



Linda S. Adams
Secretary for
Environmental Protection



Department of Toxic Substances Control

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N00221_001432
MARE ISLAND
SSIC NO. 5090.3.A



Arnold Schwarzenegger
Governor

December 3, 2009

Michael Bloom
Department of the Navy
BRAC Program Management Office West
1455 Frazee Road, Suite 900
San Diego, California 92108-4310

Dear Mr. Bloom:

The Department of Toxic Substances Control (DTSC) has completed its review of the Engineering Evaluation/Cost Analysis Munitions Non-Time-Critical Removal Action, Production Manufacturing Area and South Shore Area prepared by Weston Solutions, Inc. and dated May 2009. The enclosed comments from DTSC's Geologic Services Branch were provided to the Navy via electronic mail on July 30, 2009. Applicable or Relevant and Appropriate Requirements were provided in DTSC's letter to the Navy on October 1, 2009 and are not enclosed. DTSC also requests that the Navy consider the following comment discussed in electronic mail exchanges in October 2009:

It would be useful to include a figure identifying the location of tidal and non-tidal wetlands, potential endangered species habitat, and potential migratory bird habitat areas to better ascertain potential impacts the proposed actions may have. It may be necessary for the Navy to conduct a biological assessment for the area to identify these areas and to determine whether there are any Federal or State-listed rare, endangered or threatened species present in the PMA/SSA area. If the proposed actions have the potential to impact these habitat areas or Federal or State-listed rare, endangered or threatened species, the Engineering Evaluation/Cost Analysis should discuss the steps that will be taken to address these potential impacts.

SENSITIVE RECORD

PORTIONS OF THIS RECORD ARE CONSIDERED SENSITIVE
AND ARE NOT AVAILABLE FOR PUBLIC VIEWING

ADDRESS OF PRIVATE CITIZEN

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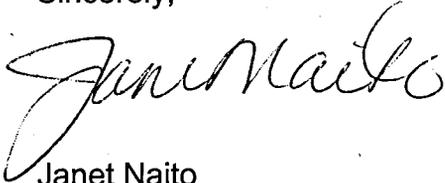
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SENSITIVE

Michael Bloom
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Thank you in advance for your consideration of our comments. If you have any questions, please contact me at (510) 540-3833 or jnaito@dtsc.ca.gov.

Sincerely,



Janet Naito
Senior Hazardous Substance Scientist

Enclosure

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MEMORANDUM

TO: Janet Naito, Project Manager
Senior Hazardous Substances Scientist
Brownfields and Environmental Restoration Program

FROM: Eileen Hughes, PG *Eileen Hughes*
Engineering Geologist
Geological Services Branch
Brownfields and Environmental Restoration Program

CONCUR: Brian Lewis, CEG, CHG *Brian Lewis*
Senior Engineering Geologist
Geological Services Branch
Brownfields and Environmental Restoration Program

DATE: July 16, 2009

SUBJECT: REVIEW OF THE DRAFT ENGINEERING EVALUATION/COST
ANALYSIS MUNITIONS NON-TIME-CRITICAL REMOVAL ACTION
PRODUCTION MANUFACTURING AREA AND SOUTH SHORE AREA,
FORMER MARE ISLAND NAVAL SHIPYARD, VALLEJO, CALIFORNIA

PCA 18040

SITE CODE 201208-18

GSU# 820409

ACTIVITY REQUESTED

The Geological Services Branch (GSB) has reviewed: *Draft Engineering Analysis/Cost Analysis, Munitions Non-Time-Critical Removal Action, Production Manufacturing Area and South Shore Area, Former Mare Island Naval Shipyard, Vallejo, California (EE/CA, dated May 2009)*, prepared by Weston Solutions, Inc. for Department of the Navy, Base Realignment and Closure, Program Management Office West (DON). Portions of the site file were reviewed for background information.

The EE/CA addresses hazards associated with munitions and explosives of concern (MEC) and munitions debris (MD). Potential chemical contamination of soils with munitions constituents (MC) is not addressed.

Comments from Jim Austreng, PE, Senior Hazardous Substances Engineer, Statewide Unexploded Ordnance Coordinator, have been incorporated into this memo.

BACKGROUND

The Production Manufacturing Area (PMA, 47 acres) and the South Shore Area (SSA, 34 acres) are located on the southeastern corner of Mare Island (MI), adjacent to MI Strait and the Carquinez Strait. PMA and SSA are located on former tidal marshes and wetlands, which were reclaimed as the facility expanded during World Wars I and II.

This EE/CA applies to onshore (upland) areas of PMA and SSA (Investigation Areas F1 and G (IA F1 and IAG)).

Offshore areas adjacent to MI and Carquinez Straits comprise IAK. Offshore areas (not addressed by this EE/CA) are divided into nearshore, mudflat, and deeper water zones.

From 1857 until 1975, munitions were stored and processed in the PMA and SSA. Ordnance was received, maintained, refurbished, demilitarized, tested, destroyed, disposed, and loaded on and off ships. Munitions manufacturing began in the PMA in 1936. Earlier munitions utilized black powder, nitroglycerin, gun cotton, and ammonium picrate (aka Yellow D and Explosive D). Later munitions (e.g., World Wars I and II) utilized Cyclotrimethylene-Trinitroamine (RDX), Cyclotetramethylene-Tetranitramine (HMX), Tetryl, and Trinitrotoluene (TNT).

Disposal of MEC in burial pits and dumping from vessels, piers, and seawalls occurred. Incidental disposal occurred near handling and storage areas and roadways. Dredging spoils containing MEC were disposed to ponds and fill areas. The geophysical site investigation strategy prioritizes anomalies that indicate burial/disposal of individual large MEC items or quantities of small MEC items grouped together.

MEC items from Civil War through World War II has been recovered, including propellants, projectiles, pyrotechnics, high explosives, fuzes, primers, flares, grenades, and gun ammunition.

The EE/CA proposes re-acquisition and excavation of anomalies identified by recent digital geophysical mapping (DGM). The EE/CA proposes 100% investigation of anomalies in areas considered most likely to contain MEC (i.e., "Category A sectors") – and 20% investigation of all other areas (i.e., "Category B sectors"). Category A sectors include storage and handling areas and other areas where MEC has been recovered.

Due to technical and cost limitations, MEC will be left-in-place (even in 100% investigation areas) and institutional controls will be required.

Anticipated future uses include wetlands/open space (limited public access), park (public access), and light industrial/commercial (*Mare Island Final Reuse Plan*, Vallejo, 1994, as amended). MEC minimum clearance depths, as specified by the Department of Defense Explosives Safety Board (DDESB) for these reuses are four, four, and ten feet, respectively.

Piers and wetlands provide habitat for nesting birds (e.g., blue herons) and endangered species (e.g., Salt Marsh Harvest Mouse, SMHM and Mason's Lileopsis).

GENERAL COMMENTS AND RECOMMENDATIONS

1) General Approach. The data and information presented in the EE/CA support the approach to investigation that is proposed (*Figure 3-2 Munitions and Explosives of Concern Decision Flowchart*). However, additional clarification is requested regarding the selection of Category A sectors and the limited (20%) investigation of Category B sectors.

Examples

- Several buildings associated with PMA processing and handling are not included in Category A sectors, including: former Buildings A80, A167, A265; Building A1 and "Filling Houses" nearby; and Buildings A15, A266, A248, A215, A216 and A900.
- SSA buildings associated with ordnance production are not all included in Category A sectors, including mine production facilities.
- In the PMA, fourteen anomaly clusters were identified in the DGM investigation. However, only thirteen clusters are presented in Category A sectors, including: four clusters between A80 and A69/A130; four clusters in the vicinity of A216; and five clusters along Blake Avenue.
- In the SSA, several clusters are not included in Category A sectors, including: one cluster southwest of Building A259, four (or five) clusters at the end of Pier 35 (aka Mine Pier), and five (or six) clusters west of Pier 35.
- SSA-3-A and SSA-8-A comprise primarily wetlands. However, DGM was not conducted in the wetlands (*Figure 2-2 Site Location Map* from Weston solutions, Inc., November 2007).
- DGM was not conducted in SSA-10-A, along Dike 12,
- SSA-9-A, a potential area of incidental handling or transportation loss from trucks/railcars (page 2-13), comprises three locations that are noncontiguous and very small in area.

Recommendations

- a) Explain why areas adjacent to buildings cited above are not included in Category A sectors.
- b) Explain why DGM clusters are not all included in Category A sectors.
- c) Describe the investigative approach for wetlands in SSA-3-A and SSA-8-A, and for SSA-10-A along Dike 12, where DGM has not been conducted.
- d) Explain why SSA-9-A's three locations are associated with trucks/railcars.
- e) Provide a table listing all Category A sectors, with rationale for inclusion as Category A sectors, including buildings, operations, and explosives used, stored, or handled.
- f) Provide additional support for the selection of 20% investigation for Category B sectors. That is, explain why 20% (and not some other percentage) is proposed.
- g) Several 4- and 6-inch projectiles were not removed from Building A266 during the intrusive investigation (page 2-4 of Roy F. Weston, Inc., August 2002).

Please ensure removal of these MEC items and other MEC items discovered (but not removed) during previous investigations.

- 2) Future Uses. It is acknowledged that because of equipment and investigation limitations, MEC will remain beneath the surface at PMA and SSA. Therefore, any intrusive activity will be potentially hazardous. Additional remediation, including environmental controls (e.g., institutional and engineering controls), to support future land use will be needed. Environmental controls are not considered in the EE/CA (4.0 *Identification and Analysis of Removal Action Alternatives*).

The text implies (page 2-14) that future use for some areas has been changed from residential/marina (as stated in previous reports) to light industrial/commercial by amendments to the *Mare Island Final Reuse Plan, Vallejo, 1994*.

Recommendations

- a) A detailed analysis of institutional controls, including costs associated with implementation, monitoring, and reporting, needs to be performed. This task may be postponed to the feasibility study.
 - b) Please include a figure illustrating future uses based on the amended reuse plan.
- 3) Depths of Investigations. DON provides explosive safety submissions (ESSs), which describe MEC field work, to the DDESB for review. DDESB approval letters, specifying minimum clearance depths and other safety requirements, must be received prior to starting fieldwork. Clarification is needed with respect to minimum clearance depths, as in the following examples.

Examples

- The EE/CA says: "Anomalies will be investigated to a depth of 4 feet and a radius of 2 feet" (*Figure 3-2 Munitions and Explosives of Concern Decision Flowchart*). However, clearance of residential/marina areas (unrestricted) is "10 feet (or four feet deeper than planned excavations, whichever is greater)" (page ES-1 of Roy, F. Weston, Inc., August 2002).
- Ten feet clearance near utilities was specified by DDESB. Is 10 feet minimum clearance at utilities assumed in the EE/CA?
- Does the change in future uses from residential/marina (unrestricted) to light industrial/commercial alter minimum clearance depths required by DDESB?
- DDESB approval letters refer to *DOD Ammunition and Explosives Safety Standards (DoD 6055.09-STD)*. The standards were revised on February 29, 2008.

Recommendations

- a) Clarify whether the depths in the EE/CA are consistent with the revised DoD 6055.09-STD.
- b) Include ESSs, approval letters, and other communication from DDESB regarding required minimum MEC clearance depths and other recommendations.
- c) Clarify whether minimum MEC clearance depths are specified in the amended reuse plan for *Mare Island Final Reuse Plan, Vallejo*. If so, include citations.

- d) DTSC's site file doesn't include an amended reuse plan. Please send DTSC a copy.
 - e) Clarify whether the change in future uses from residential/marina (unrestricted) to light industrial/commercial alters the depth of minimum clearance required.
 - f) For all anomalies beyond the depth of clearance (i.e., excavation), provide a map clearly indicating where such an anomaly (or anomalies) exist along with description of likely source. Include the map in the field report.
 - g) On the figure of future uses (requested in General Comment 2 b), include minimum required clearance depths.
- 4) Accessible nearshore areas. Concerns about the scope of work, with respect to nearshore areas are expressed below. Other concerns about the scope of work are included in the following comments.
- a) Because the shoreline presents an attractive potential hazard for humans, it was DTSC's understanding that the nearshore area would be prioritized with respect to MEC investigations. The text says (page ES-2): "Some Category A sector boundaries extend into the Investigation Area (IA) K offshore areas, however the IA-K anomalies will be addressed separately by the DON." That is, the text indicates that accessible nearshore areas are outside the scope of work of the EE/CA.
 - b) In contradiction to the text cited above, Category A boundaries seem to include some (but not all) nearshore areas of SSA as shown on *Figure 2-10 South Shore Area Category A Sectors*.
 - c) In previous discussions, the Navy indicated that all accessible nearshore areas would be 100% investigated. However, 20% investigation is proposed for Category B portions of the accessible nearshore of PMA and SSA, including the northern nearshore of PMA (*Figure 2-9 Production Manufacturing Area Category A Sectors*) and portions of the southern nearshore of SSA (*Figure 2-10 South Shore Category A Sectors*).
 - d) The figures provided do not delineate the portions of all sectors that are addressed by this EE/CA. For example, *Figure 2-9 Production Manufacturing Area Category A Sectors* and *Figure 2-10 South Shore Area Category A Sectors* do not distinguish between areas included and areas not included. Therefore, the exact scope of work of the EE/CA is not clear.
 - e) Results of intrusive investigations in the late 1990s are included (i.e., *Figures 2-5 Production Manufacturing Area and IR Site 04 Investigation Anomalies* and *Figure 2-6 South Shore Area Site Investigation Anomalies*). However, results of digital geophysical mapping (DGM) are not included (Weston Solutions, Inc., 2007). Therefore, all anomalies are not presented in the EE/CA.

Recommendations

- a) Conduct 100% re-acquisition and excavation in all accessible PMA and SSA nearshore areas.
- b) If the scope of work is not revised to include nearshore areas, overlap into nearshore areas is recommended – to ensure that no areas are omitted.
- c) If the scope of work is not revised to include nearshore areas, please provide a schedule for nearshore re-acquisition and excavation.

- d) Clarify the boundary between onshore and nearshore areas (e.g., higher high water level).
 - e) Please provide figures delineating the area of the proposed removal action.
 - f) Include figures illustrating DGM anomalies (Weston Solutions, Inc., 2007).
- 5) PMA Housing Area Boundary
- a) Formerly, the adjacent PMA Housing Area included only the hilltop. Currently, the PMA Housing Area boundary extends down the hillsides to the break in slope where upland terrain meets the filled areas of PMA and SSA. Because the future use of the hillsides is anticipated to be residential (unrestricted), an additional investigation of the hillsides is warranted, in order to confirm or negate the possible presence of kick-out from explosions in the PMA.
 - b) Since the boundary between PMA, SSA and PMA Housing Area is not well-defined in the EE/CA, it is not clear whether hillsides adjacent to PMA Housing Area are included in the scope of work. Figures 2-9 and 2-10 seem to indicate that hillsides are not included in Category A sectors.
 - c) It is not clear if hillsides are included in Category B sectors. The dig list for Category B sector will be prioritized with respect to: areas of high anomaly density, geophysical signal response cross-section, and spatial distribution (Figure 3-2). Hillsides are not prioritized in this scheme.
 - d) The extent of previous investigations of hillsides has not been summarized.

Recommendations

- a) Include hillsides adjacent to the PMA Housing Area in the scope of work for the EE/CA.
 - b) Summarize previous investigations in the hillsides adjacent to PMA and SSA.
 - c) In text and figures, clarify the boundary between the PMA, SSA and PMA Housing Area.
 - d) Further discussion on the boundaries of the PMA Housing Area was provided in a recent memorandum (July 2009).
- 6) SSA Boundary. Recent investigations in the SSA included the seaward side of Dike 12, facing Pier 35. That is, the entire embayment enclosed by Dike 12 and Pier 35 was included in SSA investigations. In the EE/CA, Dike 12 is excluded from the SSA (but included as Category A sector SSA-10-A).

Recommendation

- a) To be consistent with previous investigations, include the seaward side of Dike 12 within SSA boundaries.
- 7) Hazardous Buildings. During demolition of Buildings A187 and A265, munitions constituents (MC) at explosive concentrations were removed from ducts, drains, and building structural components. Some drain lines were "packed" with explosives (e.g., ammonium picrate and RDX). Seven remaining PMA buildings with similar ordnance process histories may be potential explosives hazards, including: A80, A159, A215, A216, A248, A271, and A280 (*Appendix E* of Roy F. Weston, Inc., August 2002). "Filling Houses" identified on historic maps may also be suspect.

Recommendations

- a) Provide an assessment for all PMA and SSA buildings, with respect to potential MEC hazards, based on historic ordnance activities.
 - b) Provide a schedule for evaluating and eliminating MEC hazards from buildings in PMA and SSA.
 - c) At Building A187, about 30 feet of 4-inch drain line was not investigated. Since other drains lines at A187 were "packed" with explosives, investigation of the remaining drain line is strongly recommended.
- 8) Areas Under Buildings. Based on site history, historic disposal practices, location of buildings on filled land, and the fact that a large number of anomalies are located around building footprints, it is reasonable to expect that MEC exists under buildings. For example, 543 anomalies were identified under Buildings A163, A223, and A224 (the only buildings investigated) (Weston Solutions, Inc., November 2007).

Recommendations

- a) Clarify how areas under remaining buildings will be investigated.
 - b) Provide a schedule for investigation under buildings.
 - c) Discuss environmental controls required for MEC potentially left-in-place under buildings (General Comment 2, above).
- 9) Utilities. MEC constituents were disposed to storm and sanitary systems. Explosive residues may remain in existing utility lines and corridors. Concentrations at explosives levels or sensitive crystals may exist. For example, during demolition of Buildings A187 and A265, drain lines "packed" with picric acid and RMX were removed by the Superintendent of Shipbuilding, Conversion, and Repair, Portsmouth, Virginia (SSPORTS) in the late 1990s (Roy F. Weston, August 2002).

Some utilities connected to former ordnance manufacturing operations were removed during intrusive investigations by SSSPORTS. The purpose of SSSPORTS' utility removal was to eliminate interferences to geophysical investigations. Particular attention was paid to utilities with potential for explosives residues or sensitive explosives (e.g., black powder or picrates). However, all potentially contaminated PMA utilities were not removed by SSSPORTS.

In PMA, active utilities and inactive utilities identified by "cognizant utility companies" were not removed. Also, SSSPORTS was not able to remove all lines that were within their scope of work, including 30 feet of 4-inch drain line at A187 and 30 feet of a 12-inch drain line at Building A225. (Roy F Weston, August 2002)

In SSA: "All utilities that interfered with the [SSSPORTS] investigation were removed, except those supporting the U.S. Coast Guard traffic monitoring facility on Pier 35 and the Mare Island distribution grid were removed." (Appendix F of Roy F. Weston, January 2003) Therefore, all utilities were not removed.

It may be difficult to differentiate utilities which are suspect from others because utilities may be interconnected (e.g., storm and sanitary lines) and utility backfills may be interconnected.

Soil contaminated with explosives (and other contaminants) may exist in the vicinity of utilities.

Recommendations

- a) Clarify whether utility removal is part of the scope of work for this EE/CA.
 - b) The health and safety plan should address avoidance measures for anomaly clearance in areas where utilities may contain explosives.
 - c) If utility removal is not within the scope of work for this EE/CA, clarify the schedule for investigation of utilities in PMA and SSA.
 - d) Discuss environmental controls required for utilities left-in-place that may contain explosives (General Comment 2, above) or asbestos (e.g., steam lines).
- 10) Shoreline Erosion. Dynamic hydrologic processes at the shoreline (i.e., tides, boat wakes, storm surges, and outfalls) as well as human and animal activities may result in daylighting of buried MEC and MD. For example, erosional processes have created a break in slope along the shoreline, with varying degrees of gulleying and sloughing. Because the shoreline is inherently unstable, investigations are limited in their effectiveness. Shoreline protection (e.g., revetment) may be needed to prevent future exposure to MEC.

Recommendations

- a) Clarify whether DON is considering shoreline protection in eroding nearshore areas of PMA and SSA.
- b) Until the shoreline has been stabilized, regular monitoring of PMA and SSA nearshore, and recovery of daylighted MEC and MD, is recommended.
- c) Discuss environmental controls required for MEC potentially left-in-place on the eroding shoreline (General Comment 2, above).

Specific Comments

- 1) *Signature Page*. Stamps are not provided for California-registered professional engineer (PE) and geologist (PG).

Recommendation

- a) Please provide PE and PG stamps.
- 2) *Executive Summary*, page ES-1. The reference "Weston Solutions, Inc., 2007" is not included in the *References* section.

Recommendation

- a) Please include "Weston Solutions, Inc., 2007" in the *References* section.
- 3) *2.2.1 Initial Assessment Study*, page 2-3. At Building A73, soil contaminated with propellant grains is mentioned. However, Building A73 is not shown on Figure 2-3, as indicated in the text.

Recommendation

- a) Add Building A73 to Figure 2-3.
- 4) *2.2.2 Early Emergency Response Actions*, page 2-5. Near Building A266, two removal actions are described in 1993 and 1994. However, on Figure 2-4, 1993 dates are given for both actions.
Recommendation
 - a) Please resolve this discrepancy.
- 5) *2.4 Streamlined Risk Evaluation*. On April 6, 2009, the Deputy Assistant Secretary of the Navy (Environment) directed the DON to use the MEC hazard assessment methodology described in *Interim Munitions and Explosives of Concern Hazard Assessment Methodology, EPA: 505B08001, Oct 2008*.
Recommendation
 - a) Provide a MEC hazard assessment consistent with the DON directive.
- 6) *3.1 Applicable or Relevant and Appropriate Requirements*. Deferred to project manager review.
- 7) *4.3 Cost*. The text indicates that removal of anomalies under buildings would be included in Alternative 2B. However, geophysical investigations were only conducted on three buildings (i.e., Buildings A163, A223, and A224).
Recommendation
 - a) Please revise the text to clarify the buildings for which anomaly investigations will be conducted.

Figures

- 1) A figure showing ecologically sensitive areas, endangered and protected species habitat, and nesting sites is not included.
Recommendation
 - a) Provide a figure illustrating ecologically sensitive areas, endangered and protected species habitat, and locations of nesting birds.
- 2) *Figure 2-3 Production Manufacturing Area Shoreline Development*. This is an excellent figure which clearly illustrates the timing and extent of infilling as well as historical piers and buildings in the PMA.
Recommendations
 - a) Please extend the figure to include SSA.
 - b) Include all historical and existing structures on Parcel V (IR04).
 - c) The dotted blue line does not correspond to parcel and IA boundaries on Figure 2-2. Please resolve this discrepancy.
 - d) In the legend, provide an explanation for the dotted blue line.
 - e) Building A265 is mislabeled as A266. Please correct the label.
- 3) *Figure 2-4 Munitions Emergency Response Actions (1990-1995) and Figure 2-7 Intrusive Investigation Recovered Munitions and Explosives of Concern*. Light blue areas are not explained.
Recommendation

- a) In the legend, provide an explanation for light blue areas.
- 4) *Figure 2-5 Production Manufacturing Area and IR Site 04 Investigation Anomalies.* Some buildings are not shaded (e.g., A131).

Recommendation

- a) In the legend, explain the difference between shaded and unshaded buildings.
- 5) *Figure 2-7 Intrusive Investigation Recovered Munitions and Explosives of Concern.* Examples are provided below of discrepancies between the figure and information presented in documents.

Examples

- One destroyed building is noted – but not labeled (Building A187). All destroyed buildings are not labeled (e.g., Building A265).
- Buildings A187 and A265 were used primarily for processing, washout, and loading of 8- and 16-inch armor-piercing projectiles during World War II. Rounds and munitions constituents (e.g., ammonium picrate, TNT, and RDX) at explosive levels were found in drains and ducts during demolition of Buildings A187 and A265. However, these findings are not shown as MEC on the figure.
- Ordnance recovered on the shoreline between Buildings A159 and A246 is not shown on the figure. (Pages 2-4 and 3-2 of Roy F. Weston, Inc., August 2002)
- 5,000 pounds of hazardous ordnance materials recovered in 1989 near Dike 14 are not shown (pages 1-4 and 3-1 of Roy F. Weston, January 2003).
- Gun ammunition primers recovered (1990 – 1994) northwest of Building 170 are not shown (page 3-1 of Roy F. Weston, January 2003).

Recommendations

- a) Please revise the figure to distinguish between existing and destroyed/removed buildings.
- b) Add an insert indicating that A187 and A265 were destroyed as part of the intrusive investigation. In the insert, include MEC found in the buildings during demolition (e.g., ammonium picrate (about 120 pounds), TNT, and RDX).
- c) Check dates of the 5,000 pound removal (e.g., 1989 or 1990). Revise the figure and text as needed.
- d) Include Building A170.
- e) Include all recovered MEC from surface and intrusive investigations.
- 6) *Figure 2-8 Intrusive Investigation Munitions-Related Soil Excavation and Sampling (1998-2002).* The figure shows seven locations where explosives were found in the soil above screening levels. Chemical analytical results are not shown. The other 29 locations where excavations occurred because of non-MEC chemical contamination are also not shown.

Recommendation

- a) Please revise figure to show all 36 sampling locations where excavations occurred. Include chemical analytical results and screening levels on the figure.
- 7) *Figure 2-9 Production Manufacturing Area Category A Sectors and Figure 2-10 South Shore Area Category A Sectors.* With respect to historical MEC in PMA and

SSA, Figures 2-9 and 2-10 should include all MEC shown on Figures 2-4 and 2-7. However, there are discrepancies between the figures with respect to locations and total numbers.

Examples

- East of Building A159. Figure 2-9 shows five locations - two locations near A159 and three locations closer to MI Strait. However, Figure 2-4 has one location near MI Strait and Figure 2-7 has three locations near MI Strait. Therefore, Figure 2-9 should show 4 locations near MI Strait and no locations close to A159.
- Buildings A266 and A246. Figure 2-9 shows two locations on the southeast corner of A266 and two locations east of A246. Figure 2-4 shows one location on the southeast corner of A266. Figure 2-7 shows two locations on the southeast corner of A266 and one location east of A246. Therefore, Figure 2-9 should show 3 locations on the southeast corner of A266 and one location east of A246.
- Dike 14. Figure 2-10 shows three locations on the shoreline near Dike 14. Figure 2-4 shows one location and Figure 2-7 shows one location. Therefore, Figure 2-10 should show two locations.
- Several MEC items removed by ECC are missing from PMA 2A in Figure 2-9 – perhaps obscured by MD locations.
- Two MEC items removed by ECC are missing from SSA 10A on Figure 2-10.

Recommendations

- a) Please compare locations on Figure 2-9 to locations on Figures 2-4 and 2-7 and to locations in previous reports. Resolve discrepancies.
 - b) Revise the figures so that MEC locations are not obscured by MD locations (e.g., PMA 2A in Figure 2-9).
 - c) For the sake of consistency, use blue dots for historical MEC locations on all four figures.
 - d) Explain what is meant by “A296 Safe Haven” and “H. Expl Safe Haven” on *Figure 2-6 South Shore Area Site Investigation Anomalies* and *Figure 2-7 Intrusive Investigation Recovered Munitions and Explosives of Concern*.
 - e) SSA-9-A is identified as a SSA Category A sector. However, SSA-(A is located in PMA. Please resolve this discrepancy.
- 8) *Figure 3-1 Production Manufacturing Area and South Shore Area Historical Sites and Buildings*. Buildings are labeled but structures area not. Recommendation. Please label: NAD seawall, NAD Retaining Wall, NAD Wharf, and Torpedo Boat Wharf.

Tables

- 1) *Table 3-3 Potential Action-Specific ARARs*. The heading for the table is “Federal” However, state codes and regulations are cited.

Recommendation

- a) Please resolve this discrepancy.

References

OTIE & TNA, May 2009. *Draft Technical Memorandum Assessing MEC as a Contaminant of Concern for the PMA Housing Area (a Portion of IA-G and Land Transfer Parcel VII-B), Former Mare Island Naval Shipyard, Vallejo, California.*

Roy F.Weston, Inc., August 2002. *Unexploded Ordnance Intrusive Investigation, Production Manufacturing Area and Installation Site 04, Mare Island, Vallejo, California.*

Roy F.Weston, Inc., January 2003. *Unexploded Ordnance Intrusive Investigation, South Shore Area, Mare Island, Vallejo, California.*

Weston Solutions, Inc., November 2007. *Draft Final Geophysical Investigation, Production Manufacturing Area and South Shore Area, Former Mare Island Shipyard, Vallejo, California.*

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Geological Services Branch
Brownfields and Environmental Restoration Program

If you have any questions or comments regarding this memorandum, please contact me at (510) 540-3760 or at ehughes@dtsc.ca.gov.

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