UNITED STATES ENVIRONMENTAL PROTECTION AGENCY - REGION II
290 BROADWAY
NEW YORK, NEW YORK 10007-1866

MAR 0 4 1997

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

S. J. Pena
Commander, CEC, U.S. Navy
Public Works Officer
U.S. Naval Station Roosevelt Roads
TSC 1008 Box 3001
Code NO
FPO AA 34051-3001

Re: RCRA Facility Investigation (RFI) Report - Operable Unit 2
U.S. Naval Station Roosevelt Roads
RCRA/HSWA Permit No. PR2170027203

Dear Commander Pena:

The United States Environmental Protection Agency (EPA) Region II has reviewed the September 1996 Draft RCRA Facility Investigation (RFI) Report - Operable Unit 2 (OU 2), transmitted on behalf of the Navy by Baker Environmental, Inc. However, EPA has not completed its review of the data validation reports for the analytical results included with this report. EPA's comments are predicated on the assumption that the analytical results included with the RFI report for OU 2 will be judged usable following EPA's data validation review. Accordingly, EPA reserves the right to revise and/or add to our comments based upon a complete review of the validity of the analytical results.

EPA does not approve the report as submitted, nor the no further action recommendations made for OU 2 SWMUs. EPA's basis for this decision is discussed below, with additional comments given in the enclosed [A.T. Kearney] Technical Review dated January 3, 1997.

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With regard to Tow Way Fuel Farm SWMUs #7 and #8, the submitted RFI report is incomplete and lacks sufficient detail. The subsurface soil characterization presented in the RFI report, for both the vadose zone (above the water table) and the saturated zone (below the water table), and all health assessment risk evaluations and conclusions, are based only on data from the present [limited] RFI investigation program, which by itself is not adequate. The same is true for the groundwater. EPA's approval of the present limited RFI investigation program was predicated on incorporation of all previous data.

An acceptable RFI final report for Tow Way Fuel Farm's SWMUs #7 and #8 must present a complete site characterization (including the subsurface soils), based upon all available data. Failing this, additional characterization work will be required.

In addition, as will be more fully discussed below, the Human Health Risk Assessment (HHRA) evaluations submitted for Tow Way Fuel Farm's SWMUs #7 and #8 are based on a non-representative and incomplete "chemicals of potential concern" (COPC) data set and/or concentrations, and are therefore not acceptable.

Furthermore, for all OU 2 SWMUs (and all other SWMUs or Areas of Concern [AOC] at Roosevelt Roads), the decision of whether or not further action is required cannot be based solely on human health considerations, as is the case in the RFI report. As discussed in Section B.7 (Determination of No Further Action) of Module III of the 1994 RCRA Operating Permit (and elsewhere in the Permit), the determination of no further action must be based on .. "demonstrating that there are no releases of hazardous wastes and/or hazardous constituents from SWMUs at the facility that pose a threat to human health **and the environment** [emphasis added].."

In addition, the locations for the background samples (surface and subsurface soil, and groundwater) were not approved by EPA (nor even submitted to EPA for its prior review). While they are described as being from "along Boxer Road northwest of the Crash Crew area" (near the airfield), there is no discussion of why these locations were selected, and whether the location of the background samples may have been impacted by contamination from activities at the facility. The revised RFI report should

contain a discussion of the representativeness of the background samples, why these locations were selected, and steps taken to verify that the background area had not been impacted by contamination.

EPA's specific comments on the present investigations and RFI report are as follows:

SWMU #7 (Tow Way Fuel Farm)

The report submitted does not adequately characterize the subsurface soils at Tow Way Fuel Farm, both in the vadose zone (above the water table) and the saturated zone (below the water table), or the groundwater.

Vadose Zone Soils (above the water table)

The current investigations included limited subsurface soil sampling from 3 shallow soil borings located in the southern portion of the fuel farm, at the base of the hill on which the fuel tanks are located, and 4 newly installed "bedrock" groundwater wells, located further north, up the slope of the hill. A total of 9 subsurface soil samples from the 3 "shallow" soil borings were analyzed for organic and inorganic constituents. Of these, 2 (7SB02-03 and 7SB03-06) appear to be clearly from vadose zone soils above the water table, while 2 (7SB01-04 and 7SB03-08) appear to straddle it. The other 5 subsurface soil samples from the "shallow" borings were from the saturated zone below the water table. Benzo(a)pyrene was detected in 1 of the 2 vadose zone soil samples (7SB02-03, from 6-8 feet) at an estimated (J qualified) concentration of 290 ug/kg, which exceeds EPA's [Region III] residential risked based concentration of 88 ug/kg.

In addition, 6 vadose zone soil samples (7MW01-07 & -12, 7MW04-07 &-11, and 7MW03-04 & -06) were analyized from subsurface samples collected during installation of the 4 "bed-rock" monitoring wells installed during these investigations. Of the 6 vadose zone samples, one (7MW01-07 from 14-16 feet below surface) had a total petroleum hydrocarbon (TPH) diesel concentration of 420 mg/kg, which exceeds the Commonwealth of Puerto Rico Environmental Quality Board's (EQB's) soil clean-up standard of 100 mg/kg.

However, these investigations (8 [possibly 10?] vadose zone samples from 5 locations) do not adequately characterize vadose zone soils/formation throughout the Tow Way Fuel Farm (TWFF), which encompasses an area of at least 350,000 square feet (8 acres). In the northern portion of TWFF the maximum thickness of the vadose zone interval is at least 73 to 79 feet, based on the "bed-rock" wells 7MW03 and 7MW04 installed during the current investigations, and 26 to 45 feet in the central portion of Tow Way Fuel Farm, based on "bed-rock" wells 7MW01A and 7MW02 (see data given in Table 4-2). Yet in the [present] draft RFI report, from 12 feet below ground surface (the maximum depth penetrated by the SWMU #8 excavation samples), an interval of approximately 14 to 33 feet of vadose zone soils/formation in the central portion of TWFF, and 61-67 feet or more in the northern portions of TWFF, has been characterized (and Human Health Risk Assessment evaluations performed) based on only the 8-10 subsurface samples from 5 locations (soil borings 7SB02 & 7SB03, and "bed-rock" monitoring wells 7MW01, 03, & 04) throughout an 8 acre site. This is not adequate, and the HHRA conclusions based only on this limited present data do not reflect or conform with significant previous investigation results or conclusions, as discussed below.

The draft RFI report submitted does not incorporate the results from extensive previous investigations at Tow Way Fuel Farm (reference Site Characterization Tow Way Fuel Facility report [the Site Characterization report] dated April 1994, prepared by Blasland, Bouck & Lee, Inc.) into the present characterization of the subsurface soils, or health assessment risk evaluations and conclusions. For example, data incorporated in the 1994 Site Characterization report indicated total petroleum hydrocarbon (TPH) concentrations as high as 22,850 mg/kg were found in soils at Tow Way Fuel Farm, and Figure 4-1 of the 1994 Site Characterization report shows a large area of soils containing petroleum hydrocarbon concentrations exceeding 100 mg/kg TPH, which is the clean-up standard for petroleum contaminated soils in the Commonwealth of Puerto Rico. Furthermore, the Site Characterization report states on page 4-1 that.. "The vertical extent of soil contamination is to the top of the water table 10 to 15 feet bls [below land surface] in the Lower TWFF [Tow Way Fuel Facility] and to approximately 16 feet bls in the Upper TWFF..." The 1994 report further states (on page 4-1) that "The

total area of soil contamination [exceeding 100 mg/kg TPH] is approximately 130,000 [square feet] and, based on an approximate average soil contamination depth of 15 feet, the total volume of contaminated soil is 2 million [square feet]."

Yet the Human Health Risk Assessments (HHRAs) presented in the RFI report for soils at SWMU #7 are based on incorporation of only a single organic hazardous constituent, benzo(a)pyrene, as a "chemical of potential concern" (COPC), and this was detected at relatively low levels (39-130 ug/kg for surface soils and 290 ug/kg for subsurface soils). Therefore, the HHRAs presented in the RFI report are not acceptable to EPA as they are based on a non-representative and incomplete COPC data set and/or concentrations. Any HHRA evaluations must be based on data from a fully characterized site and representative COPCs and concentrations. The RFI report and HHRA evaluations must be revised to incorporate previous data.

Saturated Zone Soils (below the water table)

In the saturated zone soil samples, of the 5 samples analyzed from the "shallow borings", 3 (all from soil boring 7SB01 located near or within [exact limits not indicated in the report] the known free phase hydrocarbon light non-aqueous phase liquid [LNAPL] plume) had TPH (total petroleum hydrocarbon) concentrations above the Commonwealth of Puerto Rico's clean-up standard of 100 mg/kg. No saturated zone soil samples were analyized from subsurface samples collected during installation of the 4 "bed-rock" monitoring wells. The present saturation zone soil sampling from 3 locations only is not sufficient to consider the saturated zone soils underlying Tow Way Fuel Farm to be fully characterized; however, additional characterization is not presently required.

Groundwater

EPA does not consider the groundwater to be fully characterized. Both organic and inorganic dissolved phase constituent plumes evidenced by the current and previous (reference the 1994 Site Characterization report) investigations have not been adequately defined. Even taking into consideration the extensive data from previous investigations of the groundwater underlying Tow Way Fuel Farm, EPA believes that additional groundwater data will eventually be required to fully characterize dissolved phase constituent plumes. However, such dissolved phase

characterization is a lower priority, pending removal of the free product/LNAPL present on top of the groundwater. Nevertheless, additional dissolved phase groundwater data should be obtained in conjunction with installation of all new wells required as part of the on-going free product/LNAPL recovery project.

Please submit documentation that a requirement to collect and analyze both vadose zone soil samples (due to reasons discussed previously) and groundwater from all future wells required to be installed as part of the on-going free product recovery program, has been or will be, added to the relevant documents issued pursuant to that project. This documentation must indicate that the vadose zone soil and groundwater samples obtained pursuant to the free product recovery project will be collected and analyzed in conformance with all relevant data collection and analytical requirements of the September 1995 approved RFI work plan.

In addition, the groundwater HHRAs for SWMU #7 presented in the RFI report are not acceptable, as they are based on a non-representative and incomplete COPC data set and/or concentrations from the limited present investigation data set, and do not incorporate significant additional COPC and concentration data from the 1994 Site Characterization report. Any HHRA evaluations performed at this time must be based on all available data. However, since EPA does not consider the dissolved constituent plumes to be fully characterized, as discussed previously, any HHRA evaluations and conclusions for groundwater at this time, must be treated as interim determinations.

Furthermore, as discussed previously, any recommendation for a no further action determination for groundwater at SWMU #7 must be based on an acceptable demonstration that the performance standards given at Section B.7 of Module III of the 1994 RCRA Operating Permit (and elsewhere in the Permit) have been met.

<u>SWMU #8 (Possible Sludge Burial Pits at Tow Way Fuel Farm)</u>

In Section 3.3 of the report on page 3-5 the text states that two test trenches and nine test pits were excavated at SWMU #8; however, Figure 3-2, labeled "Test Pit and Test Trench Locations SWMU 8", shows 5 test trenches and 6 test pits. Appendix B of the report, contains 11 "Test Pit Records" which include all test excavations (trenches and pits). Please clarify, and/or correct these inconsistencies.

The geophysical investigations conducted (reference Appendix A) do not contribute to establishing the existence or location of suspected sludge burial pits (or identifiable remnants thereof) at the Tow Way Fuel Farm. This was the objective of the geophysical program in the approved RFI Work Plan. Figures 12 through 34 of the Geophysical Investigation Report, which portray in plane (map) view extrapolated conductivities at various frequency settings, are of little value, as no interpretation of that data relative to possible locations of sludge burial pits (or identifiable remnants thereof) is attempted in the report. The failure of this key element in the RFI work plan causes significant gaps in overall site characterization with regards to possible sludge burial pits, which is now based only on the results of aerially limited excavation trenching.

Furthermore, the program of investigative excavations (trenches and pits) for SWMU #8 was never intended nor designed to characterize the vadose zone interval overlying the groundwater at Tow Way Fuel Farm.

However, since the area of SWMU #8 (possible sludge burial pits) is wholly contiguous with the area of SWMU #7, EPA will require no further investigations focused on locating/characterizing past sludge burial pits at SWMU #8. Rather, EPA will evaluate the significance, or lack thereof, of any SWMU #8 data gaps resulting from failure of the geophysical program, as regards the adequacy of overall site wide characterization of all vadose zone soils at Tow Way Fuel Farm, irregardless of whether they may have been impacted by releases from SWMU #7 or SWMU #8.

Therefore, EPA requests that the Navy submit a revised Draft RFI report for Tow Way Fuel Farm's SWMUs #7 and #8 that includes an integrated site characterization of all SWMU #7/#8 area vadose zone soils, incorporating all available data, including all past data incorporated into the 1994 Site Characterization report (which includes data from the 1992 O'Brien & Gere report "Underground Fuel Investigation Tow Way Fuel Farm"). EPA recognizes that there may be differences of data quality, usability, and contemporaneousness, between the different vintages of data. However, as requested by the Navy at that time, EPA's approval of the present limited RFI investigations was predicated on incorporation of all previous data (which

indicates significant contamination) into the final site characterization. The differences of data quality, usability, and contemporaneousness must be evaluated and discussed, or additional characterization work will be necessary.

SWMU #9 (Tanks 212 - 217)

Vadose Zone Soils (above water table)

Three of the 12 subsurface soil samples analyzed from the test pits/excavations at SWMU #9 contained significant TPH gasoline concentrations. Sample 9TP02-06 from Area B had 6400 ug/kg TPH gasoline. While samples 9TP07-04 and 9TP09-04 from Area A had respectively 8900 ug/kg [J qualified] and 15000 ug/kg of TPH gasoline. Though these levels are below the EQB soil cleanup standard of 100 mg/kg, they nevertheless indicate releases, that do not appear to be fully characterized. Therefore, since excavation 9TP07, where an elevated TPH gasoline concentration (J qualified) was measured in sample 9TP07-04, is shown to be located at the southern edge of a suspected disposal pit area (refer to Figure 3-3), EPA requires that at least 1 additional excavation, oriented north-south, be installed and sampled north of excavation 9TP07. Also, two additional excavations, oriented perpendicular to existing excavations 9TP02 and 9TP09 respectively, should be installed and sampled to better characterize the releases evidenced by elevated TPH concentrations found in samples 9TP02-06 and 9TP09-04 respectively. Please submit a brief work plan for these 3 additional excavations with the revised RFI report.

In addition, 5 vadose zone subsurface soil samples (9MW01-08, 9MW02-06, 9MW03-04, and 9MW04-04 & -05) were analyzed from those collected during installation of the 4 new SWMU #9 monitoring wells. One of these (9MW02-06 from 12-14 feet below surface) measured benzene at a concentration of 960 ug/kg, toluene at 5300 ug/kg, ethylbenzene at 1300 ug/kg, total xylene at 4700 ug/kg, and TPH gasoline at 57000 ug/kg (refer to Appendix I). All the concentrations are estimated (J qualified). The well log for well 9MW02 notes "solvent like" odors from this interval.

Therefore, the statement in section 5.4.1.2 (page 5-16) that "Organic analyses of these samples show that there were no compounds detected above method detection limits in samples from 9MW01 or 9TP10 (Table 5-19)", is incorrect, and should be changed. Also, the statement in the same section that "The

deepest sample from this well 9MW02-10, contained a TPH diesel concentration of 180 mg/kg", does not agree with the results given in Appendix I ([full] Laboratory Analytical Results), which list 5.9(U) mg/kg for TPH diesel, but 180 ug/kg for TPH gasoline. Please clarify and revise as necessary.

In addition, no maps were included for subsurface soil organic detections at SWMU #9, as for all other constituent classes (refer to Figures 5-10 through 5-17). Such maps for all subsurface soil organic detections (including J qualified) should be submitted, since detections were apparently recorded in both the excavations and new monitoring wells, as discussed above. Also, it is not possible to ascertain the extent and full location of the excavation trenches for SWMU #9 from any of the maps submitted (refer to Figures 3-3, 3-4, and 5-10 through 5-17). This is especially significant in the case of test pit/trench 9TP02, which is indicated to have a length of 96 feet; yet is only shown on the above figures by a single point. Please revise the above figures to graphically show the [approximate] full extent and location of all SWMU #9 test pits/excavations. Also on the revised figures, each storage tank should be identified by number. Also, please clarify whether there are 2 or 3 (as appears on the above figures) storage tanks at Area B (labeled as tanks 214-215).

Also, please clarify why no test pit/excavation was performed at the disposal pit shown in Area B on Figure 3-3 just west of surface sample location 9SS03. Furthermore, please confirm that there was no visual evidence of sludges or other residues, indicating past sludge burial, observed in any of the SWMU #9 test excavations/pits (none is described on the test pit records in Appendix B, or elsewhere).

Groundwater

The September 1995 approved RFI work plan (refer to page 5 and Figure A-1 of the Navy submitted SOP F103 Revision 2) had required the well screens for all the newly installed RFI wells to be set approximately 2 feet above the water table to allow for light non-aqueous phase liquids (LNAPL) detection. However, the well screens in wells 9MW02 and 9MW03 were improperly set below the water table, which may preclude detection of LNAPL in these wells. This is especially significant for well 9MW02 where the presence of LNAPL is highly possible, as dissolved benzene was measured in the groundwater at a concentration of 1600 ug/l, far

above EPA's maximum concentration level (mcl) of 5 ug/l. The well log for 9MW02 reports "diesel-like odors" from 6 feet to 10 feet and "solvent like" odors from 12 feet to 16 feet, in split spoon samples from above the water table at 21.5 feet below surface (top of screen at 24 feet below surface). No LNAPL is reported on the well log (or well development record); however, black staining is described in samples from 40 - 42 feet, over 18 feet below the present water table.

In upgradient well 9MW01 the well screen was set 7 feet above the water table, but no LNAPL was reported (benzene was non-detect in the groundwater, conforming with the absence of LNAPL). However, the 9MW01 well log describes black staining in split-spoon samples straddling the water table interval in this well. The Navy is requested to clarify if any LNAPL was observed in wells 9MW01 or 9MW02, or any other 9MW series well, during drilling or completion of the 4 wells installed during the SWMU #9 RFI investigations.

In addition, the Navy is requested to submit well logs ("test boring and well construction records") for all 13GW series wells where groundwater was sampled during the current SWMU #9 RFI investigations. EPA notes that the March 24, 1996 well development records (Appendix D) for wells 13GW02 and 13GW03 both report "visible sheen on purge water", indicating probable LNAPL. EPA requests the Navy to submit any other data describing present or past observations or measurements of LNAPL in any or all of the 13GW series wells (particularly wells 13GW02 and 13GW05, where benzene concentrations of 130 ug/l and 140 ug/l were measured in groundwater samples collected during the RFI). Also, please submit the water table elevation (datum adjusted) for well 13GW01, for May 10, 1996 (the date indicated on Figure 4-10), or the measurement nearest that date. Also, please indicate why the March 24, 1996 well development record for 13GW01 contains no water level data, as do the development records for all other wells.

Moreover, EPA does not consider the dissolved benzene plume penetrated by well 9MW02 to be adequately characterized. EPA requests that the Navy submit a workplan to install 1 groundwater well along Manika Bay Road approximately 450 feet southeast of well 9MW02, and 1 well approximately 450 feet northeast of 9MW02, along the road to tanks 214 and 215 ("area B"). In addition, as discussed previously, since well 9MW02 was improperly constructed, such that LNAPL may not be detected, this well must

be re-installed. Groundwater in these 3 new wells should be sampled for, at a minimum, the 4 individual BTEX constituents (benzene, toluene, ethylbenzene, and xylene) and RCRA metals (i.e., those listed in Table 1 of 40 CFR 261.24). Also, any LNAPL presence must be noted and the thickness accurately measured. Also, during installation of the new wells (excluding the replacement to 9MW02), the subsurface vadose zone soils should be sampled for the 4 individual BTEX constituents, TPH, and RCRA metals.

In addition to addressing all of EPA's comments above and in the enclosed Technical Review, the revised RFI report should also include the following for the combined SWMU#7/#8 area:

1. A demonstration that sufficient data to be statistically representative of the entire site has been obtained for the relevant environmental media or zones, i.e. vadose zone soils and groundwater. In this regards, EPA would refer you to the guidance document Methods for Evaluating the Attainment of Cleanup Standards EPA publication #230/02-89-042.

2. Isopleth (equal concentration) maps for the vadose zone soils for each hazardous constituent, and/or TPH, and/or diesel concentration where there are 3 or more detection points, including all analytical results incorporated into the 1994 Site Characterization report.

3. Isopleth maps of all soil gas concentration data, including results incorporated into the 1994 Site Characterization report, measured in the soils at Tow Way Fuel Farm.

4. Isopach (equal thickness) maps of the vadose zone interval at Tow Way Fuel Farm, including any data incorporated into the 1994 Site Characterization report.

5. Isopleth (equal concentration) maps of the groundwater for all hazardous constituents and/or TPH concentrations where more than 3 detection points have been reported (including results incorporated into the 1994 Site Characterization report) in the groundwater.

In addition, for all OU 2 SWMUs (#7/#8 and #9) any HHRA evaluations submitted must be based on data from a fully characterized site and include representative COPCs and concentrations.

Furthermore, any recommendation of no further action for any of the media impacted by releases from the OU 2 SWMUs must be supported not only by demonstration of no unacceptable human health risks, but also no unacceptable adverse environmental impact..

Please submit by May 15, 1997, 3 complete copies of a suitably revised Draft RFI report for OU 2, which fully address all of the above and enclosed comments.

Please contact Mr. Tim Gordon of my staff, at (212) 637-4167 if you have any questions.

Sincerely yours,

Nicoletta DiForte
Chief, Caribbean Section
RCRA Programs Branch

Enclosure

cc: Mr. Israel Torres, EQB, w encl.
Mr. Christopher T. Penny, LANTDIV Code 1822, w encl.
Mr. Tom Fuller, Baker Environmental, Inc., w encl.
Mr. Doug Sullivan, A.T.Kearney, Inc., w/o encl.

TECHNICAL REVIEW

RCRA FACILITY INVESTIGATION REPORT FOR PHASE I INVESTIGATIONS AT OPERABLE UNIT 2

Submitted to:

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Regional Project Officer
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Region 2
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Submitted by:

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January 3, 1997

TECHNICAL REVIEW

RCRA FACILITY INVESTIGATION REPORT
FOR
PHASE I INVESTIGATIONS AT
OPERABLE UNIT 2

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TECHNICAL REVIEW

RCRA FACILITY INVESTIGATION REPORT
FOR
PHASE I INVESTIGATIONS AT
OPERABLE UNIT 2

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has requested that the A.T. Kearney Team (Kearney Team) provide support to the Agency under Work Assignment No. R02020 for technical review of documents associated with the RCRA Facility Investigation (RFI) of the U.S. Naval Station Roosevelt Roads (NSRR) located in Ceiba, Puerto Rico.

The NSRR is located on the east coast of Puerto Rico in the municipality of Ceiba, approximately 33 miles southeast of San Juan. The primary mission of NSRR is to provide full support for the Atlantic Fleet weapons training and development activities. NSRR is currently operating under a Draft RCRA Corrective Action Permit that includes varying degrees of work at 28 Solid Waste Management Units (SWMUs) and three Areas of Concern (AOCs).

EPA requested the Kearney Team to review the *Draft RCRA Facility Investigation (RFI) Report for Phase I Investigations at Operable Unit 2, September 1996*, prepared by Baker Environmental, Inc. The Baker document is designed to provide a summary of activities and findings completed during the Phase I RFI investigation activities at Operable Unit 2. The report consists of two volumes. Volume I contains eight sections describing the environmental setting, facility background, investigation activities and results, health and environmental risk assessments, and conclusions and recommendations. Volume II consists of appendices which present supporting information including summarized analytical results, slug test data results, toxicological profiles, and human health risk calculations.

This report presents the findings of the Kearney Team's technical evaluation. Section 1.0 of this report discusses the scope of this technical evaluation. Section 2.0 identifies the methods

and objectives of this technical evaluation. Section 3.0 presents general comments and Section 4.0 provides page-specific comments.

2.0 METHODOLOGY

Pursuant to the EPA Work Assignment Manager's (WAM's) Technical Directive dated October 4, 1996, the Kearney Team reviewed Sections 4.4.2, 4.4.3,5, 6, and 7 of Volume I, and Appendices B, C, E, F, I, J, and L contained in Volume II. The Kearney Team's review focused on evaluating technical adequacy of the findings, interpretations, conclusions and recommendations.

3.0 GENERAL COMMENTS

1) Section 4.4 should be expanded to include a description of the underlying geology at SWMU 8, incorporating generalized site data and site specific test-pit data.

2) Section 5.0 sample locations/data sets should present information regarding topographic and hydrogeologic locations, relative to each SWMU. The information should correlate to the physical conditions described in Section 3.0, and be presented in all summary and conclusion statements regarding each SWMU, to include but not limited to, Section 7.0.

3) All section 6.0 risk assessment methodologies and procedures were thoroughly reviewed and were found to meet current EPA Guidance.

4) The site has not been adequately characterized and further site characterization is warranted. At SWMUs 7, 8, and 9, the source of soil and ground water contamination should be identified. To assess a potential source at SWMU 7, a leak test of each tank to confirm their integrity should be performed. Additional investigative activities should be completed to identify the source of contamination at each SWMU. The investigations should seek to delineate the complete extent of contamination as well as identify the potential migration pathways. Analytical evidence should be provided to support statements of natural attenuation and

biodegradation.

5) Since analytical results are presented in comparison to industrial and residential risk based criteria, the conclusions should be expanded to clarify the rationale for discussing only industrial criteria and not residential.

4.0 PAGE-SPECIFIC COMMENTS

Page 4-6, ¶2, Section 4.3.3
The subsurface data available to date at UGW-2, is not sufficient to support the statement that the fuel farm is situated over a buried valley where bedrock slopes steeply from the flanks toward the center of the site. Additional subsurface data(e.g. information from soil borings) should be obtained to further delineate this subsurface feature and incorporated into a more detailed understanding and description of the subsurface geology at this SWMU 7.

Page 4-9, ¶1, Section 4.4.2
The text should be expanded to discuss depth to ground water and saturated thickness of the water bearing units. The text should provide the geologic description of the water bearing units and identify the specific ground water monitoring wells for reference. The water bearing units described in this section should be incorporated throughout all descriptive text sections in Section 4.0.

Page 4-10, ¶2, Section 4.4.2.1
A description of the water bearing unit, identified in Section 4.4.2, should be presented along with the depth to ground water. Ground water monitoring wells utilized during the tidal study should be identified.

Page 4-10, ¶3, Section 4.4.2
The influence of sea walls on the tidal effect of ground water has not been adequately supported in the text. The text should provide the depth below ground surface of the seawall, and correlate the seawall to the water bearing unit identified within Section 4.4.2.

Page 4-10, ¶ 1, Section 4.4.2.2

The text should correlate the ground water monitoring wells utilized during the slug test to specific hydrogeologic units.

Table 4-2:
The table should identify the water bearing unit of each ground water monitoring well.

Figures 4-2, 4-3, and 4-4
Since the subsurface information provided for SWMU 7 is from one location, UGW-2, the findings do not adequately support the conclusion that the fuel farm is situated over a buried valley where bedrock slopes steeply from the flanks east and west to the center of the site. The boring log for UGW-2 should be provided in Appendix B. Additionally, boring logs for UGW-23, 24, and 25 must also be presented and the information correlated to the geologic descriptions and illustrations.

Page 5-10, ¶ 1, Section 5.3.2
The text should be expanded to present the depth to ground water (if encountered) and the total depth of each test pit.

Table 6-5:
The source of the risk based criteria for benzo(g,h,i)perylene should be provided.

Table 6-6:
The source of the risk based criteria for benzyl alcohol should be provided.

Table 6-7:
The source of the risk based criteria for o-cresol and m&p-cresol should be provided.

Table 6-8:
The source of the risk based criteria for dibromochloromethane, 2-methylnaphthalene, and dimethylnphthalate should be provided.

Page 7-1, ¶3, Section 7.1
The text should discuss ground water contamination relative to each water bearing unit described at SWMU 7 and correlate contaminant information (see Section 5.0 General Comment) to historical data regarding the product plume.

Page 7-5, ¶4, Section 7.2
Since sufficient data have not been presented to characterize the nature and extent of contamination and subsurface conditions, additional subsurface information should be obtained to delineate the nature and extent of the sludge disposal pits at SWMU 8. Additional subsurface investigations should include but not be limited to test pits and soil borings.

Page 7-6, Section 7.3, General Comment
The analytical data presented in Section 5.0 evidenced organic and inorganic contamination above RBCs and MCLs in surface soil and ground water. The source and extent of contamination is assumed by the Navy as small and localized, but this assumption has not been adequately supported by analytical data (i.e. subsurface investigations and corresponding subsurface sampling data has not delineated the extent of contamination at each SWMU). In addition, sufficient information has not been presented to support the assumption that natural attenuation and biodegradation will reduce the concentrations of detected contaminants below risk based criteria. Additional investigations are needed in order to fully determine the nature and extent of contamination at each SWMU, specifically; a subsurface soil boring/monitoring well program focussing on retrieving sample media, analyzing for site specific contaminants, and correlating

the data into a conceptual site model for each SWMU.