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Project No. 0709.02

Mr. Dennis Gagne
U.S. Environmental Protection
Agency, Region I
John F. Kennedy Federal
Building, Room 2303
Boston, MA 02203

Subject: New Bedford Harbor, Massachusetts
PCB Contamination
NUS Oversight Project No. 0709.02

Dear Mr. Gagne:

As you requested on February 14, 1983, NUS has completed a review of documents pertaining to remedial actions for PCB contamination in the vicinity of New Bedford Harbor, Massachusetts. The documents that were reviewed are:

1. New Bedford Remedial Action Master Plan (RAMP) prepared by Roy F. Weston, draft report dated January 24, 1983, and

2. Evaluation of Remedial Alternatives for the Aerovox Property, New Bedford, Massachusetts, prepared by GHR Engineering Corporation and dated February 11, 1983.

Additional insight was provided from PCB Pollution in the New Bedford (Harbor), Massachusetts Area, A Status Report, prepared by the Massachusetts Coastal Zone Management Agency dated June 1982 and from a brief field visit to the New Bedford Harbor area on March 9, 1983. Mr. Jerry Sotolongo, EPA Project Officer, provided a site map prepared by Massachusetts Coastal Zone Management dated January 1982. Mr. Sotolongo indicated that most of the additional site information was spread over a number of files concerning this site. Comments pertaining to each of the two documents reviewed are provided below.

Document 1 - New Bedford Remedial Action Master Plan

This RAMP contains a brief summary of present site knowledge and a general description of proposed work statements. Likewise, our review of this document is limited to developing general oversight comments on the proposed work approach in relation to the site knowledge presented.

1. The RAMP presents a reasonable and adequate technical approach to solving the main geotechnical, geological, hydrogeological, and civil engineering issues. This opinion is based on the limited amount of background information available to us for review. We feel it is important that the results of the individual work tasks (New Bedford Municipal Landfill, Sullivan's Ledge, and other sites) should be compiled and collectively evaluated to allow an understanding of the overall geotechnical framework of the entire New Bedford Harbor site.

2. We do not have details concerning the development of cost estimates for the various work tasks. We have some concern regarding these costs. Projected costs for the following work statements could be low, depending on details of the proposed work:

   Project Work Statement 004—Sampling Investigation - Acushnet River Estuary/New Bedford Harbor/Buzzard's Bay

   Project Work Statement 005—Hydrogeologic Investigation of the New Bedford Landfill

   Project Work Statement 006—Hydrogeologic Investigation of Sullivan's Ledge

   Project Work Statement 007—Investigation of Undisclosed Sources/Sites

   Project Work Statement 010—Investigation of Potential Disposal Sites

   This statement is based on the potential of encountering significant complexities during subsurface evaluations. Again, details of individual work efforts may justify these costs, however, due to the massive scope of this project, our concerns should be noted.

3. The feasibility of disposing PCB contaminated dredging spoils in the New Bedford Landfill may be questionable. Public acceptance may be difficult as a result of the adverse feelings that likely exist toward the local contamination problem in general. In addition, the disposal of dredging spoils may reduce or eliminate valuable capacity at this landfill and have an adverse affect on available disposal capacity for other wastes generated in the community. To use this landfill for the disposal of hazardous wastes may not be institutionally possible from a regulatory requirement standpoint in addition to possible technical constraints. Furthermore, the landfill closure is predicted for 1985.

4. The value of transport model and food chain model must be considered with respect to cost and overall remedial effort. The cost of the model may be difficult to justify in relation to the results obtained. Although the actual sampling and analysis program is required to determine the existing situation and assess alternative remedial measures, generating data from a complicated and combined estuary transport and ecological food chain model may not be feasible. The complexity (or depth of analysis) of each component may render the total model ineffective.

5. Direct hydraulic dredging and hydraulic transport to a properly constructed disposal area onshore should be examined. Mini-dredges (Mud Cat) operable to 15-25' depths may be feasible in some areas and cost efficient in removing PCB-contaminated sediment.

6. Allowing each contractor to develop his own health and safety plan and quality assurance protocols is questionable. There will not be the required uniformity and consistency of protection and chemical analytical data unless the plans are developed by one entity for all operating elements.

7. Any treatability studies should be carried out with the contaminants at the expected concentrations in-situ. Otherwise, results of the tests may not be valid for removal when the influent is in the ppb range.

8. Consideration should be given to utilizing the ambient air testing program to include pinpointing or locating sources of contamination.

Document 2 - Evaluation of Remedial Alternatives for the Aerovox Property, New Bedford, Massachusetts

This report presents technical data concerning remedial alternatives at this property. It does not cover other areas considered a part of the New Bedford site. Furthermore, cost information is not included. Our comments are restricted to the specific technical considerations discussed in the report.

1. The study area was restricted to the Aerovox property adjacent to the river. It is not clear to us from the data available for review if the potentially contaminated areas do not extend to other portions of the property. It would be helpful if more details on site history, specifically, filling, industrial development, construction, and PCB waste dumping at this site were available. This type of information would enable us to establish the geotechnical framework and historical perspective.

2. The tidal fluctuation in the Acushnet River is important with regard to remedial actions. The following tidal information was provided:

   Maximum high tide - El. +4.24} Datum MSL
   Minimum low tide - El. -2.10}
   Lowest recorded high tide - El. +1.58
   Mean of observed high tides - El. +2.92
   Mean of observed low tides - El. -1.57

   It appears that tidal fluctuates nominally from Elevation +4 to Elevation -2. On this basis, it seems that any vertical barrier installed along riverward edge of site should extend down at least to Elevation -2. This implies construction below sea level and below fluctuating tidal range.

   Will these tidal fluctuations tend to wash PCBs (and other wastes) downward and riverward? If the depths of PCB concentrations in soil samples from Phase 2 borings (Table 2-3) are plotted on soil profiles (Figures 4-2 through 4-5), along with nominal tidal range (+4 to -2 Elevation), this indeed seems to be the case.

3. Soil descriptions and characterizations (pages 4-2 through 407) do not present a profound understanding of the geotechnical framework of the site or an appreciation for deposition--patterns and details--particularly in the Peat Zone. Also, full-size and true scale soil profiles would be helpful. Soil grain size data in Table 4-1 and Appendix B are not too meaningful in view of limited number of samples and the unknown level of sampling and testing expertise.

   Peat Zone is the key soil zone at this site. Better information on the location, extent, continuity, and stratification details of this zone is needed.

4. Any evidence of piping (internal erosion) of bank soils due to tidal fluctuation--especially in fill behind and above the sea wall? Any sampling and testing for PCBs in silt and other sediment in tidal zone along base of sea wall? (We would expect tidal fluctuations to have concentrated PCBs and other wastes in tidal zone soils behind the sea wall and river sediment in front of the sea wall.) Some mention of sampling in estuary adjacent to Aerovox in Weston RAMP, pages 15, B-10, and B-11, exists.

5. The number of observation wells to characterize the flow pattern outside the immediate river bank--or even in the river bank--in view of depositional complexity of soils here, may not be adequate. Tidal fluctuations (and precipitation-induced river stage fluctuations) are

clearly the main groundwater controls in the near-bank area; a total of five observation wells in the shallow aquifer and six wells in the deep aquifer may not be sufficient. There are only two other wells (5 and 6) landward of bank and none in paved parking area south of the Aerovox Building. Local groundwater patterns, both shallow and deep, could be different from those characterized in the report.

6. Soil porosity value of 25 percent used in the groundwater flow volume calculations (pages 4-15, 4-17) seems too low by factor of at least two for relatively loose random fill and alluvial-glaciofluvial marsh type soils at the site. It is impossible to begin to check these flow volume calculations without more information.

7. It is unclear why a bentonite slurry trench cutoff wall construction technique is not applicable to the Aerovox site and why the slurry trench was rejected. It seems that the slurry trench or soil-bentonite wall would be ideal to get below the zone of tidal fluctuation and key into the Peat Zone, subaqueous excavation in loose, potentially unstable soil adjacent to river; bentonite swelling removes the need for heavy compaction of cutoff.

8. Capping previous portions of site and installation of a vertical barrier are conceptually the most effective remedial measures here. As far as capping goes (pages 6-5 through 6-15), either hydraulic asphalt concrete or standard asphalt concrete seems feasible and adequate. Final selection depends on costs, which were not provided.

9. The comments below concern the Vertical Barrier - Cutoff Wall (pages 6-16 through 7-8):

   A. Figure 7-1 on page 7-4 shows a total wall length of approximately 770'. Assume a trench 3' wide by 9' average depth. Volume = 1 x 3 x 770 ÷ 3 = 770 yd.^{3} Trench area = 770 x 9 = 6930 ft.^{2} This is actually a very small cutoff trench job.

   B. Excavation of potentially contaminated soil for trench = approximately 770 yd.^{3}. They propose spreading and compacting this soil in the area to be capped (page 6-21) 770 yd.^{3} = 20,790 ft.^{3} over area of approximately 28,000 ft.^{2} (page 6-12) --- 0.74 ft. ~9 in. depth, say 0.5 to 0.6 ft. after compaction. It is not clear at the moment that they can efficiently use 28,000 ft.^{2} for this, so actual thickness may be 0.7 to 1.0 ft. Cannot tell if site grading will allow this in absence of site plan drawing SP-1. If not, we recommend consideration be given to off-site disposal of potentially contaminated soil in approved landfill.

C. Proposed cutoff is to extend to peat, average depth 7 to 9 ft. (page 6-16). Peat Zone is highly variable in depositional characteristics and has surface irregularities. We recommend keying cutoff into peat or other impervious strata, based on inspection of trench excavation with some minimum depth or maximum elevation for base of cutoff, e.g. Elevation -2, minimum low tide level, and some minimum depth, e.g. 2 to 3 ft., into impervious soil.

D. The only feasible cutoff walls we view are a bentonite slurry wall, soil-bentonite wall, or compacted cohesive soil wall. Slurry or soil-bentonite walls can be constructed adequately below level of river and tides without dewatering but with inspection of base soils.

E. Silt washings wall recommended in Remedial Plan (page 7-1) is not recommended because:

1) These washings (source and gradation not specified, page 6-16) are cohesionless soil fines (silt and very fine sand) and would be extremely difficult to handle and compact, especially in a wet trench (with probable caving sides) extending below nominal river level.

2) Cohesionless silt has no piping (internal erosion) resistance due to lack of cohesion and uniform small grains.

3) Tidal fluctuations would tend to wash the poorly compacted silt into voids in loose, generally coarse grained, random fill on the trench sides (little, if any, self-filtering action by silt; we can't assume the random fill will act as a soil filter) and cause localized piping failures in a silt wall.

4) Marginally compacted silt, especially without conservative filter and transition zones, should not be used for a hazardous waste cutoff wall.

F. A sheetpile wall (pages 6-17 through 6-18) is not recommended because of:

1) Potential driving problems in random fill,

2) Potential problems from underground utilities,

3) Probable open cracks at interlocks, and

4) Corrosion potential from the salt water from estuary or fill and wastes placed at the site.

G. Reconstruction of an existing sea wall (page 6-18) is not recommended if it cannot be adequately repaired, especially below the nominal river level (page 6-19).

H. If the use of bentonite is chemically unfeasible, then a compacted earth cutoff should be constructed of a reasonably well graded soil with some cohesion (clay) so that it can be compacted well and have good resistance to piping. Some dewatering--sumps and pumps or well points--may be required to permit excavation of cutoff trench and compaction of soil in base.

I. If a slurry wall or soil-bentonite wall is used, trench support and dewatering will be unnecessary as bentonite slurry will support the sides.

J. Whatever type of cutoff wall is installed, continuous and careful inspection is mandatory to ensure adequate depth and keying into impervious or semi-pervious strata and to ensure wall continuity.

6. In the event the existing monitoring wells are plugged, we recommend that additional monitoring wells be installed to determine the effectiveness of the cover and contamination barrier to be installed.

Our general recommendation is to install a cutoff wall to key into the peat or other impervious strata. The cutoff wall should be a slurry trench, soil-bentonite wall, or compacted cohesive soil. It should be installed with approved construction inspection and post-construction monitoring. Pervious portions of the site can be covered with hydraulic asphalt or regular asphalt, depending on cost.

We hope the above comments on these two documents are useful for your needs. Please keep in mind that these comments were made based strictly on the data made available to us. If you have any additional comments or questions, please do not hesitate to contact James Hamel, Joe Bern of NUS or me.

Very truly yours,

Daniel Threlfall

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DT:bjs

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