

FOR OCTOBER 31

Meeting Minutes

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MCAS EL TORO
SSIC # 5090.3

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CLEAN II
Interoffice Memorandum

To: David Cowser Bechtel

Subject: **Meeting Minutes for the Progress Meeting** Date: 24 October 1994
Phase II RI/FS Work Plans
MCAS El Toro, CTO-059 From: Tim Latas

Of: Kleinfelder

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MEETING DATE: 12-13 October 1994
MEETING TIME: 1000-1630, 0900-1430
ATTENDEES: See Attached Sheets

AGENDA: Provided by Tim Latas on October 24, 1994

Introduction - Purpose and Objectives

Tim Latas of Kleinfelder began the October 24 RI/FS Update Meetings held at Kleinfelder, San Diego with a brief introduction and a review of the day's agenda. The October 24 Update Meeting was held to discuss the specific approaches and sampling strategies for the implementation of specific RI/FS activities at MCAS El Toro. The update meeting specifically covered the composition of the Work Plan, the possible field screening, analytical techniques, detection level requirements for site specific discussions for the VOC Source Area, and some discussion regarding site specific decisions for the landfills. The information presented and comments submitted during the meetings are to be used in preparing the Work Plan, FSP, and QAPP. These plans are scheduled to be submitted to the reviewing agencies on December 9, 1994. On October 24, Tim Latas, Pat Brooks, and Katrina Lyons of Kleinfelder, presented briefings on the RI/FS approaches for the Work Plan, the QAPP, VOC Source Areas (Sites 24 and 25), and Landfills (OU-2 Sites).

Rationale for Draft Final Phase II RI/FS Work Plan

Tim Latas began the RI/FS update meeting with a presentation on the rationale for the Draft Final Phase II RI/FS Work Plan. Handouts were distributed outlining the presentation which included the objective of the Phase II RI/FS, the basis of Draft Final Phase II Work Plan, comments on the Draft Phase II Work Plan, and changes in the Draft Final Phase II Work Plan. Also included was information regarding the tiered approach, field screening, sampling programs, schedule, and costs. The following describes the information relayed in the presentation:

The objectives of the Phase II RI/FS include guidance from the 1988 CERCLA Guidelines and the ultimate goal defined as base closure by 1999. CERCLA Guidance includes, "Characterizing the nature and extent of risks posed by uncontrolled hazardous waste sites," and to "Gather information sufficient to support an informed risk management decision regarding which remedy appears to be most appropriate for a given site." Ultimate goal considerations are: 1) high certainty in risks associated with sites; 2) to expedite remediation where needed; and, 3) to document where remediation is not necessary.

- The basis of the Draft Final Phase II Work Plan includes:
 - 1) Phase I Results involving site and strata (unit) boundaries, analytical results (COPCs, Preliminary RBCs), Geology, Hydrogeology, Sensitive Species and Habitats, and Soil Gas information.
 - 2) Regulatory Agency Comments
 - 3) Soil Gas Survey
 - 4) Interviews
 - 5) RCRA Interviews
- Comments on the Draft Phase II Work Plan consisted of the following:
 - 1) Did not *optimize* sampling plan to characterize nature and extent
 - 2) Would require *additional phase* after Phase II effort
 - 3) *Homogeneity* assumption may not be valid
 - 4) DQOs not written in *7-step DQO* process
 - 5) Vleach model may not be accurate
 - 6) Need to *maximize* field screening
 - 7) Eliminate *redundancy* in documents
- Changes in the Draft Final Phase II Work Plan are:
 - 1) Use of a Tiered Approach
 - 2) Field Screening
 - 3) Judgmental Sampling (particularly in the VOC Source Area) and Systematic (search) Sampling using a grid system for hot spots delineation
 - 4) SACM and Removal Actions
 - 5) Emphasis on extent to establish: 1) finding hotspots (areas of unacceptable risks); 2) evaluating remedial or removal actions; 3) providing accurate schedule and cost of remedial or removal actions; and, 4) confidence in NFA (areas of acceptable risk).
 - 6) Presumptive remedies to be used in landfill efforts
- The Tiered Approach would be applied to each site in the following manner:
 - 1) Tier 1 includes less expensive methods such as field screening (immunoassay, portable GC) and is intended to cover large areas.
 - 2) Tier 2 will include more expensive methods (GC/MS, analytical testing for metals) and will focus on areas of higher concentrations.
 - 3) Tier 3 involves assessing the human and ecological risks and developing and evaluating feasible remedial and removal actions if needed (pilot testing for SVE or sparging).
- Field screening efforts will consist of the following:
 - 1) Sample observations such as odors or stains
 - 2) PID/FID used primarily for volatiles
 - 3) Immunoassays used primarily for PAH and PCBs
 - 4) Portable GC or GC/MS for organics
 - 5) Mobile laboratories used mainly for fuel hydrocarbons

Some things still being evaluated include assessing field analyses detection limits and analytes to RBCs, PRGs, and CLP (some methods may not coincide with the required low detection levels) as well as assessing the number of field screened samples versus the number of laboratory samples to confirm the confidence level.

- Sampling programs are comprised of the following components:
 - 1) Systematic (search) sampling (mode of statistics looking for hot spots)
 - 2) Judgmental sampling from deeper borings, monitoring wells, sediment samples, and ecological samples
 - 3) A potential to use random sampling acceptable for estimating mean values and total if the population is homogeneous (if these assumptions have not been overridden)
- The overall schedule is being driven by the ultimate goal of base closure in 1999. Currently, the Phase II RI/FS is planned to begin on April, 1995. The field efforts for the VOC Source Area, Landfill efforts, and OU-3 sites are expected to take anywhere from 6 to 8 months. The Desalter Project, scheduled to begin in 1996, is a consideration to completing some aspects of the RI/FS.
- Costs must also always be a consideration in this project. The following outlines areas of the controlled costs as well as areas which have an impact on costs:
 - 1) Control on costs include utilizing field screening to reduce the number of offsite analyses, one mobilization, and designate the proper methods to assess risks and feasibility analyses
 - 2) Impacts on costs include deep groundwater, number of known or suspected areas of deep contamination, and RBCs requiring low detection limits which increase laboratory costs

Discussion Points:

1. Bonnie Arthur mentioned a problem calling the report a draft "final" citing that this name would required only a 30 day review period. It was mentioned however, that 60 days for review of the reports had already been included in the schedule.
2. Vish Parpiani asked if the CLEAN II Team had been using a database compiled by SWDIV which included a large number of geotechnical boring logs. The CLEAN II Team and CLEAN I representatives did not have knowledge of this database.
3. It was emphasized that despite the overall approaches as defined for the Work Plan, it was understood that site specific goals will be recognized

Action Items:

1. Jason Ashman is to look for the SWDIV database containing geotechnical information mentioned by Vish.

Phase II RI/FS Analytical Methods and Detection Levels

Stacie Wissler presented information regarding the different analytical methods, field screening methods, and possible detection limits to be used during the Phase II RI/FS. The purpose of this presentation was to provide information so that the regulators and CLEAN II Team could decide which methods would be the most time and cost efficient while providing the best analytical data possible. Handouts for the presentation were distributed and information was presented on gas chromatography, gas chromatography/mass spectroscopy, immunoassay and mobile laboratories. The presentation consisted of the following information:

- The presentation began by defining MCAS El Toro as a Superfund site, or a site on the National Priorities List. Thus, MCAS El Toro is required to use Level D QC as defined by NEESA, and must also use EPA CLP methods. However, it has been requested that El Toro use Risk Based Characteristics (RBCs) for clean-up levels. Unfortunately, RBCs are substantially lower than regular detection levels, requiring more expensive analytical methods to achieve these levels. The information presented is intended to clarify the use of some of the analytical methods and decide which may be used and which areas will require specific analytical methods to evaluate the RBCs.
- Gas Chromatography was the first field screening method presented. Ms. Wissler described the technique and then mapped out the advantages and disadvantages of this methodology. Advantages for this methodology

included the speed of analysis, resolution, both qualitative and quantitative analysis (which are compared to a reference standard which has been previously calibrated), sensitivity (detection can go to 0.5 ppb), simplicity, and inexpensive costs. The main disadvantage is that it cannot identify unknown compounds as well as other methodologies.

- Gas Chromatography/Mass Spectroscopy (GC/MS) was the second methodology described. After the technique was explained, the advantages and disadvantages were compared. The advantages consisted on being able to identify a wider array of unknown compounds in a samples from a large library of identified compounds and their daughter compounds, as well as also being able to perform both qualitative and quantitative analyses. The disadvantages include not being as sensitive as GC, being more expensive on a per sample basis, and it may require more time to perform than GC.
- The third methodology presented was immunoassay. The technique was described and the advantages were identified as follows: 1) faster results than the GC or GC/MS, 2) both qualitative and quantitative analyses can be performed, 3) least expensive on a per sample basis, 4) certified technology by EPA methods, 5) highly specific antibodies, and 6) it has been very successful in the medical industry.
- Ms. Wissler provided a graph detailing the cost, turnaround time, and detection limits associated with five analytical methods as stated by three laboratories. This illustrated the costs associated with each analysis and what may be required for the special analyses dictated by the RBCs. These were then contrasted with the costs associated with other types of field screening, namely mobile laboratories and immunoassays kits. Further details regarding these two options are outlined below:
 - 1) Mobile laboratories will be used primarily for EPA Methods 8010/8020/8015m/418.1. The cost associated with this is approximately \$1500/day for 16-30+ analyses. The advantages to this option include fast results, valid qualitative and quantitative data, QA/QC procedures, and data which can be confirmed at a fixed laboratory.
 - 2) Immunoassay kits costs approximately \$35.00 per sample and can handle a high sample volume. The kits come complete with all equipment needed to analyze samples. Eight hour training and certification are available and highly recommended. It only takes approximately 45 minutes to analyze 4 samples. Confirmation of quantitative screening can be performed in a fixed based laboratory. The tests are analyte specific while ignoring all other compounds that could otherwise cause interference. QA/QC procedures of EPA approved methods can be performed. Finally, the successful use of this methodology will limit the number of non-detect samples sent to a fixed laboratory for testing and thus allows your fixed based laboratory analyses to be more cost effective.
- In conclusion, at a minimum, 10% of all field screening samples will be sent to a fixed based laboratory to confirm both positive and negative results.

Discussion Points:

1. It was mentioned that GC/MS may not be necessary as most of the compounds for El Toro have already been identified.
2. Stacie Wissler mentioned that development of field screening using GC/MS was occurring at Tufts' University and that she would research it.
3. A question was posed regarding the low detection limits of the RBCs and if GC/MS could accommodate those. Ms. Wissler answered that GC/MS can go to low detection limits on some analyses, but not on all. It was also mentioned that if the detection limits were pushed too low, the data values would be questionable. Ms. Wissler suggested defining the detection limits as the instrument detection limit. Bonnie Arthur also mentioned that there is limited availability for mobile GC/MS.
4. A discussion ensued regarding the immunoassay tests. Ms. Wissler mentioned that the PAH, PCB, and TPH methodologies were all approved by the EPA. However, TPH will be analyzed by EPA Method 8015 in a mobile laboratory for the Phae II RI work. It was reiterated that this would be a good way to reduce the number of non-detect samples analyzed at the offsite lab. The detection limit can get down to 0.4 ppm for PCBs.
5. Ms. Wissler appealed to the regulators to make a decision regarding the detection limits as the laboratories would need to know these in advance to quote pricing and timing needs.

6. It was mentioned that HPLC EPA Method 8310 gives lower detection than 8270, but demonstrated that it is not a common method in southern California laboratories. No decision has been made regarding which method to use.
7. It was stated that mobile laboratories can analyze for low detection limits and can do a lot of analyses in a smaller period of time.
8. Bonnie Arthur questioned if most mobile laboratories have a second column that do GC. Ms. Wissler responded that most do have a second column and that second column confirmation would be ideal.
9. CH2MHILL suggested that when sending the samples to the lab, the lab it should always use CLP methods.
10. Bonnie Arthur questioned that if only 10% of the field screened samples would be going to the fixed based lab for confirmation, and these samples were taken through judgmental sampling and selected samples were being sent to the laboratory, would this affect the validity of the field screening. Ms. Wissler responded that both non-detects as well as positive detections would be sent to the fixed based lab.
11. Yueh Chuang stated that all samples used to confirm a NFA site should be sent to a fixed based laboratory. John Broderick mentioned that for some sites, already have samples performed by fixed based laboratories. Bonnie Arthur agreed in that the field screening can be used as extra confidence. However, 10% of field screen samples will be sent offsite to verify field screen results.
12. Pat Wiegand mentioned that the Risk Assessors stated that if 10% of the samples were analyzed at a fixed based laboratory and these conclusions agreed with the field screening analyses, then all of the field screening analyses would be acceptable to use for risk assessments.
13. Bonnie Arthur mentioned that 10% of field screened samples sent to a fixed based laboratory is the EPA minimum guidelines.
14. Stacie Wissler began a discussion regarding RBCs values vs. CLP values. Bonnie Arthur stated that this requirement would depend on a site by site basis. John Broderick suggested that analyses begin with CLPs. If hotspots were defined, then move to RBC detection limits.
15. Bonnie Arthur requested that metals be tested for if applicable. It was stated that if it is known that PNAs are present, then RBCs should be used. In this manner, the RBC requirement may also be directed by a specific chemical.
16. Another discussion regarding immunoassays ensued. The detection limits were identified for TPH at 10 ppm and for PCBs at 0.4 to 1.0 ppm. Bonnie Arthur mentioned concern for TPH detection limits only at 10 ppm. It was stated that the immunoassay would be used primarily for PCBs and that mobile laboratories would be used for TPH. It was also stated that the detection limits for PAHs were 1.0 ppm. It was also stated that the immunoassay methodology leaned to the positive. This reduces the number of false negatives; if anything, a false positive will occur, but the success rate for this methodology has been 95%.

Action Items:

1. There appeared to be a consensus approving the proposed field screening method with 10% of the field screened samples sent offsite for analyses including non-detects and positives.
2. There also appeared to be agreement on the idea of using CLP detection limits unless a hotspot is identified, and then perhaps RBCs will be used. This will limit the number of expensive analyses required.

Phase II RI/FS Sampling Strategy for the VOC Source Area

Pat Brooks presented a discussion on the proposed investigation and sampling strategy for the VOC Source Area (Sites 24 and 25). Handouts were distributed with an outline of the presentation and maps of the VOC Source Area. The figures were used to illustrate the most contaminated areas in all media. Costs associated with the proposed geophysical investigation and a schedule for performing the field work was also included. The primary goals of the RI/FS strategy is to identify and characterize the nature and extent of the contamination and to collect sufficient data to support the remedial decision making. The presentation outlining the proposed strategy consisted of the following:

- The Phase II RI/FS for the VOC Source Area was based on results of previous investigations including data from soil investigations, soil gas surveys, and groundwater investigations.

- The objectives of the Phase II RI/FS for the VOC Source Area is to support risk management decisions, to determine the nature and extent of contamination, and to perform remedial method pilot testing.
- The current locations of contaminated areas and media were described illustrating the location where soil gas showed a large amount of contamination and the area of contaminated groundwater that is approximately 1500 - 2000 feet downgradient. Pat Brooks offered three hypothesis to explain this.
 - 1) The TCE source is in the area of the soil gas contamination and the contaminant infiltrated vertically to the groundwater table. The soil source became depleted and the groundwater hotspot then moved downgradient to its current location.
 - 2) The TCE contamination began to vertically migrate and then it came in contact with a possible clay layer which allowed the contamination to migrate horizontally to its current location.
 - 3) There is a possible unidentified source at the location of the groundwater hotspot. However, no contaminated soil gas was found around the “hottest” well during the Soil Gas Survey.
- In order to determine the stratigraphy and migration pathways, the following was proposed:
 - 1) Drill 8 mud rotary borings to the water table
 - 2) Perform continuous soil sampling for lithologic analysis (ten foot core barrel)
 - 3) Perform geophysical logging including resistivity (to distinguish fluid types), spontaneous potential (for bed boundaries and relative permeability), and gamma ray (to determine clay content and bed boundaries)
- The purpose of this investigation is to attempt to find the tentatively identified clay layer that may control horizontal migration of contamination. Evidence for this clay layer, named “clay layer II” is seen at approximately 60 feet below ground surface (at the pinchout) and will be further assess with cpt, hollow stem and mud rotary drilling, and geophysical logging. The location of the proposed borings are between the area of the soil gas hot spot and the groundwater hot spot.
- The costs associated with the mud rotary borings were presented and compared with other types of drilling methods. The approximate cost of a mud rotary boring is about the same as a hollow-stem auger boring. The cost for down hole geophysics for each hole is approximately \$2,500 additional per boring.
- The soil gas characterization investigation was presented. It was stated that currently, the deepest characterization of soil gas was to 30 feet below ground surface. The intent is to continue that characterization to at least 50 feet below ground surface using CPT (deeper if possible). The purpose of this to connect the soil gas with the groundwater plume. It is proposed to take approximately 175 samples collected in the permeable layers identified with the CPT (and other lithologic data) between 30 and 50 feet. The locations of all the samples was outlined in the handout illustrating approximately 100 samples to be taken from the main soil gas area and approximately 75 samples to be taken from outside the main soil gas area. .
- The soil gas investigation will continue using hollow-stem auger borings if CPT cannot collect samples of deep soil gas. Approximately 60 soil gas samples have been proposed to be taken from 50 - 120 feet below ground surface. The purpose of this activity is to connect the shallow, intermediate, and deep soil gas plumes to the groundwater plume. It was stated that both hollow stem auger and air rotary methods should be able to hit the groundwater table. It was also emphasized that soil sample collection would be based on lithology and field screening and not solely by collecting samples at pre-determined 5-foot increments. Soil samples will be collected at minimum 5-foot increments.
- To characterize the nature and extent of VOC contamination in the subsurface soil the following is proposed:
 - 1) 37 hollow-stem auger borings, 19 of which will be continuously sampled, 18 of which will drive samples every five feet; soil vapor extraction wells to be installed where contamination is found
 - 2) 12 air rotary borings from which drive samples will be taken at minimum 5-foot intervals; installation of monitoring and air sparging wells
 - 3) 20 backhoe test pits from which grab samples will be taken based on field screening
 - 4) 10 hand auger borings from which grab samples will be taken based on field screening
- Soil sample analyses will consist of the following:
 - 1) Field screening utilizing portable flame-ionization detector, portable photo-ionization detector, and field gas chromatograph
 - 2) Mobile laboratory analyses of soil samples for VOCs by EPA Method 8010
 - 3) 10% of the soil samples analyzed by the mobile lab will be submitted to a NEESA Level D analytical laboratory for analyses by EPA Methods 8010 and 8240

- 4) The 10% sent to the lab will consist of both positive and negative results; the 8010 is used due to its lower detection level and the 8240 will be used to confirm what was found by the GC.
- The vertical characterization of the VOC-impacted groundwater is to be completed with air-rotary/casing driver drilling methods. Up to three deep well will be drilled to 250, 350, and 400 feet below ground surface. One deep well will be drilled near 22_DBMW47 and one deep well will be drilled near 08_DGMW74. All the wells proposed by CH2MHILL have been included. Based on the past information, it was stated that there was confidence in being able to characterize the vertical extent with possibly only one well. It was emphasized that if the vertical extent was delineated with one well with non-detects, then the other wells do not need to be installed.
 - The horizontal characterization of the groundwater is composed of:
 - 1) Two water table wells drilled 400 feet northwest and 650 feet northeast of well 09_DBMW45
 - 2) One water table well drilled approximately 250 feet southwest of Building 435
 - 3) One water table well drilled approximately 400 feet north of well 18_BGMW03
 - 4) One water table well drilled approximately 400 feet north of Building 297
 - 5) This includes all wells proposed by CH2MHILL and two additional wells to define the extent of the plume "hotspot"
 - Monitoring well construction was presented to consist of the following:
 - 1) 4-inch diameter SCH 40 PVC Casing
 - 2) 4- inch diameter stainless steel screen
 - 3) 40 feet of screen for water table wells (to account for drop in water table which may occur after the desalter begins operation)
 - 4) 20 feet of screen for deep wells (designed for consistence with the CH2MHILL work)
 - 5) Slotted will depend on formation - 0.010 / 0.020
 - 6) Filter pack will depend on slots and the formation
 - 7) Bentonite seal
 - The proposed groundwater sample analyses was distributed in the handout and reviewed
 - One pilot test proposed is an air sparging pilot test which includes the installation of two air sparging wells in the 09_DBMW45 area. Test data to be collected will include the effective radius of influence, optimum sparging well spacing and depth, groundwater VOC mass removal rate, spacing of SVE wells for sparging air capture, and the expected time of cleanup.
 - Another pilot test proposed was a SVE pilot test. The test data collected from this will include the effective radius of influence, optimum SVE well spacing, concentration of VOCs in the soil gas, soil gas VOC mass removal rate, treatment method for effluent air, and the expected time of cleanup
 - Surface water characterization at the major drainages will also continue to evaluate non-point source contributions to surface water contamination. This investigation will include sampling during the first storm event at Agua Chion, Bee Canyon, Borrego Canyon, Marshburn Channel, and San Diego Creek. These samples will be analyzed for VOCs, SVOCs, Pesticides, PCBs, Herbicides, TFH gasoline, diesel, metals, and general chemistry
 - The subsurface soil investigation at the major drainages will consist of:
 - 1) Three HSA borings at Agua Chion Wash and one HSA boring at Bee Canyon Wash. These will be continuously sampled for lithology and field screened with FID, PID, and Field GC
 - 2) These soil samples will be analyzed for previously detected contaminants including VOCs, SVOCs, TFH gasoline, and TFH diesel
 - 3) These borings will be completed as vapor extraction wells if VOC contaminated soil is encountered
Some of this activity will coordinate with the EE/CA actions
 - Sediment sampling will be taken at the major drainages to evaluate the risk to ecological receptors. Upstream and downstream samples will be taken at Marshburn Channel and will be analyzed for previously detected contaminants such as pesticides, PCBs, and metals (mercury).
 - In conclusion, the schedule was presented totaling approximately 70 weeks from the beginning of the field work to finalizing the FS report

Discussion Points:

1. A discussion ensued regarding the second hypothesis suggested by Mr. Brooks. John Broderick stated that he wouldn't expect a clay layer to be so dipping. Tim Latas mentioned the possibility of the facies shifting. John Turbeville suggested that the dip is actually pretty shallow. John Broderick also stated that a fine grained layer is capable of holding a lot of contamination and perhaps the materials moved through the clay as suggested in hypothesis 1.
2. Yueh Chuang mentioned that CH2MHILL recently received the pumping data from Orange County and found that there was one well, TIC 55, located within the base boundary and that it was by the DW cluster where the screens are higher. He stated that on the average it pumps 268 gallons/minute, but they have noticed that when it is pumping it actually pumps maybe 450 - 500 gpm. Pat Brooks responded by stating that this possibly could be pulling the contamination both vertical and horizontal, however the well was sampled and there were very low concentrations of TCE (low ppb) detected. Mr. Chuang stated that the change in water levels were definitely noticeable while performing the pump tests and they believed this was attributed to Tick 55. Bonnie Arthur questioned what the water in this well is used for and it was stated that its purpose is for agricultural uses.
3. A discussion ensued regarding the use of stratigraphy and the 8 mud rotary borings. Bonnie Arthur questioned what type of stratigraphy data for shallow depths was available. John Lovenburg stated that all the lithologic samples from the Phase I were in the trailer at MCAS El Toro and could be studied. Pat Brooks stated that he would definitely like to look at them however, the sampling done before was not continuous and the mud rotary would provide a better stratigraphic picture than the previous borings.
4. Yueh Chuang questioned the possibility of hitting a DNAPL while drilling. Pat Brooks responded that this was the purpose of doing continuous drilling so that the samples could be analyzed continuously to look for possible DNAPL. However, he did not think that there will be much, if any DNAPL. His reasoning is that the TCE probably mixed with the water. John Broderick agreed stating that the concentrations detected are not high enough to indicate the existence of a DNAPL. John Turbeville stated that the density flow and transport of water with dissolved TCE in the unsaturated zone is similar to a DNAPL in a saturated zone. Because of low concentrations, a DNAPL is not expected on Site 24.
5. Again the second hypothesis was discussed. Several maps were examined and John Turbeville illustrated where there may be an edge to "clay layer II" and showed a ponding effect by the groundwater hotspot. It was stated that it was difficult to confirm this hypothesis as the data in the area is sparse. John Lovenburg and Yueh Chuang were skeptical of the hypothesis stating that the groundwater contamination may have moved due to seasonal groundwater changes. John Broderick stated that if the movement of the contamination occurred solely due to groundwater flows and pumping disturbances that this would have been detected by monitoring data. However, no monitoring was ever performed. John Broderick also mentioned that this same problem occurred at Norton Air Force Base, but no data nor conclusions have been produced.
6. Ginny Garelick mentioned the study of the area's regional groundwater performed Argonne Laboratory and suggested that it was worth examining. John Broderick stated that MCAS El Toro was too distal from the region addressed by that study and thus the conclusions would probably not be influential.
7. Yueh Chuang mentioned that unfortunately there was no soil gas data in the area which would possibly prove the hypothesis. Pat Brooks mentioned that he would liked to have seen flow measurements in the soil gas surveys. John Broderick posed the question is the hypothesis worth spending the money for the holes.
8. Pat Brooks stated that he thought it would be beneficial to try three holes first and then analyze the results. It would then be possible to hold a meeting to decide it would be beneficial to continue with mud rotary borings. Mr. Brooks stated that if it appeared successful he would like to continue with the other five, however if the efforts were unsuccessful, he agreed that it would not be worth spending the money on the extra five borings. Juan Jimenez, Bonnie Arthur, Larry Vitale, and Ginny Garelick all agreed that this would be a good strategy. John Broderick also stated that these efforts would be beneficial as this information would be necessary for re-construction of the stratigraphy in order to design a remediation system.
9. Joe Zarnoch questioned if this information was truly necessary for remediation. Pat Brooks responded that the data drawn from these borings would not only help with well placement, but would also provide insight into the fate and transport possibilities of the contaminant. Mr. Brooks stated that this information would not be necessary for groundwater clean-up, and soil contamination clean-up, and that it is crucial to clean up the soil if it is desired to clean up the groundwater.
10. The question was raised if field screening would be performed on the mud generated from the mud rotary borings. Mr. Brooks stated that some field screening with the FID and PID would be performed.

11. A discussion regarding the intermediate depth soil gas characterization using CPT ensued. John Broderick stated that in order to drill these borings it would be necessary to coordinate with the appropriate buildings. John Lovenburg mentioned how patching was performed in Phase I and Pat Brook stated that it would be performed in the same manner in Phase II.
12. Joe Zarnoch questioned if any hydrocarbon hits had been identified. It was stated that only a few were identified by the UST areas and in Agua Chinon.
13. It was agreed that with the appropriate equipment, the CPT should be OK to 50 feet bgs. However, there may be some problems near Agua Chinon due to gravels. The problems with the CPT will vary depending on the area. Pat Brooks stated that contractor thought there would be no problem with 50 feet. The contractor has not worked on the base but has worked in the Irvine basin.
14. Bonnie questioned how soil gas would be collected below 50 feet. Pat Brooks stated that below the levels possible with the CPT, soil gas samples would be taken from a hollow-stem auger. A discussion ensued regarding the procedures used to take a soil gas sample from a hollow-stem auger.
15. It was stated that the data collected from the geophysics investigation could also be used in these efforts to define the location of permeable zones from which to take soil gas samples. Joe Zarnoch questioned if it would be possible to locate the "clay layer 2" using just the CPT. John Turbeville responded that the CPT would be calibrated with the geophysical logs for best accuracy when projecting data. Tim Latas also stated that it was not desired to rely solely on the CPT for lithologic information.
16. Sherrill Beard examined the proposed locations of the first three mud rotary borings proposed. She stated that she was not convinced that it would be possible to correlate the data over the amount of distance between the three borings. She stated that it would depend on how continuous the stratigraphy is. Joe Zarnoch questioned how it would be possible to remediate the area if the borings were too far apart. Tim Latas responded that there would also be CPT data and data from hollow-stem augers.
17. Bonnie Arthur began a discussion regarding the type of analyses to be used. She stated that she would like to research the use of 8240 for field screening and that maybe it would be necessary to submit only a portion of confirmation samples for 8240 analyses.
18. Joe Zarnoch questioned how many soil samples were to be analyzed. Pat Brooks responded that the number was approximately 500 samples. Joe Zarnoch emphasized that he did not wish for too many samples to be analyzed, especially since there had been problems with the loss of VOCs from the samples. Mr. Zarnoch stated that perhaps more soil gas samples could be taken instead. John Broderick mentioned that some soil samples were necessary because soil gas does not work everywhere, especially at lower depths, as mentioned by Bonnie Arthur. Pat Brooks also stated that he would use the stratigraphic information to decide from which areas he would need to take soil samples as well as to decide how to place the screens in the wells.
19. Yueh Chuang brought up the problem of wells which had been proposed in this area but were to be used for the OU-1 site. These wells had been proposed to get better "control" of the plume. Jason Ashman previously had written that OU-3 wells were not to be used for OU-1 in a way to explain that there were fewer wells proposed for OU-3 because the wells for OU-1 were not involved in the OU-3 investigation. Jason Ashman stated that he would try to find out under which investigation the status of these wells is to be handled.
20. John Broderick mentioned the need for an overall groundwater monitoring plan and hopes that this issue of its funding will be address shortly.
21. Joe Zarnoch initiated a discussion regarding air sparging and questioned why sparging would occur in an area where there was no soil contamination. Pat Brooks responded that sparging would be used the remove dissolved VOCs from the groundwater and sorbed VOCs from the aquifer skeletal material. A vapor extraction well would be installed in the same boring as the air sparging boring to collect the air sparging gas. This is the proposed dual extraction system as opposed to the pump and treat method which Pat Brooks stated was really just moving the contaminated groundwater.
22. Yueh Chuang questioned if the CLEAN II Team had anticipated changing the conclusions depending on the type of data the investigation recovers. Pat Brooks stated that all remedial options will be based on the data collected from the investigation and that conclusions could easily change.
23. A discussion ensued contrasting and comparing the differences between air sparging and pump and treat. John Broderick supported the air sparging test. Yueh Chuang stated that the pumping tests performed in Phase I had not collected sufficient data to make any conclusions. He stated that the aquifer characteristics were not completely understood and that a pump and treat test was necessary to fill the data gap. This was

concurrent with by all present and Pat Brooks agreed to discuss a deep well for a long term pump test with the Navy (it may not be in the scope of work).

24. A discussion began regarding the influence of the desalter operations on the project. John Zarnoch stated that the Navy's previous position was to treat the contaminated water on-site and then send the discharge to the desalter. TDSs has not been considered a problem. The Navy wants to be certain that any possible DNAPL can be treated before it is handled by the Orange County Desalter Plant.
25. John Lovenburg mentioned that all wells below 200 feet use schedule 80, 5-inch diameter PVC casing. Further discussion continued regarding the screening of the wells. It also was decided that the bentonite seal would be mixed on the surface and then tremied down the well. Sherrill Beard requested a cross-section of proposed monitoring and sparging well to be included in the Work Plan.
26. Juan Jimenez questioned if Soil Vapor Extraction was acceptable to the Navy. Ginny Garelick responded that it was as SVE is a presumptive remedy. Sherrill Beard asked where the pilot test would be performed. Pat Brooks responded that it would be done in the most contaminated area of soil. Bonnie Arthur questioned if Agua Chinon should be tested. Joe Zarnoch commented that there used to be an engine test pad at that location.

Action Items:

1. Pat Brooks, Yueh Chuang and John Lovenburg need to share information regarding the lithology samples in the trailer at MCAS El Toro and pumping data. Information also needs to be shared regarding the boundaries of some of the sites as the crash crew pits may have moved.
2. It was decided that three borings would be installed initially to test the success of geophysical logging and then a meeting would be held to decide if this technology should continue to be used. Pat Brooks is to incorporate this into the Work Plan.
3. Bonnie Arthur and Pat Brooks are to discuss which samples should be analyzed by 8240.
4. Jason Ashman is to determine under which investigation should the wells located in Sites 25 and 25 but associated with OU-1 be handled.
5. Pat Brooks is to incorporate the new sealing method for the wells in the Work Plan.
6. Andy Piszkin is to discuss need for a deep well to be used for a long term pump test with CH2MHill Interim Feasibility Study Team.
7. Pat Brooks is to incorporate a cross-section of a proposed monitoring well in the Work Plan.
8. Pat Brooks and John Lovenburg are to share information regarding the exact locations for surface water sampling.
9. Jason Ashman is to find out about the status of funding for a groundwater monitoring plan.

Jason Ashman then distributed his notes taken during the BCT meeting on October 20. He requested that all parties review the notes to ensure their correctness and return comments to him.

Phase II RI/FS Sampling Strategy for the Landfill Sites (OU-2)

Katrina Lyons gave a presentation on the investigation and sampling strategies for the Phase II RI/FS Landfill sites (OU-2). Handouts were distributed with an outline of the presentation, site specific details for each landfill, and a map of each landfill. The purpose of this meeting was to determine the primary goals of the RI/FS for each landfill and to determine the which methods would be best used to achieve these goals. The major points of the presentation are highlighted below.

- The objectives of this presentation is to outline presumptive remedies and how they can be applied to each of the four landfills. Also presented were how to define a "hot spot" characterization and outline the RI/FS approach and to determine how each of these factors can be applied to each of the four landfills.
- Presumptive Remedies as applied to landfills consist of the following:
 1. To prevent direct contact of the material itself with groundwater, which can be accomplished with a cap
 2. To minimize infiltration of water, which can be accomplished with a cap

3. To control runoff/erosion, which can be accomplished with a cap
4. To collect and treat groundwater and leachate; this can be controlled by a cap and monitored through an established monitoring network
5. To collect and treat landfill gas; this can be controlled by a cap and monitoring through an established monitoring network
6. Comply with institutional controls, the primary concern here being deed restrictions

The main point of the presumptive remedies is to illustrate that capping the landfills will minimize any other required work.

- “Hot Spot” Characterization consists of the following:
 - 1) Determine the presence and approximate location of waste
 - 2) Determine the principal threat of the waste
 - 3) Determine the size and severity of the contamination and determine if it is economically feasible to remove the waste; it is important to note that this process allows for a great deal of leniency when determining economic feasibility

There must be a “yes” answer to these questions before characterizing a site as a “hot spot”
- Utilizing methods such as a soil gas grid to determine possible hot spots and a permanent perimeter probe to be used to monitor landfill gas were presented next. A chart was presented illustrating which sites needed action in which area of the presumptive remedies. This chart moved the presentation into a site specific discussion on Site 2.
- The Phase II RI/FS for Site 2 is currently proposed to consist of the following:
 1. Surface Geophysics
 2. Soil Gas monitoring
 3. Groundwater monitoring
 4. Downhole Geophysics
 5. Landfill gas monitoring
 6. Surface water sampling
- Changes made in this plan as opposed to previous presentations included limiting trenches around the boundary. In addition, no individual investigations would occur in each of the defined areas if the EMI results are inconclusive.
- Another change stated that the proposed monitoring wells are located closer to the area than what CH2MHILL had proposed.
- The rest of the handouts covered site specific details to be discussed at the meeting scheduled for Friday, October 28.

Discussion Points:

1. The first discussion regarded leachate monitoring and the use of lysimeters, which have been proposed. Sherrill Beard referred the issue to the RWQCB as she felt this was their jurisdiction. John Broderick and Larry Vitale agreed that they had been used previously and were allowable.
2. John Broderick posed the question to the Navy as to what their RI objective is and if they want to meet state requirements which is performing a SWAT. John Broderick stated that a SWAT is the only way the RWQCB will issue a letter closing the landfill. John Broderick and Ginny Garelick continued this discussion with John Broderick describing what would be required for a SWAT. John Broderick concluded stating that the RWQCB did like the Work Plan for the landfills submitted by CH2MHILL.
3. Jason Ashman stated that he would need to identify the objectives of the RI.
4. It was stated that if the RI followed an EPA investigation and implemented presumptive remedies, this investigation would not yield enough information for a SWAT. Bonnie Arthur stated that it would be necessary for the EPA and RWQCB to make some compromises.
5. Tim Latas suggested implementing the Work Plan submitted by CH2MHILL and then adding some items for presumptive remedies.
6. John Broderick mentioned that Site 5 and 17 do not have adequate monitoring to even implement some presumptive remedies, much less a SWAT.

7. Katrina Lyons questioned if a soil gas survey would be appropriate. A discussion ensued comparing and contrasting soil gas surveys with monitoring programs. Ginny Garelick stated that this was a BCT decision while John Broderick voiced that it should be a Navy decision.
8. It was agreed that a soil gas survey must be performed at Site 2.
9. Tim Latas posed the question if the soil gas could be utilized by the risk assessors. John Broderick responded that he thought the current surface soil samples and past air SWAT would be acceptable.
10. The question was posed as to what would be the final use of these sites. Would like they be transferred or maintained by the Navy? Jason Ashman stated that this would depend on what happens in the areas around the sites. It was stated that this decision came from the re-use committee.
11. It was questioned what other landfills had done previously. John Broderick answered that one did an RI which was more than a SWAT and then went to NFA. The other was capped.
12. Yueh Chuang mentioned that it was not probable that the re-use committee would make any decisions in time for the RI. He stated the CH2MHILL looked at "likely" uses and then applied the most stringent guidelines when writing the Work Plan.
13. Joe Zarnoch commented that some of the landfills have already been built upon. Bonnie Arthur stated that she did not think these landfills would be built upon even more. John Broderick and Yueh Chuang disagreed with this statement.
14. Bonnie Arthur stated that even though a SWAT may be a smaller effort, it could take a longer time.
15. John Broderick posed the question to the Navy asking how much they would want to characterize the landfills. This will guide their decision on leachate monitoring.
16. It was stated that landfill gas and sites 2 and 17 need to be monitored. A soil gas probe will be necessary to help design the cap. John Broderick mentioned that a gas collection system would then be necessary and would EPA require a feasibility study for this.
17. It was stated that Site 2 will require some extra work to designate the boundaries. It was also stated that the size of the plume is questionable as only two groundwater monitoring events occurred.
18. Yueh Chuang mentioned that the soil samples collected from the upgradient well detected high levels of contamination and perhaps this was not this extent of the landfill.
19. Katrina Lyons stated that the new wells proposed are consistent with what was proposed from CH2MHILL.
20. A discussion began regarding the stains that are proposed to be included in the investigation. Yueh Chuang stated that it was not practical to investigate all of the stains. Katrina Lyons stated that these had been included based on agency comments expressing a desire to have these investigated. Yueh Chuang also stated that inclusion of the storage area was unnecessary. Katrina Lyons responded stating that this was also requested by the agencies.
21. A discussion began regarding the location of some of the wells. Tim Latas questioned if it was feasible to put in a 3rd well at the drainage ditch. It was not identified if this area was actually part of the landfill. It was mentioned that the grading from the Alton Parkway expansion is moving the wash into the landfill. The discussion continued regarding where the actual locations of some wells should be.
22. Sherrill Beard questioned which wells were intended for extraction and Yueh Chuang responded that it was Well 60 and New well 2.
23. Sherrill Beard questioned the need for the number of wells proposed. Yueh Chuang explained that the two existing wells are points and the depth to water at well 27 is several hundred feet. There is very steep gradient between the two wells.
24. John Broderick stated that it would be best to drill a few borings and sample to delineate the plume and the set the wells.
25. Bonnie Arthur questioned the use of the CPT. Katrina Lyons stated that they would try to use the CPT where possible. Then regular borings would be drilled and a bat sample would be taken to delineate the plume and install the wells.
26. In commenting on the characterizations of the sites, Tim Latas stated that test pits would not be used to characterize what is in the landfill. Soil gas results will be the only method used in determining possible hot spot locations. Joe Zarnoch agreed with this stating that trenching is not necessary for a presumptive remedy.
27. Yueh Chuang voiced a concern stating that the boundaries of all the landfills have expanded from the CLEAN I Team recommendations. He stated that he thought it would be significant for the Navy to know why these boundaries have expanded. John Broderick commented that interviews with the individuals who worked at

Site 5 stated that the boundaries should change due to practices at the landfill. However, he thought that this had already been covered with the other sites.

28. It was questioned how the extra areas requested by the regulators to be investigated should be handled. The Navy needs to decide if these should be part of the landfill, not part of the landfill, but part of the investigation, or if they should not be handled with this investigation at all. Joe Zarnoch requested a breakout of these areas from the SAIC report. Joe Zarnoch also requested that these anomalies be re-considered to determined if they really need to be investigated.
29. It was confirmed that the landfill boundaries were expanded due to agency comments, SAIC photos, and interviews with onsite personnel. Jason Ashman requested that for the time being, these sites be included in the Work Plan for investigation, but not be considered part of the landfill. Katrina Lyons responded that she was unsure if this would be covered in the current scope. Tim Latas questioned if this would be part of the RI/FS or part of a different investigation.
30. Dave Cowser requested that the Navy address this issue and the release some type of language directing what action should be taken by the CLEAN II Team.

Action Items:

1. The Navy needs to define the objective of the RI/FS to determine how comprehensive of an investigation should be performed at the landfills.
2. The BCT needs to determine if it would be beneficial to perform a soil gas survey on sites 2 and 17 or if this should wait to a later date.
3. The Navy needs to determine what type of re-use possibilities these sites may have.
4. A decision needs to be made to determine if leachate monitoring is required.
5. The Navy needs to determine how extensive they would like to characterize the landfills.
6. The Navy needs to determine how to handle the other areas outside of the landfills that have been requested by the agencies to be investigated.

A discussion of the landfill sites will continue on Friday, October 28.

MEETING ATTENDEES - OCTOBER 24, 1994

David Cowser	Bechtel
Pat Wiegand	Brown & Caldwell
Sherrill Beard	CalEPA
Juan Jimenez	CalEPA/DTSC
Joe Zarnoch	CalEPA/DTSC
Yueh Chuang	CH2MHILL
John Lovenburg	CH2MHILL
Pat Brooks	Kleinfelder
Jerry Jackson	Kleinfelder
Tim Latas	Kleinfelder
Katrina Lyons	Kleinfelder
Linda Nebiker	Kleinfelder
John Turbeville	Kleinfelder
Stacie Wissler	Kleinfelder
Vish Parpiani	MCAS El Toro
John Broderick	RWQCB
Larry Vitale	RWQCB
Jason Ashman	SWDIV
Ginny Garelick	SWDIV
Bonnie Arthur	USEPA

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MCAS EL TORO

OCTOBER 24, 1994

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