

U.S. Department of the Navy's (Navy) responses to U.S. Environmental Protection Agency (EPA) and California Regional Water Quality Control Board, San Francisco Bay Region (Water Board) comments on the Draft Basewide Five-Year Review Report, Installation Restoration Sites 1, 22, 26, and 28, Former Naval Air Station Moffett Field, Moffett Field, California, October 2009.

EPA GENERAL COMMENTS

1. Issues, Recommendations and Follow-up Actions: EPA has provided the issues, recommendations, and follow-up actions we have identified in the Five-Year Review that affect the protectiveness of the remedy at the Site 1 Landfill, Site 22 Golf Course Landfill, Site 26 East-side Aquifer Treatment System (EATS) Area, and Site 28 West-side Aquifers Treatment System (WATS) Area (see Attachment 1). In addition, the table includes the party responsible for implementing the recommended follow-up actions, the oversight agency, and expected completion milestone dates, and indicates whether the issues affect current or future protectiveness.

Response: The Navy generally agrees with many of EPA's comments and has provided an alternate table, included as Attachment 1 at the end of this document. The Navy will include the issues, recommendations, and follow-up actions as presented by the EPA, except as discussed below and revised in Attachment 1.

Site 1 – "Barium and copper are above the CCL" will not be listed as an issue. This is discussed further in response to EPA specific comment 7 of this document.

Site 1 – "Develop and implement a plan to address burrowing" will be changed to "Evaluate the effectiveness of current abatement plan. Determine the next course of action based on the results." The Navy has implemented a burrowing mammal trapping plan (abatement plan) at Site 1.

Additionally, the following will be added to Section 4.3.1: "As indicated by DEH quarterly inspection reports, burrowing rodent activity is still a concern at Site 1. In response, the Navy has implemented a burrowing mammal trapping plan (abatement plan). The Navy will continue to implement the abatement plan and evaluate the results, making adjustments as necessary."

Site 22 – "NASA is not issuing reports on the status and continued efficacy of institutional controls for which NASA is responsible" will not be listed as an issue because of its similarity to the second issue. Institutional control (IC) implementation will be addressed as one issue (for all sites) to be addressed by NASA.

Site 22 – The burrowing mammal issue will be deleted, as recent DEH inspection reports indicate that burrowing is under control.

Site 26 – The Navy will maintain the existing recommendation to the issue of the East-side Aquifer Treatment System (EATS) being inefficient and ineffective: “Continue implementing the pilot test and determine the next course of action based on the results.”

Site 28 – Based on response to EPA general comment 2(b) below, the table has been revised in the following manner:

“Indoor air sampling has not been performed at many of the buildings within EPA’s vapor intrusion study area” has been removed as an issue.

The following issue has been added: “Potential actions need to be taken to ensure long term protectiveness from vapor intrusion.”

- This issue has the following recommendations and follow-up actions:
 - Update NASA’s internal directive on environment and incorporate ICs related to VI.
 - Follow EPA's VI Pathway study and incorporate relevant measures into Ames construction permits normally required of permittees and lessees when redeveloping or remodeling structures and sites at Ames.
- The Party Responsible is listed as NASA, the Oversight Agency is listed as EPA, the Completion Milestone date is listed as 2010, Current Protectiveness is listed as “No”, and Future Protectiveness is listed as “Yes”.

Site 28 – The Navy will maintain the existing recommendation to the issue of potential contamination from Building 88: “Continue implementing the pilot test and determine the next course of action based on the results.” The milestone date will be 2011.

Site 28 – The Navy disagrees with the issue “The mass removal efficiency of the current groundwater remedy is ineffective” for Site 28. The Navy disagrees with the issue “Groundwater contamination plume is not fully captured” for Site 28. These issues are discussed further in response to general comments 2(c) and 4(b). The Navy’s recommendation will be to “Continue to participate in a regional strategy to address groundwater contamination and document the strategy in an FS report.”

2. Protectiveness Statements: (a) The protectiveness statements should be revised to reflect that the remedies at the Site 1 Landfill, Site 22 Golf Course Landfill, and Site 26 EATS Area are currently protective of human health and the environment because the groundwater contamination plume or concentrations are stable and based on the information presented, the potential exposure pathways are incomplete. However, in order for the remedies to be protective

in the long-term, the follow-up actions recommended in EPA's attached table must be implemented to ensure long-term protectiveness.

Response: (a) The Navy agrees that the remedies for Sites 1, 22, and 26 are currently protective of human health and the environment. The Navy also believes that in order for the remedies to be protective in the long term, the follow-up actions recommended in EPA's attached table, as revised by the Navy and included as Attachment 1 at the end of this document, must be implemented. The protectiveness statements for Sites 1, 22, and 26 will be revised as follows:

Site 1: The remedy for Site 1 is currently protective of human health and the environment because potential exposure pathways are incomplete, groundwater contaminant concentrations are stable, landfill gas is not migrating from the landfill, and the landfill cover is functioning as intended. To ensure long-term protectiveness of the remedy, the following actions must be taken:

- Incorporate institutional controls into NASA's Master Plan. Report completion and documentation of this task to the Agencies. Provide a schedule for future reporting on the status and efficacy of institutional controls.
- Evaluate the effectiveness of the current abatement plan.

Site 22: The remedy for Site 22 is currently protective of human health and the environment because potential exposure pathways are incomplete, groundwater contaminant concentrations are stable, and landfill gas is not migrating from the landfill, and the biotic barrier is functioning as intended. To ensure long-term protectiveness of the remedy, the following actions must be taken:

- Incorporate institutional controls into NASA's Master Plan. Report completion and documentation of this task to the Agencies. Provide a schedule for future reporting on the status and efficacy of institutional controls.

Site 26: The remedy for Site 26 is currently protective of human health and the environment because groundwater contaminant plumes are stable or decreasing and potential exposure pathways are incomplete. To ensure long-term protectiveness of the remedy, the following actions must be taken:

- Continue implementing the pilot test and determine the next course of action based on the results.
- Incorporate institutional controls into NASA's Master Plan. Report completion and documentation of this task to the Agencies. Provide a schedule for future reporting on the status and efficacy of institutional controls.

(b) In addition, EPA disagrees with the Navy's statement that the remedy at Site 28 is currently protective because the groundwater remedy at the Middlefield-Ellis-Whisman (MEW) Site, which includes the Site 28, WATS Area, does not adequately address the subsurface vapor intrusion pathway. Specifically, the remedy is not protective because it does not adequately address potential health risks from long-term exposure to trichloroethene (TCE) and other volatile organic compounds (VOCs) through the vapor intrusion pathway. Remedial actions are necessary to ensure protection of human health. The Navy's protectiveness statement should be revised to be consistent with the protectiveness determination in EPA's Final Second Five-Year Review Report for the MEW Superfund Study Area, dated September 2009, and the following actions need to be taken to ensure the protectiveness of the remedy:

- Finalize the amendment to the Record of Decision (ROD Amendment) for the vapor intrusion pathway.
- Complete baseline sampling and evaluation of buildings within the Vapor Intrusion Study Area.
- Implement remedial actions on existing and future buildings within the Vapor Intrusion Study Area, as needed, in accordance with the ROD Amendment and design documents.

EPA anticipates issuing a ROD Amendment in winter 2010 and estimates that implementation of the vapor intrusion remedy will take approximately three years to complete (November 2012).

Response: (b) It should be noted that the Navy no longer owns or operates the buildings at Moffett Field located above the groundwater plume; NASA is the federal facility property manager with responsibility for the safe operation of the buildings. Therefore, the Navy does not have direct responsibility for implementing any response action involving the buildings to address potential health risks from long-term exposure to TCE and other VOCs through the vapor intrusion pathway.

The Navy maintains the remedy is currently protective with respect to VI based on actions NASA is currently taking to address the issue. The following will be added to Section 7.4.2.2: "NASA has been sampling selected buildings for VI, retrofitting where necessary, and consistently resampling. Sampling at NASA has focused primarily on buildings located above the contaminated groundwater plume as well as unoccupied historic buildings that are also located above the contaminated groundwater. Where elevated indoor air concentrations have been found, they have taken measures such as upgrading or replacing the HVAC systems and making adjustments to AC to bring concentrations within suggested levels. They have then done follow-on sampling to ensure levels were reduced and have consistent recurring sampling protocols.

NASA has not sampled unoccupied buildings slated for demolition. NASA has also not sampled occupied buildings that are slated for demolition as part of the University Associates redevelopment, as this development is scheduled to occur within five years. Should this development get delayed, NASA plans to reexamine the need for sampling in those buildings.

NASA states that sampling and follow-on actions have been conducted in cooperation with and to the satisfaction of EPA.

While the remedy is currently protective with respect to VI based on the actions NASA has taken to address the issue, additional measures may need to be taken by NASA to ensure long term protectiveness of the remedy. NASA is currently updating their internal directive on environment and plans on incorporating ICs related to VI. NASA has also been following EPA's VI Pathway study and will incorporate relevant measures into Ames construction permits normally required of permittees and lessees when redeveloping or remodeling structures and sites at Ames.”

While the Navy recognizes EPA’s Five Year Review for the MEW Superfund Study Area states the remedy is not protective because it does not address health risks from long term exposure to VOCs through the VI pathway for the entire regional plume, the Navy believes the active steps NASA is taking address the risks over Site 28. Additionally, the Navy’s Protectiveness Statement follows EPA Guidance on protectiveness determinations which states, “Even if there is a need to conduct further actions, it does not mean the remedy is not protective.” EPA Guidance further indicates four conditions which should occur in order to conclude that a remedy is not protective; however, none of the listed conditions apply to Site 28.

The Navy proposes the following revisions to the Site 28 Protectiveness Statement:

“The remedy for Site 28 is currently protective of human health and the environment because on-site contaminant plumes are stable or decreasing, contaminated groundwater is being treated by WATS, and potential exposure pathways that could result in unacceptable risks are being controlled. EPA has determined that there are no short-term health risks from exposure to vapor intrusion, and NASA has taken measures to mitigate known and potential future threats from the vapor intrusion pathway. To ensure long-term protectiveness of the remedy, the following actions must be taken:

- Update NASA’s internal directive on environment and incorporate ICs related to vapor intrusion.
- Follow EPA's Vapor Intrusion Pathway study and incorporate relevant measures into Ames construction permits normally required of permittees and lessees when redeveloping or remodeling structures and sites at NASA Ames.”
- Continue implementing the pilot test and determine the next course of action based on the results.
- Continue to participate in a regional strategy to address groundwater contamination and document the strategy in a Feasibility Study report.

- Evaluate need for institutional controls in Site-wide Groundwater Feasibility Study for the MEW Study Area.

(c) The groundwater is not being used as a potable water supply, and there are no direct exposure pathways to the contaminated groundwater while groundwater cleanup continues. EPA will evaluate the need for institutional controls to continue to ensure there are no direct exposure pathways to contaminated groundwater. The following actions must be taken to fully capture the regional groundwater plume at the downgradient boundaries and limit vertical migration of contaminants to the B1/A2 and B2 Aquifers:

- Enhance groundwater contaminant plume capture and groundwater cleanup efforts by implementing facility-specific and Regional Program optimization plans.
- Evaluate and perform pilot treatability studies of alternative groundwater cleanup technologies to expedite contaminant mass removal and cleanup time and reduce VOC concentrations throughout the groundwater VOC plume.

Response: (c) Comment noted regarding ICs. Please see response to EPA general comment 4(b) regarding capture.

- The Navy has presented its recommendations regarding plume capture for WATS and issued the *Draft WATS Site 28 Optimization Evaluation Report* that is currently being reviewed by the agencies as discussed in response to Water Board specific comment 13(b). A regional plan has not been submitted to the Navy. The Navy will review and address the Regional Program optimization plan when it is presented.
- The Navy is conducting a pilot test to evaluate a more effective remedial method to address groundwater contamination at Site 28. The pilot test will consist of a characterization stage in which the Navy will collect additional samples to help target higher concentration areas. The characterization stage will be followed by a treatment stage in which three different substrates will be injected into three different areas of the regional plume (Building 88 area, Traffic Island area, well W9-18 area) to evaluate the potential for the in situ remedial technologies to achieve cleanup levels.

3. Site-wide Protectiveness Statement. Although the Site has not reached construction completion, the remedial actions for Sites 1, 22, 26, and 28 have been constructed and the remedies are in place. EPA recommends that a comprehensive Site-wide protectiveness statement be made that summarizes that the remedy at Sites 1, 22, and 26 are currently protective of human health and the environment and actions are necessary to ensure long-term protectiveness. However, because the remedy at Site 28, the WATS Area, is not protective, the NAS Moffett Field Site is not protective of human health at this time.

Response: Comment noted. This Five-Year Review will no longer be a “basewide” report, as discussed in response to EPA general comment 7. No changes will be made as a result of this comment.

4. Question A: Is the Remedy Functioning as Intended by the Decision Documents? EPA disagrees that the remedy is functioning as intended by the decision documents for Site 26, EATS Area, and Site 28, WATS Area, and the Five-Year Review Report should be revised accordingly.

- (a) Operable Unit 5 – Site 26, East-Side Aquifer Treatment System (EATS) Area

The existing groundwater extraction and treatment remedy is currently not operating and the institutional control restricting domestic use of groundwater into NASA’s land use planning documents is not in place. Therefore, the remedy is not functioning as intended by the 1996 ROD. However, EPA acknowledges its approval of the temporary shutdown of the groundwater extraction and treatment system during the implementation and evaluation of the pilot test of the alternate cleanup technology currently underway. EPA agrees that the temporary shut down and the lack of institutional controls do not affect the current protectiveness of the remedy since the plume is stable and there are currently no complete exposure pathways. However, the actions recommended in EPA’s Issues Table (Attachment 1) need to be completed to ensure long-term protectiveness. EPA supports the Navy’s effort to evaluate options to more effectively achieve the cleanup levels specified in the ROD to ensure long-term protectiveness.

Response: (a) The Navy agrees that the answer to Question A should be “no” for Site 26 because language restricting groundwater use at Site 26 has not been added to NASA’s Master Plan and because EATS is currently off. However, as stated in the report, the agencies concurred with the decision to turn EATS off temporarily to implement and evaluate a pilot test. The Navy agrees that the actions in EPA’s Issues Table, as revised by the Navy and presented as Attachment 1 at the end of this document, must be completed to ensure long-term protectiveness.

- (b) Site 28, West-Side Aquifers Treatment System (WATS) Area

EPA disagrees with the Navy’s statement that WATS has achieved complete hydraulic containment of the target capture zone; thus the remedy is not functioning as intended. EPA has identified issues in the WATS area and in the regional groundwater contamination plume area on Moffett Field. Increasing concentrations in the B2 aquifer zone have been identified in several monitoring wells on Moffett Field and groundwater contamination is not being contained or cleaned up in the downgradient portion of the plume. The Five-Year Report should be revised to address the issues and concerns identified in EPA’s Final Second Five-Year Review Report for the MEW Superfund Study Area – September 2009 and in EPA’s Issues Table (Attachment 1).

Response: (b) The Navy disagrees with EPA's capture zone assessment of WATS and does not agree that the answer to Question A should be “no” for Site 28. WATS is functioning as intended and has achieved complete hydraulic containment of the target capture zone.

The Navy disagrees that groundwater in the area of MW WU4-19, which is in the front portion of the downgradient plume in the lower portion of the A aquifer, is not being captured and treated by WATS. The apparent increase in plume size between 2007 and 2008 occurred because more wells were sampled in 2008 than in the two previous years. MW WU4-19 was not sampled in 2006 and 2007, and as such, plume maps were not inferred. Plume size can be accurately evaluated by comparing the difference between the 2005 and 2008 plume data. TCE concentrations at this well have decreased significantly from 190 micrograms per liter ($\mu\text{g/L}$) in 2005 to 45 $\mu\text{g/L}$ in 2008, indicating effective capturing by WATS.

The Navy also disagrees that the small area of TCE concentrations at MW WU4-11, also near the front portion of the downgradient plume in the lower portion of the A aquifer, results from lack of capture. TCE concentrations at MW WU4-11 have remained stable for the last four years (11 $\mu\text{g/L}$ in 2005, 13 $\mu\text{g/L}$ in 2006, 12 $\mu\text{g/L}$ in 2007, and 11 $\mu\text{g/L}$ in 2008). The Navy's capture zone maps indicate effective capture at MW WU4-11.

The deepest aquifer that the Navy monitors at Site 28 is the B2 aquifer. The Navy monitored four wells in the B2 aquifer zone intermittently between 1992 and 1998, and annually from 2003 to 2008 (wells 45B2, W9-12, W9-15, and W9-40). Samples were also collected from B2 aquifer zone wells W9-3 and W9-5 in 2007. TCE concentrations in all B2 aquifer samples have been below the EPA maximum contaminant level (MCL) of 5 $\mu\text{g/L}$, and all recent samples have either not been detected or have been detected below 0.5 $\mu\text{g/L}$.

In a letter dated December 14, 2009, the Navy requested a meeting with EPA to discuss the discrepancy in capture zone analysis in order to achieve a mutual understanding on this issue and clarify a path forward concerning recommendations in the Five-Year Review.

No revisions will be made as a result of portion (b) of this comment. The issues will be identified as currently presented in Attachment 1 at the end of this document.

5. Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of Remedy Selection Still Valid?

EPA disagrees with the Navy response for Question B for the Site 28, WATS Area. The subsurface vapor intrusion pathway is an exposure pathway that was not addressed by the soil and groundwater remedy in EPA's 1989 ROD for the MEW Superfund Study Area. The response to Question B should be changed to “No.”

Response: The Navy agrees that the answer to Question B for Site 28 should be “no” and will revise the report accordingly.

6. Institutional Controls Not In Place. The lack of institutional controls (i.e., groundwater restrictions in NASA’s Comprehensive Use Plan, and Site 1 and Site 22 restrictions in NASA’s Environmental Resources documents) are issues that are affecting long-term protectiveness of the remedies. The Navy needs to ensure that NASA implements the required institutional controls and provides the documentation to the Agencies that all the institutional controls required in the decision documents and agreements are recorded in NASA’s land use planning and environmental resources documents.

Response: The Navy agrees with this comment and will continue to work with NASA to ensure that ICs, as required by RODs and memoranda of understanding (MOA), are incorporated into NASA’s Master Plan. The NASA Restoration Project Manager has indicated that NASA’s Facilities Group is currently revising the Master Plan with input from the Environmental Department. NASA will incorporate institutional controls for Sites 1, 22, and 26 into the Master Plan.

7. Comprehensive Basewide Report: While the Navy’s intent of this report is to present a basewide Five-year Review, the discussion of Sites other than Sites 1, 22, 26, and 28 needs more detail. Throughout the Five-Year Review Report, the Navy should clarify which Installation Restoration sites are CERCLA sites and which sites are petroleum only sites. Also, for sites that are labeled as closed, the Navy should reference the appropriate closure documentation. For example, Table 1 lists multiple sites where soils are “closed,” but no reference is made to the decision document closing the soil portions of these sites. The Five Year Review should include a list of all the past RODs and removal actions at Moffett Field. In addition, Orion Park is still considered part of the NAS Moffett Field Superfund Site and should be discussed as an active site since no Record of Decision has closed this site.

Response: The word “Basewide” will be removed from the title of the report and throughout the document to eliminate confusion about which sites are included in this Five-Year Review. This is a Five-Year Review of Sites 1, 22, 26, 28 because they are the only sites subject to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Five-Year Review requirement at this time. The term “basewide” comes from Navy policy whereby all sites requiring Five-Year Reviews will be conducted on the same schedule; it is not intended to include all sites on an entire base.

The text in Section 1.2 after the first paragraph will be revised as follows:

“Sites 5, 8 (petroleum contamination), 9, 12, 14, 15, 16, 17, 18, 19, 20, and 24 are petroleum IR sites and are not addressed under CERCLA. Thus they are not discussed further in this Five-Year Review Report.” Sites 1, 3, 4, 6, 7, 8 (CERCLA contamination), 10, 11, 13, 21, 22, 23, 25, 26, 27, and 28 are CERCLA sites.

“Sites 1, 22, 26, and 28 are the subject of this Five-Year Review and are addressed in this report. Sites 3, 4, 6, 7, 10, 11, and 13 are part of the October 1994 Final OU2-East ROD in which no action was the selected remedial action (Navy 1994). Site 23 is part of the August 2002

Stationwide No Action Sites ROD (Navy 2002). Site 2 is part of OU 1 and the OU 1 ROD (Navy 1997); however, all waste at Site 2 was removed and consolidated into the Site 1 landfill, groundwater monitoring was discontinued with regulatory agency concurrence in 2003, and no further action is required. Site 2 is discussed further in this report as it relates to remedial actions at OU1 (Sites 1 and 2).”

“The petroleum portion of Site 8 has been closed under the petroleum program. The investigation of PCBs at Site 8 was completed under a CERCLA Action Memorandum (May 1991) and received closure. A NASA contractor (on behalf of the Navy) is currently developing a work plan for a PCB soil removal action in a drainage swale (adjacent to Site 8, which is closed) for 2010.”

“Site 21 soils were removed in January 2007 as part of Site 27 soils removal.”

The text will be revised to state that the Final ROD for Site 25 was signed in November 2009. No changes will be made to the discussion for Sites 27 and 29.

“The Orion Park housing area was transferred to the U.S. Air Force (Air Force) in 1994, and from the Air Force to the Department of the Army (Army) in 2000. In accordance with Department of Defense policy, the Army is responsible for the environmental condition of the Orion Park Housing Area. As a result, the Orion Park Housing Area is not discussed further in this Five-Year Review Report.” The brief discussion of Orion Park in Section 3 will be deleted.

8. Building 191. Multiple sites in this Five-Year Review rely on Building 191 pumping station to be operational. The Navy should include more information demonstrating that the Building 191 pumping station is operating as planned and will continue to operate throughout the operation of the remedies. In addition, the discussion of sea level rise at Site 1 (page 74 of the text) suggests that flooding can be prevented by increasing the capacity of Building 191; however, there is not enough information in the Report to determine if Building 191 has the extra capacity (i.e., the level of storm event that it can handle and any contingency plans if Building 191 fails to operate for an extended period). The Report should be revised to address these concerns.

Response: As federal facility manager, NASA operates the Building 191 pump station. In the 1999 MOA for Operable Unit (OU) 5, NASA agreed to “maintain the Building 191 pump station and drain/subdrain system as long as NASA either owns the property or maintains operations control over the site. This restriction will be recorded in NASA’s Environmental Resources Document.” NASA’s responsibility for operations and maintenance (O&M) of the Building 191 pump station is restated in the 2008 MOA for Site 22. Moreover, NASA currently operates the Building 191 pump station to provide flood protection for the entire northern portion of Moffett Field.

The Site 1, 22, and 26 IC portions of Sections 4.2 will be revised to state that NASA's Facilities Group is currently revising the Master Plan with input from the Environmental Department to ensure inclusion of language regarding NASA's continued and future operation of the Building 191 pump station. The Navy will continue to work with NASA to incorporate the restriction in NASA's Master Plan.

Please see response to Water Board specific comment 18(a) for revisions to Section 7.1.3 regarding O&M of the Building 191 pump station and its capacity to address flooding.

9. NASA Involvement in the Five Year Review Process. The Interviews section, Section 6.6 does not include an interview of the current property owner, NASA. While there are other means of involving NASA in the Five-Year Review process, coordination with NASA is not discussed in the Report. This coordination is particularly important in reference to some of the protectiveness issues where NASA is a party responsible for implementing the remedy.

Response: After this comment was made, NASA was interviewed regarding the status of IC implementation in NASA's Master Plan, operation of Building 191 pump station, and vapor intrusion. Section 6.6 will be updated with a summary of the interview with NASA Restoration Project Manager Don Chuck.

10. Progress Since Last Five-Year Review. Both the Site 1 and Site 22 landfills have an issue with squirrel burrowing that was identified in previous Five-Year Reviews (Section 5). Issues identified in the Five-Year Review should include follow-up actions with milestone dates (for completion). The issues or follow-up actions should not be described as "ongoing." If the issues from the previous Five-Year Review has not been addressed or completed yet, the answer to the completion question is "no."

Response: Section 5 specifies issues and milestone dates as presented in previous Five-Year Reviews. The only new information appears in the last column, in which the current Five-Year Review assesses the status of the recommendations and follow-up actions from the previous Five-Year Reviews. Squirrel burrowing was identified as an issue in the previous Five-Year Review for Site 1; however, it was not identified as an issue in the previous Five-Year Review for Site 22.

To eliminate confusion, the header of the last column of all tables in Section 5.0 will be changed to "Status of Recommendations and Follow-up Actions from last Five-Year Review." The statuses will be given as "completed," "not completed," or "issue addressed, recommendation and follow-up actions continue." For Site 1, text will be added to explain that in addition to filling holes identified during DEH inspections, the Navy has implemented a new burrowing mammal abatement plan which focuses on trapping.

Issues identified by the current Five-Year Review in Section 8.0 will be given tangible milestone dates. Use of the word "ongoing" will not be used for milestone dates in Section 8.0.

EPA SPECIFIC COMMENTS

1. Page ES-8. Since this is a Base-wide Five Year Review, only one summary form is necessary. The single form can contain information specific to each site. Since this is the third Five-Year Review for OU1 (Site 1), the Five-Year Review Summary Form should indicate that this is the third Five-Year Review.

Response: Comment noted. As previously stated, the word “basewide” will be removed from the Five-Year Review report to eliminate confusion about which sites are included in the review. Sites 1, 22, 26, and 28 are the only sites subject to the CERCLA Five-Year Review at this time. Separate summary forms will be maintained. No changes will be made as a result of this comment.

2. Section 3.1.5, Basis for Taking Action, Page 12. The last sentence discusses potentially destroyed wetlands and mitigation of those wetlands to be addressed in a Station-wide ROD. Since the capping action has already occurred, the Navy should discuss the extent to which wetlands were destroyed in the capping process. In addition, clarify the text to accurately reflect how and in what final decision document that the wetlands were addressed. The station-wide ROD referenced in the OU1 Record of Decision has not been issued.

Response: Wetland mitigation was addressed at the time that the ROD for OU1 was developed. To eliminate confusion, the wetlands section of this paragraph will be revised as follows: “According to the OU1 ROD, the proposed landfill capping would also affect potential wetlands in the vicinity of Site 1. However, the Navy and regulatory agencies determined that a landfill cap was a necessary component of the remedy. Filling small areas of potential wetlands was required to cap the Site 1 landfill. Therefore, as part of the remedial design, the Navy met the substantive requirements of Nationwide Permit 38 through the U.S. Army Corps of Engineers. This allowed for fill to be placed in wetlands if filling was associated with the remediation of hazardous and toxic waste. The agencies concurred with the OU1 ROD in 1997.”

3. Section 3.4.3, History of Contamination, Page 19. (a) This section mentions the Hangar 1 former aircraft wash rack as a potential source for Site 28, WATS Area, however, the Report does not contain any follow-up information describing how this source was addressed. The Report should be revised to include information as to how this source was addressed.

Response: (a) The discussion of the aircraft wash rack in Section 3.4.3 will be revised as follows: “The former aircraft wash rack area is approximately 250 feet south of Hangar 1. The former wash rack was used to clean aircraft and consisted of a 90-foot by 100-foot section of pavement that was sloped to central catchment basin 297A. Effluent from the catchment basin was routed under Cody Road to the Sump 25 oil-water separator which, in turn, discharged to the station sanitary sewer system. Sump 25 was a 2,000-gallon concrete, dual-chamber oil-water separator that used an oil skimmer system for oil recovery. Sump 25 was removed in May 1994 (PRC 1996b). The Navy is currently assessing Sump 25 as a petroleum site.”

A discussion of the aircraft wash rack will be added to Section 4.2.4, Pre-WATS Source Control Measures: “According to the *Draft Wash Rack Area Investigation Technical Memorandum* (PRC 1996b), the soil surrounding Sump 25 was sampled for VOCs during its removal in May 1994. No VOCs were detected, although detection limits were elevated (1,000 µg/kg for most compounds) due to high concentrations of petroleum constituents in the samples. Soil and groundwater samples from the former aircraft wash rack area were collected and analyzed in October 1995 as part of the wash rack area investigation. The analytical results indicated that VOCs were present in groundwater in the wash rack area at concentrations elevated relative to the regional VOC plume, specifically near stormwater catchment basin 297A. TCE was detected in both the soil and groundwater in the wash rack area at concentrations indicating a potential source in the area. Consequently, the Navy proposed installing a groundwater extraction well in the upper portion of the A aquifer near the former aircraft wash rack area as a source control measure (PRC 1996b). EPA reviewed the report and had no comment. A copy of EPA’s no comment letter is included in Appendix A. The Navy later installed extraction well EA1-2 as a component of WATS to address contamination from the former aircraft wash rack.”

(b) Section 4.2.4 indicates that the Building 29 Underground Storage Tank (UST) area and the Building 31 UST area as sources areas at Site 28. Clarify whether these areas overlap the Hangar 1 former aircraft wash rack.

Response: (b) According to Figure 4, Building 29 and 31 USTs are separated from the aircraft wash rack by approximately 1,000 feet. The Building 29 and 31 USTs were part of petroleum Site 9. The Navy received closure/no further action for these USTs from the Water Board.

4. Section 4.2.1, Site 1, Page 27. (a) The depth to groundwater is not stated, thus the efficacy of the groundwater extraction trench is not clear. The text states that the trench is “a contingency measure intended to control contaminated groundwater migration off-site” and that “the trench is approximately 5.5 feet deep...and lined with geosynthetic material.” It is not clear whether this trench will effectively prevent contaminated groundwater from reaching the stormwater retention pond.

Response: (a) The following will be added to Section 3.1.1 (physical characteristics): “Based on data obtained during the review period, depth to groundwater at Site 1 is between approximately 2.5 feet below msl in the northern portion of the landfill to approximately 3.5 feet below msl in the southern portion of the landfill.”

The discussion of the groundwater collection trench in Section 4.2.1, Landfill Activity, will be revised as follows: “A collection trench was constructed across the northern boundary of the landfill as a contingency measure intended to act as a control system should the need arise to manage contaminated groundwater migrating off site. The collection trench is approximately 5.5 feet deep (elevation of -5.0 feet msl) and is lined with geosynthetic material as described in the *As-Built Report and Remedial Action Completion Report, Site 1 and Site 2 Landfill Closures* (ITC 2000a). Depth to groundwater beneath Site 1 is approximately 2.5 to 3.5 feet below msl. Based on the drawings in the As-Built Report, the geosynthetic liner extends from the surface of

the landfill over the top of the collection trench and continues into the north side of the collection trench. This effectively forms an impermeable barrier between the collection trench and the stormwater retention pond north of the landfill. Two wells (collection trench wells WI-22 and WI-23) are screened within the backfill material of the collection trench (Figure 2-1). Groundwater monitoring wells were installed along the landfill perimeter (TtFW 2004c).

(b) The text in Section 7.1.1.1, Remedial Action Performance, notes that “the collection wells in the trench have not shown significant quantities of water,” which may suggest that the trench is not functioning properly. No cross-sections depicting the landfill, the trench, the groundwater, and the stormwater retention pond are referenced or provided. Revise the text to include a discussion of the depth to groundwater in this area, including a reference to a figure depicting a cross section of the landfill, the trench, the groundwater, and the stormwater retention pond.

Response: **(b)** The following text will be deleted from the last sentence of Section 7.1.1.1: “and the collection wells in the trench have not shown significant quantities of water.” The last sentence will now read: “Groundwater is monitored on a routine basis as previously discussed in Section 4.2.1.” The figure described in the comment does not exist. No further modifications to the text will be made as a result of this comment.

5. Section 4.2.1, Site 1, Page 28. The Report should briefly explain the basis for the CCLs and how they are used for management decisions.

Response: The following text will be added before the last paragraph of Section 4.2.1, Groundwater Monitoring: “CCLs were developed based on ecological screening criteria and site-specific attenuation factors for groundwater. CCLs are used as initial screening criteria in the groundwater evaluation. If analytical results are less than the CCLs, then no release from the landfill is presumed and no additional evaluation is required. If CCLs are exceeded, then additional evaluation of upgradient and downgradient data is necessary to evaluate whether there has been a release from the landfill. If upgradient concentrations are higher than downgradient concentrations, then most likely there was no release from the landfill. If downgradient concentrations are higher than upgradient concentrations, then additional sampling events will be performed and results are evaluated to assess whether there has been a release from the landfill (TtFW 2004c).”

The last paragraph of Section 4.2.1, Groundwater Monitoring will be revised as follows: “The following groundwater monitoring wells and collection trench wells are sampled during each event (see Figure 3): W1-1R, W1-5, W1-8, W1-12R, W1-14, W1-15, W1-16, W1-19, W1-22 (collection trench well), W1-23 (collection trench well), and W1-24. Based on the groundwater flow direction, wells WI-5, WI-8, and WI-12R are classified as upgradient or background wells and are not influenced by the Site 1 Landfill. The remaining wells, with the exception of the collection trench wells, have been classified as downgradient. The collection trench wells are included in the sampling program, as required by the OUI ROD; however, they are not considered to be representative of actual groundwater conditions at Site 1 (TtFW 2004c).

Analytical data from the collection trench wells are removed from consideration in the Five-Year Review.”

6. Section 4.3.2, Site 22, Page 40. Explain why settlement surveying was not performed in 2005.

Response: The Five-Year Review will be revised to state that settlement surveying “was not performed in 2005 due to Navy oversight.”

7. Section 6.4.1.3, Groundwater Sampling Data, Page 55. It is not clear that elevated barium and copper concentrations found in Site 1 groundwater monitoring points are due to elevated background from seawater intrusion. The text states that “barium and copper are found in seawater...and are considered a part of the composition of natural groundwater at Site 1.” According to Figure 14 (Site 1, Groundwater Concentration Trends Barium and Copper), the largest exceedances of the barium CCL occur in well W1-22. This well is a collection trench well, near the stormwater retention pond. If the observed concentrations of barium are due to landfill waste, the groundwater collection trench may need to be pumped to avoid barium contamination affecting the pond. If the observed concentrations of barium are attributable to background, the CCL should be raised for barium to reflect elevated background concentrations. Revise the text to clarify why elevated barium concentrations are reasonably attributable to elevated background. If these elevated levels of barium and copper cannot be justified as attributable to elevated background/sea water intrusion, the proposed approach to addressing these levels above the CCL should be discussed in the Five-Year Review Report.

Response: Reference to barium being a part of the composition of natural groundwater at Site 1 will be removed from the text. With regard to elevated concentrations in well W1-22, the text will be revised to state that “barium in collection trench W1-22 is removed from further consideration because samples from collection trench wells are not considered to be representative of actual groundwater conditions at Site 1 (TtFW 2004c).”

The discussion on barium will be further revised as follows: “Barium consistently exceeded the CCL of 40 µg/L in all four monitoring events during 2007 and 2008 (TN&A 2008a; Insight 2009a). The maximum historical barium concentration from an upgradient monitoring well was 653 µg/L (well W1-5 in July 2003) (Insight 2009a). During the April 2007, June 2008, and October 2008 sampling events, the maximum reported barium concentrations were from upgradient well W1-5 (excluding data from the collection trench wells). In October 2007, the maximum barium concentration (excluding the collection trench wells) was 627 µg/L (well W1-24). In accordance with the procedures for data evaluation presented in the Site 1 Long Term Monitoring Plan (Appendix C, Section 3.0), the likelihood that the landfill is the source of barium is removed from further consideration because the maximum exceedance from each sampling event was from an upgradient well (April 2007 and both 2008 events), or it was less than historical upgradient levels (October 2007) (TtFW 2005a).”

The discussion on copper will be revised as follows: “The maximum historical copper concentration detected in an upgradient monitoring well at Site 1 was 19.3 µg/L (upgradient well W1-12R in October 2003). Copper was detected above its CCL at a concentration of 9.9 µg/L in downgradient well W1-14 in October 2008. Copper was also detected above its CCL in upgradient well W1-12R at concentrations of 7.35 µg/L in April 2007 and 6.8 µg/L in October 2008. In accordance with the procedures for data evaluation presented in the Site 1 Long Term Monitoring Plan (Appendix C, Section 3.0), the likelihood that the landfill is the source of copper in wells W1-12R and W1-14 in October 2008 is removed from further consideration because the concentrations were less than historical upgradient concentrations. It is removed from further consideration in well W1-12R in April 2007 because it was the maximum exceedance for the sampling event (excluding data from the collection trenches wells) and came from an upgradient well (TtFW 2005a).”

Because barium and copper detections at Site 1 are not an issue, Figure 14 will be deleted from the report.

8. Section 6.4.2.3, Groundwater Sampling Data, Page 56. This section discusses chloroform CCL exceedances, which were also highlighted as an issue in the previous Five-Year Review for Site 22. The Five-Year Review Report should be revised to include an analysis of these exceedances of the CCL in accordance with the Operations Maintenance and Monitoring Plan for Site 22. The revised Report should also discuss possible sources of chloroform at Site 22 and whether the exceedances suggest that the remedy may need to be re-evaluated.

Response: The following will be added to Section 4.2.2, Groundwater Monitoring: “According to the OMMP Addendum, monitoring wells WGC2-8, WGC2-9, WGC2-10, and WGC2-11 are the downgradient wells; WGC2-4 and WGC2-13 are the upgradient (background) wells; and WGC2-6 and WGC2-12 are the reference wells. Reference wells are useful for assessing groundwater conditions relative to the site, but do not contain groundwater that will flow under the landfill. Wells WGC2-1 and WGC2-5 are crossgradient wells and may receive groundwater from off site. The groundwater from these monitoring wells does not impact groundwater under the landfill; nor does the landfill impact groundwater within these wells. The OMMP Addendum stated that these wells would not be monitored for water quality. Thus, even though they are sampled, they are not useful for determining if a release from the landfill has occurred (TtEC 2007).”

“Analytical monitoring parameters (MP) are a subset of the COCs at Site 22. The MPs are *cis*-1,2-DCE, chloroform, TCE, and xylenes. The VOCs selected as MPs were based on the frequency of detection and/or properties of each compound, with those selected that would most likely be present in the groundwater (TtEC 2007).”

“The data evaluation process follows the requirements of the ROD and the ARARs identified in the ROD. Regularly scheduled groundwater sampling data of the MPs will be compared to the respective CCLs to assess whether there is an exceedance. If downgradient analytical data are lower than or equal to the respective CCLs, no further action will be necessary. If concentration

of a downgradient analyte is greater than its CCL, a statistical evaluation will be required to assess if a release has occurred. The evaluation process is described further in the OMMP Addendum (TtEC 2007).”

Section 6.4.2.3 will be revised as follows: “As stated in the previous Five-Year Review for Site 22, chloroform has been detected above its CCL in background wells WGC2-8 and WGC2-9 in prior years. Statistical evaluations of chloroform detections associated with wells WGC2-8 and WGC2-9 were completed and documented in the *Final 2006 Annual Report Site 22 Landfill* (TN&A 2007a). The evaluations indicated a statistically measurably significant difference between well WGC2-9 and background wells; however the concentration trend was decreasing, suggesting natural attenuation. For well WGC2-8, there was no statistically measurably significant difference from background concentrations. Chloroform concentrations have been below the CCL in well WGC2-8 since April 2007 and below the CCL in well WGC2-9 since April 2006.”

“In the current Five-Year Review reporting period, chloroform was reported at a concentration of 6.9 µg/L in the August 2008 sampling event, which is greater than the CCL of 3.5 µg/L. This sample came from crossgradient well WCG2-1. Except for this exceedance, chloroform was not detected above the CCL in this well or any other Site 22 well within the current Five-Year Review reporting period. The OMMP Addendum (TtEC 2007) indicated WGC2-1 may receive water from off site and was not useful as a water quality monitoring point. The OMMP Addendum for Site 22 recommended discontinuing monitoring at crossgradient wells WGC2-1 and WGC2-5 since they are not representative of Site 22 groundwater quality. In accordance with the OMMP Addendum, it appears that there have been no releases of chloroform from the Site 22 landfill since April 2006, when concentrations in well WGC2-9 dropped below the CCL.”

The following will be added to the end of the discussion bullet for bis(2-ethylhexyl)phthalate: “As indicated in the OMMP Addendum (TtEC 2007), well WGC2-5 is not representative of Site 22 groundwater quality.”

9. Section 6.4.4.4, Groundwater Sampling Data, Page 65. The statement that the vinyl chloride concentrations are stable or decreasing overall in the WATS area contradicts the well descriptions in the bulleted list below that statement. More wells show an increasing trend than a decreasing trend. Correct the apparent discrepancies.

Response: The sentence will be revised as follows: “Analytical results indicate that overall, vinyl chloride concentrations are stable or increasing at Site 28, suggesting that PCE and TCE are undergoing reductive dechlorination and degrading to vinyl chloride.”

10. Section 7.1.1.5, Monitoring Activities, Page 72. The discussion of monitoring activities does not discuss landfill gas monitoring activities. Only groundwater monitoring is discussed. Since landfill gas monitoring and venting both occur at Site 1, monitoring of the gas media should be discussed. Revise the text to include a discussion of landfill gas monitoring at Site 1.

Response: The following will be added to Section 7.1.1.5: “Landfill gas monitoring is conducted quarterly at Site 1 in accordance with the *Site 1 Landfill Final Closure Plan and Post-Closure Maintenance Plan* (TtEMI 1998a), the *Post-Closure Monitoring (Site 1) and Groundwater Monitoring (Site 2) Sampling and Analysis Plan* (ITC 2000b), *Final Sampling and Analysis Plan Addendum* (FWEC 2001a), and the *Final Site 1 Landfill Post-Closure Long-Term Monitoring Plan* (TtFW 2005a). After the June 2009 quarterly inspections, the Navy began using a landfill gas detection device recommended by the Santa Clara County DEH. The new detection device improves the accuracy of landfill gas measurements at Site 1 by using a more sensitive scale.” Discussion of the updated testing device will also be added to Section 7.2.1.5, Site 22 Monitoring Activities.

Additionally, the following sentence in Section 6.6 will be revised: “The Navy is currently looking into a new field measurement instrument for landfill gas.” The revision will be as follows: “The Navy began using a new field measurement instrument for landfill gas after the June 2009 quarterly inspection. The new device improves the accuracy of landfill gas measurements at Sites 1 and 22 by using a more sensitive scale.”

11. Section 7.1.2.5, Expected Progress Toward Meeting RAOs, Page 73: The text states that “the RAOs are currently being met, and it is anticipated that the RAOs will continue to be met in the near future.” However, no reference is provided to the explicit listing of the RAOs. In addition, the text in Section 4.1.1, Site 1, states that “the ROD did not identify RAOs” for Site 1. Explain in this section what RAOs are being used to determine whether Site 1 is making expected progress.

Response: The text will be revised to state: “As discussed in Section 4.1.1, the ROD for OU1 did not list RAOs. However, numerical remedial goals were later developed as CCLs in the *Final Technical Memorandum, Site 1 Groundwater Evaluation Process* (TtFW 2004c). Site 1 CCLs are discussed in Section 4.2.1. Based on an analysis of the groundwater data in accordance with the *Final Technical Memorandum*, there have been no releases from the Site 1 landfill during the Five-Year Review reporting period.”

12. Section 7.2.1.6, Optimization, Page 76. The text states that the “frequency of landfill gas and groundwater monitoring could be reduced from quarterly to semiannually” since “landfill gas migration is not occurring and landfill contaminants are detected infrequently, sporadically, and in low and trace concentrations.” This section should be revised to include more justification for reducing the frequency of monitoring. Details from the Operation, Maintenance and Monitoring Plan regarding reduction in monitoring frequency would be helpful.

Response: The text will be revised with the following: “Analysis has shown that landfill gas migration is not occurring and that landfill contaminants are detected infrequently, sporadically, and in low and trace concentrations in groundwater. As such, the frequency of landfill gas and groundwater monitoring could be reduced from quarterly to semiannually. The Navy proposed revising the groundwater monitoring sampling frequency at Site 22 to a semiannual basis in the OMMP Addendum (TtEC 2007). This recommendation was based on historical trends in Site 22

water levels and the limited detections of COCs in groundwater samples collected from Site 22 monitoring wells. Additionally, as stated in the OMMP Addendum (TtEC 2007), because crossgradient wells WGC2-1 and WGC2-5 are not considered representative of groundwater quality at Site 22, groundwater monitoring could be discontinued in these wells. The Navy believes that reduction to semi-annual monitoring and elimination of the crossgradient wells from the monitoring program will be cost-effective and appropriate for determining if there is a release from the landfill.”

13. Section 7.4.1.6, Optimization, Page 84. The text should be revised to summarize the significant optimization changes and recommendations of WATS.

Response: The following will be added to the text: “To improve efficiency and reduce operating costs, the draft optimization evaluation report recommended the following revisions to WATS:

- Shut down EA1-1 and EA1-6.
- Reduce the total pumping rate in the upper A aquifer extraction wells from 24.4 to 19.7 gpm.
- Reduce the total pumping rate in the lower A aquifer extraction wells from 44.5 to 35.0 gpm.

Additionally, the draft optimization evaluation report recommended that pilot testing be considered in the WATS area, in coordination with pilot testing by the MEW companies and NASA. Table 6-2 from the draft optimization evaluation report presents a screening of several alternative groundwater remediation technologies considered for Site 28. These include biostimulation, bioaugmentation, combined abiotic/biotic treatment, in situ chemical oxidation, permeable reactive barrier, thermal treatment, pulsed extraction, multiphase extraction, alcohol or surfactant flushing, phytoremediation, and monitoring natural attenuation (SES-Tech 2008).”

14. Section 8.2, Site 22, Page 91: The extent to which small mammal burrowing has been controlled at Site 22 is not clear. According to Section 8.2 (Site 22), “ground squirrels and gophers continue to burrow within the landfill boundary,” and this fact is considered an issue. However, the text in Section 7.2.1.2 (System Operations and O&M) notes that “during the last inspection by the Santa Clara DEH, it was reported that burrowing activity had become negligible because golf course maintenance crews were effectively controlling their activities.” These statements appear to be contradictory. Revise the Report to correct the discrepancies and clarify the extent to which burrowing animals have been controlled at Site 22.

Response: Burrowing mammal activity at Site 22 is under control. It will be removed as an issue from Section 8.2. As stated in Section 4.3.2, in March 2009, “ground squirrel and gopher activity was deemed effectively under control by golf course maintenance.” DEH inspection reports for June and September 2009, which were not included in the Draft, will be added to

Appendix C of the Five-Year Review. The June report states that “Sites 1 and 22 continue to have issues with gophers digging into the final cover.” However, according to Navy personnel who attended the inspection, this was only applicable to Site 1. The September 2009 report states that “gopher activity appears minimal; golf course personnel are controlling gophers.” The Five-Year Review will be updated with this information.

15. Table 1. This table should be revised to indicate that the Site 22 Landfill is part of the CERCLA Operable Unit (OU) 7.

Response: Comment noted. The Navy’s administrative record was searched and there is no record of an OU7. No changes will be made as a result of this comment.

16. Table 9, Monitoring Parameters for Site 22. The table “Monitoring Parameters for Site 22” is not included in the Report. Only the “Calculated Concentration Limits for COCs, Site 22” table is presented. The monitoring parameters for Site 1 are presented in Table 7 (Monitoring Parameters for Site 1). Revise the text to include a table discussing the monitoring parameters for Site 22 similar to the Table 7 presentation, which discusses monitoring parameters for Site 1.

Response: Section 4.2.2 will be revised to include a discussion of Site 22 analytical MPs, as previously described in the response to specific comment 8. However, because there are only four analytical MPs, these will be noted in the current Table 8, and a note will be added to explain that *cis*-1,2-DCE, chloroform, TCE, and xylenes are the Site 22 MPs.

17. Figures. The Five-Year Review Report does not include a figure presenting a cross-section of the landfill cap for Site 22. The figures include Figure 6, “Site 1, Landfill Cap Schematic,” but no corresponding figure is included for Site 22. Revise the Report to include a figure of the Site 22 landfill cap schematic.

Response: A figure presenting a cross-section of the landfill cap and biotic barrier at Site 22 will be added to the report.

18. Appendix G: Several problems with wells are discussed in the inspection report for Site 22 in Appendix G. The discussion of monitoring wells notes that “several of the monitoring wells were missing bolts (WGC2-4, WGC2-10, WGC2-12) or had broken bolt heads (WGC2-8)” and that “one additional, unnamed and unlabeled monitoring well was found to the southeast of WGC2-9.” The Navy should address these issues as part of the routine maintenance at the Site 22.

Response: The following will be added to Section IX, B, Adequacy of O&M, on page 10 of the Site 22 Inspection Checklist: “The Navy addresses monitoring well maintenance as part of routine maintenance activities during quarterly site inspections.”

19. Appendix G, Five-Year Review Site Inspection Checklist, IR Site 22 Landfill, Page 2: The section regarding the O&M documents indicates that no as-built drawings exist for Site 22. While no as-built drawings may exist for the landfill, such drawings likely exist for the wells and monitoring points. Revise the text to explain why no as-built drawings were verified.

Response: As-built drawings are included in the final *Remedial Action Report for Installation Restoration Site 22 Landfill* dated April 4, 2004, by Tetra Tech FW, Inc. Consequently, section III, A on page 2 of the Site 22 inspection checklist will be revised to state that the as-built drawings are readily available and up to date.

EPA CLARIFICATION COMMENTS

1. Page ES-5. The second full paragraph says that groundwater use is prohibited at Site 26 for “other reasons”. Clarify what the “other reasons” are.

Response: The last sentence of this paragraph will be revised as follows: “Currently, groundwater use is prohibited at Site 26 by language contained in NASA's *Comprehensive Use Plan* that restricts access and development because of safety considerations related to munitions storage and runway/air operations.”

2. Section 3.2.2, Land and Resource Use, Page 13. The text states that “groundwater at Site 26 is not considered potable,” but the rest of the paragraph refers to Site 22. Correct this apparent discrepancy.

Response: Site 26 will be changed to Site 22 in this paragraph.

3. Section 3.3.5, Basis for Taking Action, Page 17. The second sentence in the last paragraph uses the acronym “1,2-DCA” for “1,2-dichloroethene.” Correct this apparent discrepancy.

Response: 1,2-dichloroethene will be changed to 1,2-dichloroethane.

4. Section 4.2.1, Site 1, Page 28. The third full paragraph states that groundwater sampling for the chemicals of concern (COCs) is scheduled every 5 years. The monitoring parameters (MP) are a subset of the COCs that are monitored semiannually. The text should clarify that the “complete list” of COCs is sampled every 5 years.

Response: The text will be revised to state that the complete list of COCs is analyzed every 5 years.

5. Section 7.1.1.2, System Operations and O&M, Page 71. The first sentence of the second full paragraph contradicts itself. The second reference to “cover” should probably be edited to read geotextile.

Response: The sentence will be revised as follows: “Ground squirrels and gophers burrow into the first, vegetative layer of the landfill cover, which serves as a soil cap for plant growth. Deeper layers of the cover prevent contact with the waste, water from infiltrating into the waste, and escape of landfill gas. There is no evidence that burrowing mammals have penetrated deeper than the first vegetative layer.”

6. Figure 3, Site 1 Groundwater and Landfill Gas Monitoring Systems. The figure does not depict the fence that surrounds the Site 1 landfill. The text states in Section 3.1.1 (Physical Characteristics) that “the landfill [at Site 1] is surrounded by a fence, except for the north side.” The location of the fence in relation to the gas vents and the approximate landfill waste extent clarifies how the fence engineering control is protective of human health. The figure also does not depict the locations of “metallic and non-metallic flashing along the Site 1 barrier fence and swing gates” used to control small burrowing mammal movement, which was discussed in Section 7.1.1.2 (System Operations and O&M). Revise the figure to include all relevant features at Site 1.

Response: The following features will be added to Figure 3, based on Figure 3-1 from the *Site 1 Landfill Post-Closure Long-Term Maintenance Plan*: site security fence, gates, metallic flashing, non-metallic flashing, and drainage ditches. Additionally, the following will be added to Section 7.1.1.2: “The metallic flashing is 3 feet tall, covers the bottom portion of the site security fencing (except for the swing gates), and was intended to form a barrier to burrowing mammals. Approximately 6 inches of the metallic flashing is buried below the ground surface. The swing gates have non-metallic flashing underneath the gates to cover the gap between the ground surface and the bottom of the swing gates.”

7. Figure 8. “Tree wells” and “tree well methane monitoring points” are not labeled as TW-2, TW-5, etc., as they are in the text. Revise the figure accordingly.

Response: Tree wells and tree well methane monitoring points are defined correctly in the legend of the figure. The text in Section 4.2.2, Landfill Gas Monitoring currently says that the Site 22 methane monitoring network includes 15 tree wells. The text will be revised to state that the Site 22 landfill gas monitoring network includes 15 tree well methane monitoring points (versus tree wells). This will correct the discrepancy noted in the comment. No revisions will be made to the figure itself to prevent the figure from becoming cluttered.

8. Figure 14, Site 1, Groundwater Concentration Trends, Barium and Copper. It is difficult to distinguish whether some of the lower barium concentrations are at or below the CCL since the CCL is almost 100 times less than the maximum measurement (e.g., all measurements lower than about 100 micrograms per liter ($\mu\text{g/L}$) are indistinguishable). A logarithmic scale, rather than a linear scale, may help to distinguish among all the well measurements. Revise the scale of the figure so that all well measurements can be read clearly.

Response: Based on the revised discussion of barium and copper that were presented in response to specific comment 7, barium and copper detections are not an issue at Site 1.

Consequently, this figure will be removed from the Five-Year Review. Similarly, based on the revised discussion of chloroform that was presented in response to specific comment 8, chloroform detections are not an issue at Site 22. Consequently, Figure 15, Site 22 Groundwater Concentration Trends, TCE and Chloroform, will be removed from the Five-Year Review.

Water Board GENERAL COMMENTS

1. Confirm that updates to the Water Board's Basin Plan have not affected cleanup standards for any of the sites. The Water Board's most recent Basin Plan was updated in January 2007. The Report references the June 1995 Basin Plan.

Response: The Basin Plan was identified as an ARAR for Sites 1, 22, 26, and 28. At the time the Site 1 ROD was signed in 1997, the Site 22 ROD was signed in 2002, and the Site 26 ROD was signed in 1996, the 1995 Basin Plan was the current plan. At the time the MEW ROD was signed in 1989, the 1986 Basin Plan was the current plan; and at the time the MEW ROD was adopted by the Navy for Site 28 in 1993, the 1992 Basin Plan was the current plan. The Basin Plan amendments contained in the 2007 Basin Plan were promulgated after these RODs were signed. Pursuant to the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) at 40 *Code of Federal Regulations* (CFR) § 300.430(f)(1)(ii)(B)(1), requirements that are promulgated or modified after ROD signature must be attained only when determined to be ARARs and necessary to ensure that the remedy is protective of human health and the environment. None of the amendments adopted in the 2007 Basin Plan are necessary to ensure that the remedy for any of these sites are protective of human health and the environment.

The CCL for arsenic at Site 1 was based on the concentration of arsenic promulgated in Table 3-3 of the 1995 Basin Plan. The 2007 Basin Plan Amendments did not change the concentration of arsenic promulgated in Table 3-3. The CCL for copper at Site 1 was based on ambient water quality criteria, specifically the EPA saltwater chronic value of 3.1 µg/L. The 1995 Basin Plan did not have a surface water WQO for copper in Table 3-3. The 2007 Basin Plan now includes Table 3-3A, which was not present in the 1995 Basin Plan. Table 3-3A promulgates surface water WQOs for copper and nickel applicable to marine and estuarine waters contiguous to San Francisco Bay, south of Dumbarton Bridge (Moffett Field is south of Dumbarton Bridge). The surface water WQO criteria for continuous concentration for copper was promulgated at 6.9 µg/L. The CCL for copper at Site 1 is 5.1 µg/L, a lower concentration than the 2007 Basin Plan Table 3-3A concentration. There were no numerical WQOs established in the 1995 Basin Plan for the organic contaminants of concern (COC) at Sites 1 and 22 (organic contaminants were the only COCs at Site 22) and there are still no numerical WQOs established in the 2007 Basin Plan.

The cleanup standards for Sites 26 and 28 are MCLs established under the Safe Drinking Water Act and promulgated in the Basin Plan. There was no change in the MCLs established for the COCs at Sites 26 and 28 from the 1995 Basin Plan to the 2007 Basin Plan.

2. Elaborate on what efforts the Navy has undertaken to have the National Aeronautics and Space Administration (NASA) incorporate land use control language for Sites 1, 22, and 26

into its land use planning document(s). The Memoranda of Agreement (MOAs) for Sites 1 and 22 require NASA modify its documents and the Navy requested the addition of language for Site 26 in a 2004 letter to NASA. It does not appear that the Navy has made any additional effort to work with or encourage NASA to complete these actions. As such, the remedies for these sites are not protective in the long term.

Response: The Navy has continued communication with NASA regarding incorporation of land use control language for Sites 1, 22, and 26 into NASA's Master Plan. Most recently, the Navy has contacted the Environmental Division at NASA, and the Division reports that it is revising its Master Plan to include the language. The Navy also agrees that long-term protectiveness cannot be achieved until this language has been added. Protectiveness statements will be revised to reflect the effect of this issue on long-term protectiveness. The Five-Year Review will be revised in other places where relevant.

Water Board SPECIFIC COMMENTS

1. **Executive Summary, page ES-5:** Identify the "other reasons" cited for prohibition of groundwater use at Site 26.

Response: Please see response to EPA Clarification Comment 1.

2. **Section 3.2.2:** Revise the paragraph starting "Groundwater at Site 26..." References to Site 22 are included and the text is unclear.

Response: Site 26 will be changed to Site 22 in this paragraph.

3. **Section 3.3.3:** Clarify if all of the contaminants listed were used at or near Site 26. The text discusses chemicals that were "generated at Moffett Field" but is unclear on whether the description is site-wide or specific to Hangar 3 and/or Site 26.

Response: The ROD does not state whether these chemicals were used at Site 26 or just at Moffett Field in general. Site 26 characterization was completed in the 1980s and 1990s, as discussed in Sections 3.3.4 and 3.3.5. To clarify, the paragraph will be revised as follows:

"Aquifer contamination at Site 26 is a result of historical military uses dating back to the 1930s. Chemicals of potential concern (COPC) were generated at Moffett Field from refueling operations, maintenance, and firefighting training. Historical contaminants included jet fuel, waste oils, solvents, paints, asbestos, battery acids, and PCBs. These contaminants were disposed of in unlined landfills, drainage ditches, and unlined storage ponds at Moffett Field. In addition, some underground storage tanks (UST) and sumps were found to have leaked petroleum hydrocarbons and fuels, and lesser amounts of waste oils and solvents. Twenty-four IRP sites were initially identified as potential sources of contamination, 14 of which overlie Site 26 groundwater (Navy 1996)."

4. Section 3.4.1: State whether B- and C-zone groundwater beneath Site 28 has been impacted by solvents. The text states that Site 28 “consists of chlorinated volatile organic compound (VOC) groundwater plumes that impact the upper and lower portions of the A aquifer” but includes no information regarding the deeper water-bearing zones.

Response: No B and C zone aquifer contamination had been detected above cleanup goals at Site 28 when the MEW ROD was issued. Because Section 3 presents information dating to before the Navy adopted the MEW ROD for Site 28, no revisions will be made as a result of this comment. B2 aquifer contamination will be discussed in Section 6.4.4.4 of the report, as indicated in response to specific comment 14 (a).

5. Section 3.4.3:

(a) Revise the text to reflect that Building 88 is a source of VOCs to groundwater. The Navy identified Building 88 as “an ongoing source of PCE” with soil contamination in two areas that is “contributing to groundwater contamination.”

Response: (a) The Final Building 88 Former Investigation Report referenced in this comment was submitted in 2008. Because this section deals with actions prior to the ROD, the words “potential” and “suspected” are appropriate here. The results of the Building 88 Investigation are discussed in Sections 4 and 6. No changes will be made to this section as a result of this comment.

(b) Provide information regarding the former aircraft wash rack, located south of Hangar 1. State what investigation and/or remediation has been performed at the former aircraft wash rack.

Response: (b) Please see response to EPA specific comment 3.

6. Section 4.2.1:

(a) State why wells W1-7, W1-20, and W1-6 are not sampled.

Response: (a) The *Final Technical Memorandum, Site 1 Groundwater Evaluation Process* (TtFW 2004c) and *Final Site 1 Landfill Post-Closure Long-Term Monitoring Plan* (TtFW 2005a) do not explain specifically why wells W1-7, W1-20, and W1-6 are not sampled. However, the tech memo states that some of the wells and piezometers are screened in deeper portions of the A1 aquifer zone (lower portion of the A aquifer), or are not applicable due to location (TtFW 2004c). The report will be revised to state that “According to the *Final Site 1 Landfill Post-Closure Long-Term Monitoring Plan*, wells W1-7, W1-20, and W1-6 are not sampled because they are either screened in lower portion of the A aquifer or are not applicable based on location. Only wells screened in the upper portion of the A aquifer are sampled at Site 1. After review of screening depths and well locations, it appears well W1-7 is not sampled because it is screened in the lower portion of the A aquifer. W1-20 is not sampled based on location because it is

located near well W1-15, which is already included in the sampling program. W1-6 is not sampled based on a combination of screening depth and location. It is screened in both the upper and lower portions of the A aquifer and it is located near well W1-15.”

(b) Revise the “Landfill Gas Monitoring” text to reflect that landfill gas monitoring “is monitored” rather than “will be” monitored. In addition, add Santa Clara County Department of Environmental Health (DEH) to the list of agencies that are notified in the event of methane exceedances.

Response: (b) The report will be revised to state that landfill gas monitoring “is monitored...” The Santa Clara County DEH will be added to the list of agencies notified in the event of methane exceedances.

7. Section 4.2.2: Define “positive flow.” The text is unclear.

Response: The text will be revised to explain that “positive flow” refers to runoff away from the landfill which the surface of the landfill was contoured to promote.

8. Section 4.3.2: Clarify if all landfill gas monitoring wells were inundated or just those that were repaired in early 2009 (LGMW-1 and LGMW-4). If landfill gas monitoring is conducted when the wells are inundated, clarify how the data being reported is representative of landfill gas.

Response: The text will be revised as follows: “The inspections also noted inundation of landfill gas monitoring wells LGMW-1 and LGMW-4 from golf course irrigation systems during the September and December 2008 inspections. No monitoring was conducted on inundated wells. Repair of landfill gas monitoring wells LGMW-1 and LGMW-4 was completed in early 2009. The wells now contain an air space that can be sampled.”

9. Sections 4.3.3 and 4.3.4: State what is included in the system operations and maintenance (O&M) costs for Sites 26 and 28. No details are provided, which is inconsistent with earlier sections in the report (4.3.1 and 4.3.2) that describe what O&M costs include.

Response: The report will be revised to state the following:

Site 26 – “O&M costs currently include water level measurements; groundwater sampling, analysis, and reporting; well maintenance; and general housekeeping activities such as removing debris and pumping out sumps as they collect water.”

Site 28 – “O&M costs include water level measurements; groundwater sampling, analysis, and reporting; well maintenance; monthly sampling of system water, influent, and effluent; maintenance of pumps and other system components; and regular replacement of filters and the granular activated carbon.”

10. Section 6.4.1.2: Revise the text to state that samples are collected from nine monitoring wells. Section 4.2.1 lists nine monitoring wells as being sampled.

Response: Section 6.4.1.2 will be revised as follows: “Water level measurements are routinely collected from 12 groundwater monitoring wells, two piezometers, and two collection trench wells at Site 1.”

Additionally, Section 6.4.1.3 will be revised as follows: “Groundwater samples are routinely collected from nine groundwater monitoring wells and two collection trench wells at Site 1.”

11. Section 6.4.1.3:

(a) Discuss the significance of the detections of barium in the trench wells and whether they are indicative of a release from the landfill. The highest detection of barium has been in trench well W1-22, and concentrations show an increasing trend. According to the Navy's Final Technical Memorandum, Groundwater Evaluation Process (April 2004), “The trench collection wells do not yield groundwater samples that are representative of actual groundwater conditions based on the construction of the collection trench and the collection trench wells.” It further states, “The collection trench wells intercept and monitor potential future contaminants to the underlying groundwater.”

Response: (a) Please see response to EPA specific comment 7.

(b) Change the text to reflect that wells W1-22 and W1-23 are trench wells and not groundwater monitoring wells.

Response: (b) The text will be revised to reference wells W1-22 and W1-23 as trench wells and not groundwater monitoring wells.

(c) Provide justification, beyond a literature reference (Hem, 1971), that copper and barium present in groundwater samples from site wells at concentrations greater than the calculated concentration limits (CCLs) are due to sea water. The landfill is adjacent to (downgradient and crossgradient of) two water bodies (NASA storm water retention pond and U.S. Fish and Wildlife [USFW] pond) that are contained by levees. Discuss the source of water in these ponds and if they are hydraulically connected to San Francisco Bay, thereby containing salt water.

Response: (c) Reference to copper and barium being a part of the composition of natural groundwater at Site 1 will be removed from the text.

12. Sections 6.4.3.2: (a) Identify the wells used to evaluate the VOC concentration trends at Site 26.

Response: (a) The report will be revised to state that the 10 wells selected to evaluate groundwater trends in the upper portion of the A aquifer are W4-3, W4-14, W4-15, W7-10, WSW-6, WU5-4, WU5-10, WU5-14, WU5-21, and WU5-25. It will also state that the four wells selected to evaluate groundwater trends in the lower portion of the A aquifer are W6-2, WU5-11, WU5-12, and WU5-13.

(b) Include a discussion of the VOC concentration trends for the lower A aquifer.

Response: (b) The last sentence before “TCE Evaluation and Trends” will be revised as follows: “All COC concentrations in samples collected from wells completed in the lower portion of the A aquifer have been either not detected or detected below MCLs throughout the Five-Year Review period. Consequently, concentrations trends for the lower portion of the A aquifer are not discussed further since they are below cleanup goals.”

(c) Include plume maps for 1,2-dichloroethene (1,2-DCE), PCE, and vinyl chloride in the report.

Response: (c) Plume maps for 1,2-DCE, PCE, and vinyl chloride will be added to the report and referenced in the appropriate sections.

13. Section 6.4.4.2:

(a) The Navy and EPA do not agree about the level of hydraulic containment at Site 28; this discrepancy must be addressed. The Report states that the West-Side Aquifer Treatment System (WATS) has “achieved complete hydraulic containment”. However, EPA, in its September 2009 Five-Year Review Report for the MEW Superfund Study Area, identifies incomplete hydraulic containment of the groundwater VOC plume as an issue.

Response: (a) Please see response to EPA general comment 4(b).

(b) Revise the text to reflect that the regulatory agencies have reviewed the Draft WATS Site 28 Optimization Evaluation Report and that, as agreed by the Navy and the regulatory agencies, comments are on hold until after the Navy completes its in situ remediation pilot testing at the site.

Response: (b) The last sentence of the fifth paragraph of Section 6.4.4.2 will be revised as follows: “The regulatory agencies have reviewed the *Draft WATS Site 28 Optimization Evaluation Report* and, as agreed by the Navy and the regulatory agencies, comments are on hold until after the Navy completes its in situ remediation pilot testing at the site.”

14. Sections 6.4.4.4:

(a) Include a discussion of VOC concentrations and trends in the B-zone and deeper aquifers.

Response: (a) The deepest aquifer that the Navy monitors at Site 28 is the B2 aquifer. The following table presents the B2 aquifer wells sampled by the Navy, as well as historical contamination trends.

Well Name	Dates sampled	TCE Trend
45B2	Annually from 2002-2008 and once in 1992	All non-detect
W9-12	Annually 2003-2008; samples also collected 1992, 1993, 1995, 1997, and 2001	Ranges from non-detect (ND) to 2.8 micrograms per liter ($\mu\text{g/L}$) – most recent result is 0.42 $\mu\text{g/L}$ (J qualifier [“J” refers to estimated value])
W9-15	Annually 2002-2008; samples also collected 1992, 1993, 1995, and 1997	Ranges from ND to 0.7 $\mu\text{g/L}$ – most current sample was ND
W9-3	Once in 2007	0.3 $\mu\text{g/L}$ (J qualifier)
W9-40	Annually 2002-2008; samples also collected 1992, 1993, 1995, 1997, and 1998	Ranges from ND to 0.8 $\mu\text{g/L}$ (J qualifier) – most recent result was ND
W9-5	Once in 2007	ND

Based on the information presented in this table, the following will be added after the introductory paragraph of Section 6.4.4.4:

“The deepest aquifer that the Navy monitors at Site 28 is the B2 aquifer. The Navy has monitored four wells in the B2 aquifer zone intermittently between 1992 and 1998, and annually from 2003 to 2008 (wells 45B2, W9-12, W9-15, and W9-40). Samples were also collected from B2 aquifer zone wells W9-3 and W9-5 in 2007. VOC contamination trends in the B2 and deeper aquifer zones are not discussed further in this report because (1) TCE concentrations in all B2 aquifer samples have been below the MCL of 5 $\mu\text{g/L}$, (2) there are no increasing trends, and (3) all recent samples have either not been detected or have been detected below 0.5 $\mu\text{g/L}$.”

(b) Identify the wells used to evaluate the VOC concentration trends at Site 28. Identify which wells show increasing chemical concentration trends.

Response: (b) The text will be revised to state that the 26 wells selected to evaluate groundwater trends in the upper portion of the A aquifer are 14C33A, 14D05A, W9-2, W9-10, W9-18, W9-19, W9SC-1, W9-31, W9-37, W9-45, W9SC-7, W9SC-13, W9SC-14, W29-1, W29-3, W29-4, W56-2, WIC-1, WU4-8, WU4-10, WU4-14, WU4-17, WU4-21, WU4-25, WWR-1, and WWR-2. The text will be revised to state that the 10 wells selected to evaluate groundwater trends in the lower portion of the A aquifer are 80B1, W9-9, W9-14, W9-20, W9-21, W9-34, W29-7, WU4-9, WU4-11, and WU4-15.

The text will be revised to reflect increasing VOC trends at the following wells:

- TCE – upper portion of the A aquifer: W29-4, WU4-14, and WU4-21
- TCE – lower portion of the A aquifer: WU4-15
- *Cis*-1,2-DCE – upper portion of the A aquifer: W9-2 and W9SC-1
- *Cis*-1,2-DCE – lower portion of the A aquifer: W9-34 and WU4-15
- PCE – no wells showed increasing VOC trends
- Vinyl chloride – upper portion of the A aquifer: W9-10, W9-18, W9-19, W9-45, W29-3, W56-2, WIC-1, and WU4-8
- Vinyl chloride – lower portion of the A aquifer: W9-9, W9-14, W9-34, W29-7, and WU4-15

(c) Revise the text regarding vinyl chloride trends. The statement that “overall, vinyl chloride concentrations are stable or decreasing” is not supported by the information presented, which includes a “long-term increasing trend in 8” of 26 wells. Only a select number of wells at the site were evaluated and vinyl chloride is increasing in at least 30% of these wells.

Response: (c): Please see response to EPA specific comment 9.

(d) Include plume maps for 1,2-DCE, PCE, and vinyl chloride in the report.

Response: (d) Plume maps for *cis*-1,2-DCE, PCE, and vinyl chloride will be added to the report as recommended.

15. Section 6.6: State why no interviews were conducted for Site 26. Information regarding shut down of the system and the current pilot test could be obtained and presented. In addition, state why the property owner, NASA, was not interviewed about any of the four sites.

Response: Please see response to EPA general comment 9 regarding an interview with NASA. Moreover, the Navy has sufficient information regarding shut down of EATS and the current pilot test at Site 26. Shut down of EATS and the current pilot test are discussed in Sections 4.2.3 and 7.3.1.1 of the report. The report will be revised to state that an interview was not necessary to acquire information about Site 26 relevant to completing the Five-Year Review in accordance with EPA and Navy guidance documents.

16. Section 7.1.1.2: Clarify how the ground squirrels and gophers have “not penetrated the cover” if they burrow into the landfill. Burrowing disturbs the landfill cover.

Response: Please see response to EPA clarification comment 5.

17. Section 7.1.1.5: Revise the text to include landfill gas monitoring.

Response: Please see response to EPA specific comment 10.

18. Section 7.1.3:

(a) Because sea level rise and wind and wave action from severe storms could affect the remedy at Site 1, the Navy’s recommendation that these be considered “in future planning” is inadequate. The Navy should develop an adaptive management plan that presents feasible options for landfill cover erosion control and protection from flooding. This plan should be incorporated into the operations maintenance and monitoring plan for the site and updated every 5 years of the operational life and post-closure maintenance period of the landfill with the most recently available and most credible information at the time of the update.

Response: (a) The Navy believes that the mechanisms currently in place to address landfill cover erosion control and protection from flooding are adequate to ensure current and future protectiveness of the remedy. To provide justification of the adequacy of these mechanisms, the existing third paragraph of Section 7.1.3 will be replaced with the following text:

“The Building 191 pump station currently provides flood protection for the entire northern portion of Moffett Field with a main pump in Building 191 and three additional auxiliary pumps. NASA installed an auxiliary pump next to Building 191 after NASA took ownership of Moffett Field. There are two additional auxiliary pumps along the northern channel (one at end of Marriage Road Ditch and one at the end of East Patrol Road Ditch). NASA maintains the pumps on a regular schedule. These pumps can be turned on during heavy flood events to provide additional capacity and are able to address most flood events. Flooding occasionally occurs because of limitations on capacity and number of discharge points for floodwater. NASA is currently looking for additional discharge points to increase its ability to mitigate effects of flooding. According to the NASA Restoration Project Manager, the landfills have been surrounded by water during past flood events, but there have been no issues resulting from the flooding and the water dissipates soon thereafter. The Navy is working with NASA to ensure

that language regarding O&M of the Building 191 pump station is added to NASA's Master Plan.

“In accordance with the *Final Site 1 Landfill Post Closure Long Term Maintenance Plan* (TtFW 2005e), the Navy inspects the landfill cover for erosion semiannually. The maintenance plan also calls for inspection of the landfill cover “after significant events” to evaluate its integrity. The Santa Clara County DEH inspects the landfill cover for erosion during quarterly inspections.

Evaluation of implementation and performance of the selected remedy indicates that the landfill cover is functioning as intended and the remedy is currently protective of human health and the environment. Because of the design of the landfill cover, because the landfill cover is inspected quarterly by the Santa Clara DEH and semiannually by the Navy, and because the landfill is inspected after significant events such as flooding, flooding is not deemed a threat to future protectiveness of the remedy at this time.”

(b) Provide justification that the Building 191 pump station can increase its capacity such that flooding will not be an issue. No information regarding the current flow rate and pumping capacity are provided in the Report.

Response: **(b)** Please see response to Water Board specific comment 18(a).

19. Section 7.3.1: Revise the answer to the Question A to “No.” The remedy, as specified in the Site 26 Record of Decision (ROD), is not functioning as intended. The remedy, which consists of a groundwater pump and treat system, is not operating. In addition, the Navy has stated that the system, if operating as designed, “would capture approximately 17 percent of the December 2006 (non-pumping) plume.”

Response: Please see response to EPA general comment 4(a).

20. Section 7.3.1.4: Provide a reference for the statement “NASA is currently in the process of adding domestic use groundwater restrictions to its planning documents.” Clarify who at NASA is completing this action and when it will be completed.

Response: The text in Section 7.3.1.4 will be revised to state that according to the NASA Restoration Project Manager, NASA's Facilities Group is currently revising the Master Plan with input from the Environmental Department. NASA will incorporate institutional controls, including restrictions on domestic groundwater use for Sites 1, 22, and 26 into the Master Plan. In Section 8, the milestone date will be 2010.

21. Section 7.4.2: Revise the answer to Question B to “No.” The vapor intrusion pathway is an exposure assumption that is not addressed by the existing remedy.

Response: The Navy agrees that the answer to Question B for Site 28 should be “no” and will revise the report accordingly.

22. Section 7.4.1.6: Discuss the pilot test planned for Site 28.

Response: Section 7.4.1.6 will be revised to include information about the pilot test contained in response to EPA general comment 2(c).

23. Table 1: Update the “status” of Sites 14 and 20 to correctly reflect that sampling has been completed and what additional work is proposed at these sites.

Response: The status of Site 14 will be revised as follows: “Sampling completed. Preparing work plan for air sparging and soil vapor extraction system installation and operation.” The status of Site 20 will be revised as follows: “Sampling completed. Evaluating analytical results.”

24. Tables: Include a table listing the monitoring parameters (MP) for Site 22.

Response: Section 4.2.2 will be revised as follows: “Analytical MPs are a subset of the COCs at Site 22. The MPs are *cis*-1,2DCE, chloroform, TCE, and xylenes. The VOCs selected as MPs were based on the frequency of detection and/or properties of each compound, with those selected that would most likely be present in the groundwater (TtEC 2007).” However, because there are only four MPs, these will be noted in the current Table 8, and a note will be added to explain that *cis*-1,2-DCE, chloroform, TCE, and xylenes are the Site 22 MPs.

25. Figures: Include a cross section of the landfill cap for Site 22.

Response: A figure presenting a cross-section of the biotic barrier at Site 22 will be added to the report. The figure will be based on Figure 10 from the Site 22 ROD, which shows the biotic barrier conceptual design.

26. Figures 17 and 18: Revise the figures to include analytical results from the newly replaced Wescoat monitoring wells. The data from these wells provides more definition along the western boundary of the groundwater plume (upper and lower A aquifer).

Response: Figures 17 and 18 present information from final 2003 and 2008 annual groundwater reports with which EPA and Water Board concurred. The *2008 Annual Groundwater Report for WATS and EATS* was the last annual groundwater report reviewed for the Five-Year Review. The Navy did not sample or include data from the newly replaced Wescoat monitoring wells in the 2008 annual groundwater report. The 2009 annual groundwater report has not been completed. EPA and Water Board will have an opportunity to review the 2009 annual groundwater report and provide comments to the Navy. No changes will be made as a result of this comment.

Attachment 1 – Issues, Recommendations, and Follow-up Actions

Site	Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Completion Milestone Date	Affects Protectiveness (Yes / No)	
						Current	Future
1	Land use restrictions have not been documented in the NASA Environmental Resources Document as specified in Memorandum of Agreement (11/15/1999).	Incorporate institutional controls into NASA's Master Plan. Report completion and documentation of this task to the Agencies. Provide a schedule for future reporting on the status and efficacy of institutional controls.	NASA	EPA and Water Board	2010	No	Yes
1	Ground squirrels and gophers continue to burrow within the landfill boundary.	Evaluate effectiveness of current abatement plan.	Navy	EPA and Water Board	2010	No	Yes
22	Land use restrictions have not been incorporated into NASA's land use planning documents as specified in the Memorandum of Agreement (9/17/2008).	Incorporate institutional controls into NASA's Master Plan. Report completion and documentation of this task to the Agencies. Provide a schedule for future reporting on the status and efficacy of institutional controls.	NASA	EPA and Water Board	2010	No	Yes
26	The <i>Final Site 26 EATS Evaluation Report</i> determined that the EATS groundwater extraction and treatment remedy is an inefficient and ineffective method to address groundwater contamination at Site 26.	Continue implementing the pilot test and determine the next course of action based on the results.	Navy	EPA and Water Board	2010	No	Yes

Site	Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Completion Milestone Date	Affects Protectiveness (Yes / No)	
						Current	Future
26	NASA has not restricted groundwater use in its land use planning documents for the EATS area as required in the Record of Decision.	Incorporate institutional controls into NASA's Master Plan. Report completion and documentation of this task to the Agencies. Provide a schedule for future reporting on the status and efficacy of institutional controls.	NASA	EPA and Water Board	2010	No	Yes
28	Potential actions need to be taken to ensure long term protectiveness from vapor intrusion.	Update NASA's internal directive on environment and incorporate institutional controls related to vapor intrusion.	NASA	EPA	2010	No	Yes
		Follow EPA's VI Pathway study and incorporate relevant measures into Ames construction permits normally required of permittees and lessees when redeveloping or remodeling structures and sites at Ames.	NASA	EPA	2010	No	Yes
28	Potential contaminant sources exist in the former Building 88 area, associated sewer lines, and the Traffic Island Area.	Continue implementing the pilot test and determine the next course of action based on the results.	Navy	EPA and Water Board	2011	No	Yes

Site	Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Completion Milestone Date	Affects Protectiveness (Yes / No)	
						Current	Future
28	WATS is functioning as intended; however, dissolved VOCs in the regional plume continue to migrate into Site 28 with groundwater underflow from upgradient source areas. The upgradient sources are contributing contaminants at concentrations greater than cleanup standards. As long as contaminants migrate into Site 28, remediation goals are unlikely to be met.	Continue to participate in a regional strategy to address groundwater contamination and document the strategy in an FS report	Navy	EPA and Water Board	2012	No	Yes
28	No institutional controls exist for groundwater.	Evaluate need for institutional controls in Site-wide Groundwater Feasibility Study for the MEW Study Area.	NASA, EPA	EPA	2010-2011	No	Yes