



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
DIVISION OF SITE REMEDIATION
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Mr. Robert Krivinskas, Remedial Project Manager
U.S. Department of the Navy
NAVFACENGCOM - Northern Division
Code 1823, Mail Stop #82
10 Industrial Highway
Lester, PA 19113-2090

7 December 1994

RE: PHASE III REMEDIAL INVESTIGATION WORK PLAN
SITE 03 - CED SOLVENT DISPOSAL AREA,
SITE 09 - ALLEN HARBOR LANDFILL, AND
BASEWIDE TERRESTRIAL ECOLOGICAL RISK ASSESSMENT
Naval Construction Battalion Center, Davisville Rhode Island
Received 31 October 1994

Dear Bob:

This Division has reviewed the above cited draft document and has generated the enclosed comments. Please note that this review does not include a review of Appendix E which was received by this Division on 18 November 1994, those comments will be forth coming.

Resolution of the attached outstanding issues during the Phase III remedial investigation is necessary prior to initiating remedial action at these sites.

If you should have any questions, please call me at (401) 277-3872 extension 7142.

Sincerely,

Judith Graham
Engineer

cc: W. Angell, DEM DSR
R. Gottlieb, DEM DSR
C. Williams, USEPA Region 1

ahlf.cov/jg

**PHASE III REMEDIAL INVESTIGATION WORK PLAN
SITE 03 - CED SOLVENT DISPOSAL AREA
SITE 09 - ALLEN HARBOR LANDFILL, AND
BASEWIDE TERRESTRIAL ECOLOGICAL RISK ASSESSMENT**

RIDEM, Division of Site Remediation Comments:

1. General Comment, Site 09:

As we proceed with this Phase III investigation the State would like to remind the Navy of its 5 August 1994 letter from Richard Gottlieb to Robert Krivinskas concerning the award of the contract to construct the landfill cap. In that letter five (5) outstanding issues were noted which included: Groundwater modelling, near shore sediments, wetlands, whole site remediation, and public participation. Therefore, as data is collected and analyzed during the Phase III RI investigation these issues must be considered. In addition to the five issues, the State also requests that the Navy consider how landfill gas will be treated as a result of the proposed landfill cap. As we proceed to the design phase this information will be crucial to selecting an appropriate design for the cap.

2. General Comment, Site 09:

The Allen Harbor Landfill has been constructed by placing waste into salt and/or brackish waters and is consequently virtually surrounded by salt or brackish water. As a result, rainfall infiltration is potentially the only major route of fresh water recharge to the fill area. Under present conditions, fresh and saline waters have most likely achieved a state of equilibrium, fluctuating with seasonal weather, storm and tidal events.

The Phase III RI should determine the potential impact to the freshwater/saltwater interface and the groundwater quality caused by the placement of an impermeable cap over the landfill area.

Also, during the fall of 1993, groundwater tables throughout the state were seriously low; concurrently, leachate samples were collected from the landfill and toxicity tests were performed. The results of this toxicity testing indicated that these saline seep water samples were more toxic than the fresh water seeps sampled during the spring and summer months of that year. Since groundwater salinity measurements were not performed during the low water table event, enough data was not generated to conclude that the groundwater table in the fall of 1993 was low enough to simulate the disappearance of the fresh water lens and to determine whether the elimination of fresh water recharge to the lens will create a more toxic discharge to the harbor.

As the Navy has previously agreed, the Phase III RI was to address this concern. The

SOW currently focuses on the containment qualities of the silt stratum located above the bedrock. Although the silt stratum may act as a partial confinement layer, groundwater within the stratum is fresh water; therefore, the silt stratum does not confine the aquifer. Since the groundwater table is no longer at a seasonal low, the Navy may have missed the window for this inquiry.

This information will be useful in determining a whole site remediation of the landfill. Specifically, the feasibility of remedial alternatives to be considered in conjunction with the RCRA C cap, i.e. groundwater pump and treat scenarios, multi-level well pumping techniques, etc.

3. Page 1-2, Section 1.3, Remedial Investigation/Ecological Risk Assessment Objectives:

The objective of the Phase III Remedial Investigation is to close any significant data gaps remaining from the Phase I and Phase II Remedial Investigations and ultimately, to support our evaluation of remedial alternatives for sites 03 and 09.

In our effort to close all such data gaps, there are two additional objectives that this Phase III Scope of Work should include. Both are specific to Site 09, the Allen Harbor Landfill.

First, as mentioned, the Allen Harbor Landfill has been constructed by placing waste into salt and/or brackish waters and is consequently virtually surrounded by salt or brackish water. As a result, rainfall infiltration is potentially the only major route of fresh water recharge to the fill area. Under present conditions, fresh and saline waters have most likely achieved a state of equilibrium, fluctuating with seasonal weather, storm and tidal events. An additional objective of the Phase III RI should be as follows:

- 7) The potential impact to the freshwater/saltwater interface and the groundwater quality caused by the placement of an impermeable cap over the landfill area.

Also, in addition to the ecological evaluation objectives listed, an additional objective of the Phase III RI should be as follows:

- 8) The impacts of the landfill on the salt water marsh to the west (the other side of Sanford Road).

4. Page 1-2, Section 1.3, Remedial Investigation/Ecological Risk Assessment Objectives; Site 03 Tasks, Item 1.

Based on the seventh RAB meeting, there may be more than four monitoring wells and/or borings required for this site. In addition, some wells were proposed for the Navy property as well as the RIPA property. These items should be updated.

5. Page 1-3, Section 1.3, Remedial Investigation/Ecological Risk Assessment Objectives:

The objective to evaluate the impact of potential VOC in the deep groundwater migrating from beneath the landfill toward, and discharging into bottom sediments in Allen Harbor was listed on the previous page yet VOC analysis is not proposed for sediment core samples (see task #6). Also, as previously discussed after the 10 November RAB meeting, sediment samples are needed from the salt water marsh to the west (the other side of Sanford Road).

The SOW should identify sampling locations for these wetlands and the rationale for their selection.

6. Figure 1-3, IR Program-Site 03, Site Plan.

Please delineate the boundary between Site 03 and the NIKE site.

7. Figure 1-6, Proposed Schedule, IR Program Sites 03 and 09.

The schedule needs to be updated to reflect current scheduling.

8. Page 2-2, Section 2.1.2, IR Program Site 03 - Solvent Disposal Area; Paragraph 2.

This paragraph should be updated to coincide with the information contained in the Environmental Baseline Survey (EBS).

9. Page 2-8 and 2-9, Section 2.2.2 and 2.2.3, Site Geology and Hydrogeology:

Groundwater resources with a GB classification are known or presumed to be unsuitable for drinking water use without treatment. It should be noted that with treatment class GB groundwater may be suitable for human consumption.

10. Page 3-1, Section 3.2, Field Sampling Plan - Site 03:

- The State suggests moving the proposed monitoring well (MW-9D), to the north and adjacent to Perimeter Road. This will allow for evaluation of the potential migration of contaminants off of base property toward this direction.
- Additional borings should be included around Buildings 378 and T16CT to confirm or eliminate these areas as potential sources.

11. Page 3-2, Section 3.3, Field Sampling Plan - Site 09:

Groundwater salinity during the seasonal low water table months is a previously identified

data gap. Also, as previously discussed, potential impact to sediments located in the salt water marsh to the west (the other side of Sanford Road) should be listed in the data gap section.

12. Page 3-3, Section 3.4, Field Sampling Plan - Site 09:

Last bullet: Please provide the rationale for advancing borings 20 to 30 feet into bedrock and for the placement of the screen interval.

13. Page 3-4, Section 3.4, Field Sampling Plan - Site 09:

- Third bullet: In order to determine whether contaminant upwelling from the landfill to the harbor sediments, sediment core samples will require VOC analysis.
- Fourth bullet: Additional sediment samples need to be taken from the wetlands on the western side of the landfill in order to determine potential impacts to the saltwater marsh.
- Last bullet: Potential mass loading due to VOC presence at the sand/silt interface (if it exists) will need to be evaluated.

**14. Page 4-7, Section 4.1.4, Current Site Investigations:
Task #7.**

Fate and Transport modeling needs to be performed for all strata and under both fresh water and saline conditions. Models used for this evaluation need to fully account for tidal impacts at the landfill. Previous evaluations utilized a filtering method described by Serfes (1991). This Division has had discussion with Mr. Serfes regarding the usefulness of this technique and has determined that it is appropriate for determining a mean groundwater elevation (i.e. general flow direction), but is inappropriate for use in fate and transport modeling. Also, in previous RI submittals, the percentage of waste estimations above and below the water table was based on low tide conditions. Tidal impacts need to be fully accounted for in such modeling; the worst case scenario in which the total volume of wastes in contact with groundwater under maximum high tide conditions must be considered in the model.

**15. Page 4-15, Section 4.4.3, Sample Collection, Handling, and Shipping;
Paragraph 4, Sentence 1.**

If filtering of the samples will not to be conducted in the field as stated, please state if low-flow pumping technique will be incorporated if necessary.

**16. Page 4-25, Section 4.7.2, Target Compound List - Organic Compounds;
Paragraph 1, Last Sentence.**

Please clarify the last sentence of this paragraph as it appears to be incomplete.

17. Page 4-26, Section 4.7.4, Petroleum Hydrocarbons; Paragraph 1.

Please note that EPA Method 418.1 is appropriate for the detection of heavy oils, however, EPA Method 8015 is more appropriate for the detection of light oils and should be used where light oils are suspected.

18. Page 5-2, Section 5.2.4, Nature and Extent of Contamination:

Basewide contaminant comparison levels (background) have already been established, additionally Figures 2-22, 2-23, 2-24, and 2-25, as presented in the Allen Harbor Phase II RI, depict the distribution of SVOC contamination for surface and subsurface soils and VOC contamination for shallow and deep groundwater over the landfill area. Additionally, bedrock and groundwater contour maps have already been developed.

Please explain how this evaluation of the nature and extent of contaminant differs from that which has already been done. If the contractor is proposing to add data acquired from the sand/silt interface and bedrock data to the evaluation already performed, please state this.

19. Page 5-2, Section 5.2.5, Contaminate Fate and Transport:

The Division considers the modeling of this site the most critical portion of the Phase III work and wants to ensure that all data needed to properly model conditions (both present and future) at the landfill is collected during this final phase of studies. Specifically, enough information must be acquired to model and/or evaluate the feasibility of the following:

- Impacts of an impermeable cap on the chemistry, fate, and transport of landfill contaminants.
- The potential use of sheet piling along the Allen Harbor perimeter of the landfill (as opposed to slope cut back) and evaluation of the groundwater containment qualities of this system and impacts to the watertable.
- The potential for dewatering of the waste (ie: lowering the water table within the confines of the landfill to a level below zero MSL).
- The potential for the utilization of a pump and treat system for contaminated groundwater.
- The potential for the utilization of a grout curtain or slurry wall for the purposes

of groundwater diversion.

The Division requests a meeting to discuss the drawbacks and merits of the proposed models.