N00639.AR.002235
NSA MID SOUTH
5090.3a

WORK PLAN FOR DEVELOPMENT OF A TANK MANAGEMENT PLAN WITH TRANSMITTAL

MILLINGTON SUPPACT TN

1/20/1993

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

Environmental
Science &
Engineering, Inc.
A CILCORP Company

January 20, 1993
393-7001G-0100

Commanding Officer
Attn: Code 0233
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Charleston, SC 29411-0068
POC: John Karlyk

Dear Mr. Karlyk:

Please find enclosed a copy of the work plan prepared by Environmental Science & Engineering, Inc. (ESE) for the development of a Tank Management Plan (TMP) for the Naval Air Station (NAS) Memphis in Millington, Tennessee (contract N62467-90-D-1118).

Following approval of the work plan, work on the TMP will commence immediately. Field work will consist of meetings with activity personnel to review and identify all underground storage tanks at the NAS. All identified tanks will be field-verified for accuracy by ESE engineers. Because of the large number of tank systems which need to be reviewed and verified, ESE is requesting that 8 weeks from the approval of the work plan be allowed for the preparation of the draft TMP.

If you have any questions regarding this work plan, please do not hesitate to call.

Sincerely,

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Dennis L. Brinkley
Project Engineer

eln:c-wr51-s8\nav.ltr

pc: T. Barker, NAS Memphis
J. Bonds, ESE
B. Hazlet, ESE

11665 Lilburn Park Road St. Louis, MO 63146-3535 Phone (314) 567-4600 Fax (314) 567-5030

1.0 INTRODUCTION

This work plan presents the approach to be utilized by Environmental Science & Engineering, Inc. (ESE) to develop a tank management plan (TMP) for the Naval Air Station (NAS) in Millington, Tennessee. The objective of the tank management plan is to provide an operational document for activity-level use. The TMP will be used to assist in managing the operation and maintenance of existing underground storage tanks (USTs) and in planning for future needs.

all tanks (AG & UG)

2.0 DESCRIPTION OF THE TANK MANAGEMENT PLAN

The TMP will be divide into nine sections with five appendices. Exhibit 2-1 contains a proposed outline for the TMP. The TMP will be formatted to adhere to the "Report Format Guidance Manual Southern Division Naval Facilities Engineering Command". The TMP will be bound in a three ring binder allowing for easy updating of the plan as changes are made to the tank systems at the NAS.

2.1 TMP Introduction

Section 1.0 of the TMP will contain the introduction. The introduction will detail the purpose and scope of the TMP and identify the contacts at the activity and the designated activity officials to implement the TMP.

2.2 TMP Site Characteristics

Section 2.0 will contain a description of the activity and the geology and hydrogeology of the area. This section will contain a discussion of the surface water and groundwater

EXHIBIT 2-1 TANK MANAGEMENT PLAN OUTLINE

1.0 INTRODUCTION

2.0 SITE CHARACTERISTICS

3.0 SCOPE OF WORK

4.0 REGULATORY OVERVIEW

5.0 UNDERGROUND STORAGE TANK INVENTORY

6.0 TANK RISK ANALYSIS

7.0 RECOMMENDATIONS

8.0 SCHEDULE AND COST ESTIMATE

9.0 TIMS DATABASE UPDATE

APPENDICES
Appendix A NAS Memphis UST Inventory
Appendix B Tennessee State Underground Storage Tank Regulations
Appendix C U.S. EPA Federal Underground Storage Tank Regulations
Appendix D Musts For USTs
Appendix E Standard Operating Procedures

5.1 UST [illegible]

5.2 Non-[illegible] tanks

10. Dumpy

in the vicinity of the NAS in addition to surrounding land uses and other information obtained from U.S. Geological Survey, the Tennessee Geological Survey, the U.S. Soil Conservation Service, and other sources.

2.3 TMP Scope of Work

Section 3.0 will contain the scope of work performed for the project. The scope of work will include a summary of; data review with facility personnel; field verification activities; and, data reduction and report preparation.

2.4 TMP Regulatory Overview

Section 4.0 will contain a review of pertinent state and federal UST regulations. The regulations will be summarized and regulatory requirements, deadlines, and options will be explained.

2.5 TMP UST Inventory

Section 5.0 will contain the results of the tank inventory. This tank information will be summarized in tables. Tank information will be presented for each tank including the Naval tank number, location, size, capacity, year of installation, status, utilization, and contents. An example of the type of information to be included in the table is presented on Table 2-1. Separate tables in this section will include; a complete tank listing; a tank listing sorted by utilization; and, a tank listing sorted by regulated status. Detailed data sheets and site location maps for each tank will be included as Appendix A.

Table 2-1 (page 1 of 2)
Summary of Underground Storage Tanks by State

State	City and Site Number	Tank No.	Tank Year	Tank Vol.	Tank Const.	Product	Pipe Year	Pipe Const.	Tank Tested	Monthly Monitoring		CP	Spill	Over-fill	Regulatory Deadline				Rating	Risk Rank
										Tank	Piping				LD	CP	SP	Over		
Philadelphia, PA	153-19149	1	80	10,000	S1W	UG	80	S1W	P,83	N	N	N	N	N	93	98	98	98	25202	378
Philadelphia, PA	153-19114-4019	1	82	10,000	S1W	UG	82	S1W	N	N	N	N	N	N	93	98	98	98	19708	409
Philadelphia, PA	153-19114-4019	3	82	2,000	S1W	FO#2	82	S1W	N	N	N	N	N	N	93	98	98	98	19708	408
Philadelphia, PA	153-19114-4019	2	82	250	S1W	WO	82	S1W	N	N	N	N	N	N	93	98	98	98	19708	407
Philadelphia, PA	153-19114-1079	5	91	15,000	S1W	DF	91	S1W	N	N	N	N	N	N	AI	AI	AI	AI	6539	503
Pittsburgh, PA	160-15233	4	60	10,000	S1W	WO	60	S1W	N	N	N	N	Y	N	89	98	98	98	229070	31
Pittsburgh, PA	160-15233	3	90	10,000	S2W	DF	90	S1W	P,90	N	N	N	Y	Y	AI	AI	AI	AI	880	545
Pittsburgh, PA	160-15233	1	60	6,000	S1W	UG	60	S1W	P,90	N	N	N	Y	Y	89	98	98	98	3213	533
Pittsburgh, PA	160-15233	2	60	6,000	S1W	UG	60	S1W	P,90	N	N	N	Y	Y	89	98	98	98	3213	532
Cranston, RI	144-02910	1	79	10,000	S1W	UG	79	S1W	N	N	N	N	N	N	92	98	85	98	94825	241
Cranston, RI	144-02910	2	79	500	S1W	WO	79	S1W	N	N	N	N	N	N	92	98	85	98	94825	242
Providence, RI	144-02909	2	60	10,000	S1W	FO#2	60	S1W	P,87	N	N	N	N	N	89	98	85	98	228876	35
Providence, RI	144-02909	3	60	500	S1W	WO	60	S1W	P,87	N	N	N	N	N	89	98	85	98	228876	34
Providence, RI	144-02909	1	76	10,000	S1W	UG	76	S1W	P,87	N	N	N	Y	N	92	98	85	98	177194	118
Dyersburg, TN	139-38024	1	73	10,000	S1W	DF	73	S1W	N	N	N	N	N	N	91	98	98	98	1673188	122
Jackson, TN	139-38301	1	61	10,000	S1W	DF	61	S1W	N	N	N	N	N	N	89	98	98	98	225390	55
Memphis, TN	139-38108	2	68	10,000	S1W	DF	68	S1W	P,90	N	N	N	N	N	90	98	98	98	24387	386
Memphis, TN	139-38108	1	68	10,000	S1W	DF	68	S1W	P,90	N	N	N	N	N	90	98	98	98	24387	385
Memphis, TN	139-38103	3	86	2,000	F1W	WO	86	S1W	N	N	N	N	N	N	93	98	98	98	7156	475
Memphis, TN	139-38103	2	86	2,000	F1W	OPP	86	S1W	N	Y	N	N	N	N	93	98	98	98	7156	474
Memphis, TN	139-38103	1	86	20,000	F1W	DF	86	S1W	N	Y	N	N	N	N	93	98	98	98	7156	473

LEGEND

Y = yes
N = no
NA = not applicable/not analyzed

Tank and Piping Construction

S1W	Steel One Wall
S2W	Steel Two Wall
F1W	Fiberglass One Wall
F2W	Fiberglass Two Wall
FCS	Fiberglass Clad Steel

Product

DF	Diesel Fuel
UL	Unleaded Gasoline
LG	Leaded Gasoline
FO#2	Fuel Oil #2
FO#1	Fuel Oil #1
WO	Waste Oil
OFO	Other Fuel Oil
OPP	Other Petroleum Product
O	Other
UN	Unknown

Tank Tested (Tightness Tested)

N	Never
P	Pass (year)
F	Fail (year)

CP:	Cathodic Protection
SPILL:	Spill Prevention Device
OVERFILL:	Overfill Prevention Device
LD:	Leak Detection
AI:	At Installation

Tank Number

* Denotes tank out of service

2.6 TMP Tank Risk Analysis

Section 6.0 will contain the results of a risk analysis of each tank using an ESE proprietary software program, PCSAFER. PCSAFER was originally developed to assist underwriters in evaluating risks that might be assumed in insuring owners of underground storage tanks against environmental impairment liability. It is also useful to managers or engineers charged with managing a large number of USTs to ensure environmental compliance and cost minimization. It estimates the probability of product loss, P, as a result of both corrosive and noncorrosive failures. PCSAFER also estimates damages, D, if a loss occurred. Damages include remediation costs and potential third party claims. The product (P x D) of the probability and the estimated damages equals the risk.

PCSAFER assumes that releases result from failures in two predominant categories: corrosive and non-corrosive. Corrosive failures are predictable, within specified limits of precision (approximately 3 years for 70 percent of bare steel tanks). The probability of corrosive failure for steel tanks is based on the depth to groundwater, soil resistivity, soil pH, presence of sulfide, and tank age. The probability determination examines corrosion of unprotected steel tank and piping.

Noncorrosive failures are more unpredictable, but are known to be related to system age, construction, utilization of spill and overfill devices, and the nature of the surface above the tanks and around dispensers. This probability determination is based on the assumptions that there is an inherent background liability associated with underground storage tanks and that the probability of noncorrosive failure is reduced through the

addition of spill and overfill protection and maintenance of an impervious surface over the tanks and around the dispenser islands. Fiberglass tanks are also evaluated for noncorrosive failure by inputting the standard failure rates associated with fiberglass reinforced plastic (FRP) failure due to improper installation or the storage of corrosive (i.e., alcohol based) materials in non-protected tanks.

Potential damages at a site are determined through a formula which incorporates remediation costs, potential claim settlements, community exposure rating, leak detection, response time, and travel time to the nearest human receptor. The remediation costs are estimated using the target clean-up levels set by the local enforcement agency, depth to groundwater, the nature of the vadose zone, the amount of product released (100 to 2,000 gallons is typical) and the nature of the material released. Potential claim settlements are determined using information on third-party claim awards obtained from the insurance industry and records of court decisions.

The community exposure rating determines the level of risk that receptors might be susceptible to in the site vicinity. The community exposure rating is arrived at by using the DRASTIC model developed by the U.S. Environmental Protection Agency (USEPA) and the National Water Well Association (NWWA) to identify the degree of susceptibility to various hydrogeologic regimes to contamination. The primary input components to this system include geologic and hydrogeologic information as well as site-specific land-use data. The last two components of the PCSAFER equation are the variable response time and travel time to the nearest human receptor.

2.7 TMP Recommendations

Section 7.0 will contain the tank specific recommendations for each tank. These recommendations will take into account the regulatory status of the tank, the tank's relative risk ranking, and the Navy's priority and planned usage of the tank. The recommendations may include tank consolidation, abandonment, removal, changes is tank type (i.e., aboveground versus underground), and other engineering management options as appropriate.

2.8 TMP Schedule and Cost Estimate

Section 8.0 will contain a schedule of necessary actions to meet regulatory requirements and recommendations. A cost estimate will be developed for the implementation of the schedule on a yearly basis. The cost estimates will include interim measure costs such as tightness testing as well as removal and replacement costs and an estimate of anticipated environmental liabilities. The schedule and cost estimates will be developed through 1998. After 1998 the schedule will be established on a per year thereafter basis.

2.9 TMP Tank Information Management System Update

Section 9.0 will contain the results of the updated Tank Information Management System (TIMS) database. The tank inventory information collected during this project will be used to update the existing TIMS and a copy of the updated program will be included on diskette.

2.10 Appendices

Appendix A will contain the detailed tank inventory survey forms and individual site maps for each tank. The site maps will locate each tank with regard to the nearest building or site feature. Additionally, a map of the activity displaying the location of all of the tank systems will be included. Appendix B will contain a copy of the current State of Tennessee UST regulations. Appendix C will contain a copy of the federal UST regulations. Appendix D will contain the USEPA publication Musts For USTs, a general summary of the final USEPA tank regulations. Appendix E will contain general operating procedures for proper UST operation. These procedures will include tank-filling and tank-reconciliation procedures.

3.0 PERFORMANCE OF THE WORK

The TMP will be developed by ESE through a combination of field verification of tank records, consultation with activity staff, review of previous tank inventory and closure reports. The recommendations and schedule will be developed with the consultation of Southern Division and activity personnel. It is estimated that field verification and review of activity records will take approximately 2 weeks. The development of the final draft TMP will take approximately 6 weeks following completion of the field work.