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EMAIL AND U S EPA REGION III RESPONSE TO U S NAVY RESPONSE TO COMMENTS REGARDING DRAFT FINAL SAMPLING AND ANALYSIS PLAN FOR SITE 7 CHEATHAM ANNEX FISC WILLIAMSBURG VA

11/09/2010

U S EPA REGION III

Monica Marrow

From: Haug.Susanne@epamail.epa.gov
Sent: Tuesday, November 09, 2010 2:20 PM
To: christopher.r.murray@navy.mil
Cc: Marlene.Ivester@CH2M.com; Stephanie.Sawyer@CH2M.com; Wade.Smith@deq.virginia.gov
Subject: Site 7 UFP SAP RTC responses
Attachments: CAX Site7 draft final EPA comments.doc

Follow Up Flag: Follow up
Flag Status: Flagged

Chris,

Responses to the RTCs for the Site 7 UFP SAP are attached. Please let me know if you have any questions.

Susanne Haug, P.E.
Remedial Project Manager
US EPA Region III (3HS11)
215-814-3394 (phone)
215-814-3025 (fax)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

Susanne Haug, P.E.
NPL/BRAC Federal Facilities Branch

Direct Dial (215) 814-3394
Mail Code: 3HS11

Date: November 9, 2010

Mr. Christopher Murray
NAVFAC MIDLANT, Code OPHREV4
9742 Maryland Avenue, Bldg N-26
Norfolk, VA 23511-3095

Subject: Response to Comments on the *Draft Final Site 7 – Old Dupont Disposal Area, Site Investigation Work Plan and Sampling and Analysis Plan, Naval Weapons Station Yorktown Cheatham Annex, Williamsburg, Virginia,* September 2010

Dear Mr. Murray:

EPA has reviewed the Navy's responses to comments dated August 31, 2010 and would like to submit the following responses. Responses to comments other than those below are acceptable.

- *Comment #1 - In 2003, Hurricane Isabel eroded approximately 15 to 20 feet of shoreline which exposed a large amount of debris on the shoreline. This suggests that there may be more debris just offshore in the York River. Please review aerial photos of the Penniman era to determine where the shoreline was at that time. After determining the Penniman-era shoreline location, the Navy should look for more debris between it and the current shoreline.*

  Response: Aerial photographs from the Penniman-era (1920s) were not found. Instead, historical aerial photographs from the EPIC Survey (conducted by the EPA) were reviewed to identify the historical shoreline location. Aerial photographs from 1937, 1942, and 1955 were reviewed; however, due to the scale of these photographs, it was not possible to compare historical shorelines.

  Due to the extensive storm surge and shoreline erosion from Hurricane Isabel, any buried debris that may have been removed from the Site 7 shoreline would not have been deposited immediately offshore in the York River. The surge likely carried and dispersed debris far from the site. The Site 7 shoreline has since been stabilized to minimize potential erosion. In addition, the TCRA completed from 2004 to 2008 included debris clean up along the shoreline, a MEC shoreline clearance to the low tide water line, and removal of all ash and debris from the upland area. Since all debris has been removed from Site 7, additional activities to search for debris will not be conducted.

  It should also be noted that all items identified along the shoreline after the storm were not considered hazardous; (i.e., glass, plastic, metal, and ceramic material), therefore, would not likely result in a hazardous release to the environment.

  EPA Response: The response makes a point about debris as being identifiable objects. This raises the concern that while the response might be applicable to debris, it is not applicable to

identification of contamination (not necessarily visible) that might also exist in these areas and elsewhere including and adjacent to this landfill, shoreline, and the York River. In particular, if debris is likely to have been carried "far from the site" as the Navy states, then it is also likely that contamination was also carried "far from the site." The sampling and analysis plan needs to address both the nature and extent of this contamination as well as address the potential for ecological risk associated with these contaminant concentrations.

- *Comment #2 – Page 46, bullet under Groundwater. Should "MDL" be "MCL"?*

  Response: The reference to MDL (method detection limit) is correct. No changes to the UFP-SAP were made.

  EPA Response: The comment refers to the possibility that a sample would require dilution which could make the MDL higher than the MCL. In that case, if an analyte's concentration was below the MDL it would be unknown if it was below the MCL.

- *Comment #8 – The report does not mention surface water and sediment sampling. However, historical sampling along the property boundary adjacent to the York River does reveal slightly elevated levels of metals and dioxin (Figures 5 and 6). Surface water and sediment samples should be collected in the river.*

  Response: The Site 7 UFP-SAP outlines proposed sampling activities to be conducted as part of a Site Inspection for groundwater at Site 7. Since there is no available analytical data from Site 7 to confirm whether or not the groundwater has been impacted from past site activities, no surface water samples will be collected from the York River. If the results of the SI determine that there was a release to groundwater and that potential risks may exist due to transportation of groundwater to surface water, additional investigations may be conducted at a later date.

  Sediment samples from the York River will not be collected for the following reasons:

  - Buried debris has been removed from the site, and the potential for future contaminant migration via surface run-off to sediment is no longer complete.
  - It has been documented that Hurricane Isabel eroded between 15 and 20 feet of shoreline from Site 7; however, due to the hurricane's extensive surge, it is unlikely that the portion of the Site 7 shoreline that was removed during this storm was deposited immediately adjacent to the site within the York River.
  - Studies of the York River, including the Estuarine Suspended Sediment Loads and Sediment Budgets in Tributaries of Chesapeake Bay, conducted by the Center for Coastal Resource Management (CCRM) and the Virginia Institute of Marine Science (VIMS) indicate that sediment within the vicinity of Site 7 is eroding (CCRM & VIMS, 2010). As part of this study, historical hydrographic surveys (1857 & 1945) conducted by NOAA were used to create a sediment accumulation map (Attachment 1). Over the course of the 88 year time frame, CCRM calculated a net loss of sediment within the vicinity of Site 7. Due to this erosion, it is unlikely that sediment data collected from along the Site 7 shoreline would be indicative of a CERCLA release at Site 7.
  - Additional risk screenings were conducted using pre-TCRA surface soil analytical data collected by Baker Environmental in 2004 from the Site 7 boundary (SO04, SO05, SO08, SO09, SO12, SO13, SO14, and SO15) along the York River to conservatively estimate

potential pre-TCRA soil (from the site) to sediment (in the York River) transport as a result of Hurricane Isabel. The results of these risk screenings indicate that any surface run-off from the site to the sediment in the York River along the Site 7 boundary would not likely pose an unacceptable risk to human health or the environment. The results of these risk screening are summarized below and will be added to the UFP-SAP.

Human Health Risk Screening

The human health risk screening for the surface soil to sediment exposure pathway was conducted assuming that the concentrations in the pre-TCRA surface soil data from samples at the edge of the site adjacent to the river are a conservative representation of the potential concentrations in the sediment. Therefore, the concentrations in these samples were compared to human health sediment screening values. The human health sediment screening values are ten times the residential soil regional screening levels (RSLs) from the USEPA RSL table (USEPA, 2010). RSLs that are based on non-carcinogenic effects were divided by 10 to account for exposure to multiple constituents. RSLs based on carcinogenic effects were used as presented in the table. Therefore, the sediment screening values for constituents with RSLs based on non-carcinogenic effects are the residential soil RSLs (RSL multiplied by ten for sediment, and then divided by ten for exposure to multiple constituents) and the sediment screening values for constituents with RSLs based on cancer are the ten times the residential soil RSLs. Appropriate constituents were chosen as surrogates for constituents not included in the RSL table, and their RSLs were used as the screening value. These constituents are identified on Table 2.3, in Attachment 2. Lead concentrations representative of the sediment were compared to the USEPA residential child soil screening value of 400 mg/kg, as determined by the IEUBK Model (USEPA, 2002).

The risk screening for the soil to sediment pathway identified two potential COPCs, arsenic and chromium. The maximum arsenic concentration is within an order of magnitude of the screening value which is based on a target cancer risk of 10-6 (4.8 mg/kg versus screening level of 3.9 mg/kg), indicating that exposure to the arsenic in the sediment would not exceed a risk level of 10-5, and there would be no unacceptable risk associated with exposure to the arsenic in the sediment (no risk above 10-4).

The analytical data for chromium are for total chromium; however, the RSL used for the screening is for hexavalent chromium, the more toxic (and carcinogenic) valence state of this metal. In the past, prior to including the New Jersey EPA oral cancer slope factor for hexavalent chromium, USEPA's RSL table presented a residential soil RSL for total chromium assuming a one to six (1:6) ratio of hexavalent chromium to trivalent chromium. Assuming this ratio is applicable to the sediment, the maximum concentration of hexavalent chromium (3.2 mg/kg, the total measured chromium concentration multiplied by 1/6) only slightly exceeds the hexavalent chromium screening value. As with arsenic, this concentration is within an order of magnitude of the screening value which is based on a target cancer risk of 10-6 (3.2 mg/kg versus screening level of 2.9 mg/kg), indicating that exposure to chromium in the sediment would not exceed a risk level of 10-5, and there would be no unacceptable risk associated with exposure to the chromium in the sediment (no risk above 10-4). It should also be noted that there is some uncertainty associated with the hexavalent chromium oral cancer slope factor (and RSL), as the value is from New Jersey

EPA and has not been included in USEPA's Integrated Risk Information System (IRIS) database.

Ecological Risk Screening

The ecological risk screening for this potential soil to sediment pathway was conducted assuming that the concentrations in the pre-TCRA surface soil (0 to 6 inches) data from samples at the site perimeter adjacent to the river are a suitable representation of the potential concentrations in the sediment. A surface soil sample was not collected at SO04 so the subsurface soil sample was used. The concentrations of all detected constituents in these eight soil samples were compared with ecological marine-based screening values. The risk screening is presented in Attachment 2.

Because of the high level of conservatism associated with estimating sediment concentrations from soil concentrations, the ecological screening utilized both conservative screening values (e.g., ER-L values) and less conservative screening values (e.g., ER-M values). Comparisons based upon mean concentrations were used when selecting potential COPCs since any soil transported from the site to the river would likely be thoroughly mixed prior to any deposition to the river bottom.

The ecological risk screening for the soil to sediment pathway identified six potential COPCs (bis[2-ethylhexyl]phthalate, di-n-octylphthalate, heptachlor epoxide, dioxin/furans, barium, and lead) based upon the most conservative screening values. Only dioxin/furans exceeded based upon the less conservative screening values (HQ of 1.56). However, the dioxin/furan data were associated with sample SO04 (the maximum concentrations for barium and lead also occurred in this sample), which was a subsurface sample that consisted almost entirely of ash. Thus, this sample is not likely to be representative (will be highly conservative) of the dioxin/ furan concentrations in the material potentially washed into the York River during Hurricane Isabel. In addition, the fine nature of this material (ash) would likely result in its deposition over a relatively large area of river bottom at concentrations that are likely to be orders of magnitude lower than those represented by sample SO04. Further, this evaluation assumes no dilution of the soil prior to deposition and that the deposited soil would constitute the entire sediment surface (exposure medium) to which potential ecological exposures would occur, both highly conservative assumptions. Dilution by a factor of just 1.56 would reduce the dioxin/furan HQ to one. Thus, unacceptable ecological risks in the York River from potential historical soil transport from the site are very unlikely.

EPA Response: Regarding the portion of the response to comment 8 called "Ecological Risk Screening", there are a number of concerns. First, it is not clear that the surface soil samples from 0-6 inches are appropriate to represent "…the potential concentrations in the sediment." The Navy has previously mentioned soil samples from the 0-24 inch layer. This raises a number of concerns. These include: a) the applicability of using soil sample contaminant concentrations to represent sediment contaminant concentrations; b) the use of historical soil contaminant concentrations to represent current sediment contaminant concentrations; c) what contaminant concentrations are below the 0-6 inch surface soil layer and even below the 0-24 inch layer of soil; d) what portion of the landfill (Site 7) has already eroded; and, e) if the vicinity of Site 7 is a net erosion zone, then an adequate fate and transport analysis must be conducted to determine where sediment and surface water sampling locations should be placed to ensure adequate characterization of the nature and extent of contamination.

The Navy chose to use conservative and less conservative screening values indentified as ERL and ERM values. The concentrations of 11 contaminants exceeded their respective ERL values and the concentrations of 3 contaminants exceeded their respective ERM values. The response then states that dilution would further reduce concentrations making unacceptable ecological risks in the York River from potential historical soil transport from the site very unlikely. It is important to note that in the final analysis BTAG support of decisions based on sediment screening is contingent on consideration of the BTAG screening values. Furthermore, the premise of dilution does not directly address the nature and extent of contaminant concentrations from Site 7 to adjacent beach, intertidal, and York River areas.

- *<u>Comment #10</u> – Worksheet #10 on page 38 states that post-removal soil samples were collected from the side walls and bottom of the excavation to evaluate post-removal conditions and assess the need for additional investigation/action. These samples are shown in Figure 4. Successful completion was based upon visual confirmation of debris removal and post-removal soil lead results. Following removal activities, the excavated area was backfilled with approximately 2,181 cubic yards of clay backfill, 6 inches of topsoil, and seeded. Because the backfill is only specified in volume and not depth, the depth of backfill used at the site is unclear. Because cleanup goals specific to ecological risk were not developed and used, if less than two feet of backfill was used, ecological risk in these areas still needs to be evaluated.*

  Response: The depth of the backfill used at the site was dependent on the depth of buried waste encountered during the Shaw removal action; therefore, an exact backfill thickness was not included in the UFP-SAP. In addition, the floor and perimeter samples that remain, following backfilling, within the 0-24" depth stratum were used in the risk screening. The first sentence of Worksheet #10 on page 40 was revised read: "All of the detected constituents in perimeter and floor confirmation soil samples within the 0 to 24 inch depth stratum (the applicable depth range for ecological exposures), following backfilling activities, were screened following the procedures described below."

  EPA Response: It is not clear why "Successful completion was based upon visual confirmation of debris removal and post-removal soil lead results." It is uncertain that lead was (is) the only contaminant of concern at this site and identifying debris is not synonymous with identifying contamination. It has not been demonstrated that it is valid to base the conclusion of "successful completion" on these two criteria. Also, because the depth of the backfill is not known, it is unknown if the samples that were collected from the 0 to 24 inch depth accurately describe ecological risk to receptors that utilize soil as habitat. Also, it is not clear if there was one or more samples from this 0-24 inch soil boring. Further information needs to be provided regarding these samples. In addition, if this landfill continues to erode, knowing contaminant concentrations below the 0-24 inch layer will be important to future response actions.

- *<u>Comment #11</u> - Worksheet #10 on page 40 states that all of the detected constituents in soil samples within the 0 to 24 inch depth stratum (the applicable depth range for ecological exposures) were screened. Depending on the depth of backfill, this could represent backfill*

material. It is unclear why ecological risk would be evaluated on backfill if sampling has already determined the fill material to be clean. This should be clarified.

Response: Floor and perimeter samples that remain, following backfilling, within the 0-24" depth stratum were used in the risk screening. No backfill data was used. The sentence was revised to read: "All of the detected constituents in perimeter and floor confirmation soil samples within the 0 to 24 inch depth stratum (the applicable depth range for ecological exposures), following backfilling activities, were screened following the procedures described below."

EPA Response: The Navy's revised sentence implies that confirmation sampling was performed after backfilling was completed. The depth of these confirmation samples must be provided. Also, the response must clarify if the soil samples are a composite of the 0-24 inch depth or if subsamples from this two foot were collected and analyzed.

- *<u>Comment #14</u> - Page 45 (under item 7) – The text indicates that only human health risk will be assessed. Ecological risk, particularly that potentially associated with the landfill soils, shoreline, intertidal area, and York River, also needs to be assessed. Regarding the upland soils, existing data, including data proposed in this report, may be sufficient. Regarding sampling in the York River, it would be beneficial to identify the areas where debris from this site was found and where groundwater from this site enters the York River. Lacking this information would require making sampling assumptions. Initial thoughts would be to locate the samples along the area protected by the geotubes, the intertidal area, and the York River.*

  Response: Following the explanation of the qualitative human health risk screening that will be conducted if a release is identified, the UFP-SAP states that a semi-quantitative ecological risk assessment (ERA) will be conducted to evaluate potential risks associated with groundwater discharge to surface water. In addition, the UFP-SAP states that a quantitative ERA will be conducted using post removal action soil data (soils within 24" of existing surface) and site specific soil pH data.

  Regarding sampling in the York River (surface water and sediment), no samples will be collected for the reasons discussed in the response to Comment #8 above.

  EPA Response: The Navy states "…a quantitative ERA will be conducted using post removal action soil data (soils within 24" of existing surface) and site specific soil pH data." As stated previously, it must be demonstrated that the post removal action soil data are appropriate. It must be clarified whether these samples were of landfill soil or backfill soil or both and if the depth (0 to 24 inches) is sufficient.

  The Navy states that no surface water and sediment samples will be collected in the York River. The rationale for this is presented in the Navy's response to comment 8. Regarding the first bullet of this response, while the Navy can document that debris has been removed from the site, they have not collected appropriate data to show that current or historic contamination from this site has or has not entered other habitats (shoreline soil, sediment, and/or surface water) at concentrations potentially putting ecological receptors at risk. Modeling from soil to sediment as opposed to collecting sediment data and making general assumptions (e.g., using dilution factors) to support the decision not to collect field data is not acceptable.

In the second bullet, the Navy indicates that Hurricane Isabel eroded 15 to 20 feet of shoreline and that this eroded material was deposited "immediately adjacent to the site." It is not clear if the 15 to 20 feet of shoreline involved the slope/edge of the landfill or if it actually means the shoreline and the York River is 15 to 20 feet closer to the slope/edge of the landfill. The exact nature and extent of the deposition of the eroded material, including contamination, is unknown. This supports the need for sediment and surface water sampling.

In the third bullet the Navy references previous studies by CCRM and VIMS to indicate the "…sediment within the vicinity of Site 7 is eroding." The Navy also states that over an 88 year time frame "…CCRM calculated a net loss of sediment within the vicinity of Site 7." The Navy does not quantify this loss of sediment on a time frame less than 88 years. Therefore, it is uncertain if this loss occurred all year long for the entire 88 year period or if there was time where sediment accumulation occurred. Despite the uncertainty of this net loss of sediment, the Navy's interpretation of the data supports the need for sampling "…far from the site" as well as adjacent to the site.

The fourth bullet indicates that data from 2004 may suggest that site soil contaminant levels are insufficient to pose risk from sediment adjacent to this site, based on modeling. This does not indicate, by direct measurement, that current and/or historic contaminant concentrations from Site 7 in habitats adjacent to and far away from Site 7 were not indicative of risk to ecological receptors that utilize the beach, intertidal area, and/or the York River. Also, maximum contaminant concentrations, not mean concentrations, need to be used to assess risk to ecological receptors like benthic macroinvertebrates and plants. According to Appendix 2, Table 2, there are 2 SVOCs, 2 pesticides, 1 dioxin TEQ, and 6 inorganics (including mercury) with maximum hazard quotients equal to or greater than 1.0; thereby indicating potential ecological risk exists.

If you have any questions, please feel free to call me at (215) 814-3394.

Sincerely,

Susanne Haug, P.E.
Federal Facility Remediation (3HS11)

Cc: Wade Smith (VaDEQ, Richmond)