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CLEAN II Program  
Bechtel Job No. 22214  
Contract No. N68711-92-D-4670  
File Code: 02163  
**IN REPLY REFERENCE: CTO-00155/0283**

September 24, 1998

Contracting Officer  
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Southwest Division  
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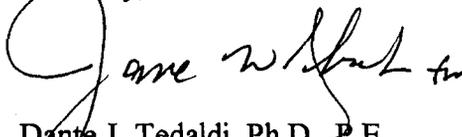
Subject: Technical Memorandum On Risk Management Considerations For OU-3A Sites 8, 11, And 12 At Marine Corps Air Station (MCAS) El Toro, California

Dear Mr. Selby:

It is our pleasure to submit this copy of the Technical Memorandum On Risk Management Considerations For OU-3A Sites 8, 11, And 12 At Marine Corps Air Station (MCAS) El Toro, California, prepared under Contract Task Order (CTO) 0155 and Contract No. N68711-92-D-4670. We gratefully acknowledge the high level of cooperation and team work demonstrated by personnel from Southwest Division during the execution of this project.

We appreciate the opportunity to be of service to you on this project. If you have any questions or would like further information, please contact me at (619) 687-8700.

Sincerely,

  
Dante J. Tedaldi, Ph.D., P.E.  
Project Manager

DJT/sp

Enclosure: Technical Memorandum On Risk Management Considerations For OU-3A Sites 8, 11, And 12



**Bechtel National, Inc.** Systems Engineers-Constructors

**TECHNICAL MEMORANDUM ON RISK MANAGEMENT  
CONSIDERATIONS FOR OU-3A SITES 8, 11, AND 12 AT  
MARINE CORPS AIR STATION (MCAS)  
EL TORO, CALIFORNIA  
SEPTEMBER 1998**

A feasibility study (FS) was prepared for OU-3A Sites 8 (DRMO Storage Yard), 11 (Transformer Storage Area), and 12 (Sludge Drying Beds) that presented alternatives for addressing the shallow soil contamination at Sites 8 (Units 1, 3, 4, and 5), 11 (Units 1 and 2), and Site 12 (Unit 3) and recommended no further action for Site 8 (Unit 2), Site 11 (Unit 3), and Site 12 (Units 1, 2, and 4). Subsequently, a preferred alternative was chosen (to address the soil contamination Sites 8 [Units 1, 3, 4, and 5], 11 [Units 1 and 2], and Site 12 [Unit 3]) to present to public for comment in a proposed plan. In BCT meetings that took place on 8 and 15 September 1998, concerning development of the proposed plan, BCT members agreed to review the basis of the risk management decisions that resulted in the remedial action designations for Sites 8 (Units 1, 3, and 4), and Site 12 (Unit 3) as well as the No Further Action decision for Site 12 (Unit 1).

Table 1 presents a site by site summary of the cancer risk, non-cancer risk, risk management considerations, and proposed recommended actions for all the units at Site 8, 11, and 12. The table is based on a review of information furnished in the OU-3A RI Report. The sites were subdivided into units based on location, physiographic characteristics, and waste-disposal activities associated with various areas at each site. The human health risk assessment grouped several of the site units within a site, as appropriate, into areas of potential concern. This association was based on the location of the site units relative to each other, the nature and magnitude of the chemical contaminants at contiguous units, and the physiographic characteristics of the various units.

The sections below provide more detailed discussions of the risk management considerations as well as discuss the information on Site 8 Units 1, 2, 3, and 4, and Site 12 Units 1 and 3 presented in Table 1. In addition, the risk management decisions for these areas of potential concern are reevaluated.

### **Risk Management**

The objectives of a human health risk assessment are: to provide assistance in determining whether additional response action is necessary at a site; to furnish a basis for determining residual chemical levels that are adequately protective of public health; to provide a basis for comparing potential health impacts of various remedial alternatives; and to help to support selection of the "no action" remedial alternative (U.S. EPA 1989a).

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) requirements (40 Code of Federal Regulations [CFR] 300.65) provide that "for known or suspected carcinogens, acceptable exposure levels are generally concentration levels that represent an excess upper-bound lifetime cancer risk to an individual of between  $1 \times 10^{-6}$  and  $1 \times 10^{-4}$  using information on the relationship between dose and response". Non-cancer risk is presented as a hazard index (HI). An HI value of 1.0 or higher indicates that lifetime exposure has limited potential to cause an adverse effect in sensitive populations. HI values of less than 1.0 are not considered to cause an adverse effect in sensitive populations. A value exceeding 1.0 does not by itself require remedial action. Values exceeding 1.0 are generally evaluated on a site-specific basis, taking

into account types of contaminants, historical activities, and systemic toxicity effects of the chemical of potential concern (COPCs).

#### **Site 8 Units 1 and 4**

Site 8 Units 1 and 4 are both contained within the East Storage Yard area of the DRMO Storage Yard (Figure 1). The DRMO Storage Yard has been in use from the late 1940s to the present. The portion of Site 8 in which Units 1 and 4 are contained is an unpaved storage area. Unit 4 (totally contained within Unit 1) is an area where a transformer containing oil with PCBs leaked. As a result of this release the top foot of soil was removed from Unit 4. The cancer risk for a resident in this area of concern of potential concern (Units 1 and 4) is  $1.7 \times 10^{-5}$  and the non-cancer risk for a resident is 0.79. Both these values are within the generally acceptable exposure levels of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  for cancer risk and less than 1.0 for non-cancer risk. The cancer risk drivers (chemicals that are attributable for at least  $1 \times 10^{-6}$  of the cancer risk) in this area of concern are Aroclor 1248 (57%) and benzo(a)pyrene (27%). The risk associated with benzo(a)pyrene was calculated based on the maximum concentration of the two reported concentrations in Units 1 and 4. Aroclors 1248, 1254, and 1260 were present to approximately 4 feet bgs through out the area of Units 1 and 4 at concentrations ranging from 0.022 to 3.02 mg/kg. These concentrations of Aroclor 1248, 1254, and 1260 do not present a threat to groundwater because PCBs are not likely to migrate in soil and groundwater beneath the site is approximately 145 feet bgs (BNI 1997).

A review of record of decision (ROD) cleanup levels for polychlorinated biphenyls (PCBs) for sites through out the United States (including California) was presented in the Final Position Paper on Cleanup Levels for Polychlorinated Biphenyls (PCBs) Unit 2 of Site 19 MCAS El Toro, California (BNI 1996). This position paper indicates "that the established cleanup levels for PCBs in residuals soils (soils remaining at the site) have been generally up to 50 ppm for industrial, and 25 ppm for residential land use with little or no soil cover." Examples are presented of sites where cleanup levels of 10 ppm or greater were selected requiring no restrictions or caps, even though the land use adjacent to the sites was residential. It appears that No Further Action could be an acceptable and logically defensible risk management decision based on: the human health risk calculated for Site 8 Units 1 and 4; the concentrations of contaminants present in these units; the fact that groundwater is present at 145 feet bgs; and information obtained on ROD cleanup levels for PCBs.

#### **Site 8 Units 2 and 3**

Site 8 Units 2 and 3 are both contained within the West Storage Yard area of the DRMO Storage Yard (Figure 1). This area is a paved storage area. Unit 3 (totally contained within Unit 2) is an area of a former refuse pile. The cancer risk for a resident in this area of potential concern (Units 2 and 3) is  $4.1 \times 10^{-5}$  and the non-cancer risk for a resident is 2.3. The cancer risk value is within the generally acceptable exposure level of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  for cancer risk. The cancer risk drivers in this area of concern are Aroclor 1254 (32%), arsenic (27%), Aroclor 1248 (57%), and Aroclor 1260 (17%). The non-cancer risk at Units 2 and 3 is above the generally acceptable level of 1.0. The non-cancer risk drivers at Units 2 and 3 are Aroclor 1254 (28%), manganese (27%), Aroclor 1248 (17%), Aroclor 1260 (15%), and arsenic (8%). Both the arsenic and manganese reported in Units 2 and 3 appears to be related to natural conditions. The cancer and non-cancer risk associated with Aroclors 1248, 1254, and 1260 were calculated based a maximum concentration for each of these chemicals from the only location in which these

chemicals were reported (one sample location in Unit 3). At this location in Unit 3, Aroclors 1248, 1254, and 1260 were reported 4 feet bgs at concentrations of 0.244, 0.397, 0.214 mg/kg, respectively. These concentrations of Aroclor 1248, 1254, and 1260 do not present a threat to groundwater (145 feet bgs)(BNI 1997).

Unit 3 is the former location of a refuse pile. The pile was removed and disposed prior to the initiation of the Phase I RI in 1991. In December 1993, the top 2 feet of the soil formerly beneath the refuse pile (approximately 229 cubic yards) was excavated and removed from Site 8 by a paving contractor. Prior to the soil excavation and removal, soil sample analytical results from the Phase I RI indicated PCB contamination in soil at Unit 3. Prior to its disposal the soil that was removed from Unit 3 was characterized and the soil sample analytical results indicated that the concentrations of total PCBs ranged from 0.1U to 20.0 mg/kg with a mean concentration of 6.37 mg/kg (BNI 1996). The results of the Phase II remedial investigation (RI) sampling indicated that not all of the PCB contaminated soil was removed from Unit 3. The Phase II RI results suggest that the remaining PCB-contamination is limited to shallow soil in a 35- by 70-foot rectangular area (2,450 square feet) encompassing the northern half of Unit 3 (BNI 1998). Based on the fact that not all the PCB-contaminated soil was removed from Unit 3 and based on the concentrations of total PCBs contained in the soil previously removed from Unit 3, it appears that it may be prudent to remove the remaining PCB-contaminated soil.

#### **Site 12 Unit 1**

Site 12 Unit 1 is the former location of West Sludge Drying Beds associated with the Waste Water Treatment Plant that operated from 1943 to 1972 at MCAS El Toro (Figure 2). The cancer risk for a resident in this area of concern of potential concern is  $7.6 \times 10^{-5}$  and the non-cancer risk for a resident is 4.6. The cancer risk value is within the generally acceptable exposure level of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  for cancer risk. The cancer risk drivers in this area of concern are benzo(a)pyrene (45%), arsenic (17%), dibenz(a,h)anthracene (12%), Aroclor 1254 (12%), benzo(k)fluoranthene (4%), benzo(b)fluoranthene (3%), benz(a)anthracene (3%), and indeno(1,2,3c,d)pyrene (2%). The risk associated with benzo(a)pyrene, dibenz(a,h)anthracene, benzo(k)fluoranthene, benzo(b)fluoranthene, benz(a)anthracene, and indeno(1,2,3c,d)pyrene were calculated based on the maximum concentration of the three reported concentrations (present in two borings) in Unit 1. Concentrations of these PAHs in the two borings in which they were reported ranged from 0.0042J kg (for benz[a]anthracene) to 0.69 mg/kg (for benz[a]anthracene) at depths of 0 to 3.5 feet bgs. Aroclor 1254 was reported in only one location at 0 feet bgs. The arsenic reported in Unit 1 appears to be related to natural conditions.

The non-cancer risk drivers at Unit 1 are 2-(2-methyl-4-chlorophenoxy)-propionic acid (MCP) (52%), manganese (14%), Aroclor 1254 (10%), and 2-methyl-4-chlorophenoxyacetic acid (MCPA) (6%). The non-cancer risk associated with MCP, Aroclor 1254, and MCPA were calculated based a maximum concentration for each of these chemicals from the only location in which these chemicals were reported in Unit 1. The manganese reported in Unit 1 appears to be related to natural conditions.

The concentrations of PAHs, pesticides, PCBs and metals at Unit 1 do not present a risk to groundwater (95 feet bgs). In addition, they appear to be confined to the upper 5-foot-bgs soil interval (BNI 1997). Based on these facts, as well as the conservative nature of the risk assessment calculations (using the maximum concentrations of chemicals of potential concern when most of them were only reported once), the decision was made to not perform a remedial

action at Site 12 Unit 1. This decision was made at the 6 February 1997, BCT meeting with the concurrence of the EPA and DTSC BCT members and their respective toxicologists (Jeffery Paul [EPA] and John Christopher [DTSC]). Based on the above information it appears that No Further Action is an acceptable and logically defensible risk management decision for Site 12 Unit 1.

### Site 12 Unit 3

Site 12 Unit 3 is the location of a drainage ditch which conveys runoff through Site 12 (Figure 2). The cancer risk for a resident in this area of potential concern is  $5.1 \times 10^{-5}$  and the non-cancer risk for a resident is 5.9. The cancer risk value is within the generally acceptable exposure range of  $1 \times 10^{-6}$  to  $1 \times 10^{-4}$  for cancer risk. The cancer risk drivers in this area of concern are benzo(a)pyrene (22%), dibenz(a,h)anthracene (13%), dieldrin (11%), dichlorodiphenyltrichloroethane (DDT), benzo(b)fluoranthene (6%), Aroclor 1260 (5%), benzo(k)fluoranthene (4%), and Aroclor 1254 (3%). The risks associated with benzo(a)pyrene (22%), dibenz(a,h)anthracene (13%), dieldrin (11%), DDT, benzo(b)fluoranthene were calculated based on maximum reported concentrations, although most of these chemicals were found throughout Unit 3. The non-cancer risk at Unit 1 is above the generally acceptable level of 1.0. The non-cancer risk drivers at Unit 3 are MCPP (66%), manganese (12%), and aluminum (5%). Both the manganese and aluminum reported in Unit 3 appear to be related to natural conditions. The risk associated with DDT was calculated based on a maximum concentrations, however DDT was reported throughout Unit 3.

The most significant issue at this area of potential concern is that although the contaminants at Unit 3 do not pose a threat to groundwater they could potentially migrate off-site into Bee Canyon Wash. In addition, Bee Canyon Wash conveys surface runoff off-Station approximately 50 feet from the point into which Unit 3 enters Bee Canyon Wash. The potential migration of contaminants from Unit 3 into Bee Canyon Wash during storm water flow events is one reason that remedial action is recommended for this unit.

### References

- Bechtel National, Inc. 1996. Final Position Paper On Cleanup Levels For Polychlorinated Biphenyls (PCBs) Unit 2 of Site 19. Marine Corps Air Station El Toro, California.
- . 1997. Draft Final Phase II Remedial Investigation Report, Operable Unit 3A Sites. Marine Corps Air Station El Toro, California.
- . 1998. Draft Final Phase II Feasibility Study, Operable Unit 3A Sites. Marine Corps Air Station El Toro, California.
- United States Environmental Protection Agency. 1989a. Risk Assessment Guidance for Superfund (RAGS). Volume II. Environmental Evaluation manual. Interim final. EPA/540-1-89-001. U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Washington, DC.

## Table 1 Site-by-Site Summary

Site/Unit	Cancer Risk <sup>a</sup>	Non-Cancer Risk <sup>a</sup>	Risk Considerations	Recommended Action
<b>Site 8</b>				
Units 1 and 4 <sup>b</sup>	2 additional cases in 100,000	0.79	PCB-contaminated soil is present in various locations throughout these units. No Further Action could be an acceptable risk management decision based on: the human health risk calculated for Site 8 Units 1 and 4; the concentrations of PCBs are significantly less than 10 ppm (typical cleanup level for PCBs in a residential area); and the fact that groundwater is present at 145 feet bgs.	No Further Action for Units 1 and 4.
Units 2 and 3 <sup>b</sup>	4 additional cases in 100,000	2.3	<p>No Further Action is recommended at Unit 2 because the only risk drivers present at this unit are arsenic and manganese. The levels of both of these metals in Unit 2 are probably related to natural conditions.</p> <p>At Unit 3, soil beneath the refuse pile formerly located at this unit was contaminated with PCBs. During construction activities, prior to the remedial investigation, most of the PCB-contaminated soil was removed. Sampling performed during the remedial investigation indicates that not all of the PCB-contaminated soil has been removed from Unit 3.</p>	<p>No Further Action for Unit 2.</p> <hr/> <p>The proposed Remedial Action for Unit 3 is to remove remaining PCB-contaminated soil at this unit.</p>
Unit 5	1 additional case in 10,000	1.1	PAH-contaminated soil is present throughout the unpaved portion of this unit.	The proposed Remedial Action is to remove PAH-contaminated soil from unpaved area at this unit.
<b>Site 11</b>				
Unit 1	9 additional cases in 100,000	4.5	Small volume of PCB-contaminated soil is present in this localized area.	Remedial Action – remove the upper six feet of soil.
Unit 2	6 additional cases in 1,000,000	0.3	Small volume of PCB-contaminated soil is present in this localized area.	Remedial Action – remove the upper six feet of soil.
Unit 3	3 additional cases in 10,000,000	0.017	Both the cancer and non-cancer risk values are acceptable	No Further Action
<b>Site 12</b>				
Unit 1	8 additional cases in 100,000	4.6 <sup>c</sup>	Based on the conservative nature of the risk assessment calculations (using the maximum concentrations of chemicals of potential concern [COPC] when most of the COPCs were only reported once); the fact that the concentrations of arsenic and manganese are probably related to natural conditions; and	No Further Action

			the fact that the concentrations of PAHs, pesticides, PCBs and metals at Unit 1 do not present a risk to groundwater and are confined to the upper 5-foot-bgs soil interval, the decision was made to not perform a remedial action at Site 12 Unit 1.	
Units 2 and 4 <sup>b</sup>	3 additional cases in 100,000	2.1 <sup>d</sup>	The cancer risk value is within the acceptable range. Although the non-cancer risk value is slightly above the acceptable range, the majority of this risk is associated with the metals manganese and arsenic which are probably related to natural conditions.	No Further Action
Unit 3	5 additional cases in 100,000	5.9	The concentrations and type of contaminants are similar to those at Site 12 Unit 1; however this unit is a drainage ditch that conveys surface water runoff into Bee Canyon Wash approximately 50 feet upstream of the Station boundary. PCB and PAH-contaminated soil in this unit may be transported off-site and eventually off-Station.	Remedial Action – remove contaminated soil from the unit to prevent migration of contaminants off-site.
Catch basin	1 additional case in 1,000,000	0.18	Both the cancer and non-cancer risk values are below the acceptable range. <sup>c</sup>	No Further Action

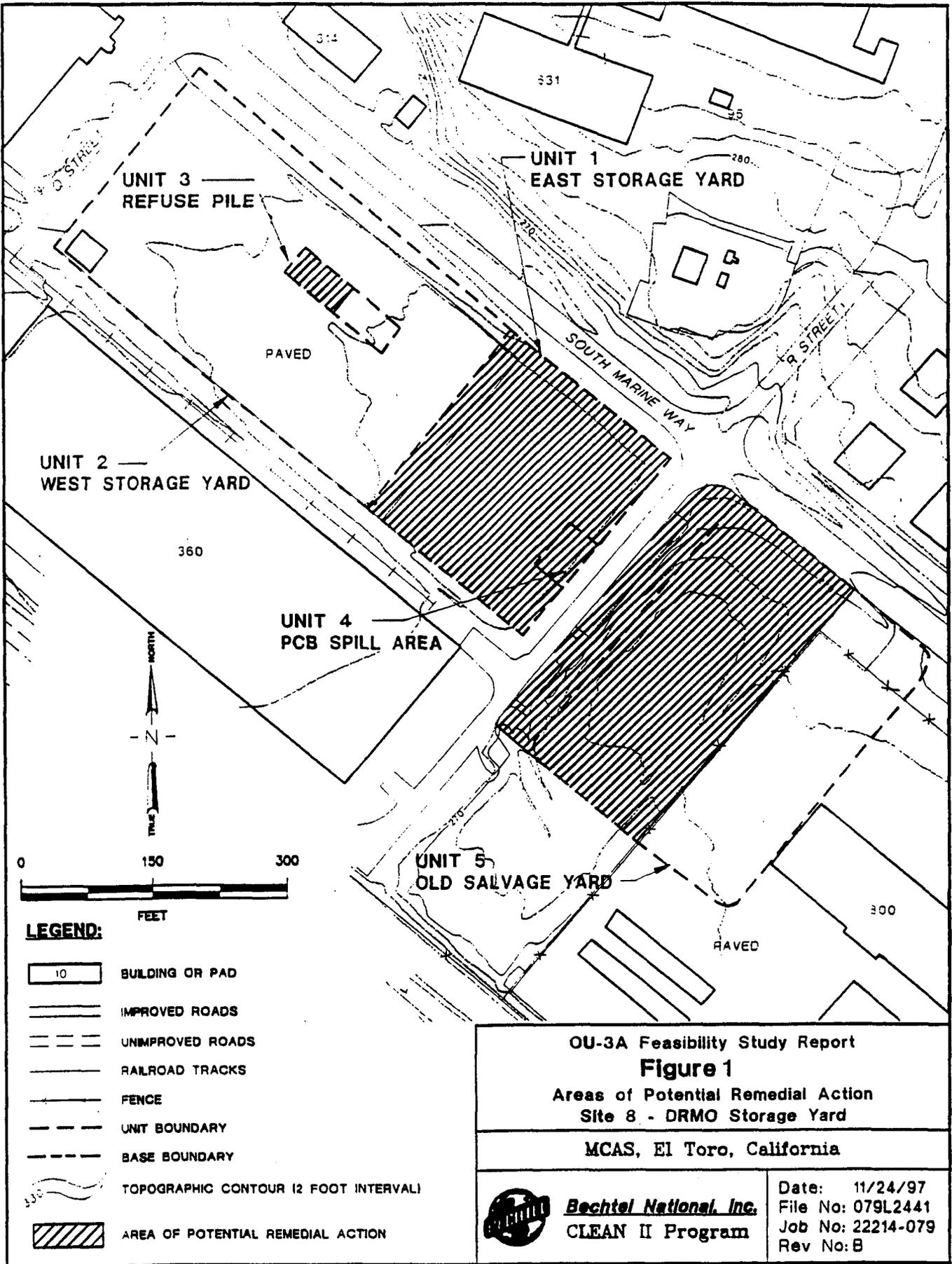
Notes:

<sup>a</sup> See "Estimating Human Health Risks on pages 4 and 5 for explanation of U.S. EPA's generally accepted range of cancer risk and the hazard index for non-cancer risk.

<sup>b</sup> Units evaluated as one area for the human health risk assessment.

<sup>c</sup> Non-cancer risk considered acceptable because value is associated with a pesticide that was only present in one sample.

<sup>d</sup> Non-cancer risk considered acceptable because value is associated with manganese, a naturally occurring metal in soil.



OU-3A Feasibility Study Report  
**Figure 1**  
 Areas of Potential Remedial Action  
 Site 8 - DRMO Storage Yard

MCAS, El Toro, California

 **Bechtel National, Inc.**  
 CLEAN II Program

Date: 11/24/97  
 File No: 079L2441  
 Job No: 22214-079  
 Rev No: B





BECHTEL NATIONAL INC.

2400

CLEAN II TRANSMITTAL/DELIVERABLE RECEIPT

Contract No. N-68711-92-D-4670

Document Control No.: CTO-0155/0283

File Code: 02163

TO: Contracting Officer
Naval Facilities Engineering Command
Southwest Division
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DATE: September 24, 1998
CTO #: 0155
LOCATION: MCAS El Toro

FROM: D. J. Tedaldi, Ph.D., P.E., Project Manager

DESCRIPTION: Technical Memorandum On Risk Management Considerations For OU-3A
Sites 8, 11, and 12 - DTD September 24, 1998

TYPE: Contract Deliverable (Cost) X CTO Deliverable (Technical) Other

VERSION: REVISION #: NA

ADMIN RECORD: Yes No X Category Confidential

SCHEDULED DELIVERY DATE: 9/24/98 ACTUAL DELIVERY DATE: 9/24/98

NUMBER OF COPIES SUBMITTED: 10/3C/3E

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