

# Groundwaters

Groundwater is water that is located beneath the Earth's surface in soil pores, fractures, and other openings in rocks. It is a vital resource for drinking water and irrigation. Groundwater is replenished by precipitation and surface water bodies. The study of groundwater is essential for understanding the hydrological cycle and managing water resources sustainably.

Environmental Science & Engineering 05-21-92 \*\*\* FIELD LOGSHEET \*\*\* FIELD GROUP: ALW2B  
 PROJECT NUMBER 3914042 0201 PROJECT NAME: JMM/ALAMEDA NASCTO-121 LAB COORD. JACKIE HARGROVE-ELLIOT

SE #	SITE/STA HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*8	TB1	VP VP VP VP			ALTB3			
*9	TB1	VP VP VP VP			ALTB3			
*10	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*11	EB2	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
(A12)	EB1	(B) (C) (C) (EC) (EC) (ED) (ED) F (HB) (HB) (LC) (LC) (MS) (MS) (MS) (NF) (NP) (NP) (O) (O) (O) (S) (VP) VP VP VP			ALW2B.2 1-2 6/13/92 0830			
*13	B-11S-1	B C F NF VP VP VP VP			ALW2B.2			
*14	B-11S-1	B C F NF VP VP VP VP			ALW2B.2			

6/19

metals, hex. Chrome, Analyze only - VOC

NOTE: CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 -CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 -HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 -PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

1 Donna Courter JMM 6/3/92 11:00 Fed-Ex 1800  
 2 V-Plem Ooo ESE 6-4 1300  
 3

SAMPLER: MORE SAMPLES TO BE SHIPPED?    IF YES, ANTICIPATED #    TO SHIP ON     
 SAMPLE CUSTODIAN: Custody Seals Intact?    Samples Iced?    Preservations Audited?    Problems?

SE #	SITE/STA HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TLM C
(6)	TB1	VP VP VP VP	6-3-92	—	ALTB3			
*9	TB4	VP VP VP VP			ALTB3			
*10	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*11	EB2	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*12	EB3	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*13	B-05PS-01	B C F NF VP VP VP VP			ALW2B.2			
(14)	B-05PS-02	<sup>CVM</sup> (B, C) <del>F</del> <del>VP</del> <del>VP</del> <del>VP</del> <del>VP</del>	6/3/92	1210	ALW2B.2	7.5	300	19°C

NOTE -CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 -CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 -HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 -PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

V. Palm Oo ESE 6-4 1300

SAMPLES: MORE SAMPLES TO BE SHIPPED? IF YES, ANTICIPATED # TO SHIP ON / /  
 SAMPLE CUSTODIAN: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems? N

\* metals not filtered or preserved. Filter apparatus is broken.

Environmental Science & Engineering 05-21-92  
 PROJECT NUMBER 2914042 0201

\*\*\* FIELD LOGSHEET \*\*\*

FIELD GROUP: ALW2B

PROJECT NAME: JMM/ALAMEDA NASCTO-121

LAB COORD. JACKIE HARGROVE-ELLIOT

SE #	SITE/STA HAZZ	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*15	B-05PS-03	B (C) F <sup>CVM</sup> <del>NE</del> <del>VP</del> <del>VP</del> <del>VP</del> <del>VP</del>	6/3/92	1315	ALW2B.2	7.0	450	19°C
*16	B-05PS-04	B (C) F <sup>CVM</sup> <del>NE</del> <del>VP</del> <del>VP</del> <del>VP</del> <del>VP</del>	6/3/92	1420	ALW2B.2	10.0	550	20°C
*17	B-05PS-05	B (C) F <sup>CVM</sup> <del>NE</del> <del>VP</del> <del>VP</del> <del>VP</del> <del>VP</del>	6/3/92	1650	ALW2B.2	7.5	270	20°C
*18	B-05PS-06	B C F NF VP VP VP VP			ALW2B.2			
*19	B-05PS-07	B C F NF VP VP VP VP			ALW2B.2			
*20	B-05PS-08	B C F NF VP VP VP VP			ALW2B.2			
*21	B-05PS-09	B C F NF VP VP VP VP			ALW2B.2			

6/19

NOTE: CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 -HAZARD CODES: I-INSTANTANEOUSLY TOXIC C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 -PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)  
 1 VP Jim Dao ESE 6-4 1300  
 2  
 3

SAMPLER: MORE SAMPLES TO BE SHIPPED?  IF YES, ANTICIPATED #  TO SHIP ON   
 SAMPLE CUSTODIAN: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems?

\*metals not filtered. Filter apparatus is broken. <sup>metals</sup> samples(F) not preserved.

ALAMEDA NAVAL AIR STATION  
SUMMARY OF SAMPLE SHIPMENT TO ESE

	Sample I.D.	Depth (feet)	Sample Type (H2O/Soil)	ESE Sample No.	Type and No. of Containers	Date Sampled	Time
1	EB-3	-	H2O	# 11	1-B; 2-C; 2-ED	6/3/92	0830
2					2-ED; 2-HB; 2-LC		
3					3-MS; 1-NF; 2-NP		
4					3-O; 1-S; <del>1-L</del>		
5							
6							
7							
8							
9							
10							
11							
12							
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24							
25							
26							
27							

TOTAL:

Cooler No.: 5 Fed. Express No.: 1382705376  
 Date Shipped: 6/3/92 Completed By: D. Courington  
 Received by (ESE): V. Piem Oo Date Received: 6-4-92

Attach COC and include this form in each cooler.

ALAMEDA NAVAL AIR STATION  
SUMMARY OF SAMPLE SHIPMENT TO ESE

	Sample I.D.	Depth (feet)	Sample Type (H2O/Soil)	ESE Sample No.	Type and No. of Containers	Date Sampled	Time
1	B-0SPS-04	\	H2O	#6	1-B, 1-G, 1-F, 4-VP	6/3/92	1420
2							
3							
4	B-0SPS-03	\	H2O	#15	1-B, 1-G, 1-F 4-VP	6/3/92	1315
5							
6							
7	B-0SPS-02	\	H2O	#14	1-B, 1-G, 1-F 4-VP	6/3/92	1210
8							
9							
10	B-0SPS-05	\	H2O	#17	1-B, 1-G, 1-F 4-VP	6/3/92	1650
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							

TOTAL:

Cooler No.: #19  
 Date Shipped: 6/3/92  
 Received by (ESE): *[Signature]*

Fed. Express No.: 1382705880  
 Completed By: *[Signature]*  
 Date Received: 6-4-92

Attach COC and include this form in each cooler.

SE #	SITE/STA HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND EMMISSION	H2O TEMP
*1	M-BG1-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*2	M-BG2-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*3	M-BG3-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*4	M-BG4-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*5	M-BG DUFF	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*6	TR1	VP VP VP VP			ALTB3			
*7	TR2	VP VP VP VP	6/4/92	1800	ALTB3			

6/19

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 - HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 - PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

ELIQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

Colleen Maxfield / JMM / 6/4/92 / 1800

Fed X / 6/4/92 / 1830

1/1-Perm Oco / ES/E 6-5 / 1300

SAMPLES TO BE SHIPPED?    IF YES, ANTICIPATED #    TO SHIP ON     
 SAMPLE CONTAINERS: Custody Seals Intact?    Samples Iced?    Preservations Audited?    Problems?

Environmental Science & Engineering 05-21-92 \*\*\* FIELD LOGSHEET \*\*\* FIELD GROUP: ALW2B  
 PROJECT NUMBER 2914042 0201 PROJECT NAME: JMM/ALAMEDA NASCTO-121 LAB COORD. JACKIE HARGROVE-ELLIOT

6/19

SE #	SITE/STA HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*8	TB4	VP VP VP VP			ALTB3			
*9	TB4	VP VP VP VP			ALTB3			
*10	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*11	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*12	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*13	B-05PS-01	(B) (C) (F) NF (VP) (VP) (VP) (VP)	6/4/92	1230	ALW2B.2	7	2300	20°C
*14	B-05PS-02	B C F NF VP VP VP VP			ALW2B.2			

NOTE -CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 -CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 -HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 -PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

Colleen Morf / JMM / 6/4/92 / 1600 . FedEx / 6/4/92 / 1800  
 ✓ Perm. O → ESE 6-5 1300

SAMPLES: MORE SAMPLES TO BE SHIPPED?      IF YES, ANTICIPATED #      TO SHIP ON      /      /       
 SAMPLE CONTAINER: Custody Seals Intact? Y Samples Iced? Y Preservations Audited? X Problems?     

\* Metals (F) not filtered or preserved. Filtering apparatus is broken

Environmental Science & Engineering 05-21-92  
 PROJECT NUMBER: 8914042 0201

\*\*\* FIELD LOGSHEET \*\*\*

FIELD GROUP: ALW2B  
 LAB COORD. JACKIE HARGROVE-ELLIOT

E #	SITE STA. HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH	SP COND	H2O TEMP
						STD UNITS	UMHOS/CM	C
*22	B-05NS-10	B C F NF VP VP VP VP			ALW2B.2			
*23	B-05NS-DUF	B C F NF VP VP VP VP	6/4/92		ALW2B.2			
*24	B-05WT-01	B C F MS MS MS NF VP	6/4/92	1545	ALW2B.3	7.0	1200	20°C
*25	B-05WT-02	B C F MS MS MS NF VP	6/4/92	1600	ALW2B.2	7.0	1050	24°C
*26	B-05HW-01	B C F MS MS MS NF VP			ALW2B.2			
*27	B-05NS-01	B C F MS MS MS NF VP			ALW2B.2			

6/19

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 CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 HAZARD CODES: I-IDENTIFIABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

1 Colleen Mack (JMM) 6/4/92 1600 FAX X 6/14/92/1800  
 2 VPum Doc ESE 6-5 1300  
 3

SAMPLER: MORE SAMPLES TO BE SHIPPED?      IF YES, ANTICIPATED #      TO SHIP ON       
 SAMPLE CUSTODIAN: Custody Seals, Intact?  Samples Iced?  Preservations Audited?  Problems?     

(F)  
 \*metals not filtered or preserved. Filtering apparatus is broken.

CTO - 121 Mod 1

Job No. 2738.0655

ALAMEDA NAVAL AIR STATION  
SUMMARY OF SAMPLE SHIPMENT TO ESE

Page 1 of 1

	Sample I.D.	Depth (feet)	Sample Type (H2O/Soil)	ESE Sample No.	Type and No. of Containers	Date Sampled	Time
1	B-05PS-01	✓	H2O	#13	1-B, 1-C, 1-F	6/4/92	1300
2	B-05PS-Dup			#23	4-VP		
3							
4							
5							
6	W05-08	✓	Surface	#21	7-WP	6/4/92	1140
7	W05-09			#22	7-WP	6/4/92	1445
8							
9							
10	B-05WT-01		H2O	#24	1-B, 1-C, 1-F	6/4/92	1545
11	B-05WT-02			#25	4-VP, 3-MS		1600
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							

TOTAL:

Cooler No.: 21 Fed. Express No.: 1382705424  
 Date Shipped: 6/4/92 Completed By: Thomas Smith  
 Received by (ESE): [Signature] Date Received: 6-5-92

Attach COC and include this form in each cooler.

SE #	SITE/STW HAZ?	FRACTIONS (CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*1	H-BG1-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS S VP NF NP NP O O O S VP VP VP VP	6/11/92	1530	ALW2B.1	7.2	13000	58.8°
*2	H-BG2-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS S VP NF NP NP O O O S VP VP VP VP			ALW2B.1			
*3	H-BG3-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS S VP NF NP NP O O O S VP VP VP VP			ALW2B.1			
*4	H-BG4-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS S VP NF NP NP O O O S VP VP VP VP			ALW2B.1			
*5	H-BG5-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS S VP NF NP NP O O O S VP VP VP VP			ALW2B.1			
*6	TR	VP VP VP VP			ALTB3			
*7	TR	VP VP VP VP			ALTB3			

7/10

NOTE - CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 - CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 HAZARD CODES: I=IGNITABLE C=CORROSIVE R=REACTIVE T=TOXIC WASTE H=OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

Thomas Smith / JMM / 6/11/92 1630

Fed Ex 6/11/92 1800  
 V. Plum Das ESE 6-12 1300

SAMPLES: HOLD SAMPLES TO BE SHIPPED? IF YES, ANTICIPATED # TO SHIP ON  
 SAMPLE CUSTODIAN: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems? N

6°C

Environmental Science & Engineering 05-21-92  
 PROJECT NUMBER: 8914042 0201

\*\*\* FIELD LOGSHEET \*\*\*

FIELD GROUP: ALW2B

PROJECT NAME: JMM/ALAMEDA NASCTO-121

LAB COORD. JACKIE HARGROVE-ELLIOT

ESE #	SITE/STA	HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*8	TB4		VP VP VP VP	6/11/92		ALTB3			
*9	TB4		VP VP VP VP			ALTB3			
*10	EB1		B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*11	EB1		B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*12	EB1		B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*13	R-113-01		B C F NF VP VP VP VP			ALW2B.2			
*14	R-113-01		B C F NF VP VP VP VP			ALW2B.2			

7/10  
 Pack by ESE

NOTE: CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 HAZARD CODES: I-IDENTIFIABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

ENQUIRED BY: NAME/ORGANIZATION/DATE/TIME VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)  
 Thomas Smith / JMM / 6/11/92 1630 Fed Ex 6/11/92 1800  
 V. Pen Oad ESE 6-12 1300

SAMPLES: MORE SAMPLES TO BE SHIPPED? IF YES, ANTICIPATED # TO SHIP ON  
 SAMPLE CONTAINER: Custody Seals Intact? Samples Iced? Preservations Audited? Problems?  
 6°C

**CTO - 107**  
**ALAMEDA NAVAL AIR STATION**  
**SUMMARY OF SAMPLE SHIPMENT TO ESE**

	Sample I.D.	Depth (feet)	Sample Type (H2O/Soil)	ESE Sample No.	Type and No. of Containers	Date Sampled	Time
1	M-B61-GW	\	H2O	#1	1-B, 2-C, 2-EC	6/11/92	1530
2					3-MS, 1-NF, 3-O		
3					<del>1-S, 1-NF</del>		
4					2-ED, 2-HB, 2-LC,		
5					2-NP, 4-VP,		
6	TB3	\		#8	4-VP	TXS Packed by ESE	
7							
8							
9							
10							
11							
12							
13							
14							
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24							
25							
26							
27							

**TOTAL:**

Cooler No.: 69 Fed. Express No.: 1382705450  
 Date Shipped: 6/11/92 Completed By: Thomas Smith  
 Received by (ESE): W. Pen O'D Date Received: 6-12-92

Attach COC and include this form in each cooler.

Environmental Science & Engineering 05-21-92  
 PROJECT NUMBER 3914042 0201

\* FIELD LOGSHEET \*\*\*

FIELD GROUP: AL2B

PROJECT NAME: JMM/ALAMEDA NASCTO-121

LAB COORD. JACKIE HARGROVE-ELLIOT

SE #	SITE/STA HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*1	M-BG1-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*2	M-BG2-GW	B C C EC EC ED ED HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP	6-12-92	0930	ALW2B.1	6.9	5500	58.6
*3	M-BG3-GW * - sample was put into BG-4 containers. Labels were changed to BG-4.	B C C EC EC ED ED HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP	6-12-92	1615	ALW2B.1	7.0	800	57.6
*4	M-BG4-GW * - sample was put into BG-3 containers. Labels were changed to BG-4.	B C C EC EC ED ED HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP	6-12-92	1200	ALW2B.1	7.0	200	56.1
*5	M-BG5-DUI	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*6	TL	VP VP VP VP			ALTB3			
*7	TL	VP VP VP VP			ALTB3			

7/10

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 - CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 - HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 - PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

1 Scott Engstrom / JMM / 6-12-92 / 1715

Fed Ex 6/12/92 1745  
 V. Palm J. ESE 6-13 1600

SAMPLES: HOW MANY SAMPLES TO BE SHIPPED?      IF YES, ANTICIPATED #      TO SHIP ON       
 SAMPLE CUSTODIAN: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems?   
 \*4-ED + \*4-O; one broke during shipping. (VPD)

7/10

SE #	SITE/STATION HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C	
*8	TB4	VP VP VP VP			ALTB3				
*9	TB4	VP VP VP VP	6-12-92		ALTB3				Packed By ESE
*10	EB1	B C C EC EC ED ED HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP	6-12-92	0730	ALW2B.1	8.0	0	70.8	BG
*11	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1				
*12	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1				
*13	EB1	B C F NF VP VP VP VP			ALW2B.2				
*14	EB1	B C F NF VP VP VP VP			ALW2B.2				

NOTE: CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 - CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 HAZARD CODES: I-IRITANT C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)  
 Scott Engstrom / JMM / 6-12-92 / 1715 Fed Ex 6-12-92 1745  
 J. Palm Oco ESE 6-13 1600

SAMPLES TO BE SHIPPED? IF YES, ANTICIPATED # TO SHIP ON  
 SAMPLE CUSTODY: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems? N

ALAMEDA NAVAL AIR STATION  
SUMMARY OF SAMPLE SHIPMENT TO ESE

	Sample I.D.	Depth (feet)	Sample Type (H <sub>2</sub> O/Soil)	ESE Sample No.	Type and No. of Containers	Date Sampled	Time
1	EB-1	/	H <sub>2</sub> O	# 10	1 B	6-12-92	0730
2					2 C		
3					2 EC		
4					2 ED		
5					2 HB		
6					2 LC		
7					3 MS		
8					1 NF		
9					2 NP		
10					3 O		
11					1 S		
12					4 VP		
13	M-BG 2-6W	/	H <sub>2</sub> O	# 2	1 B	6-12-92	0930
14					2 C		
15					2 EC		
16					2 ED		
17					2 HB		
18					2 LC		
19					3 MS		
20					1 NF		
21					2 NP		
22					3 O		
23					1 S		
24					4 VP		
25	M-BG 4-6W	/	H <sub>2</sub> O	# 4	1 B	6-12-92	1200
26					2 C		
27					2 EC		
28					2 ED		
TOTAL:					(CONT)		

Cooler No.: \_\_\_\_\_ Fed. Express No.: \_\_\_\_\_

Date Shipped: \_\_\_\_\_ Completed By: \_\_\_\_\_

Received by (ESE): W. Plum Ows Date Received: 6-13-92

Attach COC and include this form in each cooler.

**ALAMEDA NAVAL AIR STATION  
SUMMARY OF SAMPLE SHIPMENT TO ESE**

	Sample I.D.	Depth (feet)	Sample Type (H <sub>2</sub> O/Soil)	ESE Sample No.	Type and No. of Containers	Date Sampled	Time
1	M-1364-GW (cont)	/	H <sub>2</sub> O	#4	2 HB	6-12-92	1200
2					2 LC		
3					3 MS		
4					1 NF		
5					2 NP		
6					3 O		
7					1 S		
8					4 VP		
9	M-1363-GW	/	H <sub>2</sub> O	#3	1 B	6-12-92	
10					2 C		
11					2 EC		
12					2 EB		
13					2 HB		
14					2 LC		
15					3 MS		
16					1 NF		
17					2 NP		
18					3 O		
19					1 S		
20					4 VP		
21							
22							
23							
24							
25							
26							
27							
28							

TOTAL:

Cooler No.: 69 Fed. Express No.: 138 2705 461  
 Date Shipped: 6-12-92 Completed By: Scott Engle  
 Received by (ESE): [Signature] Date Received: 6-13-92

Attach COC and include this form in each cooler.

Environmental Science & Engineering 05-21-92  
 PROJECT NUMBER 3914042 0201

\*\*\* FIELD LOGSHEET \*\*\*

FIELD GROUP: ALW2B

PROJECT NAME: JMM/ALAMEDA NASCTO-121

LAB COORD. JACKIE HARGROVE-ELLIOT

7/17

SE #	SITE STA NAME	FRACTIONS (CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*8	TB4	VP VP VP VP			ALTB3			
*9	TB4	VP VP VP VP			ALTB3			
*10	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*11	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP	6-15-92	0900	ALW2B.1	8.0	0	70.8
*12	EB1	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*13	N-01S-0	B C F NF VP VP VP VP			ALW2B.2			
*14	N-01S-0	B C F NF VP VP VP VP			ALW2B.2			

NOTE: CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 - CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

1  
 2  
 3  
 N. Plummer OGD ESE 676 1600

SAMPLES: MORE SAMPLES TO BE SHIPPED?      IF YES, ANTICIPATED #      TO SHIP ON       
 SAMPLE CUSTODIAN: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems? N

Environmental Science & Engineering 05-21-92  
 PROJECT NUMBER E914042 0201

\*\*\* FIELD LOGSHEET \*\*\*

FIELD GROUP: ALW2B

PROJECT NAME: JMM/ALAMEDA NASCTO-121

LAB COORD. JACKIE HARGROVE-ELLIOT

SE #	SITE/STA HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*22	B-051S-10	B C F NF VP VP VP VP			ALW2B.2			
*23	B-051S-DUI	B C F NF VP VP VP VP			ALW2B.2			
*24	B-05WT-01	B C F MS MS MS NF VP VP VP VP			ALW2B.3			
*25	B-05WT-01	B C F MS MS MS NF VP VP VP VP			ALW2B.2			
*26	B-05HW-01	B C F MS MS MS NF VP VP VP VP	6.15-92	1300	ALW2B.2 3	7.1	900	65.5
*27	B-05ES-01	B C F MS MS MS NF VP VP VP VP	6.15-92	1130	ALW2B.2 3	6.4	7000	65.9

7/17

NOTE - CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 - CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 - HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 - PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)  
 6.15.92/1445 Fed Ex 6.15.92 1445  
 V. P. O. O. O. ESE 6-16 1600

SAMPLES: MORE SAMPLES TO BE SHIPPED? \_\_\_ IF YES, ANTICIPATED # \_\_\_ TO SHIP ON 1/1  
 SAMPLE CONTAINERS: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems? N

CTO - 121 modi

Job No. 2738.0652

**ALAMEDA NAVAL AIR STATION  
SUMMARY OF SAMPLE SHIPMENT TO ESE**

Page 1 of    

	Sample I.D.	Depth (feet)	Sample Type (H <sub>2</sub> O/Soil)	ESE Sample No.	Type and No. of Containers	Date Sampled	Time
1	EBZ	/	H <sub>2</sub> O	# 11	1 B	6-15-92	0900
2					2 C		
3					2 EG		
4					2 ED		
5					2 AB		
6					2 LC		
7					3 NS		
8					1 NF		
9					2 NP		
10					3 O		
11					1 S		
12					4 VP		
13	B-05BS-01	/	H <sub>2</sub> O	# 27	1 B	6-15-92	1130
14					1 C		
15					<del>1</del> SC		
16					3 MS		
17					1 NF		
18					4 VP		
19	B-05HW-01	/	H <sub>2</sub> O	# 26	1 B	6-15-92	1300
20					1 C		
21					3 MS		
22					1 NF		
23					4 VP	6-15-92	1300
24	M-BG-DUP1	/	H <sub>2</sub> O	# 5	1 B		
25					1 C		
26					3 MS		
27					1 NF		
28					4 VP		

TOTAL: 55 CONTAINERS

Cooler No.: 69 Fed. Express No.: 138 270 9 72  
 Date Shipped: 6-15-92 Completed By: Scott Engstrom  
 Received by (ESE): \_\_\_\_\_ Date Received: \_\_\_\_\_

Attach COC and include this form in each cooler.

USE #	SITE/STA HAZ?	FRACTIONS(CIRCLE)	DATE	TIME	PARAMETER LIST	FIELD PH STD UNITS	SP COND UMHOS/CM	H2O TEMP C
*1	M-BG1-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*2	M-BG2-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*3	M-BG3-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*4	M-BG4-GW	B C C EC EC ED ED F HB HB LC LC MS MS MS NF NP NP O O O S VP VP VP VP			ALW2B.1			
*5	M-EG-DUP1	B C <del>EC EC ED ED F</del> <del>HB HB LC LC MS MS MS</del> NF NP NP O O O S VP VP VP VP	6-15-92	1300	ALW2B.1A	7.1	900	65.5
*6	TB1 ALW1 + LAC	VP VP VP VP			ALTB3			
*7	TB2	VP VP VP VP			ALTB3			

7/17

*(Handwritten circled notes around row 5)*

*Packet By ESE*

NOTE -CHANGE OR ENTER SITE ID AS NECESSARY; UP TO 9 ALPHANUMERIC CHARACTERS MAY BE USED  
 -CIRCLE FRACTIONS COLLECTED. ENTER DATE, TIME, FIELD DATA (IF REQUIRED), HAZARD CODE AND NOTES  
 -HAZARD CODES: I-IGNITABLE C-CORROSIVE R-REACTIVE T-TOXIC WASTE H-OTHER ACUTE HAZARD; IDENTIFY SPECIFICS IF KNOWN  
 -PLEASE RETURN COMPLETED LOGSHEETS WITH SAMPLES TO Environmental Science & Engineering, Inc.

RELINQUISHED BY: (NAME/ORGANIZATION/DATE/TIME) VIA: REC'D BY (NAME/ORGANIZATION/DATE/TIME)

1 *Scott Engstrom / JMM / 6-15-92 / 1415* *Fed Ex* *6-15-92 1445*

2 *Walter Ows ESE 6-16 1600*

3

SAMPLER: MORE SAMPLES TO BE SHIPPED?      IF YES, ANTICIPATED #      TO SHIP ON     

SAMPLE CUSTODIAN: Custody Seals Intact?  Samples Iced?  Preservations Audited?  Problems?

**APPENDIX G**  
**REPORTING LIMITS**

**VOLATILE ORGANIC COMPOUNDS (VOCs) REPORTING LIMITS,  
CLP-RAS AND SAS METHODS(a)**

<b>Volatiles</b>	<b>Water (µg/L)</b>	<b>Soil/Sediment (µg/Kg)</b>
Chloromethane	2	10
Bromomethane	2	10
Vinyl Chloride	0.5 (b)	10
Chloroethane	2	10
Methylene Chloride	1	5
Acetone	2	10
Carbon Disulfide	1	5
1,1-Dichloroethene	1	5
1,1-Dichloroethane	1	5
1,2-Dichloroethene	1	5
Chloroform	1	5
1,2-Dichloroethane	0.5 (b)	5
2-Butanone	2	10
1,1,1-Trichloroethane	1	5
Carbon Tetrachloride	0.5 (b)	5
Vinyl Acetate	2	10
Bromodichloroethane	1	5
1,2-Dichloropropane	1	5
cis-1,3-Dichloropropene	1	5
Trichloropropene	1	5
Dibromochloromethane	1	5
1,1,2-Trichloromethane	1	5
Benzene	1	5
trans-1,3-Dichloropropene	0.5 (b)	5
Bromoform	1	5
4-Methyl-2-pentanone	2	10
2-Hexanone	2	10
Tetrachloroethene	1	5
Toluene	1	5
1,1,2,2-Tetrachloroethane	1	5
Chlorobenzene	1	5
Ethylbenzene	1	5
Styrene	1	5
Total Xylenes	1	5

**Notes:**

- (a) Reporting limits are equivalent to CLP Contract Required Quantitation Limits (CRQL).
- (b) A detection limit of 0.5 µg/L is required to meet the California MCL. However, this limit may not be achievable.

**SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs) REPORTING LIMITS, CLP RAS (a)**

(Page 1 of 2)

Semivolatiles	Water (µg/L)	Soil/Sediment (µg/Kg) (b)
Phenol	10	330
bis (2-Chloroethyl) Ether	10	330
2-Chlorophenol	10	330
1,3-Dichlorobenzene	10	330
1,4-Dichlorobenzene	5(c)	330
Benzyl Alcohol	10	330
1,2-Dichlorobenzene	10	330
2-Methylphenol	10	330
bis (2-Chloroisopropyl) Ether	10	330
4-Methylphenol	10	330
N-nitroso-di-n-propylamine	10	330
Hexachloroethane	10	330
Nitrobenzene	10	330
Isophorone	10	330
2-Nitrophenol	10	330
2,4-Dimethylphenol	10	330
Benzoic Acid	50	1600
bis (2-Chloroethoxy) methane	10	330
2,4-Dichlorophenol	10	330
1,2,4-Trichlorobenzene	10	330
Naphthalene	10	330
4-Chloroaniline	10	330
Hexachlorobutadiene	10	330
4-chloro-3-methylphenol (para-Chloro-meta-cresol)	10	330
2-Methylnaphthalene	10	330
Hexachlorocyclopentadiene	10	330
2,4,6-Trichlorophenol	10	330
2,4,5-Trichlorophenol	50	1600
2-Chloronaphthalene	10	330
2-Nitroaniline	50	1600
Dimethylphthalate	10	330
Acenaphthylene	10	330
2,6-Dinitrotoluene	10	330
3-Nitroaniline	50	1600
Acenaphthene	10	330
2,4-Dinitrophenol	50	1600
4-Nitrophenol	50	1600
Dibenzofuran	10	330
2,4-Dinitrotoluene	10	330
Diethylphthalate	10	330
4-Chlorophenyl-phenyl Ether	10	330
Fluorene	10	330
4-Nitroaniline	50	1600
4,6-Dinitro-2-methylphenol	50	1600
N-Nitrosodiphenylamine	10	330

**SEMIVOLATILE ORGANIC COMPOUNDS (SVOCs) REPORTING LIMITS, CLP RAS (a)**

(Page 2 of 2)

Semivolatiles	Water (µg/L)	Soil/Sediment (µg/Kg) (b)
4-Bromophenyl-phenylether	10	330
Hexachlorobenzene	10	330
Pentachlorophenol	50	1600
Phenanthrene	10	330
Anthracene	10	330
Di-n-butylphthalate	10	330
Fluoranthene	10	330
Pyrene	10	330
Butylbenzylphthalate	10	330
3,3-Dichlorobenzidene	20	660
Benzo(a)anthracene	10	330
Chrysene	10	330
bis (2-Ethylhexyl) phthalate	10	330
Di-n-octylphthalate	10	330
Benzo(b)fluoranthene	10	330
Benzo(k)fluoranthene	10	330
Benzo(a)pyrene	10	330
Indeno(1,2,3-cd)pyrene	10	330
Dibenzo(a,h)anthracene	10	330
Benzo(g,h,i)pyrene	10	330

**Notes:**

(a) CLP contract required quantitation limits are listed. Specific Quantitation limits are highly matrix dependant. The quantitation limits listed herein are provided for guidance and may not always be achievable

(b) Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis is required by the CLP protocols, will be higher.

(c) A reporting limit of 5µg/L is required for 1,4-dichlorobenzene to meet California MCL. The CLP limit is 10 µg/L.

**ORGANOCHLORINE PESTICIDES AND PCBs REPORTING LIMITS, CLP RAS (a)**

Compound	Water (µg/L)	Soil/Sediment (µg/Kg) (b)
<b><u>OC Pesticides</u></b>		
alpha-BHC	0.05	8.00
beta-BHC	0.05	8.00
delta-BHC	0.05	8.00
gamma-BHC (Lindane)	0.05	8.00
Heptachlor	0.05	8.00
Aldrin	0.05	8.00
Heptachlor Epoxide	0.05	8.00
Endosulfan I	0.05	8.00
Dieldrin	0.10	16.00
4,4-DDE	0.10	16.00
Endrin	0.10	16.00
Endosulfan II	0.10	16.00
4,4-DDD	0.10	16.00
Endosulfan sulfate	0.10	16.00
4,4-DDT	0.10	16.00
Methoxychlor	0.50	80.00
Endrin Ketone	0.10	16.00
alpha-Chlordane	0.50	80.00
gamma-Chlordane	0.50	80.00
Toxaphene	1.00	160.00
 <b><u>PCBs</u></b>		
Arochlor-1016	0.50	80.00
Arochlor-1221	0.50	80.00
Arochlor-1232	0.50	80.00
Arochlor-1242	0.50	80.00
Arochlor-1248	0.50	80.00
Arochlor-1254	1.00	160.00
Arochlor-1260	1.00	160.00

**Notes:**

- (a) CLP contract required quantitation limits are listed. Specific Quantitation limits are highly matrix dependant. The quantitation limits listed herein are provided for guidance and may not always be achievable
- (b) Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis is required by the CLP protocols, will be higher.

**ORGANOPHOSPHORUS PESTICIDES REPORTING LIMITS,  
METHOD 8140/CLP-SAS (a)**

<b>Compound</b>	<b>Water (µg/L)</b>	<b>Soil/Sediment (µg/Kg)</b>
Azinphos methyl	10	100
Bolstar	10	100
Chlorpyrifos	10	100
Coumaphos	10	100
Dementon-O	10	100
Dementon-S	10	100
Diazinon	10	100
Dichlorvos	10	100
Disulfoton	10	100
Ethoprop	10	100
Fensulfothion	10	100
Fenthion	10	100
Merphos	10	100
Mevinphos	10	100
Naled	10	100
Parathion methyl	10	100
Phorate	10	100
Ronnel	10	100
Stirophos (Tetrachlorvinphos)	10	100
Tokuthion (Prothiophos)	10	100
Trichloronate	10	100
Bromocil	2.94	500 (b)
Simazine	0.588	100 (b)

**Notes:**

(a) Reporting limits are equivalent to CLP Contract Required Quantitation Limits (CRQLs). Specific quantitation limits are highly matrix dependant. The quantitation limits listed herein are provided for guidance, actual limits reported by the laboratory will vary.

(b) Provided by ESE.

**CHLORINATED HERBICIDES REPORTING LIMITS,  
METHOD 8150/CLP-SAS (a)**

<b>Compound</b>	<b>Water (µg/L)</b>	<b>Soil/Sediment (µg/Kg)</b>
Dalapon	1.00	10
Dicamba	1.00	10
2,4-DP (Dichloroprop)	1.00	10
2,4-D	1.00	10
MCPP	1.00	10
MCPA	1.00	10
2,4,5-TP (Silvex)	1.00	10
2,4,5-T	1.00	10
2,4-DB	1.00	10
Dinoseb	1.00	10

**Notes:**

**(a) Reporting limits are equivalent to CLP Contract Required Quantitation Limits (CRQLs) Specific quantitation limits are are highly matrix dependant. The quantitation limits listed herein are provided for guidance, actual limits reported by the laboratory will vary.**

### METALS TARGET ANALYTE LIST DETECTION LIMITS, CLP-RAS

Compound	Contract Required Detection Limit (a) (µg/L)
Aluminum	200
Antimony	60
Arsenic	10
Barium	200
Beryllium	5
Cadmium	5
Calcium	5000
Chromium	10
Cobalt	50
Copper	25
Iron	100
Lead	3
Magnesium	5000
Manganese	15
Mercury	0.2
Nickel	40
Potassium	5000
Selenium	5
Silver	10
Sodium	5000
Thallium	10
Vanadium	50
Zinc	20

**Notes:**

- (a) The CRDLs are the instrument detection limits obtained in pure water that must be met using the procedure described in the CLP Statement of Work.

## REPORTING LIMITS FOR INORGANIC AND PHYSICAL MEASUREMENTS

<b>Parameter</b>	<b>Contract Required Detection Limit (a) Water (mg/L)</b>
<b>Bicarbonate, Carbonate, and Alkalinity</b>	<b>2.00</b>
<b>Total Dissolved Solids (TDS)</b>	<b>20.00</b>
<b>Total Organic Carbon (TOC)</b>	<b>1.00</b>
<b>Nitrate and Nitrite</b>	<b>0.10</b>
<b>Cyanide</b>	<b>0.01</b>
<b><u>Anions</u></b>	
<b>Chloride</b>	<b>1.00</b>
<b>Sulfate</b>	<b>1.00</b>
<b>Fluoride</b>	<b>0.10</b>

### Notes:

(a) Detection limits may vary with the selection of the subcontract laboratory.

### MISCELLANEOUS ORGANIC PARAMETERS REPORTING LIMITS

Compound	Method	Water ( $\mu\text{g/L}$ )	Soil/Sediment ( $\mu\text{g/Kg}$ )
Total Recoverable Petroleum Hydrocarbons	418.1	0.17	20.00
Oil and Grease	413.2	21.00	NA

**VOLATILE COMPOUNDS - CLP-RAS METHOD  
MATRIX SPIKE/MATRIX DUPLICATE AND SURROGATE SPIKE RECOVERY  
LIMITS**

Fraction	Matrix Spike Compound	Water		Soil/Sediment	
		Recovery	RPD	Recovery	RPD
VOC	1,1-Dichloroethene	61-145	14	59-172	22
VOC	Trichloroethene	71-120	14	62-137	24
VOC	Chlorobenzene	75-130	13	60-133	21
VOC	Toluene	76-125	13	59-139	21
VOC	Benzene	76-127	11	66-142	21

Fraction	Surrogate Compound	Water	Soil/Sediment
		Recovery	RPD
VOC	Toluene - d8	88-110	81-117
VOC	4-Bromofluorobenzene	86-115	74-121
VOC	1,2-Dichloroethane - d4	76-114	70-121

**SEMIVOLATILE COMPOUNDS - CLP-RAS METHOD  
MATRIX SPIKE/MATRIX DUPLICATE AND SURROGATE SPIKE RECOVERY  
LIMITS**

Fraction	Matrix Spike Compound	Water		Soil/Sediment	
		Recovery	RPD	Recovery	RPD
Base/Neutral	1,2,4-Trichlorobenzene	39-98	28	38-107	23
Base/Neutral	Acenaphthalene	46-118	31	31-137	19
Base/Neutral	2,4-Dinitrotoluene	24-96	38	28-89	47
Base/Neutral	Pyrene	26-127	31	35-142	36
Base/Neutral	N-Nitroso-Di-n-Propylamine	41-116	38	41-126	38
Base/Neutral	1,4-Dichlorobenzene	36-97	28	28-104	27
Acid	Pentachlorophenol	9-103	50	17-109	47
Acid	Phenol	12.0-89	42	26-90	35
Acid	2-Chlorophenol	27-123	40	25-102	50
Acid	4-Chloro-3-Methylphenol	23-97	42	26-103	33
Acid	4-Nitrophenol	10.0-80	50	11-114	50

Fraction	Surrogate Compound	Water	Soil/Sediment
Base/Neutral	Nitrobenzene-d5	35-114	23-120
Base/Neutral	2-Fluorobiphenyl	43-116	30-115
Base/Neutral	p-Terphenyl-d14	33-141	18-137
Acid	Phenol-d5	10.0-94	24-113
Acid	2-Fluorophenol	21-100	25-121
Acid	2,4,6-Tribromophenol	10-123	19-122

**ORGANOCHLORINE PESTICIDES/PCBs - CLP-RAS METHOD  
MATRIX SPIKE/MATRIX SPIKE DUPLICATE AND SURROGATE SPIKE RECOVERY LIMITS\***

Fraction	Matrix Spike Compound	Water		Soil/Sediment	
		Recovery	RPD	Recovery	RPD
Pesticides	Lindane	56-123	15	46-127	50
Pesticides	Heptachlor	40-131	20	35-130	31
Pesticides	Aldrin	40-120	22	34-132	43
Pesticides	Dieldrin	51-126	18	31-134	38
Pesticides	Endrin	56-121	21	42-139	45
Pesticides	4,4-DDT	38-127	27	23-134	50

Fraction	Surrogate Compound	Water	Soil/Sediment
Pesticides	Dibutylchlorodate	24-154	20-150

**Notes:**

\*These limits are for advisory purposes only. They are not used to determine if a sample should be re-analyzed. When sufficient data becomes available, the USEPA may set performance based contract required windows.

**ORGANOPHOSPHORUS PESTICIDES - METHOD 8140  
MATRIX SPIKE/MATRIX SPIKE DUPLICATE AND SURROGATE  
RECOVERY LIMITS**

Matrix Spike Compound	Water		Soil/Sediment	
	Recovery	RPD	Recovery	RPD
Diazinon	61-155	30	75-133	50
Ethyl parathion	50-130	30	50-130	50
Guthion	44-146	30	59-161	50
Malathion	64-134	30	72-148	50

Surrogate Compound	Water	Soil/Sediment
Triphenylphosphate	50-130	55-125

**CHLORINATED HERBICIDES - METHOD 8150**  
**MATRIX SPIKE/MATRIX SPIKE DUPLICATE AND SURROGATE**  
**RECOVERY LIMITS**

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<b>Matrix Spike Compound</b>	<b>Water</b>		<b>Soil/Sediment</b>	
	<b>Recovery</b>	<b>RPD</b>	<b>Recovery</b>	<b>RPD</b>
Dicamba	21-115	30	57-121	50
2,4-D	9-119	30	35-131	50
2,4,5-TP	33-135	30	61-143	50

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<b>Surrogate Compound</b>	<b>Water</b>	<b>Soil/Sediment</b>
Dichlorophenyl acetic acid	60-120	60-120

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**METALS - CLP-RAS METHOD  
CONTROL LIMITS (a)**

Matrix Spike Compound	Water		Soil/Sediment	
	Recovery (%)	RPD (%)	Recovery (%)	RPD (%)
Metals	72-125	20	75-125	35

**Notes:**

(a) Recovery and RPD Limits are based on a spiked sample and duplicate samples, respectively.

**APPENDIX H**  
**SECOND ROUND BACKGROUND SAMPLING AND RESAMPLE**  
**RESULTS FOR SITES 4 AND 5**

**NAVAL AIR STATION, ALAMEDA  
ALAMEDA, CALIFORNIA  
SECOND ROUND BACKGROUND GROUNDWATER SAMPLE RESULTS AND RESAMPLE  
RESULTS FOR SITES 4 AND 5  
OCTOBER 16, 1995**

This addendum presents results for the second round of groundwater samples collected from the background wells located at NAS Alameda. Also included are the semivolatile organic compound (SVOC) results of one groundwater sample collected from the Site 5 wastewater treatment area and the cyanide results of three surface samples collected from the Sites 4 and 5 plating shops.

**BACKGROUND**

In May of 1992, four background monitoring wells were installed in the first water-bearing zone at NAS Alameda (Figure 1). The background monitoring wells were installed to provide a basis for evaluating naturally occurring levels of inorganic constituents in groundwater in the vicinity of NAS Alameda. Monitoring wells MBG-1 and MBG-2 were located within the base housing area. Monitoring well MBG-4 was located within the area currently used as athletic fields and a parade ground. Monitoring well MBG-3 was located outside the fenced boundary of NAS Alameda, at the intersection of Atlantic Avenue and Main Street. These background monitoring wells were sampled twice. Groundwater samples were collected on June 11 and 12, 1992 and again on July 13 and 14. Results for the June samples were presented in the Draft Final Background and Tidal Influence Studies and Additional Work at Sites 4 and 5 Data Summary Report dated August 4, 1992 (PRC/JMM 1992b). Results of the July samples are presented in this addendum. Results from the June sampling are also included for comparison purposes.

At the same time the background wells were installed, additional work was conducted at Site 5 to investigate areas that were not included in the Phases 2B and 3 work. Additional work at Site 5 included soil and groundwater sampling underneath a plating shop, a selective plating shop, a wastewater treatment area, a former hazardous waste storage area, and a battery storage area that had not been previously investigated. Due to a laboratory error, one of the groundwater samples collected at the wastewater treatment area (sample B-05WT-02) had to be resampled and reanalyzed for SVOC. This precluded the inclusion of the SVOC results for sample B-05WT-02 in the August 4, 1992, draft

final data summary report (JMM/PRC 1992b). SVOC results for the resample are reported in this addendum.

As part of the additional work, surface wipe and scrape samples were collected in the Sites 4 and 5 plating shops in order to further characterize the extent of metals and cyanide on interior plating shop surfaces identified in the Phases 2B and 3 work (Site 4) and to investigate a plating shop that was not included in the Phases 2B and 3 work (Site 5). Due to insufficient sample volume, samples W04-11 and W04-12 from Site 4 and sample W05-01 from Site 5 could not be analyzed for cyanide.

Additional sample volume was collected on July 2, 1992, to complete the cyanide analysis. Cyanide results for these three samples are included in this addendum.

All work for this project followed protocols described in the revised background sampling plan submitted by the Navy to the California Department of Toxic Substances Control (DTSC) on February 25, 1991, and the work plan for proposed additional work at Sites 4 and 5 submitted by the Navy to DTSC on May 5, 1992.

All data were validated using EPA functional guidelines (EPA 1988a, 1988b). Data qualifications and rationales are included in data tables two through four and six through eight.

## **ANALYTICAL RESULTS FOR BACKGROUND GROUNDWATER SAMPLES**

Background groundwater samples were analyzed for the constituents listed in Table 1. Analytical results for the first and second rounds of groundwater samples are presented in Tables 2, 3, and 4 for organic compounds, metals, and inorganic constituents, respectively. Table 2 lists only the organic compounds that were detected in at least one of the groundwater samples; if a target compound for the analysis was not detected in any of the samples, it was not included in the summary table. A duplicate sample for QA/QC purposes was collected from well MBG-2.

## **Volatile Organic Compounds**

Methylene chloride was detected at a concentration of 11 micrograms per liter ( $\mu\text{g/L}$ ) in well MBG-4. Although methylene chloride is a common laboratory contaminant, the data validation did not reveal any method blank contamination of this compound. No other volatile organic compounds (VOC) were detected in any of the second round background groundwater samples. No VOC were detected in the first round samples.

## **Semivolatile Organic Compounds**

Five polycyclic aromatic hydrocarbon (PAH) compounds and two phthalates were detected in the second round background groundwater samples. The PAH acenaphthene, fluoranthene, phenanthrene, and pyrene were detected in well MBG-2. All of these compounds and the PAH chrysene were also detected in the duplicate of MBG-2. The soil sample collected at a depth of 5 feet from MBG-2 contained detectable levels of the same PAH compounds as the groundwater sample. PAH were not detected in the other three wells. With the exception of anthracene, the same PAH were detected in both the first and second round samples from MBG-2. Anthracene was detected at  $1 \mu\text{g/L}$  in the first round and was not detected in the second round. The PAH pyrene was detected in well MBG-1 at a concentration of  $1.3 \mu\text{g/L}$  in the first round and was not detected in the second round. PAH were not detected in either of the two rounds in wells MBG-3 and MBG-4.

As discussed in Section 16.0 of the Phases 2B and 3 Data Summary Report (PRC/JMM 1992a), PAH have very low solubilities in water and a high soil/water partition coefficient, indicating they will strongly partition into the soil and not into groundwater. It is likely that the compounds detected in the background groundwater samples are actually sorbed to particulates in the unfiltered groundwater samples.

Bis(2-ethylhexyl)phthalate was detected in MBG-1, MBG-2, and MBG-3. Although bis(2-ethylhexyl)phthalate is a common laboratory contaminant, the data validation did not reveal any method blank contamination of this compound. Dimethylphthalate was detected in both MBG-2 and its duplicate. Bis(2-ethylhexyl)phthalate concentrations appear slightly higher in the second round.

All three of the first round detections were qualified as non-detected based on method blank contamination. Dimethylphthalate was not detected in the first round samples.

### **Pesticides/PCBs**

Neither pesticides, herbicides, nor PCBs were detected in second round background groundwater samples. The pesticide monuron was detected in the first round sample from MBG-2 at a concentration of 0.227  $\mu\text{g/L}$ .

### **Oil and Grease**

Oil and grease was detected in all of the second round groundwater samples. After data qualification, all of the oil and grease detections except the 0.6 milligrams per liter (mg/L) detected in the duplicate sample from MBG-2 were qualified as non-detected. The only unqualified detection in the first round was 1.6 mg/L in MBG-4. The oil and grease measurement technique used for this study (EPA Method 413.1) is not compound-specific and may register naturally occurring organic material related to plant and animal remains.

### **Metals**

The results of metals analyses for the background groundwater samples are found in Table 3. The results of these samples, along with the results from the first round, were used to calculate the estimated range of naturally occurring background metals found in the groundwater at NAS Alameda. The estimated ranges will be compared to results for Phases 1, 2A, 2B, and 3 groundwater samples and used to assess which metals are present at levels in excess of background levels. The significance of analytical results in excess of background levels will be evaluated during the risk assessment performed as part of Phase 7, the preparation of the comprehensive remedial investigation (RI) report.

## **Inorganic Constituents**

The results of inorganic constituent analyses for the background groundwater samples are found in Table 4. The California State Water Resources Control Board's total dissolved solids criteria for drinking water is 3,000 mg/L (SWRCB 1988). Based on this criterion, the groundwater in MBG-1 and MBG-2 is too saline to be classified as drinking water; the groundwater found in the other two wells is below the 3,000 mg/L criterion.

The hardness and acidity in wells MBG-1 and MBG-2 is significantly higher than the other two wells. For example, the hardness measured in wells MBG-1 and MBG-2 during the second sampling round was 1,800 and 967 mg/L, respectively. The hardness measured in MBG-3 and MBG-4 during the same sampling round was only 380 and 280 mg/L, respectively. Acidity values in MBG-1 and MBG-2 were 164 and 186 mg/L during the second sampling round while the values measured in MBG-3 and MBG-4 were only 56.8 and 11.5 mg/L.

Nitrate and nitrite were detected only in MBG-4 at a total concentration of 1.26 mg/L. Cyanide was not detected in any of the first or second round samples.

## **STATISTICAL ANALYSIS OF METALS CONCENTRATIONS IN GROUNDWATER**

A statistical analysis designed to estimate the background metals concentrations in groundwater at NAS Alameda is presented in Section 2.6 of the August 4, 1992, draft final data summary report (PRC/JMM 1992b). The statistical calculations have been updated to include the results of the second round of groundwater sampling. The results of the updated calculations are presented in Table 5. A description of the statistical methods may be found in the original background study data summary report (PRC/JMM 1992b).

In the Phase 7 comprehensive RI report, samples collected at the RI sites throughout the base in the phased investigations will be compared to the 95%/95% statistical tolerance interval. A discussion of whether or not they may be above background concentrations and the significance of the reported

concentrations exceeding background concentrations will be addressed in a preliminary risk assessment to be performed as part of the Phase 7 comprehensive RI report.

#### **ANALYTICAL RESULTS FOR SITE 5 - WASTEWATER TREATMENT AREA GROUNDWATER SAMPLES**

Due to a laboratory error, the original water sample collected from boring B-05WT-02 (Figure 2) was not analyzed for SVOC. A second sample was collected on July 22, 1992, from a boring drilled adjacent to the original B-05WT-02 boring and analyzed for SVOC. The results of the resample are found on Table 6. Two chlorinated hydrocarbons were detected. 1,2-Dichlorobenzene was detected at a concentration of 220  $\mu\text{g/L}$  and 1,4-Dichlorobenzene was detected at a concentration of 59  $\mu\text{g/L}$ . Both values were qualified as estimated due to low surrogate recovery. Naphthalene and 2-methylnaphthalene were detected at 380  $\mu\text{g/L}$  and 50.4  $\mu\text{g/L}$ , respectively. As with the chlorinated hydrocarbons, the detected values are qualified as estimated due to surrogate recovery.

#### **ANALYTICAL RESULTS FOR SITES 4 AND 5 SURFACE SAMPLES**

Due to insufficient sample volume during the initial sample collection, samples W04-11 and W04-12 from the Site 4 plating shop (Figure 3) and sample W05-11 from the Site 5 plating shop (Figure 4) could not be analyzed for cyanide. These locations were resampled on July 2, 1992 and analyzed for cyanide. Results for the Site 4 resamples are included on Table 7 and results for the Site 5 resample are included on Table 8. For comparison purposes, Tables 7 and 8 also include the data presented in the August 4, 1992, draft final data summary report (PRC/JMM 1992b). All three resamples contained cyanide. Sample W04-11 contained 535 micrograms per square foot ( $\mu\text{g}/\text{ft}^2$ ), sample W04-12 contained 509  $\mu\text{g}/\text{ft}^2$ , and sample W05-01 contained 1,200 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ).

The hexavalent chromium results presented in Tables 7 and 8 differ from those originally presented in the draft final data summary report (PRC/JMM 1992b). They have been corrected for a laboratory error that was discovered after submission of the draft final report. The final data summary report will contain the corrected data and the laboratory error and resulting corrections to the data will be explained in detail.

Minor variations of the detection limits for metals results presented in Tables 7 and 8 are due to differences in the moisture content between samples. For example, the detection limits reported for beryllium samples W04-03 and W04-04 are <0.501 mg/kg and <0.497 mg/kg, respectively. These variations are normal and all detection limits fall within CLP guidelines. More substantial variations in detection limits such as <39 mg/kg and <7.6 mg/kg for the antimony analysis of samples W05-01 and W05-02 are due to dilution. Dilutions are required when an analyte or compound is found at a concentration that is above quantitation limits for the analytical procedure. The sample is then diluted to bring the concentration within method control limits. The detection limit is multiplied by the dilution factor.

## **SUMMARY**

This addendum presents the results of the second round of background groundwater sampling at NAS Alameda and the analytical results of recollected samples at the Site 5 wastewater treatment area, the Site 5 plating shop, and the Site 4 plating shop. The results of the second round of background groundwater samples are comparable to the first round. Methylene chloride was detected at a low concentration in MBG-4. No other VOCs were detected. Polycyclic aromatic hydrocarbons were detected in MBG-2. Phthalates were detected at very low concentrations in MBG-1, MBG-2, and MBG-3. Neither pesticides, herbicides, nor PCBs were detected in any of the wells. Oil and grease was detected at low concentration in each of the wells. The oil and grease measurement technique used for this study (EPA Method 413.1) is not compound-specific and may register naturally occurring organic material related to plant and animal remains. Metals results from the second round samples were included in the statistical analysis data set that was started after the first round. Based on TDS, MBG-1 and MBG-2 are too saline to be classified as drinking water wells and wells MBG-3 and MBG-4 are classified as potentially potable.

Due to a laboratory error during the original analysis, grab groundwater sample B-05WT-02 was recollected and analyzed for SVOC. Two chlorinated hydrocarbons, 1,2-dichlorobenzene and 1,4-dichlorobenzene were detected. Naphthalene and 2-methylnaphthalene were also detected.

Due to insufficient sample volume, two surface wipe samples from the interior of the Site 4 plating shop and one surface scrape sample from the interior of the Site 5 plating shop had to be recollected and analyzed for cyanide. Cyanide was detected in all three samples.

## REFERENCES

California State Water Resources Control Board (SWRCB). 1988. "Adoption of Policy Entitled Sources of Drinking Water," Resolution No. 88-63, adopted at State Water Resources Control Board Meeting. May 19, 1988.

United States Environmental Protection Agency (EPA). 1988a. Laboratory Data Validation, Functional Guidelines for Evaluating Organic Analyses, prepared for the Hazardous Site Evaluation Division of the EPA. February 1, 1988.

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PRC/James M. Montgomery Engineers, Inc. (PRC/JMM). 1992a. NAS Alameda, Alameda, California, Data Summary Report RI/FS Phases 2B and 3 Draft Final. Prepared for NAVY-WESTDIV. April 1992.

PRC/JMM. 1992b. NAS Alameda, Alameda, California, Data Summary Report Background and Tidal Influence Studies and Additional Work at Sites 4 and 5 Draft Final. Prepared for NAVY-WESTDIV. August 4, 1992.

**TABLE 1  
LABORATORY ANALYSES  
BACKGROUND SAMPLES**

	<b>Method</b>
<b>GROUNDWATER</b>	
VOC	CLP/RAS
SVOC	CLP/RAS
TAL Metals	CLP/RAS
General Minerals	Various
Ethylene Dibromide	CLP/RAS
Pesticides/PCBs	CLP/RAS
Herbicides	CLP SAS/8150
Organophosphorus Pesticides	CLP SAS/8140
Oil and Grease	EPA 413.1
Total Petroleum Hydrocarbons	EPA 418.1
Mercury	EPA 245.1
Total Cyanide	CLP/RAS
Total Organic Carbon	SAS/415.1
Hardness	SAS/130.1
Alkalinity	SAS/SM403
Total Dissolved Solids	SAS/160.1
pH	EPA 150.1
Acidity	SAS/305.1
Specific Conductance	EPA 120.1
Chemical Oxygen Demand	SAS 410
Biochemical Oxygen Demand	EPA 405.1

TAL Metals include Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mn, Mg, Hg, Ni,

K, Se, Ag, Na, Tl, V, and Zn

VOC - volatile organic compounds

SVOC - semivolatile organic compounds

CLP - contract laboratory program

RAS - routine analytical services

TAL - target analyte list

SAS - special analytical services

General Minerals include:

Chloride

Sulfate

Fluoride

Nitrate/Nitrite

**TABLE 2**  
**NAS ALAMEDA - BACKGROUND BORINGS**  
**GROUNDWATER ANALYTICAL RESULTS - ORGANIC COMPOUNDS**

Sample Round Sample I.D. Date Sampled	1st Round MBG-1-GW 06/11/92			2nd Round MBG-1-GW 07/13/92			1st Round MBG-2-GW 06/12/92			2nd Round MBG-2-GW 07/13/92			2nd Round MBG-2-GW Dup 07/13/92		
	Results	DQF	Rtnl	Results	DQF	Rtnl									
<b>Volatile Organic Compounds (µg/L)</b>															
Methylene Chloride	<1.0			<1.0			<1.0			<1.0			<1.0		
<b>Semivolatile Organic Compounds (µg/L)</b>															
Acenaphthene	<1.0			<1.0			17			13			13		
Anthracene	<1.0			<1.0			1			<1.0			<1.0		
Bis (2-Ethylhexyl) phthalate	<2.0			2.7			2.4	UJ	a	6.6			2.4		
Chrysene	<1.5			<1.0			<1.5			<1.0			1.1		
Dimethylphthalate	<2.0			<1.0			<2.0			1.3			9.1		
Fluoranthene	<1.0			<1.0			3.1			1.3			3.0		
Phenanthrene	<1.0			<1.0			3.4			3.3			3.3		
Pyrene	1.3			<1.0			3.7			1.9			6.4		
<b>Pesticides/PCBs (µg/L)</b>															
Monuron	<0.197			<0.197			0.227			<0.197			<0.197		
<b>Oil and Grease (mg/L)</b>															
	<0.2			0.4	UJ	a	0.2	UJ	a	0.4	UJ	a	0.6		

Notes:

< = Analyte reported below detection limit  
DQF = Data qualification flags, defined below  
UJ = Qualified, estimated not detected  
J = Qualified, estimated value  
R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
a = method blank                      e = laboratory control sample  
b = surrogate spike                  f = replicate  
c = matrix spike                      g = post-digestion spike recovery  
d = holding time                        h = serial dilution

**TABLE 2**  
**NAS ALAMEDA - BACKGROUND BORINGS**  
**GROUNDWATER ANALYTICAL RESULTS - ORGANIC COMPOUNDS**

Sample Round Sample I.D. Date Sampled	1st Round MBG-3-GW 06/12/92			2nd Round MBG-3-GW 07/14/92			1st Round MBG-4-GW 06/12/92			2nd Round MBG-4-GW 07/14/92		
	Results	DQF	Rtnl									
<b>PARAMETER REPORTED</b>												
<b>Volatile Organic Compounds (µg/L)</b>												
Methylene Chloride	<1.0			<1.0			<1.0			11		
<b>Semivolatile Organic Compounds (µg/L)</b>												
Acenaphthene	<1.0			<1.0			<1.0			<1.0		
Anthracene	<1.0			<1.0			<1.0			<1.0		
Bis (2-Ethylhexyl) phthalate	5.4	UJ	a	1.7			7.1	UJ	a	<1.0		
Chrysene	<1.5			<1.0			<1.5			<1.0		
Dimethylphthalate	<2.0			<1.0			<2.0			<1.0		
Fluoranthene	<1.0			<1.0			<1.0			<1.0		
Phenanthrene	<1.0			<1.0			<1.0			<1.0		
Pyrene	<1.0			<1.0			<1.0			<1.0		
<b>Pesticides/PCBs (µg/L)</b>												
Monuron	<0.197			<0.197			<0.197			<0.197		
<b>Oil and Grease (mg/L)</b>												
	<0.2			0.2	UJ	a	1.6			0.3	UJ	a

Notes:

< = Analyte reported below detection limit  
DQF = Data qualification flags, defined below  
UJ = Qualified, estimated not detected  
J = Qualified, estimated value  
R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
a = method blank                      e = laboratory control sample  
b = surrogate spike                  f = replicate  
c = matrix spike                      g = post-digestion spike recovery  
d = holding time                      h = serial dilution

**TABLE 3  
NAS ALAMEDA - BACKGROUND BORINGS  
GROUNDWATER ANALYTICAL RESULTS - METALS**

Sample Round Sample I.D. Date Sampled PARAMETER REPORTED	1st Round MBG-1-GW 06/11/92			2nd Round MBG-1-GW 07/13/92			1st Round MBG-2-GW 06/12/92			2nd Round MBG-2-GW 07/13/92			2nd Round MBG-2-GW Dup 07/13/92		
	Results	DQF	Rtnl	Results	DQF	Rtnl									
<b>Metals (µg/L)</b>															
Aluminum	58.7			<40.7			<40.7			<40.7			<40.7		
Antimony	37.9			47.8			<37.5			<37.5			<37.5		
Arsenic	11.4			7.9			<1.9			<1.9			2.2		
Barium	679			558			150			244			249		
Beryllium	<2.5			<2.5			<2.5			<2.5			<2.5		
Cadmium	<3.9			<3.9			<3.9			<3.9			<3.9		
Calcium	117000			116000			114000			112000			109000		
Chromium	<6.3			<6.3			<6.3			<6.3			<6.3		
Cobalt	<17.2			<17.2			<17.2			<17.2			<17.2		
Copper	<3.8			6.0			<3.8			7.7			4.7		
Iron	2040	J	f	226			2370	J	f	652			1150		
Lead	<2.0	UJ	g	<2.0			<2.0			<2.0			<2.0		
Magnesium	331000			355000			55600			140000			142000		
Manganese	1760			1720			1090			1660			1700		
Mercury	<0.2			<0.2			<0.2			<0.2			<0.2		
Nickel	<13.2			<13.2			<13.2			<13.2			<13.2		
Potassium	101000			110000			33400			66800			68000		
Selenium	<2.0	UJ	g	<2.0	UJ	g	<2.0	UJ	g	<10.0			<10.0	UJ	c
Silver	<4.8			<4.8			<4.8			<4.8			<4.8		
Sodium	3710			3900000			720000			1560000			1500000	J	c
Thallium	<1.7			<1.7			<1.7			<1.7			<1.7		
Vanadium	24.5			19.0			7.6			18.2			16.0		
Zinc	<4.6			<4.6			<4.6			<4.6			<4.6		

Notes:

< = Analyte reported below detection limit  
DQF = Data qualification flags, defined below  
UJ = Qualified, estimated not detected  
J = Qualified, estimated value  
R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
a = method blank                    e = laboratory control sample  
b = surrogate spike                f = replicate  
c = matrix spike                    g = post-digestion spike recovery  
d = holding time                    h = serial dilution

**TABLE 3  
NAS ALAMEDA - BACKGROUND BORINGS  
GROUNDWATER ANALYTICAL RESULTS - METALS**

Sample Round Sample I.D. Date Sample PARAMETER REPORTED	1st Round MBG-3-GW 06/12/92			2nd Round MBG-3-GW 07/14/92			1st Round MBG-4-GW 06/12/92			2nd Round MBG-4-GW 07/14/92		
	Results	DQF	Rtnl									
<b>Metals (µg/L)</b>												
Aluminum	<40.7			<40.7			<40.7			<40.7		
Antimony	<37.5			<37.5			<37.5			<37.5		
Arsenic	5.5			5.9			<1.9			<1.9		
Barium	96.4			85.1			54.7			41.3		
Beryllium	<2.5			<2.5			<2.5			<2.5		
Cadmium	<3.9			<3.9			<3.9			<3.9		
Calcium	34000			42000			68900			627000		
Chromium	<6.3			<6.3			<6.3			<6.3		
Cobalt	<17.2			<17.2			<17.2			<17.2		
Copper	9.4			<3.8			<3.8			20.4		
Iron	25.3	J	f	483			<7.7			<7.7		
Lead	<2.0			2.9			<2.0			<2.0		
Magnesium	47100			61500			11300			11100		
Manganese	489			723			227			176		
Mercury	<0.2			<0.2			<0.2			<0.2		
Nickel	<13.2			<13.2			<13.2			<13.2		
Potassium	21300			22400			5090			6280		
Selenium	<2.0			<2.0			<2.0			<2.0		
Silver	<4.8			<4.8			<4.8			<4.8		
Sodium	201000			157000			15800			17700		
Thallium	<1.7			<1.7			<1.7			<1.7		
Vanadium	8.3			11.3			<6.0			<6.0		
Zinc	<4.6			<4.6			9.1			<4.6		

Notes:

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J = Qualified, estimated value  
R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below

a = method blank                    e = laboratory control sample  
b = surrogate spike                  f = replicate  
c = matrix spike                      g = post-digestion spike recovery  
d = holding time                      h = serial dilution

**TABLE 4**  
**NAS ALAMEDA - BACKGROUND BORINGS**  
**GROUNDWATER ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample Round Sample I.D. Date Sampled PARAMETER REPORTED	1st Round MBG-1-GW 06/11/92			2nd Round MBG-1-GW 07/13/92			1st Round MBG-2-GW 06/12/92			2nd Round MBG-2-GW 07/13/92			2nd Round MBG-2-GWDup 07/13/92		
	Results	DQF	Rtnl	Results	DQF	Rtnl									
<b>Physical Parameters - Lab</b>															
Alkalinity, Carbonate - mg/L CaCO <sub>3</sub>	<5.0			<5.0			<5.0			<5.0			<5.0		
Alkalinity, Bicarbonate - mg/L CaCO <sub>3</sub>	143			418			126			600			1060		
Alkalinity, Hydroxide - mg/L CaCO <sub>3</sub>	<5.0			<5.0			<5.0			<5.0			<5.0		
Alkalinity, Phenolphthalein - mg/L	<5.0			<5.0			<5.0			<5.0			<5.0		
Alkalinity, Total - mg/L CaCO <sub>3</sub>	143			418			126			600			1060		
Acidity, Total - mg/L CaCO <sub>3</sub>	170			164			107			186			75.1	J	c
Hardness - mg/L CaCO <sub>3</sub>	2280			1800			1120			967			790		
Total Dissolved Solids - mg/L	13800			11400			5360			5550			4870		
<b>Biochemical Oxygen Demand, 5-day - mg/L</b>	45.6			4.2	J	h	16.2			2.4	J	h	5.0	J	h
<b>Chemical Oxygen Demand - mg/L</b>	417			331.0			201			201.0			188.0		
<b>Total Organic Carbon - mg/L</b>	60			75.0			35.4			32.6			51.3	J	c
<b>Anions - mg/L</b>															
Chloride	5290			5941			3305			2773			2149		
Sulfate	227.7			225.6			6.760			2.641			3.448		
Fluoride	0.98			0.98			0.48			0.44			0.43		
Nitrate/Nitrite, NO <sub>3</sub> +NO <sub>2</sub>	<0.010			0.019			<0.160			<0.010			0.019	J	c
<b>Cyanide - µg/L</b>	<10.0			<10.0	UJ	f	<10.0			<10.0	UJ	f	<10.0	UJ	f

Notes:

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DQF = Data qualification flags, defined below  
UJ = Qualified, estimated not detected  
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Rtnl = Rationale for data qualification, defined below  
a = method blank                      e = laboratory control sample  
b = surrogate spike                    f = replicate  
c = matrix spike                        g = post-digestion spike recovery  
d = holding time                        h = insufficient QC data

**TABLE 4**  
**NAS ALAMEDA - BACKGROUND BORINGS**  
**GROUNDWATER ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample Round Sample I.D. Date Sampled	1st Round MBG-3-GW 06/12/92			2nd Round MBG-3-GW 07/14/92			1st Round MBG-4-GW 06/12/92			2nd Round MBG-4-GW 07/14/92		
	Results	DQF	Rtnl									
<b>PARAMETER REPORTED</b>												
<b>Physical Parameters - Lab</b>												
Alkalinity, Carbonate - mg/L CaCO <sub>3</sub>	<5.0			<5.0			<5.0			<5.0		
Alkalinity, Bicarbonate - mg/L CaCO <sub>3</sub>	125			498			106			400		
Alkalinity, Hydroxide - mg/L CaCO <sub>3</sub>	<5.0			<5.0			<5.0			<5.0		
Alkalinity, Phenolphthalein - mg/L	<5.0			<5.0			<5.0			<5.0		
Alkalinity, Total - mg/L CaCO <sub>3</sub>	125			498			106			400		
Acidity, Total - mg/L CaCO <sub>3</sub>	18.7			56.8			13.8			11.5		
Hardness - mg/L CaCO <sub>3</sub>	352			380			300			280		
Total Dissolved Solids - mg/L	1130			862			13.8			337		
<b>Biochemical Oxygen Demand, 5-day - mg/L</b>	1.0			<6.8	UJ	h	1.9			1.2	J	h
<b>Chemical Oxygen Demand - mg/L</b>	141			130.0			264			<50.0		
<b>Total Organic Carbon - mg/L</b>	51.2			43.7			34.6			15.4		
<b>Anions - mg/L</b>												
Chloride	35.10			28.25			14.45			16.37		
Sulfate	8.201			5.030			12.34			11.35		
Fluoride	0.90			1.16			0.21			0.20		
Nitrate/Nitrite, NO <sub>3</sub> +NO <sub>2</sub>	<0.010			<0.010			1.26			1.94		
<b>Cyanide - µg/L</b>	<10.0			<10.0	UJ	f	<10.0			<10.0	UJ	f

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a = method blank                      e = laboratory control sample  
b = surrogate spike                  f = replicate  
c = matrix spike                      g = post-digestion spike recovery  
d = holding time                      h = insufficient QC data

**TABLE 5**  
**NAS ALAMEDA - BACKGROUND BORINGS**  
**STATISTICAL ANALYSIS OF METALS RESULTS FOR GROUNDWATER SAMPLES**

	Average Concentration (µg/L)	Standard Deviation	Number of Samples	Statistical Tolerance Factor	95%/95% Statistical Tolerance Interval	
					Lower Limit (µg/L) (a)	Upper Limit (µg/L)
Aluminum	24.6	12.8	9	3.53	0	69.8
Antimony	24.1	10.9	9	3.53	0	62.6
Arsenic	4.1	3.8	9	3.53	0	17.5
Barium	239.7	229.3	9	3.53	0	1049
Beryllium	1.3	0	9	3.53	1.3	1.3
Cadmium	1.95	0	9	3.53	2.0	2.0
Calcium	148878	182305	9	3.53	0	792779
Chromium	3.2	0	9	3.53	3.2	3.2
Cobalt	8.6	0	9	3.53	8.6	8.6
Copper	6.2	6.0	9	3.53	0	27.5
Iron	773	897	9	3.53	0	3941
Lead	1.2	0.6	9	3.53	0	3.4
Magnesium	128289	130657	9	3.53	0	589770
Manganese	1061	672	9	3.53	0	3434
Mercury	0.1	0	9	3.53	0.1	0.1
Nickel	6.6	0	9	3.53	6.6	6.6
Potassium	48252	39638	9	3.53	0	188252
Selenium	1.9	1.8	9	3.53	0	8.1
Silver	2.4	0	9	3.53	2.4	2.4
Sodium	897246	1286088	9	3.53	0	5439709
Thallium	0.9	0	9	3.53	0.9	0.9
Vanadium	12.3	7.5	9	3.53	0	38.9
Zinc	3.1	2.3	9	3.53	0	11.1

Tolerance Interval = Average ± (Standard Deviation \* Statistical Tolerance Factor) (Taylor, 1990)

(a) - negative concentrations are rounded to zero.

**TABLE 6  
 NAS ALAMEDA - SITE 5 WASTEWATER TREATMENT AREA  
 GROUNDWATER ANALYTICAL RESULTS - ORGANIC COMPOUNDS**

Sample Number	B-05WT-01			B-05WT-02			B-05WT-02 Resample		
	06/4/92			06/4/92			07/22/92		
PARAMETER REPORTED	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
<b>Volatile Organic Compounds (µg/L)</b>									
Acetone	17	UJ	a	<50			NA		
Chlorobenzene	12			45			NA		
Chloroethane	140			210			NA		
1,1-Dichloroethane	180			24			NA		
1,2-Dichloroethene, Total	120			62			NA		
Ethylbenzene	100			36			NA		
Methylene Chloride	<5.0			25			NA		
Toluene	30			<25			NA		
Vinyl Chloride	62			40			NA		
Xylenes, Total	660			160			NA		
<b>Semivolatile Organic Compounds (µg/L)</b>									
Bis (2-Ethylhexyl) phthalate	2.5	UJ	a	NA			<40	UJ	b
Di-N-butyl phthalate	1.7			NA			<20	UJ	b
1,2-Dichlorobenzene	17			NA			220	J	b
1,4-Dichlorobenzene	<1.0			NA			59	J	b
2,4-Dimethylphenol	8.5			NA			<600	UJ	b
4-Methyl phenol	2.1			NA			<40	UJ	b
Naphthalene	4.4			NA			380	J	b
2-Methylnaphthalene	<1.0			NA			50.4	J	b

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 a = method blank                      e = laboratory control sample  
 b = surrogate spike                    f = replicate  
 c = matrix spike                        g = post-digestion spike recovery  
 d = holding time                        h = serial dilution

**TABLE 7**  
**NAS ALAMEDA - SITE 4 PLATING SHOP**  
**SURFACE SCRAPE AND WIPE SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample I.D. Date Sampled	Scrape W04-03 06/9/92			Scrape W04-04 06/9/92			Scrape W04-05 06/9/92			Scrape W04-06 06/9/92		
	Results	DQF	Rtnl									
<b>PARAMETER REPORTED</b>												
<b>Units</b>	(mg/kg)			(mg/kg)			(mg/kg)			(mg/kg)		
<b>Metals</b>												
Aluminum	5750	J	c,e	2670	J	e	6280	J	e	8010	J	e
Antimony	3200	J	c,e	2500	J	e	78	J	e	190	J	e
Arsenic	8.98	J	c	5.95			13.6			7.41		
Barium	81.4			81.4			217			230		
Beryllium	<0.501			<0.497			1.47			0.783		
Cadmium	38.4	J	c	260			3700			2990		
Calcium	14300	J	c	2250			26000			13500		
Chromium, Total	28500	J	c	63600			24300			2590		
Chromium, Hexavalent	8160	J	f	5720	J	f	53.8	J	c,f	<0.205	UJ	f
Cobalt	67.5			99.4			117			197		
Copper	438	J	c,e	702	J	e	1360	J	e	1830	J	e
Iron	7390	J	c	19600			158000			35600		
Lead	130000	J	c,f	107000	J	f	5240	J	f	12400	J	f
Magnesium	2720	J	c	564			2600			2090		
Manganese	176	J	c	131			1250			319		
Mercury	0.105			0.789			6.3			1.17		
Nickel	867			4950			6520			17200		
Potassium	697	J	e,h	304	J	e,h	779	J	e,h	1750	J	e,h
Selenium	<4.01	UJ	c	<0.404			6.27			23.2		
Silver	56.5	J	c	122			714			849		
Sodium	4670	J	c	1290			1400			11400		
Thallium	<1.70	UJ	g	<1.72	UJ	g	<1.75			<0.344		
Vanadium	17.9			38.9			14.7			20.3		
Zinc	198	J	f	702	J	f	11300	J	f	3840	J	f
<b>Cyanide</b>	5.2			5.4			2.2			11.4		

Notes:

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Rtnl = Rationale for data qualification, defined below  
 a = method blank      f = replicate  
 b = surrogate spike    g = post-digestion spike recovery  
 c = matrix spike        h = serial dilution  
 d = holding time        i = exceeds total chromium value  
 e = laboratory control sample

**TABLE 7**  
**NAS ALAMEDA - SITE 4 PLATING SHOP**  
**SURFACE SCRAPE AND WIPE SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample I.D. Date Sampled	Wipe W04-07 06/9/92			Wipe W04-07 Duplicate 06/9/92			Wipe W04-08 06/9/92			Wipe W04-09 06/9/92		
	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
PARAMETER REPORTED	(µg/sq. ft.)			(µg/sq. ft.)			(µg/sq. ft.)			(µg/sq. ft.)		
Units												
<b>Metals</b>												
Aluminum	8270			9050			9940			7920		
Antimony	12.7	J	h	<7.50	J	h	10.6	J	h	19	J	h
Arsenic	0.460			<0.380			0.78			<0.380		
Barium	12300	J	c	13900			14400			10500		
Beryllium	<0.500			<0.500			<0.500			<0.500		
Cadmium	25.1			13.9			5.48			31.5		
Calcium	4440			4710			7960			4510		
Chromium, Total	292			168			610			3290		
Chromium, Hexavalent	14.0			<0.2			1.0			8.2		
Cobalt	46.1			20.4			24.2			216		
Copper	104			55.2			93.5			183		
Iron	1960			1110			1970			2960		
Lead	179			93			135			265		
Magnesium	772			781			866			879		
Manganese	19.9			11.8			19.2			45.7		
Mercury	0.04			0.046			0.395			0.117		
Nickel	2380			993			3550			8840		
Potassium	6480			7120			7550			5740		
Selenium	<0.400			<0.400			<0.400	UJ	g	<0.400		
Silver	17.6			17.2			10.5			10.9		
Sodium	20600			23100			24200			21100		
Thallium	<21.8	J	h	<21.8	J	h	<21.8	J	h	<21.8	J	h
Vanadium	1.88	J	h	<1.20	J	h	1.6	J	h	3.66	J	h
Zinc	8440	J	c	9270			9700			7970		
<b>Cyanide</b>	5040			7680	J	c	<5000			8210		

Notes:

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 a = method blank  
 b = surrogate spike  
 c = matrix spike  
 d = holding time  
 e = laboratory control sample  
 f = replicate  
 g = post-digestion spike recovery  
 h = serial dilution  
 i = exceeds total chromium value

**TABLE 7  
 NAS ALAMEDA - SITE 4 PLATING SHOP  
 SURFACE SCRAPE AND WIPE SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample I.D. Date Sampled	Wipe W04-10 06/9/92			Wipe W04-11 06/9/92			Wipe W04-11 Resample 07/2/92		
	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
<b>PARAMETER REPORTED</b>									
<b>Units</b>	(µg/sq. ft.)			(µg/sq. ft.)			(µg/sq. ft.)		
<b>Metals</b>									
Aluminum	5950			16100			N/A		
Antimony	<7.50	J	h	115	J	h	N/A		
Arsenic	<0.380			9.72			N/A		
Barium	9400			5160			N/A		
Beryllium	<0.500			<0.500			N/A		
Cadmium	4.66			1530			N/A		
Calcium	3180			45600			N/A		
Chromium, Total	716			101000			N/A		
Chromium, Hexavalent	31.0			136			N/A		
Cobalt	13.9			190			N/A		
Copper	81.9			3360			N/A		
Iron	784			62800			N/A		
Lead	148			5020			N/A		
Magnesium	548			4300			N/A		
Manganese	9.13			4540			N/A		
Mercury	0.018			4.39			N/A		
Nickel	682			23700			N/A		
Potassium	5090			5400			N/A		
Selenium	1.08			12			N/A		
Silver	11.3			914			N/A		
Sodium	16600			48900			N/A		
Thallium	<21.8	J	h	120	J	h	N/A		
Vanadium	<1.20	J	h	53.7	J	h	N/A		
Zinc	6550			16500			N/A		
<b>Cyanide</b>	<5000			N/A			535		

Notes:

N/A = Not Analyzed

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DQF = Data qualification flags, defined below

UJ = Qualified, estimated not detected

J = Qualified, estimated value

R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below

a = method blank                      f = replicate

b = surrogate spike                    g = post-digestion spike recovery

c = matrix spike                        h = serial dilution

d = holding time                        i = exceeds total chromium value

e = laboratory control sample

**TABLE 7  
NAS ALAMEDA - SITE 4 PLATING SHOP  
SURFACE SCRAPE AND WIPE SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample I.D. Date Sampled	Wipe W04-12 06/9/92			Wipe W04-12 Resample 07/2/92			Wipe W04-13 06/9/92			Wipe W04-14 06/9/92		
	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
PARAMETER REPORTED												
Units	(µg/sq. ft.)			(µg/sq. ft.)			(µg/sq. ft.)			(µg/sq. ft.)		
<b>Metals</b>												
Aluminum	77800			N/A			36200			22000		
Antimony	2420	J	h	N/A			253	J	h	107	J	h
Arsenic	46.8			N/A			7.9			2.84		
Barium	554			N/A			4790			10900		
Beryllium	0.576			N/A			<0.500			<0.500		
Cadmium	4430			N/A			570			6450		
Calcium	252000			N/A			16200			13400		
Chromium, Total	47600			N/A			24000			13900		
Chromium, Hexavalent	0.3			N/A			16.7			32.4		
Cobalt	1450			N/A			646			363		
Copper	11800			N/A			3840			2290		
Iron	174000			N/A			48400			36200		
Lead	22600			N/A			7670			6010		
Magnesium	13700			N/A			4590			3350		
Manganese	2100			N/A			573			490		
Mercury	2.55			N/A			0.858			0.579		
Nickel	145000			N/A			111000			36600		
Potassium	11700			N/A			5290			8400		
Selenium	11.1	J	g	N/A			3.74			<2.00		
Silver	854			N/A			265			829		
Sodium	98100			N/A			164000			42800		
Thallium	218	J	h	N/A			73.8	J	h	28.7	J	h
Vanadium	138	J	h	N/A			45.7	J	h	29.1	J	h
Zinc	79600			N/A			15500			13600		
<b>Cyanide</b>	N/A			509			118000			59200		

Notes:

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 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
 a = method blank  
 b = surrogate spike  
 c = matrix spike  
 d = holding time  
 e = laboratory control sample  
 f = replicate  
 g = post-digestion spike recovery  
 h = serial dilution  
 i = exceeds total chromium value

**TABLE 8**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**SURFACE SCRAPE AND WIPE SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample I.D. Date Sampled PARAMETER REPORTED Units Metals	Scrape W05-01 06/9/92			Scrape W05-01 Resample 07/2/92			Scrape W05-02 06/9/92			Scrape W05-03 06/9/92			Scrape W05-04 06/9/92		
	Results (mg/kg)	DQF	Rtnl	Results (mg/kg)	DQF	Rtnl	Results (mg/kg)	DQF	Rtnl	Results (mg/kg)	DQF	Rtnl	Results (mg/kg)	DQF	Rtnl
Aluminum	28800	J	e	N/A			678	J	e	8190	J	e	9320	J	e
Antimony	<39	UJ	e,h	N/A			<7.6	UJ	e,h	34	J	e,h	21	J	e,h
Arsenic	3			N/A			<0.390			2.58			2.79		
Barium	611	J	f	N/A			37.9	J	f	416	J	f	1190	J	f
Beryllium	<2.57			N/A			<0.508			1.38			3.9		
Cadmium	1640	J	h	N/A			56.3	J	h	66900	J	h	14600	J	h
Calcium	3360			N/A			3370			18800			18300		
Chromium, Total	12100	J	h	N/A			1270	J	h	2490	J	h	1700	J	h
Chromium, Hexavalent	2940	J	f	N/A			0.186	J	f	0.649	J	f	0.799	J	f
Cobalt	<17.7			N/A			<3.50			7.69			9.17		
Copper	646	J	h	N/A			47.7	J	h	161	J	h	605	J	h
Iron	2600			N/A			502			25200			16700		
Lead	861	J	f,h	N/A			61.4	J	f,h	2070	J	f,h	1110	J	f,h
Magnesium	468			N/A			240			3880			3270		
Manganese	46.9			N/A			12.7			271			218		
Mercury	0.339			N/A			<0.102			0.112			0.462		
Nickel	15100	J	h	N/A			107	J	h	353	J	h	1160	J	h
Potassium	<550			N/A			121			402			588		
Selenium	<2.22			N/A			<0.411			<0.457	UJ	g	<0.595	UJ	g
Silver	<4.93	UJ	h	N/A			<0.976	UJ	h	<1.05	UJ	h	<1.48	UJ	h
Sodium	230000			N/A			2240			15300			26100		
Thallium	<1.89			N/A			<0.349			2.65			<0.505		
Vanadium	<6.17			N/A			<1.22			1.66			5.18		
Zinc	481			N/A			92.9			571			1850		
<b>Cyanide</b>	N/A			1200			1.6			138			65.5		

Notes:

N/A = Not analyzed due to insufficient sample volume  
 < = Analyte reported below detection limit  
 DQF = Data qualification flags, defined below  
 UJ = Qualified, estimated not detected  
 J = Qualified, estimated value  
 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
 a = method blank  
 b = surrogate spike  
 c = matrix spike  
 d = holding time  
 e = laboratory control sample  
 f = replicate  
 g = post-digestion spike recovery  
 h = serial dilution  
 i = exceeds total chromium value

**TABLE 8**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**SURFACE SCRAPE AND WIPE SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample I.D. Date Sampled	Wipe W05-05 06/9/92			Wipe W05-06 06/9/92			Wipe W05-07 06/9/92			Wipe W05-08 06/9/92			Duplicate W05-08 06/9/92		
	Results	DQF	Rtnl	Results	DQF	Rtnl									
PARAMETER REPORTED															
Units															
Metals	(µg/sq. ft.)			(µg/sq. ft.)											
Aluminum	5700			6430			7750			9660			8370		
Antimony	<7.50			11.6			<7.50			12.2			8.99		
Arsenic	0.88			1.16			0.52			3.08			2.06		
Barium	8670			6180			10900			11800	J	c	7640		
Beryllium	<0.500			<0.500			0.804			0.898			<0.500		
Cadmium	370			28.4			23.2			45			46.1		
Calcium	5420			4890			21400			33200	J	c	61500		
Chromium, Total	122			4500			301			1690	J	c	1520		
Chromium, Hexavalent	<1.0			1.2			1.8			1.6			1.4		
Cobalt	4.59			8.32			17.8			36			70.5		
Copper	68.9			153			15.2			71.6			72.5		
Iron	697			1110			689			1620			1800		
Lead	62.6			360			809			1430	J	c	2740		
Magnesium	616			701			1100			1840			3060		
Manganese	9.52			24.6			18.4			41.8			56		
Mercury	<0.020			<0.020			0.037			0.07			0.14		
Nickel	42.1			118			36.6			801	J	c	492		
Potassium	4540			3390			5720			6730			4950		
Selenium	<0.400			<0.400			<0.400			<0.400	UJ	g	<0.400		
Silver	<0.960			<0.960			<0.960			<0.960			<0.960		
Sodium	16100			11300			19000			22300			16600		
Thallium	<21.8	J	h	<21.8			<21.8			<21.8			<21.8		
Vanadium	<1.20	J	h	<1.20			<1.20			2.24			3.22		
Zinc	6310			4600			7480			11100	J	c	6080		
<b>Cyanide</b>	5570	J	d	<5000	UJ	d	<5000	UJ	d	<5000	UJ	d	<5000	UJ	d

Notes:

N/A = Not analyzed due to insufficient sample volume  
 < = Analyte reported below detection limit  
 DQF = Data qualification flags, defined below  
 UJ = Qualified, estimated not detected  
 J = Qualified, estimated value  
 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
 a = method blank                      e = LCS  
 b = surrogate spike                    f = replicate  
 c = matrix spike                        g = post-digestion spike recovery  
 d = holding time                        h = serial dilution

**TABLE 8**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**SURFACE SCRAPE AND WIPE SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample I.D. Date Sampled	Wipe W05-09 06/9/92			Wipe W05-10 06/9/92			Wipe W05-11 06/9/92			Wipe W05-12 06/9/92		
	Results	DQF	Rtnl									
PARAMETER REPORTED												
Units	(µg/sq. ft.)											
<b>Metals</b>												
Aluminum	8470			10400			83500			26000		
Antimony	41.5			43.6	J	h	221	J	h	269	J	h
Arsenic	0.6			2.42			35.3			7.88		
Barium	5040			11300			575			4690		
Beryllium	0.912			<0.500			0.734			<0.500		
Cadmium	472			245			5210			638		
Calcium	6030			8140			60000			20500		
Chromium, Total	2950			10400			70700			8500		
Chromium, Hexavalent	3.5			288			1.3			1.3		
Cobalt	7.06			9.1			92.8			31.3		
Copper	592			552			7850			919		
Iron	11200			6800			143000			32500		
Lead	396			783			6900			912		
Magnesium	1830			1650			18700			13600		
Manganese	255			154			2460			665		
Mercury	0.048			0.456			1.61			0.478		
Nickel	2340			1180			23300			2350		
Potassium	3580			6470			14300			4710		
Selenium	<0.400			<0.400	UJ	g	2.00	UJ	g	<2.00		
Silver	2.89			2.65			38.2			3.59		
Sodium	14200			23300			130000			18700		
Thallium	<21.8			<21.8	UJ	h	135	J	h	24.2	J	h
Vanadium	12.8			9.06	J	h	146	J	h	32.1	J	h
Zinc	4420			8390			22400			4280		
<b>Cyanide</b>	9260	J	d	40900			541000			83900		

Notes:

N/A = Not analyzed due to insufficient sample volume  
 < = Analyte reported below detection limit  
 DQF = Data qualification flags, defined below  
 UJ = Qualified, estimated not detected  
 J = Qualified, estimated value  
 R = Qualified, not usable

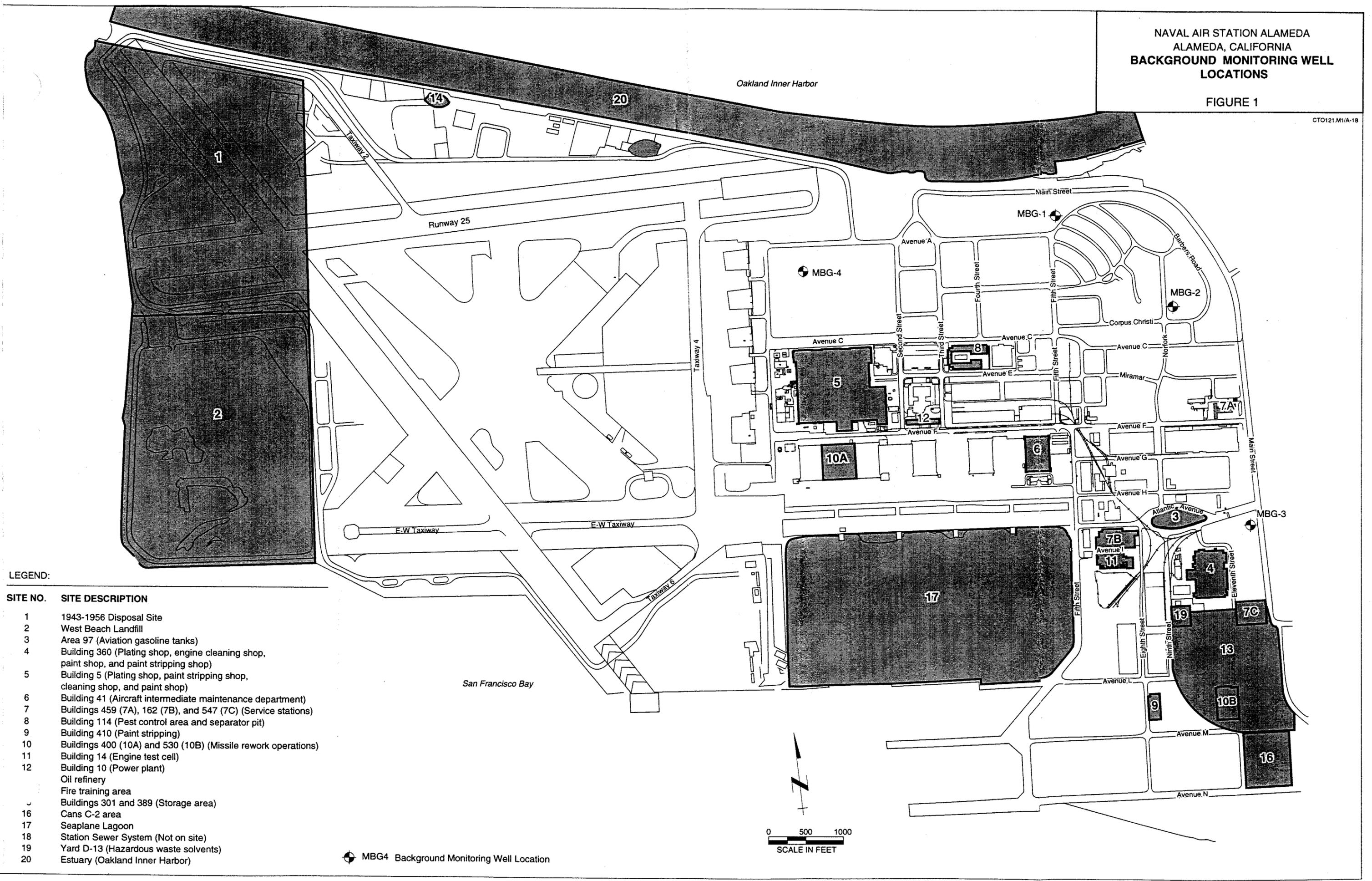
Rtnl = Rationale for data qualification, defined below

a = method blank                      e = LCS  
 b = surrogate spike                    f = replicate  
 c = matrix spike                        g = post-digestion spike recovery  
 d = holding time                        h = serial dilution

NAVAL AIR STATION ALAMEDA  
ALAMEDA, CALIFORNIA  
BACKGROUND MONITORING WELL  
LOCATIONS

FIGURE 1

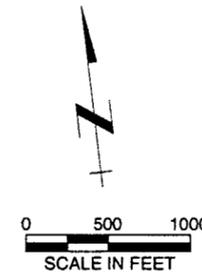
CTO121.M1/A-18

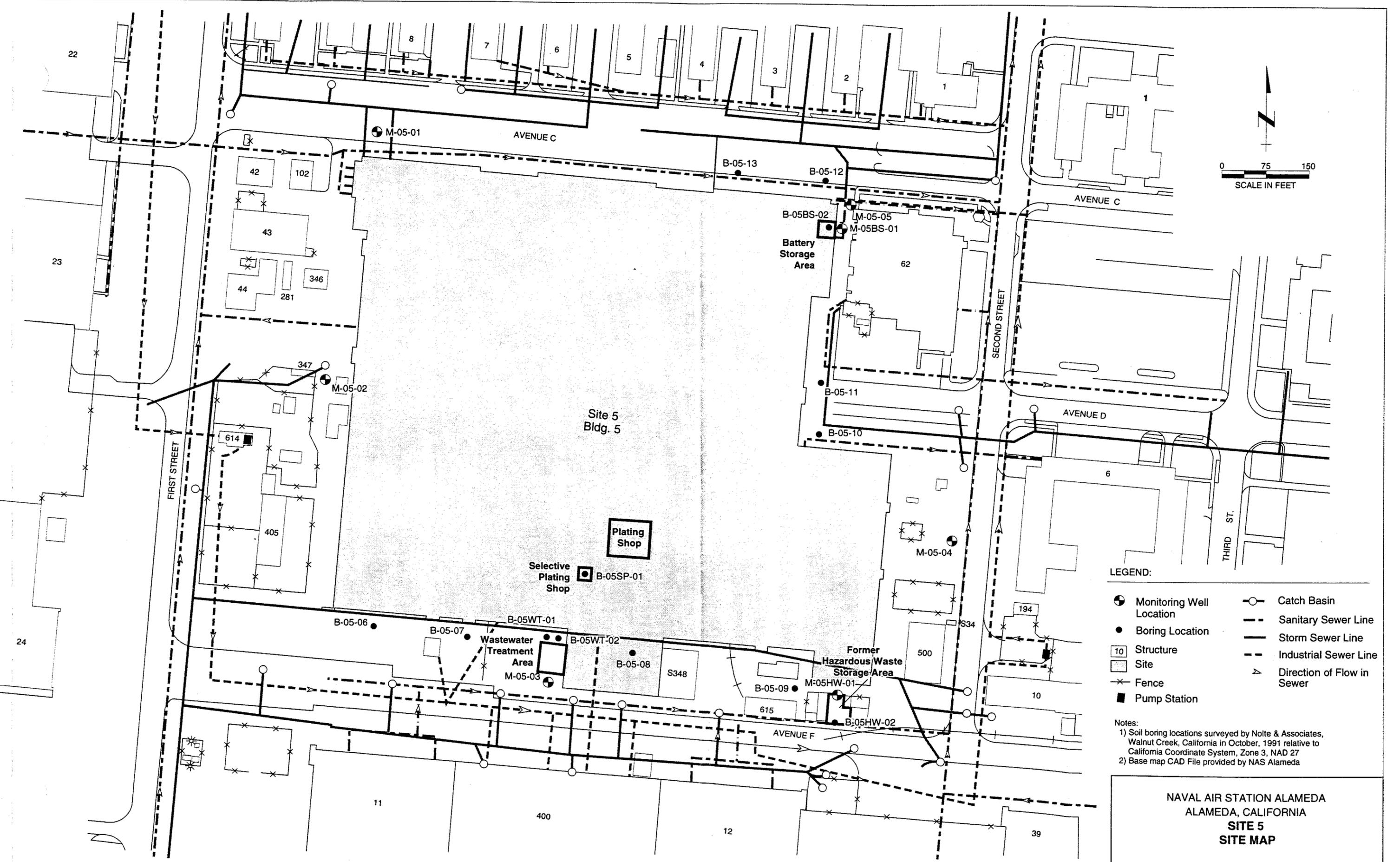


LEGEND:

SITE NO.	SITE DESCRIPTION
1	1943-1956 Disposal Site
2	West Beach Landfill
3	Area 97 (Aviation gasoline tanks)
4	Building 360 (Plating shop, engine cleaning shop, paint shop, and paint stripping shop)
5	Building 5 (Plating shop, paint stripping shop, cleaning shop, and paint shop)
6	Building 41 (Aircraft intermediate maintenance department)
7	Buildings 459 (7A), 162 (7B), and 547 (7C) (Service stations)
8	Building 114 (Pest control area and separator pit)
9	Building 410 (Paint stripping)
10	Buildings 400 (10A) and 530 (10B) (Missile rework operations)
11	Building 14 (Engine test cell)
12	Building 10 (Power plant)
	Oil refinery
	Fire training area
	Buildings 301 and 389 (Storage area)
16	Cans C-2 area
17	Seaplane Lagoon
18	Station Sewer System (Not on site)
19	Yard D-13 (Hazardous waste solvents)
20	Estuary (Oakland Inner Harbor)

MBG4 Background Monitoring Well Location



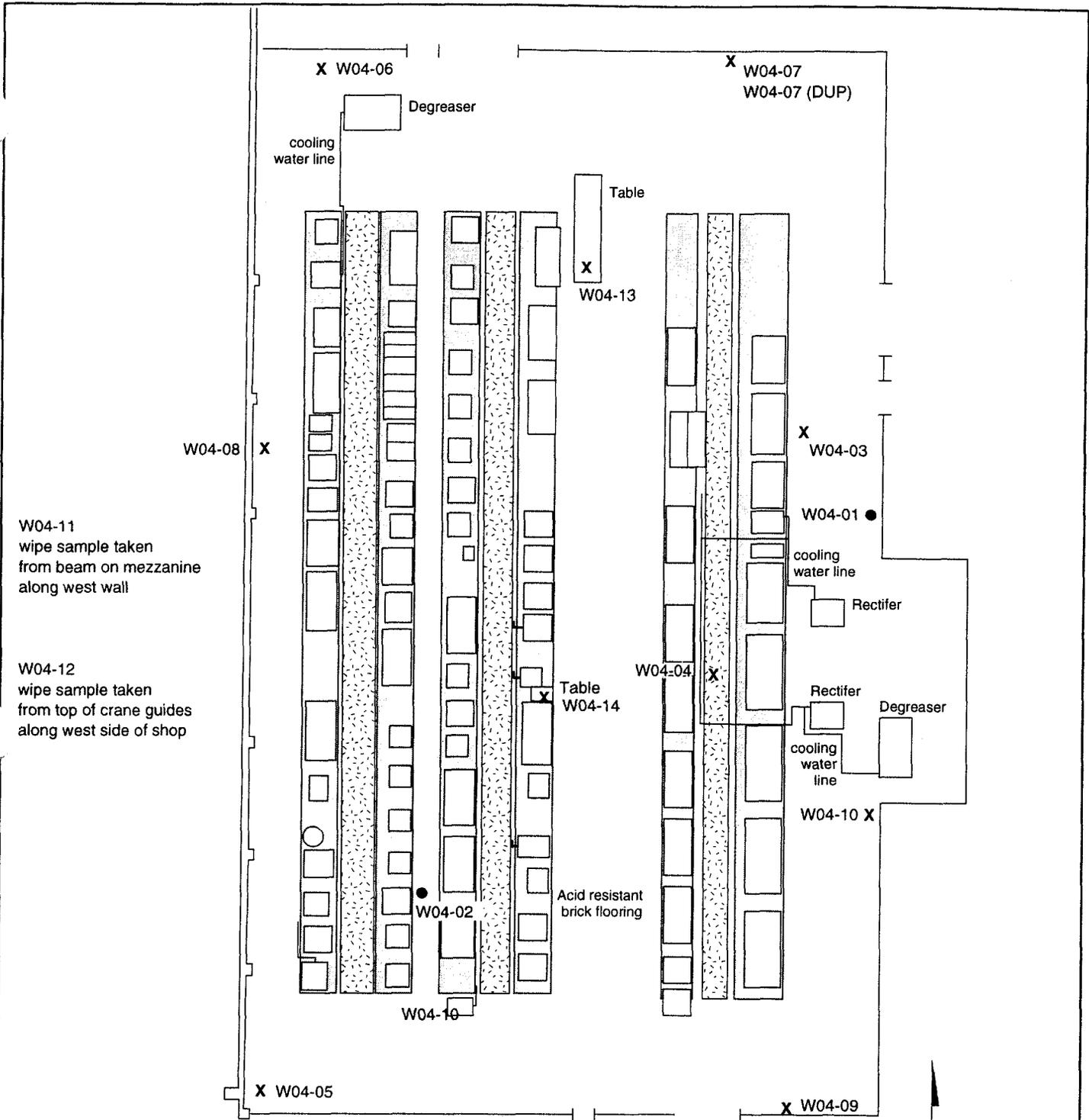


- LEGEND:**
- Monitoring Well Location
  - Boring Location
  - 10 Structure
  - Site
  - ✕ Fence
  - Pump Station
  - Catch Basin
  - - - Sanitary Sewer Line
  - Storm Sewer Line
  - - - Industrial Sewer Line
  - ▷ Direction of Flow in Sewer

**Notes:**

- 1) Soil boring locations surveyed by Nolte & Associates, Walnut Creek, California in October, 1991 relative to California Coordinate System, Zone 3, NAD 27
- 2) Base map CAD File provided by NAS Alameda

**NAVAL AIR STATION ALAMEDA**  
**ALAMEDA, CALIFORNIA**  
**SITE 5**  
**SITE MAP**  
**FIGURE 2**



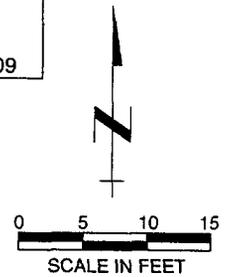
W04-11  
wipe sample taken  
from beam on mezzanine  
along west wall

W04-12  
wipe sample taken  
from top of crane guides  
along west side of shop

**LEGEND:**

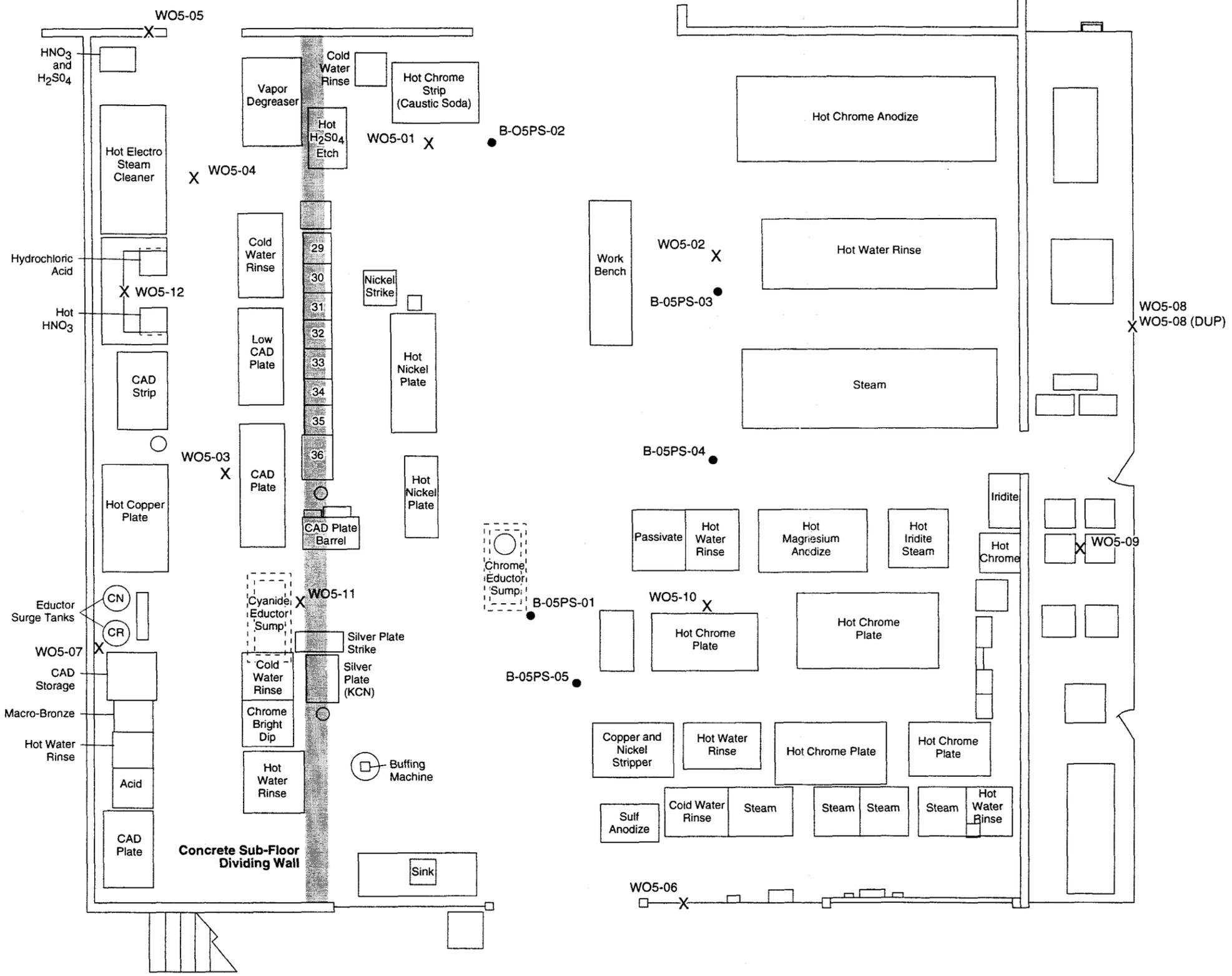
-  Vat
-  Wet Trench
-  Dry Trench
- X** Wipe or Scrape Sample (August 1992 DSR)
- Wipe or Scrape Sample (February 1992 DSR)
-  Door

Note: Additional volume collected from sample locations W04-11 and W04-12 for cyanide analyses reported in this Addendum



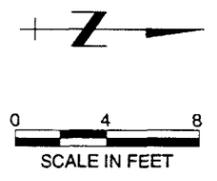
NAVAL AIR STATION ALAMEDA  
ALAMEDA, CALIFORNIA  
**SITE 4**  
**PLATING SHOP**  
**SITE MAP**

**FIGURE 3**



- LEGEND**
- B-05PS-01 ● Soil Boring Location
  - WO5-01 X Wipe or Scrape Sample Location
  - DUP Indicates Duplicate Sample Collected
  - ⬜ Educator Sump Location
  - 29 Plating Tank
  - Concrete Sub-Floor Dividing Wall
  - HNO<sub>3</sub> Nitric Acid
  - H<sub>2</sub>SO<sub>4</sub> Sulfuric Acid
  - CAD Cadmium
  - KCN Potassium Cyanide

- Notes: Numbered tanks contain the following:**
- 29 Hot Copper Plate
  - 30 Zincate
  - 31 Cold Water
  - 32 Acid
  - 33 Nitric and Sulfuric Acid
  - 34 Acid
  - 35 Cold Water
  - 36 Hot Caustic Etch



NAVAL AIR STATION ALAMEDA  
ALAMEDA, CALIFORNIA  
SITE 5 PLATING SHOP

FIGURE 4

**APPENDIX I**  
**ADDITIONAL SITE INVESTIGATION, SITE 5 PLATING SHOP**

**NAVAL AIR STATION, ALAMEDA  
ALAMEDA, CALIFORNIA  
ADDITIONAL SITE INVESTIGATION  
SITE 5 PLATING SHOP  
OCTOBER 16, 1995**

This report summarizes the results of the additional site investigation conducted on September 21 and 22, 1993, as part of the Installation Restoration Program (IRP). Site 5 is one of 23 IRP sites as shown on Figure 1. Remedial investigations/feasibility studies (RI/FS) are currently being performed at these 23 IRP sites by PRC and Montgomery Watson, herein referred to as the PRC team. This letter report contains the following information:

- Background
- Current Investigation
- Geology/Hydrogeology
- Results of Chemical Analyses
- Conclusions

This report also incorporates written comments from Naval Aviation Depot, Alameda (NADEP), and verbal comments from the Base Closure Team (BCT) on the November 1, 1993 draft letter report.

## **BACKGROUND**

Site 5 consists of Building 5 and is located between First and Second Streets, and Avenues C and F. The building, which covers approximately 18.5 acres, has been in operation since 1942. Operations conducted at this site included cleaning, reworking, and manufacturing of metal parts; tool maintenance; plating; and painting. The paint shop contained two paint bays and several smaller paint spray booths. Processes in the plating shop included degreasing; caustic and acid etching; metal stripping and cleaning; and chrome, nickel, silver, cadmium, and copper plating.

The plating shop is an area where aircraft parts were plated using both cyanide and chromium processes. It was closed in June 1990, when a replacement facility was opened in another part of the base.

In 1983, Ecology & Environment (E&E) prepared an initial assessment study (IAS) of NAS Alameda (E&E 1983). The report identified high levels of chemical oxygen demand, chromium, iron, phenol, and zinc in paint bay process waters. In the paint stripping operations, wastewaters contained chromium, methylene chloride, oil and grease, and phenol. In the conversion coating operations, wastewater contained aluminum, chromium, and iron; and had a high pH. No subsurface soil or groundwater samples were collected during the IAS.

An initial remedial investigation (RI) was conducted at Site 5 in 1991 and 1992 by the PRC team. The Site 5 RI was conducted together with the RI work performed for other IRP sites. The initial RI for the 23 IRP sites was conducted in various phases: Phases 1 and 2A (Sites 1 [partial], 2 [partial], 3, 4 [partial], 7C, 9, 10B, 13, 16, and 19), Phases 2B and 3 (Sites 4 [partial], 5, 6, 7A, 7B, 8, 10A, 11, 12, 14, and 15), Phase 4 (Sites 17 and 20), and Phases 5 and 6 (Sites 1 [partial] and 2 [partial]). The initial RI for Site 5 was conducted under Phases 2B and 3. With the exception of Phase 4 (the ecological assessment for Sites 17 and 20), the RI work was completed, and results of the investigation were presented in three data summary reports (DSR) (PRC/JMM 1992a; PRC/Montgomery 1993a and 1993b). The ecological assessment is currently being conducted by PRC and the report will be completed by early 1994.

During the Phases 2B and 3 investigation, a total of 13 soil borings and 5 monitoring wells were installed and sampled for chemical and physical analyses at Site 5. Volatile organic compounds (VOC), semivolatile organic compounds (SVOC), metals, and cyanide were found in soil and groundwater samples collected from this site. Results of the Site 5 RI investigation are discussed in the final DSR RI/FS Phases 2B and 3, dated October 1992 (PRC/JMM 1992a).

Results of the Phases 2B and 3 investigation indicated that five areas in or around Site 5 would require additional investigation. These five areas are the plating shop, the selective plating shop, the

wastewater treatment area, the former hazardous waste storage area, and the battery storage area. The locations of these areas are shown on Figure 2. A work plan for the additional work for these five areas was submitted to California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) on March 13, 1992. The work plan was accepted by DTSC on May 7, 1992.

The additional site investigation was conducted under Modification 01 of CTO No. 0121. The additional investigation included collection of soil and grab groundwater samples from these five areas for chemical analyses. The work plan proposed that at the plating shop, 10 soil borings be installed and sampled for chemical analyses from both the chromium and cyanide process areas. However, during the field work at the plating shop, the pump at the cyanide process line sump was inoperative. Approximately 6 inches of water and/or plating fluids were observed in the sump. The presence of the liquid in the sump prevented field sampling at the cyanide process sump area. Subsequently, the five proposed soil borings at the cyanide process sump area were not installed and sampled during this site investigation.

VOCs, SVOCs, cyanide, and metals were found in soil and groundwater samples collected from this site. Results of the additional investigation are summarized in the draft final DSR for background and tidal influence studies/additional work at Sites 4 and 5, August 1992 (PRC/JMM 1992b).

The objective of the current investigation performed under CTO No. 0252 is to complete the remaining site investigation at the cyanide process sump area of the plating shop in Site 5. This letter report summarizes results of this investigation, and serves as an addendum to the draft final DSR background and tidal influence studies/additional work at Sites 4 and 5 (PRC/JMM 1992b).

## **CURRENT INVESTIGATION**

The current investigation was conducted in accordance with the March 13, 1992 work plan; no modifications were made during the investigation. The investigation included drilling five boreholes through the sub-floor at the cyanide process area. Four of the boreholes were drilled to a depth of approximately 5 feet. The remaining borehole was drilled to a depth of approximately 23 feet, and

was located adjacent to an 18-foot sump used to drain the concrete sub-floor at the cyanide process side. Locations of these five borings are shown on Figure 3.

Thirteen soil samples (twelve soil samples and one duplicate) and six grab groundwater samples (five grab groundwater samples and one duplicate) were collected from the five borings for chemical analyses. A summary of the soil and groundwater samples and the laboratory analysis protocol are presented in Table 1.

## **GEOLOGY/HYDROGEOLOGY**

Subsurface soil encountered during the current field investigation consists of fine- to medium-grained silty sand to sand, to a depth of approximately 22 feet. According to the boring log of boring B-05PS-08, the sand and silty sand was underlain by clay at approximately 22 feet in the deep boring. These units are consistent with geology observed at Site 5 during previous investigations. Groundwater was encountered at a depth of approximately 3.5 feet below ground surface (bgs) at all five boring locations. Copies of the boring logs are included in Attachment A of this letter report.

## **RESULTS OF CHEMICAL ANALYSES**

As listed in Table 1, the soil samples were analyzed for metals, hexavalent chromium, VOCs, cyanide, percent moisture, pH, and total organic carbon (TOC). The grab groundwater samples were analyzed for metals, hexavalent chromium, VOC, total cyanide, and total dissolved solids (TDS). All groundwater samples were unfiltered. The chemical analyses were performed by a Navy CLEAN certified laboratory using Contract Laboratory Program (CLP) protocol.

The analytical data were reviewed by the PRC team using U.S. Environmental Protection Agency (EPA) national functional guidelines for organic data review (EPA 1991) and the functional guidelines for evaluating inorganic analyses (EPA 1988). A majority of the data were qualified as estimated (J) because the values reported are below the contract required quantitation limit (CRQL) but are considered usable. However, useable data are considered valid. Conclusions and recommendations, therefore, can be drawn from the data. Several metals, such as thallium, selenium, and arsenic, were qualified as estimates due to spike recoveries outside the control limits. The spike recoveries of these

metals analyses outside the control limits is likely due to organic constituents in the soil samples. Both the organic and inorganic data for the soil and groundwater samples are found to be usable for the RI/FS evaluation.

### **Volatile Organic Compounds - Soil Samples**

The results of VOC analyses of the soil samples are presented in Table 2 and on Figure 4. Only compounds that were detected in at least one of the samples are listed on the table and shown on Figure 4. Compounds that are not listed were not detected in any of the samples.

Carbon disulfide was detected in the 22-foot sample from boring B-05PS-08; the sample was from the bay mud at a concentration of 31 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ). This compound is commonly found in organic-rich soils; the 22-foot sample also had the highest TOC value (4.9 mg/kg). 1,1-Dichloroethane (DCA) was detected in two samples, the 1.25-foot and 22-foot samples from boring B-05PS-08, at concentrations of 5  $\mu\text{g}/\text{kg}$  and 4,300  $\mu\text{g}/\text{kg}$ , respectively. Trichloroethene (TCE) was detected in 1.25-foot samples from borings B-05PS-08 and B-05PS-09 at concentrations of 30  $\mu\text{g}/\text{kg}$  and 2  $\mu\text{g}/\text{kg}$ , respectively. Chloroethane was only detected in the 17.5-foot sample from boring B-05PS-08, at a concentration of 31  $\mu\text{g}/\text{kg}$ . Trichloroethane (TCA) was detected in nine of the soil samples (B-05PS-07 at 0.5 foot; B-05PS-08 at 1.25 feet, 2.5 feet, and 22 feet; B-05PS-DUP1 at 1.25 feet; B-05PS-09 at 1.25 feet and 2 feet; B-05PS-10 at 0.75 foot and 3 feet), at concentrations ranging from 3  $\mu\text{g}/\text{kg}$  to 1,100  $\mu\text{g}/\text{kg}$ . The highest concentration was detected in the 1.25-foot sample from boring B-05PS-08; the duplicate sample was approximately an order of magnitude less (180  $\mu\text{g}/\text{kg}$ ).

### **Inorganic Constituents - Soil Samples**

The results of inorganic analyses of soil samples collected from the Site 5 plating shop are presented in Table 3 and on Figure 5. All of the soil samples were analyzed for CLP metals, hexavalent chromium, cyanide, TOC, percent moisture, and pH.

The concentrations of metals in the soil samples from the Site 5 plating shop were compared to the upper limit of the 95%/95% statistical tolerance interval computed for soil samples as discussed in Section 2.6 of the CTO No. 0121 Mod 1 DSR (PRC/JMM 1992a). Samples with concentrations

greater than the upper limit of the statistical tolerance interval may represent elevated concentration with respect to background. These metal constituents are as follows:

- Arsenic concentrations exceed the upper limit in the 22-foot samples from boring B-05PS-08.
- Cadmium concentrations exceed the upper limit in 11 of the samples. All samples collected from above the water table have a cadmium concentration that exceeds the limit. The highest cadmium concentration was detected in the 1.25-foot sample from boring B-05PS-09.
- Chromium concentrations exceed the upper limit in five samples. The highest concentration of chromium was detected in the 2-foot sample from B-05PS-09. Hexavalent chromium was detected in two soil samples. The highest concentration of hexavalent chromium was detected in the 0.75-foot sample from B-05PS-10.
- Cobalt concentrations exceed the upper limit in only one sample. The concentration of cobalt was detected in the 22-foot sample from B-05PS-08.
- Copper concentrations exceed the upper limit in six samples. The highest concentration of copper was detected in the 1.25-foot sample from B-05PS-08.
- Thallium concentrations exceed the upper limit in three samples. The concentration of thallium detected in all three samples is 0.6 mg/kg.
- Vanadium concentrations exceed the upper limit in only the 22-foot sample from boring B-05PS-08.

Cyanide was detected in 11 of the 13 samples at concentrations ranging from 0.36 milligrams per kilogram (mg/kg) to 27.2 mg/kg. TOC detected in the soil samples ranges from 0.2 to 4.9 mg/kg. Percent moisture ranges from 6 to 43 percent and pH ranges from 8.3 to 10.3. The significance of concentrations of these inorganic constituents found in the soil samples will be addressed in the risk assessment portion of the RI/FS evaluation.

### **Volatile Organic Compounds - Grab Groundwater Samples**

Grab groundwater samples were collected from each of the five borings in the Site 5 plating shop. Additionally, a duplicate of sample B-05PS-08 was collected. The results of the organic analyses for groundwater samples are presented in Table 4 and on Figure 6. The table and the figure list only

those compounds detected in at least one sample. Compounds that are not listed were not detected in any of the samples.

1,1-DCA and TCA were detected in groundwater samples from the Site 5 plating shop. 1,1-DCA was detected only in the duplicate sample from boring B-05PS-08 at a concentration of 35 micrograms per liter ( $\mu\text{g/L}$ ). TCA was detected in all of the samples at concentrations ranging from 48  $\mu\text{g/L}$  to 8,800  $\mu\text{g/L}$ . The lowest concentration of TCA was detected in the sample from B-05PS-09 and the highest concentration was detected in the sample from boring B-05PS-08.

### **Inorganic Constituents - Grab Groundwater Samples**

The results for the inorganic analyses of the groundwater samples collected at the Site 5 plating shop are presented in Table 5 and on Figure 7. The groundwater samples were analyzed for TAL metals, cyanide, and TDS.

The concentration of metals detected in the groundwater beneath the Site 5 plating shop were compared to the upper limit of the 95%/95% statistical tolerance interval for groundwater samples computed in Section 2.7 of the CTO No. 0121 Mod 1 DSR (PRC/JMM 1992b). Background concentrations were exceeded for aluminum, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc in all of the grab groundwater samples. Concentrations exceed the upper limit of the tolerance interval for barium in only one sample (B-05PS-08), manganese in two samples (B-05PS-08 and B-05PS-09), selenium in three samples (B-05PS-06, B-05PS-07, and B-05PS-10), and silver in four samples (B-05PS-08, B-05PS-DUP2, B-05PS-09, and B-05PS-10).

Cyanide was detected in all of the samples. The concentration ranged from 42.6  $\mu\text{g/L}$  in the sample from boring B-05PS-10 to 5,150  $\mu\text{g/L}$  in the sample from boring B-05PS-09. Cadmium was detected in groundwater sample (B-05PS-08) at 130,000  $\mu\text{g/L}$ .

In comparison to the State Water Resources Control Board's total dissolved solids (TDS) upper limit of 3,000 mg/L for potable water, the collected samples TDS concentration ranged from 132 mg/L in the sample from boring B-05PS-10 to 552 mg/L in the sample from boring B-05PS-06.

The significance of the metals and cyanide results will be addressed in the risk assessment of the RI/FS evaluation.

## CONCLUSIONS

Moderate to high levels of solvents were detected in soils beneath the plating shop. Elevated levels (> 1,000 micrograms per kilogram [ug/kg]) of the VOC 1,1-dichloroethane (1,1-DCA) were detected at a depth of 22 feet bgs in boring B-05PS-08. However, the 4,300  $\mu\text{g}/\text{kg}$  of 1,1-DCA detected in soil at B-05PS-08 is below concentrations of total VOCs detected in samples collected from two locations outside of Building 5: 22,940  $\mu\text{g}/\text{kg}$  at B-05-03 on the south side of the building and 41,200  $\mu\text{g}/\text{kg}$  at B-05-11 on the east side of the building (PRC/Montgomery Watson 1993b). 1,1-DCA was not detected in soils at B-05-03 and B-05-11; however, this may be attributed to the elevated detection limits (670  $\mu\text{g}/\text{kg}$  and 1,500  $\mu\text{g}/\text{kg}$ , respectively) caused by the high concentrations of other constituents in the samples.

The metals arsenic, cadmium, chromium, cobalt, copper, thallium, and vanadium were detected in soils beneath the plating shop at levels in excess of the 95%/95% statistical tolerance interval. Hexavalent chromium was detected in two soil samples. These levels indicate that activities in the plating shop may have impacted soil beneath the shop.

Groundwater beneath the plating shop contained moderate to relatively high levels of common industrial solvents and their transformation products. 1,1,1-Trichloroethane (TCA) at 8,800  $\mu\text{g}/\text{L}$  was detected in the grab groundwater sample from B-05PS-08. By comparison, an outside monitoring well, (M05-04, east of Building 5) showed only 36  $\mu\text{g}/\text{L}$  of TCA but had concentrations as high as 920  $\mu\text{g}/\text{L}$  of five other VOCs not detected in the samples collected beneath the plating shop (PRC/Montgomery Watson 1993b). These compounds were detected at higher concentrations in groundwater samples collected in the previous plating shop investigation (PRC/JMM 1992b). In addition, cyanide was detected in all groundwater samples collected from beneath the plating shop during the current investigation.

Aluminum, beryllium, cadmium, chromium, cobalt, copper, lead, mercury, nickel, vanadium, and zinc were identified at levels in excess of background concentrations in all grab groundwater samples

collected beneath the plating shop. Barium, manganese, selenium, and silver were present in excess of background concentrations in one or more samples. The presence of metals and cyanide in groundwater beneath the plating shop is most likely related to past plating shop activities.

The significance of the presence of metals, cyanide, and VOCs in soil and groundwater underneath the plating shop will be addressed in the risk assessment task of the RI/FS evaluation. Based on the data collected during this investigation and the CTO No. 0121 Mod. 01 investigation at the plating shop, sufficient information has been collected at the plating shop for the RI/FS evaluation.

## REFERENCES

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TABLE 1

SITE 5 - PLATING SHOP  
 SUMMARY OF LABORATORY ANALYSES PERFORMED ON  
 SOIL AND GROUNDWATER SAMPLES  
 FOR SEPTEMBER 21 AND 22, 1993 INVESTIGATION

Boring	Depth (ft)	Matrix	CLP Metals	Hex Chrom	VOC	Total CN	% Moisture	pH	TOC	TDS
B-05PS-06	0.75-1.25	Soil	•	•	•	•	•	•	•	•
B-05PS-06	3.0-3.5	Soil	•	•	•	•	•	•	•	•
B-05PS-07	0.5-1.0	Soil	•	•	•	•	•	•	•	•
B-05PS-07	2.5-3.0	Soil	•	•	•	•	•	•	•	•
B-05PS-08	1.25-1.75	Soil	•	•	•	•	•	•	•	•
B-05PS-DUP01	1.25-1.75	Soil	•	•	•	•	•	•	•	•
B-05PS-08	2.5-3.0	Soil	•	•	•	•	•	•	•	•
B-05PS-08	17.5-18.0	Soil	•	•	•	•	•	•	•	•
B-05PS-08	22.0-22.5	Soil	•	•	•	•	•	•	•	•
B-05PS-09	1.25-1.75	Soil	•	•	•	•	•	•	•	•
B-05PS-09	2.0-2.5	Soil	•	•	•	•	•	•	•	•
B-05PS-10	0.75-1.25	Soil	•	•	•	•	•	•	•	•
B-05PS-10	3.0-3.5	Soil	•	•	•	•	•	•	•	•
B-05PS-06	NA	Groundwater	•	•	•	•				•
B-05PS-07	NA	Groundwater	•	•	•	•				•
B-05PS-08	NA	Groundwater	•	•	•	•				•
B-05PS-DUP02	NA	Groundwater	•	•	•	•				•
B-05PS-09	NA	Groundwater	•	•	•	•				•
B-05PS-10	NA	Groundwater	•	•	•	•				•

Notes:

- CLP - contract laboratory program
- Hex Chrom - hexavalent chromium
- VOC - volatile organic compounds
- Total CN - total cyanide
- % Moisture - percent moisture
- TOC - total organic carbon
- TDS - total dissolved solids

**TABLE 2**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**SOIL SAMPLE ANALYTICAL RESULTS - ORGANIC COMPOUNDS**

Sample Number Depth (feet) Date Sampled	B-05PS-06 0.75 9/21/93			B-05PS-06 3.00 9/21/93			B-05PS-07 0.50 9/21/93			B-05PS-07 2.50 9/21/93		
	Results	DQF	Rtnl									
<b>Volatile Organic Compounds (µg/kg)</b>												
Carbon Disulfide	53	U		11	U		60	U		12	U	
1,1-Dichloroethane	53	U		11	U		60	U		12	U	
Trichloroethene (TCE)	53	U		11	U		60	U		12	U	
Chloroethane	53	U		11	U		60	U		12	U	
1,1,1-Trichloroethane (TCA)	53	U		11	U		73			12	U	

Notes:

DQF = Data qualification flags, defined below  
 U = Not detected, "Results" shows detection limit  
 UJ = Qualified, estimated not detected  
 J = Qualified, estimated value  
 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
 a = method blank                      e = laboratory control sample  
 b = surrogate spike                    f = replicate  
 c = matrix spike                        g = post-digestion spike recovery  
 d = holding time                        h = serial dilution  
 i = below contract required quantitation limit (CRQL)

**TABLE 2**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**SOIL SAMPLE ANALYTICAL RESULTS - ORGANIC COMPOUNDS**

Sample Number Depth (feet) Date Sampled	B-05PS-08 1.25 9/22/93			DUP of 08-1.25 B-05PS-DUP1 1.25 9/22/93			B-05PS-08 2.50 9/22/93			B-05PS-08 17.50 9/22/93		
	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
<b>Volatile Organic Compounds (µg/kg)</b>												
Carbon Disulfide	11	U		23	U		56	U		13	U	
1,1-Dichloroethane	5	J	i	23	U		56	U		13	U	
Trichloroethene (TCE)	30			23	U		56	U		13	U	
Chloroethane	11	U		23	U		56	U		31		
1,1,1-Trichloroethane	1100	J	i	180			360			13	U	

Notes:

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 c = matrix spike                        g = post-digestion spike recovery  
 d = holding time                        h = serial dilution  
 i = below contract required quantitation limit (CRQL)

**TABLE 2**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**SOIL SAMPLE ANALYTICAL RESULTS - ORGANIC COMPOUNDS**

Sample Number	B-05PS-08			B-05PS-09			B-05PS-09			B-05PS-10			B-05PS-10		
Depth (feet)	22.00			1.25			2.00			0.75			3.00		
Date Sampled	9/22/93			9/22/93			9/22/93			9/22/93			9/22/93		
PARAMETER REPORTED	Results	DQF	Rtnl												
<b>Volatile Organic Compounds (µg/kg)</b>															
Carbon Disulfide	31			11	U		12	U		11	U		12	U	
1,1-Dichloroethane	4300			11	U		12	U		11	U		12	U	
Trichloroethene (TCE)	18	U		2	J	i	12	U		11	U		12	U	
Chloroethane	18	U		11	U		12	U		11	U		12	U	
1,1,1-Trichloroethane	5	J	i	190			16			84			3	J	i

Notes:

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Rtnl = Rationale for data qualification, defined below  
 a = method blank                      e = laboratory control sample  
 b = surrogate spike                    f = replicate  
 c = matrix spike                        g = post-digestion spike recovery  
 d = holding time                        h = serial dilution  
 i = below contract required quantitation limit (CRQL)

**TABLE 3  
NAS ALAMEDA - SITE 5 PLATING SHOP  
SOIL SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample Number Depth (feet) Date Sampled	95%/95% Statistical Tolerance Level	B-05PS-06 0.75 09/21/93			B-05PS-06 3.00 09/21/93			B-05PS-07 0.50 09/21/93			B-05PS-07 2.50 09/21/93			B-05PS-08 1.25 09/22/93		
		Results	DQF	Rtnl												
<b>Parameter Reported</b>	<b>Upper limit</b>															
<b>Metals (mg/kg)</b>																
Aluminum	18925	4720			5020			2950			2650			2470		
Antimony	5.6	3	UJ	g	3	UJ	g	4	UJ	g	4	UJ	g	4	UJ	g
Arsenic	4.8	1.6	J	i	1.6	J	i	1.5	J	g,i	1.5	J	g,i	2.5		
Barium	110.5	33.7	J	i	24.8	J	i	35.2	J	i	25.4	J	i	15.9	J	i
Beryllium	0.873	0.12	J	i	0.11	J	i	0.1	J	i	0.1	U		0.1	U	
Cadmium	0.761	44.4			33.2			1.9			5.1			95.2		
Calcium	6744	2730.0			2420.0			1540.0			1230.0			2480.0		
Chromium, Total	64.35	23.8			21.6			22.5			22.0			186.0		
Chromium, Hexavalent		0.110	U		0.110	U		0.110	U		0.099	U		0.056	U	
Cobalt	10.870	6.8	J	i	5.7	J	i	4.4	J	i	4.4	J	i	4.9	J	i
Copper	33.01	32.6			22.1			24.7			18.1			78.6		
Iron	28017	10500.0			11800.0			6610.0			5870.0			5790.0		
Lead	61.15	10.2			4.7			2.1			2.0			17.5		
Magnesium	8614	3140.0			3500.0			1880.0			1600.0			1710.0		
Manganese	390	172			165			102			71			67		
Mercury	0.498	0.05	J	i	0.05	U		0.06	U		0.06			0.06	U	
Nickel	57.6	29.7			21.1			23.2			19.0			25.0		
Potassium	2386	799.0	J	i	449.0	J	i	546.0	J	i	469.0	J	i	540.0	J	i
Selenium	1.07	0.43	UJ	g	0.44	UJ	g	0.48	UJ	g	0.47	UJ	g	0.45	UJ	g
Silver	55.62	0.28	U		0.28	U		0.31	U		0.31	UJ	g	0.29	UJ	g
Sodium	1233	152.0	J	i	299.0	J	i	142.0	J	i	102.0	J	i	366.0	J	i
Thallium	0.25	0.58	U		0.59	U		0.65	UJ	g	0.64	UJ	g	0.61	UJ	g
Vanadium	59.7	20.8			23.3			14.6			13.4			12.1		
Zinc	257	27.3			28.1			19.4			18.8			31.1		
<b>Total Organic Carbon (TOC) (mg/kg)</b>		0.9			0.7			0.7			0.5			0.4		
<b>Percent Moisture</b>		6.0			8.0			16.0			15.0			11.0		
<b>pH</b>		9.2			9.4			9.0			9.2			9.2		
<b>Cyanide (mg/kg)</b>		0.78	J	i	5.2			0.73	J	i	0.36	J	i	23.7		

**Notes:**

DQF = Data qualification flags, defined below  
 U = Not detected, "Results" shows detection limit  
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 J = Qualified, estimated value  
 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
 a = method blank  
 b = surrogate spike  
 c = matrix spike  
 d = holding time  
 e = laboratory control sample  
 f = replicate  
 g = spike recovery  
 h = serial dilution  
 i = below contract required quantitation limit (CRQL)

**TABLE 3  
NAS ALAMEDA - SITE 5 PLATING SHOP  
SOIL SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample Number Depth (feet) Date Sampled	DUP of 08-1.25 B-05PS-DUP1			B-05PS-08 2.50			B-05PS-08 17.50			B-05PS-08 22.00			B-05PS-09 1.25						
	95%/95% Statistical Tolerance Level	1.25 09/22/93	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl		
<b>Parameter Reported</b>	<b>Upper limit</b>																		
<b>Metals (mg/kg)</b>																			
Aluminum	18925		1880					3710						17300			3410		
Antimony	5.6		3.5	UJ	g			4	UJ	g			5.4	UJ	g		4.4	J	g,i
Arsenic	4.8		2.2	J	i			1.4	J	i			5.8				3.3		
Barium	110.5		12.1	J	i			22.9	J	i			36.1	J	i		21.6	J	i
Beryllium	0.873		0.05	UJ	g			0.08	J	i			0.49	J	i		0.06	J	i
Cadmium	0.761		80.3					235.0					0.56	U			452		
Calcium	6744		2180					1390.0					3490				3430		
Chromium, Total	64.35		48.6					104.0					64.4				91.9		
Chromium, Hexavalent			0.068	U				0.056	U				0.088	U			0.057	U	
Cobalt	10.870		4.4	J	i			5.9	J	i			17.7				5.7	J	i
Copper	33.01		58					69.4					44.4				36.1		
Iron	28017		4390					8690.0					35400				7880		
Lead	61.15		4.1					17.1					16				20.3		
Magnesium	8614		1200					2730.0					13200				2330		
Manganese	390		50.3					124					360				107		
Mercury	0.498		0.06	U				0.11					0.33	U			0.06	U	
Nickel	57.6		19					25.8					77.7				33.2		
Potassium	2386		546	J	i			641.0	J	i			3640				574	J	i
Selenium	1.07		0.45	UJ	g			0.45	UJ	g			0.70	UJ	g		0.46	UJ	g
Silver	55.62		0.29	U				0.29	UJ	g			0.46	U			0.30	U	
Sodium	1233		485	J	i			373.0	J	i			9430				407	J	i
Thallium	0.25		0.61	U				0.61	U				0.95	U			0.62	UJ	g
Vanadium	59.7		8.3	J	i			17.4					62.3				16.2		
Zinc	257		27.9					34.2					89.3				49.2		
<b>Total Organic Carbon (TOC) (mg/kg)</b>			0.4					1.6					4.9				1.4		
<b>Percent Moisture</b>			12					11.0					43				12		
<b>pH</b>			10					10.2					8.3				9.6		
<b>Cyanide (mg/kg)</b>			27.2					5.2					<0.11	U			7.4		

Notes:

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 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below

a = method blank  
 b = surrogate spike  
 c = matrix spike  
 d = holding time  
 e = laboratory control sample  
 f = replicate  
 g = spike recovery  
 h = serial dilution  
 i = below contract required quantitation limit (CRQL)

**TABLE 3**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**SOIL SAMPLE ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample Number Depth (feet) Date Sampled Parameter Reported	95%/95% Statistical Tolerance Level Upper limit	B-05PS-09 2.00 09/22/93			B-05PS-10 0.75 09/22/93			B-05PS-10 3.00 09/22/93		
		Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
<b>Metals (mg/kg)</b>										
Aluminum	18925	3760			4910			3150		
Antimony	5.6	3.6	UJ	g	3.4	UJ	g	3.7	UJ	g
Arsenic	4.8	1.2	J	g, i	1.6	J	i	2.4		
Barium	110.5	21.4	J	i	26.4	J	i	30.1	J	i
Beryllium	0.873	0.11	J	i	0.13	J	i	0.07	J	i
Cadmium	0.761	177			4.5			38.6		
Calcium	6744	1920			4840			1390		
Chromium, Total	64.35	244			37.2			33		
Chromium, Hexavalent		0.230			1.400			0.059	U	
Cobalt	10.870	5.1	J	i	8.8	J	i	4.5	J	i
Copper	33.01	133			23.5			19		
Iron	28017	8700			11900			6930		
Lead	61.15	11.4	J	g	15.0			2.5		
Magnesium	8614	2540			3680.0			1970		
Manganese	390	106			184			83.7		
Mercury	0.498	0.06	U		0.09	J	i	0.06	U	
Nickel	57.6	41.2			17.7			24.8		
Potassium	2386	640	J	i	610	J	i	535	J	i
Selenium	1.07	0.45	UJ	g	0.45	UJ	g	0.48	UJ	g
Silver	55.62	0.31	J	i	0.32	J	i	0.31	U	
Sodium	1233	359	J	i	714	J	i	83.1	J	i
Thallium	0.25	0.63	U		0.59	U		0.64	U	
Vanadium	59.7	17.4			26.2			15.3		
Zinc	257	60.1			86.5			21.8		
<b>Total Organic Carbon (TOC) (mg/kg)</b>		0.7			0.6			0.2		
<b>Percent Moisture</b>		14			9			16		
<b>pH</b>		9.6			10.3			9		
<b>Cyanide (mg/kg)</b>		0.73	J	i	0.47	J	i	1.2		

Notes:

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 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below

a = method blank  
 b = surrogate spike  
 c = matrix spike  
 d = holding time  
 e = laboratory control sample  
 f = replicate  
 g = spike recovery  
 h = serial dilution  
 i = below contract required quantitation limit (CRQL)

**TABLE 4**  
**NAS ALAMEDA - SITE 5 PLATING SHOP**  
**GRAB GROUNDWATER ANALYTICAL RESULTS - ORGANIC COMPOUNDS**

Sample Number Date Sampled PARAMETER REPORTED	B-05PS-06 9/22/93			B-05PS-07 9/22/93			B-05PS-08 9/22/93			DUP of 08 B-05PS-DUP2 9/22/93		
	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
<b>Volatile Organic Compounds (µg/L)</b>												
1,1-Dichloroethane	100	U		50	U		1000	U		35	J	i
1,1,1-Trichloroethane	1000			990			8800			1300		

Notes:

DQF = Data qualification flags, defined below  
 U = Not detected, "Results" shows detection limit  
 UJ = Qualified, estimated not detected  
 J = Qualified, estimated value  
 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
 a = method blank                      e = laboratory control sample  
 b = surrogate spike                  f = replicate  
 c = matrix spike                      g = spike recovery  
 d = holding time                      h = serial dilution  
 i = below contract required quantitation limit (CRQL)



**TABLE 5  
NAS ALAMEDA - SITE 5 PLATING SHOP  
GRAB GROUNDWATER ANALYTICAL RESULTS - INORGANIC CONSTITUENTS**

Sample Number Date Sampled PARAMETER REPORTED	95%/95% Statistical Tolerance Level Upper limit	B-05PS-06 09/22/93			B-05PS-07 09/22/93			B-05PS-08 09/22/93			DUP of 08 B-05PS-DUP2 09/22/93			B-05PS-09 09/22/93			B-05PS-10 09/22/93		
		Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl	Results	DQF	Rtnl
<b>Metals (µg/L)</b>																			
Aluminum	152.1	186000			274000			664000			192000			231000			201000		
Antimony	84.5	42.2	J	i	15.4	UJ	g	77	UJ	g	15.4	UJ	g	15.5	J	g,i	38.4	J	g,i
Arsenic	36.3	7.4	J	i	5.1	J	g,i	25	UJ	g	12	J	g	11.9	J	g	12.7	J	g
Barium	2105	1630			1870			5410			1430			1190			1460		
Beryllium	1.3	3.8	J	i	5.3			16.5	J	i	3.7	J	i	4	J	i	3.6	J	i
Cadmium	2.0	697			791			130000			34000			18100			1280		
Calcium	336033	56200			74200			329000			63900			126000			89200		
Chromium, Total	3.2	2240			4430			35000			10500			18000			11700		
Chromium, Hexavalent		14.3	U		10	U		10	U		10	U		10	U		10	U	
Cobalt	8.6	146			198			432			115			197			186		
Copper	27.7	675			430			248			346			3250			580		
Iron	9211	310000			444000			1210000			292000			404000			318000	J	f
Lead	1.0	328			231			1080			124			841			191		
Magnesium	1052432	73100			10200			351000			77700			108000			87300		
Manganese	5239	3060			3730			19600			4460			5320			4450		
Mercury	0.1	2.5			4.5			13.1			9.2			8.1			4.3		
Nickel	6.6	1980			1830			2180			803			1950			2780		
Potassium	308767	22000			29500			68500			26200	J	k	20200	J	k	19700	J	k
Selenium	1.0	22.3	J	g,i	25.7	J	g,i	20	UJ	g	20	UJ	g	2	UJ	g	26.3	J	g,i
Silver	2.4	1.3	UJ	g	1.3	UJ	g	64.7			34.6			220			95.3		
Sodium	2373034	45800			41400			73900			34000			32300			33700		
Thallium	0.9	2.7	UJ	g	27	U		27	UJ	g	2.7	UJ	g	27	UJ	g	2.7	UJ	g
Vanadium	70.7	572			803			1790			621			810			712		
Zinc	25.7	868			1040			55400			15000			1780			709		
<b>Cyanide (µg/L)</b>		111			328			3610			4900			5150			42.6		
<b>Total Dissolved Solids (mg/L)</b>		552			214			200			163			158			132		

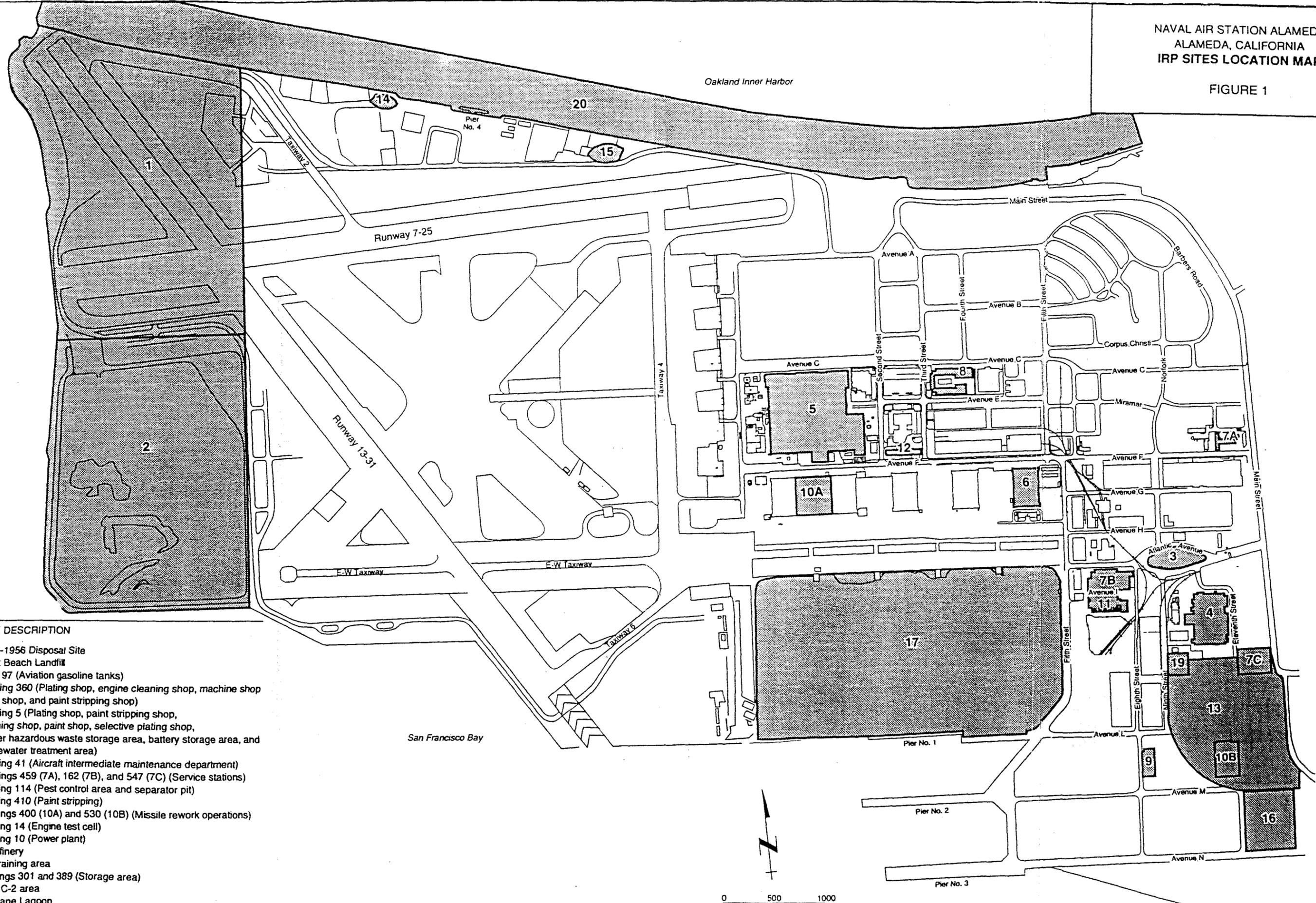
Notes:

DQF = Data qualification flags, defined below  
 U = Not detected, "Results" shows detection limit  
 UJ = Qualified, estimated not detected  
 J = Qualified, estimated value  
 R = Qualified, not usable

Rtnl = Rationale for data qualification, defined below  
 a = method blank  
 b = surrogate spike  
 c = matrix spike  
 d = holding time  
 e = laboratory control sample  
 f = replicate  
 g = spike recovery  
 h = serial dilution  
 i = below contract required quantitation limit (CRQL)  
 k = value exceeds calibration range

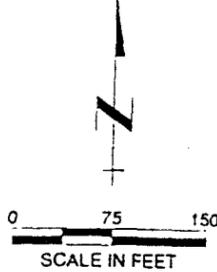
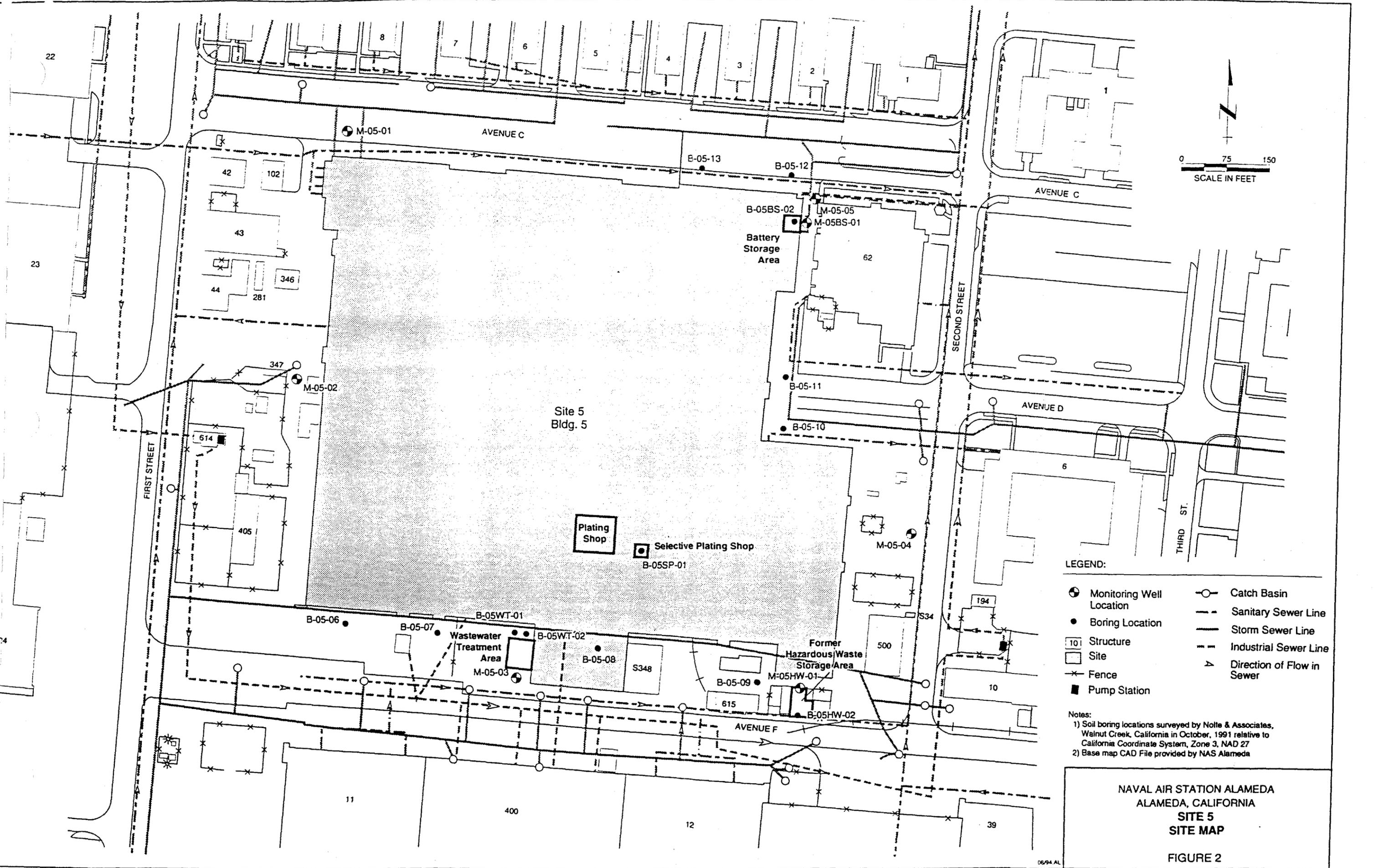
FIGURE 1

252.9/93 AL



LEGEND:

SITE NO.	SITE DESCRIPTION
1	1943-1956 Disposal Site
2	West Beach Landfill
3	Area 97 (Aviation gasoline tanks)
4	Building 360 (Plating shop, engine cleaning shop, machine shop, paint shop, and paint stripping shop)
5*	Building 5 (Plating shop, paint stripping shop, cleaning shop, paint shop, selective plating shop, former hazardous waste storage area, battery storage area, and wastewater treatment area)
6	Building 41 (Aircraft intermediate maintenance department)
7	Buildings 459 (7A), 162 (7B), and 547 (7C) (Service stations)
8	Building 114 (Pest control area and separator pit)
9	Building 410 (Paint stripping)
10	Buildings 400 (10A) and 530 (10B) (Missile rework operations)
11	Building 14 (Engine test cell)
12	Building 10 (Power plant)
13	Oil refinery
14	Fire training area
15	Buildings 301 and 389 (Storage area)
16	Cans C-2 area
17	Seaplane Lagoon
18	Station Sewer System (Not on site)
19	Yard D-13 (Hazardous waste solvents)

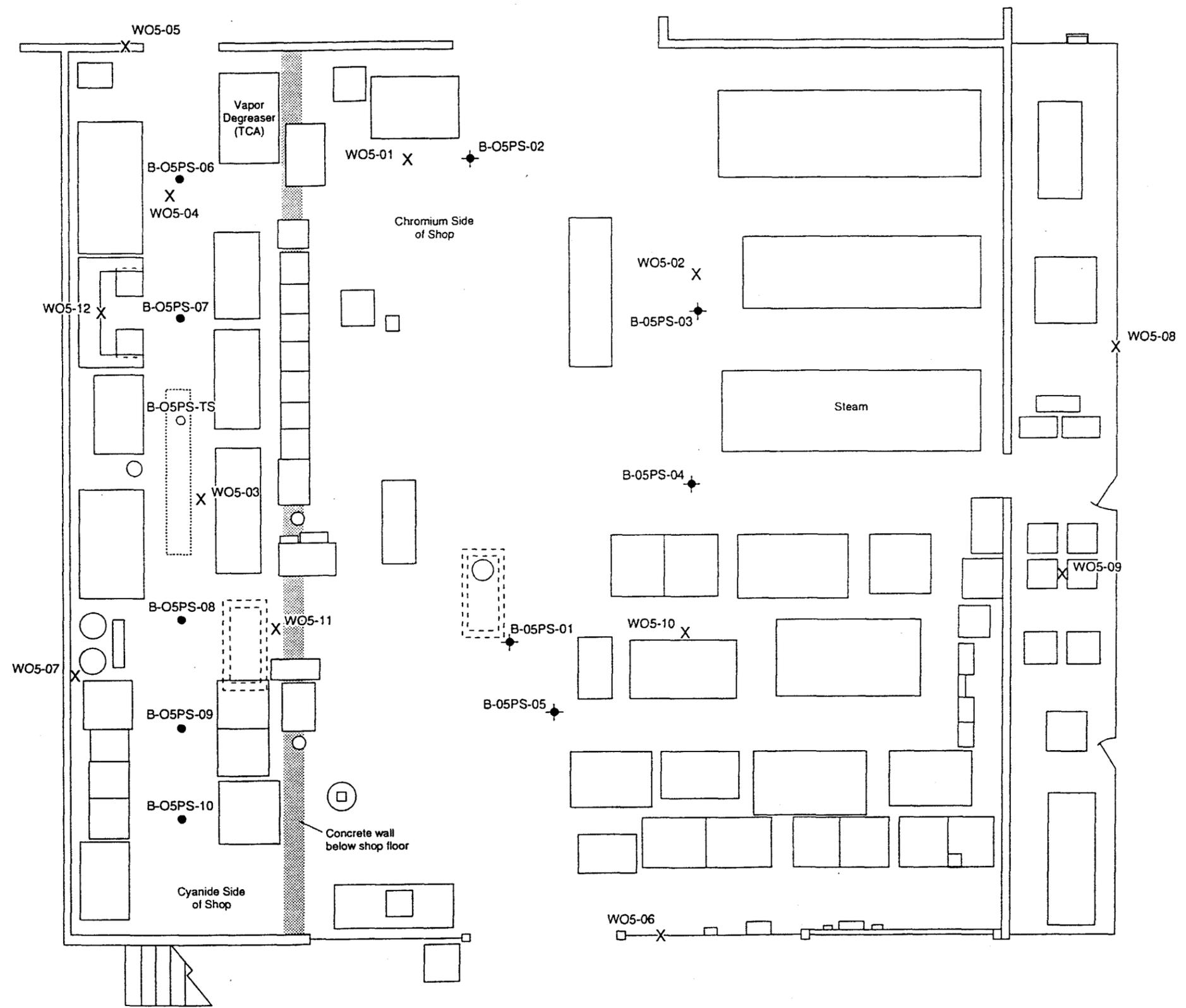


- LEGEND:**
- Monitoring Well Location
  - Boring Location
  - ▭ Structure
  - ▭ Site
  - × Fence
  - Pump Station
  - Catch Basin
  - - - Sanitary Sewer Line
  - Storm Sewer Line
  - - - Industrial Sewer Line
  - Direction of Flow in Sewer

**Notes:**  
 1) Soil boring locations surveyed by Nolte & Associates, Walnut Creek, California in October, 1991 relative to California Coordinate System, Zone 3, NAD 27  
 2) Base map CAD File provided by NAS Alameda

NAVAL AIR STATION ALAMEDA  
 ALAMEDA, CALIFORNIA  
**SITE 5**  
**SITE MAP**  
 FIGURE 2

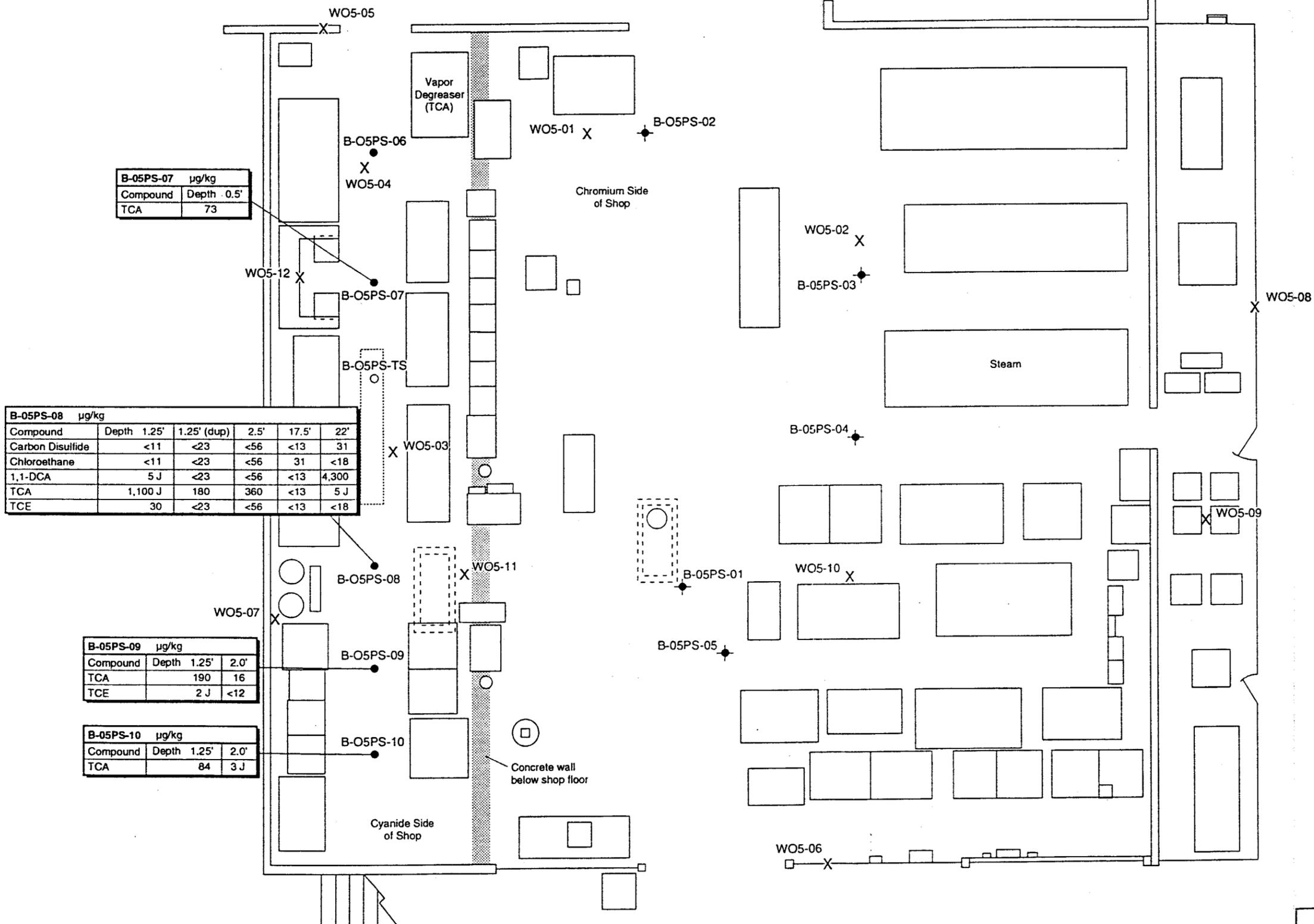
06/94 AL



- LEGEND**
- B-05PS-06 ● Soil Boring Location This Investigation
  - B-05PS-TS ○ Trench Sample Location
  - B-05PS-01 ◆ Soil Boring Location Previous Investigation
  - WO5-01 X Wipe or Scrape Sample Location Previous Investigation
  - ⎓ Eductor Sump Location
  - ⋯ Trench in Sub-Floor

NAVAL AIR STATION ALAMEDA  
 ALAMEDA, CALIFORNIA  
 SITE 5 PLATING SHOP  
 SAMPLING LOCATIONS FOR THE  
 SEPTEMBER 21 AND 22, 1993 INVESTIGATION

FIGURE 3



B-05PS-07 $\mu\text{g}/\text{kg}$		
Compound	Depth 0.5'	
TCA	73	

B-05PS-08 $\mu\text{g}/\text{kg}$						
Compound	Depth	1.25'	1.25' (dup)	2.5'	17.5'	22'
Carbon Disulfide		<11	<23	<56	<13	31
Chloroethane		<11	<23	<56	31	<18
1,1-DCA		5 J	<23	<56	<13	4,300
TCA		1,100 J	180	360	<13	5 J
TCE		30	<23	<56	<13	<18

B-05PS-09 $\mu\text{g}/\text{kg}$		
Compound	Depth	
TCA	1.25'	2.0'
TCE	2 J	<12

B-05PS-10 $\mu\text{g}/\text{kg}$		
Compound	Depth	
TCA	1.25'	2.0'
	84	3 J

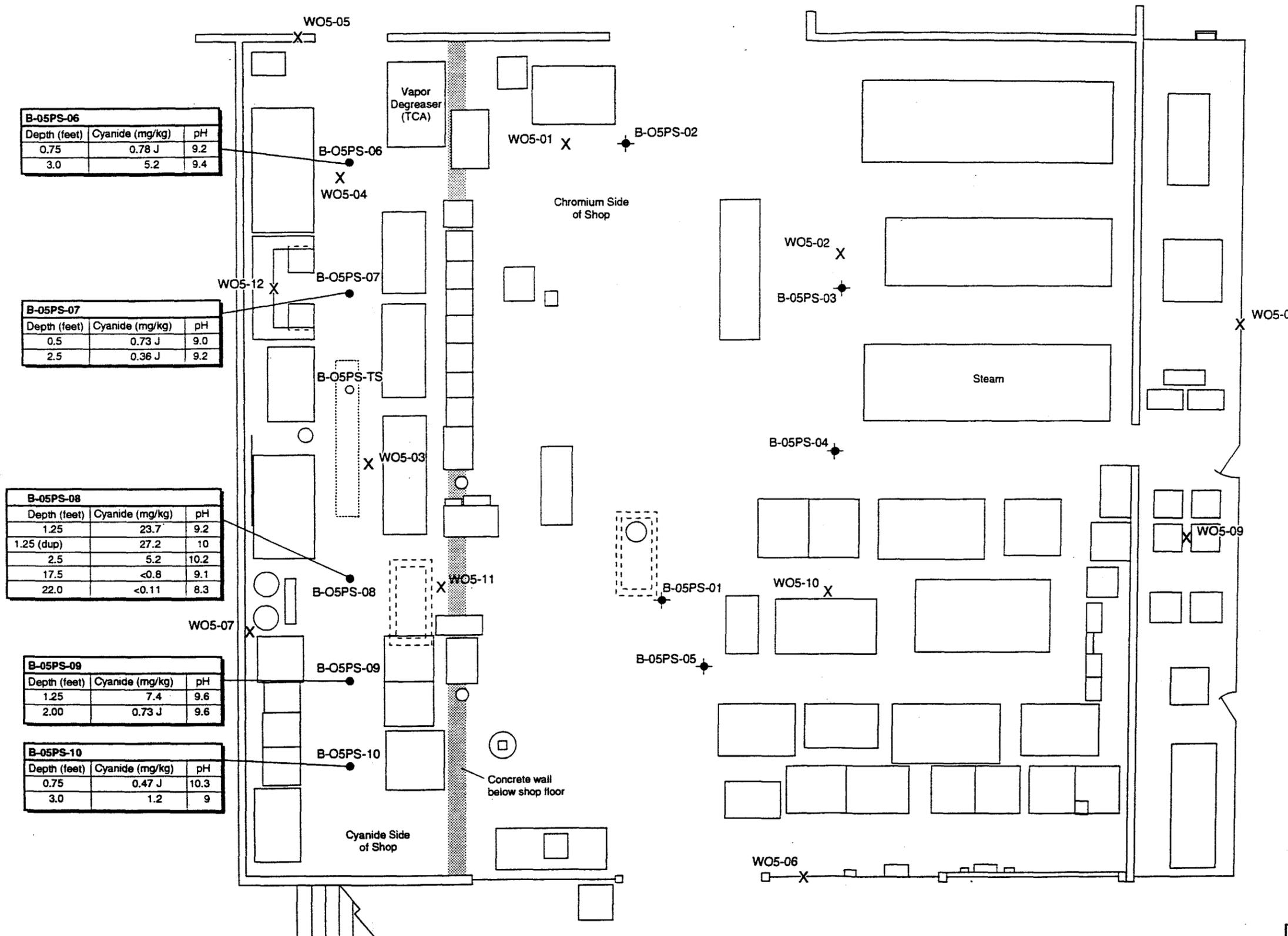
- LEGEND**
- B-05PS-06 ● Soil Boring Location This Investigation
  - B-05PS-TS ○ Trench Sample Location
  - B-05PS-01 ◆ Soil Boring Location Previous Investigation
  - WO5-01 X Wipe or Scrape Sample Location Previous Investigation
  - ⋯⋯⋯ Eductor Sump Location
  - ⋯⋯⋯ Trench in Sub-Floor
  - 1,1-DCA 1,1-Dichloroethane
  - TCA 1,1,1-Trichloroethane
  - TCE Trichloroethane
  - J Qualified, estimated value



NAVAL AIR STATION ALAMEDA  
 ALAMEDA, CALIFORNIA  
 SITE 5 PLATING SHOP  
 ANALYTICAL RESULTS FOR  
 ORGANIC COMPOUNDS IN SOIL FOR  
 THE SEPTEMBER 21 AND 22, 1993 INVESTIGATION

FIGURE 4

10/93 AL



B-05PS-06		
Depth (feet)	Cyanide (mg/kg)	pH
0.75	0.78 J	9.2
3.0	5.2	9.4

B-05PS-07		
Depth (feet)	Cyanide (mg/kg)	pH
0.5	0.73 J	9.0
2.5	0.36 J	9.2

B-05PS-08		
Depth (feet)	Cyanide (mg/kg)	pH
1.25	23.7	9.2
1.25 (dup)	27.2	10
2.5	5.2	10.2
17.5	<0.8	9.1
22.0	<0.11	8.3

B-05PS-09		
Depth (feet)	Cyanide (mg/kg)	pH
1.25	7.4	9.6
2.00	0.73 J	9.6

B-05PS-10		
Depth (feet)	Cyanide (mg/kg)	pH
0.75	0.47 J	10.3
3.0	1.2	9

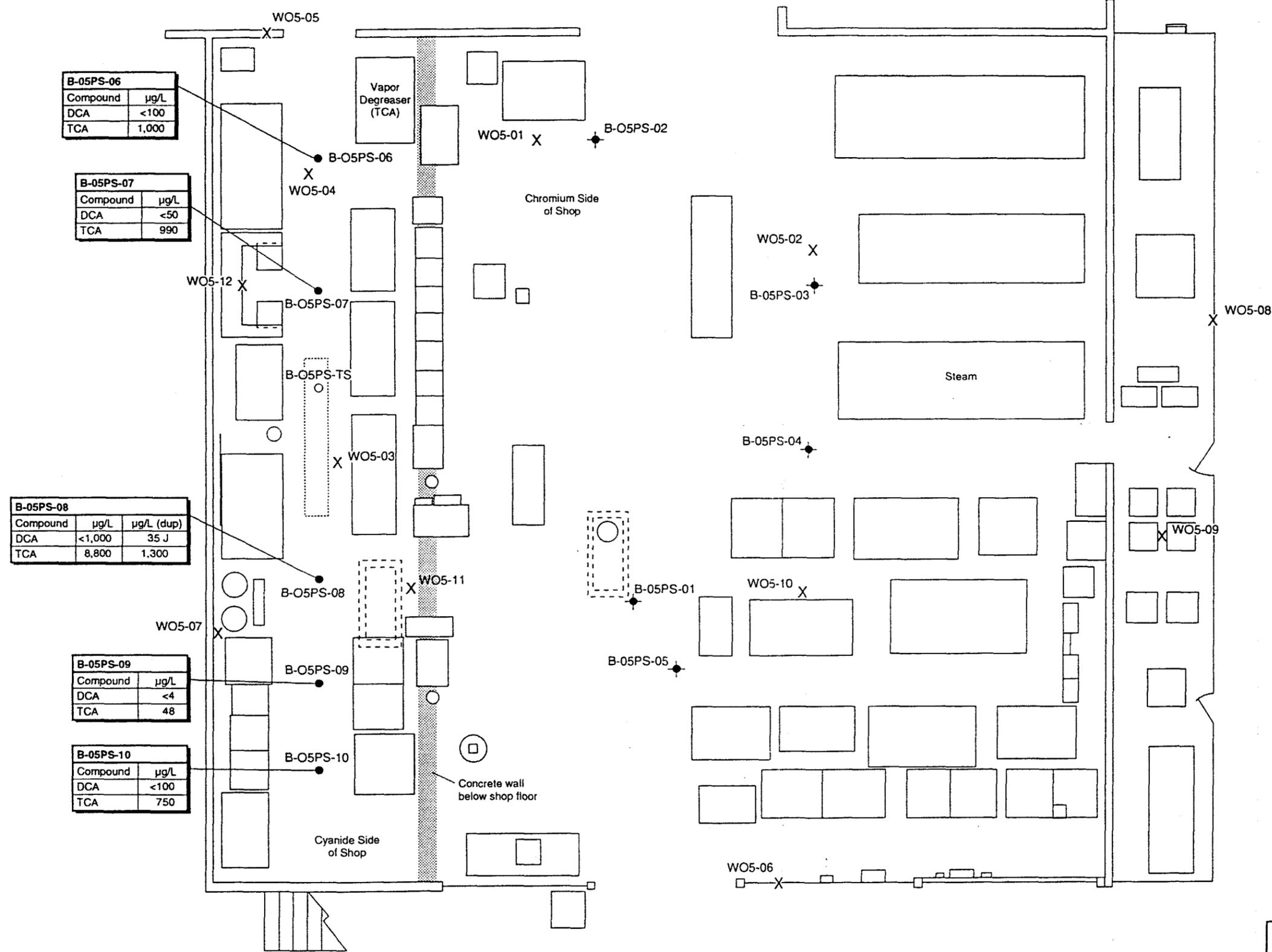
- LEGEND**
- B-05PS-06 ● Soil Boring Location This Investigation
  - B-05PS-TS ○ Trench Sample Location
  - B-05PS-01 ◆ Soil Boring Location Previous Investigation
  - WO5-01 X Wipe or Scrape Sample Location Previous Investigation
  - ⊞ Eductor Sump Location
  - ⊞ Trench in Sub-Floor
  - J Qualified, estimated value

NAVAL AIR STATION ALAMEDA  
 ALAMEDA, CALIFORNIA  
 SITE 5 PLATING SHOP  
 ANALYTICAL RESULTS FOR  
 INORGANIC CONSTITUENTS IN SOIL FOR  
 THE SEPTEMBER 21 AND 22, 1993 INVESTIGATION

FIGURE 5



10/93.AL



B-05PS-06	
Compound	µg/L
DCA	<100
TCA	1,000

B-05PS-07	
Compound	µg/L
DCA	<50
TCA	990

B-05PS-08		
Compound	µg/L	µg/L (dup)
DCA	<1,000	35 J
TCA	8,800	1,300

B-05PS-09	
Compound	µg/L
DCA	<4
TCA	48

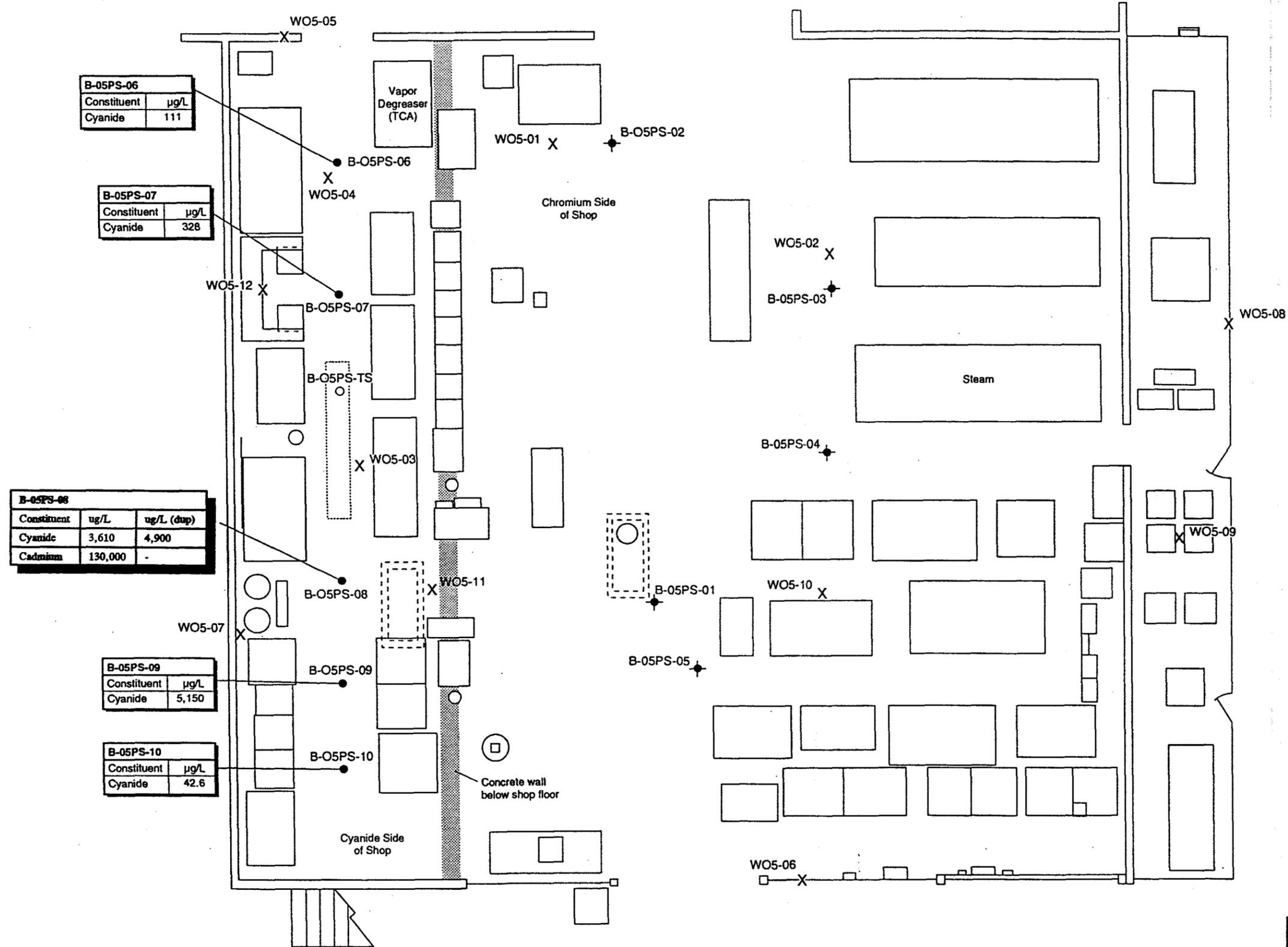
B-05PS-10	
Compound	µg/L
DCA	<100
TCA	750

- LEGEND**
- B-05PS-06 ● Soil Boring Location This Investigation
  - B-05PS-TS ○ Trench Sample Location
  - B-05PS-01 ◆ Soil Boring Location Previous Investigation
  - WO5-01 X Wipe or Scrape Sample Location Previous Investigation
  - ⊞ Eductor Sump Location
  - ⊞ Trench in Sub-Floor
  - DCA Dichloroethane
  - TCA Trichloroethane
  - TCE Trichloroethene
  - J Qualified, estimated value

NAVAL AIR STATION ALAMEDA  
 ALAMEDA, CALIFORNIA  
 SITE 5 PLATING SHOP  
 ANALYTICAL RESULTS FOR  
 ORGANIC COMPOUNDS IN GROUNDWATER FOR  
 THE SEPTEMBER 21 AND 22, 1993 INVESTIGATION



FIGURE 6



- LEGEND**
- B-05PS-06 ● Soil Boring Location This Investigation
  - B-05PS-TS ○ Trench Sample Location
  - B-05PS-01 ◆ Soil Boring Location Previous Investigation
  - WO5-01 X Wipe or Scrape Sample Location Previous Investigation
  - ⊞ Eductor Sump Location
  - ⊞ Trench in Sub-Floor

NAVAL AIR STATION ALAMEDA  
 ALAMEDA, CALIFORNIA  
 SITE 5 PLATING SHOP  
 ANALYTICAL RESULTS FOR  
 INORGANIC CONSTITUENTS IN GROUNDWATER FOR  
 THE SEPTEMBER 21 AND 22, 1993 INVESTIGATION

FIGURE 7

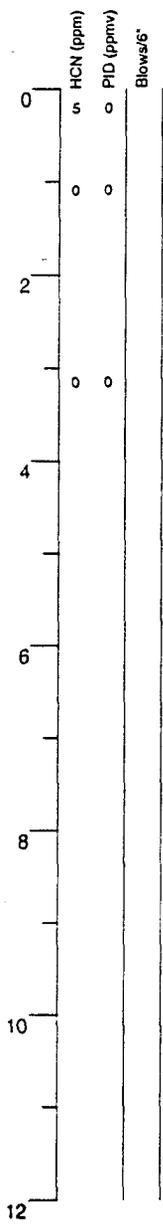
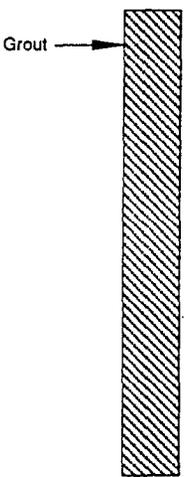
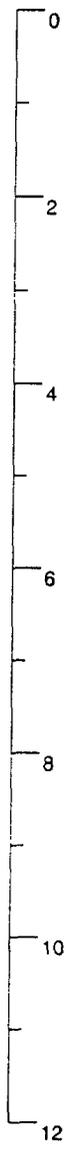


**ATTACHMENT A**

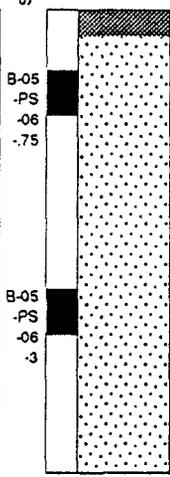
**BORING LOGS**

**(six pages)**

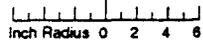
Depth Below Ground Surface (Feet)



GRAPHIC LOG DESCRIPTION



Concrete (cored) hard cutting  
 Sand (SP); orange-brown; loose; moist; 20-25% fines; fine sand; high est K  
 Sand (SP); orange-brown; loose; moist; 15-25% fines; fine sand; flowing sands; high est K  
 TD = 5'



Geologist: Scott Weber  
 Project Mgr: Scott Weber  
 Dates Drilled: 9/21/93

Drilling Company: Gregg Drilling  
 Drilling Method: Hydraulic Ramset 1000  
 Driller: Ted Hogan  
 Drill Rig:

Well Head Completion: None  
 Type of Sampler: 4" Push Point  
 TD (Total Depth): 5.0 ft. below ground surface  
 Top of Casing:

EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered core sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- NR No recovery

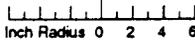
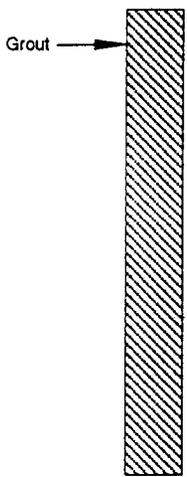


Boring Log  
 B-05PS-06  
 NAS Alameda  
 Site 5 Plating Shop  
 Alameda, California

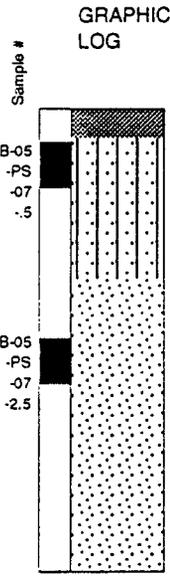
SOIL BORING

B-05PS-06

Depth Below Ground Surface (Feet)



HCN (ppm)  
PID (ppmv)  
Blows/ft  
Sample #



**GRAPHIC LOG DESCRIPTION**

Concrete floor (cored) easy cutting

Silty Sand (SM); orange brown; loose; moist; 30-35% fines; fine sand; high est K

Sand (SP); orange-brown; loose; moist; 10-20% fines; fine sand; high est K

TD = 5'

Geologist: Scott Weber  
Project Mgr: Scott Weber  
Dates Drilled: 9/21/93

Drilling Company: Gregg Drilling  
Drilling Method: Hydraulic Ramset 1000  
Driller: Ted Hogan  
Drill Rig:

Well Head Completion: None  
Type of Sampler: 4" Push Point  
TD (Total Depth): 5.0 ft. below ground surface  
Top of Casing:

**EXPLANATION**

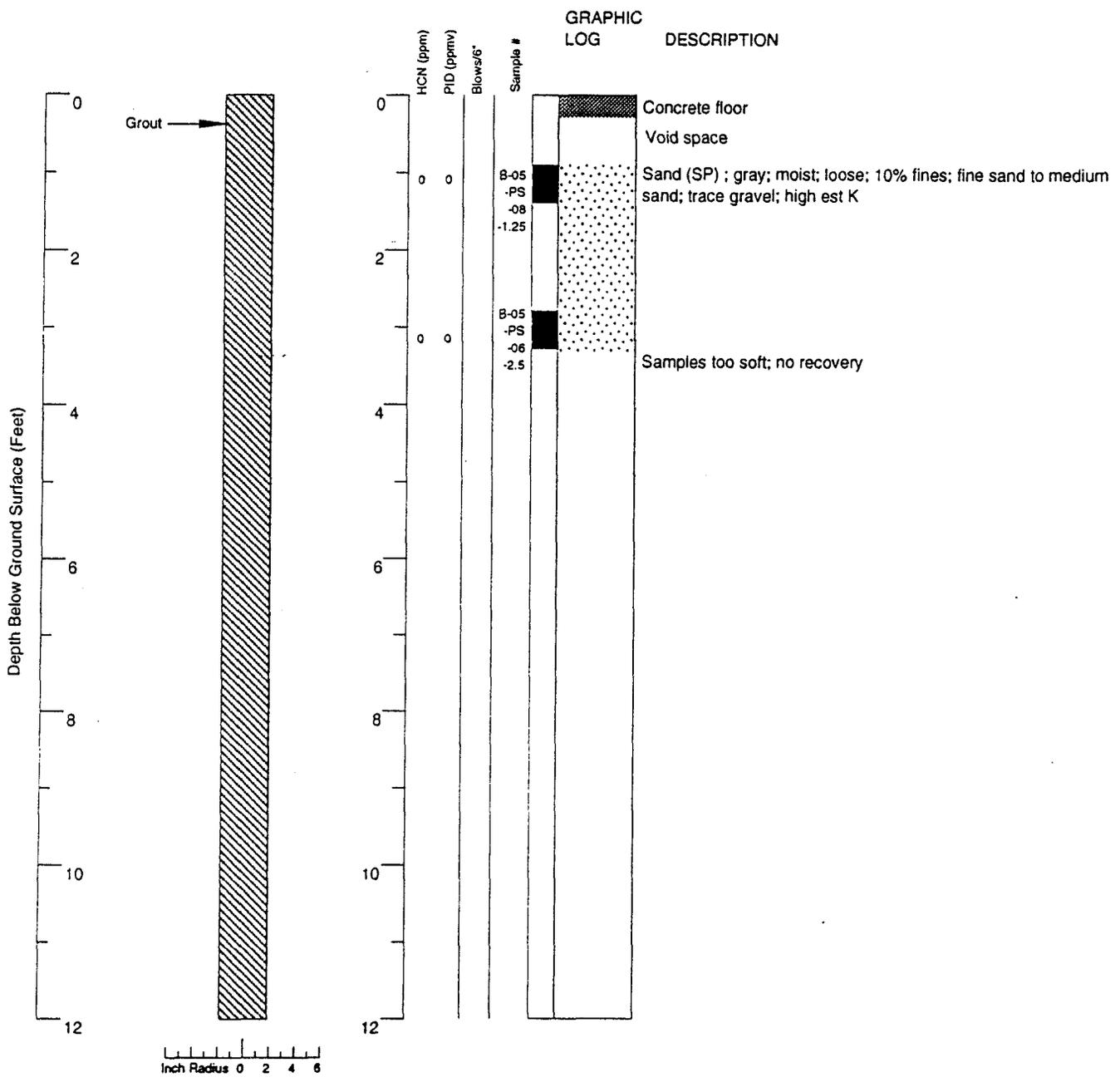
- ☒ Water level during drilling
- ☒ Water level in completed well
- ☒ Location of recovered core sample
- ☒ Location of sample sealed for chemical analysis
- ☒ Sieve sample
- ☒ Grab sample
- Contacts: Solid where certain
- ..... Dotted where approximate
- - - Dashed where uncertain
- ////// Hachured where gradational
- NR No recovery



Boring Log  
B-05PS-07  
NAS Alameda  
Site 5 Plating Shop  
Alameda, California

SOIL BORING

**B-05PS-07**



Continues

Geologist: Scott Weber  
 Project Mgr: Scott Weber  
 Dates Drilled: 9/22/93

Drilling Company: Gregg Drilling  
 Drilling Method: Hydraulic Ramset 1000  
 Driller: Ted Hogan  
 Drill Rig:

Well Head Completion: None  
 Type of Sampler: 4" Push Point  
 TD (Total Depth): 24.0 ft. below ground surface  
 Top of Casing:

**EXPLANATION**

- ☒ Water level during drilling
  - ☒ Water level in completed well
  - ☒ Location of recovered core sample
  - ☒ Location of sample sealed for chemical analysis
  - ☒ Sieve sample
  - ☒ Grab sample
- Contacts: Solid where certain
  - ..... Dotted where approximate
  - - - Dashed where uncertain
  - ////// Hachured where gradational
  - NR No recovery



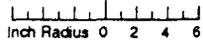
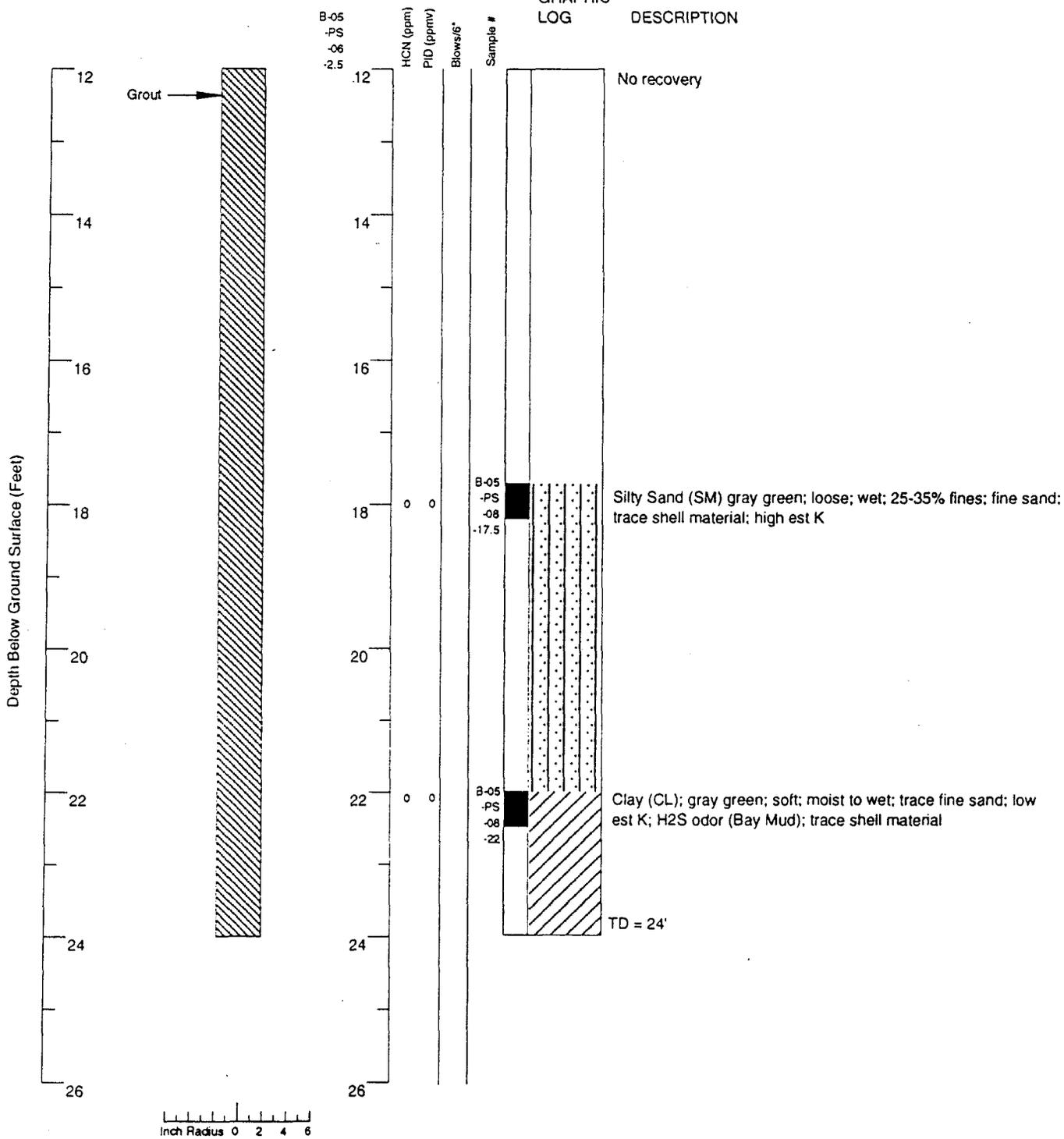
**MONTGOMERY WATSON**

Boring Log  
 B-05PS-08  
 NAS Alameda  
 Site 5 Plating Shop  
 Alameda, California

SOIL BORING

**B-05PS-08**

GRAPHIC LOG DESCRIPTION



EXPLANATION

- Water level during drilling
- Water level in completed well
- Location of recovered core sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- NR No recovery

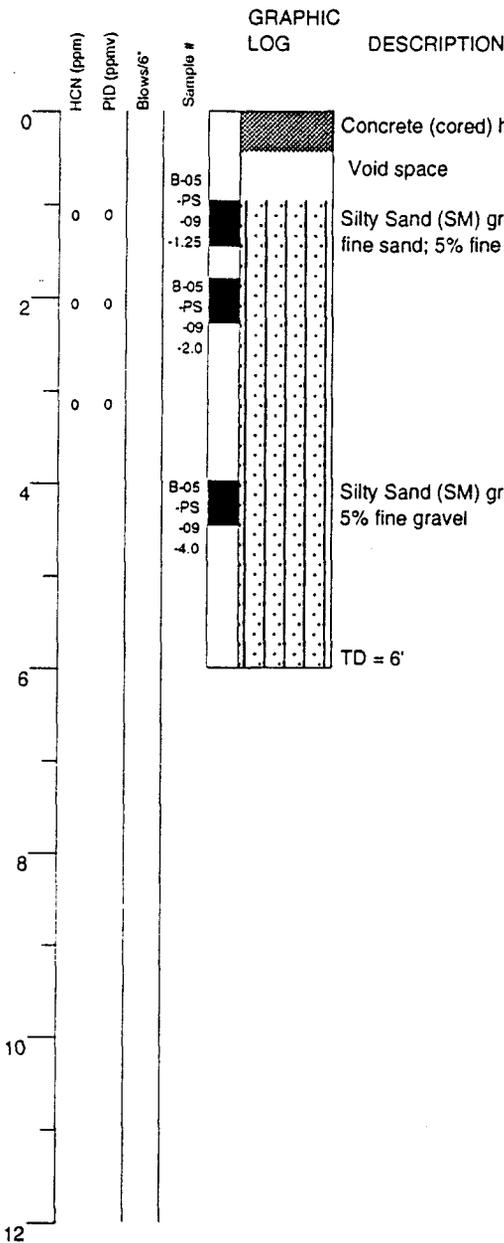
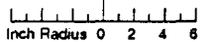
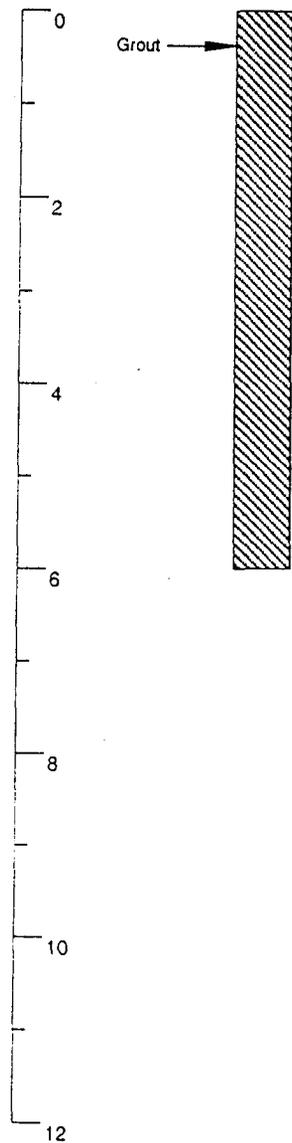


Boring Log  
 B-05PS-08  
 NAS Alameda  
 Site 5 Plating Shop  
 Alameda, California

SOIL BORING

B-05PS-08

Depth Below Ground Surface (Feet)



Geologist: Scott Weber	Drilling Company: Gregg Drilling	Well Head Completion: None
Project Mgr: Scott Weber	Drilling Method: Hydraulic Ramset 1000	Type of Sampler: 4" Push Point
Dates Drilled: 9/22/93	Driller: Ted Hogan	TD (Total Depth): 6.0 ft. below ground surface
	Drill Rig:	Top of Casing:

EXPLANATION	
Water level during drilling	Contacts: Solid where certain
Water level in completed well	Dotted where approximate
Location of recovered core sample	Dashed where uncertain
Location of sample sealed for chemical analysis	Hachured where gradational
Sieve sample	NR No recovery
Grab sample	

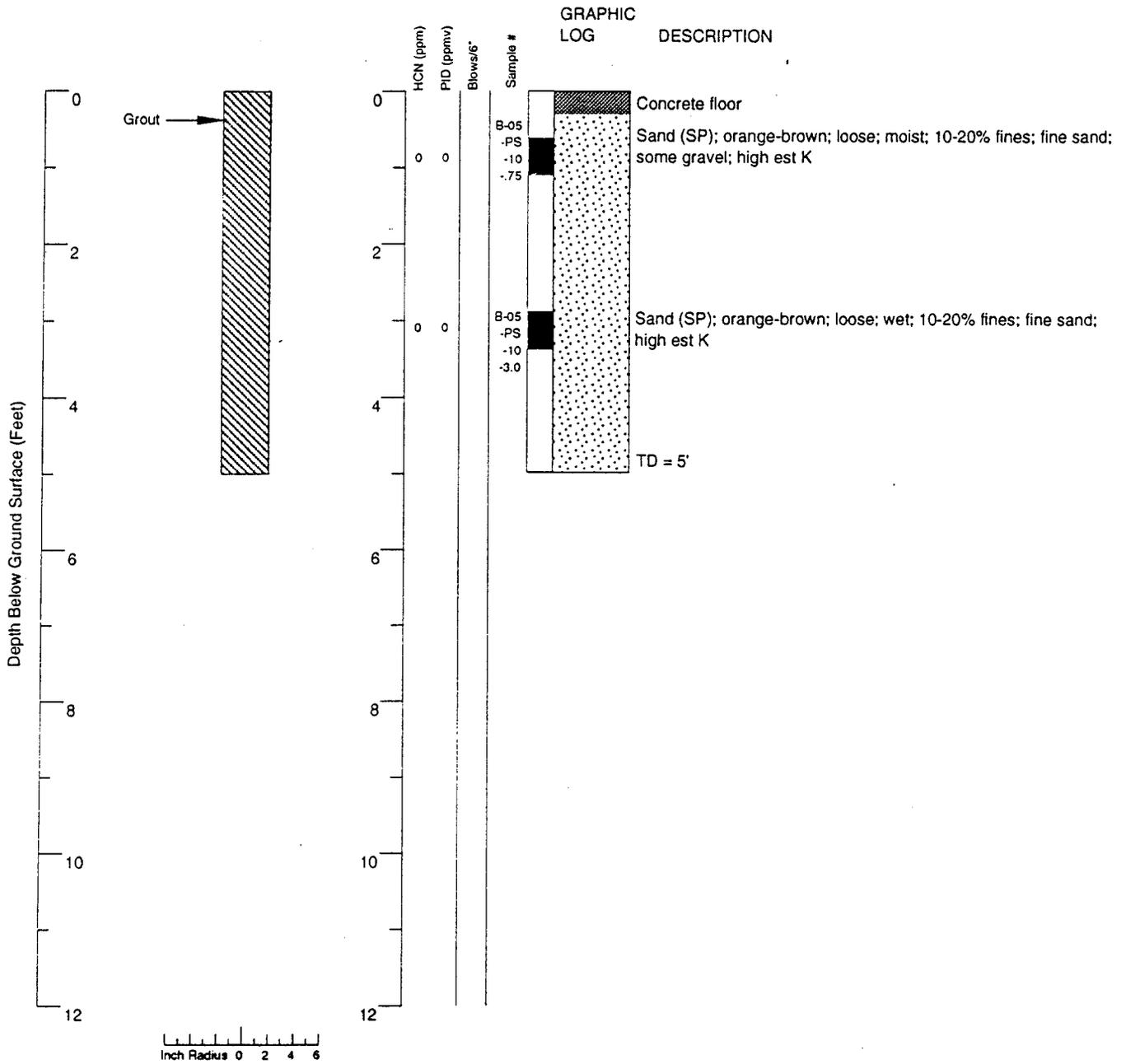
MONTGOMERY WATSON

Boring Log  
 B-05PS-09  
 NAS Alameda  
 Site 5 Plating Shop  
 Alameda, California

SOIL BORING

**B-05PS-09**

Pg. 1 of 1



Geologist: Scott Weber  
 Project Mgr: Scott Weber  
 Dates Drilled: 9/22/93

Drilling Company: Gregg Drilling  
 Drilling Method: Hydraulic Ramset 1000  
 Driller: Ted Hogan  
 Drill Rig:

Well Head Completion: None  
 Type of Sampler: 4" Push Point  
 TD (Total Depth): 5.0 ft. below ground surface  
 Top of Casing:

**EXPLANATION**

- Water level during drilling
- Water level in completed well
- Location of recovered core sample
- Location of sample sealed for chemical analysis
- Sieve sample
- Grab sample
- Contacts: Solid where certain
- Dotted where approximate
- Dashed where uncertain
- Hachured where gradational
- NR No recovery



Boring Log  
 B-05PS-10  
 NAS Alameda  
 Site 5 Plating Shop  
 Alameda, California

SOIL BORING

**B-05PS-10**