	<0.10	<0.10	0.248	<0.65	0.009
stat 99th%	<0.07	<0.10	<0.10	<0.10	<0.10	<0.10	0.814	<0.65	0.049

nd – no discharge **nr** – no report / sample **red** – violation **blue** – detection limit over stds

Appendix 8
Table 8.6 – Bldg 155 Water-Jet Cutting (NPDES Outfall 004i)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
2005 4th Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
08/24/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
04/19/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
02/01/05	<0.07	<0.1	0.12	<0.1	<0.1	<0.1	0.11	<0.65	<0.01
2004 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
07/21/04	<0.07	<0.1	0.21	<0.1	0.11	<0.1	<0.1	<0.65	<0.01
05/10/04	<0.1	0.13	1.37	<0.1	0.92	<0.1	0.29	<0.65	0.024
01/20/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
stat mean	<0.07	0.036	0.308	<0.10	0.194	<0.10	0.089	<0.65	0.005
stat 99th%	<0.07	0.083	1.529	<0.10	1.026	<0.10	0.329	<0.65	0.027

Appendix 8
Table 8.7 – Bldg 1456 Steam Plant Cleanliness Hose Flush (NPDES Outfall 008i)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
12/14/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
07/25/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
04/12/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.004
01/18/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
11/22/04	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
07/24/04	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
04/12/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
03/03/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	<0.01
stat mean	<0.07	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.65	0.003
stat 99th%	<0.07	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.65	0.005

Appendix 8
Table 8.8 – Bldg 1670A Tank 3 Hose Hydrotest Room (NPDES Outfall 010iA)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
10/18/05	<0.07	<0.1	0.41	0.11	<0.1	<0.1	0.75	<0.65	0.110
07/12/05	<0.07	<0.1	0.28	<0.1	<0.1	<0.1	0.60	<0.65	0.056
04/12/05	<0.07	<0.1	0.17	<0.1	<0.1	<0.1	0.39	<0.65	0.001
01/24/05	<0.07	<0.1	0.22	<0.1	<0.1	<0.1	0.61	<0.65	0.049
11/01/04	<0.07	<0.1	0.28	<0.1	<0.1	<0.1	0.44	<0.65	0.487
09/27/04	<0.07	<0.1	0.30	0.13	<0.1	<0.1	0.41	<0.65	0.184
2000 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
03/03/04	<0.1	<0.1	0.30	<0.1	<0.1	<0.1	0.33	<0.65	0.242
stat mean	<0.07	<0.10	0.264	0.055	<0.10	<0.10	0.504	<0.65	0.161
stat 99th%	<0.07	<0.10	0.453	0.160	<0.10	<0.10	0.857	<0.65	0.548

nd – no discharge **nr** – no report / sample **red** – violation **blue** – detection limit over stds

Appendix 8
Table 8.9 – Bldg 1670B Tank 1 Teflon/Sign Shop (NPDES Outfall 010iB)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
2005 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 3rd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
05/12/05	**nr**	<0.1	0.16	<0.1	<0.1	<0.1	0.55	**nr**	**nr**
2005 1st Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2004 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2004 3rd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
04/05/04	<0.1	<0.1	0.38	<0.1	<0.1	<0.1	0.10	**<1**	0.031
2004 1st Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
stat mean	<0.1	<0.1	0.27	<0.1	<0.1	<0.1	0.325	-	0.018
stat 99th%	<0.1	<0.1	0.633	<0.1	<0.1	<0.1	1.066	-	0.061

Appendix 8
Table 8.10 – Bldg 1725 Aluminum Flame Spray (NPDES Outfall 011i)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
2005 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 3rd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 2nd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 1st Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2004 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2004 3rd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2004 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
2004 1st Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
stat mean	-	-	-	-	-	-	-	-	-
stat 99th%	-	-	-	-	-	-	-	-	-

Appendix 8
Table 8.11 – Bldg 1770A Antenna Shop (NPDES Outfall 012iA)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
11/01/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.008
2005 3rd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2005 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	nr
03/30/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.010
11/01/04	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.008
08/23/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.015
05/03/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.032
02/09/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.022
stat mean	<0.07	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.65	0.016
stat 99th%	<0.07	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.65	0.038

nd – no discharge **nr** – no report / sample **red** – violation **blue** – detection limit over stds

Appendix 8
Table 8.12 – Bldg 1770B Insulation Shop (NPDES Outfall 012iB)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
11/29/05	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01	<0.65	0.005
2005 3rd Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
04/12/05	<0.07	<0.1	0.89	0.41	<0.1	<0.1	0.12	<0.65	0.010
2005 1st Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
2004 4th Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
08/04/04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.65	0.019
04/12/04	<0.1	<0.1	0.18	<0.1	0.11	<0.1	<0.1	<0.65	0.008
01/27/04	<0.1	<0.1	0.34	<0.1	<0.1	<0.1	0.14	<0.65	0.008
stat mean	<0.07	<0.10	0.306	0.098	0.038	<0.10	0.076	<0.65	0.010
stat 99th%	<0.07	<0.10	1.112	0.504	0.132	<0.10	0.177	<0.65	0.022

Appendix 8
Table 8.13 – Bldg 1770C Valve Shop (NPDES Outfall 012iC)

(mg/l)	Cd	Cr	Cu	Pb	Ni	Ag	Zn	CNt	TTO
2005 4th Qtr	nd	nd	nd	nd	nd	nd	nd	nd	nd
08/01/05	<0.07	<0.1	0.10	<0.1	0.22	<0.1	<0.1	<0.1	0.018
2005 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
2005 1st Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
11/22/04	<0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.01
2004 3rd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
2004 2nd Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
2004 1st Qtr	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**	**nr**
stat mean	<0.07	<0.1	0.075	<0.1	0.135	<0.1	<0.1	<0.65	0.012
stat 99th%	<0.07	<0.1	0.157	<0.1	0.415	<0.1	<0.1	<0.65	0.033

nd – no discharge **nr** – no report / sample **red** – violation **blue** – detection limit over stds