UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

130-6

April 2, 1998

Orlando Monaco
Naval Facilities Engineering Command
Environmental Contracts Branch
10 Industrial Highway
Lester, Pennsylvania 19113

Re: Naval Air Warfare Center, Warminster, PA

Dear Mr. Monaco:

Please find attached EPA comments on Sections 5 and 6 of the Draft Phase III RI Report for Media Other Than Groundwater. These comments address Area B and Area C. As discussed, comments regarding offbase surface water and sediment in this report will be provided upon receipt and review of the Draft Removal Evaluation Report for Area A.

Should you have any questions regarding the subject comments, please let me know.

Sincerely,

Darius Ostrauskas

Remedial Project Manager

Attachment

cc: Tom Ames, NAWC

April Flipse, PADEP

ATTACHMENT TO EPA LETTER OF APRIL 2, 1998

EPA COMMENTS ON DRAFT PHASE III RI REPORT FOR NAWC

5.0 AREA B HISTORY AND DESCRIPTION

It is suggested the language under this heading be deleted and replaced with the following: "Area B includes the following sites reportedly used for disposal of wastes potentially containing CERCLA hazardous substances: Site 5, Site 6 and Site 7. Significant background information regarding these sites is provided below."

To help identify the potential locations of the subject sites, Figure 5-1 should include the locations of the Inertial Guidance Facility and the Chief Staff Officer's quarters and provide additional coverage of the extent of the enlisted mens family housing area and the property boundary in this portion of the base.

5.1.1 Site 5

Based on the information discussed below, it is suggested that Site 5 not be referred to as the "South Runaway Landfill".

It is recommended the text of this section read as follows:

"Site 5 was initially reported to have been used for waste disposal purposes in the Navy Shore Facility Fact Form (1980). Site 5 reportedly consisted of 6 to 8 trenches which were used for the disposal of demolition wastes, paint, solvents, scrap metal, aircraft paints, cans and asphalt. With the exception of a reported 30 drums of asphalt, the quantity of materials disposed was reported as unknown. These disposal trenches were reportedly within 100 feet of the enlisted mens housing units located south of the runway, within 700 feet of the Inertial Navigation facility and 400 feet from the NAWC property boundary (see Figure 5-1). The trenches were reportedly operated from 1955 to 1970, were approximately 12 x 70 X 8 feet in dimension and were covered with 2 feet of fill, graded and seeded.

EPIC (1995) identifies at least two trenches which may be part of the disposal site reported as Site 5. Trench TR3 was identified in an aerial photo dated September 23, 1958 and measured approximately 225 feet in length, while Trench TR5 measures 150 feet in length in a photo dated March 31, 1965 (see Figure 5-1). Both of these former trenches are located within the current enlisted men's housing area. It has been reported that during the construction of housing unit 401, that buried waste was encountered and excavated. This information would be consistent with the findings of EPIC, which indicate trench TR5 to lie at

the location of this housing unit. While 6 to 8 trenches were reportedly used for disposal in this area, only two trenches in the housing area were identified in EPIC (1994). "

Any additional available information regarding the type and quantity of waste materials excavated and/or removed form the site during the construction of the subject housing unit(s) should be noted in this section.

It is worth noting that a subsequent, more detailed review of additional aerial photographs assembled by EPIC indicate several locations of apparent disturbed ground with areal dimensions similar to those of TR3 and TR5 immediately north of these trenches. As discussed, these apparent areas of disturbed ground should be investigated to determine whether these features represent remnants of the other trenches which may have been used for disposal in this area.

5.1.2. Site 6

Again, based on available information , it is suggested that Site 6 not be referred to as "Waste Pit No.3".

While the results of investigations of "Site 6" are described in detail in other reports, it is suggested that this report at least contain an accurate description of reported and known background information regarding the subject disposal area.

The text in the section, as currently written, is inconsistent with information previously reported by the Navy and should be rewritten. It is suggested that this section read as follows:

"The Navy initially reported disposal at Site 6 in the Navy Shore Activity Fact Form (1980), which indicated that Site 6 was an area where one or two trenches were used for the disposal of approximately 700 cubic yards of industrial waste sludge cake generated at the on-base waste water treatment facility. The disposal reportedly took place between 1950 and 1955 in a trench (or two trenches) 12' x 100' x 8' in size. The location was indicated as being within 500' of the enlisted men's housing, 500' to 700' from the Inertial Guidance Facility, 800' from the quarters of the Chief Staff Officer and 800' from the base boundary. After disposal, the trenches were reportedly covered with 2 feet of soil, graded and seeded.

EPIC (1994) identified only two trenches within the vicinity of Area B which were active in the 1950's. One of these trenches, identified as Trench TR3, has generally been considered to be part of Site 5 (see above). In addition, EPIC (1995) identified a possible trench (TR4) approximately 250' in length in an aerial photo dated September 23, 1958 (see Figure 5-1). While considerably longer than the trench (or two trenches) reportedly

100 feet in length, it is possible that the site may have consisted of two approximately 100' trenches aligned end to end."

Significantly, recent investigations of the location of TR4 have confirmed the presence of a material with elevated levels of metals which may be the sludge reportedly disposed in Site 6. These studies suggest the subject material was disposed in a trench well over 100 feet long. (Studies to date are inconclusive regarding the actual length of the trench/apparent disposed sludge.)

The Site 6 Summary Report should be referenced for those who interested in RI work for trench TR4. (At the time of these comments, only a draft version of this report dated January 19, 1998 was available.)

5.1.3 Site 7

While Site 7 is identified as "Sludge Disposal Pits", previous information reported by the Navy does not indicate that sludge was disposed at this reported disposal site. Again, it suggested that this disposal site simply be referred to as Site 7 and the text of this section be deleted and replaced with the following:

"Again, the Navy initially reported disposal of waste at Site 7 in the Navy Shore Activity Disposal Fact Form (1980), which indicated that Site 7 of consisted of pits where paint, solvents, demolition waste, oil, flammable waste and grease trap waste were disposed, backfilled and covered. The disposal reportedly took place from 1960 to mid-1980. No information was provided regarding dimensions of the pits or the quantity of waste disposed. The location of the site was described as being within 900' of the Chief Staff Officer's Quarters, within 400' of enlisted mens housing, within 1000 feet of the Inertial Navigation Facility and approximately 900 feet from the nearest station boundary.

EPIC (1994) identified two disposal trenches which were operated within or in the vicinity of Area B during the subject time frame and location. Trench TR11 was identified in a photo dated 1971 and measured approximately 125' in length, while Trench TR12 (and an associated possible pit P7) was identified in a photo dated 1978 and measured over 200 feet in length. (Note: This trench is not currently shown in Figure 5-1.) Subsequent field reconnaissance and geophysical investigations identified numerous additional trenches and pits in the area of these two trenches as (as well as Trench TR4). These pits and trenches are identified in Figure 5-1."

Figure 5-1 should clearly distinguish which features were identified by EPIC as opposed to those that which were identified through field recons/geophysical work.

While the text currently indicates that two potential locations for Site 7 have been identified in Figure 5-1, this figure identifies three areas which are delineated "Site 7?" One of these locations, "POSS TR6", should be indicated in the text as two possible trenches identified in an aerial photo dated 1965 in EPIC (1994). It is worth noting, however, that this feature appears directly adjacent to the site boundary and that there have been no reports of disposal this close to the site boundary.

With regard to the two other areas identified in Figure 5-1 as "Site 7?" and "Possible Fill Area", more detail than "based on recollections of base personnel" should be provided. In particular, are these "recollections" documented in any interview results on file? If so, these interview results should be referenced. Did the "recollections" of interest report provide any information regarding the nature of the potential disposal operations or the material disposed? Did the recollections specifically indicate the areas on Figure 5-1 as being the potential fill areas or were these areas delineated on a map by the author of the report? Again, it is worth noting that the location of these two areas does not fit the description of any disposal location reported in Fact Form (1980). In particular, while both of the delineated "possible fill areas" are located within 200 feet of the Inertial Guidance Facility, Fact Form (1980) reported that the Site 7 was up to 1000 feet from this facility. As result, it appears unlikely that the disposal area reported in Fact Form (1980) as Site 7 is either of these "possible fill areas". In addition, Fact Form (1980) reported that Sites 5 and 6 were between 500 and 700 feet of the Inertial Guidance Facility, again suggesting that these "possible fill areas" also were not part of the disposal areas reported by Fact Form (1980).

5.2 SUMMARY OF PREVIOUS INVESTIGATIONS

5.2.1 Site 5

The section should be more accurately referred to as "pre-CERCLA RI investigations". As currently written, this section does not effectively describe these investigations. This section should be re-written to include references to the documents which actually describe the subject investigations.

5.2.2 Site 7

See comments above regarding Site 5.

While this section refers to previous investigations of "Site 7" or the "vicinity of Site 7", it is not at all clear what area is being referred to or, in particular, whether the subject investigations addressed the area originally reported as being "Site 7". For example, as noted above, the location of the "potential fill areas/site 7?" identified in Figure 5-1 do not fit the description of the location of Site 7 as reported in Fact Form (1980). This should be made clear in the text.

5.2.3 Groundwater Investigations

Since most of the information referenced in this section is RI data, it is suggested this section be moved to Remedial Investigations (Sec. 5.3).

This section should also include a figure which indicates all current monitoring well locations in Area B and describe any significant findings regarding groundwater in this area since the issuance of the OU-1 RI Report. References to any documents containing such findings should be provided. There should be a reference to the Perimeter Groundwater Monitoring Reports which contain more recent groundwater quality data within and downgradient of Area B.

5.3 Remedial Investigations

Again, it should be made clear that many of the investigations described in this section, while discussed under the heading of "Site 7", are not within the location of the disposal area originally reported as "Site 7".

The work plan(s) describing the work actually performed should be referenced.

5.3.1 Electromagnetic (EM) Survey

It should be indicated why no geophysical survey was performed in the case of Site 5.

5.4.5 Groundwater Use

This section should be updated as needed. For example, most (offbase) residents near Area B no longer rely on groundwater supplies as the first sentence in this section indicates.

The source of water supply for the enlisted mens family housing, Inertial Guidance Facility , and former Chief Staff Officer's Quarters should be indicated.

5.5. NATURE AND EXTENT OF CONTAMINATION

Generally, it is suggested the information for Site 5 and Site 7

be reorganized to clearly present the findings of RI work. For example, it is suggested that the initial section for each site discuss on Phase I RI findings, and that the geophysical survey results and soil gas survey results be discussed first, followed by a discussion of observations during soil borings/test pits and, finally, the soil sampling. The next section in each case would discuss the results of Phase III RI work in the same sequence.

5.5.1 Site 5

Based on the limited number of borings conducted during the Phase I RI, the basis for the areas of waste material and "clean fill" depicted in Figure 5-9 is unclear.

It should be indicated which soil borings were conducted and samples collected during the Phase II RI.

To support the discussion of observations during Phase III RI soil borings, the text should refer to Figure 5-7 for the locations of borings and Appendix E-2 for the boring logs. Figures 5-7 and 5-16 are not consistent with regard to the location Borings SB-05-22, 23 and 24. In addition, the boring logs for these locations are not included.

While it is indicated borings were drilled within EPIC features TR3 and TR5, more accurately,these borings were drilled into the **estimated** location of these features.

Boring numbers in Figure 5-7 do not match up with the boring numbers referred to in the text or in the boring logs in Appendix E-2. For example, is boring SB-05-1 in Figure 5-7 the same as boring SB-5 referred to the text? The notations should be consistent.

The text indicates that borings SB-5 and SB-6 were advanced into the estimated location of TR5 and encountered waste from 2 to 6 below ground surface. However, if the text is referring to the results of Borings SB-05-05 and SB-05-06 as depicted in Figure 5-16, these borings were conducted 50' and 70' north, respectively of the estimated location of TR5.

While the text indicates that 17 borings were drilled within EPIC feature TR3 during Phase III, Figure 5-7 indicates that only 8 borings were drilled within the estimated area of TR3. The text is unclear regarding which borings within the estimated area of TR3 actually encountered waste. For example, while it is initially stated that waste material was encountered at between 2 and 10 feet bgs in SB-2/3, 10, 11 and 12, it is later stated that waste materials encountered in SB-12, 20, and 21 appear to be consistent with materials reportedly disposed of at Site 5. Based on the boring/sample logs, the only borings within the

estimated area of TR3 which contained waste were SB-05-20 and SB-05-26. With regard Boring SB-05-26, Appendix E-2 contains only a sample log for this boring which states that "boring log was not completed". (Why?) However, the sample log for this location indicates that gravel fill, wood, glass and wire were encountered at 8' in depth. It is worth noting that Borings SB-05-20 and -26 were located on either side of Building 401, while the borings with no waste were located along a line parallel to and 25' to 35' from Building 401. This suggests that the location of trench TR3 may extend under Building 401. This would be consistent reports that waste materials were encountered during the construction of Building 401.

The objective of borings SB-4, 5, 6, and 7, and borings SB-18, 19, 22, 23 and 24 should be indicated. It should be indicated that at least several of the latter sample locations were conducted to help determine whether "Site 5" extended to property west of the "Patrol Road". Note that at this time, no boring or sample logs have been included in the report for SB-22, 23, and 24. In addition, Figure 5-7 indicates that SB-05-25 was at a certain location, while Figure 5-16 indicates SB-05-26 to be at that same location. No boring or sample log is provided for SB-05-25, while only a sample log is provided for SB-05-26.

A review of boring logs recently provided for SB-05-22, 23 and 24 indicates that cinders, glass, ash and miscellaneous debris were encountered in boring SB-05-23 from the ground surface down to 6 feet, where the boring was terminated (reason unspecified in the boring log). Assuming the boring location is as depicted in Figure 5-16, this information further confirms disposal activity in this area.

Generally, the observations recorded in the boring logs appear to indicate several significant findings. Firstly, with regard to borings conducted in the estimated location of trench TR3, the only borings with wastes observed were those along a line which runs under Building 401 - SB-05-20 and SB-05-25. On the other hand, no wastes were detected in borings conducted along a line which ran parallel to and approximately 35 feet south of these borings. This information suggests that disposal in trench TR3 may have extended under Building 401 from the location of SB-05-20 to SB-05-25. This possibility is consistent with reports that buried waste was encountered during the construction of Building 401.

5.5.1.3 Air Monitoring

References should be provided for the data and other information discussed in this section and associated figures/tables. In addition, it should be clearly indicated that this work was conducted as part of the Phase I RI.

Table 5-1 does not contain the results of Tenax analyses in the text and it appears that not all of the data of interest has been presented.

The second paragraph indicates organic compound levels at 10 ppb or less. These units are not consistent with units in the table. Also, when referring to ppb, please note if this is by weight or volume.

Note the result for Sample 89-12-14-C-002 (0.009 ppm) is not in the table.

5.5.1.4 Surface Soil Results

It should be indicated which samples were from below asphalt or paving.

When identifying where contaminants were detected in surface soils, the locations of interest should be identified by sample number rather than referred to as being in the area of or within an EPIC feature. As currently written, the text is ambiguous regarding where contaminants were detected. The discussion of the results should be organized in terms of areas, e.g., within the estimated area of TR3, north of the estimated area of TR5, etc.

The first paragraph suggests that the presence of organic contaminants in samples collected about 50 feet north of the estimated location of trench TR5 may be due to 1) TR5 being larger than projected based on aerial photos or 2) materials from TR5 being disturbed and scattered during construction activities. In addition, further review of aerial photos provided by EPIC indicate locations of disturbed ground in the shape of a trenches in the area immediately north of TR5. These photos, the subject data and reports that Site 5 consisted of 6 to 8 trenches, rather than the two identified to date, indicate trenches TR3 and TR5 may not be the only trenches which may have been used for waste disposal in this area.

5.5.1.5 Subsurface Soil Results

It is worth noting that while 24 mg/kg of Aroclor-1254 was detected in surface soil sample SS-05-07, samples from soil borings SB-05-05 and -06, which both contained miscellaneous waste materials and were located in the vicinity of SS-05-07, were not analyzed for PCBs. As a result, given the limited extent of data on PCBs in surface soils in this area and no data for subsurface soils, the nature and extent of PCB contaminated soils in this area is unknown. It is worth noting that the detected level of PCBs in SS-05-07 exceeds the EPA Removal Action Level of 16 mg/kg.

While 15 to 20 ppm of VOCs was detected by PID at a depth of 5' to 7' in soil boring SB-05-20, no TCL volatile or semi-volatile organics were detected. (It is worth noting that this sample was apparently diluted for SVOC analysis, resulting in elevated quantitation limits for SVOCs.) To help determine the source of the subject VOCs, tentatively identified compound data for this sample location should be evaluated.

Quantitation limits for a soil sample collected from SB-05-21 are similarly elevated. Given no VOCs were detected via PID in this boring, why is this the case?

5.5.2 Site 7

The reference to Figure 5-17 in the first paragraph should appear after the first, rather than the second, sentence.

In the second paragraph, it is noted that "Mr. Law indicated that the Site 7 disposal trenches were located just northeast of the paved walkway between the inertial reference building and Site 6. This area is marked in Figure 5-1." Currently, Figure 5-1 does not clearly indicate the area of concern. If it is one of the two areas denoted "possible fill area", it should be specified which of these areas this is. In addition, the basis for the location of the other fill area should provided. In any case, as noted earlier, the location of both of these "possible fill areas" is not consistent with disposal information reported for this area by the Navy in the Fact Form (1980). It should be noted when Mr. Law visited the site with NAWC Warminster representatives. In addition, the level of certainty expressed by Mr. Law regarding the location of trenches during this site visit should be indicated in the text. For example, while the text suggests that Mr. Law was relatively certain regarding the location of the trenches, this may not have been the case.

The third paragraph indicates that the "EM survey indicated a large anomaly in and around this area" and that the "soil gas survey, confirmation borings and test pits did not find any discernable evidence of the sewage sludge in the area Mr. Law indicated". Was the subject work conducted under the Phase I RI? Did the Phase I RI draw these same conclusions? If so, this should be indicated. In addition, because Site 7 was reportedly used for the disposal of other wastes rather than sludges, observations (or lack thereof) of other wastes (as well as PID readings, if applicable) during test boring/pits should be included.

The fourth paragraph indicates that four test pits were excavated at Site 7 during the Phase III RI" and appears to indicate that Phase III RI soil gas and geophysical survey results were considered to determine the locations of the pits. If this is the case, this should be more clearly stated and the results of

these test should be discussed prior to discussing the results of the test pits. It should be clear which EPIC features were investigated during the Phase III RI (e.g., possible trench TR6).

While the text refer to Test Pit Nos. 1 through 4, there is no map referenced to indicate the locations of the test pits or test pit logs referenced. In addition, the discussion of the results of the test pits is ambiguous. For example, it is stated that the four test pits "encountered only native soils or clean fill ranging from 6.4 to 8.5 bgs". What was encountered from 0 to 6.4 feet and below 8.5 feet? Was fill only encountered from 6.4 to 8.5 feet and native soil encountered otherwise. Please clarify.

5.5.2.2 Soil Gas Survey Results

While it is indicated that no positive soil gas readings were obtained (during the Phase III RI? ...please specify) with the exception of one location with a concentration of 150 ug/l xylene, Figures 5-11 and 5-13 clearly indicate at least two anomalies. Please indicate where the above anomaly was detected and provide information regarding the second anomaly.

5.5.2.3 Surface Soil Results

The depth of the collected soil samples should be indicated. The last sentence in the first paragraph indicates that "the nature of VOC contamination in these surface soil samples is unknown based on past activities at the site because Site 7 was never formally identified during the RI". This statement is ambiguous and should be deleted. Has a review of the quality of the data confirmed that the low levels of TCE were present in the soil samples that were collected?

Table 5-7 does not include a comparison of detected levels to federal screening criteria for the protection of groundwater or include any references for the criteria that are identified. Please provide both. By comparing detected levels of TCE to the EPA screening level of 60 ug/kg for protection of groundwater, it should become evident that while the subject soils do not present a threat to groundwater, it should be confirmed that subsurface soils in these areas do not present a risk to groundwater.

5.5.2.4 Subsurface Soil

As noted above, given the detection of TCE in surface soils in this area, the discussion should indicate that subsurface soils were investigated in areas where surface soils contained low levels of TCE and provide the location and depth of subsurface samples collected relative to the surface soil sample locations of concern.

It is indicated that "no chemicals were found above detections limits". Were any metals found at levels significantly above background?

5.7 BASELINE RISK ASSESSMENT

Site 5

Table 5-24: Correct the name and/or contents of the table.

Based comments on the balance of Section 5, available sampling data does not appear to be representative of wastes and/or soils associated with Site 5. Additional investigations should be performed and the risk assessment revised based on the results of these additional investigations.

See previous EPA comments regarding the subject report prepared by Nancy Rios Jafolla dated April 17, 1997.

5.8 CONCLUSIONS AND RECOMMENDATIONS

Site 5

Based on observations recorded in the soil boring logs, only two samples may have been collected within the location of Trench TR3, which was estimated by EPIC to be approximately 225 feet long. Given previous investigations of trenches have averaged one sample per approximatley forty feet of trench, there appears to be inadequate data to characterize the contents of trench TR5 at this time. It is worth noting, however, that an estimated 100 feet of this length is currently covered by Building 401 and part may be covered with Building 402 and that available data suggests that any waste which may be present at the location of TR3 is not a threat to groundwater or air quality.

With regard to trench TR5, which was estimated to be 150 feet in length, apparently only two of the borings projected to be within the area of this feature encountered waste - SB-05-21 and SB-05-23. Perhaps signficantly, these two borings were conducted roughly 10 to 20 feet south of the five other borings intended to be within TR5. Observations from borings conducted to date suggest that TR5 could also potentially extend under Building 401. However, again, any waste associated with TR5 does not appear to present a threat to groundwater or air quality.

The detection of waste materials at depths of 2 to 6 feet in borings SB-5 and SNB-6 suggests the presense of another disposal trench or pit approximatly 50 feet from the estimated location of trench TR5. The location of the subject waste disposal may corerespond to recently identified aerial photo anomolies which suggest the presence of additional dispsoal trenches in this area.

Aroclor-1254 was detected at 24 mg/kg in a surface soil sample collected below asphalt at SS-05-07. While sample results from sample points SS-05-08 and SS-05-06/11 provide some information regarding the limits of this contamination, additional soil investigation in this area is needed to determine the nature and extent of the subject contamination and to confirm that any contamination of concern in this case is not potentially accessible to residents in the housing area.

It is assumed that the data gaps identified above can be addressed by RI work planned for areas where recent evaluation of aerial photos suggests additional disposal trenches.

Site 7

Based on available information and RI data, it appears that the disposal area originally reported as Site 7 is likely to be the series of waste disposal trenches and pits which have been referred to by the Navy in RI reports as Site 6. With regard to the reported disposal of industrial waste treatment sludges south of the runway, this disposal appears to have occurred in trench TR4 within the area RI reports have referred to as Site 6.

Based on the above and previous comments in this letter, additional investigation of areas referred to as Site 7 in this document do not appear to be necessary.

AREA C

6.1 AREA C HISTORY AND DESCRIPTION

It is suggested the first sentence be replaced with the following, "Area C includes Sites 4 and 8 and locations where releases may have resulted in groundwater contamination which has been identified both on and off base in this area. These locations include, but are not limited to, a maintenance area and septic system tile field associated with Quarters A, the former residence of the base commander. Details regarding the nature and extent of groundwater contamination in this area can be found in a Remedial Investigation Report for Operable Unit 3 at NAWC (Halliburton NUS, 1994)."

6.1.2 Fire-Training Area - Site 8

The second sentence in this paragraph should read, "...and is about 250 feet from the base boundary and 600 feet from the former base commander's residence."

While Werner Park is mentioned in the text, the location is not indicated on Figure 6-1. Please indicate.

The second paragraph should indicate that the Navy initially reported Site 8 as a disposal site in Fact Form (1980). Fact Form (1980) indicates that the berm was 6 feet (rather than 3 to 5 feet) in height. While the text indicates that "flammable materials" were ignited at Site 8, Fact Form (1980) reported that about 3000 gallons of contaminated aviation fuels from the NADC fuel farm were burned at this location per year from 1961 through at least 1980, the year Fact Form (1980) was compiled. This distinction should be made to identify the specific flammable materials which were reportedly burned. While it is indicated that scrapped cars and other debris were reportedly stored and burned at Site 8, the source of this information is unclear.

Information regarding the nature of the contaminants in the burned fuel should be provided.

Any information regarding past cleanup actions at the site should be provided, including information regarding actions taken to address the berms for both of the apparent fire training pits. In addition, any actions addressing soils around the runway or the runway itself should be identified and discussed.

Information should be provided regarding impact of OU-3 construction a activities on this area. In particular, the area and depth of soil removed and or replaced with clean fill during the installation of the groundwater conveyance piping, transfer vaults, etc. should be indicated.

The nature of Structure S1 on the runway should be identified.

6.1.3 Maintenance Area and Tile Field

The report should indicate that available information suggested that these two areas could be potential source of PCE in groundwater and indicate the available information of interest.

In the case of the maintenance area, available information regarding the use or storage of hazardous substances or petroleum products should be provided to help indicate why the "maintenance area" was chosen for investigation. Did activities in this area (e.g., those in the Auto Hobby Shop, etc.) include maintenance of vehicles and, if so, did these or any other activities in this area potentially include the use of chlorinated solvents for degreasing or other purposes?

More information should be provided to explain why the "tile field" was targeted for investigation and the nature of this site. For clarification purposes, the site should be referred to as the "septic system tile field". The nature of the septic system and associated drain lines should be discussed and the current status of the system identified, i.e., are the septic system and lines still in place or have they been removed, etc.?

6.1.4 Other Area C Features

The location of the firing range should be indicated on Figure 6-1.

6.2.1 Site 8

Second paragraph: Define "PPL contaminants".

6.2.2 Groundwater Investigations

Second paragraph, page 6-5, third, fourth and fifth sentences: It is suggested these sentences be replaced with the following - "Available groundwater data suggests that releases from Site 4 and Site 8 may not be the source of PCE in groundwater in this area. Instead, the pattern of groundwater contamination suggests that the PCE releases of concern may have occurred within the portion of Area C which includes the maintenance area and the septic system tile field."

Suggest the last paragraph be deleted.

6.3 REMEDIAL INVESTIGATIONS

It should be stated that the objectives of the RI were to determine the nature and extent of any hazardous substance releases at the Fire Training Area (Site 8) and to determine whether the septic system tile field and/or the maintenance area are the source of releases of PCE to groundwater and, if applicable, the nature and extent of any residual soil contamination in these areas.

6.3.2 Soil Gas Survey

While the text indicates a soil gas survey was performed in the septic system tile field area, Figure 6-2 does not indicate where the survey in this area was conducted as the text suggests.

Assuming Figure 6-2 indicates soil gas survey results from the Phase I RI, this should be indicated in the legend and the nature of this survey discussed in this section. Also, the legend should indicate that the prominently hatched area is where the Phase III soil gas survey was conducted if this is the case.

The text should indicate whether soil gas samples were collected from one or two depths and what these depth(s) were.

6.3.4 Surface Soil Sampling

It should be indicated that surface soil samples were collected

primarily at locations where aerial photos assembled by EPIC indicated potential impacts from surface drainage from the runway, standing liquids and/or stained soils.

The depth of the surface soil samples should be indicated.

The basis for sample locations within the maintenance area should be discussed.

6.3.5 Subsurface Soil Sampling

The reason for conducting the test pits north of the runway is unclear.

Since the soil gas survey results provide the basis of many of the subsurface soil sample locations, the soil gas survey results should be discussed before the subsurface soil sampling locations are discussed.

It is unclear why no samples were collected within the tile field.

6.5 NATURE AND EXTENT OF CONTAMINATION

6.5.1 Site 8

The text should also indicate that no stained soils were observed and that potential fill material was observed in the soil borings.

It is notable that the logs for borings immediately west of the runway provide little indication that fire training activities were conducted at this site over a period of over twenty years. This suggests that soils next to the runway during burning activities may have been removed, perhaps at the time of the soil berm removal(s). As requested earlier, information regarding such removal activities should be provided.

6.5.1.3 Surface soil Results

The concentration of PCE detected in the one sample should be indicated in the text.

Given the reported use of aviation fuels for fire training exercises at this site, analytical results indicative of the presence of aviation fuels should be discussed and included in the report to document, for property transfer purposes, where releases of petroleum products to soils occurred. The subject data should, in particular, include any relevant volatile or semi-volatile Tentatively Identified Compound (TIC) data.

It should be noted that the highest levels of lead (1000 mg/kg)

and arsenic (33 mg/kg) were in the southernmost sample west of the runway. Significantly, there is no data south of this point to determine the nature and extent of the lead and arsenic contamination of interest.

It is notable that dioxins were detected in surface soils at a significant level in only one case - the single sample location east of the runway. While the detected dioxin levels were not above health-based levels, due to the lack of additional surface soil sample east of the runway, it is unknown whether the levels of dioxins are higher at other locations in this area (see previous EPA comments in letter of July 17, 1996). As noted, the presence of dioxins is indicative of burning activities such as those conducted at Site 8. The data suggests that soils present during burning activities east of the runway may still be in place.

6.5.1.4 Subsurface Soil Results

The boring numbers in the boring logs do not match up with the boring log numbers in the figures. Please correct.

The depth of subsurface soil samples from soil borings should be noted. A review of the sample logs indicates that all of these samples were collected from below a depth of 6 feet.

Again, given the reported use of aviation fuels, any VOC or SVOC TIC data indicative of the presence of aviation fuels should be discussed and included.

Discuss and include information/data regarding the detection of hazardous substances or petroleum product in soils during the construction of the remedy for OU-3 in this area.

Again, the general lack of contaminants in both surface and subsurface soils suggests that soils west of the runway which were impacted by the site may have been removed. However, without any sample data between 2 and 6 feet, it is not possible to confirm that any soil removal activities were adequate to protect human health.

6.5.2 Maintenance Area

6.5.2.1 Soil Gas Survey Results

While the text and Figure 6-9, -10 and -11 clearly indicate the detection of VOCs in soil gas at the southern boundary of the soil gas survey, the text also indicates that these results did not warrant expanding the survey in this area. The decision not to expand the survey in this area was not consistent with the workplan, despite the reference to the "...low levels of soil gas

detections and the absence of deeper soil gas contamination." Later it is also concluded that based on the soil gas results, "it does not appear that the maintenance area is a source of PCE contamination within Area C." Again, without additional investigation of the area south of the subject soil gas survey grid, this statement is premature.

6.5.2.2 Surface Soil Results

The depth of the samples should be indicated.

6.5.2.3 Subsurface Soil Results

The results of the subsurface soil sample collected at the location of cis-1,2-DCE in soil gas should be identified.

6.5.3 Tile Field

This section includes a misplaced discussion regarding the results of subsurface soil sampling within the maintenance area.

6.5.3.1 Soil Gas Survey Results

It is indicated that samples were collected at one depth at each location. Please indicate this depth and why only one depth was sampled in this area.

The location of well EW-21 should be indicated in Figure 6-15 and the concentration of PCE detected in this well indicated in the text.

6.7 BASELINE RISK ASSESSMENT

6.7.1.1 Surface Soil

Noncarcinogenic Risks

While the text states that for the future residential receptors pathways, all HQs are less that 1.0, Table 6-15 indicates that the HQ for dermal contact with vanadium is 1.3. Please confirm this HQ and/or correct the text as needed.

Carcinogenic Risks

The next to last sentence indicates that "...the principal COCs contributing to the surface soil cancer risk... are arsenic (via ingestion), benzo(a)pyrene (via ingestion) and dermal contact." Please correct. It is further stated that "...the total cancer risk (exposure to COCs via all three pathways) exceeds the 1.0E-04 to 1.0E-06 target acceptable risk range for

the future residential receptor." However, Table 6-17 does not indicate the estimated total cancer risk.

It is indicated that the total cancer risk exceeds the acceptable risk range for the future residential receptors. However, again, Table 6-17 only indicates the risk for each pathway but does not indicate the total risk.

Blood Lead Modeling

As noted earlier, available data suggests that the lead levels in surface soils at Site 8 may be higher than that assumed in the subject modeling. This modeling should be performed again with the benefit of additional surface soil data for the area of interest.

6.8 CONCLUSIONS AND RECOMMENDATIONS

6.8.1 Conclusions

While it is stated that the objectives of the RI were met, the objectives were never clearly stated. As suggested earlier, it should be stated that the objectives were to determined the nature and extent of hazardous substance contamination at Site 8 and to determine whether PCE in groundwater is attributable to releases in the septic system tile field or the maintenance area and, if applicable, whether any residual levels of PCE in these areas continue to present a threat to human health and the environment.

6.8.1.1 Site 8

With regard to Site 8, PCE was detected only once in soil - in a surface soil sample at 3 ug/kg. While there is a concern regarding the lack of any soil sampling between a depth of 2 and 6 feet and the lack of information presented regarding past response and construction activities at this site, available subsurface soil data does suggest that Site 8 is unlikely to be the source of PCE in Area C groundwater.

As noted, lead and arsenic detected in surface soils west of the runway in the southern-most portion of the investigation area may be indicative of an unacceptable health risk in this area. Due to the lack of samples south and west of subject sample location, the nature and extent of the lead and arsenic in soils within this area is currently unknown.

As noted above and in our letter of July 17, 1997, there is currently inadequate data to determine whether contaminants in soils east of the runway present an unacceptable risk. In addition, subsurface soils between a depth of 2 and 6 feet west

of the runway should be characterized to confirm whether apparent removal activities in this area were adequate to protect human health or otherwise are protective.

Under the third bullet, what is meant by "...still stained surface soils..."?

The fourth bullet indicates that the "western edge of the Site 8 runway was visibly stained during Phase I (but not during subsequent RI phases..." Again, per previous comments, in addition to information regarding the removal of the former berms, information should be provided regarding any past actions taken at Site 8 to address visibly stained soils and/or the surface of the runway. For example, the current runway surface shows no evidence of the fire training activities of interest.

The fourth bullet further indicates that "...surface soil results suggest that contamination exists between the point of runway runoff and a nearby cement drainage culvert." It is not clear what data is being referred to in this case. It is further stated under this bullet that "...soils in this area have been extensively disturbed due to the installation of groundwater transfer piping." Per previous comments, which "area" is being referred to in this case and what is the nature of the "disturbance"?

6.8.1.2 Maintenance Area

Section 6.8.1 indicates that "other potential sources of contamination may be present in Area C, including the former storage barn at the Base Commander's residence, the former chicken coop, and an area of disturbed ground located east of the maintenance area." What is the status the followup to the recommendation that "...if necessary, these potential sources may warrant study as part of EBS work at the base".

It should be noted that cis-1,2-DCE, which was detected at an estimated 3.2 ug/l in a soil gas sample in the far southern corner of the survey grid, is a potential degradation product of PCE, suggesting that PCE may have been released to soil and/or groundwater in this area. While the workplan called for the collection of additional soil gas samples to determine the nature and extent of such a soil gas anomaly, no additional soil gas samples were collected for this purpose in this case. Additional investigation should be performed to confirm that the cis-1,2-DCE detected in soil gas in this case is not the result of a PCE source in this area which presents a threat to groundwater.

6.8.1.3 Tile Field

The detection of PCE in soil gas next to the septic system/tile field suggests that PCE was released to soil in this area and

that the releases from septic system/tile field may be a source of PCE currently in soil gas and groundwater. However, the detection of only low levels of PCE across the soil gas station grid and the lack of any detection of PCE in soil samples suggests that soils in this area are unlikely to be a significant continuing source of PCE contamination in groundwater.

6.8.2 Recommendations

Site 8

It is indicated that "...because the Site 8 area is planned for municipal or industrial land use, no further action is recommended for surface or subsurface soils at this site". As has been agreed for all risk assessment work for NAWC, regardless of planned future land use, the risk for a residential land use should be assessed and restrictions placed on such use if needed based on this assessment. In this case, additional investigation work should be conducted to address data gaps identified in Section 6.8.1.1, regardless of the projected future use.