

October 2001

Response to Review Comments

Document Title:

- (1) Draft Final Work Plan, Phase II Remedial Investigation, Installation Restoration Program (IRP) Site 1, Explosive Ordnance Disposal (EOD) Range, Marine Corps Air Station (MCAS), El Toro, California, February 2001.

Reviewer: Triss Chesney, Department of Toxic Substances Control, Letter dated March 19, 2001.

Comment No.	Section/ Page No.	Comment	Response
<b>Response to Comments Submitted by Triss Chesney, Letter dated December 15, 2000</b>			
<b>GENERAL COMMENTS</b>			
1.	Comments 1 through 11, and 13 and 14.	Responses to DTSC Comment Numbers 1 through 11, 13, and 14 (submitted by Triss Chesney) were adequately addressed.	
2.	Comment 12	<p>DTSC Comment Number 12 (Submitted by Triss Chesney), Tables 4-3 and 4-4, Requirements for Soil and Groundwater Sample Preservation, Maximum Holding Time, and Containers: Verify holding times with the Third Edition of Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW-846 (SW-846), prepared by the United States Environmental Protection Agency (EPA). If holding times differ, provide an explanation. For example, in Tables 4-3 and 4-4, the maximum holding time for nitrate is identified as 14 days; however, SW-846 specifies a holding time of 48 hours for sample extraction to analysis.</p> <p>DoN response: Has been revised to be consistent with SW-846.</p> <p>It appears that the holding times for nitrate in both Tables 4-3 and 4-4 have not been revised to reflect SW-846. The holding time from sample extraction to analysis should be 48 hours, rather than 14 days. Please revise the values in the tables.</p>	<p>The method for nitrate is cited in the Work Plan from the Chemical Method for Analysis of Water and Waste [EPA/600/4-79-020 (EPA 2000)], that specifies a holding time for water samples of 14 days.</p> <p>Previous drafts of the plan indicated that the analysis would be for a combination of nitrate and nitrite, for which nitrite has a 48-hour holding time. This was clarified to indicate that only total nitrate would be analyzed, and the method reference will only be EPA 300.0 (Determination of Inorganic Anions In Water By Ion Chromatography).</p>

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<b>SPECIFIC COMMENTS</b>			
1.	Section 2.7	<p>Site Characterization: In general, this section summarizes and provides a general statement regarding the results of previous investigations. It is recommended that analytical results from the previous investigations be compiled into tables in Appendix B. Appendix B includes some of the data from previous investigations, but is not comprehensive. Since this data is being used as a basis for the Phase II RI, it should be presented clearly. Additionally, where results of the analytical data is summarized in general statements, the specific values that are being used for comparison should be provided. For example, Section 2.7.4, Subsurface Soil (deeper than 10 feet bgs), Perchlorate Verification Study, states, "All samples were reported with concentrations below the reporting limit for perchlorate." Please provide the reporting limit for perchlorate.</p>	<p>Analytical results from previous investigations have been included in Appendix B.</p> <p>The text has been revised to include specific values, such as reporting limits.</p>
2.	Section 2.7.2	<p>Surface Soil (0-1 feet bgs [below ground surface]), Phase I RI: This section states, "None of the analytes exceeded applicable preliminary remediation goals (PRGs)..." For completeness, the results should be included in Appendix B. Please specify the PRGs considered to be "applicable," e.g. residential or industrial.</p>	<p>The Phase I RI results have been included in Appendix B.</p> <p>It was originally reported in the <i>Phase II RI/FS Draft Work Plan</i> (JEG 1993b) that none of the analytes exceeded applicable human health or ecological criteria. This reference has been removed and the text revised as follows:</p> <p>"The <i>Phase I RI</i> report (JEG 1993a) stated that low levels of fuel hydrocarbons were detected (TFH-gasoline and TFH-diesel), as well as low concentrations of VOCs (carbon tetrachloride and toluene); SVOCs, pesticides, PCBs, dioxins, and furans were not detected (JEG 1993a). All reported concentrations are below current EPA Region IX residential preliminary remediation goals (PRGs) (EPA 2000) and/or background concentrations."</p>

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3.	Section 2.7.2	Surface Soil (0-1 feet bgs), Perchlorate Verification Study: This section states, "The summary of the analytical results for these samples is included in Appendix B." Appendix B does not include the results of perchlorate analysis for surface samples SS-01, SS-02 and SS-03. For completeness, the results should be included in Appendix B.	Surface Soil Perchlorate analytical results have been included in Appendix B.
4.	Section 2.7.3	Shallow Soil (1-10 feet bgs), Perchlorate Verification Study: This section states, "A summary of the analytical results included in Appendix B." Appendix B does not include the results of perchlorate analysis for the shallow soil samples collected at approximately 1 and 5 feet bgs at each of the 14 locations (HA-01 through HA-14). For completeness, the results should be included in Appendix B.	Shallow soil perchlorate analytical results have been included in Appendix B.
5.	Section 2.7.4	Subsurface Soil (deeper than 10 feet bgs), Phase I RI: This section states, "None of the analytes exceeded applicable PRGs..." Please specify the PRGs considered to be "applicable," e.g. residential or industrial.	<p>The <i>Phase I RI</i> report (JEG 1993a) stated that no organic chemicals (except minor concentrations of VOCs) were detected in the subsurface samples collected from boreholes 01_DGMW57 and 01_DGMW58. All analytes except metals were reported with concentrations below detection limits, with the exception of 2-butanone (2 µg/kg to 4 µg/kg).</p> <p>However, these boreholes were located outside the boundary of the EOD Range (Site 1 boundary during the Phase I investigation) and were considered as downgradient locations.</p> <p>The locations of boreholes 01_DGMW57 and 01_DGMW58 are in the Buffer Zone within the boundary of Site 1 as demarcated in this work plan. A comparison to current EPA Region IX residential PRGs (EPA 2000) and/or background concentrations indicates that none of the analytes exceeded these thresholds, with the exception of arsenic.</p> <p>The text has been revised to reflect this.</p>

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6.	Section 3.3.3	Decision Inputs: Item number 4 includes California DHS [Department of Health Services] Action Levels (ALS). 1,4-Dioxane is a stabilizer for chlorinated solvents. According to the OPPT [Office of Pollution Prevention and Toxics] Chemical Fact Sheet for 1,4 Dioxane (CAS No. 123-9-1) (EPA, February 1995), 1,4-Dioxane does not bind well to soil and should readily leach to groundwater. As a result, transport to groundwater could occur without leaving significant residue in soil. The respective California Drinking Water AL specified by DHS is 0.003 milligrams per liter (mg/L). EPA Methods 8260 and 8270 can be modified to quantify 1,4-dioxane. The reporting limit for 1,4-dioxane should be at or as close to the AL as practicable. Please include 1,4-dioxane in the analysis of groundwater samples and modify the associated sections (e.g. Section 3.3.5 – Decision Rules, Section 3.3.7 – Sampling Design, Section 5.2.2 – Laboratory Analytical Methods and Requirements, Section 5.2.3 – Quality Control Requirements, etc.), accordingly.	<p>Evaluation of groundwater sampling data for Site 1 indicates that chlorinated solvents have not impacted groundwater. Therefore, as indicated in the comment, since 1,4 Dioxane is a stabilizer for chlorinated solvents, the likelihood of it being present in the groundwater is very low.</p> <p>Based on this evaluation, 1, 4 Dioxane is not considered as a chemical of potential concern.</p>
7.	Section 3.3.5	Decision Rules: Item number 6 states, "Groundwater sample(s) with maximum perchlorate concentration(s) will be analyzed for NDMA." Please incorporate the decision rule for NDMA into Section 3.3.7, Sampling Design.	Decision rule for NDMA was incorporated into Section 3.3.7.
8.	Section 3.3.7.3, Tier 3	The third paragraph states, "Groundwater samples will be analyzed for...and radionuclides." Please clarify how sampling and analysis for radionuclides in groundwater during Tier 3 will be coordinated with the station-wide evaluation described in Section 2.5.2, Radionuclide Investigation. According to Section 2.5.1, Radionuclide Investigation, "a station-wide radionuclide evaluation, including Site 1, is currently being conducted. This radionuclide evaluation will provide more definitive data on the origin of radioisotopes detected in groundwater at various sites on the station, including Site 1. Conclusions and recommendations of this evaluation pertaining to Site 1 will be incorporated into the RI, as appropriate."	<p>The text has been revised to reflect the conclusions of the Draft Technical Memorandum; Phase II Evaluation of Radionuclides in Groundwater at Former Landfill Sites and the EOD Range.</p> <p>The Phase II Radionuclide Evaluation concluded that radionuclides in groundwater at MCAS, El Toro (including Site 1) are naturally occurring. Therefore, no analysis of radionuclides will be conducted during the Phase II RI. However, sampling for radionuclides in accordance with the CERCLA Groundwater Monitoring Plan will continue.</p>

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9.	Table 5-2, Table 5-3	Table 5-2, Project Quality Control Criteria for Soil Samples and Table 5-3, Project Quality Control Criteria for Groundwater Samples: Note <sup>a</sup> states, "For VOCs, SVOCs, explosives, dioxins, and perchlorate, the lower of California Modified PRGs and EPA Region IX PRGs (October 1999 Update) has been used..." Since the residential scenario will be evaluated to ensure flexibility in risk management decisions, the required reporting limit should be compared against the residential PRGs (California Modified and EPA Region IX). Please reflect this in the table and the associated notes.	The tables have been revised to reflect a comparison of the required reporting limit to the residential PRGs.
10.		Additional comments prepared by the Industrial Hygiene and Field Safety Section (IHSS) and the Geological Services Unit (GSU) are also included. The Human and Ecological Risk Division (HERD) did not have additional comments.	

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<b>GENERAL COMMENTS</b>			
1.	Section 4.2.5.1, Page 4-3	<b>Well Installation and Construction:</b>	A letter describing the rationale and placement of wells will be submitted to the BCT prior to proceeding to Tier 3. This statement has been included in Section 3.3.7.3.  If necessary a justification that the existing well(s) provide adequate coverage and monitoring will be included.
A.		GSU suggest that a well installation work plan be submitted prior to proceeding to Tier 3. The BCT would then have an opportunity to agree on the number and location of any new groundwater monitoring wells. The Work Plan would propose the new well locations or justification that an existing well is appropriately located for monitoring the groundwater.	
B.		The Report states that the well casing will consist of 4-inch inside diameter flush-threaded, Schedule 40 polyvinyl chloride (PVC) with 0.020-inch slotted screen and 20-40 size quartz sand or equivalent filter pack material.	
i.		GSU recommends that this section also discuss the dimensions of the borehole diameter and outer casing diameter. GSU recommends that the borehole diameter be at least four inches larger than the outside diameter of the casing.	The borehole diameter and outer casing diameter has been specified as recommended.
ii.		The selection of the filter pack grain size and the screen slot size should be based on a grain size analysis of the formation. Proper sizing of the filter pack and screen slot size may reduce the turbidity levels in new wells compared to the high turbidity levels recorded in existing wells.	The well design was proposed based on typical specifications for the lithology that was encountered in the boreholes of existing Site 1 wells. A grain size analysis (field method) will be conducted to confirm the proposed slot and filter pack material size.
iii.		The length of the screen interval is not discussed in the Report. GSU recommends that the screen length not exceed 15 feet and the screen be installed across the groundwater table with two to five feet of screened casing above the water table.	The recommended screen length criteria have been incorporated into the final work plan.
<b>SPECIFIC COMMENTS</b>			
1.		Adequate responses were provided for GSU's comments numbers 2.A, 3, 4, 5.b, 6, 9, 10, 11.A, and 11.B. The appropriate text and figures were revised in the Report.	

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2.		<p><b>GSU Comment Number 1 (Response to Comment Number 1):</b> The report states that no ponding or accumulation contributing to surface water flow has occurred during recent times. GSU recommends that the report include the time period in which no ponding of water occurred instead of "recent times." It is GSU's recollection that the retention pond was not visible from the main road or area where EOD activities primarily took place and therefore was not inspected on a regular basis. It is possible that the retention pond still holds water during rainy periods and supports wildlife or a vernal pool community.</p> <p><b>Response to GSU Comment:</b> A hydrological assessment was conducted to evaluate the accumulation of water in the pond during a 100-year storm. The results indicate that ponding can be expected but no overflow will occur that will contribute to runoff from the site. This pond was designated as a vernal pond during the Environmental Impact Study (EIR); sampling conducted in the pool detected the Riverside Fairy Shrimp, which is listed as a federally endangered species. The work plan has been revised to include evaluation of the surface water pathway.</p> <p><b>GSU Response:</b> This information should be included in Section 2.6.3, Ecology that discusses animal and plant species.</p>	<p>Information pertaining to the Riverside Fairy Shrimp has been included in Section 2.6.3, Ecology. The ecology section has been revised to be more specific.</p>

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3.		<p><b>GSU's Comment number 2.B. (Response to Comment Number 3)</b> In the upper northeast end of Site 1, the groundwater flow, based on water level measurements from wells 01_MW101, 01_MW102, and 01_MW202 is to the west (Figure 2-4). The estimated groundwater flow direction (south-southwest) in the center portion of Site 1 is based on groundwater data from wells installed along the length of Site 1. GSU is concerned that groundwater may flow in a more westerly direction in the center portion of the Site. GSU would like to have groundwater level measurements collected from the northwest boundary of Site 1 to verify the groundwater flow direction. If groundwater flow in the vicinity of well 01_MW201 is actually to the west, perchlorate detected in well 01_MW201 may not intersect well 01_MW205, which is currently believed to be a downgradient well.</p> <p><b>Response to GSU Comment:</b> Water level data from wells located in the Northwest boundary would not add to the current understanding of groundwater flow direction in the center of the site. Based on the current conceptual site model and existing water level data for Site 1, the general groundwater flow direction appears to be to the south-southwest, which is consistent with the surface topography. In addition, the RI Work Plan has been revised to include groundwater sampling as part of Tier 1 activities. Results from this sampling event along with soil sampling results from Tier 1 and 2 will be used to optimize placement of additional wells including cross-gradient wells.</p> <p><b>GSU Response:</b> GSU still has reservation regarding the groundwater flow gradient beneath Site 1. Figure 2-3 shows that the sandstone and siltstone bedrock underlying the unconsolidated alluvium is saturated and is not an aquiclude for groundwater flow. Once a conceptual model for fate and transport is developed, a plan to investigate and verify the model should be developed. Although groundwater flow direction generally mimics surface topography, it is not always the case. GSU recommends that a groundwater monitoring well or temporary well be installed in the southwest portion of Site 1 to confirm the groundwater flow gradient and flow direction</p>	<p>GSU's reservations and concerns regarding the groundwater flow gradient are noted.</p> <p>A groundwater monitoring well in the southwest portion of Site 1 will be installed as recommended, in addition to other wells that may be required based on Tier 1 and Tier 2 soil and groundwater sampling results.</p> <p>The rationale for the location of groundwater well(s) will be presented in a letter to the BCT as per Comment 1A.</p>

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4.		<p><b>GSU's Comment Number 5.A. (Response to Comment Number 6):</b> GSU is concerned that a data gap exist in the depiction of groundwater flow direction beneath Site 1. Site 1 is shaped like a trough trending northeast to southwest. Except for wells 01_MW102 and 01_MW207, the groundwater monitoring wells are installed along the longitudinal axis of Site 1 (Figure 2-1). The groundwater flow direction is shown as flowing south-southwest based on the line of wells. GSU believes that groundwater in the central portion of Site 1 may flow to the west and southwest. GSU recommends that a well be installed to the west of wells 01_MW205 or 01_MW206 to verify the groundwater flow direction and determine whether well 01_MW205 is actually downgradient to well 01_MW201. GSU also recommends that groundwater samples be collected in the vicinity of 01_MW201 to determine the extent of groundwater contamination that exceeds the California DHS Action Level for perchlorate.</p> <p><b>Response to GSU Comment:</b> Six additional monitoring wells were installed during the Perchlorate Verification Study to supplement data for defining the extent of perchlorate in groundwater and to determine the magnitude and direction of groundwater gradient. Well locations were based on the conceptual model for groundwater flow at this site. Groundwater flow direction in the shallow aquifer is consistent with site topography and is generally towards the south-southwest. Groundwater samples will be collected as part of Tier 1 activities. The intent is to optimize placement based on soil contamination identified during Tier 1 and Tier 2 sampling.</p> <p><b>GSU Response:</b> See GSU response to comment number 3.</p>	<p>See response to GSU Comment Number 3.</p>

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5.		<p><b>GSU's Comment Number 7 (Response to Comment Number 9):</b> GSU believes that additional investigation is necessary to define extent of groundwater contamination that exceeds the California DHS Action Level for perchlorate. The report states that the perchlorate contamination has been defined based on one groundwater monitoring well (01_MW201). The perchlorate detected in well 01_MW201 could be water collected from the center or fringe of a plume. The size of the plume and mass of perchlorate in the groundwater is unknown. Following the decision logic that is proposed for soil investigation, further investigation is warranted to define the extent of the "hot spot" groundwater contamination. Additional groundwater investigation would be prudent to make a better estimate of the concentration and extent of perchlorate for risk predictions and remedial planning purposes.</p> <p><b>Response to GSU Comment:</b> Six additional monitoring wells were installed during the Perchlorate Verification Study to supplement data for defining the extent of perchlorate in groundwater. Based on perchlorate analysis data collected from wells located upgradient and downgradient of 01_MW201, and the conceptual model for this site, the detection of perchlorate in groundwater is localized. The RI Work Plan has been revised to include groundwater sampling as part of TIER 1 activities. Results from this sampling event along with soil sampling results from Tier 1 and Tier 2 will be used to optimize placement of additional wells including cross-gradient wells.</p> <p><b>GSU Response:</b> See GSU response to comment number 3.</p>	See response to GSU Comment Number 3.

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6.		<p><b>GSU's Comment Number 8 (Response to Comment Number 10):</b> The soil sampling proposal is a systematic pattern in which soil samples are collected from two depths approximately 1.5 and 5 feet below ground surface from 25 locations per study area. The sample locations will be at the center of 170 by 170 feet grid blocks. Grid blocks that contain a previous soil sampling location will be excluded from this sampling event. In addition to the systematic sampling pattern GSU strongly recommends that soil samples be collected at the geophysical anomaly locations with samples targeted at the bottom of the former trench excavations. The plotted geophysical anomalies (Figure 2-2) show lineations that may indicate former trenches used for waste disposal. Each lineation may also contain varying amounts of waste and constituents of concern depending on the time period that the material was buried. The previous sampling of anomalies involved the collection soil samples at depths between 1 and 5 feet below ground surface. The report does not indicate whether the samples were collected at the bottom of the former trenches. Samples collected at shallower depths may have been waste, non-contaminated backfill soil, or a mixture. GSU recommends that the depth of the former trenches be determined before the proposed sampling event to help develop the sampling strategy. At each sampling location, one sample should be collected at 0.5 – 1.0 feet below ground surface and a deeper sample collected from the bottom of the former trench. Three (or more) samples per location may be necessary if the former trenches are greater than 5 feet in depth. The bottom of the trenches can be determined by trenching perpendicular to the lineations or by collecting and logging soil cores.</p> <p><b>Response to GSU Comment:</b> Existing data at these locations will be combined with Tier 1 data to determine the presence of any hot spots that may be associated with the observed geophysical anomalies. The bottom of the former trenches that were used for EOD training cannot be established conclusively by geophysical surveys. Therefore, during the Tier 2 activities trenching through the anomalies will be conducted. During this trenching, every attempt to confirm the trench bottoms will be made. If field observation confirm the bottom of the trenches, soil sample will be collected at these depths.</p>	<p>The Tier 2 Sampling Design (Section 3.3.7.2) (both in the Draft and the Draft Final Work Plans already addresses GSU's recommendation to collect judgmental samples at geophysical anomaly areas. Response to GSU's comment indicated that every attempt would be made to confirm the trench bottom and collect a sample there.</p> <p>Section 3.3.7.2 (Tier 2) will be expanded to briefly summarize and discuss the evaluation of anomaly locations in accordance with the <i>Ordnance and Explosives Range Evaluation Work Plan</i>.</p> <p>In summary, Tier 1 sampling is systematic (nonjudgmental) up to 5-foot depths. Tier 2 and 3 are judgmental sampling. Tier 2 will involve collection of samples from former trenches (as indicated by geophysical anomalies), in conjunction with OE Range Evaluation activities, by excavation using a backhoe. The maximum depth of sample collection will be either the bottom of the trench or the maximum reach of the backhoe. If the bottom of the trench is beyond the reach of the backhoe, then establishing the bottom and collecting a sample will be implemented during Tier 3 via soil boreholes.</p>

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6. (cont.)		<p>Samples to characterize any residuals (resulting from EOD training activities) within each trench/sampling location will also be collected.</p> <p><b>GSU Response:</b> The response did not address GSU's concerns. GSU recommended that in addition to systematic random sampling strategy, judgmental samples be collected to target the geophysical survey anomalies. Suspected disposal trenches should be sampled to determine if they contain elevated concentrations of hazardous substances. Tier 1 soil sampling is proposed at 1.5 and 5-foot depths. Our concern is that the 5-foot soil sample may not reach the bottom of the suspected trenches. GSU recommends that the samples depths be selected based on the observation of continuous cores. When a former trench is encountered, samples should be collected at intervals down to the base of the trench. The field geologist can adjust the depth of soil samples based on the visual examination of the soil core.</p>	