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**RESPONSE TO COMMENTS
DRAFT FINAL REMEDIAL INVESTIGATION AND
THE FEASIBILITY STUDY ECOLOGICAL RISK ASSESSMENT
FOR SITE 25
MCAS EL TORO, CALIFORNIA**

<p>Originator: Clarence A. Callahan, Ph.D., Biologist U.S. EPA</p> <p>To: Glenn Kistner, RPM U.S. EPA</p> <p>Date: 5 February 1997</p>	<p>CLEAN II Program Contract No. N68711-92-D-4670 CTO-0073 File Code: 0222</p>
<p><u>SPECIFIC COMMENTS</u></p> <p>1. Page 7-6 - The species of wildlife should include those species that are known to occur at the site for this phase of the project and it appears that an important group of food items, the invertebrates have not been sampled, "No specific surveys have been conducted for invertebrate populations at MCAS El Toro."</p>	<p><u>RESPONSES TO SPECIFIC COMMENTS</u></p> <p>RESPONSE 1: Comment noted. However, comparison of metal levels in the washes with background information for MCAS El Toro, as presented in Final Technical Memorandum, Background and Reference Levels, Remedial Investigation, Marine Air Corps Station El Toro, California, CTO-0076/0272 (October, 1996), indicated that most metal levels were below ambient background levels for the Station, including several organic compounds (i.e., DDT and breakdown products). For example, of the metals, only mercury in Marshburn Channel and San Diego Creek sediment were selected as COPECs after incorporating the regional background information. These changes in the revised ecological risk assessment demonstrate a much lower ecological risk than was first estimated. Based on this new data, CLEAN II believes that specific surveys for invertebrate populations at MCAS El Toro are not necessary.</p>
<p>2. Page 7-20, Table 7-4 - Terrestrial plant and invertebrate uptake factors. These are the numbers that have to be validated after being used in the predictive phase.</p>	<p>RESPONSE 2: Comment noted. Based on the much lower hazard quotients estimated in the revised ecological risk assessment, CLEAN II believes that a validation study is not required for Site 25.</p>
<p>3. Page 7-33 - Table 7-10 - Surrogate toxicity benchmarks for selected receptors at Site 25 shows many benchmarks that are different than the acceptable Region 9 benchmarks, for instance, arsenic, cadmium, copper, lead, mercury, nickel, selenium zinc and DDT, DDD, DDE are all higher than the Region 9 toxicity reference values except for arsenic. The result of this will underestimate the risk for the receptors at this site.</p>	<p>RESPONSE 3: The surrogate toxicity benchmarks are based on NOAELs for the different chemicals presented in "Toxicological Benchmarks for Wildlife" prepared by Oak Ridge National Laboratories (Opresko 1995). These surrogate toxicity benchmarks are considered conservative and unlikely to underestimate hazard to ecological receptors because most of the surrogate benchmarks are based on reproduction endpoint NOAELs. Furthermore, the ecological risk assessment used conservative exposure assumptions (i.e., 100 percent bioavailability and receptors feeding exclusively at either the maximum concentration or the 95 percent UCL for all dietary requirement over a lifetime). Hazards to ecological receptors are not likely to be underestimated.</p>

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<p>4. Page 7-39, Table 7-12 - Terrestrial and aquatic invertebrate and plant benchmark values. These values are of questionable use for anything more than classifying the locations into low, medium and high potential risk. These numbers cannot be used to eliminate locations and COCs from further evaluation.</p> <p>5. Page 7-39, Table 7-11 - Hazard quotients for selected receptors at Site 25. Several of the COCs produced HQs above 1.0 for several of the areas, therefore indicating that the validation phase is required. Although few guidelines are available, the Ontario Ministry of the Environment being one, it is not valid for use in Region 9 for any efforts more than a screening effort that classifies the sites into low, medium and high potential risk (see discussion on page 7-44). There are several statements made in apparent attempt to minimize the potential effects and risks of these contaminants that are not logical and supported by the data presented. For instance, "... the conservative approach used in the derivation of the soil benchmark values (NOTE: no invertebrate samples were collected) (i.e., rigorous extraction procedures) [meaning what?] may not be representative of site conditions (i.e., bioavailability of chemicals in Borrego Canyon Wash.) Note, that the bioavailability was modeled by "bioconcentration factors" rather than measured as required in a validation study.</p>	<p>RESPONSE 4: The plant and invertebrate benchmark values were not used to select COPECs for this ecological risk assessment. In the absence of specific benchmarks for plants and invertebrates for this site, the most conservative benchmarks available were used to determine whether potential impacts are occurring at the site. As the revised ecological risk assessment shows, although potential impacts may be possible for ecological receptors, it is unlikely that those impacts are associated with MCAS El Toro activities.</p> <p>RESPONSE 5: The ecological risk assessment has been revised to reflect changes in the selection of COPECs in the washes, Marshburn Channel, and San Diego Creek. Based on the results from the revised ecological risk assessment, CLEAN II believes that validation studies are not required for Site 25.</p>
<p>6. Page 7-45 - Another statement, "It is difficult to ascertain potential impacts to terrestrial and aquatic invertebrate and plant receptors since these receptors were not collected or analyzed for chemical residues" makes the need for validation studies more important.</p> <p>The report incorrectly minimizes the potential risk assessments by</p>	<p>RESPONSE 6: Based on the revised list of COPECs for the ecological risk assessment, most of the reported concentrations of metals present in the washes are below background levels. These findings resulted in a much lower ecological risk being estimated for Site 25. Based on the lower risk, CLEAN II believes that a validation phase is not required. Regarding the selection of toxicity criteria for the ecological risk assessment, see response to specific</p>

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<p>using very high benchmarks rather than those recognized by Region 9. For instance, benchmarks and the differences between those in Table 7-10, Page 7-33, compared to Region 9, expressed as ratios are as follows DDT, DDE, DDD, (2.5 times lower); copper (15 times lower); lead (13,453 times lower); mercury (59 times lower) and zinc (42 times lower). The Region 9 toxicity reference values (TRV) are more conservative and are based on a very thorough literature search including the primary citations not the secondary citations. By using the least conservative TRVs the Navy is underestimating the apparent risk.</p>	<p>comment 3 above.</p>
<p>7. Page 7-45 - Ecological Significance - There are many statements made that are not supported by data, for instance, "There are no site-specific invertebrate population data for Borrego Canyon Wash. However, the habitat may not be suitable for burrowing invertebrate populations and the potential for adverse impacts are low for invertebrate populations (no data were collected).</p>	<p>RESPONSE 7: The ecological risk assessment has been revised to reflect changes in the selection of COPECs by incorporating regional background concentrations. These changes resulted in a much lower ecological risk being estimated for Site 25. Based on the lower estimated risk, CLEAN II does not believe that a validation phase is needed.</p>
<p>8. Page 7-46 - Another illogical statement that must be validated, "Because most of the hazard at the site is from exposures to cadmium and aluminum, the surrogate benchmarks were based on forms of the metals that are not likely to be encountered in nature (i.e., chloride forms)." It is illogical and generally inappropriate to build in a conservative risk assessment and then discount the conservative nature of the effort in order to ignore the potential risk observed by the presentation. A statement made without any kind of supporting data or reasonable inference includes, "Given the conservatism in the modeled intake and reference toxicity values (remember these are very inadequate), it is unlikely that the exposures would be expressed in population or ecosystem impacts for those populations or receptors dependent on an invertebrate diet," There are no data presented in any form to address the population and certainly not</p>	<p>RESPONSE 8: The ecological risk assessment has been revised to incorporate this comment. For example, metal COPECs were selected only if their concentrations exceeded the regional background concentration. For organics, such as DDT, the risk was calculated based on site conditions and was compared to the risk due to background conditions. Based on the results from the revised ecological risk assessment, it is unlikely that potential adverse impacts to ecological receptors are associated with activities at MCAS El Toro.</p>

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<p>the "ecosystem level" for any endpoint evaluated.</p>	
<p>9. <u>Page 7-46</u> - "Based on the conservative nature of the assessment, it is unlikely that chemical exposures at Agua Chinon Wash would be expressed in population or ecosystem impacts for receptors dependent on a plant for animal diet."</p> <p>"A number of chemicals exceeded their respective NOAELs for receptors potentially present in Marshburn Channel. Most of the exceedances were less than SEVEN (emphasis added) times their respective NOAELs, except for cadmium (which was approximately 25 times its surrogate toxicity benchmark for the deer mouse). And the reason this is not significant, "However, upstream levels of cadmium were approximately 70 percent of the maximum detected concentration used in the food-web modeling." Now what?</p>	<p>RESPONSE 9: The ecological risk assessment has been revised to reflect changes in the selection of COPECs. Based on the regional background concentration for metals, only mercury was selected as a COPEC in Marshburn Channel and San Diego Creek sediment. In keeping with DTSC ecological risk assessment guidance, other (non-metal) detected chemicals were retained in the risk assessment. The potential ecological hazards associated with exposures to these COPECs in sediment were compared to ecological hazards associated with exposure at regional background levels. Results of the ecological risk assessment show that although some hazard quotients are greater than 1 (e.g., 4,4'-DDD, 4,4'-DDE and 4,4'-DDT), hazard quotients due to background exposures are greater than site exposures; this indicates that potential impacts to receptors are not associated with activities at MCAS El Toro.</p>
<p>10. <u>Page 7-47</u> - And finally, the best reason for performing validation studies include the statement, "The avian NOAEL for antimony was derived from a mammalian study (emphasis added) in which rats were given antimony potassium tartrate in water."</p>	<p>RESPONSE 10: The final list of COPECs for Site 25 has been revised and most metals of concern in sediment have not been selected as COPECs. Only mercury in sediment was selected as a COPEC in Marshburn Channel and San Diego Creek.</p>
<p>11. Risk characterization should not be a repeat of the hazard quotient results but a comprehensive comparison and contrasting of the estimated effects and the distribution of contaminant concentrations that are observed at the site. The risk characterization should place risk estimates in the context of the types and extent of anticipated effects which may be evaluated in context of several variables:</p> <ol style="list-style-type: none"> 1) the nature and magnitude of effects; 2) the spatial and temporal patterns of effects; 3) the duration of effects, and 	<p>RESPONSE 11: Comment noted. The risk characterization has been revised to reflect changes in the selection of COPECs for Site 25. Furthermore, potential impacts to ecological receptors were placed in the environmental context of the site (e.g., individual hazard quotients for DDT were greater than 1 based on exposures to site concentrations by avian receptors; however, comparable exposures to background levels were several times greater, which suggests that exposures to DDT are unlikely to be associated with activities at MCAS El Toro).</p>

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4) the potential for the system or species to recover from the effects. I don't believe that the Navy has provided an adequate risk characterization that addresses the above four points.	

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FEASIBILITY STUDY ADDENDUM, SITE 25,
MAJOR DRAINAGES
MCAS EL TORO, CALIFORNIA**

<p>Originator: John P. Christopher, Toxicologist DTSC</p> <p>To: Tayseer Mahmoud DTSC</p> <p>Date: 20 March 1997</p>	<p>CLEAN II Program Contract No. N68711-92-D-4670 CTO-0073 File Code: 0222</p>
<p><u>GENERAL COMMENTS</u></p> <p>1. Overall: The human health risk assessment is well done. The ecological risk assessment shows very large hazard quotients at several locations, due mainly to the presence of metals, but these are dismissed. We cannot accept the ecological risk assessment as written.</p> <p>2. Ambient Concentrations of Metals: Because background for metals in soils or sediments are derived from a single upstream sample in each of the drainages, it was not possible to eliminate many metals as constituents of potential (ecological) concern (COPC, COPEC). Data previously presented on basewide ambient concentrations of metals should have been used for this purpose.</p>	<p><u>RESPONSES TO GENERAL COMMENTS</u></p> <p>RESPONSE 1: The ecological risk assessment for Site 25, MCAS El Toro, has been revised to incorporate DTSC comments. Based on a comparison with regional background levels for metals, much lower hazard quotients are estimated.</p> <p>RESPONSE 2: The revised ecological risk assessment compares sediment analytical results with the background concentrations of metals in soil and sediment described in the Final Technical Memorandum, Background and Reference Levels, Remedial Investigation, Marine Air Corps Station El Toro, California, CTO-0076/0272 (October, 1996). Only those metal analytes that exceeded background concentrations were selected as COPECs in the revised ecological risk assessment. Mercury was the only metal that exceeded the background level (only in Marshburn Channel and San Diego Creek) and, therefore, mercury was selected as a COPEC in Marshburn Channel and San Diego Creek sediment. Based on DTSC ecological risk assessment guidance, organic chemicals detected in sediment were retained in the risk assessment even though chemical levels were below regional background values. The potential ecological risk to these compounds was then compared to risk due to background concentrations.</p>
<p><u>SPECIFIC COMMENTS</u></p> <p>1. Metals As COPC and COPEC, Sec. 6.1.1, p. 6-2, Sec. 7.2.2.2, p. 7-17 - The Navy eliminated naturally occurring metals as COPC and COPEC based on comparison of single samples in each drainage to an upstream sample in the same drainage. This left 2-15 metals as COPC or COPEC in each drainage and these metals drove nearly all the estimates of risk and hazard.</p>	<p><u>RESPONSES TO SPECIFIC COMMENTS</u></p> <p>RESPONSE 1: CLEAN II concurs with this comment. The ecological risk assessment was revised to include the use of background levels to determine the list of COPECs for the ecological risk assessment. When sediment analytical results were compared to background concentrations, only mercury was selected as a metal COPEC for sediment in Marshburn Channel (on-Station) and San Diego Creek (off-Station). All organic chemicals that were</p>

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<p>We previously approved the Navy's document entitled "Final Technical Memorandum, Background and California, CTO-0076/0272" (October, 1996). In this document the Navy concluded that concentrations of metals differed little among the various geological formations which comprise the base. Because sediments in the drainage channels may be expected to reflect regional soil conditions, we find it far preferable to use this body of 43 samples for selecting COPC and COPEC.</p>	<p>detected in sediment were selected as COPECs.</p>
<p>We reproduce here as Attachment 1 portions of Table 4 from the Technical memorandum to show the range of detected values for metals in the background samples, together with an estimate of the 95th quantile of the ambient distribution of each metal. In Attachment 2, these ranges and 95th quantiles are compared to detected values for metals in the drainages (Table E1-1 - E1-5) to select COPC and COPEC. The essential nutrients calcium, iron, magnesium, potassium, and sodium, are not included. It is noteworthy that many concentrations of metals in sediments in these drainages were lower than the range of detected values in the background data set.</p> <p>The analyses in Attachment 2 show that metals fall within or below the range of the regional background concentrations in every case but one. Mercury in Marshburn Channel is the only metal which should be selected as COPC or COPEC in any drainage. The single hit of mercury in Agua Chinon Wash fell above the 95th quantile of the background data set, but this value was well within the range of the detected values in the background data set. Therefore, a Wilcoxon Rank Sum test would find no significant difference between mercury in background and mercury in sediment at Agua Chinon Wash. Of all metals detected in the drainages, we recommend that the Navy select as COPC and COPEC only mercury</p>	

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<p>in Marshburn Channel. The final draft of the risk assessments should be adjusted accordingly.</p>	
<p><u>Human Health Risk Assessment</u></p>	
<p>2. <u>Tables 6-3, 6-6, and 6-7, pp. 6-15 ff</u> - Footnote e in Table 6-3 is not consistent with the body of the table nor with Tables 6-6 and 6-7. Please make these cross references agree.</p>	<p>RESPONSE 2: Comment acknowledged. The footnote in Table 6-3 will be consistent with the body of the table. Tables 6-6 and 6-7 have been eliminated from the final draft.</p>
<p>3. <u>Toxicity Values, Table EIII-1, p. EIII-2-3</u> - The surrogate value used 1,3-dichlorobenzene is the one agreed upon. However, the National Center for Exposure Assessment has published a provisional reference dose of 3E-03 mg/kg-day for this compound. Please use the new value in future assessments. Also, the Navy may use 4.7E-02 mg/kg-day as the oral reference dose for manganese, if they choose.</p>	<p>RESPONSE 3: The final RI assessed the toxicity of manganese based on the oral reference dose used for the draft. Future assessments will use the new reference dose values for manganese and for 1,3-dichlorobenzene.</p>
<p>4. <u>Risk Characterization, Sec. 6.4, pp. 6-14 ff</u> - With metals removed as COPC, cancer risks and non-cancer hazards associated with recreational use of Site 25 will be insignificant.</p>	<p>RESPONSE 4: Concur with comment. Cancer risks and noncancer hazards associated with the recreational use scenario of Site 25 will be insignificant with the metals removed as COPCs. Furthermore, The Phase I RI data demonstrated that the cumulative excess cancer risk did not exceed the 1×10^{-6} or the hazard index of 1 for sediments at the drainages and San Diego Creek.</p>
<p><u>Ecological Risk Assessment</u></p>	
<p>5. <u>Uptake Factors, Tables 7-4, 7-5, F-3, and F-4</u> - Please specify whether these factors are expressed on a wet weight or dry weight basis. Regarding uptake of organic chemicals from sediment by invertebrates (Table 7-4), it does not seem possible that a hydrophilic substance such as bis(2-ethylhexyl)phthalate could have the same value as strongly hydrophobic substances such as the congeners of DDT. Please explain this.</p>	<p>RESPONSE 5: Factors presented in Tables 7-4, 7-5, F-3, and F-4 are expressed on a wet weight basis and these tables have been revised to include this information. The uptake factor for DDT and its breakdown products from sediment by invertebrates has been revised to reflect the strongly hydrophobic nature of DDT and its potential to bioaccumulate in organisms.</p>

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<p>6. <u>Biological Effects, Sec. 7.4, p. 7-32 and Table 7-10</u> - Please make a clear reference to Table F-8, where the derivation of these toxicity values can be found.</p>	<p>RESPONSE 6: Values presented in Table F-8 are discussed in more detail in Sections F3.3.1 and F3.3.2. The derivation of the surrogate toxicity criteria used in the ecological risk assessment for the selected receptors is also discussed in Section F3.2.</p>
<p>7. <u>Risk Characterization, Sec. 7.5.2, pp. 7-45 ff</u> - After comparing metals in sediment to regional background values in soil, the number of COPECs at each site decreases. Using the remainder of the information in Table 7-11, cumulative hazard quotients (ΣHQ) can be estimated for each species. However, these values should be confirmed by the Navy's risk assessor.</p> <p>No COPEC remain for Borrego Canyon and Agua Chinon Washes. At Bee Canyon Wash, bis(2-ethylhexyl)-phthalate, the only remaining COPEC, yields hazard quotients (HQ) less than 1.0 for all species. In Marshburn Channel, levels DDT and congeners and of the herbicide dichloroprop yield a cumulative HQ of approximately 2.5 for the red-tailed hawk; ΣHQ was less than 1.0 for the other species. In San Diego Creek, ΣHQ is about 2.0 for the mallard duck due to phthalates in surface water; ΣHQ was less than 1.0 for the other species.</p>	<p>RESPONSE 7: The ecological risk assessment has been revised to reflect the changes in the selection of COPECs in the washes and San Diego Creek. No COPECs were selected for Borrego Canyon Wash or Agua Chinon Wash. Only bis(2-ethylhexyl)phthalate was selected as a COPEC in Bee Canyon Wash. In Marshburn Channel, mercury, 2,4-DB, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dichloroprop, and methylene chloride were selected a COPECs in sediment. For San Diego Creek, mercury, 4-methylphenol, 4,4'-DDT, acetone, and dalapon were selected as COPECs in sediment. Because no regional background information was available for chemicals in surface water (except upstream concentrations), all chemicals in surface water with higher concentrations downstream than upstream were selected as COPECs which include aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, lead, manganese, nickel, selenium, silver, thallium, vanadium, zinc, 1,3-dichlorobenzene, 2-methylnaphthalene, 2-nitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol, acetone, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, chloromethane, di-n-butyl phthalate, and gamma-chlordane.</p>
<p><u>CONCLUSIONS AND RECOMMENDATIONS</u></p> <p>After comparison to regional background levels in soil, all metals detected in sediments from drainages should be removed as COPC and COPEC, except for mercury at Marshburn Channel. This method is preferable to comparing to a single upstream sample. Eliminating these metals removes nearly all risks and hazards. The risk assessments, especially the ecological assessment, should be corrected to reflect the proper suite of COPC and COPEC.</p>	<p><u>RESPONSE TO CONCLUSIONS AND RECOMMENDATIONS</u></p> <p>For the revised ecological risk assessment, only mercury was selected as a metal COPEC in Marshburn Channel (on-Station) and San Diego Creek (off-Station) as mercury concentrations from these drainages exceeded the background concentration.</p> <p>For the revised human-health risk assessment, results of the Phase I RI (Jacobs 1993b) demonstrated that for all of the drainages and San Diego Creek, risk to human health from sediment was characterized by an excess cancer risk of less than 1×10^{-6} and a hazard index of less than 1. Consequently, for the Phase II RI, sediment samples from Marshburn Channel were collected and analyzed to</p>

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	<p>assist with the ecological risk assessment only. The Phase II sample data were compared to the Phase I sediment data and to background values established in the Final Technical Memorandum on Background and Reference Levels (BNI 1996a). This comparison showed that among the Phase II downstream sediment sample results, only copper (11.6 mg/kg) exceeded the background level of 10.5 mg/kg. The Phase II result for copper was less than the Phase I concentration of 12.4 mg/kg. These data corroborate the Phase I results and suggest that the additional sample results would not increase the cumulative cancer risk to a level greater than 1×10^{-6} and the hazard index would remain less than 1. Thus no COPCs in sediment were selected from the drainages and the creek.</p>

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<p>Originator: Lawrence Vitale CRWQCB</p> <p>To: Tayseer Mahmoud, RPM Cal EPA</p> <p>Date: 5 February 1997</p>	<p>CLEAN II Program Contract No. N68711-92-D-4670 CTO-0073 File Code: 0222</p>
<p><u>GENERAL COMMENTS</u></p> <p><u>EXECUTIVE SUMMARY</u></p> <p>1. Page ES-1 - The second paragraph states that Site 25 was once thought to be a source of regional groundwater VOC contamination but the draft Final Phase II RI for Site 24 demonstrated that Site 24 was the source of groundwater contamination, not Site 25. Based on this scenario, please explain the objective for this RI/FS addendum for Site 25.</p>	<p><u>RESPONSES TO GENERAL COMMENTS</u></p> <p>RESPONSE 1: The objectives of this RI/FS addendum are to characterize the nature and extent of contamination by building on the results of the Phase I RI, estimate the risk to human health from exposure to surface water, estimate the ecological risk due to sediment and surface water, and determine whether an FS is required for the site. In summary, the results of the RI suggest that historical agricultural practices, natural geologic conditions, and runoff from parking areas and roadways can account for most of the COPCs found in surface water and sediment at Site 25. Petroleum contamination beneath Agua Chinon and Bee Canyon Washes appears to be due to small surface discharges and is limited in extent both horizontally and vertically. Based on the findings of this RI, an FS is not needed and this site is recommended for no further action.</p>
<p>2. Page ES-3 Subsurface Soil - A Phase I soil sample collected beneath Agua Chinon had a reported concentration of 131,000 mg/kg TPH as gasoline and 15,300 mg/kg TPH as diesel at a depth of 17 feet below ground surface. The report states that the TPH contamination has been delineated vertically and horizontally. Please explain what if any action was taken to remediate the contamination.</p>	<p>RESPONSE 2: No action was taken to remediate the contamination as the release appeared to be very limited in horizontal and vertical extent, and does not appear to impact groundwater.</p>
<p><u>SECTION 8, CONCLUSIONS</u></p> <p>3. Page 8-2, Surface Water - The first paragraph states, "Results from surface water sampling indicate that there is no significant Station contribution beyond what is expected in an urban environment." Also, "These low concentrations are typical of storm water runoff from parking lots and roadways." Please provide the source of information used to characterize the expected runoff from an "urban</p>	<p>RESPONSE 3: The basis for these statements was a comparison of upstream and downstream analytical results, and a review of the area land use and watershed geology. The phrase "typical of storm water runoff from parking lots and roadways" and the reference to expected runoff conditions from an urban environment have been deleted from the draft final RI.</p>

**RESPONSE TO COMMENTS
DRAFT PHASE II REMEDIAL INVESTIGATION/
FEASIBILITY STUDY ADDENDUM SITE 25 -
MAJOR DRAINAGES
MCAS EL TORO, CALIFORNIA**

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environment” and “typical” stormwater runoff from parking lots and roadways.	