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CLEAN II Program
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December 23, 1997

California Environmental Protection Agency
Department of Toxic Substances Control
Office of Military Facilities
45 West Broadway, Suite 425
Long Beach, California 90802-4444

Subject: Final Position Paper on Cleanup Levels for Polychlorinated Biphenyls (PCBs) Unit 2 of Site 19

Dear Mr. Bautista:

As per our discussion on December 16, regarding CTO-145 ~~Site 7 at Naval Station~~ MCAS EL TORO, enclosed please find two copies of the Final Position Paper on Cleanup Levels for Polychlorinated Biphenyls (PCBs) Unit 2 of Site 19 for your review.

If you have any comments or questions, please call me at (619) 687-8795 or Kathryn Parker at (619) 687-8714.

Sincerely,

Jerald F. Bailey
Project Manager

Enclosures

cc: B. Davis - DTSC
T. Morley - NAVSTA
E. Dias - SWDIV
K. Parker - Bechtel

MG00050.0014.31

Southwest Division
Naval Facilities Engineering Command
Contracts Department
1220 Pacific Highway, Room 135
San Diego, California 92132-5187

Contract No. N68711-92-D-4670

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY

CLEAN II

FINAL POSITION PAPER ON CLEANUP LEVELS FOR POLYCHLORINATED BIPHENYLS (PCBs) UNIT 2 OF SITE 19 MCAS EL TORO, CALIFORNIA

CTO-0079/0122

March 1996

Prepared by:

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Signature: Craig Carlisle Date: 3/26/96

Craig Carlisle, CTO Leader

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ACRONYMS/ABBREVIATIONS

ACER	aircraft expeditionary refueling
ARAR	applicable or relevant and appropriate requirement
BCT	BRAC Cleanup Team
bgs	below ground surface
BNI	Bechtel National, Inc.
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
CLEAN	Comprehensive Long-Term Environmental Action Navy
COPC	chemical of potential concern
CTO	Contract Task Order
DNAPL	dense nonaqueous phase liquid
EE/CA	Engineering Evaluation/Cost Analysis
ERA	early removal action
MCAS	Marine Corps Air Station
MCL	maximum contaminant level
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
PCB	polychlorinated biphenyl
ppb	parts per billion
ppm	parts per million
PRG	preliminary remediation goal
RAC	Remedial Action Contract
RI	Remedial Investigation
ROD	Record of Decision
SVOC	semivolatile organic compound
SWDIV	Southwest Division Naval Facilities Engineering Command
TSCA	Toxic Substances Control Act
U.S. EPA	United States Environmental Protection Agency
VOC	volatile organic compound

Section 1
INTRODUCTION

An early removal action is planned for Unit 2 of Site 19 at the Marine Corps Air Station (MCAS) El Toro, located in Orange County, California (Figure 1-1). This draft Position Paper proposes a cleanup level for removal of polychlorinated biphenyls (PCBs) from Unit 2 of Site 19. This document has been prepared on behalf of the Southwest Division Naval Facilities Engineering Command (SWDIV) by Bechtel National, Inc. (BNI), under Contract Task Order (CTO)-0079, Comprehensive Long-Term Environmental Action Navy (CLEAN) II Program, contract No. N68711-92-D-4670.

1.1 BACKGROUND

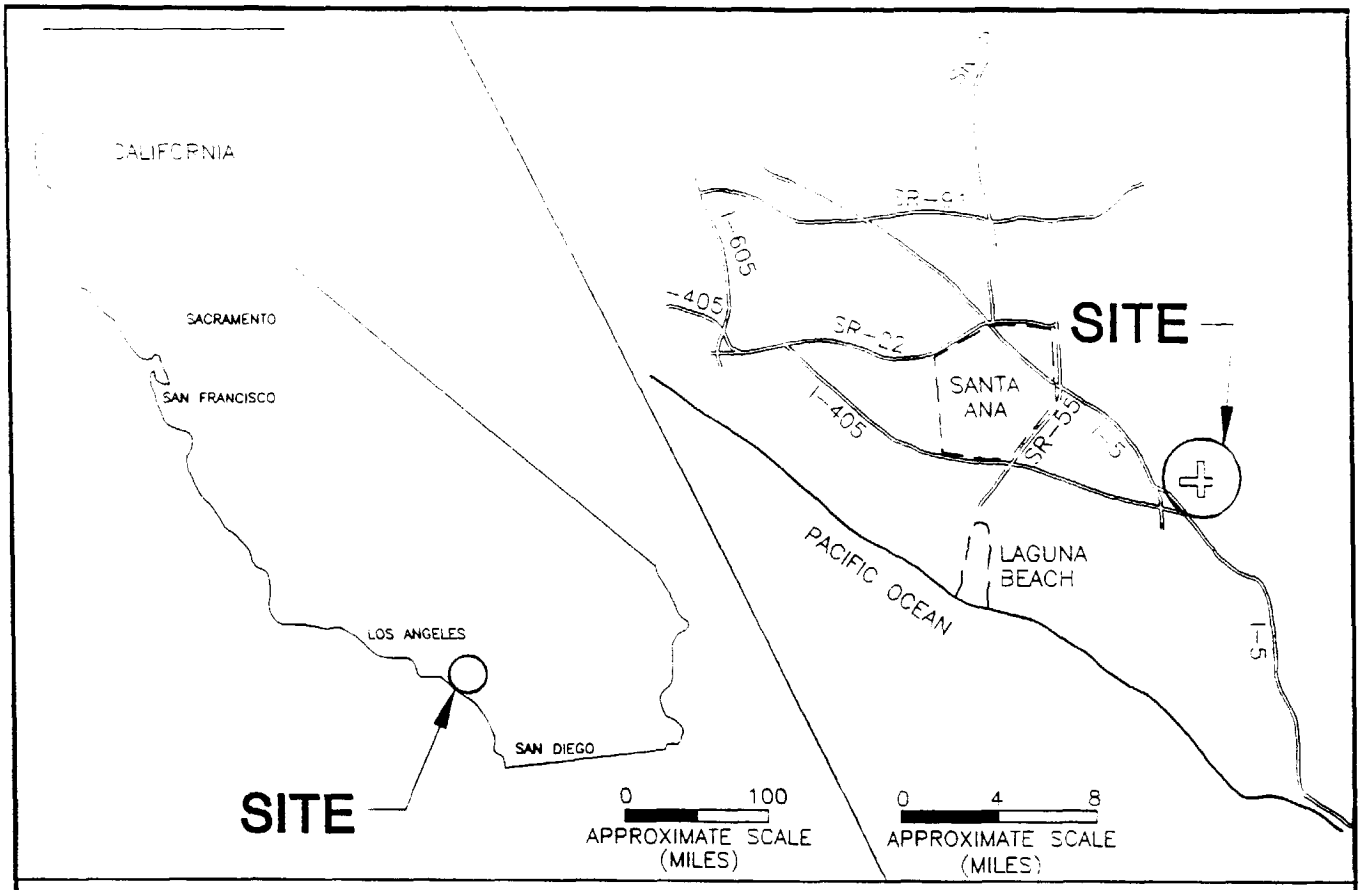
MCAS El Toro is on the United States Environmental Protection Agency (U.S. EPA) National Priorities List (NPL) and subject to closure under the Base Realignment and Closure (BRAC) Act. To expedite the base closure activities in MCAS El Toro, the BRAC cleanup team (BCT) has selected this site (Unit 2 of Site 19) for an early removal action (ERA), also referred to as an expedited removal action. The planned ERA for this site is to be implemented as a non-time-critical removal action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

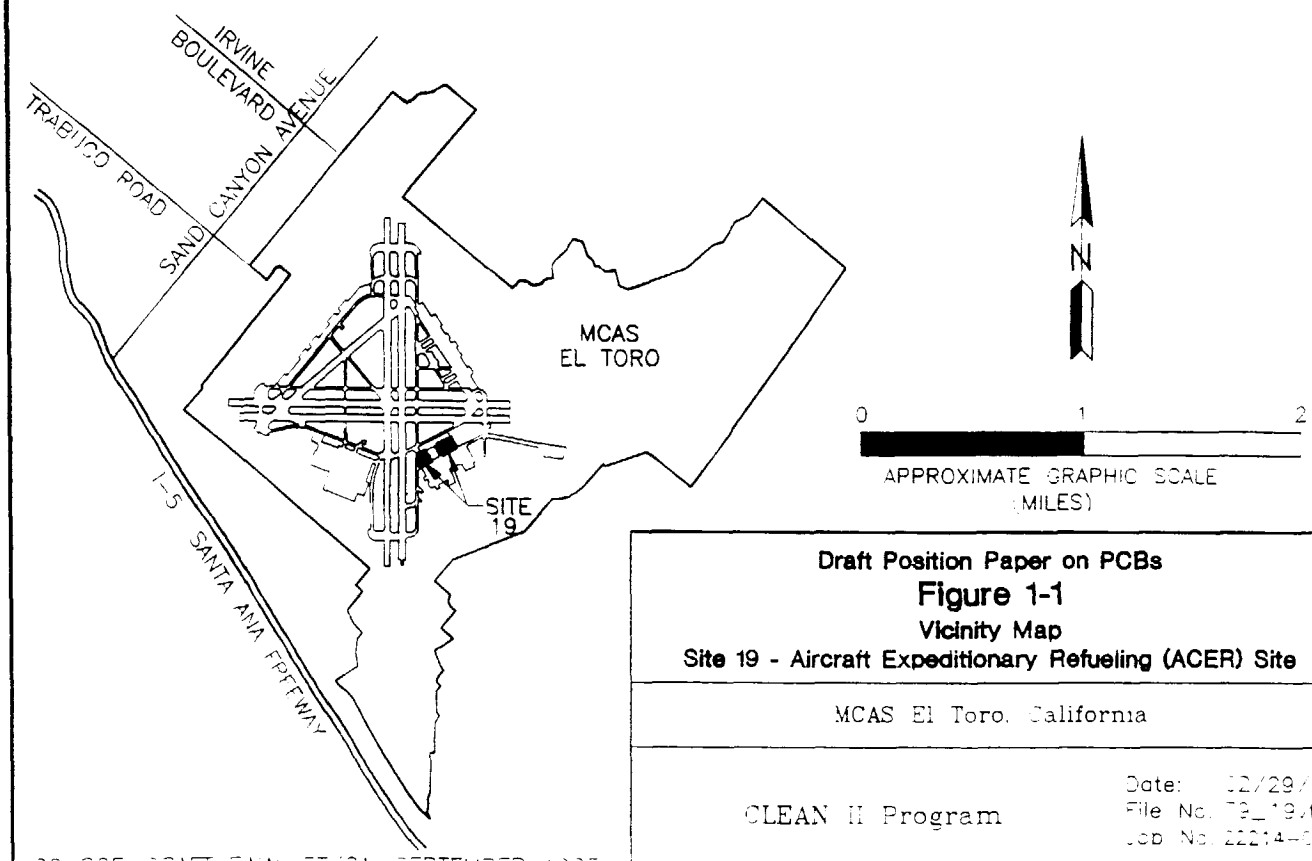
A Draft Final Engineering Evaluation and Cost Analysis (EE/CA) was developed for the proposed ERA on 27 September 1995 for public review (BNI 1995). After resolution of the public comments and review of the document by the lead agencies, a draft Action Memorandum was issued on 28 December 1995 for public and agency review. Based on comments from the lead agencies, modifications are to be made to the draft Action Memorandum mainly because of the PCB cleanup levels. The removal action at the site will proceed after the final Action Memorandum has been approved. The ERA will be implemented by a remedial action contractor in accordance with the Navy environmental Remedial Action Contract (RAC), and within the requirements of a technical package specific to each delivery order, collectively referred to as the "specification" in this document.

1.2 PURPOSE AND SCOPE

This Position Paper provides the rationale and recommendations for adopting a PCB cleanup level for the proposed ERA at this site. It is essential to have consensus on a cleanup level for PCBs before the final Action Memorandum is issued, because the selected PCB cleanup level will significantly impact the proposed ERA and the final Action Memorandum.

This Position Paper is based on the site environmental data and site background information furnished by SWDIV under the Phase I Remedial Investigation (RI) (Jacobs Engineering 1993).





SOURCE: DRAFT FINAL SEMOA SEPTEMBER 1995

Draft Position Paper on PCBs

Figure 1-1

Vicinity Map

Site 19 - Aircraft Expeditionary Refueling (ACER) Site

MCAS El Toro, California

CLEAN II Program

Date: 12/29/96
File No. 19_19.dgn
Job No. 22214-019

The approach and recommendations provided in this document are contingent upon the accuracy of the information, data, and assumptions as presented. The use of this document is limited to the intended purpose as stated above.

Section 2
SITE DESCRIPTION

This section describes the site boundaries, history, and conditions as summarized from the draft final EE/CA.

2.1 SITE DEFINITION AND BOUNDARIES

Site 19 is located in the southeastern quadrant of MCAS El Toro (Figure 1-1). Unit 2 of Site 19 is the subject of this document. The boundaries of Unit 2 are shown in Figure 2-1, which also indicates the approximate area designated for removal. The removal area consists of a pit partially backfilled with soils containing low concentrations of PCBs (Section 3). Figure 2-2 presents a cross section of the pit area.

Site 19 overlies approximately 300 feet of Quaternary alluvial deposits. The ground surface elevation is approximately 330 feet above mean sea level, and the depth to groundwater is approximately 150 feet below grade.

2.2 SITE HISTORY

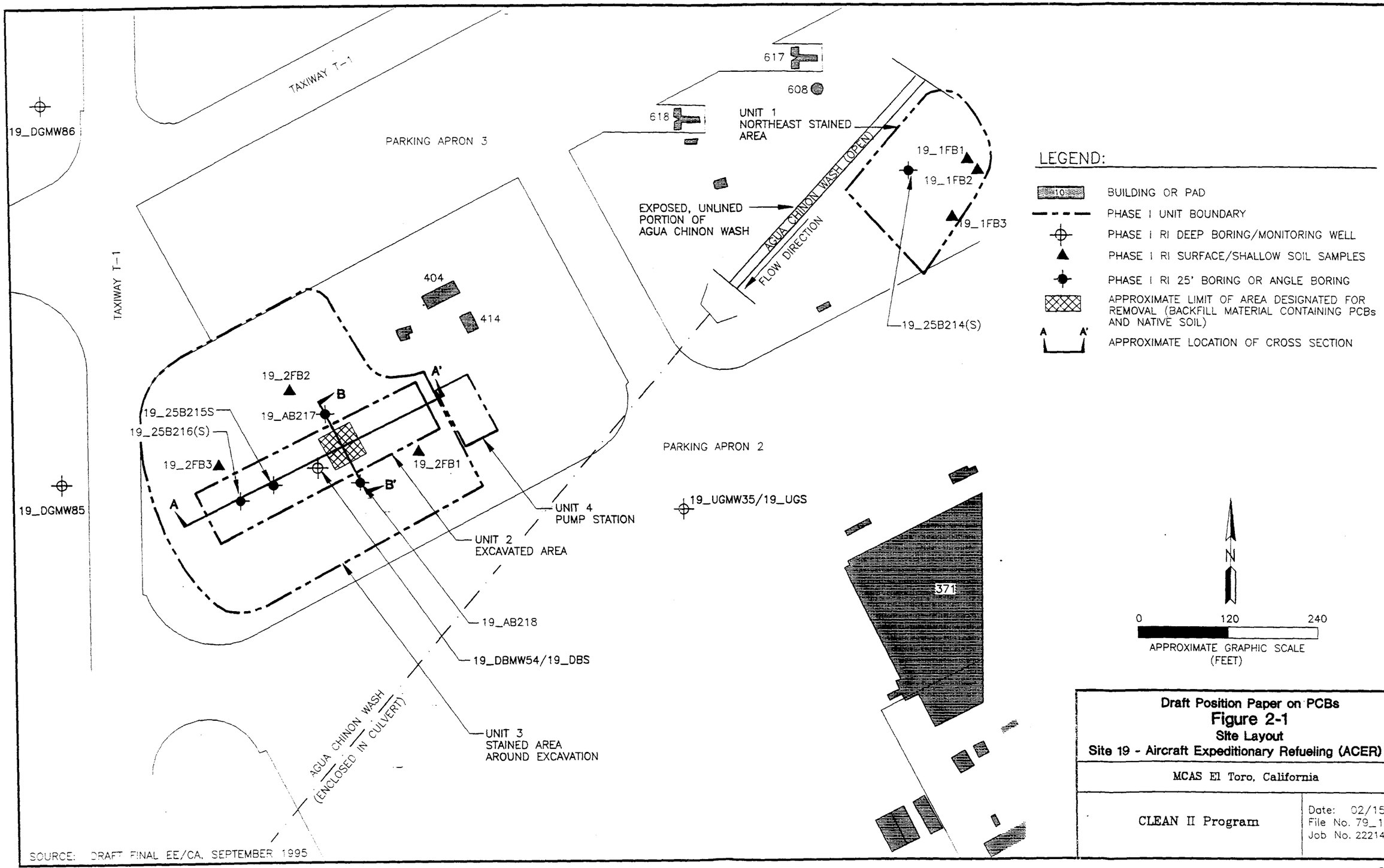
Site 19 was used as aircraft expeditionary refueling (ACER) facility between 1964 and 1986. Six fuel bladders (20,000-gallon-capacity) were located in Unit 2 to store JP-5. In 1986, approximately 15,000 gallons of JP-5 were spilled due to a fuel bladder rupture. During the same year, the fuel bladders and affected soils were removed, and storage of fuel at the site was discontinued. A large, shallow excavation area and a deep pit remain from this excavation activity. The pit created during the 1986 excavation was approximately 30 by 30 feet on plan dimensions, and 15 feet deep.

Soil samples were obtained from Unit 2 during the Phase I RI to confirm removal of the spilled JP-5 fuel. However, confirmation soil samples were not obtained from the pit perimeters (i.e., pit walls and bottom). Additional soil sampling at the perimeter of the pit and in other parts of Site 19 (Units 1, 2, 3, and 4) is to be conducted to further characterize the site under a separate program.

In 1994, approximately 230 cubic yards of soils were imported from a stockpile at Site 8 to Unit 2 of Site 19 and used to partially backfill the pit. The depth of this pit is currently about 9 feet. Therefore, the backfill soils extend from approximately 9 feet below grade to 15 feet below grade. Prior to importing the soil from Site 8 to Site 19, 13 soil samples were tested from the stockpile (1994 data). The results indicate that the stockpile soil samples contained low levels of PCB concentrations as described in the next subsection.

2.3 CHARACTERIZATION

As described in the final draft EE/CA, the planned ERA within Unit 2 requires removal of the backfill soils from the pit if PCB concentrations exceed cleanup levels. It further requires that confirmation soil samples from the pit parameters be analyzed for PCBs and other chemicals of potential concern (COPCs). Removal of soil containing COPCs other than PCBs is not called for in the proposed ERA. Therefore, for purposes of this document, site characterization for removal is limited to PCBs only.



SOURCE: DRAFT FINAL EE/CA, SEPTEMBER 1995

Draft Position Paper on PCBs

Figure 2-1

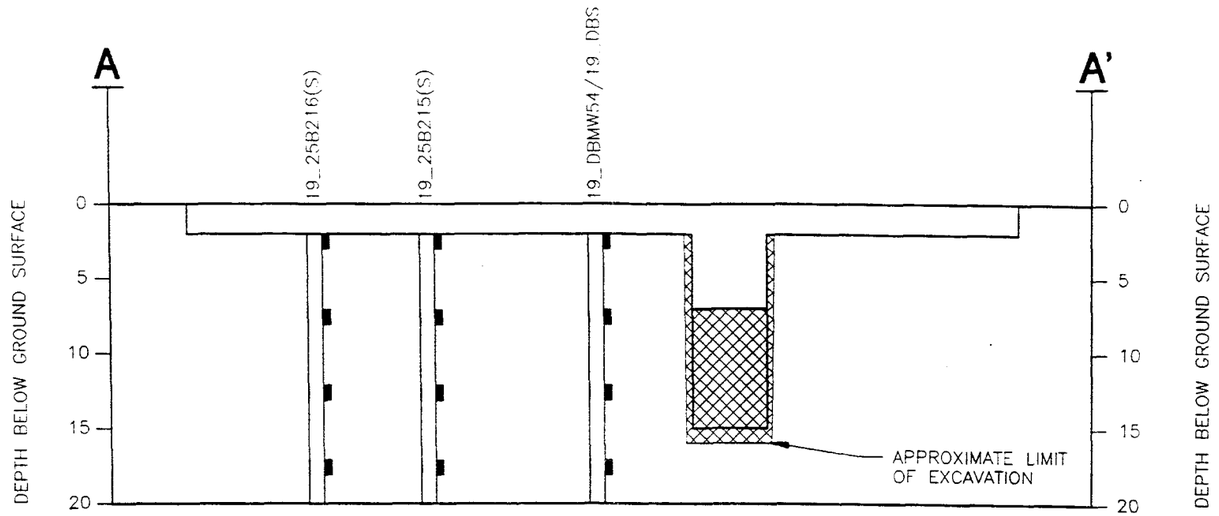
Site Layout

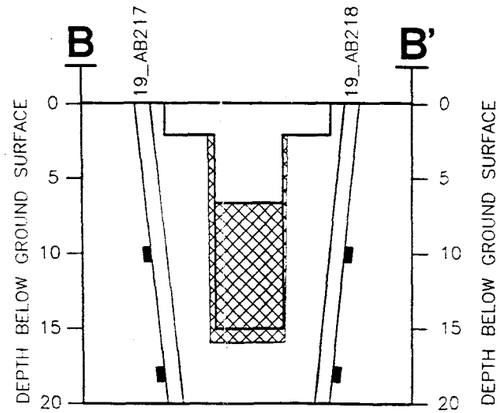
Site 19 - Aircraft Expeditionary Refueling (ACER) Site

MCAS El Toro, California

CLEAN II Program

Date: 02/15/96
File No. 79_19lay
Job No. 22214-079





LEGEND:

BACKFILLED SOIL CONTAMINATED WITH PCB's

-PHASE I SOIL BORING-

19_25B215(S) — PHASE I RI SAMPLE DESIGNATION

PHASE I RI SAMPLE LOCATIONS

0 10 20

APPROXIMATE VERTICAL SCALE (FEET)

0 60 120

APPROXIMATE HORIZONTAL SCALE (FEET)

SOURCE: DRAFT FINAL EE/CA, SEPTEMBER 1995

Draft Position Paper on PCBs

Figure 2-2

Data Summary on Cross Sections
Site 19 - Aircraft Refueling Expeditionary (ACER) Site

MCAS El Toro, California

CLEAN II Program

Date: 02/15/96
File No. 79_19xtm
Job No. 22214-079

As described earlier. 13 soil samples were analyzed for this backfill. Considering the size of the backfilled area (30 by 30 feet. and 6 feet thick), the consolidated volume of *in situ* backfill soils within the pit is calculated to be 200 cubic yards. which reasonably compares with the original unconsolidated volume of 230 cubic yards.

The results of analysis on the 13 soil samples from the Site 8 stockpile (draft final EE/CA) are summarized in Table 2-1. A review of the data in Table 2-1 indicates that the imported backfill soil within the pit contained PCB concentrations ranging from 0.1 milligrams per kilogram (mg/kg) to 20 mg/kg. The PCB concentration for only one soil sample was 20 mg/kg (maximum point); the mean value for all 13 soil samples is a PCB concentration of 6.37 mg/kg.

For risk considerations, the "average" PCB concentration for the backfill is assumed to be 6 parts per million (ppm). This assumption is conservative because risk values are calculated using the "average concentration of PCBs in soil over the exposure period" (U.S. EPA 1990, Section 3.1.2). The concentrations of PCBs decrease due to volatilization over the assumed exposure period. Therefore, the average value of exposed concentration is always less than the mean. For example, if the initial PCB concentration in a 10-inch layer of soil is 10 ppm, the average concentration of PCBs in an exposure period of 6 years is only 5.4 ppm; and the average is only 2.8 ppm over an exposure period of 30 years (U.S. EPA 1990, Section 3.1.2).

Table 2-1
PCB[a] Concentrations on Soil Sampies from Stockpile at Site 8

Sequence Number	Sample Identification	PCB Concentrations (mg/kg)[b]
1	I-1	0.1U[c]
2	I-3	0.4
3	Q4-8	0.5
4	I-2	0.9
5	Q4-7	1.7
6	Q3-5	3.7
7	Q1-1	4.6
8	Q3-4	5.9
9	Q2-2	6.0
10	Q3-1	10.0
11	Q2-4	12.0
12	Q1-4	17.1
13	Q2-6	20.0
	MEAN	6.37

Source: BNI 1995

Notes:
[a] PCB – polychlorinated biphenyl
[b] mg/kg – milligrams per kilogram
[c] undetected, with the instrument detection limit at 0.1 mg/kg

Section 3
CLEANUP GOALS

This section presents various factors to be considered in selecting a PCB cleanup goal for Unit 2 of Site 19 in MCAS El Toro. These factors include regulatory requirements, risk levels, groundwater protection, and precedence set by the past records of decision (RODs).

3.1 REGULATORY REQUIREMENTS

The PCB regulations under the Toxic Substances Control Act (TSCA) provide remediation options (treatment or containment) for PCB concentrations equal to or greater than 50 ppm. In the case of lower PCB concentrations (less than 50 ppm), the primary regulation governing the PCB cleanup at Superfund sites is the NCP, as described in more detail in Section 2.2 of the PCB Guidance (U.S. EPA 1990). TSCA is addressed by the *Code of Federal Regulations* (CFR), under 40 CFR 761. For lower PCB concentrations, TSCA cleanup requirements do not apply except by implications such as the antidilution provisions [40 CFR 761.1(b)].

The PCB Spill Cleanup Policy under TSCA is not an applicable or relevant and appropriate requirement (ARAR) for Superfund response actions because it is not a regulation and because it applies only to recent spills (occurring after 04 May 1987). However, the policy is to be considered in developing guidance for PCB cleanup levels as described in Section 2.6 of U.S. EPA 1990.

3.2 RISK LEVELS

Using very conservative exposure assumptions, U.S. EPA has calculated the following risk levels for unrestricted access at residential areas (U.S. EPA 1990, Appendix B).

Soil Polychlorinated Biphenyl Concentrations (parts per million)	Cumulative Cancer Risk Level
0.1	1.5×10^{-6}
1	1.5×10^{-5}
10	1.5×10^{-4}

These risk levels were calculated for direct contact (ingestion, dermal, and inhalation) assuming that the contaminated PCB soils are at the ground surface with no cover, and using the following exposure scenarios:

- ingestion – every day for 6 years for a child, 24 years for an adult (until age 30);
- inhalation – every day for 30 years for an adult (through age 30); and
- dermal – child for 15 years at 132 events per year; adult for 12 years at 52 events per year (age 3 through 30).

Based on the risk considerations presented above, the following action levels are recommended in the PCB Spill Cleanup Policy (U.S. EPA 1990, Section 3.1).

Land Use	Action Levels (parts per million)	Cleanup Levels (parts per million)
Residential	1	10 (with 10-inch soil cover)
Industrial	10 - 25	25 - 50

According to the EPA, the action level, or preliminary remediation goal (PRG), of 1 ppm for residential scenario is only a starting point, equating approximately to a 10^{-5} excess cancer risk using conservative risk factors and assuming no soil cover or management controls. It reflects a "protective and quantifiable" concentration for soils. Lower concentrations, reflecting 10^{-6} risk level, are "not generally quantifiable" (U.S. EPA 1990, Section 3.1).

Although the PCB Spill Cleanup Policy is not an ARAR, it is a codified policy representing scientific and technical evaluation; therefore, the policy is commonly used in developing guidelines for cleanup levels. The PCB Spill Cleanup Policy is more relaxed for lower volumes of PCB spills as shown in Table 3-1 (U.S. EPA 1990, Section 2.6).

Besides the risk considerations for direct exposure pathways (i.e., ingestion, dermal, and inhalation), the indirect exposure pathways to groundwater and surface waters are also considered to determine the cleanup levels as discussed in Section 3.3.

3.3 GROUNDWATER PROTECTION

PCB cleaning levels or containment requirements for PCB soils are sometimes determined by the groundwater considerations as discussed below and summarized in Table 3-2.

For groundwater protection, a maximum contaminant level (MCL) of 0.5 parts per billion (ppb) is considered as the limiting condition (U.S. EPA 1990, Appendix C). Containment options, including a cap, may or may not be required depending on the site conditions and concentrations of the residual PCBs in the soils. U.S. EPA has calculated cover design requirements for four hypothetical PCB concentrations by performing groundwater model studies, setting an MCL of 0.5 ppb as the limiting criteria for groundwater, and using generally conservative assumptions, including:

- climatic conditions (Seattle climate),
- shallow groundwater conditions (20 feet below grade),
- medium permeability soil parameters, and
- a thickness of 5 feet for PCB-contaminated soils near ground surface.

Table 3-1
PCB[a] Spill Cleanup Policy Requirements for Soils[b]

PCB Levels	Industrial Area	Nonrestricted Access or Residential Areas
LC[c]-LV[d]	No cleanup levels, visual cleanup	Wipe test indoor residential surfaces
	Remove soil in spill area	Same as industrial area (all areas)
	Backfill with clean soil (< 1 ppm[e])	
	No confirmation sampling required	
HC[f] and LC-HV[g]	25-ppm cleanup	10-ppm cleanup
	Remove soil in spill area to cleanup level	Remove soil in spill area to cleanup level, but at least 10 inches of excavation
	Backfill with clean soil (< 1 ppm)	Backfill with clean soil (< 1 ppm)
	Wipe test surfaces	Wipe test surfaces
	Confirmation sampling required	Confirmation sampling required
	For outdoor electric substations: Same as above or cleanup level of 50 ppm with a sign posted	
	Wipe test and confirmation sampling required for either case	

Source: U.S. EPA 1990, Section 2.6

Notes:
[a] PCB – polychlorinated biphenyl
[b] published in 40 *Code of Federal Regulations* 761.120 through 761.139, 02 April 1987; applies only to recent spills since 04 May 1987
[c] LC – low concentrations (PCBs at 50 to 500 ppm)
[d] LV – low volume (less than 1 pound)
[e] ppm – parts per million
[f] HC – high concentrations (PCBs at 500 ppm or greater)
[g] HV – high volume (1 pound or greater)

Table 3-2
Cover Design for Groundwater Protection[a]

PCB[b] Concentrations (for soils remaining at the site) (ppm)[c]	Recommended Cap Requirements	Other Recommendations
5	12 inches of soil cover	Soil cover[d]
20	12 inches of soil cover	Deed[e] and cement cover[f]
50	12 inches of soil and 24 inches of clay[g]	Deed
100	24 inches of soil, FML[h] 12 inches of clays and silts[i]	Deed, fence, and periodic groundwater monitoring may be required.

Source: U.S. EPA 1990, Appendix C

Notes:
[a] long-term projection over 1,000 to 1,500 years
[b] PCB – polychlorinated biphenyl
[c] ppm – parts per million
[d] soil cover is recommended for residential areas to prevent contact with concentrations greater than 1 ppm (the starting point action level)
[e] deed notice may be warranted
[f] cement cover may be warranted for same reasons given under note "d"
[g] permeability coefficient of 8.5×10^{-7} centimeters per second (cm/sec) or less
[h] FML – flexible membrane liner with permeability of 10^{-14} cm/sec or less
[i] permeability coefficient of 3.7×10^{-4} cm/sec or less

As can be observed, the above assumptions are conservative for conditions at Site 19: the precipitation at the site is much less than that in Seattle (approximately 12 inches per year as opposed to 39 inches per year), and the groundwater is approximately at 150 feet below ground surface (bgs) rather than 20 feet bgs. Notwithstanding the conservative assumptions, the cover design requirements based on the referenced U.S. EPA calculations are summarized in Table 3-2. To prevent contamination of surface waters, the cover should also be designed to control erosion by proper runoff.

3.4 PAST RECORDS OF DECISION

Eighty-one RODs are summarized in Appendix A of the U.S. EPA 1990. These RODs were issued between 1982 and 1989 for NPL sites with PCB-contaminated soils located in various U.S. EPA regions. The summary RODs are briefly presented in Table 3-3. The cleanup levels indicated in the summary RODs were also referred to as the excavation levels because they triggered excavation for disposal or treatment. The restrictions required for each site (e.g., cap, fence, deed notice) were not clearly identified in the referenced summary RODs. However, in most cases, little or no restrictions were implied if the cleanup level was below 25 ppm.

Table 3-3
Summary RODs[a] (1982 through 1989) for 81 Sites in Various States

Soil Cleanup Levels[b] (range in ppm)[c]	Number of RODs	Comments
5	6	Restricted or nonrestricted areas[d]
6 to 13	14	Restricted or nonrestricted areas[d]
20 to 25	7	Limited or no restrictions stated[d]
50	6	With or without cover[d]
100	1	Containment
Background levels	1	No number is given for background
None stated in the ROD summary	33	
Not applicable; applies to sediments or groundwater	13	

Source: U.S. EPA 1990, Appendix A

Notes:
[a] ROD – Record of Decision
[b] also called excavation level when it triggers excavation for disposal and/or treatment
[c] ppm – parts per million
[d] depending on the site circumstances, the referenced summary is not clear

A summary of 17 RODs (1985 through 1989) is also available for PCB-contaminated sites with specific focus on the restriction requirements for each site (U.S. EPA 1990, Appendix F). The cleanup levels and cover design for each of these 17 sites are presented in Table 3-4.

As can be seen from Tables 3-3 and 3-4, cleanup levels vary from 1 to 100 ppm depending on the site-specific circumstances. Where groundwater is not very shallow, the prevalent cleanup levels generally range from 5 to 25 ppm, requiring little or no restrictions (minimal or no requirements for soil cover, deed notice, or fence). However, the summary RODs do not provide adequate information on the rationale for selection of cleanup levels, required restrictions, and site-specific conditions. In an attempt to focus more specifically on rationale and restrictions per recent RODs in the state of California, a review was recently conducted of the federal RODs issued for California NPL sites between 1988 to 1995 (BNI 1996). Out of 30 RODs issued, only five RODs were found to involve sites with PCB-contaminated soils. Based on the review of these five RODs, the PCB cleanup levels and required restrictions (long-term management controls) are summarized in Table 3-5.

Table 3-5 shows that only one California site (Site 3) has conditions somewhat similar to those at Unit 2 of Site 19 for reasons discussed below. The primary contaminants affecting soils at Site 3 are PCBs, and the required remedy focuses on PCBs only. However, the selected the remedies (capping and/or 5-year review of the remedy) at the other four sites involved PCBs and other contaminants, as detailed below.

Table 3-4
Summary of 17 Federal RODs[a] (1985 to 1989) with Cover Design

Sequence Number	Site Number[b]	Site Designation and State	ROD Date	Groundwater Depth (feet)	PCB[c] Cleanup Levels (ppm)[d]	Cover Design	Comments
1	7	Peper's Steel & Alloys Medley, FL	3/12/86	5 to 6	1	12-inch crushed rock	Fill and peat
2	11	Commencement Bay/Near Shore Tacoma, WA	12/30/87	8 to 12	1	2-inch asphalt seal	
3	4	Wide Beach Brant, NY	09/30/85	NS[e]	10	None	Dirt road, residential area
4	9	Fort Wayne Fort Wayne, ID	08/26/88	15	10	2 feet clay, 6 inches vegetative cover	
5	1	Ottati and Goss Kingston, NH	01/16/87	0 to 2	20	9 inches of soil	
6	10	French Limited Crosby, TX	03/24/88	< 50	23	None	*In situ* biotreatment and/or stabilization
7	2	Re-Solve, MA North Dartmouth, MA	07/24/87	60	25	Regrade and grass	Dirt road
8	6	Mowbray Engineering ----------, AL	09/25/86	18	25	RCRA[f] cap	Swamp
9	12	Pacific Hide and Fur Pocatello, ID	06/28/88	30	25 to 10	RCRA cap	
10	8	Belvidere Landfill Belvidere, IL	06/30/88	7	50	RCRA cap	Landfill
11	17	Town of Norwood Norfolk County, MA	01/89 Draft	NS	50 to 10	3-inch asphalt and composite cap	
12-17		6 other sites			NA[g] or NS		

Source: U.S. EPA 1990, Appendix F

Notes:
[a] ROD - record of decision
[b] site numbers as listed in Appendix F of the U.S. EPA 1990; for more details, see the source cited for this table
[c] PCB – polychlorinated biphenyl
[d] ppm - parts per million
[e] NS - none stated in the summary
[f] RCRA - Resource Conservation and Recovery Act
[g] NA - not applicable

Table 3-5
Records of Decision for Five PCB[a] Sites in California (1988 to 1995)

Sequence Number	Site Designation and Location	ROD[b] Date	Subsoils	Depth to Groundwater (feet)	Contaminants	PCB Cleanup Levels (ppm)[c]	Cover Design	Land Use	Management Controls
Site 1	Lorents Barrel and Drum, San Jose	8/26/93	Clays	18	PCBs, VOCs[d], and metals	50 for stockpile and 1.7 for excavation	Industrial	5-year review, deed notice for residential and wells	Cap with single layer asphalt
Site 2	McClellan Air Force Base, Sacramento County	9/3/93 Interim ROD	Hard pan, carbonaceous	100 to 105	PCBs, VOCs, and SVOCs[e]	10 (for 0 to 3 feet bgs[f]) 100 (for > 3 feet bgs)	Industrial	Final remedy pending, deed notice for residential use	Cap with 2-inch-thick asphalt
Site 3	MGM Brakes, Cloverdale	9/29/88	Silty clay on bedrock	2 to 5	PCBs	10	Residential and mixed use	Unrestricted access, no deed notice	10-inch soil cover
Site 4	Waste Disposal Inc., Santa Fe Springs	12/27/93	Soil	Not available from the ROD abstract	PCBs, pesticides, metals, VOCs, and SVOCs	0.22, on-site landfill	Industrial	1-year review, deed restrictions	RCRA[g] cap
Site 5	Westinghouse Electric, Sunnyvale	10/16/91	Sands, silts, and clays	25	PCBs[h], DNAPLs[i], solvents, fuel compounds	25 (for 0 to 8 feet bgs)	Industrial	5-year review, deed notice for residential and wells	Asphalt cap
Note[j]	Unit 2, Site 19, MCAS El Toro	None	Silts, sands, and clays (alluvial)	Approximately 150	PCBs	TBD[k]	TBD	TBD	TBD

Source: U.S. EPA Computer Database

Notes:

[a] PCB – polychlorinated biphenyl
[b] ROD – record of decision
[c] ppm – parts per million
[d] VOC – volatile organic compound
[e] SVOC - semivolatile organic compound
[f] bgs – below ground surface
[g] RCRA – Resource Conservation and Recovery Act
[h] spatially discontinuous PCB liquids
[i] DNAPL – dense nonaqueous phase liquid
[j] there is no ROD for Site 19; information in this column is provided for comparison with the other five sites with RODs
[k] TBD – to be determined

- Site 1 contains metals and volatile organic compounds (VOCs).
- Site 2 is under an interim ROD only; the area has been capped pending development of a final remedy. The remedy provides for PCBs as well as other chemicals (VOCs and semivolatile organic compounds [SVOCs]).
- Site 4 is a former waste dump containing pesticides, VOCs, and metals.
- Site 5 contains solvents, fuel compounds, and spatially discontinuous liquid, dense nonaqueous phase liquids (DNAPLs) including PCBs.

Thus, the selected remedies at these four California sites cannot be directly related to the PCB cleanup levels independent of other contaminants. For Site 3, a PCB cleanup level of 10 ppm was selected for residential area without any cover or restrictions. As can be observed in Table 3-5, the groundwater for Site 3 is encountered at 2 to 5 feet below grade. Applying this remedy at Unit 2 of Site 19 would be very conservative considering that 1) at Site 19 the depth to groundwater is approximately 150 feet below grade, 2) the PCB-contaminated soils are approximately 10 feet deep, and 3) the mean value of the PCB concentrations for these soils is only 6 ppm.

A similar review of Tables 3-3 and 3-4 is not possible because of insufficient data available from the summary RODs. However, a cursory review of Table 3-4, which summarizes 17 federal RODs, indicates that two sites are somewhat comparable to Site 19 at MCAS El Toro.

- Site 2 in Massachusetts – The groundwater is at 60 feet below grade with PCB contamination of surface soils (resulting from spreading waste oil on dirt road). A cleanup level of 25 ppm was selected requiring no restrictions except for regrading and grass cover; the land use is not stated in the summary ROD, although it is known to be a dirt road.
- Site 4 in New York – The groundwater depth is not stated in the summary ROD, but the PCB-contaminated soils are at or near the ground surface (resulting from spreading waste oil on dirt road). A cleanup level of 25 ppm was selected requiring no restrictions or cap, even though the land use is dirt road near a residential area.

Section 4

CONCLUSIONS AND RECOMMENDATIONS

Based on information discussed in the previous sections of this document, the following conclusions and recommendations are presented with respect to cleanup levels of soils containing low levels of PCBs at Unit 2 of Site 19 in MCAS El Toro.

4.1 CONCLUSIONS

Tables 3-3 through 3-5 indicate that, for sites where groundwater is not very shallow, the established cleanup levels for PCBs in the residual 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. The required soil cover has been typically 10 inches of soil, or just backfill of the excavation area, to prevent direct contact and to achieve risk levels significantly higher than 10^{-6}. Containment (clay cap, a composite cap, or a Resource Conservation and Recovery Act cap, and periodic groundwater monitoring) has been required only if one or more of the following conditions exist.

- The PCB concentrations in the residual soils is higher than the levels indicated above (up to 100 ppm or, in exceptional cases, up to 500 ppm).
- The groundwater is at or near the surface.
- Metals and other constituents are also present in the residual soils.

As discussed in Section 3, the U.S. EPA calculations for cover design requires a soil cover thickness of only 12 inches using conservative assumptions for groundwater at 20 feet. Also, the cleanup recommendations by the PCB Spill Cleanup Policy imply a cancer risk level of 10^{-6} or better if the following cleanup levels are adopted.

Land Use	Cleanup Levels (parts per million)
Residential	10 (with 10-inch soil cover)
Industrial	25 to 50

For Unit 2 at Site 19, the following site-specific conditions are emphasized in adopting a cleanup level for the residual PCBs.

- The backfill with the PCB soils is located at the bottom of the pit, approximately 10 feet below the existing grade. If clean soil is used to fill the pit to grade, a cover of 10 feet would be achieved, which is considerably more than the 10-inch soil cover required for 10^{-6} risk levels under residential scenarios in the case of soils with PCB concentrations of 10 ppm. Even a 10-inch cover is conservative for Unit 2 site conditions because the average concentration of PCBs within the backfill at this site is below 6 ppm.
- The groundwater is approximately at 150 feet below grade, rather than 20 feet as assumed for calculation of a 12-inch cover over soils with PCB concentrations of 20 ppm. Therefore, a 12-inch cover at Site 19 could easily meet the

groundwater protection requirements even if PCBs in the residual soils were as high as 100 ppm.

- The volume of the soil with PCBs is very limited at this site, approximately 200 cubic yards only (30 by 30 feet square, and 6 feet thick). The pit area is only a fraction of the entire property typically used for residential lots (on the order of 10,000 square feet including the yard area). Therefore, exposure potential is much less at a small area within a typical lot. For the same risk levels (e.g., 10^{-6}), much higher PCB concentrations can be tolerated at a small area within the property. Thus, exposure assumptions made for calculating cancer risks for typical residential scenarios are conservative and unrealistic if directly applied to the pit area.

The following conditions will be considered for the PCB cleanup level at Unit 2 of Site 19:

- site-specific conditions including the limited size and location of the backfill containing low levels of PCBs;
- the 6 ppm average value of PCBs within the backfill;
- typical cover design and risk calculations made by U.S. EPA, acknowledging that they are conservative and selecting the typical case with conditions most similar to Site 19;
- past RODs if they have conditions similar to Site 19; and
- ARARs and PCB Spill Cleanup Policy.

Considering the above, PCB cleanup levels were developed for the site as presented in Section 4.2.1 below.

4.2 RECOMMENDATIONS

Because the mean value of PCBs in the backfill is only about 6 ppm, it is recommended that existing PCB soils be left within the pit, and that the pit be backfilled to grade using clean soils (silts and/or clays). This option would easily meet the residential land use scenario. The deed notice, if required at all, would be applicable to the pit area rather than the entire area of Unit 2. Such a notice would require precautionary measures for future drilling or excavations deeper than 9 feet below grade within this small area.

The contact between the PCB soils at the bottom of the pit and the new clean backfill should be marked to facilitate recognition of the contact boundaries in case of future excavations. This may be accomplished by placing a permeable geotextile membrane at the present bottom of the pit before the pit is backfilled with clean soils. Similarly, the top of the clean backfill near the ground surface may be marked to facilitate identification of the pit area. Metal utility marking tapes may also be used to facilitate future identification of the pit area by geophysical survey. The clean backfill should be brought up to grade for proper surface runoff. No other restrictions or long-term management controls would be required.

Section 5
REFERENCES

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