



DEPARTMENT OF THE NAVY

NORTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
10 INDUSTRIAL HIGHWAY
MAIL STOP, #82
LESTER, PA 19113-2090

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NSY PORTSMOUTH
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IN REPLY REFER TO

5090
Code 1823/FE

10 NOV 1999

Ms. Meghan Cassidy
U.S. Environmental Protection Agency, Region I
JFK Federal Building HBT
Boston, MA 02203-2211

Mr. Iver McLeod
Maine Department of Environmental Protection
State House Station 17
Augusta, ME 04333-0017

Dear Ms. Cassidy/Mr. McLeod:

SUBJECT: MTADS GEOPHYSICAL SURVEY FOR THE INSTALLATION
RESTORATION PROGRAM, PORTSMOUTH NAVAL SHIPYARD,
KITTERY, ME

Enclosed are the responses to comments on the 18 May, 1999
Draft MTADS Geophysical Survey of the Jamaica Island Landfill
and Topeka Pier Landfills for your review and comment. Please
provide comments on the responses to comments on or before
December 1, 1999.

If additional information is required, please contact me at
610-595-0567, x159.

For the Community Restoration Advisory Board (RAB) members;
if you have any comments or questions on these issues, they can
be provided to the Navy at a RAB meeting, by calling the Public
Affairs Office at (207) 438-1140 or by writing to:

Portsmouth Naval Shipyard
Code 106.3R Bldg 44
Attn Marty Raymond
Portsmouth, NH 03804-5000

Sincerely,



FREDERICK J. EVANS, P.E.
Remedial Project Manager
By direction of the
Commanding Officer

Copy to:

NOAA (K. Finkelstein)
ME DMR (D. Card)
Mr. Doug Bogen
Ms. Michele Dionne
Ms. Mary Marshall
Mr. Jack McKenna
Mr. Onil Roy
Dr. Roger Wells
PNS Code 100PAO
PNS (Code 106.3R, M. Raymond)

US FWS (K. Munney)
NH Fish & Game (C. McBane)
Mr. Jeff Clifford
Ms. Eileen Foley
Mr. Phil McCarthy
Ms. Mary Menconi
Ms. Johanna Lyons
Ms. Carolyn Lepage
TtNUS (L. Klink, D. Cohen)
COMSUBGRU TWO (R. Jones)

RESPONSE TO EPA COMMENTS DATED JUNE 21, 1999 ON THE MTADS GEOPHYSICAL OF THE JAMAICA ISLAND AND TOPEKA PIER LANDFILLS

- 1. Comment:** EPA's only comment relates to the proposed test pitting to be performed at the JILF. The MTADS report identifies twenty-six locations for test pitting. These twenty-six locations are based on the MTADS survey. At the May 20, 1999 Restoration Advisory Board (RAB) Meeting the Navy indicated that some of these test pits expected to be excavated would be in areas not accessible for MTADS work. Will these test pits be in addition to those proposed in the MTADS report? The Draft Remedial Action Work Plan for Mercury Burial Vault II and Drum Test Pit Excavations" states that 25 test pit locations will be selected. The Navy must provide a concise summary of the proposed test pit locations and the justification as to why the locations are being selected. This summary should be provided to EPA, Maine Department of Environmental Protection and the RAB for review and discussion prior to field work being initiated.

Response: The Navy will provide a concise summary of the proposed test pit locations with a justification why those locations are being selected to the EPA, the Maine Department of Environmental Protection, and the RAB for review and discussion prior to field work being initiated.

RESPONSE TO MEDEP COMMENTS DATED JUNE 3, 1999 ON THE MTADS GEOPHYSICAL OF THE JAMAICA ISLAND AND TOPEKA PIER LANDFILLS

General Comments

1. **Comment:** This report is of high quality, and the graphics are exceptionally well presented and are clear.

Response: Comment noted and appreciated.

2. **Comment:** The geophysical results show many potential buried metal targets for test-pitting consideration. It is difficult to specify a ceiling number of locations to investigate in advance of actually digging some of the locations. At a minimum, the Department is interested in two additional locations (T#33 and T#43), and hopes the Navy will include these. These additional targets are in the H-27 area of the JILF (Table B1), where only 6 test pits in an area of widely spread geophysical hits are now scheduled.

Response: Comment noted. Please see our response to EPA Comment No. 1. However, NRL's analysis does not indicate anomalies T#33 and T#43 are unique. Based on the MTADS information, anomaly T#33 is similar to the suggested anomaly at T#1, and anomaly T#43 is a small member of a cluster of targets not unlike anomalies T#2 and T#3.

3. **Comment:** At the May 20 RAB, the Navy also indicated they would be test pitting within the area of the JILF that was inaccessible to the survey. This work is not listed in the draft MTADS report. Will details of this test pitting be provided in the final MTADS report or under separate cover?

Response: Please see our response to EPA Comment No. 1.

4. **Comment:** No test pits are proposed for the Topeka Pier Survey Area. Admittedly, many utilities are present, both above ground and below ground. However, a few red anomalies appear on Figures C3 and C4 that apparently are not associated with known utilities. MEDEP encourages the Navy to select several of these to investigate. If no pits are dug, our knowledge of this area will have no chance of being enhanced.

Response: Comment noted. Test pitting recommendations were only requested for Site 8, Jamaica Island Landfill. Please see our response to MEDEP comment no. 2. The Arc View images in C3 and C4 contain only part of the utilities - other utility overlays correlate with other MTADS features. However, as noted in section 5.2 of the report there are very few features that do not correlate either with buried utilities or with visible surface features.

Specific Comments

5. **Comment:** 5.0 Survey Results, p. 7

Please include the term "nT" in the acronym list.

Response: The term "nT" (nanoTesla) will be included in the acronym list. As a point of reference, the Earth's magnetic field at PNS is about 50,000 nT.

6. **Comment:** Figures 7 and 9, Distribution of calculated object depths, p. 9, 11

Displaying the data in increments of 0.1 meters resolution gives a very busy appearance to the graphs. The need for increments of less than 0.25 meters is not apparent to us. Please consider reformatting this scale.

Response: The data in the figures is generated from software used to locate unexploded ordnance where increments of 0.1 meters (approximately 4 inches) could be critical. The Navy does not plan

to modify NRL's reporting techniques for this particular report because both methods accurately report the distribution of calculated object depths.

7. Table 2, Suggested Targets for Further Investigation, p. 13

- a. **Comment:** This table identifies 25 suggested targets for further investigation out of over 300 targets identified in the survey. What is the rationale for choosing only 25 targets for test pitting?

Response: The Navy assumed 25 test pits would be sufficient to determine whether there are over 9000 drums containing waste oil or solvents buried in the landfill between 1945 and 1965. This quantity of drums would take up at least 1-1/3 acres of the area filled between 1945 and 1965 (approximately 9 acres). Twenty-five 5-foot by 20-foot test pits are proposed within uncapped portions of the landfill both north and south of Parker Avenue to confirm whether a large quantity of drums exist above the water table in this area.

- b. **Comment:** The accuracy of the geophysical instruments and methodology is very impressive, especially when the applied algorithms furnish diameters and depths to hundredths of a meter. Please consider rounding these values to the nearest 0.1 meter. It matters little to the public and the excavation process to drop the hundredths, and in doing so the Naval Research Laboratory substantially reduces the risk of over-selling the capabilities of subsurface geophysics. These predictions will retain more creditability as these rather precise depths and diameters undoubtedly will not be verified in many instances.

Response: Depth data in Tables 2, A1 and B1 will be rounded to the nearest 0.1 m. as requested.

8. Appendix C

- a. **Comment:** The GIS overlays on the Topeka Pier EM anomaly image maps (Figures C3 and C4) is confusing. For the most part, utilities don't seem to match with anomalies in the EM maps. In addition, the EM anomaly image maps don't seem to correspond with the maps presented in Figures C1 and C2 even though they are supposed to be the same maps. The utility maps seem to correspond better with Figures C1 and C2.

Response: Please see our response to MEDEP Comment No. 4.

- b. **Comment:** It is puzzling that X and Y coordinate scales are not shown, as is the case for all other image maps in this report. If this cannot be added, the distance scale should be changed to meters or feet, from miles.

Response: We are unable to add the X and Y coordinate scales to Figures C3 and C4 because of the software used. We are investigating whether the distance scale can be changed to meters or feet, from miles.

RESPONSE TO SAPL COMMENTS DATED JUNE 30, 1999 ON THE MTADS GEOPHYSICAL OF THE JAMAICA ISLAND AND TOPEKA PIER LANDFILLS

Comments from Lepage Environmental Services

1. **Comment:** Page 1, Section 1.0 INTRODUCTION. The September 1998 *MTADS Work Plan* should be cited in this section and should be added to the References section. Any significant deviations from the work plan should also be noted in the report.

Response: Comment noted. Section 1.0, INTRODUCTION, will be revised as requested. Also, Section 4.0, will be revised to indicate there were no significant deviations from the work plan.

2. **Comment:** Page 4, Section 3.1.1 The Jamaica Island Landfill. This section should include a brief description of the two mercury burial vault locations (MBI and MBII) and Site 8 as they are shown on Figure 4 and are important potential sources of contamination associated with the Jamaica Island Landfill.

Response: The brief descriptions of Sites 9 and 11 included in the MTADS workplan (Sections 3.2.2 and 3.2.3) will be included in the report.

3. **Comment:** Page 5, Section 3.1.2 Site 32 – The Topeka Pier Site. The final sentence on the page should be revised to read "...and a draft report has been reviewed by EPA, ...".

Response: The final sentence on the page will be deleted.

4. **Comment:** Page 11, Section 5.2 Site 32 (Topeka Pier). *"In contrast with Site 8, this area does not have the same high signal level, nor does it show a high density of unidentified extensive burials. Many buried utility lines can be distinguished by examination of the Arc View overlays from the water, power utilities, and sewer storm drains, Figures C3 and C4."*

There appear to be a number of areas of potential interest that do not match up with the GIS overlays in Appendix C. These areas appear to need additional investigation. Please clarify.

Response: Please see the our response to MEDEP Comment No. 4.

5. **Comment:** Page 12, Section 6.0 TEST PITS. Why were 28 targets selected (why not 20 or 40, etc.)? Why are there no targets located at Topeka Pier where there are some anomalies that are not associated with utilities (see comment 4, above)?

Response: NRL was requested to recommend 25 locations based solely on the MTADS information by Northern Division, Naval Facilities Engineering Command. The actual location of testpits will be provided as discussed in response to EPA's Comment No. 1.

6. **Comment:** Page 13, Table 2. Why were these particular 28 targets selected and not other locations? Why was Target 81 selected when it had a relatively low fit quality (6.14 versus .8 to .9 for the vast majority of other targets)?

Response: The criteria used by NRL for selecting targets for testpitting are provided in the first paragraph on page 12 of the report.

Comments from Northeast Geophysical Services

1. **Comment:** Overall I think the report is very good. The geophysical equipment used (magnetometer and EM-61) are appropriate for the survey objectives. The colored maps are well presented and clearly show anomalous metal responses. However, there are some things in the report that I feel need clarification.

Response: Comment noted and appreciated.

2. **Comment:** First, I would like to know what areas of the study area were not covered by the survey. In the report (section 5.1 page 8) it is stated that about 30% of the 30-acre site (~7.5 acres) was not surveyed. The report also states (section 5.2 page 10) that significant parts of the Topeka Pier site were inaccessible because of surface obstructions such as vehicles and equipment. It would be useful to have a map that shows just the location of the survey points without contours in order to see what areas were not covered. If subsurface information about the Topeka Pier site is important it should be resurveyed after vehicles and other movable surface metal have been removed.

Response: A note will be added in each figure's caption to denote how the unsurveyed areas appear. Please note all unsurveyed areas appear as black except for figures B4, C3, and C4 where unsurveyed areas appear as white.

3. **Comment:** The survey results show hundreds of metallic anomalies. Most of these anomalies are likely caused by scrap metal debris and not metal drums. However it is impossible to confidently tell if an anomaly represents a drum or cache of drums or if it is caused by similar sized pieces of metal. It would be impractical to examine all the anomalies and so only a finite number of locations will be test pitted. It is in the selection of which anomalies to test pit that I disagree most with the authors of the MTADS report.

Response: Please see our response to EPA Comment No. 1.

4. **Comment:** The primary purpose of the surveys was "to identify ferrous or steel-reinforced concrete containers". A secondary objective was to determine if possible the locations and burial depths of individual targets. The geophysical survey results are to be used to select test pit locations.

Response: Comment noted.

5. **Comment:** In the Draft Remedial Work Plan dated March 1999 it is stated (4.3.2 page 4-4) that approximately 25 test pits will be made and that it is assumed that maximum of about 40 drums will be encountered at 5 locations. I am curious as to where these numbers came from. Is there information that about this many drums were disposed of in the landfill or is this just an arbitrary number? What it suggests is that caches of drums may exist in the landfill.

Response: Please see our response to EPA Comment No. 1.

6. **Comment:** The reason this is important is because in the MTADS report (6.0 page 12) they suggest test pitting 26 positions. Of these 26 positions 19 are of isolated targets and only 7 locations represent large objects or groups of objects. I see no rational reason to assume that any drums that may exist in the landfill were purposely isolated from other drums or metal debris. In fact, I think exactly the opposite is more likely. I don't think it makes sense to devote a majority of the test pits examining individual anomalies at the expense of ignoring the larger, more extensive metallic anomalies.

Response: Please see our response to EPA Comment No. 1.

7. **Comment:** The authors of the MTADS report explain that the reason they picked isolated targets for further testing is because these were the anomalies that they could model with their computer program that predicts burial depth and size of the object. In Table 2 and more extensively in Table A1 are given modeled predictions of burial depth and size of the analyzed targets to the nearest centimeter. If these are accurate this is impressive and if we were looking for unexploded ordinance this would be important. However, I doubt they are that accurate and for the objectives of this survey this level of precision is unnecessary. The test pits are planned to be about 6 meters deep, whether a target is 2.89 meters or 3.15 meters deep is not that important.

Response: Please see our response to EPA Comment No. 1.

8. **Comment:** My suggestion is that a much larger percentage of the test pits be sited on the larger anomalies. Certainly it would be more important for the overall investigation if a cache of twenty drums were found than if a single drum were found. There are a lot of elephant-sized anomalies that should be investigated before we look at the rabbit-sized ones.

Response: Please see our response to EPA Comment No. 1.

9. **Comment:** Another question you may wish to ask is how the EM-61 results compare with the magnetic results. If you compare the magnetic anomaly map A-2 with the EM-61 anomaly map A-3 you will see that there are differences in the anomaly size and locations. Unfortunately the report does not have large-scale EM maps that correspond with the magnetic anomaly maps A-3, 4 and 5. It would be most interesting to see the EM-61 responses of the selected targets.

Response: All data were analyzed using both magnetometer and EM data. Targets do not appear in different locations in the different sensor data sets. Size information derived from EM data are not nearly as accurate as that resulting from magnetometry data fits. The latter information appears in the tables.

10. **Comment:** My own experience has been that the EM-61 has some advantages over the magnetometer in that it is designed to respond more to larger, drum-sized objects and tends to ignore smaller metal objects. This makes it very useful on a site that has abundant bits and pieces of metal because you can focus in on likely buried drums. In the report (2.1 page 2) it is stated that the EM-61 sensors used on this survey were modified so that they would respond to small metal objects. If this is the case perhaps the EM-61 instruments used in this survey no longer have the capability of discriminating larger objects from small ones.

Response: Modifications were made to the EM-61 array to make it more sensitive to targets of all sizes at all depths. The ability of the EM system to differentiate size is improved over the unmodified EM-61, however; it remains inferior to the size information which can be derived from the magnetometry data fitting algorithms.

11. **Comment:** It would also be useful to know what EM-61 measurement was used to generate the EM-61 anomaly map A-3. Normally we contour the differential between the upper receiver coil and the lower receiver coil. Sometimes people contour just the bottom coil response. This is somewhat analogous to the difference between contouring magnetic gradient and total field magnetic readings. I think that the differential contour of the EM-61 results would be most appropriate for this site.

Response: None of the data are presented as contour plots. All graphics are false color images of numerical sensor reading values interpolated onto a 10cm grid. We considered the images generated from the difference in upper and lower coil readings, however, this information was not useful. EM graphics were generated from the lower coil readings. All graphics images are provided primarily for visual impact and as general guidance to differentiate between targets during excavation.

12. **Comment:** Those are the major points I wanted to make about the report. As I said in the beginning I think it is very good overall. I know there are some other points we discussed earlier on the phone.

Response: Comment noted and appreciated.

13. **Comment:** Hopefully, you wrote down any that were of interest to you. Also, I suggest that you review the questions and comments I made in my letter to you dated August 31, 1998 regarding the work plan for this survey. Check to see if they have been addressed in this MTADS report.

Response: No response required.