Appendix C-5

Landau 1990: Thompson-Isaacson Site, Soil Remedial Action Plan

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Thompson-Isaacson Site Soil Remedial Action Plan

December 17, 1990

Prepared for

The Boeing Company

Prepared by

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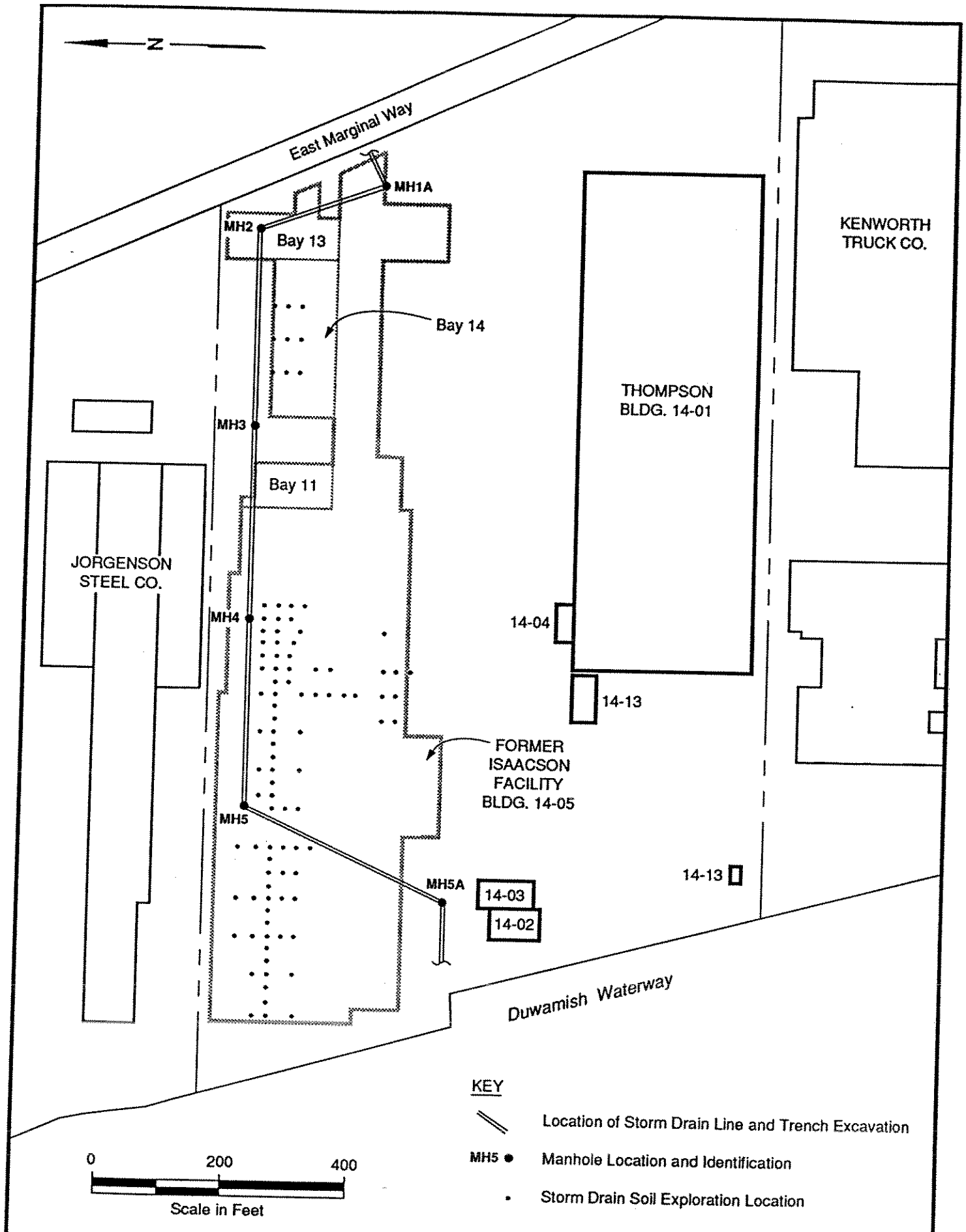
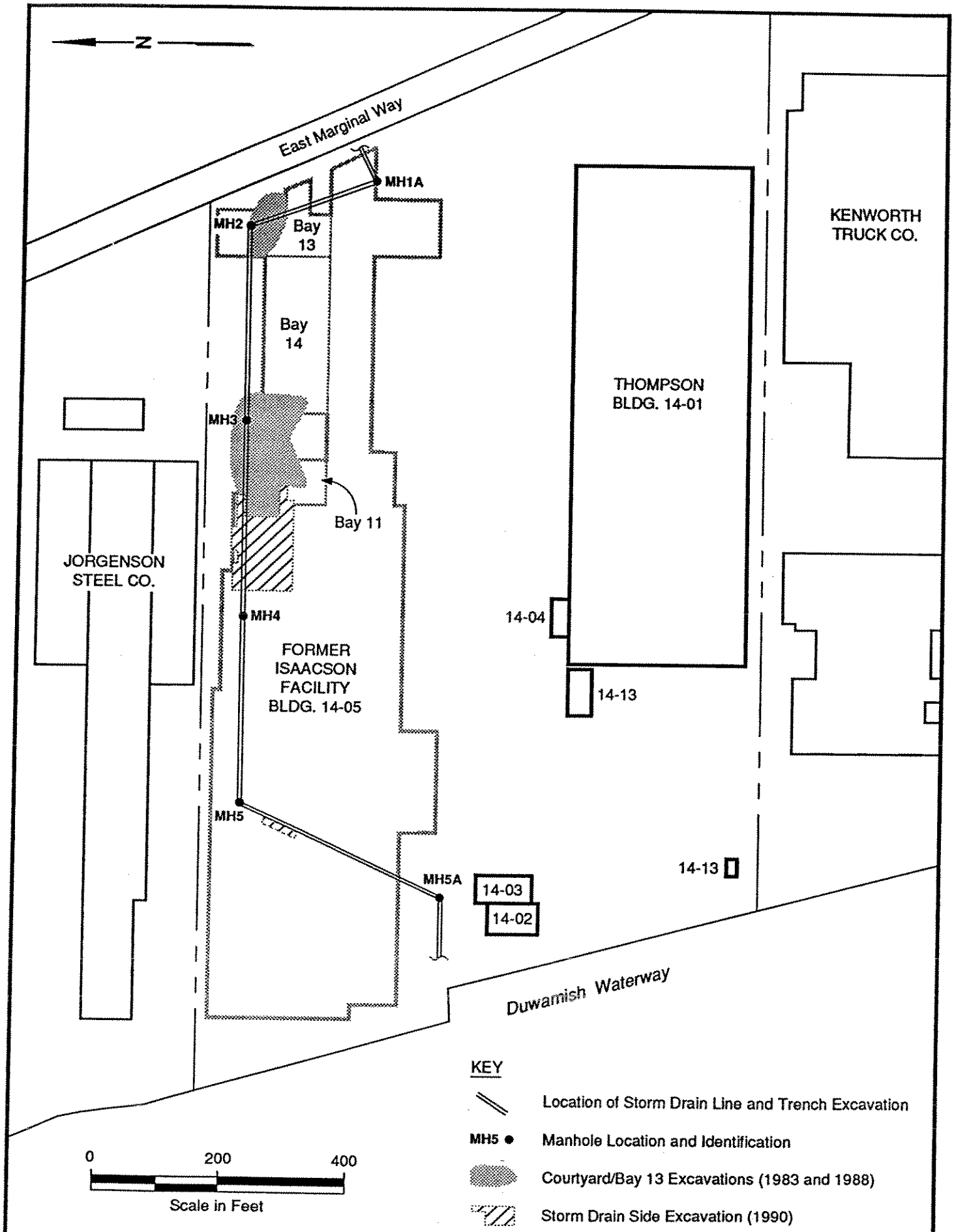


25-26.30 Boeing/Thompson-Isaacson Site/Soil Remedial Action Plan 12/90

LANDAU ASSOCIATES, INC.

Locations of Storm Drain Soil Explorations

Figure 5

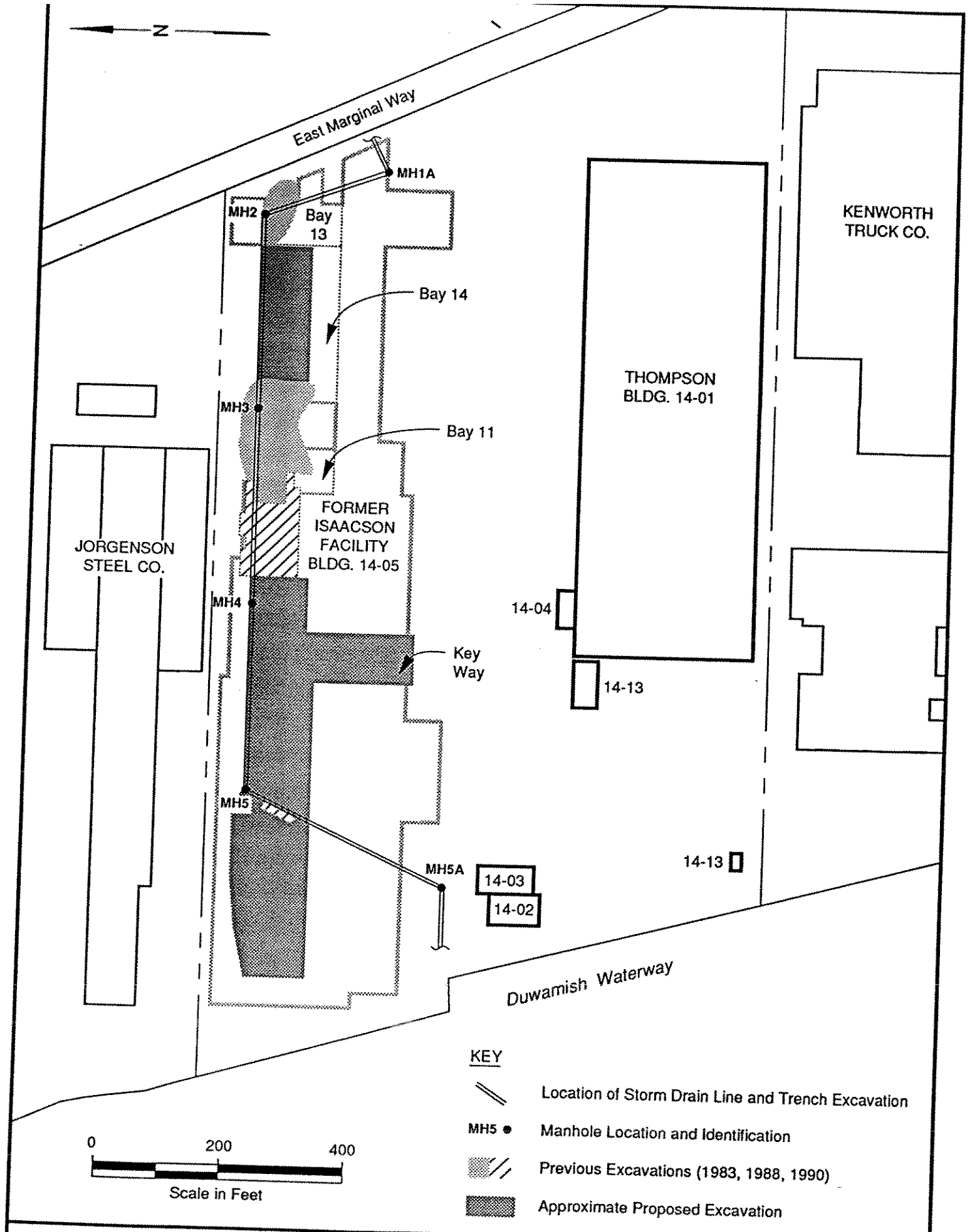


LANDAU ASSOCIATES, INC.

Locations of Previous Remedial Actions

Figure 6

26-20.30 Boeing/Thompson-Isaacson Site/Soil Remedial Action Plan 10/90

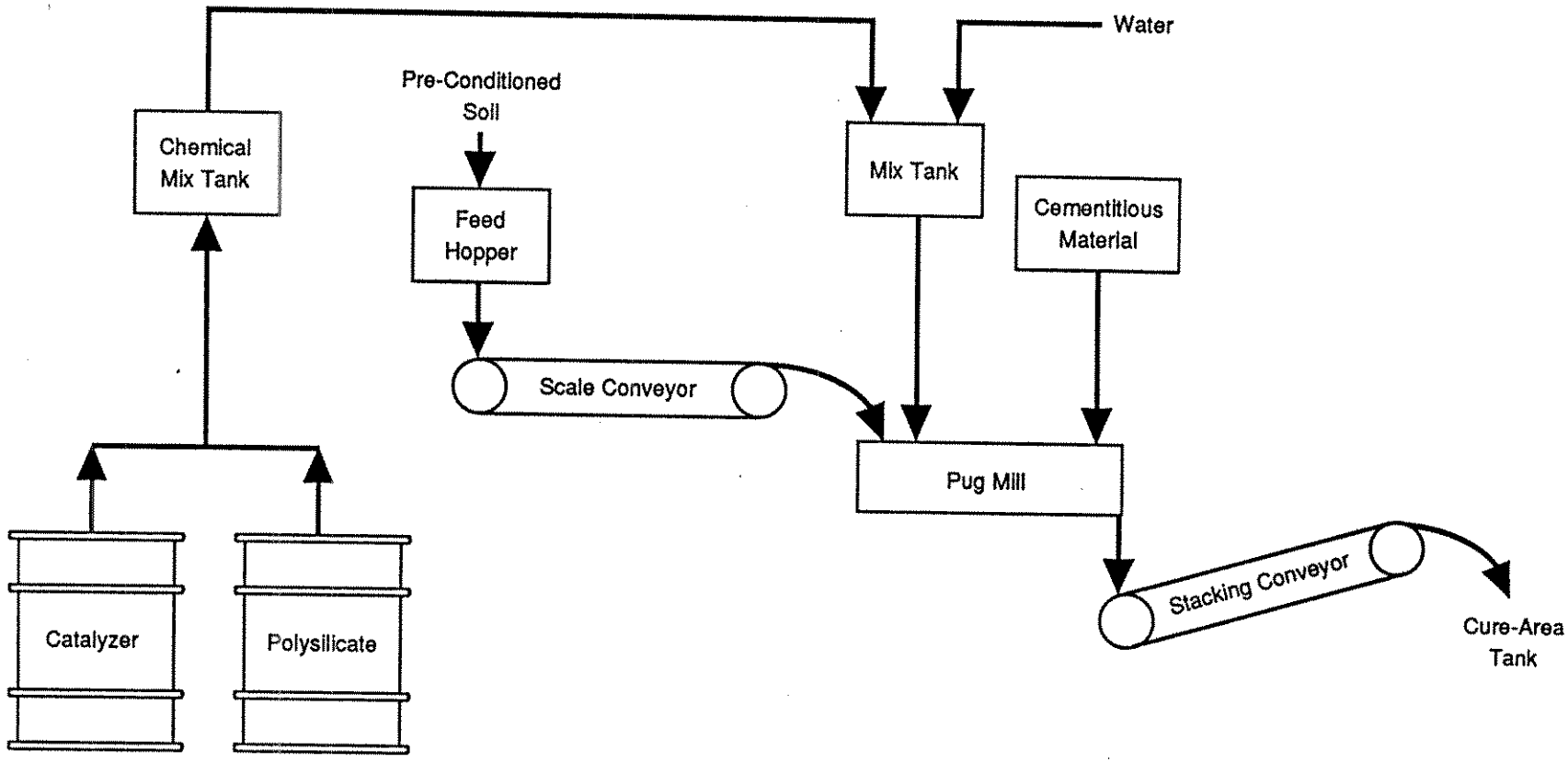


25-26.30 Boeing/Thompson-Isaacson Site/Soil Remedial Action Plan 12/90

LANDAU ASSOCIATES, INC.

Locations of Approximate Proposed Excavations

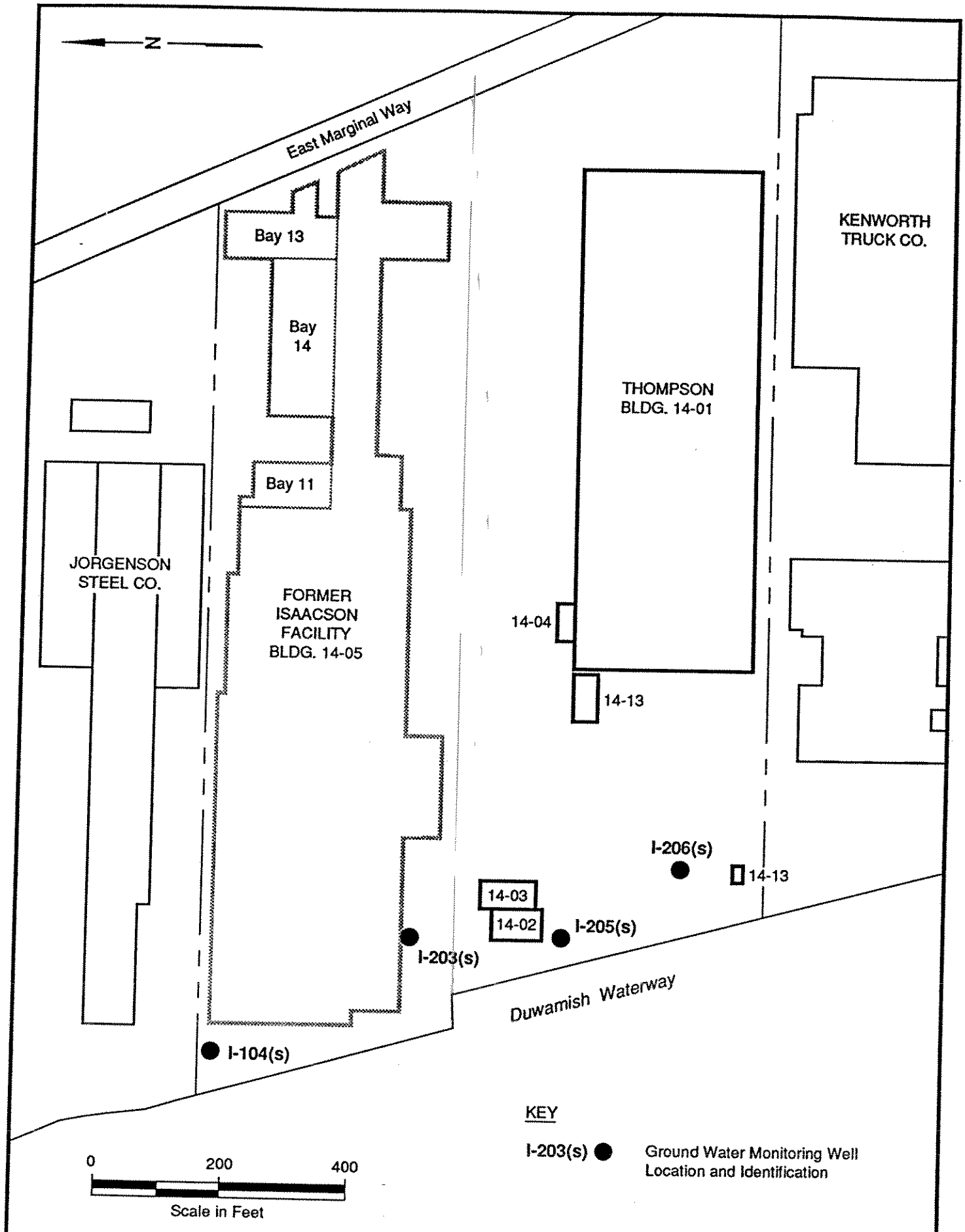
Figure 7



LANDAU ASSOCIATES, INC.

Process Flow Diagram

Figure 8



25-26.30 Boeing/Thompson-Isaacson Site/Soil Remedial Action Plan 12/90

LANDAU ASSOCIATES, INC.

Locations of Long-Term Ground Water Monitoring Wells

Figure 9

Appendix C-6

Technical Dryer 1991: Thompson-Isaacson Site, Storm Drain Line and Soil Core Sampling, Summary Report

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THOMPSON-ISAACSON SITE
STORM DRAIN LINE
AND SOIL CORE SAMPLING

SUMMARY REPORT

MARCH 6, 1991

Prepared for

Boeing Environmental Affairs

Prepared by

Technical Dryer, Inc.
24104 11 Ave. South
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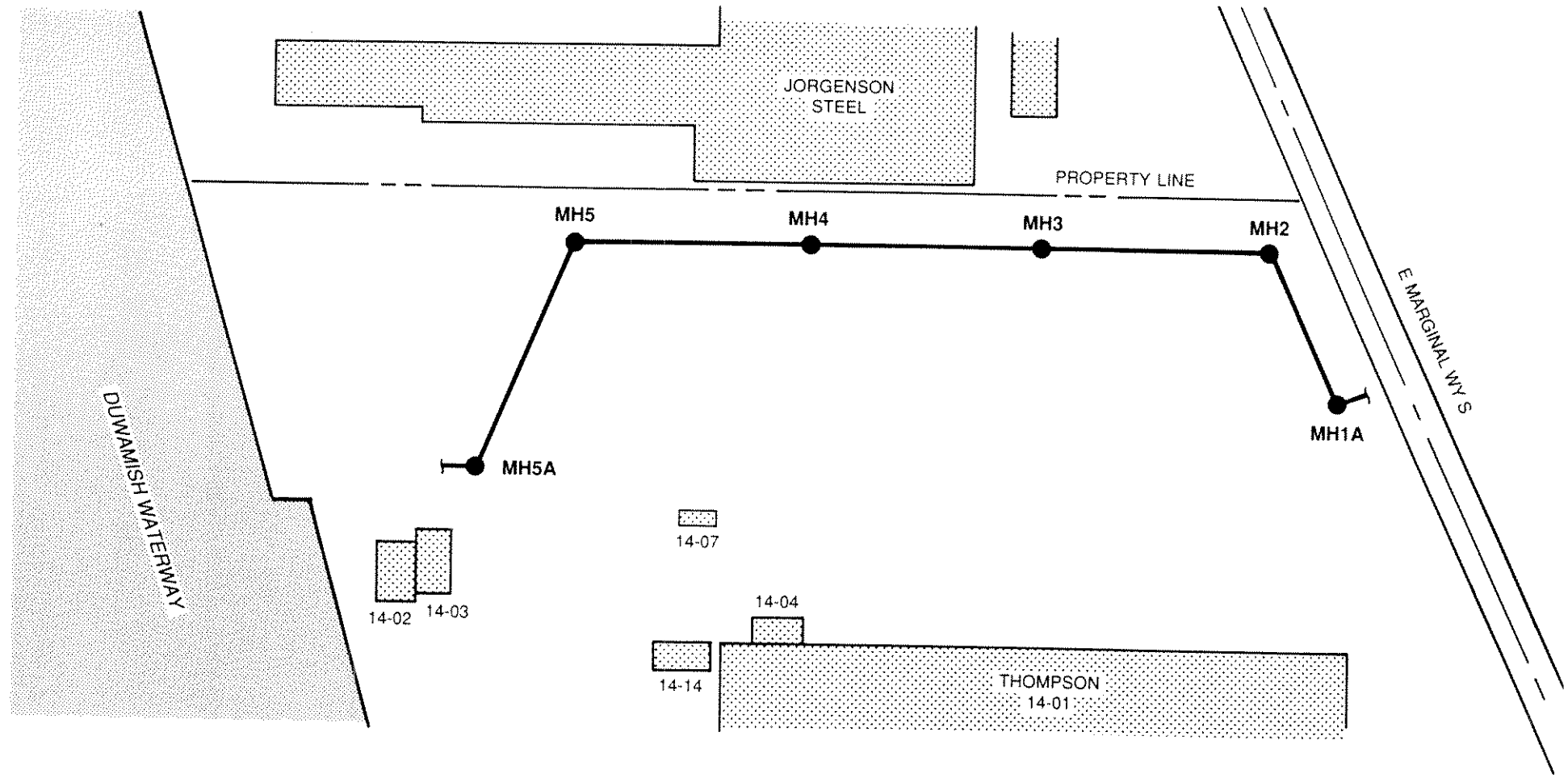
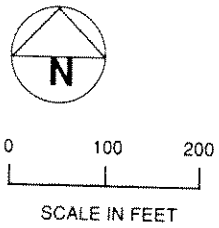




Legend

Pipeline

MH1A Manhole Location and Number

Figure 2.
Project Site Map

TABLE 1

ARSENIC VALUES FOR FIELD TEST
ISAACSON SITE

SAMPLE PILES

SAMPLE NUMBER	PILE SIZE	FIELD ARSENIC PPM AS IS	AVERAGE FOR 10 YD PILES	LAUCK'S As PPM DRY WGT.	DISPOSITION
1	50 YARDS	25			SITE BACK FILL
2	50 YARDS	< 25			SITE BACK FILL
3	50 YARDS	25			SITE BACK FILL
4	50 YARDS	< 25			SITE BACK FILL
5	50 YARDS	< 25			SITE BACK FILL
6	50 YARDS	< 25			SITE BACK FILL
7	50 YARDS	< 25			SITE BACK FILL
8	50 YARDS	< 25			SITE BACK FILL
9	50 YARDS	< 25			SITE BACK FILL
10	50 YARDS	< 25			SITE BACK FILL
11	50 YARDS	< 25			SITE BACK FILL
12	50 YARDS	< 10			SITE BACK FILL
13	50 YARDS	10			SITE BACK FILL
14	50 YARDS	< 10			SITE BACK FILL
15	50 YARDS	140			SITE BACK FILL
16	50 YARDS	30			SITE BACK FILL
17	50 YARDS	10			SITE BACK FILL
18	50 YARDS	10			SITE BACK FILL
19	50 YARDS	< 10			SITE BACK FILL
20	50 YARDS	< 10			SITE BACK FILL
20 DUP	50 YARDS	< 10		< 50	
21	50 YARDS	30			SITE BACK FILL
22	50 YARDS	40			SITE BACK FILL
23	50 YARDS	1,900			CLASS I LANDFILL
24	50 YARDS	3,000			CLASS I LANDFILL
25	50 YARDS	1,900			CLASS I LANDFILL
26-A	10 YARDS	2,100			CLASS I LANDFILL
26-B	10 YARDS	2,200			CLASS I LANDFILL
26-C	10 YARDS	1,900	1,502		CLASS I LANDFILL
26-D	10 YARDS	1,300			CLASS I LANDFILL
26-E	10 YARDS	< 10			CLASS I LANDFILL
27-A	10 YARDS	400			CLASS I LANDFILL
27-B	10 YARDS	1,400			CLASS I LANDFILL
27-C	10 YARDS	800	900		CLASS I LANDFILL
27-D	10 YARDS	1,100			CLASS I LANDFILL
27-E	10 YARDS	800			CLASS I LANDFILL
28-A	10 YARDS	1,000			CLASS I LANDFILL
28-B	10 YARDS	< 10			CLASS I LANDFILL
28-B DUP	10 YARDS	< 10	260	< 50	
28-C	10 YARDS	< 10			CLASS I LANDFILL
28-D	10 YARDS	140			CLASS I LANDFILL
28-E	10 YARDS	140			CLASS I LANDFILL

TABLE 1

ARSENIC VALUES FOR FIELD TEST
ISAACSON SITE

SAMPLE PILES

SAMPLE NUMBER	PILE SIZE	FIELD ARSENIC PPM AS IS	AVERAGE FOR 10 YD PILES	LAUCK'S As PPM DRY WGT.	DISPOSITION
29-A	10 YARDS	1,000			CLASS I LANDFILL
29-B	10 YARDS	80			CLASS I LANDFILL
29-C	10 YARDS	1,000	588		CLASS I LANDFILL
29-D	10 YARDS	400			CLASS I LANDFILL
29-E	10 YARDS	140			CLASS I LANDFILL
30-A	10 YARDS	400			CLASS I LANDFILL
30-B	10 YARDS	400	316		CLASS I LANDFILL
30-B DUP	10 YARDS	400		260	
30-C	10 YARDS	200			CLASS I LANDFILL
30-D	10 YARDS	180			CLASS I LANDFILL
30-E	10 YARDS	400			CLASS I LANDFILL
31-A	10 YARDS	400			SITE BACKFILL
31-B	10 YARDS	600			CLASS I LANDFILL
31-C	10 YARDS	190	348		SITE BACKFILL
31-D	10 YARDS	150			SITE BACKFILL
31-E	10 YARDS	400			SITE BACKFILL
32	50 YARDS	400		590	CLASS I LANDFILL
33	50 YARDS	400		570	CLASS I LANDFILL
34	50 YARDS	210			SITE BACKFILL
35	50 YARDS	160			SITE BACKFILL
36	50 YARDS	170			SITE BACKFILL
37	50 YARDS	120			SITE BACKFILL
38	50 YARDS	110			SITE BACKFILL
39	50 YARDS	220			SITE BACKFILL
40	50 YARDS	400		570	CLASS I LANDFILL
41	50 YARDS	400		350	SITE BACKFILL
42	50 YARDS	300		370	SITE BACKFILL
43	50 YARDS	300		220	SITE BACKFILL
44	50 YARDS	180			SITE BACKFILL
45	50 YARDS	60			SITE BACKFILL
45-DUP	50 YARDS	50		< 60	
46	50 YARDS	50			SITE BACKFILL
47	50 YARDS	600			CLASS I LANDFILL
48	50 YARDS	400		680	CLASS I LANDFILL
49	50 YARDS	300			SITE BACKFILL
50	50 YARDS	500			CLASS I LANDFILL
51	50 YARDS	200			SITE BACKFILL
52	50 YARDS	200			SITE BACKFILL
53	50 YARDS	200			SITE BACKFILL
54	50 YARDS	500			CLASS I LANDFILL
55	50 YARDS	200			SITE BACKFILL

TABLE 1

ARSENIC VALUES FOR FIELD TEST
ISAACSON SITE

SAMPLE PILES

SAMPLE NUMBER	PILE SIZE	FIELD ARSENIC PPM AS IS	AVERAGE FOR 10 YD PILES	LAUCK'S As PPM DRY WGT.	DISPOSITION
56-A	10 YARDS	170			SITE BACKFILL
56-B	10 YARDS	600			CLASS I LANDFILL
56-C	10 YARDS	500	394		CLASS I LANDFILL
56-D	10 YARDS	300			SITE BACKFILL
56-E	10 YARDS	400			SITE BACKFILL
57-A	10 YARDS	200			SITE BACKFILL
57-B	10 YARDS	200			SITE BACKFILL
57-C	10 YARDS	200	280		SITE BACKFILL
57-D	10 YARDS	200			SITE BACKFILL
57-D DUP	10 YARDS	200		200	
57-E	10 YARDS	600			CLASS I LANDFILL
58-A	10 YARDS	210			CLASS I LANDFILL
58-B	10 YARDS	600			CLASS I LANDFILL
58-C	10 YARDS	600	502		CLASS I LANDFILL
58-D	10 YARDS	500			CLASS I LANDFILL
58-E	10 YARDS	600			CLASS I LANDFILL
					CLASS I LANDFILL
59-A	10 YARDS	600			CLASS I LANDFILL
59-B	10 YARDS	900	750		CLASS I LANDFILL
					CLASS I LANDFILL
60	50 YARDS	5,000			CLASS I LANDFILL
61	50 YARDS	2,000			CLASS I LANDFILL
62	50 YARDS	1,900			CLASS I LANDFILL
63	50 YARDS	1,500			CLASS I LANDFILL
64	50 YARDS	650			CLASS I LANDFILL
65	50 YARDS	850			CLASS I LANDFILL
66	50 YARDS	350			SITE BACKFILL
67	50 YARDS	650			CLASS I LANDFILL

PILES 68 TO 78 CONSIST OF BACKFILL FROM PREVIOUSLY EXCAVATED COURTYARD AREA AND THUS WERE NOT SAMPLED

79	50 YARDS	50			SITE BACKFILL
80	50 YARDS	50			SITE BACKFILL
81	50 YARDS	80			SITE BACKFILL
82	50 YARDS	120			SITE BACKFILL
83	50 YARDS	90		190	SITE BACKFILL
83 DUP	50 YARDS	80			
84	50 YARDS	70			SITE BACKFILL
85	50 YARDS	170			SITE BACKFILL
86	50 YARDS	70			SITE BACKFILL
87	50 YARDS	20			SITE BACKFILL

TABLE 1

ARSENIC VALUES FOR FIELD TEST
ISAACSON SITE

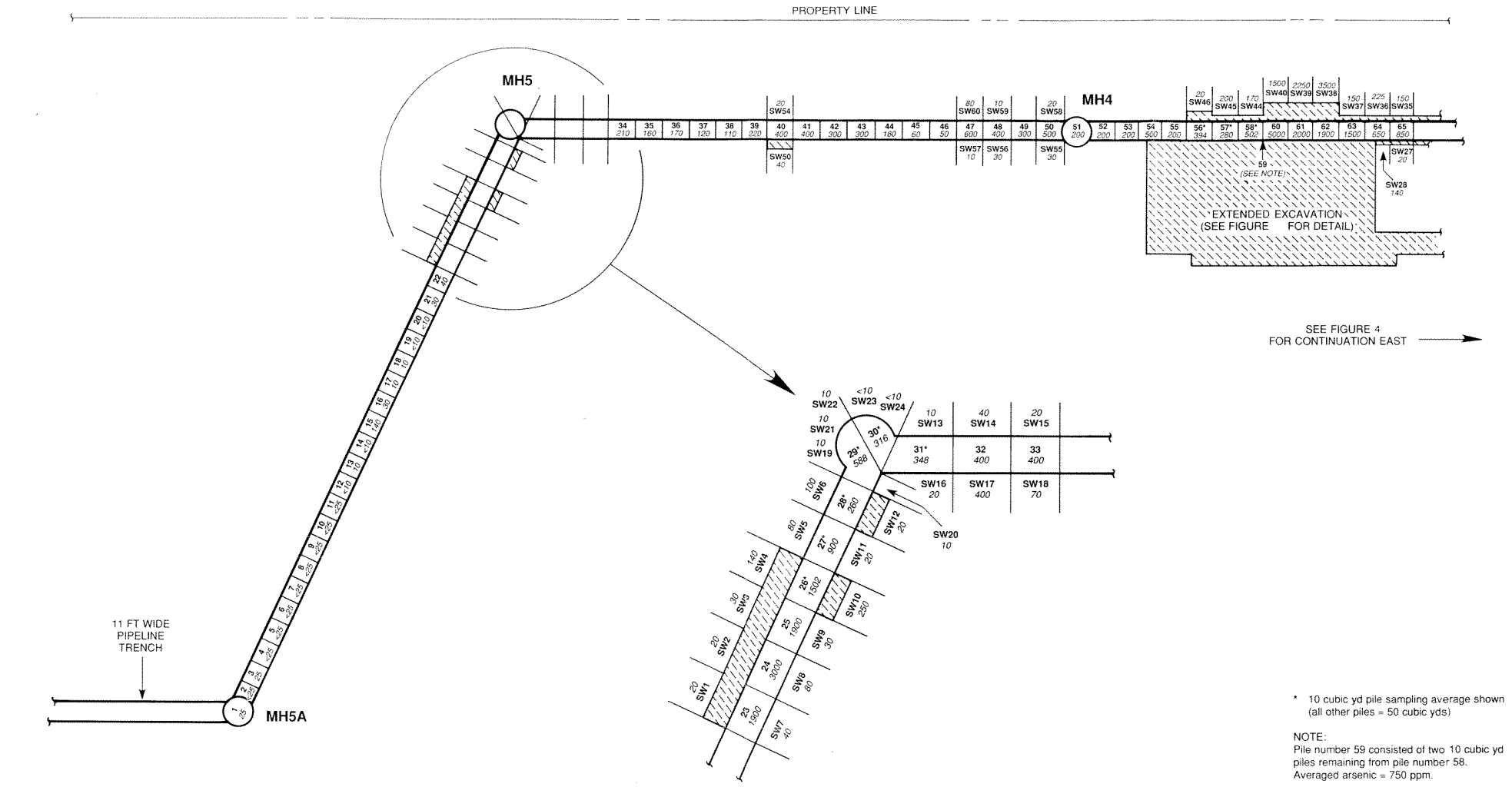
SAMPLE PILES

SAMPLE NUMBER	PILE SIZE	FIELD ARSENIC PPM AS IS	AVERAGE FOR 10 YD PILES	LAUCK'S As PPM DRY WGT.	DISPOSITION
88-A	10 YARDS	< 10			SITE BACKFILL
88-B	10 YARDS	40			SITE BACKFILL
88-C	10 YARDS	90	46		SITE BACKFILL
88-D	10 YARDS	30			SITE BACKFILL
88-E	10 YARDS	60			SITE BACKFILL
89-A	10 YARDS	140			SITE BACKFILL
89-B	10 YARDS	60			SITE BACKFILL
89-C	10 YARDS	40	70		SITE BACKFILL
89-D	10 YARDS	60			SITE BACKFILL
89-E	10 YARDS	50			SITE BACKFILL
*90-A	10 YARDS	90			SITE BACKFILL
91	50 YARDS	50			SITE BACKFILL
92	50 YARDS	50			SITE BACKFILL
93	50 YARDS	100			SITE BACKFILL
94	50 YARDS	110			SITE BACKFILL
95	50 YARDS	100			SITE BACKFILL
96	50 YARDS	80			SITE BACKFILL
97	50 YARDS	110			SITE BACKFILL
98	50 YARDS	70			SITE BACKFILL
99	50 YARDS	70			SITE BACKFILL
100	50 YARDS	70			SITE BACKFILL
100 DUP	50 YARDS	80		210	

PILES 101 THROUGH 111 CONSIST OF BACKFILL FROM THE PREVIOUSLY EXCAVATED BAY 13 AREA AND THUS WERE NOT SAMPLED.

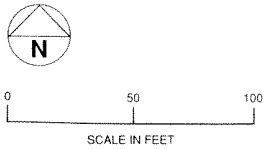
112	50 YARDS	70			SITE BACKFILL
113	50 YARDS	10			SITE BACKFILL
114	50 YARDS	< 10			SITE BACKFILL
115	50 YARDS	< 10			SITE BACKFILL
116	50 YARDS	< 10			SITE BACKFILL
117	50 YARDS	< 45			SITE BACKFILL
118	50 YARDS	< 45			SITE BACKFILL
119	50 YARDS	< 45			SITE BACKFILL
120	50 YARDS	< 45			SITE BACKFILL
121	50 YARDS	< 45			SITE BACKFILL
122	50 YARDS	<10			SITE BACKFILL
123	50 YARDS	<10			SITE BACKFILL
124	50 YARDS	<10		77	SITE BACKFILL
125	50 YARDS	<10			SITE BACKFILL
126	50 YARDS	<10			SITE BACKFILL

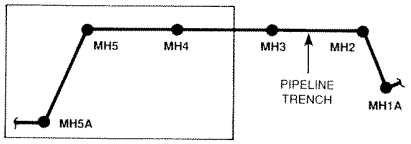
* ONE TEN CUBIC YARD PILE REMAINING FROM 89



* 10 cubic yd pile sampling average shown (all other piles = 50 cubic yds)

NOTE:
Pile number 59 consisted of two 10 cubic yd piles remaining from pile number 58. Averaged arsenic = 750 ppm.

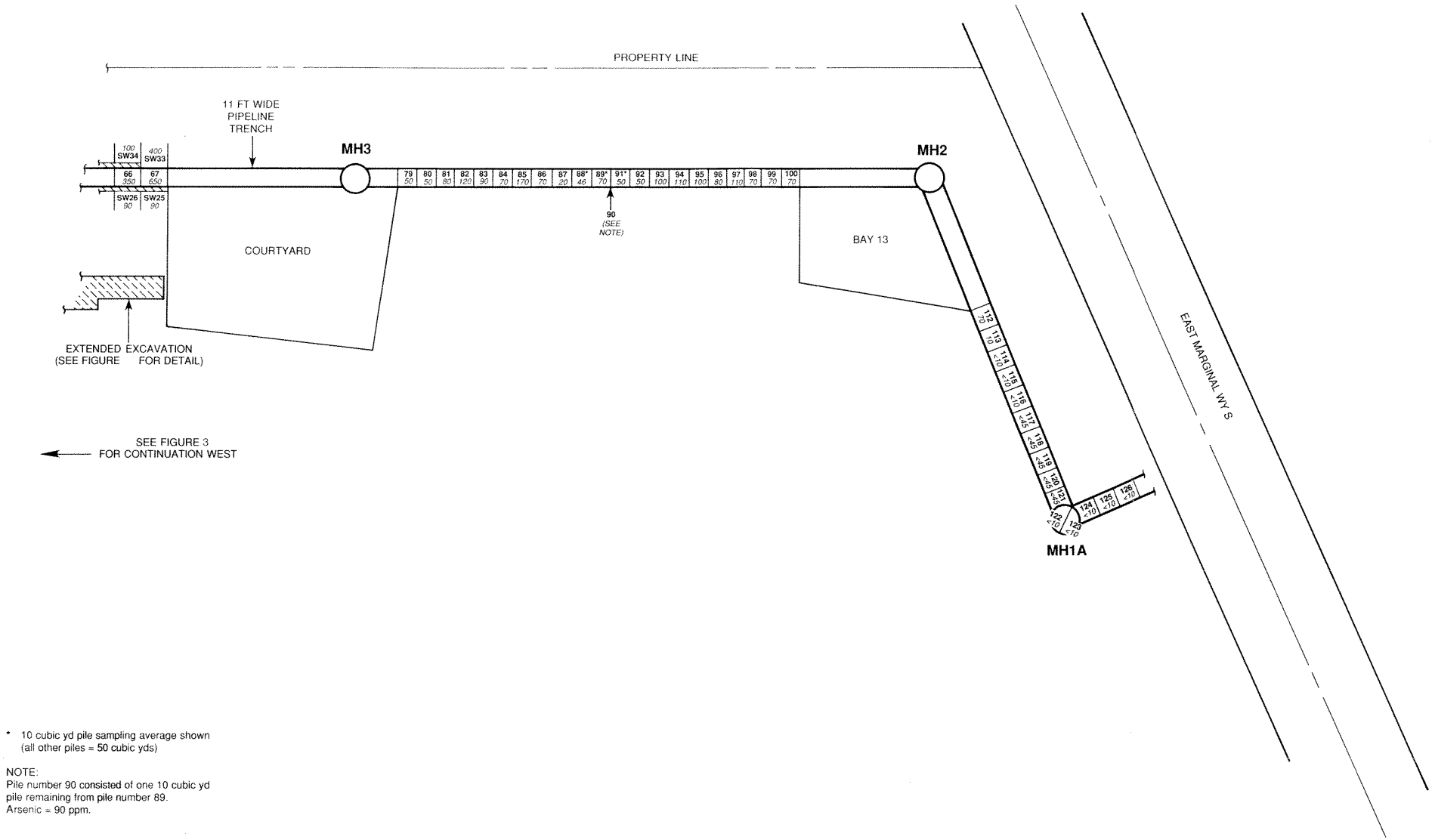




Legend

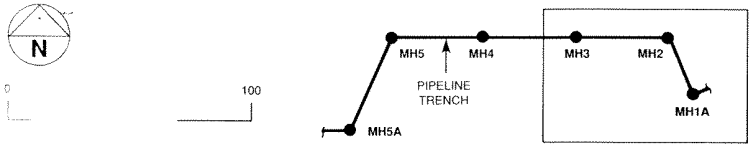
126	Trench Sample Number and Location	*2250*	Arsenic Value (ppm) Screen Test Values
SW60	Sidewall Sample Number and Location		Excavated area

Figure 3.
Sample Pile Arsenic Values (ppm) – West Project Area



* 10 cubic yd pile sampling average shown (all other piles = 50 cubic yds)

NOTE:
Pile number 90 consisted of one 10 cubic yd pile remaining from pile number 89.
Arsenic = 90 ppm.



Legend

26	Trench Sample Number and Location	*2250*	Arsenic Value (ppm) Screen Test Values
SW33	Sidewall Sample Number and Location		Excavated area

Figure 4.
Sample Pile Arsenic Values (ppm) – East Project Area

TABLE 2

PIPELINE
SIDEWALL SAMPLES
ARSENIC VALUES

SIDEWALL SAMPLE NUMBER	ASSOCIATED PILE # WALL SIDE	PRIMARY SERIES ARSENIC PPM AS IS	-A SERIES 5 FT ADD'N ARSENIC PPM AS IS	PRIMARY SERIES LAUCK'S As PPM DRY
SW1	23W	20		
SW2	24W	1,750	20	
SW3	25W	2,500	30	3,300
SW4	26W	2,750	140	4,000
SW5	27W	80		
SW6	28W	100		
SW7	23E	40		
SW7 DUP	23E	40		180
SW8	24E	80		
SW9	25E	30		
SW10	26E	2,750	250	3,000
SW11	27E	20		
SW12	28E	1,200	20	
SW13	31N	10		
SW14	32N	40		
SW15	33N	20		
SW16	31S	20		
SW17	32S	400		270
SW18	33S	70		
SW19	30N	10		
SW20	30N	10		
SW21	29W	10		
SW22	29W	10		
SW23	30N	< 10		
SW24	30N	< 10		

UNLESS OTHERWISE SPECIFIED, THE ARSENIC VALUES ARE THE FIELD TEST VALUES.

"PRIMARY SERIES" ARE THE ARSENIC VALUES FOR THE ORIGINAL SIDEWALL.

"-A SERIES" COLUMN ARE THE ARSENIC VALUES AFTER FIVE FEET OF SOIL HAD BEEN EXCAVATED.

SAMPLES 1 TO 24 ARE FOR PILES 23 TO 33. BEGINNING 66 FEET SOUTH OF MANHOLE 5 PROCEEDING NORTH AND FOLLOWING THE TRENCH AROUND THE MANHOLE. SIDEWALL LENGTHS ARE TEN FEET EACH.

SAMPLES SW19 TO SW24 WERE TAKEN FROM THE WALL AROUND MANHOLE 5.

TABLE 2

PIPELINE
SIDEWALL SAMPLES
ARSENIC VALUES

SIDEWALL SAMPLE NUMBER	ASSOCIATED PILE # WALL SIDE	PRIMARY SERIES ARSENIC PPM AS IS	-A SERIES 3 FT ADD'N ARSENIC PPM AS IS	PRIMARY SERIES LAUCK'S AS PPM DRY
SW25	67 S	250	90	
SW26	66 S	1,000	90	
SW27	65 S	600	20	
SW28	64 S	500	140	
SW29	63 S	2,000	2,000	
SW30	62 S	2,000	1,500	
SW31	61 S	2,500	1,500	
SW32	60 S	1,750	7,500	
SW33	67 N	400	-	
SW34	66 N	550	100	
SW35	65 N	450	150	
SW36	64 N	300	225	
SW37	63 N	700	150	
SW38	62 N	1,350	1,500	
SW39	61 N	950	1,580	
SW40	60 N	750	1,750	
SW40 DUP	60 N	750	-	1,200
SW41	58 S	1,250	1,500	
SW42	57 S	1,250	3,000	
SW43	56 S	600	<10	
SW44	58 N	250	170	
SW45	57 N	300	200	
SW46	56 N	400	680	
SW47	43 S	-	-	
SW48	42 S	-	-	
SW49	41 S	-	-	
SW50	40 S	1,300	40	
SW54	40 N	20		
SW51	43 N	-	-	
SW52	42 N	-	-	
SW53	41 N	-	-	
SW55	50 S	30	-	
SW56	48 S	30	-	< 60
SW57	47 S	10	-	
SW58	50 N	20	-	
SW59	48 N	10	-	
SW60	47 N	80	-	

SIDEWALL SAMPLE NUMBER 25 BEGINS 106 FEET WEST OF MANHOLE 3. SIDEWALL SAMPLE MEASUREMENT LOCATIONS FOR SAMPLE NUMBERS 25 THROUGH 60 ARE BASED ON THIS INITIAL POINT. SIDEWALL LENGTHS ARE 12 FEET.

SAMPLES SW47 TO SW49 AND SW51 TO SW53, WERE NOT ANALYSED AS THE ASSOCIATED PILE HAD ASENIC VALUES BELOW THE THRESHOLD VALUE.

TABLE 3

EXTENDED EXCAVATION
SIDEWALL ARSENIC VALUES

SIDEWALL SAMPLE NUMBER	ASSOCIATED PILE # WALL SIDE	PRIMARY SERIES ARSENIC PPM AS IS	3 FT ADD'N -A SERIES ARSENIC PPM AS IS	5 FT ADD'N -B SERIES ARSENIC PPM AS IS	10 FT ADD'N -C SERIES ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.
SW25	67 S	250	90	--	--	
SW26	66 S	1,000	90	--	--	
SW27	65 S	600	20	--	--	
SW28	64 S	500	140	--	--	
SW29	63 S	2,000	2,000	2,750	3,500	
SW30	62 S	2,000	1,500	2,500	3,000	
SW31	61 S	2,500	1,500	2,500	4,250	
SW32	60 S	1,750	7,500	1,750	750	
SW32-C DUP		--	--	--	750	
SW41	58 S	1,250	2,750	1,500	1,250	
SW42	57 S	1,250	750	3,000	600	
SW43	56 S	600	950	<10	--	
SW33	67 N	400	--	--	--	
SW34	66 N	550	100	--	--	
SW35	65 N	450	150	--	--	
SW34-A DUP	65 N	--	135	--	--	380
SW36	64 N	300	225	--	--	
SW37	63 N	700	150	--	--	
SW38	62 N	1,350	1,500	2,500	3,500	
SW39	61 N	950	1,580	1,750	2,250	
SW40	60 N	750	1,750	4,250	1,500	
SW40 DUP		750	--	--	--	1,200
SW44	58 N	250	170	--	--	
SW45	57 N	300	200	--	--	
SW46	56 N	400	680	20	--	

UNLESS OTHERWISE SPECIFIED, THE ARSENIC VALUES ARE THE FIELD TEST VALUES.

TABLE 3

EXTENDED EXCAVATION
SIDEWALL ARSENIC VALUES

SIDEWALL SAMPLE NUMBER	-D SERIES 6 Ft Add'n ARSENIC PPM AS IS	-E SERIES 6 Ft Add'n ARSENIC PPM AS IS	-F SERIES 6Ft Add'n ARSENIC PPM AS IS	-G SERIES 6Ft Add'n ARSENIC PPM AS IS	-H SERIES 6Ft ADD'N ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.
SW29	1,750	3,500	3,500	1,000	550	
SW30	2,500	1,750	3,500	8,750	1,750	
SW30-H DUP	--	--	--	--	1,500	1,200
SW31	4,750	3,250	10,000	6,250	1,500	
SW32	4,500	3,750	7,500	10,000	2,000	
SW41	2,750	3,500	6,250	1,000	3,500	
SW42	2,000	4,500	6,250	12,500	6,250	
SW42-F DUP	--	--	7,500	--	--	8,300
SW43 *	--	--	3,500	5,000	6,250	

SIDEWALL SAMPLE NUMBER	-I SERIES 6 FT ADD'N. ARSENIC PPM AS IS	-I SERIES LAUCK'S As PPM DRY WGT.
SW28	70	220
SW29	300	320
SW30	200	270
SW31	250	290
SW32	400	550
SW41	300	450
SW41-I DUP	300	500
SW42	200	490
SW43	200	330
SW61	1,500	-
SW62	800	-

61-I AND 62-I ARE THE SOUTH WALL SAMPLES AFTER THIS AREA WAS EXPOSED BY FURTHER REMOVAL OF THE WEST WALL ON 2/19/90. 61-I IS ADJACENT TO 43-I AND PROCEEDS WEST.

* ONE-HALF WALL LENGTH.

TABLE 3

EXTENDED EXCAVATION
NORTH AND SOUTH WALLS
FINGER PIT
SIDEWALL ARSENIC VALUES

SIDEWALL SAMPLE No.	-H SERIES ARSENIC PPM AS IS	-H SERIES LAUCK'S As PPM DRY	-EE SERIES ARSENIC PPM AS IS	-EE SERIES LAUCK'S As PPM DRY
SW25	350	730	110	400
SW26	190	770	450	1,600
SW27	400	800	130	620
SW28	3,250	--	120	870

"-H SERIES" IS THE SOUTH WALL OF THE TRENCH, EXTENDING EAST OF THE MAIN EXCAVATION. #28 IS ADJACENT TO THE MAIN EXCAVATION, WITH #25 BEING THE FARTHEST EAST.
THIS TRENCH CORRESPONDS TO THE E-400 SERIES.

"-EE SERIES" IS THE NORTH WALL OF THE ABOVE DESCRIBED TRENCH FINGER.

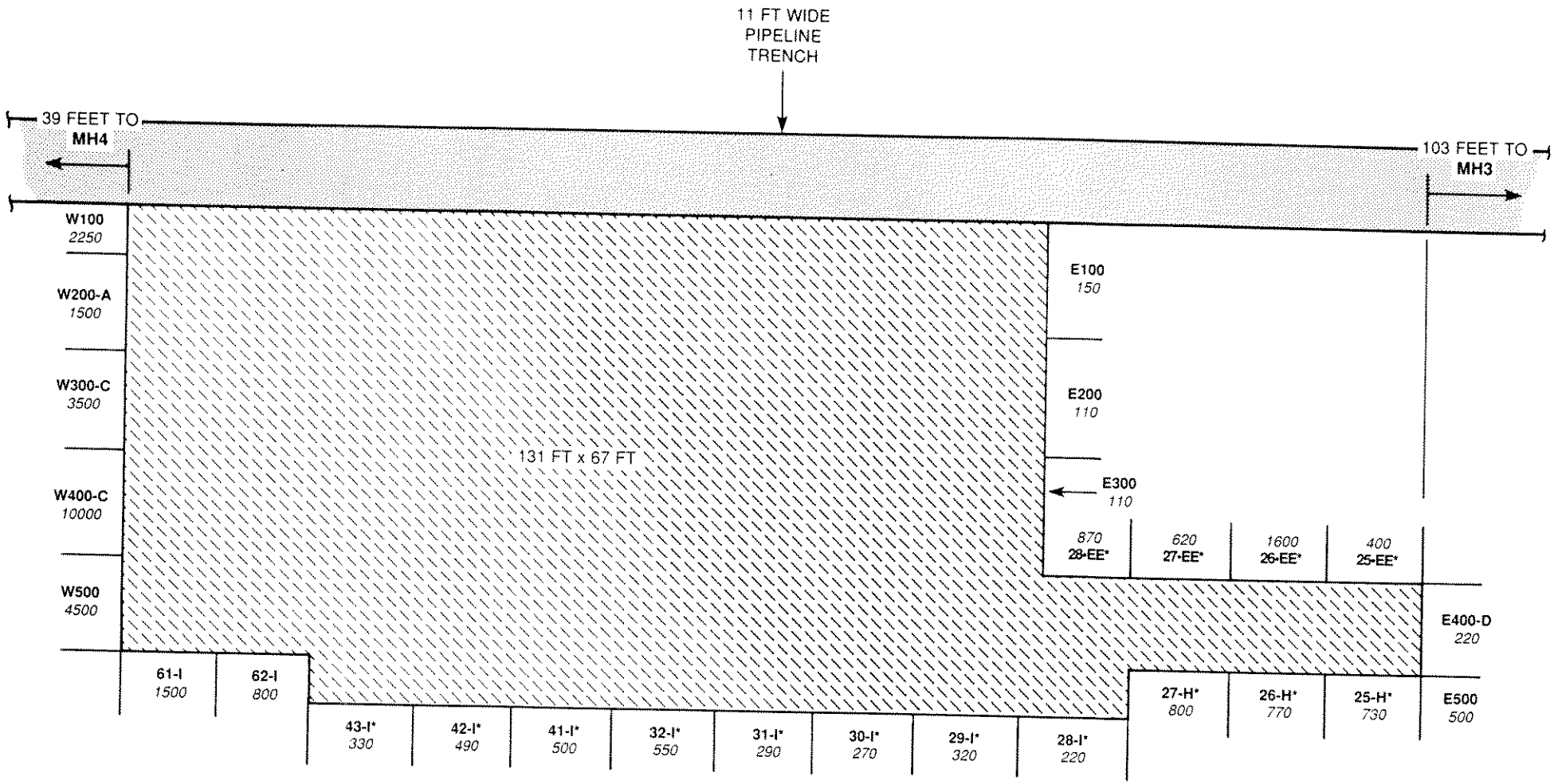
PLEASE REFER TO FIGURE 6 FOR CLARIFICATION OF LOCATIONS.

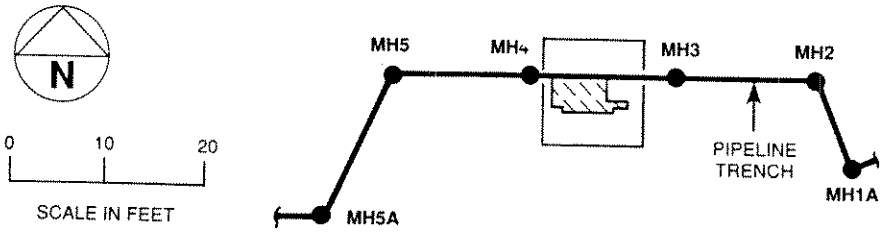
TABLE 3

EXTENDED EXCAVATION
EAST AND WEST WALLS
SIDEWALL ARSENIC VALUES

SIDEWALL SAMPLE No.	INITIAL & PARTIAL DUG ARSENIC PPM AS IS	-D SERIES 5 Ft ADD'N ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.
SW E-100	150		
SW E-200	110		
SW E-300	110		
SW E-400C	3,000	220	
SW E-500	500		
SW W-100	1,050	2,250	
SW W-200A	1,500	1,500	
SW W-300C	5,250	3,500	
SW W-400C	5,000	10,000	
SW W-400C DUP	5,000	--	8,900
SW W-500	11,250	4,500	

THE EAST AND WEST WALLS ARE DESIGNATED BY AN "E" OR "W" SUFFIX RESPECTIVELY.





Legend

W100	Sample Number	*	Lauck's Arsenic Value (ppm)
2250	Arsenic Value (ppm) Screen Test Values		Excavated area

Figure 6. Excavation Detail

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH

TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
1A-A	300		GREY/BLACK CLAY WOOD BARK BENEATH
1A-B	3,250		HARD SAND, GREY MOTTLED CLAY BENEATH
1B-A	8,750		SIMILAR TO 1A
1B-B	13,750	16,000	SIMILAR TO 1A
1C-A	1,750		SIMILAR TO 1A
1C-B	250		SIMILAR TO 1A
1D-A	140		COARSE BROWN SAND
1D-B	400	680	GREY MOTTLED CLAY
2A-A	750		SIMILAR TO 1A
2A-B	3,250		SIMILAR TO 1A
2B-A	1,000		SIMILAR TO 1A
2B-B	11,250	16,000	SIMILAR TO 1A
2C-A	130		SIMILAR TO 1A
2C-B	20		SIMILAR TO 1A
3A-A	80		SIMILAR TO 1A
3A-B	3,250		SIMILAR TO 1A
3B-A	1,750		SIMILAR TO 1A
3B-B	10,000		SIMILAR TO 1A
3C-A	60		SIMILAR TO 1A, BLACK CLAY THINNER
3C-B	<10	110	GREY MOTTLED CLAY, NO HARD SAND
3I-AA	30		FINE BROWN SAND
3I-A	20		SAND AND DIRT
3I-B	10	60	DIRT AND GRAVEL, NO CLAY
4A-A	400		SIMILAR TO 1A
4A-B	3,750		SIMILAR TO 1A
4B-A	3,500		SIMILAR TO 1A
4B-B	15,000		SIMILAR TO 1A
4B-B DUP	15,000		SIMILAR TO 1A
4C-A	<10		SIMILAR TO 3C
4C-B	<10		SIMILAR TO 3C
5A-A	110		SIMILAR TO 1A
5A-B	5,250		SIMILAR TO 1A
5B-A	7,500		SIMILAR TO 1A
5B-B	12,500		SIMILAR TO 1A
5C-A	350		SIMILAR TO 3C
5C-B	450		SIMILAR TO 3C
6A-A	3,000		SIMILAR TO 1A
6A-B	450		SIMILAR TO 1A
6B-A	200	390	SIMILAR TO 1A
6B-B	12,500		SIMILAR TO 1A

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH

TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
6C-A	2,500	3,500	SIMILAR TO 1A
6C-B	120		SIMILAR TO 1A
6E-AA	50		COARSE BROWN SAND
6E-A	450		BROWN SAND
6E-B	3,500		SAND AND MOTTLED CLAY BENEATH
6F-AA	60		SAND
6F-A	90		THIN BLACK CALY BAND, SAND BENEATH
6F-B	10	98	SAND, MOTTLED CLAY BENEATH
6I-AA	300		SAND AND GRAVEL
6I-A	10		SAND, THIN LAYER BLACK CLAY BENEATH
6I-B	20	<60	SAND, MOTTLED CLAY BENEATH
6J-AA	<20		SAND
6J-A	120		SAND, GRAVEL
6J-B	4,000		SAND, GRAVEL, IRON CABLE
6K-AA	<10		SAND
6K-A	<10		SAND, DIRT
6K-B	<10	<60	DIRT, GRAVEL
7A-A	NOT SAMPLED		
7B-A	450		GREY/BLACK CLAY, WOOD BARK BENEATH
7B-B	10,000		HARD SAND, GREY MOTTLED CLAY BENEATH
7C-A	2,500		SIMILAR TO 7B
7C-B	1,000		SIMILAR TO 7B
8A-AA	10		COARSE BROWN SAND
8A-A	400		GREY/BLACK CLAY, WOOD BARK BENEATH
8A-B	5,000		HARD LIGHT BROWN SAND
8B-A	450		SIMILAR TO 7B
8B-B	13,750		SIMILAR TO 7B
8C-	NOT SAMPLED		
8D-AA	50	180	BROWN SAND AND CLAY
8D-A	850		BROWN SAND AND CLAY
8D-B	200		BROWN SAND AND CLAY
8E-AA	40		SAND
8E-A	4,250		GREY/BALCK CLAY NO BARK
8E-B	2,500	4,000	GREY MOTTLED LIGHT BROWN CLAY
8F-AA	20		COARSE BROWN SAND
8F-A	550		SAND, GREY/BALCK CLAY
8F-B	6,000		GREY MOTTLED LIGHT BROWN CLAY
8G-AA	150		GRAVEL, SAND
8G-A	750		SAND, LIGHT GREY CLAY
8G-B	1,100		SAND, GREY MOTTLED BROWN CLAY

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH

TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
8H-AA	250		SAND, GRAVEL
8H-A	30		SAND, GREY CLAY, GREY/BLACK CLAY
8H-B	2,500		BLACK CLAY, GREY MOTTLED CLAY
8I-AA	500		SAND, GRAVEL
8I-A	650		SAND
8I-B	2,000	3,300	SAND, GREY MOTTLED CALY
8J-AA	<20		COARSE AND FINE BROWN SAND
8J-A	<20		SAND, GRAVEL, SLAG
8J-B	20		SAND, BROKEN BRICK, SLAG
9B-A	210	330	GREY/BALCK GLAY
9B-B	13,000		HARD SAND, GREY MOTTLED CLAY
10B-A	50		SIMILAR TO 9B
10B-B	13,750		SIMILAR TO 9B
10I-AA	30		COARSE BROWN SAND
10I-A	--		UNABLE TO SAMPLE
10I-B	--		SOLELY SLAG & BRICK.
10J-AA	<20		COARSE AND FINE GRAVEL
10J-A	<20		SLAG AND BRICK PIECES
10J-B	<20		SLAG AND BRICK PIECES
11A-AA	30		SAND
11A-A	30		GREY/BALCK CLAY
11A-B	4,500		GREY MOTTLED LIGHT BROWN CALY
11B-A	90		GREY/BALCK GLAY
11B-B	12,500		HARD SAND, GREY MOTTLED CLAY
11D-AA	30	150	SAND
11D-A	20		GREY/BALCK CLAY
11D-A DUP	10	150	
11D-B	20	<60	GREY FINE LOOSE SAND
12B-A	300	550	GREY/BALCK CLAY
12B-B	12,500	23,000	HARD TAN SAND
13B-A	300	890	SIMILAR TO 12B
13B-B	20,000	24,000	SIMILAR TO 12B
14A-AA	15		SAND
14A-A	10		GREY/BLACK CLAY
14A-B	5,000		GREY MOTTLED LIGHT BROWN CLAY
14B-A	1,500		SIMILAR TO 12B
14B-B	15,000		SIMILAR TO 12B

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH
XN- SERIES WERE SAMPLED NORTH OF THE PIPELINE.

TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
14D-AA	<10		DARK CALY
14D-A	20		SAND, DARK CLAY
14D-B	170	360	SIMILAR TO 12B
15B-A	3,500		SIMILAR TO 12B
15B-B	15,000		SIMILAR TO 12B
16A-AA	50		SIMILAR TO 12B
16A-A	20		SIMILAR TO 12B
16A-B	3,250		SIMILAR TO 12B
16B-A	350		SIMILAR TO 12B
16B-B	650		SIMILAR TO 12B
17B-A	16,250		GREY/BLACK CLAY, BARK BENEATH
17B-B	16,250		GREY MOTTLED CLAY, SAND
17C-AA	70		COARSE BROWN SAND
17C-A	20		GREY CALY
17C-B	<10	99	SAND
17D-AA	<10		BROWN SAND
17D-A	20		SAND
17D-B	40	180	DARK GREY CLAY
18A-AA	<10		SAND
18A-AA DUP	<10	130	
18A-A	20		GREY/BLACK CLAY
18A-B	4,200	5,000	GREY MOTTLED CALY
18B-AA	10		SIMILAR TO 18A
18B-A	80	290	SIMILAR TO 18A
18B-B	2,250		SIMILAR TO 18A
18C-AA	<10		SIMILAR TO 18A
18C-A	10		SIMILAR TO 18A
18C-B	1,750		SIMILAR TO 18A
18D-AA	<10		SIMILAR TO 18A
18D-A	10		SIMILAR TO 18A
18D-B	3,250		SIMILAR TO 18A
18E-AA	10		SAND
18E-A	20		GREY MOTTLED CLAY
18E-B	100	200	GREY SANDY SOIL
18N-AA	<10		SAND
18N-A	30		SAND, BLACK CLAY
18N-B	350	310	BALCK CLAY, GREY MOTTLED CLAY

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH
XN- SERIES WERE SAMPLED NORTH OF THE PIPELINE.

TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
19B-AA	10		SIMILAR TO 18A
19B-A	30		SIMILAR TO 18A
19B-B	2,000		SIMILAR TO 18A
20B-AA	10		SAND, BROWN CLAY
20B-A DUP	10	110	
20B-A	20		GREY/BLACK CLAY
20B-B	2,000		HARD SAND, GREY MOTTLED CLAY
20C-AA	<10		SAND
20C-A	20		GREY/BALCK CLAY
20C-B	350	840	GREY MOTTLED CLAY, SAND
20D-AA	<10		BROWN SAND
20D-A	10		GREY SAND
20D-B	170	290	GREY MOTTLED CLAY
21B-AA	10		COARSE BROWN SAND
21B-A	30	140	SIMILAR TO 20B
21B-B	5,250		SIMILAR TO 20B
22A-AA	20		SAND
22A-AA DUP	10	160	
22A-A	<10		GREY/BLACK CLAY
22A-B	980	1,100	GREY/BLACK CLAY, GREY MOTTLED CLAY
22B-AA	10		SIMILAR TO 21B
22B-A	10		SIMILAR TO 21B
22B-B	4,000		SIMILAR TO 21B
22C-AA	<10		SAND
22C-A	<10		SOLID AND BROKEN SLAG
22C-B	500		GREY MOTTLED CLAY
22C-B DUP	450	1,000	
22D-AA	<10		SAND
22D-A	10		SAND, CLAY
22D-B	70	290	GREY/BALCK CLAY,DARK GREY SAND
22N-AA	<10		COARSE SAND
22N-A	40		SAND, GREY/BLACK CLAY
22N-B	10	150	GREY/BLACK CLAY, GREY MOTTLED CLAY
23B-AA	10		SIMILAR TO 21B
23B-A	10	180	SIMILAR TO 21B
23B-B	2,750		SIMILAR TO 21B
24B-AA	10		SIMILAR TO 21B
24B-A	50		SIMILAR TO 21B
24B-B	2,250		SIMILAR TO 21B

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH
XN- SERIES WERE SAMPLED NORTH OF THE PIPELINE.

TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
25A-AA	<10		BROWN SAND
25A-A	<10		GREY/BLACK CALY
25A-B	160	460	DARK GREY MOTTLED CALY
25B-AA	<10		SIMILAR TO 21B
25B-A	10		SIMILAR TO 21B
25B-B	950		SIMILAR TO 21B
25C-AA	<10		SIMILAR TO 21B
25C-A	<10		SIMILAR TO 21B
25C-B	1,500		SIMILAR TO 21B
25D-AA	<10		SIMILAR TO 25A
25D-A	<10		SIMILAR TO 25A
25D-B	130	410	SIMILAR TO 25A
25N-AA	50		SIMILAR TO 22N
25N-A	<10		SIMILAR TO 22N
25N-B	30	120	SIMILAR TO 22N
26B-AA	<10		COARSE BROWN SAND
26B-A	<10		GREY/BALCK CLAY
26B-B	2,500		SAND & SLAG
27B-AA	<10		BROWN & ORANGE SAND
27B-A	650	90	GREY/BLACK CLAY
27B-B	2,000		GREY MOTTLED BROWN CLAY
28A-AA	10		BROWN SAND
28A-A	40		SAND, GREY/BLACK CLAY
28A-B	100	280	GREY/BLACK CLAY, GREY MOTTLED CLAY
28B-AA	<10		BROWN COARSE SAND
28B-A	<10		BROWN SAND
28B-B	100		GREY/BLACK CLAY, GREY MOTTLED CLAY
28D-AA	20		SAND, SLAG LAYER
28D-A	10		BROWN SAND
28D-B	40	200	GREY MOTTLED BROWN CLAY

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH
XN- SERIES WERE SAMPLED NORTH OF THE PIPELINE.

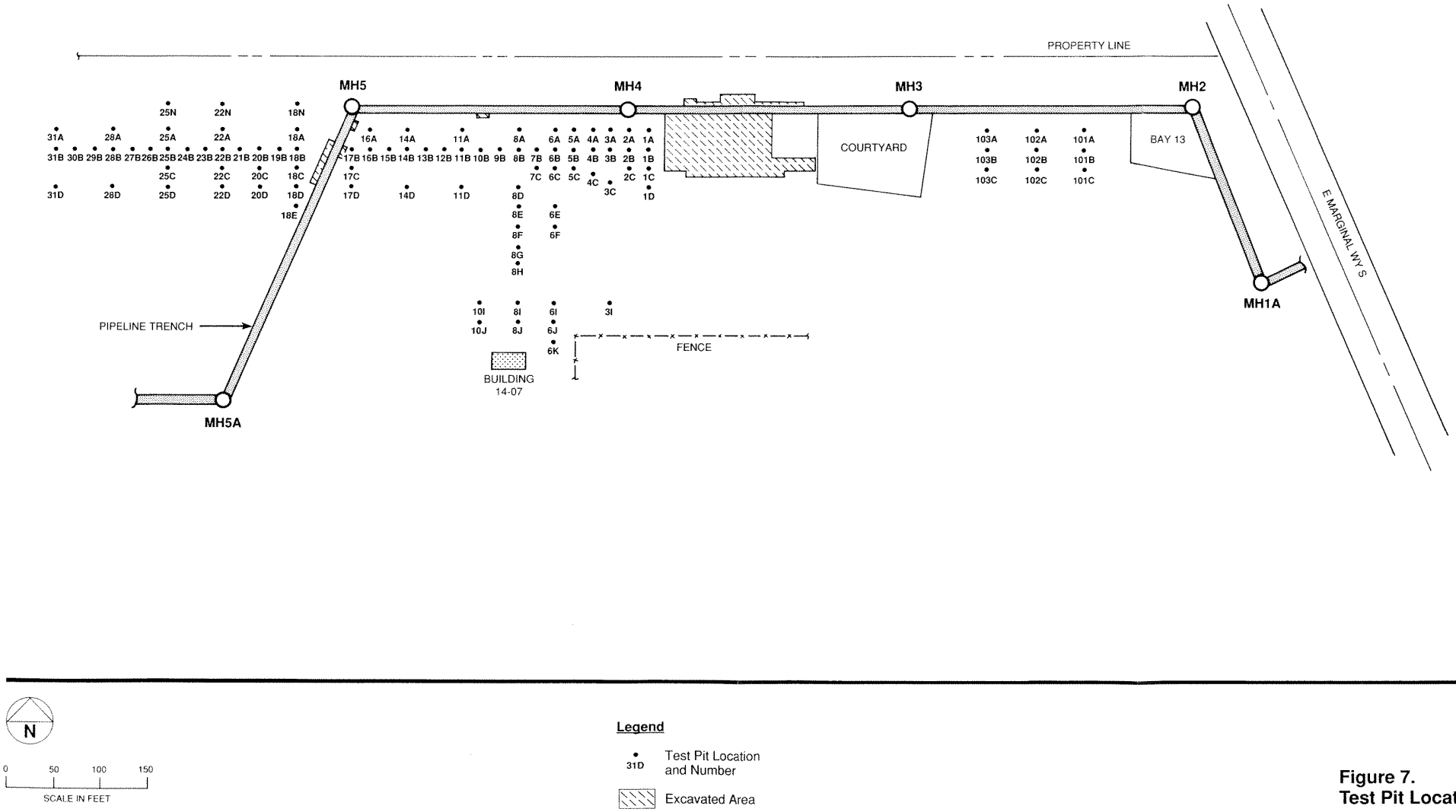
TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
29B-AA	<10		COARSE BROWN SAND & SALG
29B-A	<10		SIMILAR TO 28B
29B-B	3,500		SIMILAR TO 28B
30B-AA	<10		BROWN SAND & SLAG LAYER
30B-A	<10	270	BROWN SAND
30B-B	280	400	GREY MOTTLED CLAY
31A-AA	10		BROWN SAND, SLAG LAYER
31A-A	10		GREY/BLACK CLAY
31A-B	10	140	GREY/BLACK CLAY, GREY MOTTLED CLAY
31B-AA	<10		COARSE BROWN SAND
31B-A	<10	270	COARSE BROWN SAND
31B-A DUP	<10		
31B-B	10	330	COARSE BROWN SAND, GREY MOTTLED CLAY
31D-AA	10		BROWN SAND, SLAY LAYER
31D-A	20		BROWN COARSE SAND
31D-B	170		GREY MOTTLED BROWN CLAY

TABLE 4

TEST PITS
ARSENIC VALUES

-AA SERIES ARE COMPOSITES OF 1 TO 3 FOOT DEPTH
-A SERIES ARE COMPOSITES OF 3 TO 5 FOOT DEPTH
-B SERIES ARE COMPOSITES OF 5 TO 9 FOOT DEPTH

TEST PIT NUMBER	FIELD ARSENIC PPM AS IS	LAUCK'S As PPM DRY WGT.	SOIL PROFILE DESCRIPTION
101A-AA	45		COARSE BROWN SAND
101A-A	2,200		BROWN & YELLOW SAND
101A-B	1,900	1,600	BROWN CLAY, SAND, LOAM
101B-AA	250		COARSE BROWN SAND, WHITE SAND
101B-A	15		BROWN LOAM, BROWN SAND
101B-B	3,200	3,100	BROWN CLAY
101C SERIES NOT SAMPLED. CONCRETE SLAB 2 FEET DOWN			
102A-AA	35		COARSE BROWN SAND
102A-A	8		YELLOW AND RUST COLORED SAND
102A-B	1,400		BROWN CLAY, BROWN SAND
102B-AA	40		COARSE BROWN SAND
102B-A	<10		COARSE BROWN SAND, WHITE SAND
102B-B	100	160	ROSE BROWN CLAY, SAND
102C-AA	25		COARSE BROWN SAND
102C-A	20		WHITE, YELLOW, & RUST SAND
102C-B	20	82	ROSE BROWN SAND, CONCRETRE SLAB
103A-AA	250		COARSE BROWN SAND
103A-A	30		YELLOW & RUST SAND
103A-B	2,800	2,900	BROWN CLAY, GREY MOTTLED CLAY
103B-AA	10		COARSE BROWN SAND
103B-A	15		RUST COLORED SAND
103B-B	110	220	BROWN CLAY, BROWN SAND
103C-AA	10		SIMILAR TO 103B
103C-A	10		SIMILAR TO 103B
103C-B	250	350	SIMILAR TO 103B



N

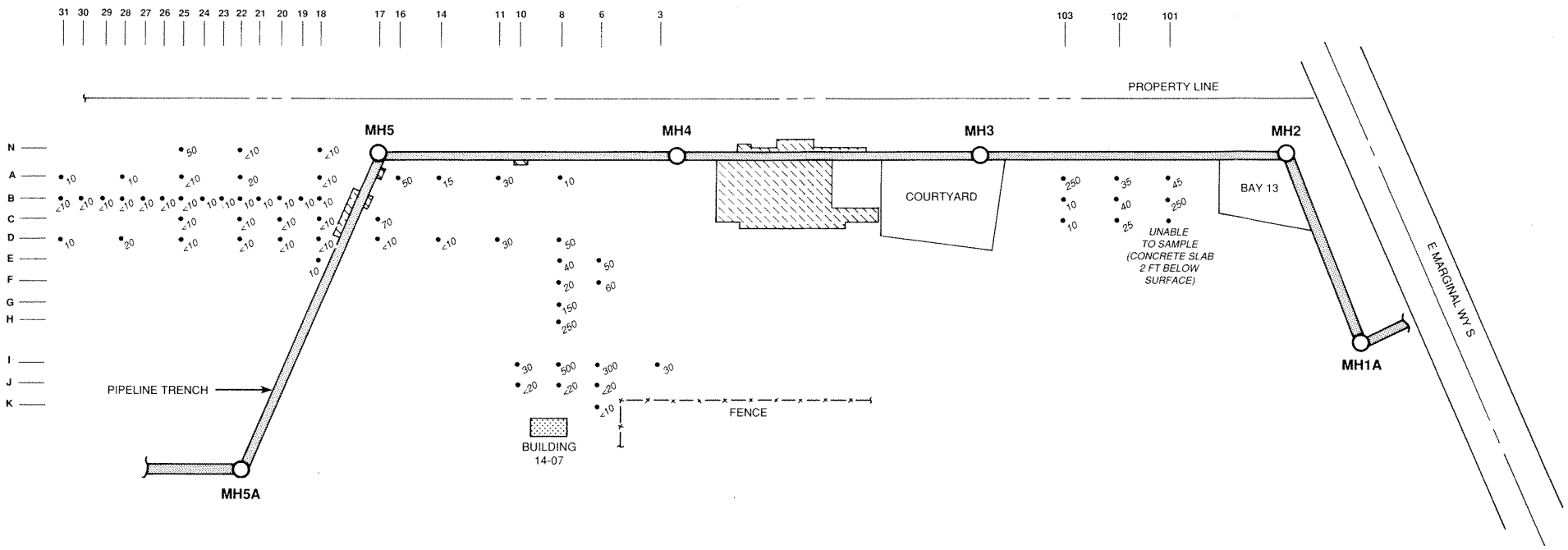
0 50 100 150
SCALE IN FEET

Legend

31D Test Pit Location and Number

Excavated Area

Figure 7.
Test Pit Locations



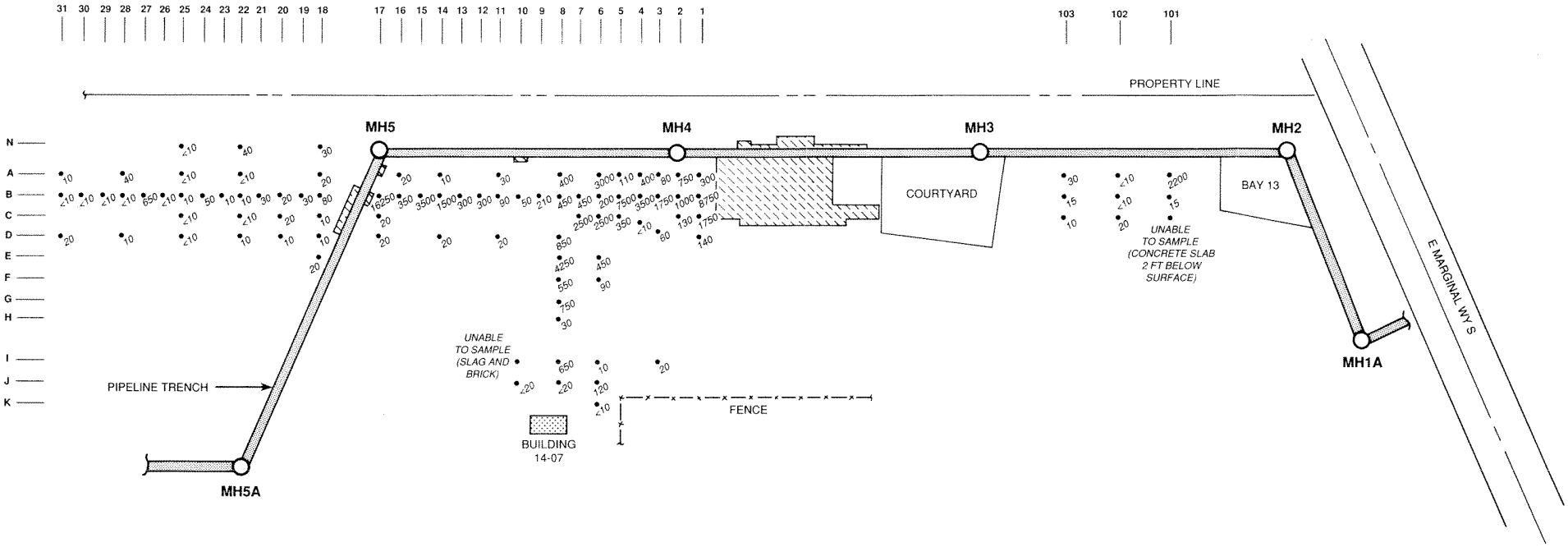
0 50 100 150
SCALE IN FEET

Legend

1900 Test Pit Location and Arsenic Value (ppm) Screen Test Values

Excavated Area

Figure 8.
AA Series Test Pits 1 to 3 Foot Depth



N

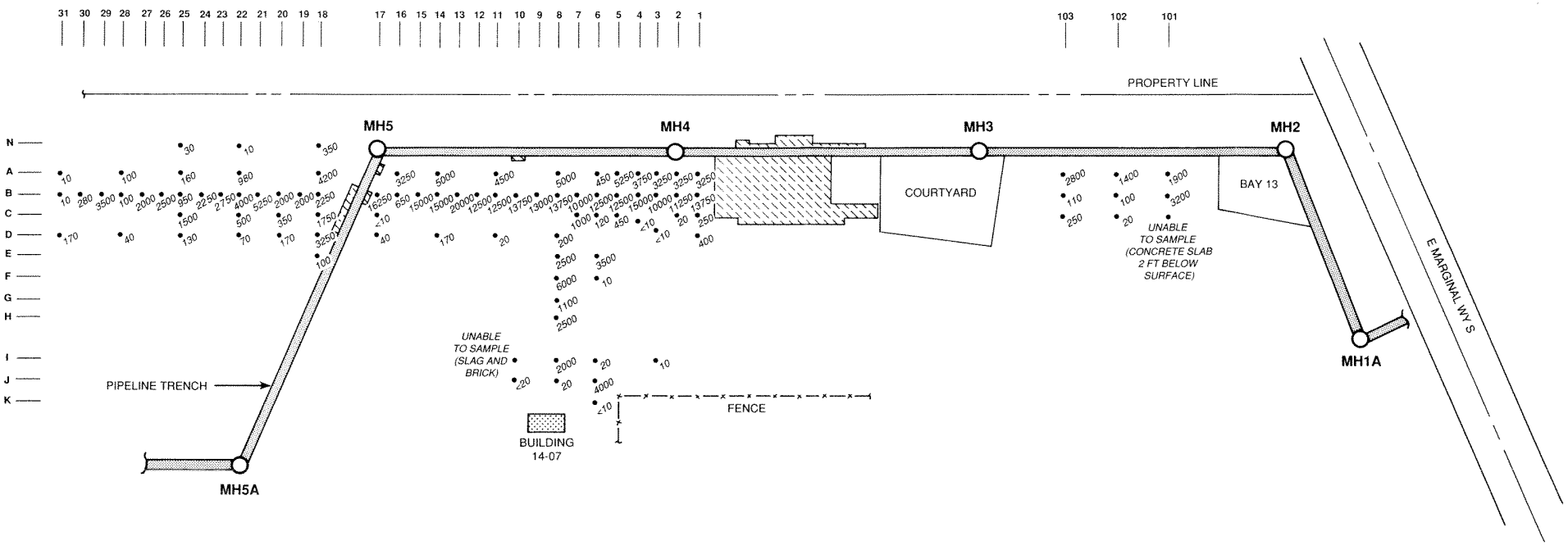
0 50 100 150
SCALE IN FEET

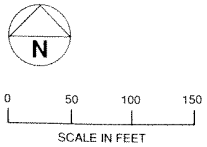
Legend

2000 Test Pit Location and Arsenic Value (ppm) Screen Test Values

Excavated Area

Figure 9.
A Series Test Pits
3 to 5 Foot Depth



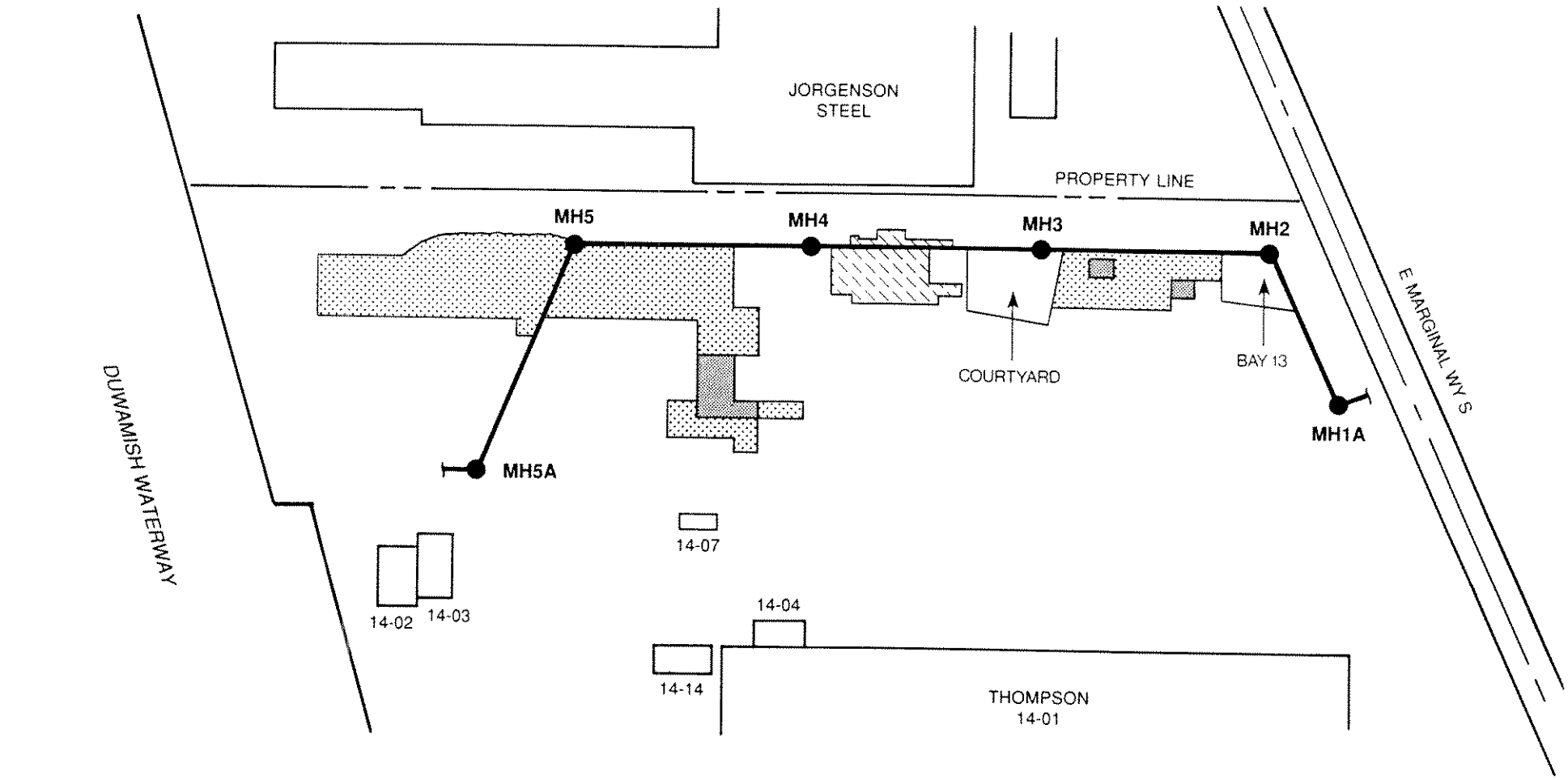


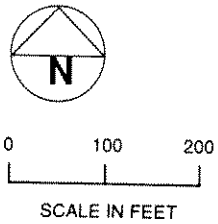
Legend

3000 Test Pit Location and Arsenic Value (ppm) Screen Test Values

Excavated Area

Figure 10.
B Series Test Pits 5 to 9 Foot Depth





Legend

<100 ppm

≥ 100 ppm

Excavated Area

Figure 11.
Arsenic Concentration Contours
1-3 Foot Depth

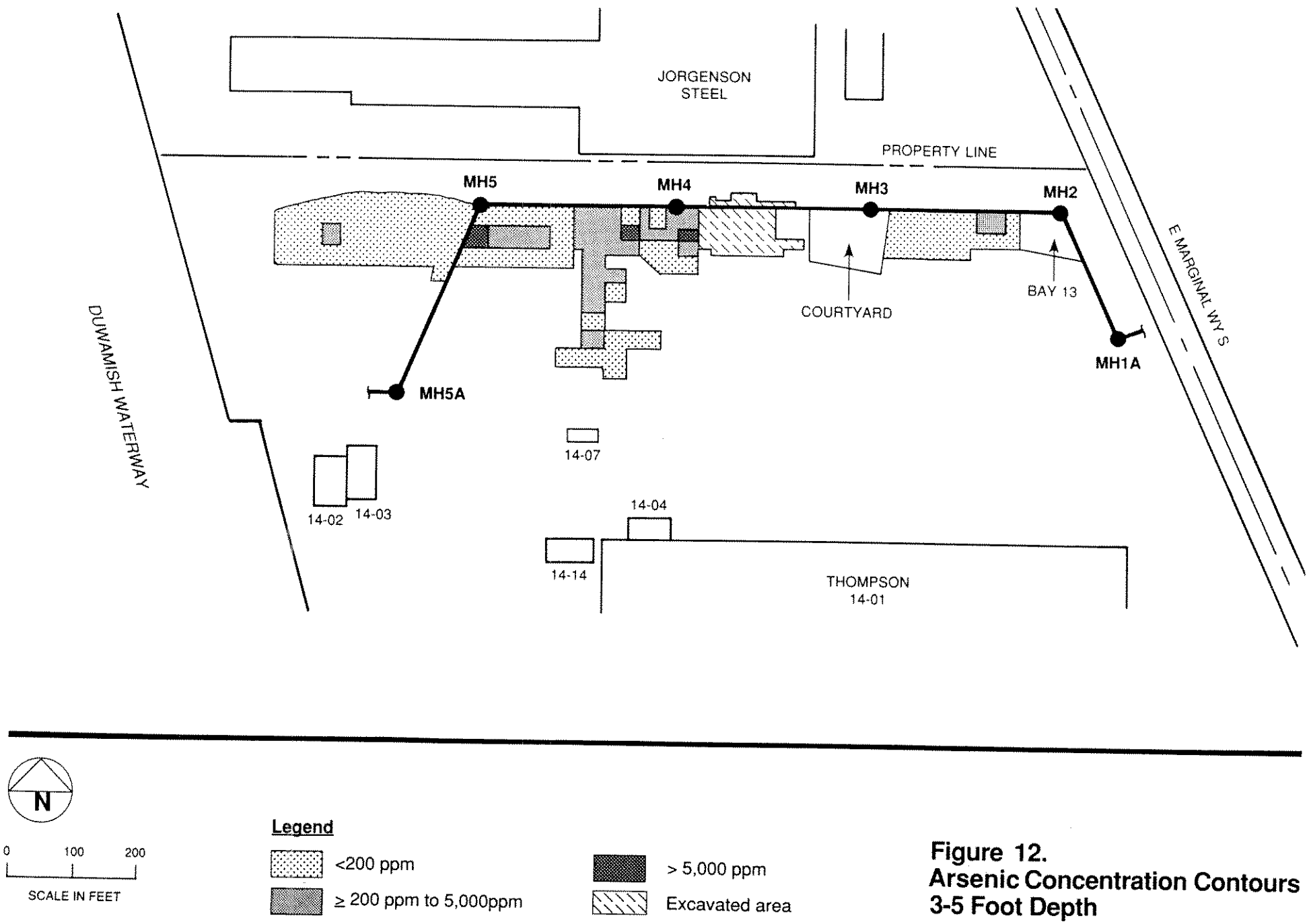


Figure 12.
Arsenic Concentration Contours
3-5 Foot Depth

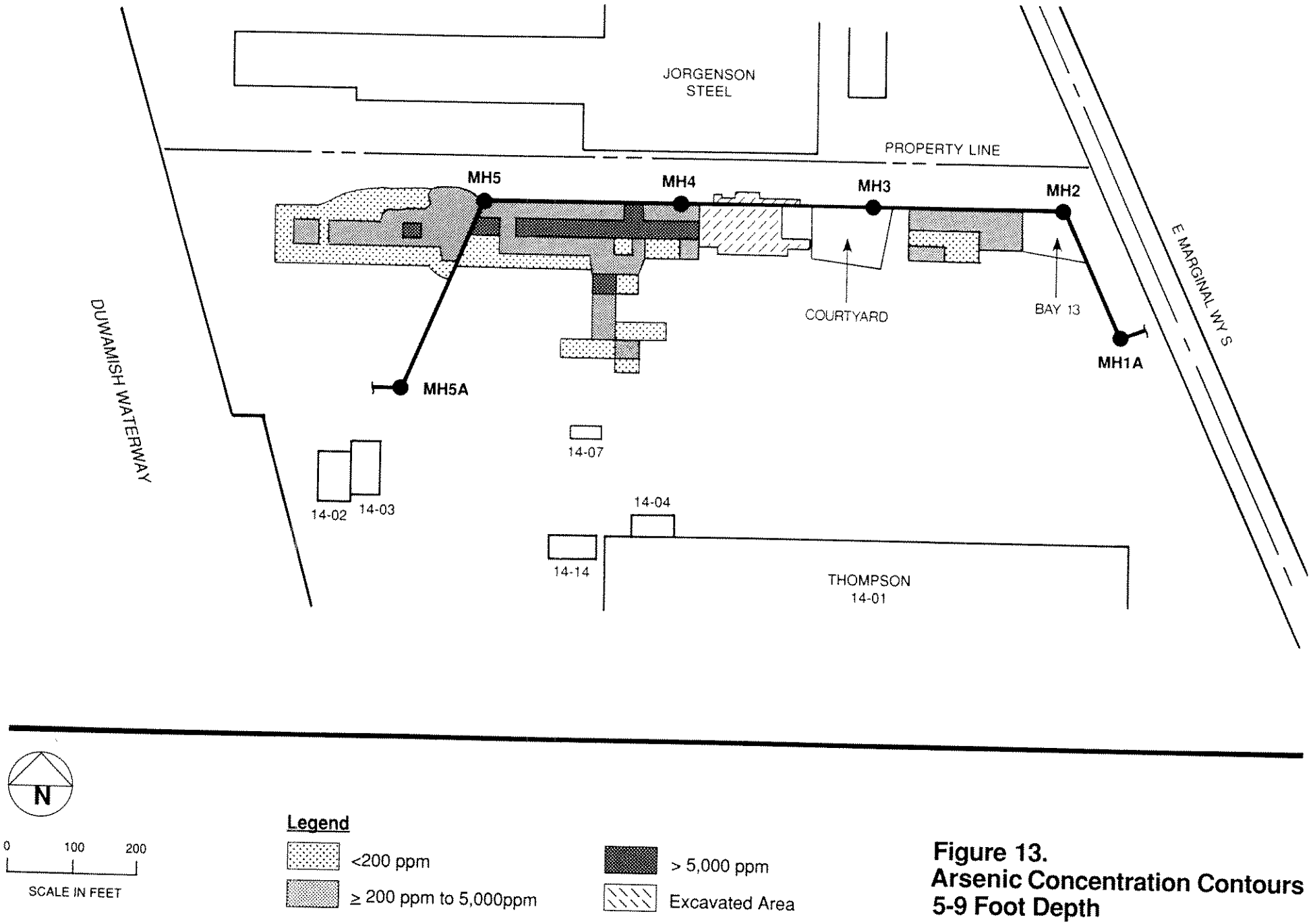


Figure 13.
Arsenic Concentration Contours
5-9 Foot Depth