



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
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NAWC WARMINSTER
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JAN 5 1993

Mr. Orlando Monaco
Naval Facilities Engineering Command
Northern Division, Mailstop #82
Environmental Contracts Branch
10 Industrial Highway
Lester, Pennsylvania 19113

Re: Naval Air Warfare (Development) Center (NAWC) - Warminster,
Pennsylvania

Dear Mr. Monaco:

Please find below EPA comments on the Phase II RI Report for the subject site. These comments complement those addressing Operable Unit One in our letter of December 29, 1992.

EXECUTIVE SUMMARY

General

For each site, the Risk Assessment section in the Executive Summary should briefly summarize all risks to human health and the environment which exceeded the acceptable range for toxicity and carcinogenicity. In addition, this section should indicate where health-based ARARs (e.g. MCLs) have been exceeded.

p. ES-1: Facility History and Description

As noted in an EPA letter to the Navy dated November 24, 1992, "the interpretation of available historical aerial photography should be performed as part of the RI for a CERCLA NPL site". The attached inventory of aerial photographs (Attachment 1) should be interpreted to help determine (1) whether the investigations conducted to date for Sites 1 through 8 are adequate and (2) whether there are additional potential sites which require investigation as part of the RI. For any additional sites identified, the photos of concern should be utilized to help scope RI work. This inventory of photos should appear in the Administrative Record for the facility to support the RI.

p. ES-4: Nature and Ext nt of Contamination - Sites 1, 2 and 3

Next to last paragraph re: jet fuel storage area - Please correct this sentence.

p. ES-6: Conclusions - Sites 1, 2 and 3

The objectives of the RI with regard to soil (and potential waste) associated with Sites 1, 2 and 3 have not been met. In particular, one of the bullets in this section should read: "Additional surface and subsurface soil sampling as necessary to assess the nature and extent of contamination and risk." This work, as well as the recommended modeling to estimate future ground water concentrations in the aquifers of concern (not just "the shallow bedrock aquifer") must be performed as part of the RI. This modeling should be performed using the subsurface soil data available after additional sampling. The recommended additional surface water and sediment sampling must also be performed as part of the RI.

Third full paragraph: This paragraph should be deleted. Given the nature and extent of soil sampling conducted to date within the area of Sites 1, 2 and 3, it is not possible to assess the risk from to exposure surface or subsurface soils by direct contact pathways (incidental ingestion and inhalation, dermal contact etc.) or to assess the risk to ground water users or surface water due to these soils/wastes (see comment above and the Navy's own recommendation regarding additional modeling).

Due to the anticipated Base Realignment and Closure and potential private development or similar activity at these (and all other) sites, all risk assessment work should assume potential privat development of the NAWC property.

p. ES-8: Conclusions - Site 4

Additional investigation of soil/waste at Site 4 is necessary to further characterize risk in this area. Given the limited number of subsurface soil samples analyzed for TCL/TAL substances (three), EPA cannot conclude that "no further action be taken for subsurface soil because it would not pose a direct contact threat even if exposed." Risk from surface soil cannot be assessed with only two TCL/TAL samples. Periodic ground water monitoring must be performed in any case. (See Section 5 below for more specific comments on conclusions regarding Site 4.

p. ES-11: Conclusions - Sites 5, 6 and 7

The narrative prior to the bullets should read as follows:
"Additional investigation should be performed as necessary to characterize the nature and extent of groundwater and soil contamination. The tasks to be performed include (at a minimum):"

Third full paragraph (starts with "It is recommended that no further action be taken...") should be deleted.

See Section 6.0 below for detailed comments regarding Site 5, 6 and 7.

p. ES-14: Conclusions - Site 8

Delete the first sentence. The first paragraph should include the following statements: "Additional sampling is necessary to fully characterize potential risks due to direct contact with surface and subsurface soils. Additional subsurface soil sampling is necessary to assess risk to groundwater users."

Second paragraph should be deleted. It is inappropriate to conclude that "because the Site 8 area is non-residential with access restrictions, no further action is recommended for surface soil". Due to BRAC, this site may undergo private development and should be addressed accordingly. In this context, analysis of three surface soil samples and three subsurface soil samples for TCL/TAL is inadequate to characterize risk.

Delete last sentence in this section.

See comments on Sec. 7.0 below.

p. ES-16: Conclusions for Off-Site Groundwater

This section should be consistent with EPA comments in a letter dated December 29, 1992.

Delete the last paragraph in this section that begins with "The available information..."

Introduction

p. 2-34: Table 2-5

TOC sampling should be conducted at discrete soil locations at variable depths. Additional samples for grain size should be taken to assess horizontal and vertical variability.

p. 2-8: Sec. 2.1.5 - Soil Gas Surveys

Note the absence of VOCs in the soil pore space (as determined by soil gas survey) does not preclude the presence of VOCs (or relatively non-volatile organic compounds) in the soil column at levels which may present an unacceptable risk to human health or the environment.

p. 2-21: Sec. 2.1.14 - Biological Characterization

EPA's Rapid Bioassessment Protocols should be utilized to complete assessment of the ecology of potentially impacted streams.

The U.S. Fish and Wildlife Service should be contacted (and referenced) to document the presence or absence of federally listed or proposed endangered and threatened species.

Bioassay sampling must be considered where sediment samples are collected in the future.

p. 3-1: Surface Water Hydrology

A map indicating surface water drainage basins and streams receiving site-related drainage should be included.

Section 4.0 - Sites 1, 2 and 3

p. 4-4: Sec. 4.3 - Phase I and II RI

A review of the aerial photo inventory (see Attachment 1) indicates a series of eight lagoons in the area of Site 1 from at least October 27, 1950 to at least August 7, 1971. As noted in EPA's letter of December 29, 1992, "the RI should investigate the nature and extent of contamination associated with all hazardous substance releases at the facility which are not regulated or not being investigated under the authority of...other federal law." In this instance, potential releases from these lagoons have not been investigated or regulated under any federal law outside of CERCLA. **These lagoons and any other potential sources of hazardous substance release revealed by aerial photo interpretation must be investigated under the RI unless the release of concern is demonstrated to be regulated under federal law.**

No surface soil samples from Sites 1, 2 and 3 underwent TAL/TCL analysis. Therefore, a risk assessment for surface soil exposure

in this area cannot be performed. A plan for generating the necessary data must be developed/implemented as part of the RI.

A total of five subsurface soil samples have undergone TCL/TAL analysis in the area of Sites 1, 2 and 3. Assuming the area of Sites 1, 2 and 3 is approximately 180,000 sq.ft. (1200 by 150 ft.) (see Figure 4-2), one subsurface soil sample per 36,000 sq.ft. has been collected. This number of samples is inadequate to assess risk due through direct contact in the event of potential development (or similar intrusive activity) and the subsequent displacement of subsurface soil to the surface or risk to future ground water use posed by leaching of soil contaminants to ground water. Ground water sampling results for this area suggest there has been a release of heavy metals from a source in this area which has not been identified. In addition, it is still unclear whether organic contaminants in ground water under this area were released from the area of Sites 1, 2 and 3. A plan for collecting the necessary soil samples must be developed and implemented as part of the RI.

As acknowledged by the report, sampling and characterization of the stream draining Sites 1, 2 and 3 to date is inadequate to characterize risk associated with this stream. Neither of the RI samples stations (Stations 1 and 2 as depicted on Figure 4-6) are downstream of Site 1 (or potentially Site 2). A plan for collecting the necessary samples must be developed and implemented as part of the RI.

p. 4-9: Sec. 4.3.7 - Subsurface Soil Sampling

The location of the subsurface soil samples (both onsite and background) should be provided in a figure.

p. 4-43: Sec. 4.5.3 - Subsurface Soil

Section 4.3.7 indicates only one background sample was collected, while this section indicates that four background samples were collected. Please reconcile. Without knowledge of the location of the background samples, EPA cannot comment on the location of these samples.

P. 4-44: Table 4-6

The unit of measurement should be provided.

p. 4-77: Sec. 4.6.2 - Potential Migration Routes

This section mentions generation of dusts from subsurface soils as a potential migration pathway. Potential migration of surface soils by this pathway should also be noted. The lack of surface soil data and any relevant site observations (see comment below) precludes an assessment of this pathway.

p. 4-79: Sec. 4.7 - Baseline Risk Assessment

In the case of this site (and the other sites), observations regarding the nature of surface conditions may contribute to an assessment of risk from exposure to surface soils and should be included in the report where appropriate e.g. note if an area is paved, covered with grass or fill, etc.

p. 4-80: Sec. 4.7

In all cases, the 95% UCL should be calculated using a one-sided t-statistic (not two-sided). Please recalculate the 95% UCL using a one sided t-statistic at $\alpha = 0.05$.

p. 4-175: Sec. 4.8.2 - Conclusions

This section should otherwise be consistent with the comments above, comments on the Executive Summary in this letter and comments in a letter from the EPA to the Navy dated December 29, 1992.

Section 5.0 - Site 4

p. 5-1: Sec. 5.3

No surface soil samples have been analyzed for TCL/TAL substances. As a result, a risk assessment for surface soil cannot be (and was not) performed. While this area may be covered with grass or "clean fill", samples must be collected to confirm this is the case. A plan for collecting the necessary surface soil samples must be developed and implemented as part of the RI.

Figure 5-2 indicates the trenches run a total length of approximately 2300 feet. A total of 3 TCL/TAL samples have been collected to characterize the material in these trenches which are estimated to be 12 feet wide and 9 feet deep. This is inadequate to characterize risk via potential direct contact

pathways. While ground water sampling results suggest there is no active release of hazardous substances to ground water from Site 4, these results do not preclude the possible presence of relatively immobile organics or metals which could pose a direct contact threat upon excavation and exposure to the surface. Significant additional sampling will be required during the RI to support "no action" with regard to subsurface soils at Site 4.

p. 5-114: Sec. 5.8.2.1 - Conclusions

Based on the comments above, additional investigation of soils is still necessary for Site 4. Based on available data, one cannot conclude that "no further action be taken for subsurface soil because it would not pose a direct contact threat even if exposed."

The first and third sentences of the second paragraph are inconsistent. A periodic monitoring plan must be implemented to evaluate future ground water quality in this area.

p. 5-114: Sec. 5.8.2.2 - Recommended Remedial Action Alternatives

Given the minimal available sampling data, EPA cannot conclude that "no remedial action objectives are recommended for Site 4." Since the waste disposal at Site 4 apparently occurred within discrete, known areas, and the quantity of waste is projected to be relatively minimal, removal of the buried waste (and any associated contaminated soil) may be an alternative preferable to performing the RI studies to necessary to support "no action". Periodic monitoring of groundwater in this area must be performed in any case.

Section 6.0 - Sites 5, 6 and 7

p. 6-1: Sec. 6.1

In all cases, but particularly in this case, the historical aerial photos in Attachment 1 must be interpreted to determine if additional investigation must be performed. Aerial photos of Site 5 dated September 23, 1958 and May 5, 1964 indicate apparent trenching/disposal activities which extend beyond the area investigated by the RI to date. Part of this trenching/disposal activity appears to extend under and around housing units/areas which have not been investigated by the RI to date.

This section notes that Site 5 was "rediscovered during construction for the foundation of a housing unit." Since th

facility is under Bas Realignment and Closure, construction within any area of current NAWC property is possible in the future. Appropriate actions must be taken to assure any construction (or similar activities) which entail intrusion into subsurface soils and potential displacement of these soils to the surface does not produce an unacceptable risk to human health and/or the environment.

p. 6-3: Sec. 6-3 - Remedial Investigation

Since no surface soil samples have been collected, risk from these soils within the areas of concern cannot be assessed. This pathway is of particular potential concern in the active housing area of Site 5. A surface soil sampling plan must be developed and implemented as part of the RI for Sites 5, 6 and 7.

p. 6-4: Sec. 6.3.1 - Air Monitoring Survey

Additional air monitoring survey work may be necessary to assess risk in areas of potential concern identified through interpretation of aerial photos. The dates and times of the air monitoring performed to date should be provided.

p. 6-4: Sec. 6.3.2 - Electromagnetic Survey

Reasons for not conducting an EM survey at Site 5 should be provided in this section.

p. 6-15: Sec. 6.3.4 - Subsurface Soil Sampling

Based on aerial photo interpretation, additional borings are necessary at Site 5. Three subsurface soil samples from Site 5, four subsurface soil samples "near" Site 6 and no soil samples from Site 7 are inadequate to assess risk from potential direct contact with subsurface soil at these sites. Additional sampling must be performed during the RI before EPA can conclude "no action" with regard to soils associated with these three sites.

p. 6-128: Sec. 6.8.2.1 - Conclusions

Delete the first sentence in this section. Additional investigations must be performed as indicated above.

To address data gaps, additional tasks (delete "design tasks") should include, at a minimum:

Surface soil sampling at all three sites and additional subsurface soil sampling

- Additional sampling to determine the extent of stream sediment contamination due to the three sites.

A remedy for groundwater contamination which presents an unacceptable risk to current and future users of ground water should be selected under Operable Unit One.

- Additional **expedited**, well survey work must be performed as necessary to determine whether current groundwater users are at unacceptable risk due to releases from the three sites. Periodic monitoring onsite and offsite well water sampling must be performed as necessary based on the survey.
- The need for additional air sampling at Site 5 must be evaluated as part of the RI.
- Conduct the ground water investigations necessary to characterize 1) flow in the shallow bedrock, 2) flow between the shallow and deep bedrock aquifers and 3) the potential for contaminated groundwater discharges to Southampton Creek.

Due to the potentially large area used for disposal in the case of Site 7 and (particularly) Site 6 and the apparent lack of information regarding the specific areas used for disposal, it is possible that no reasonable sampling effort will allow EPA to conclude that "no action" is appropriate in the case of subsurface soil at these sites. Institutional land-use controls may still be necessary in any case to maintain a cap over subsurface contamination which was not detected by any additional sampling or to control any action involving movement of any such material.

EPA concurs that "additional soil borings and test pits should be drilled (or excavated) to better define the possible source area of ground water contamination within Site 6."

Section 7.0 - Site 8

Sec. 7.1 - Site History and Description

Please provide more detail on "surface water observed to collect within this area." When (or does) the surface water collect and for what duration? What area did (does) the water cover? (Note: This information is needed to ascertain whether this "surface water could support flora or fauna of environmental concern.) Please provide all available information regarding the area

adjacent to Site 8 where "the removed material was deposited" i.e. the specific location of deposition, quantity of material deposited, etc.

The aerial photo inventory must be interpreted to further identify the history of Site 8.

Sec. 7.3.4 - Groundwater Sampling

Is there any historical data from sampling of Well DG-11? If so, please include. Since Well DG-11 is the only well monitoring the overburden downgradient of Site 8 and no samples were collected from Well DG-11, the impact of Site 8 on groundwater has not been fully characterized at this time. In addition, the current groundwater monitoring well network for this site may be inadequate (see comments in Attachment 2). The RI must include an evaluation of the effectiveness of the current monitoring well network.

Sec. 7.3.5 - Sediment/Surface Water Sampling

A surface water sample was **not** collected from Station 4 during Phase II (see typo, second paragraph, first sentence).

If "surface water" ponding in this area can or does support flora/fauna of concern, water and sediment in this pond should be sampled.

Sec. 7.3.6 - Surficial and Subsurface Soil Sampling

What was the rationale for the location of the surface soil samples? Given available information, two surface soil samples are not representative of surface soil conditions in this area. A plan to further characterize surface soils in Site 8 must be developed and implemented as part of the RI.

Given available information, two subsurface soil samples collected at depths of 18 to 24 inches do not adequately characterize subsurface soil conditions at this site. A plan to further characterize subsurface soils in Site 8 must be developed and implemented as part of the RI.

Sec. 7.4.5 - Ecology

As noted above, more detail is necessary regarding the "ponded surface water."

Sec. 7.8.2.1 - Data Limitations and Recommendations for Future Work

The first sentence of this section should be deleted. Given available data, it **cannot** be concluded that "no additional investigation is necessary in the vicinity of Site 8."

Based on two subsurface and two surface TCL/TAL soil samples, it cannot be concluded that no further action is needed for subsurface and surface soil, respectively.

The report states that "because the Site area is nonresidential with access restrictions, no further action is recommended for surface soil". The area of Site 8 is may developed by private parties and there may be no access restrictions in the future. Additional information is needed to conclude that surface soil (and any subsurface soil that may be displaced to the surface) requires no further action.

Available data is inadequate to assess the potential impact of soil at Site 8 on ground water or current impacts of Site 8 on the overburden aquifer and possibly the bedrock aquifer.

The report states that "no further action be taken for ground water at Site 8" and that "periodic monitoring at Site 8 may be warranted to evaluate future groundwater quality in this area". These statements are contradictory. The EPA concurs with the latter conclusion. In addition, the effectiveness of the current monitoring well network must be assessed as part of the RI.

7.8.2.2 - Recommended Remedial Action Objectives

Based on available information, EPA cannot conclude there are no remedial action objectives for Site 8.

Please note the following general comments on the **Risk Assessment** portions of the report:

- 1) See applicable comments in a letter from the EPA to the Navy dated December 29, 1992.
- 2) The fraction of soil ingested for the residential scenario is assumed to be 1, not 0.1. The fraction of soil ingested for other scenarios (e.g. the worker scenrio) may be assumed to be less than 1 on a site-specific basis. Please correct this error in the Risk Assessment.
- 3) Please state in the report that the aggregate distribution mode value used in the fugitive dust emssion model to

calculate the threshold friction velocity was not obtained experimentally.

- 4) The ingestion rate for surface water of 0.2 l/day should be modified to 0.05 l/day. Please refer to the Risk Assessment Guidance for Superfund (RAGS).
- 5) The Lead Uptake/Biokinetic Model should be used to assess the risk lead may pose to children. The risk lead may pose to adults should be done qualitatively, as there are currently no toxicity criteria available to do a quantitative risk assessment. The action level for lead of 15 ppb in drinking water and 500 ppm in residential soil can be used to qualitatively assess risk to both adults and children.
- 6) Please include in the discussion on the Toxicity Profile for Lead the effects of lead on small children and pregnant women, especially with respect to IQ and/or birth defects.
- 7) Regarding the risk characterization for Site 8: The estimated risks for adult residents via the dermal route would exceed $1E-5$ (not $1E-4$) because of pyrene (not pyren , benz(a) anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene and chrysene). Please correct this error (see p. 7-112).
- 8) The appropriateness of using contaminated "background" soil samples for risk assessment is questioned. Additional sampling is necessary to identify background soil concentrations.
- 9) Regarding references: The citation for reference EPA, 1992f should be provided in the reference section.
- 10) p. 5-109, paragraph 7, line 4 under Uncertainty Analysis: Please replace CSF with RFD.

Please see Attachment 2 for additional EPA comments on the Phase II RI report.

Finally, below are two additional comments regarding the Phase II RI as it relates to OU-1:

- 1) p. 1-13: Delete the following sentence, "In addition, there is no conclusive evidence that the sites are contributing to significant VOC concentrations off site (i.e. no well-defined groundwater plume has been identified)".

2) The report should be consistent with all EPA comments.

As noted previously, additional RI work must be performed as necessary based on an interpretation of historical aerial photos (Attachment 1). The interpretation must identify any additional sites which may warrant investigation. Should no additional sites be identified, the aerial photo interpretation should be utilized to support this conclusion. A focus of the aerial photo interpretation should be areas west of Jacksonville Road (or areas immediately east of the road), particularly those areas which may be a source of shallow bedrock and deep bedrock contamination of unknown origin underlying this area. Interviews must be conducted with current and former employees and persons familiar with the past handling of wastes or products containing hazardous substances, and particularly chlorinated organic solvents. Information obtained during these interviews should include a description of any liquid waste disposal into 1) floor drains within buildings, 2) "dry wells" within or outside buildings, 3) sewer or storm drainage systems underlying and adjacent to buildings and a description of any onsite treatment, storage or disposal units for handling of wastes containing hazardous substances that were in operation prior to the effective date of RCRA. The specific nature of the wastes handled should be identified to the extent possible. Any relevant maps or records should be obtained and reviewed.

The EPA would like to take this opportunity to provide preliminary comments on the Draft Initial Screening of Technologies and Process Options report and the Focused Feasibility Study (FFS) for Operable Unit One. Based on a review of the subject report, the EPA recommends the FFS for OU-1 evaluate two alternatives in detail - "no action" and an "action alternative" consisting of the extraction of contaminated ground water followed by treatment of organic compounds in the extracted water through air stripping/carbon adsorption and treatment of inorganics through precipitation/filtration and, if necessary, ion exchange.

We look forward to meeting with you on January 8, 1993, to discuss the comments above as well as comments in a letter from

the EPA dated December 29, 1992. Should you have any questions or comments in the interim, please give me a call at 215-597-0549.

Sincerely,

A handwritten signature in cursive script, appearing to read "Darius Ostrauskas".

Darius Ostrauskas
Remedial Project Manager

cc: Ben Mykijewycz
Frank Kurdziel, NAWC
David Kennedy, PADER