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ENVIRONMENTAL ENGINEERING SURVEY

NAVAL COASTAL SYSTEMS CENTER

PANAMA CITY, FLORIDA

UIC - N61331

OCTOBER 1980

BY

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SOUTHERN DIVISION

NAVAL FACILITIES ENGINEERING COMMAND

CHARLESTON, SOUTH CAROLINA

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I. INTRODUCTION

A. Description of Activity

The Naval Coastal Systems Center, Panama City, Florida, is a major research and development activity of the Navy Material Command. The shore activity was established in September 1945 as a Navy Countermeasures Station. On 1 February 1972 it was established as the Naval Coastal Systems Laboratory in order to centralize research and development efforts in the vital area of coastal warfare technology.

The Center proper is located on 350 acres of land on St. Andrews Bay in Bay County, Florida, west of Panama City. Outlying areas include 300 acres of ordinance area across Alligator Bayou and smaller research stations on the Apalachicola River and the Gulf of Mexico. The land topography at the main activity is relatively flat ranging between 0 and 17 feet above mean sea level. Soil borings indicate a predominately fine sandy soil to a depth of 50 feet. The climate is mild with a mean daily temperature of 76° to 89° in summer and 46° to 63° in winter. Prevailing winds range between 10 to 20 knots and the mean annual rainfall is 55.2 inches. The main station population is 1,446 officers enlisted and civilian personnel.

B. Purpose and Scope of Survey

The purpose of the survey was to review the current status of environmental protection facilities and to assist the activity in their compliance with current and projected state and federal environmental regulations.

C. Authority

This survey was accomplished in accordance with NAVFACINST 5450.19B of 15 October 1974.

D. Personnel Contacted

LCDR Martin	Public Works Officer
Mr. Southall	Director of Engineering
Mr. Cross	Maintenance Control Director
Mr. Holmes	Environmental Coordinator
Mr. Meyers	Electrical Engineer
Mr. Ward	Sewage Treatment Plant Operator
Mr. Bedall	Director of Safety

II. SUMMARY OF DEFICIENCIES AND RECOMMENDATIONS

A. Air Pollution Control

Naval Coastal Systems Center (NCSC) is in compliance with state and federal pollution control regulations.

B. Potable Water Supply

The Experimental Diving Unit consumes approximately 700,000 gallons of water per month in diving tanks that are routinely flushed to the storm drainage system. This water should be recycled if at all possible.

C. Water Pollution Control

1. Domestic Wastewater Collection

The excessive infiltration into the domestic wastewater collection system should be corrected by construction contract N62467-80-B-2847 scheduled to begin on 22 September 1980.

2. Domestic Wastewater Treatment Plant

The operation of the sewage treatment plant has been improved with the addition of a grit removal system, a comminutor, a new chlorine contact chamber, and an additional sludge drying bed. The plant still has several minor problems including the lack of sufficient hydraulic head at the trickling filter mixing chamber to maintain constant rotation of the distribution arms.

The primary sewage treatment plant operator is certified and one of the roving watch mechanics has also become certified as recommended in the last environmental engineering survey.

The State Department of Environmental Regulation has expressed disapproval of the location of the sewage treatment plant effluent discharge structure. NCSC is currently testing for alternative locations further out in the Bay.

D. Oil Spill Prevention

Drums of waste oil previously stored near Building 228 have been removed.

E. Hazardous Waste Management

Polychlorinated biphenyl (PCB) transformers have been labeled and are periodically inspected for possible leakage.

The plans for providing alterations to the plating and battery shops should be changed to delete the installation of chemical waste spill holding tanks because the installation of these tanks would cause a new hazard.

III. DISCUSSION

A. Air Pollution Control

NCSC Panama City is in compliance with current state and federal air pollution control regulations.

B. Potable Water Supply

Activity potable water is purchased from the Bay County Water System at a cost of \$0.60 per 1,000 gallons. Water reaches NCSC via two service lines that tie to a 16-inch main that crosses the Bay Bridge. NCSC authorities have expressed concern that NCSC water service is vulnerable to interruption caused by damage to the 16 inch main that crosses the bridge.

NCSC has five deep water wells and a 200,000 gallon elevated water storage tank on station. The wells were taken out of service and abandoned when the Center joined the Bay County Water System. Special project documents are currently being developed to reactivate one of the wells to serve as a standby potable water source.

The State Department of Environmental Regulation local representative has stated verbally that the Navy will not be allowed to connect the new water source to the existing Bay County Water System on station for fear of contaminating the county water system.

The reactivation of an existing well is commendable; however, it may be difficult to maintain the well pump and chemical feed systems in working order unless they are used on a regular basis. Public Works should consider installing a small parallel distribution system to service one or more high water consumption facilities such as washracks or the Navy Experimental Diving Unit (NEDU) facility.

The NEDU facility is estimated to consume approximately one third of the total water used by the station. This is an estimate based on per capita consumption data and the estimated number of water changes in the two 55,000 gallon experimental diving tanks. The NEDU test schedule may require that the diving tanks water be changed between once a week to once a month. All of the water drained from the tanks is wasted to the storm drainage system. A water meter should be installed at the NEDU facility and alternative usage of wasted water should be considered.

C. Water Pollution Control

1. Domestic Wastewater Collection

Excessive surface and ground water flow into the station domestic wastewater collection system has been confirmed by television inspection and a contract has been awarded to Parker Mechanical Contracting for \$221,721 to accomplish the necessary repairs. The project preconstruction conference was held on 10 September and the work is expected to be completed in December 1980.

An analysis of the sewage treatment plant flow records for July 1979 through August 1980 (Appendix A) shows the impact of rainfall on the domestic sewage flow rate. The lowest monthly average flow of 93 MGD occurred in February 1980, a month with a total rainfall of 1.35 inches spread over four separate days. The highest monthly average flow of 258 MGD occurred in September 1979, a month with total rainfall of 10.5 inches spread over ten separate days. It was noted that the flow rate generally peaked on the day following a day that it rained which suggests infiltration (through the ground) rather than inflow (through surface openings) into the sewage collection system. A comparison of this flow data with data generated after the sewage collection system improvements project is completed will verify the effectiveness of the system improvements.

2. Domestic Wastewater Treatment Plant

MILCON Project P-255, Sewage Treatment Plant Improvements is currently under construction. The project should increase the sewage treatment plant capacity from 150,000 GPD to 200,000 GPD and provide for better plant effluent quality control.

The Florida Department of Environmental Regulation has expressed concern that the sewage treatment plant effluent discharge pipe into the Bay is too close to shore. The outfall is in shallow water where the effluent is channeled by wind force rather than current force. Prevailing winds cause the effluent to drift, undiluted by bay waters, toward a private marina approximately one mile from the outfall structure.

The Naval Sea Systems Laboratory is currently conducting experiments with dyes discharged at various points in the Bay near the sewage treatment plant to determine the best location for the outfall structure. So far their experiments have not been successful in finding a good dispersal point within 400 feet of the existing structure. The extension of the outfall structure with a mechanical dispersal system such as a perforated discharge pipe should alleviate Department of Environmental Regulation officials concern.

The trickling filter is located beneath several large live oak trees that continually drop small leaves into the filter dosing chamber. The leaves are carried with the effluent to the filter distribution arm where the leaves clog the distribution nozzles. This problem could be eliminated by the placement of a screen over the open top of the dosing box. The trickling filter has four distribution arms though only two are being used. The two arms are adequate for normal flow but on occasional peak flows the dosing box overflows before the influent can be distributed by the two arms. If all four arms are used during normal flow, there is insufficient velocity at the discharge nozzles to cause the arms to rotate.

The operation of the filter could be improved by modifying two of the distribution arms so that they will automatically become active when flow peaks. An inverted trap with a six inch freeboard should be installed in the normally inactive distribution arms. A sketch of this configuration is shown as Appendix B. The trap freeboard should be set just below the dosing box overflow elevation.

D. Oil Spill Prevention

The large number of containers previously stored adjacent to Bldg 288 have been removed. There were approximately 200 containers of various sizes that contained unknown liquids. Of the 200 containers, 56 contained nothing but rainwater. The contents of all of the containers were analyzed before disposal and hazardous wastes were containerized in Department of Transportation approved containers and hauled to a hazardous waste disposal site.

NCSC Panama City is well equipped to contain and clean up surface water oil spills.

NCSC Panama City has the full complement of surface water oil spill cleanup equipment except for the work boat platform and permanent boom. The equipment appeared to be well maintained and in order.

Key personnel have been trained in operating and maintaining the equipment but there was no evidence of scheduled equipment operator training. Operator training exercises should be conducted on a scheduled basis as recommended in the equipment operations manual.

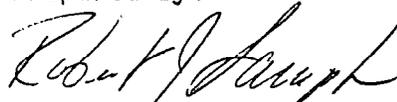
E. Hazardous Waste Management

Pollution abatement project W-266L has been designed to provide chemical process vapor controls and spill prevention controls. The chemical spill control features included the construction of secondary containment structures around chemical holding tanks and connecting the spill containment structures to one of two buried storage tanks via valved piping systems. Theoretically, if a spill occurs, a valve in the spill containment structure is opened allowing the chemical to flow into one of the buried spill holding tanks.

The installation of the two buried spill storage tanks connected to the various spill containment structures is not acceptable. If these tanks were installed in accordance with the design they too would be required to have spill containment structures. Also, it is most likely that shop personnel would use the spill containment drainage system and holding tanks as a disposal system causing the inadvertent mixing of noncompatible chemicals and wash water in the holding tanks.

All spill transfer and storage systems should be deleted from the project. If a spill occurs, it should be removed from the spill containment structure manually and containerized for disposal.

Prepared by:

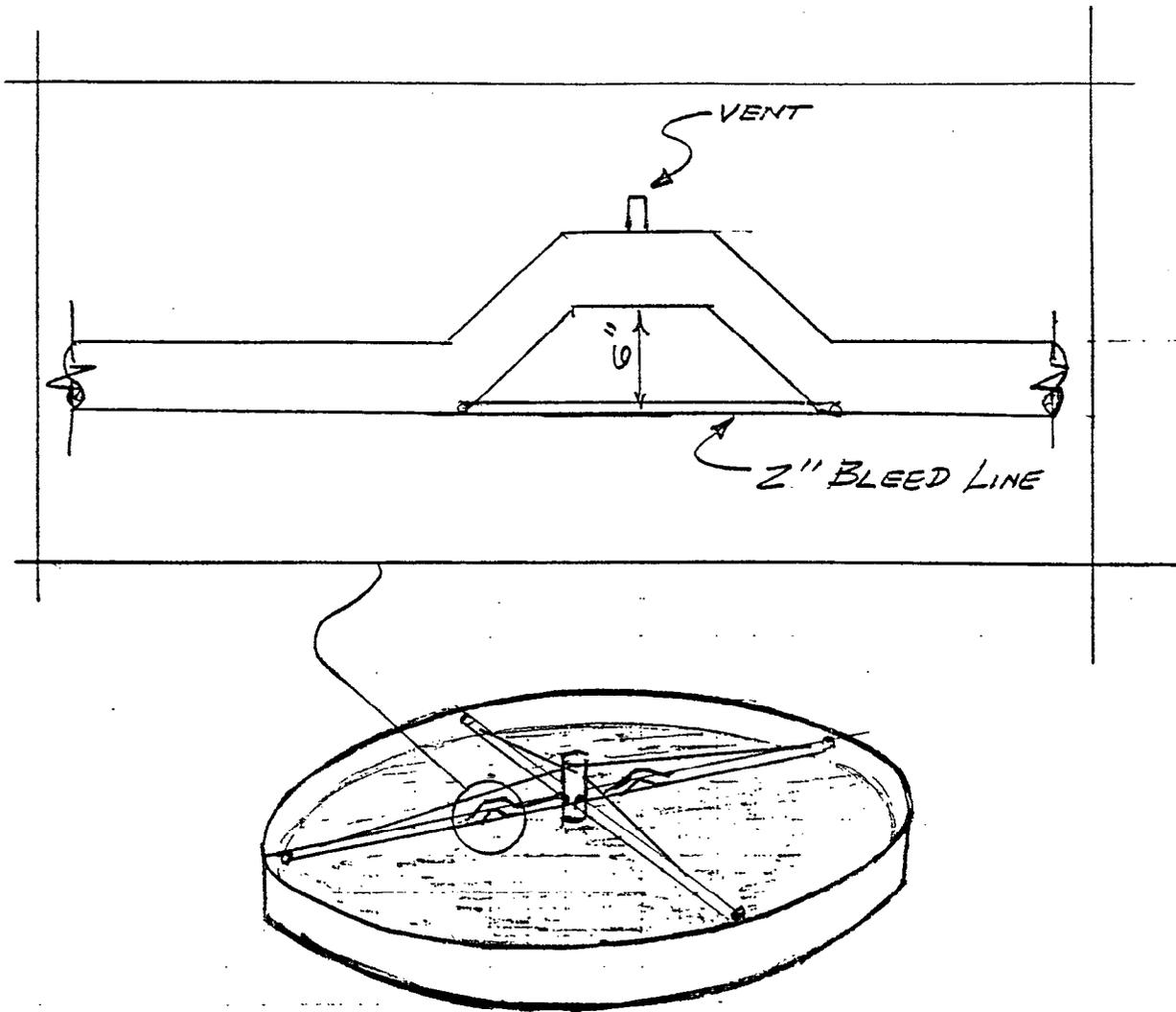


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NAVAL COASTAL SYSTEMS CENTER
 PANAMA CITY, FLORIDA
 SEWAGE TREATMENT PLANT FLOW DATA

<u>Total Treated</u>		<u>High/Date</u>	<u>Low/Date</u>	<u>Max Rain In./Date</u>	<u>Rain Flow Date/Next Day</u>	<u>Mo Avg</u>	<u>Rain Days</u>	<u>Total Monthly Rainfall In.</u>
5863	Jul 79	266/25	117.5/4	2.24/11	153/240	189	11	8.89
6627	Aug 79	285/2	157/19	1.83/1	275/285	213	13	9.74
7745	Sep 79	337/27	153/9	4.0/26	294/337	258	10	10.5
5999	Oct 79	277/1	145/30	.03/4	245/229	194	1	0.03
4548	Nov 79	178/23	110.7/22	1.55/23	178/141	151	4	3.55
4927	Dec 79	193/5	112/7	1.09/5	193/194	159	5	2.86
5202	Jan 80	187/31	121/19	1.60/25	157/175	168	12	5.67
2694	Feb 80	187/1	87/25	.62/5	160/172	93	4	1.35
5576	Mar 80	269/24	152/23	2/24	200/202	180	13	7.23
6520	Apr 80	388/1	113/17	1.4/2	296/218	217	12	7.42
4787	May 80	187/2	112/18	1.48/21	186/178	154	5	3.28
4686	Jun 80	217/26	110/12	1.97/24	187/203	156	7	6.5
5781	Jul 80	276/28	83/9	2.0/23	150/273	185	8	5.7
5854	Aug 80	266/15	128/3	1.11/21	132/198	189	5	1.98
Averages		292.75	141.7	1.91	233.83/ 253.75	208.8	9.16	6.22

Flows are expressed in thousands of gallons per day



SKETCH OF LATENT DISTRIBUTION
ARMS