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PRELIMINARY
WASTE CHARACTERIZATION TEST RESULTS
NEW BUFFALO INDUSTRIAL PARK
BUFFALO, NEW YORK

Volume 2

Prepared for:

Buffalo Urban Renewal Agency
Buffalo, New York

Prepared by:

Goldberg-Zoino Associates of New York, P.C.
Buffalo, New York

May 1987

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Goldberg-Zoino Associates of New York, P.C.

GZA

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GENERAL MANAGER

May 27, 1987
File: R5726.70

Buffalo Urban Renewal Agency
920 City Hall
Buffalo, New York 14202

Attention: Rosanne Frandina

Re: New Buffalo Industrial Park
Preliminary Waste Characterization Test Results

Gentlemen:

Pursuant to our discussion of May 26, 1987, Goldberg-Zoino Associates of New York, P.C. (GZA) has reviewed Recra Environmental, Inc.'s (Recra) report of test results for the samples collected from test pits A-II-13 and A-III-33 made within Areas II and III, respectively. These samples replaced composite Sample No. 5, as requested by the New York State Department of Environmental Conservation's (NYSDEC) request (File: R5726.70 dated May 21, 1987, copy enclosed, Appendix A).

SAMPLE IDENTIFICATION[1]

Sample No.	Study Area	Test Pit No.	Sample Description
5a	II	A-II-13	oil-laden soil
5b	III	A-III-33	oil-laden soil

[1]See Figures 1, 2 and 3 for locations.

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Test Parameters

Total Organic Halide (TOX)
Hazardous Substance List (HSL)
pH
Total/Amenable cyanide
Total sulfide
Reactivity (if sample contains ≥250 ppm total cyanide and/or ≥500 ppm total sulfide)
Weak/dissociable cyanide (if sample positive for cyanide)
EP Toxicity (metals fraction)

Results

The analytical test results for each sample are presented in Appendix B. Please note that these samples have not been tested for the following parameters pending receipt of the applicable test methods from NYSDEC: sulfate, chloride, total organic and inorganic carbon and specific gravity.

The sample test results indicate that the oil-laden soil, as represented by Samples No. 5a and 5b, does not exhibit the following characteristics of a hazardous waste: reactivity, corrosivity and EP Toxicity (40CFR261). Additionally, polychlorinated biphenyls (PCBs) were not detected.

Sample No. 5a (A-II-13) contained only two volatile organic compounds above the laboratory detection limit (i.e. acetone 56 ppm and methylene chloride 56 ppm) whereas none were detected in Sample No. 5b (A-III-33).

The samples (Nos. 5a and 5b) contain relatively low levels of polynuclear aromatic hydrocarbons [PNAs (0.45-40 ppm)], organochlorine pesticides (0.013-3.1 ppm), total recoverable phenolics (0.18 and 0.96 ppm, respectively) and total organic halides (0.45 and 0.90 ppm, respectively). Ammonia was detected in Sample Nos. 5a and 5b at concentrations of 1700 and 1500 ppm, respectively.

Summary

Preliminary test results indicate that the samples of oil-laden soil do not exhibit the characteristics of a hazardous waste. Additionally, the presence of PNAs, organochlorine pesticides, acetone, methylene chloride, total recoverable phenolics and total organic halide do not appear to be sufficient cause to designate this material as hazardous. However, a final determination by NYSDEC as to the classification of the material(s) as

hazardous or nonhazardous waste cannot occur until NYSDEC has reviewed the analytical test results.

We are hopeful this letter is suitable for your purposes. If you are in need of any additional information, please feel free to contact the undersigned.

Very truly yours,

GOLDBERG-ZOINO ASSOCIATES OF NY, PC

Rick P. Harding/aml

Rick P. Harding, Ph.D.
Project Manager

Raymond L. Kampff
Senior Geologist

Irvine G. Reinig II, P.E.
Associate-in-Charge

RPH/aml

GZA

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May 21, 1987
File: R5726.70

New York State Department of
Environmental Conservation
600 Delaware Avenue
Buffalo, New York 14202

Attention: Mr. John S. Tygert, P.E.
Associate Sanitary Engineer

Re: New Buffalo Industrial Park
Waste Characterization Samples

Gentlemen:

Per your verbal request of May 11, 1987, composite sample No. 5 from test pits A-II-33 and A-III-30 (see enclosure) has been replaced with two individual samples from test pits A-II-13 and A-III-33. The revised list of seven samples for analytical testing is presented below.

SAMPLE IDENTIFICATION

Composite Sample No.	LOCATION[1] Area	Test Pit No.	Sample Description
1	III	A-III-11	"Purple" sludge
		A-III-21	"Purple" sludge
2	III	A-III-9	"Purple" sludge
		A-III-5	"Purple" sludge
3	II	A-II-30	"Purple" sludge
		A-II-8	"Purple" sludge
4	II	A-II-45	"Purple" sludge
		A-II-53	"Purple" sludge

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Composite Sample No.	LOCATION[1] Area	Test Pit No.	Sample Description
5a (not composite)	II	A-II-13	Oil-laden soil
5b (not composite)	III	A-III-33	Oil-laden soil
6	III	Surface deposit ~200 feet north	Blue granular material

[1]See Figures 1 and 2 (enclosed)

Test Parameters

TOX
Hazardous Substance List
pH
Total/amenable cyanide
Total sulfide
Reactivity (if sample contains ≥250 ppm total cyanide and/or ≥500 ppm total sulfide)
Weak/dissociable cyanide (if sample positive for cyanide)
EP Toxicity (metals fraction)

As discussed with the New York State Department of Environmental Conservation (NYSDEC) on May 5 and 11, 1987, Goldberg-Zoino Associates of New York, P.C. (GZA) has proceeded with the testing of these samples as indicated above. Please note that NYSDEC has yet to provide GZA with the applicable test methodologies to do sulfate, chloride, total organic carbon, total inorganic carbon and specific gravity, analyses for this sample matrix (i.e. soil, not water). Upon receipt of the appropriate test methods, the above-referenced samples will be tested for the remaining parameters.

Very truly yours,

GOLDBERG-ZOINO ASSOCIATES OF NY, PC

Rick P. Harding, Ph.D.
Project Manager

Irvine G. Reinig II, P.E.
Associate and General Manager

RPH:kf
CC: R. Frandina
Enclosure

GZA OF NEW YORK, P.C.
GOLDBERG • ZOINO ASSOCIATES OF NEW YORK, P.C.
GEOTECHNICAL-GEOHYDROLOGICAL CONSULTANTS

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GENERAL MANAGER

May 6, 1987
File: R5726.70

New York State Department of
Environmental Conservation
600 Delaware Avenue
Buffalo, New York 14202-1073

Attention: Mr. John S. Tygert, P.E.
Associate Sanitary Engineer

Re: New Buffalo Industrial Park

Gentlemen:

The New York State Department of Environmental Conservation (NYSDEC) has submitted to Buffalo Urban Renewal Agency (BURA) a list of recommended test parameters to characterize the waste deposits at the New Buffalo Industrial Park (NBIP) site (Enclosure 1). The specific wastes are the two purple sludge deposits (Area II and III) as shown on the attached figures (Enclosure 2). In this same submittal, NYSDEC also requested a proposal, indicating the nature, location and number of samples to be tested, per the above-referenced parameter list. Based on discussions between Goldberg-Zoino Associates of New York, P.C. (GZA) and NYSDEC, GZA proposes that the following composite samples be tested as indicated above.

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TABLE 1.0

SAMPLE IDENTIFICATION

Composite Sample No.	Location[1] Area	Test Pit No.	Sample Description
1	III	A-III-11	Purple Sludge
		A-III-21	Purple Sludge
2	III	A-III-9	Purple Sludge
		A-III-5	Purple Sludge
3	II	A-II-30	Purple Sludge
		A-II-8	Purple Sludge
4	II	A-II-45	Purple Sludge
		A-II-53	Purple Sludge
5 a	II/III	A-II-33	Oil Laden Soil
b		A-III-30	Oil Laden Soil
6	III	surface deposit ~200 feet north	Blue Granular Material

[1]See Figures 1 and 2 (Enclosure 2).

Test Parameters

TOX
Hazardous Substances List (Enclosure 1)
pH
Total/amenable cyanide
Total Sulfide
Reactivity (if sample contains ≥250 ppm total cyanide and/or ≥500 ppm total sulfide)
Weak/dissociable cyanide (if sample positive for cyanide)
EP toxicity (metals fraction)

GZA

As discussed with NYSDEC on May 5, 1987, GZA has proceeded with the testing of these samples as indicated above.

Very truly yours,

GOLDBERG ZOINO ASSOCIATES OF NY, PC

Rick P. Harding, Ph.D.
Director of Environmental Services

Irvine G. Reinig II, P.E.
Associate and General Manager

RPH/aml
CC: R. Frandina
Enclosures

GZA

ENCLOSURE 1

New York State Department of Environmental Conservation
600 Delaware Avenue, Buffalo, New York 14202-1073

Henry G. Williams
Commissioner

April 28, 1987

Ms. Rosanne Frandina
Buffalo Urban Renewal Agency
920 City Hall
Buffalo, New York 14202

Dear Ms. Frandina:

Re: New Buffalo Industrial Park

As per request from Mr. Richard Harding of GZA, we have reviewed the following list of parameters, to characterize the wastes found in the New Buffalo Industrial Park.

- pH
- Reactivity
- EP - Toxicity (Metals Only)
- TOC
- Total and Amenable Cyanides
- Dissociable cyanides

We feel that, in order to characterize the waste properly, in addition to the above parameters, it should also be tested for:

- TOX
- Hazardous Substances List (HSL)

Please submit us a proposal indicating the nature, location and number of samples to be selected for testing.

Very truly yours,

John S. Tygert, P.E.
Associate Sanitary Engineer

cc: Mr. Peter Burke
Mr. Richard Harding
Mr. Christopher Allen

TABLE 3

ANALYTICAL PARAMETERS
HAZARDOUS SUBSTANCE LIST

	Volatiles	CAS Number
1.	Chloromethane	74-87-3
2.	Bromomethane	74-83-9
3.	Vinyl Chloride	75-01-4
4.	Chloroethane	75-00-3
5.	Methylene Chloride	75-09-2
6.	Acetone	67-64-1
7.	Carbon Disulfide	75-15-0
8.	1,1-Dichloroethene	75-35-4
9.	1,1-Dichloroethane	75-35-3
10.	trans-1,2-Dichloroethene	156-60-5
11.	Chloroform	67-66-3
12.	1,2-Dichloroethane	107-06-2
13.	2-Butanone	78-93-3
14.	1,1,1-Trichloroethane	71-55-6
15.	Carbon Tetrachloride	56-23-5
16.	Vinyl Acetate	108-05-4
17.	Bromodichloromethane	75-27-4
18.	1,1,2,2-Tetrachloroethane	79-34-5
19.	1,2-Dichloropropane	78-87-5
20.	trans-1,3-Dichloropropene	10061-02-6
21.	Trichloroethene	79-01-6
22.	Dibromochloromethane	124-48-1
23.	1,1,2-Trichloroethane	79-00-5
24.	Benzene	71-43-2
25.	cis-1,3-Dichloropropene	10061-01-5
26.	2-Chloroethyl Vinyl Ether	110-75-8
27.	Bromoform	75-25-2
28.	2-Hexanone	591-78-6
29.	4-Methyl-2-pentanone	108-10-1
30.	Tetrachloroethene	127-18-4
31.	Toluene	108-88-3
32.	Chlorobenzene	108-90-7
33.	Ethyl Benzene	100-41-4
34.	Styrene	100-42-5
35.	Total Xylenes	

TABLE 3
(Continued)

ANALYTICAL PARAMETER
HAZARDOUS SUBSTANCE LIST

	Semi Volatiles (acid extr.)	CAS Number
36.	N-Nitrosodimethylamine	62-75-9
37.	Phenol	108-95-2
38.	Aniline	62-53-3
39.	bis(2-Chloroethyle) ether	111-44-4
40.	2-Chlorophenol	95-57-8
41.	1,3-Dichlorobenzene	541-73-1
42.	1,4-Dichlorobenzene	106-46-7
43.	Benzyl Alcohol	100-51-6
44.	1.2-Dichlorobezene	95-50-1
45.	2-Methylphenol	95-48-7
46.	Bis(2-Chloroisopropyl) ether	39638-32-9
47.	4-Methylphenol	106-44-5
48.	N-Nitroso-Dipropylamine	621-64-7
49.	Hexachloroethane	67-72-1
50.	Nitrobenzene	98-95-3
51.	Isophorone	78-59-1
52.	2-Nitrophenol	88-75-5
53.	2,4-Dimethylphenol	105-67-9
54.	Benzoic Acid	65-85-0
55.	bis(2-Chloroethoxy) methane	111-91-1
56.	2,4-Dichlorophenol	120-83-2
57.	1,2,4-Trichlorobenzene	120-82-1
58.	Naphthalene	91-20-3
59.	4-Chloroaniline	106-47-8
60.	Hexachlorobutadiene	87-68-3
61.	4-Chloro-3-methylphenol (para-chloro-meta-cresol)	59-50-7
62.	2-Methylnaphthalene	91-57-6
63.	Hexachlorocyclopentadiene	77-47-4
64.	2,4,6-Trichlorophenol	88-06-2
65.	2,4,5-Trichlorophenol	95-95-4
66.	2-Chloronaphthalene	91-58-7
67.	2-Nitroaniline	88-74-4
68.	Dimethyl Phthalate	131-11-3
69.	Acenaphthylene	208-96-8
70.	3-Nitroaniline	99-09-2
71.	Acenaphthene	83-32-9
72.	2,4-Dinitrophenol	51-28-5
73.	4-Nitrophenol	100-02-7
74.	Dibenzofuran	132-64-9
75.	2,4-Dinitrotoluene	121-14-2

TABLE 3
(Continued)

ANALYTICAL PARAMETER
HAZARDOUS SUBSTANCE LIST

	Semi Volatiles (continued)	CAS Number
76.	2,6-Dinitrotoluene	606-20-2
77.	Diethylphthalate	84-66-2
78.	4-Chlorophenyl Phenyl ether	1005-72-3
79.	Fluorene	86-73-7
80.	4-Nitroaniline	100-01-6
81.	4,6-Dinitro-2-methylphenol	534-52-1
82.	N-nitrosodiphenylamine	86-30-6
83.	4-Bromophenyl Phenyl ether	101-55-3
84.	Hexachlorobenzene	118-74-1
85.	Pentachlorophenol	87-86-5
86.	Phenanthrene	85-01-8
87.	Anthracene	120-12-7
88.	Di-n-butylphthalate	84-74-2
89.	Fluoranthene	206-44-0
90.	Benzidine	92-87-5
91.	Pyrene	129-00-0
92.	Butyl Benzyl Phthalate	85-68-7
93.	3,3'-Dichlorobenzidine	91-94-1
94.	Benzo(a)anthracene	56-55-3
95.	bis(2-ethylhexyl)phthalate	117-81-7
96.	Chrysene	218-01-9
97.	Di-n-octyl Phthalate	117-84-0
98.	Benzo(b)fluoranthene	205-99-2
99.	Benzo(k)flouranthene	207-08-9
100.	Benzo(a)pyrene	50-32-8
101.	Indeno(1,2,3-cd)pyrene	193-39-5
102.	Dibenz(a,h)anthracene	53-70-3
103.	Benzo(g,h,i)perylene	191-24-2

TABLE 3
(Continued)

ANALYTICAL PARAMETER
HAZARDOUS SUBSTANCE LIST

	Pesticiess	CAS Number
104.	alpha-BHC	319-84-6
105.	beta-BHC	319-85-7
106.	delta-BHC	319-86-8
107.	gamma-BHC (Lindane)	58-89-9
108.	Heptachlor	76-44-8
109.	Aldrin	309-00-2
110.	Heptachlor Epoxide	1024-57-3
111.	Endosulfan I	959-98-9
112.	Dieldrin	60-57-1
113.	4,4'-DDE	72-55-9
114.	Endrin	72-20-8
115.	Endosulfan II	33213-65-9
116.	4,4'-DDD	72-54-8
117.	Endrin Aldehyde	7421-93-4
118.	Endosulfan Sulfate	1031-07-8
119.	4,4'-DDT	50-29-3
120.	Endrin Ketone	53494-70-5
121.	Methoxychlor	72-43-5
122.	Chlordane	57-74-9
123.	Toxaphene	8001-35-2
124.	AROCLOR-1016	12674-28-2
125.	AROCLOR-1221	11104-28-2
126.	AROCLOR-1232	11141-16-5
127.	AROCLOR-1242	53469-21-9
128.	AROCLOR-1248	12672-29-6
129.	AROCLOR-1254	11097-69-1
130.	AROCLOR-1260	11096-82-5

TABLE 4

ANALYTICAL PARAMETERS
INORGANIC CONSTITUENTS[2]

Arsenic (206.2)[1]

Barium (208.1)

Cadmium (213.2)

Chromium, *total* (218.1)

Chromium, hexavalent (7185)

Lead (239.2)

Mercury (245.1)

Nickel (249.2)

Selenium (270.2)

Silver (272.2)

Sodium (273.1)

Calcium (215.1)

Magnesium (242.1)

Sulfate (375.4)

Chloride (325.3)

Ammonia Nitrogen (350.3)

[1]Method number refer to EPA-600/4-79-020; Method for Chemical Analysis of Water and Wastes *except hexavalent chromium which refers to Sw-846*

[2]All Metals analysis will be performed as soluble constituents unless, as is the case with certain methods, the method dictates otherwise.

TABLE 5

ANALYTICAL PARAMETERS
INDICATOR CONSTITUENTS

Total Organic Carbon (415.1)[1]

Total Inorganic Carbon (415.1)

Total Recoverable Phenolics (420.1)

Specific Gravity (D-1429)

[1]Method number refer to EPA-600/4-79-020; Methods for Chemical Analysis of Water and Wastes except for specific gravity which is a method from American Society for Testing and Meterials (ASTM)

1/5503

RECRA ENVIRONMENTAL, INC.

Chemical Waste Analysis, Prevention and Control

May 20, 1987

Dr. Rick Harding
Goldberg Zoino Associates
364 Nagel Drive
Buffalo, NY 14225

Re: Analytical Results

Dear Dr. Harding:

Please find enclosed results concerning the analyses of the samples recently submitted by your firm. Applicable methodology to perform Sulfate and Chloride analyses were not available for this matrix.

Pertinent Information: Quote #: Q87-311
Matrix: Sludge
Samples Received: 5/12/87

If you have any questions concerning these data, do not hesitate to contact our Customer Service Representative at (716) 691-2600.

Sincerely,

RECRA ENVIRONMENTAL, INC.

Arun K. Bhattacharya ppl

Arun K. Bhattacharya, Ph.D.
Senior Vice President/
Laboratory Director

MDL/AKB/jhs
Enclosure

I.D. #87-553
#7A510614

RECEIVED
MAY 22 1987
Goldberg—Zoino Assoc.
of New York, P.C.
Hand Delivered 12:05 pm.

ANALYTICAL RESULTS

Prepared For

Goldberg Zoino Associates
364 Nagel Drive
Buffalo, NY 14225

Prepared By

Recra Environmental, Inc.
10 Hazelwood Drive, Suite 106
Amherst, New York 14150

METHODOLOGIES

The specific methodologies employed in obtaining the enclosed analytical results are indicated on the specific data table. The method numbers presented refer to the following U.S. Environmental Protection Agency reference unless noted otherwise in this report.

- U.S. Environmental Protection Agency "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods". Office of Solid Waste and Emergency Response. November 1986, SW-846, Third Edition.

COMMENTS

Comments pertain to data on one or all pages of this report.

The values reported as "less than" (<) indicate the working detection limit for the particular sample and/or parameter.

The values reported as "less than or equal to" ($\leq$) indicate the compound may be present at trace levels relative to the detection limit but not subject to accurate quantification.

Methods used for the EP Toxicity Test procedure as well as the analysis of the resulting extract are presented in U.S. Environmental Protection Agency publication, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods". November 1986, SW-846, Third Edition.

Results of the analysis of Pesticide/PCB's are based on the matching of retention times between samples and standards on a single gas chromatographic column.

Results of the analysis of soils are corrected for moisture content and reported on a dry weight basis.

SLUDGE MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	TP-II-13	TP-III-33
Acetone	56	<10
Benzene	<4.4	<4.4
Bromodichloromethane	<2.2	<2.2
Bromoform	<4.7	<4.7
Bromomethane	<10	<10
2-Butanone	<10	<10
Carbon disulfide	<5.0	<5.0
Carbon tetrachloride	<2.8	<2.8
Chlorobenzene	<6.0	<6.0
Chloroethane	<10	<10
2-Chloroethylvinyl ether	<10	<10
Chloroform	<1.6	<1.6
Chloromethane	<10	<10
Dibromochloromethane	<3.1	<3.1
1,1-Dichloroethane	<4.7	<4.7
1,2-Dichloroethane	<2.8	<2.8
1,1-Dichloroethylene	<2.8	<2.8
trans-1,2-Dichloroethylene	<1.6	<1.6
1,2-Dichloropropane	<6.0	<6.0
cis-1,3-Dichloropropene	<5.0	<5.0
trans-1,3-Dichloropropene	<5.0	<5.0
Ethylbenzene	<7.2	<7.2
2-Hexanone	<10	<10
Methylene chloride	56	<2.8
4-Methyl-2-pentanone	<10	<10
Styrene	<5.0	<5.0
1,1,2,2-Tetrachloroethane	<6.9	<6.9
Tetrachloroethylene	<4.1	<4.1
Toluene	<6.0	<6.0
1,1,1-Trichloroethane	<3.8	<3.8
1,1,2-Trichloroethane	<5.0	<5.0
Trichloroethylene	<1.9	<1.9
Vinyl acetate	<10	<10
Vinyl chloride	<10	<10
Total Xylenes	<5.0	<5.0
Analysis Date	5/14/87	5/14/87
Internal Standards Level Added = 0.05 µg/g (% Recovery)		
Bromochloromethane	96	104
1,4-Difluorobenzene	94	100
Chlorobenzene D_5	91	99

SLUDGE MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	TP-II-13*	TP-III-33
Acenaphthene	1.3	<0.33
Acenaphthylene	<0.66	<0.33
Anthracene	6.6	<0.33
Benzo(a)anthracene	7.2	0.45
Benzo(a)pyrene	2.6	<0.33
Benzo(b)fluoranthene	2.4**	<0.33
Benzo(g,h,i)perylene	0.97	<0.33
Benzo(k)fluoranthene	<0.66	<0.33
Benzoic acid	<0.66	<0.33
Benzyl alcohol	<0.66	<0.33
Bis(2-chloroethoxy)methane	<0.66	<0.33
Bis(2-chloroethyl)ether	<0.66	<0.33
Bis(2-chloroisopropyl)ether	<0.66	<0.33
Bis(2-ethylhexyl)phthalate	<0.66	<0.33
4-Bromophenylphenylether	<0.66	<0.33
Butylbenzylphthalate	<0.66	<0.33
4-Chloroaniline	<0.66	<0.33
2-Chloronaphthalene	<0.66	<0.33
4-Chlorophenylphenylether	<0.66	<0.33
Chrysene	7.0	<0.33
Dibenzo(a,h)anthracene	<0.66	<0.33
Dibenzofuran	4.0	<0.33
1,2-Dichlorobenzene	<0.66	<0.33
1,3-Dichlorobenzene	<0.66	<0.33
1,4-Dichlorobenzene	<0.66	<0.33
3,3'-Dichlorobenzidine	<1.3	<0.66
Diethylphthalate	<0.66	<0.33
Dimethylphthalate	<0.66	<0.33
Di-n-butylphthalate	<0.66	<0.33
2,6-Dinitrotoluene	<0.66	<0.33
2,4-Dinitrotoluene	<0.66	<0.33
Di-n-octylphthalate	<0.66	<0.33
Fluoranthene	0.62	1.2
Fluorene	4.2	<0.33
Hexachlorobenzene	<0.66	<0.33
Hexachlorobutadiene	<0.66	<0.33
Hexachlorocylopentadiene	<0.66	<0.33
Hexachloroethane	<0.66	<0.33
Indeno(1,2,3-cd)pyrene	1.1	<0.33
Isophorone	<0.66	<0.33

**Chromatographically, Benzo(b)fluoranthene and Benzo(k)fluoranthene coelute. The reported value is therefore an "and/or" value.

(Continued)

SLUDGE MATRIX
METHOD 8270 - HAZARDOUS SUBSTANCE LIST BASE/NEUTRAL/ACID EXTRACTABLES

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	TP-II-13*	TP-III-33
2-Methylnaphthalene	2.1	<0.33
Naphthalene	5.1	<0.33
2-Nitroaniline	<3.2	<1.6
3-Nitroaniline	<3.2	<1.6
4-Nitroaniline	<3.2	<1.6
Nitrobenzene	<0.66	<0.33
N-nitrosodi-n-propylamine	<0.66	<0.33
N-nitrosodiphenylamine	<0.66	<0.33
Phenanthrene	40	<0.33
Pyrene	38	1.1
1,2,4-Trichlorobenzene	<0.66	<0.33
2-Chlorophenol	<0.66	<0.33
2,4-Dichlorophenol	<0.66	<0.33
2,4-Dimethylphenol	<0.66	<0.33
4,6-Dinitro-o-cresol	<3.2	<1.6
2,4-Dinitrophenol	<3.2	<1.6
2-Methylphenol	<0.66	<0.33
4-Methylphenol	<0.66	0.82
2-Nitrophenol	<0.66	<0.33
4-Nitrophenol	<3.2	<1.6
p-Chloro-m-cresol	<0.66	<0.33
Pentachlorophenol	<3.2	<1.6
Phenol	<0.66	0.49
2,4,5-Trichlorophenol	<3.2	<1.6
2,4,6-Trichlorophenol	<0.66	<0.33
Additional Compounds		
Aniline	<0.66	<0.33
Benzidine	<20	<10
N-Nitrosodimethylamine	<0.66	<0.33
Extraction Date	5/14/87	5/14/87
Analysis Date	5/19/87	5/19/87
Internal Standards		
Level Added = 1.0 µg/g		
Phenanthrene-D_{10} (% Recovery)	86	87
Surrogates		
Level Added = 5.0 µg/g (% Recovery)		
Decafluorobiphenyl	21	28
2-Fluorobiphenyl	17	17
2-Fluorophenol	30	31
Phenol-D_6	38	37

*Elevated detection limits are the result of a dilution necessitated by sample matrix.

SLUDGE MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES/PCB'S

COMPOUND (Units of Measure = µg/g dry)	SAMPLE IDENTIFICATION	
	TP-II-13	TP-III-33
Aldrin	<0.03	<0.006
Alpha-BHC	<0.02	<0.006
Beta-BHC	0.15	0.050
Delta-BHC	0.063	0.023
Gamma-BHC	<0.03	<0.006
Chlordane	<0.7	<0.2
4,4'-DDD	<0.1	<0.03
4,4'-DDE	<0.05	0.013
4,4'-DDT	0.50	<0.03
Dieldrin	<0.05	<0.02
Endosulfan I	0.054	0.013
Endosulfan II	<0.1	<0.03
Endosulfan sulfate	3.1	0.087
Endrin	<0.05	<0.02
Heptachlor	<0.03	<0.006
Heptachlor epoxide	<0.03	<0.006
Toxaphene	<1	<0.3
Aroclor 1016	<2	<0.6
Aroclor 1221	<5	<2
Aroclor 1232	<5	<2
Aroclor 1242	<2	<0.6
Aroclor 1248	<2	<0.6
Aroclor 1254	<2	<0.3
Aroclor 1260	<2	<0.3
Endrin ketone	<0.5	<0.2
Methoxychlor	<0.9	<0.3
Additional Compounds		
Endrin aldehyde	<0.1	<0.03
Extraction Date	5/13/87	5/13/87
Analysis Date	5/16/87	5/15/87

SLUDGE MATRIX
METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	ANALYSIS DATE	SAMPLE IDENTIFICATION	
			TP-II-13	TP-III-33
Total Arsenic	7060	5/14/87	240	21
Total Barium	7080	5/18/87	250	2,100
Total Cadmium	7130	5/16/87	5.4	16
Total Calcium	7140	5/18/87	92,000	65,000
Total Chromium	7190	5/13/87	51	190
Hexavalent Chromium	7195	5/16/87	<0.08	<0.09
Total Lead	7421	5/13/87	410	8,700
Total Magnesium	7450	5/16/87	19,000	5,900
Total Mercury	7471	5/15/87	0.43	0.12
Total Nickel	7520	5/15/87	24	110
Total Selenium	7740	5/14/87	<0.6	<0.6
Total Silver	7760	5/18/87	0.64	1.8
Total Sodium	7770	5/16/87	<500	2,100

SLUDGE MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	ANALYSIS DATE	SAMPLE IDENTIFICATION	
				TP-II-13	TP-III-33
Ammonia	*	µg/g dry	5/16/87	1,700	1,500
Total Cyanide	9010	µg/g dry	5/14/87	4.2	3.9
Weak and Dissociable Cyanide	412H**	µg/g dry	5/15/87	<0.5	<0.7
Total Available Cyanide	7.3.3.2	µg/g dry	5/19/87	<12	26
Leachable pH	9045	Standard Units	5/13/87	8.76	7.44
Total Recoverable Phenolics	9065	µg/g dry	5/18/87	0.18	0.96
Sulfides	9030	µg/g dry	5/18/87	1,500	4,300
Total Available Sulfide	7.3.4.1	µg/g dry	5/19/87	6.7	19

*U.S. EPA "Chemistry Laboratory Manual for Bottom Sediments and Elutriate Testing" PB-294 596, March 1979 - Methods CRL 324, 312 followed by specific ion method for Ammonia.

**Standard Methods for the Examination of Water and Wastewater, 16th Edition.

SLUDGE MATRIX

SAMPLE IDENTIFICATION	PARAMETER (UNITS OF MEASURE) DRY WEIGHT AT 103°C (%)
TP-II-13	89
TP-III-33	74

EP TOXICITY TEST EXTRACT - METALS

PARAMETER (Units of Measure = mg/l)	ANALYSIS DATE	EPA MAX. CONC.	SAMPLE IDENTIFICATION	
			TP-II-13	TP-III-33
Total Arsenic	5/19/87	5.0	0.19	<0.01
Total Barium	5/19/87	100.0	0.42	0.22
Total Cadmium	5/19/87	1.0	0.02	<0.01
Total Chromium	5/19/87	5.0	<0.005	<0.005
Total Lead	5/19/87	5.0	0.41	0.05
Total Mercury	5/19/87	0.2	<0.0005	<0.001
Total Selenium	5/19/87	1.0	<0.005	<0.005
Total Silver	5/19/87	5.0	<0.005	<0.005

X Standard Addition
___ Non-Standard Addition

SLUDGE MATRIX
METHOD 9020

SAMPLE IDENTIFICATION	PARAMETER (UNITS OF MEASURE) TOTAL ORGANIC HALIDE (µg/g dry)
TP-II-13	0.45
TP-III-33	0.90

QUALITY CONTROL INFORMATION
SLUDGE MATRIX
METHOD 8240 - HAZARDOUS SUBSTANCE LIST VOLATILE ORGANICS

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

SAMPLE IDENTIFICATION TP-III-33

COMPOUND	CONC. SPIKE ADDED (ng)	SAMPLE RESULT	CONC. MS	% REC	CONC. MSD	% REC
Benzene	250	0	344	138	276	110
Chlorobenzene	250	0	312	125	246	98
1,1-Dichloro-ethylene	250	0	398	159	322	129
Toluene	250	0	293	117	238	95
Trichloroethylene	250	0	373	149	312	125

ADDITIONAL SAMPLE INFORMATION	SAMPLE RESULT	MATRIX SPIKE	MATRIX SPIKE DUPLICATE
Analysis Date	5/14/87	5/14/87	5/15/87
Internal Standard Level Added = 0.05 µg/g (% Recovery)			
Bromochloromethane	104	83	92
1,4-Difluoromethane	100	81	90
Chlorobenzene D_5	99	81	91

QUALITY CONTROL INFORMATION - ACCURACY
SLUDGE MATRIX
METHOD 8080 - HAZARDOUS SUBSTANCE LIST ORGANOCHLORINE PESTICIDES

SAMPLE IDENTIFICATION TP-II-13

COMPOUND	NANOGRAMS OF SPIKE	PERCENT RECOVERY
Aldrin	0.20	110
Gamma-BHC	0.20	130
4,4'-DDE	0.20	75
Endosulfan II	0.20	80
Endrin	0.20	65
Heptachlor	0.20	110
Extraction Date	5/13/87	
Analysis Date	5/18/87	

QUALITY CONTROL INFORMATION - PRECISION
SLUDGE MATRIX
METALS

PARAMETER (Units of Measure = µg/g dry)	METHOD NUMBER	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	7060	TP-II-13	280	200	240	57
Total Barium	7080		260	230	250	21
Total Cadmium	7130		9.2	1.6	5.4	5.4
Total Calcium	7140		93,000	90,000	92,000	2,100
Total Chromium	7190		53	49	51	2.8
Hexavalent Chromium	7195		<0.08	<0.08	<0.08	-
Total Lead	7421		500	320	410	130
Total Magnesium	7450		20,000	18,000	19,000	1,400
Total Mercury	7471		0.52	0.34	0.43	0.13
Total Nickel	7520		27	21	24	4.2
Total Selenium	7740		<0.6	<0.6	<0.6	-
Total Silver	7760		0.75	0.53	0.64	0.16
Total Sodium	7770		<500	<500	<500	-

QUALITY CONTROL INFORMATION - ACCURACY
SLUDGE MATRIX
METALS

PARAMETER	METHOD NUMBER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Total Arsenic	7060	TP-II-13	50	96
Total Barium	7080		5,000	103
Total Cadmium	7130		500	102
Total Calcium	7140		5,000	103
Total Chromium	7190		500	82
Hexavalent Chromium	7195		500	94
Total Lead	7421		50	101
Total Magnesium	7450		5,000	98
Total Mercury	7471		0.4	113
Total Nickel	7520		500	86
Total Selenium	7740		50	104
Total Silver	7760		500	91
Total Sodium	7770		5,000	108

QUALITY CONTROL INFORMATION - PRECISION
SLUDGE MATRIX

PARAMETER	METHOD NUMBER	UNITS OF MEASURE	SAMPLE IDENTIFICATION	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Ammonia	*	µg/g dry	TP-III-33	1,300	1,600	1,500	210
Weak and Dissociable Cyanide	412H**	µg/g dry	TP-III-33	<0.7	<0.7	<0.7	-
Leachable pH	9045	Standard Units	TP-II-13	8.78	8.74	8.76	0.028
Sulfides	9030	µg/g dry	TP-II-13	1,300	1,700	1,500	280

*U.S. EPA "Chemistry Laboratory Manual for Bottom Sediments and Elutriate Testing" PB-294 596, March 1979 - Methods CRL 324, 312 followed by specific ion method for Ammonia.

**Standard Methods for the Examination of Water and Wastewater, 16th Edition.

QUALITY CONTROL INFORMATION - ACCURACY
SLUDGE MATRIX

PARAMETER	SAMPLE IDENTIFICATION	MICROGRAMS OF SPIKE	PERCENT RECOVERY
Ammonia	TP-III-33	1,000	103
Weak and Dissociable Cyanide	TP-III-33	45	90
Total Recoverable Phenolics	*	41	98

*Quality control results were generated from a sample of similar matrix at the time of analysis.

QUALITY CONTROL INFORMATION - PRECISION
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION TP-III-33

PARAMETER (Units of Measure = mg/l)	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION
Total Arsenic	<0.01	<0.01	<0.01	-
Total Barium	0.23	0.20	0.22	0.021
Total Cadmium	<0.01	<0.01	<0.01	-
Total Chromium	<0.005	<0.005	<0.005	-
Total Lead	0.05	0.05	0.05	0
Total Mercury	<0.001	<0.001	<0.001	-
Total Selenium	<0.005	<0.005	<0.005	-
Total Silver	<0.005	<0.005	<0.005	-

X Standard Addition
___ Non-Standard Addition

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

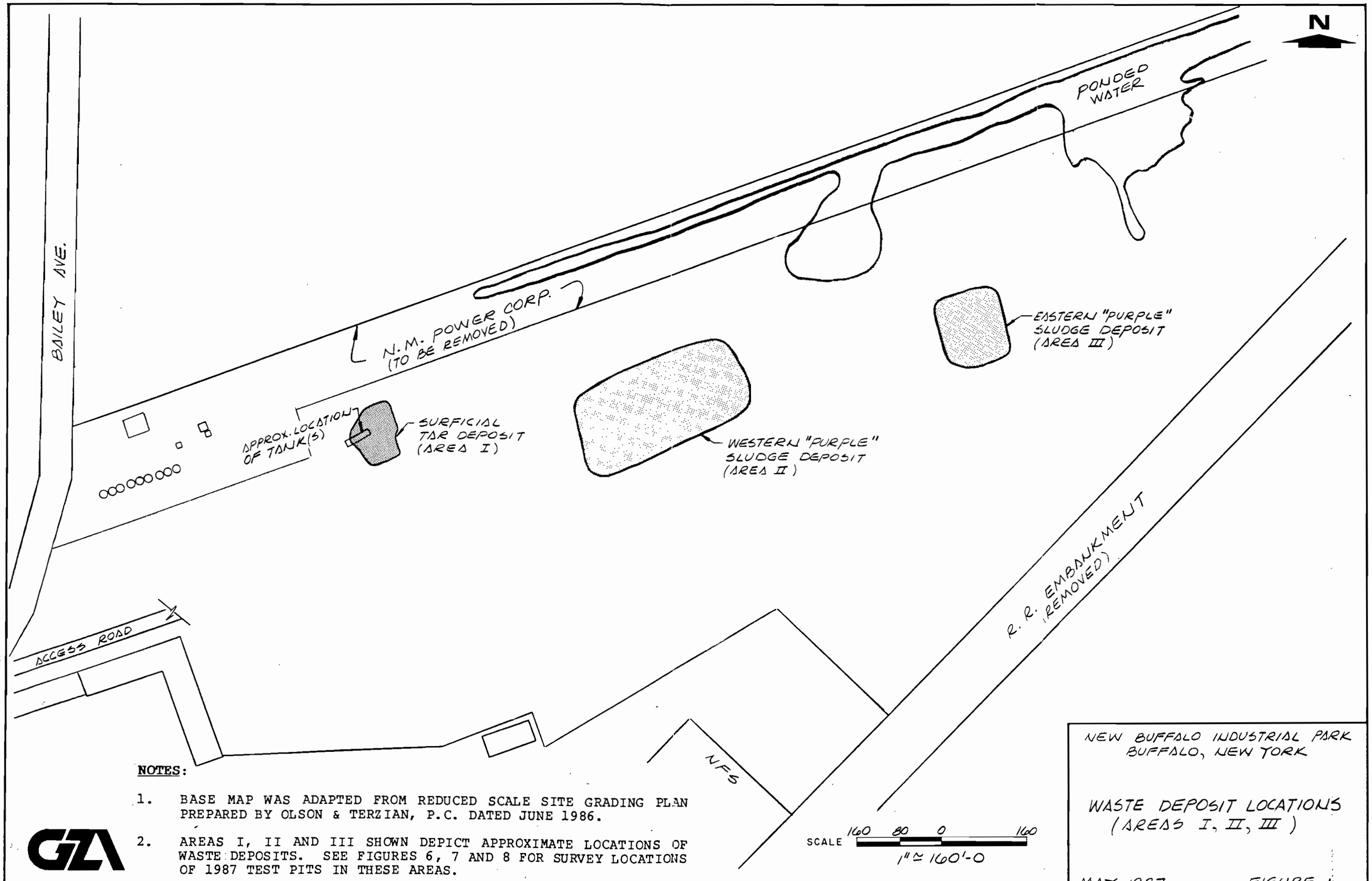
SAMPLE IDENTIFICATION TP-II-13

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	111
	50	121
Total Barium	2,500	112
	5,000	113
Total Cadmium	250	103
	500	98
Total Chromium	250	83
	500	85
Total Lead	2,500	96
	5,000	95
Total Mercury	0.2	106
	0.4	103
Total Selenium	25	88
	50	86
Total Silver	250	98
	500	99

QUALITY CONTROL INFORMATION - ACCURACY
EP TOXICITY TEST EXTRACT - METALS

SAMPLE IDENTIFICATION TP-III-33

PARAMETER	µg OF SPIKE	% RECOVERY
Total Arsenic	25	100
	50	94
Total Barium	2,500	117
	5,000	120
Total Cadmium	250	101
	500	99
Total Chromium	250	86
	500	86
Total Lead	2,500	97
	5,000	96
Total Mercury	0.2	104
	0.4	101
Total Selenium	25	92
	50	88
Total Silver	250	99
	500	100



NOTES:

1. BASE MAP WAS ADAPTED FROM REDUCED SCALE SITE GRADING PLAN PREPARED BY OLSON & TERZIAN, P.C. DATED JUNE 1986.
2. AREAS I, II AND III SHOWN DEPICT APPROXIMATE LOCATIONS OF WASTE DEPOSITS. SEE FIGURES 6, 7 AND 8 FOR SURVEY LOCATIONS OF 1987 TEST PITS IN THESE AREAS.

GZA

DWG. No.

FILE No.

NEW BUFFALO INDUSTRIAL PARK
BUFFALO, NEW YORK

WASTE DEPOSIT LOCATIONS (AREAS I, II, III)

MAY 1987 FIGURE 1

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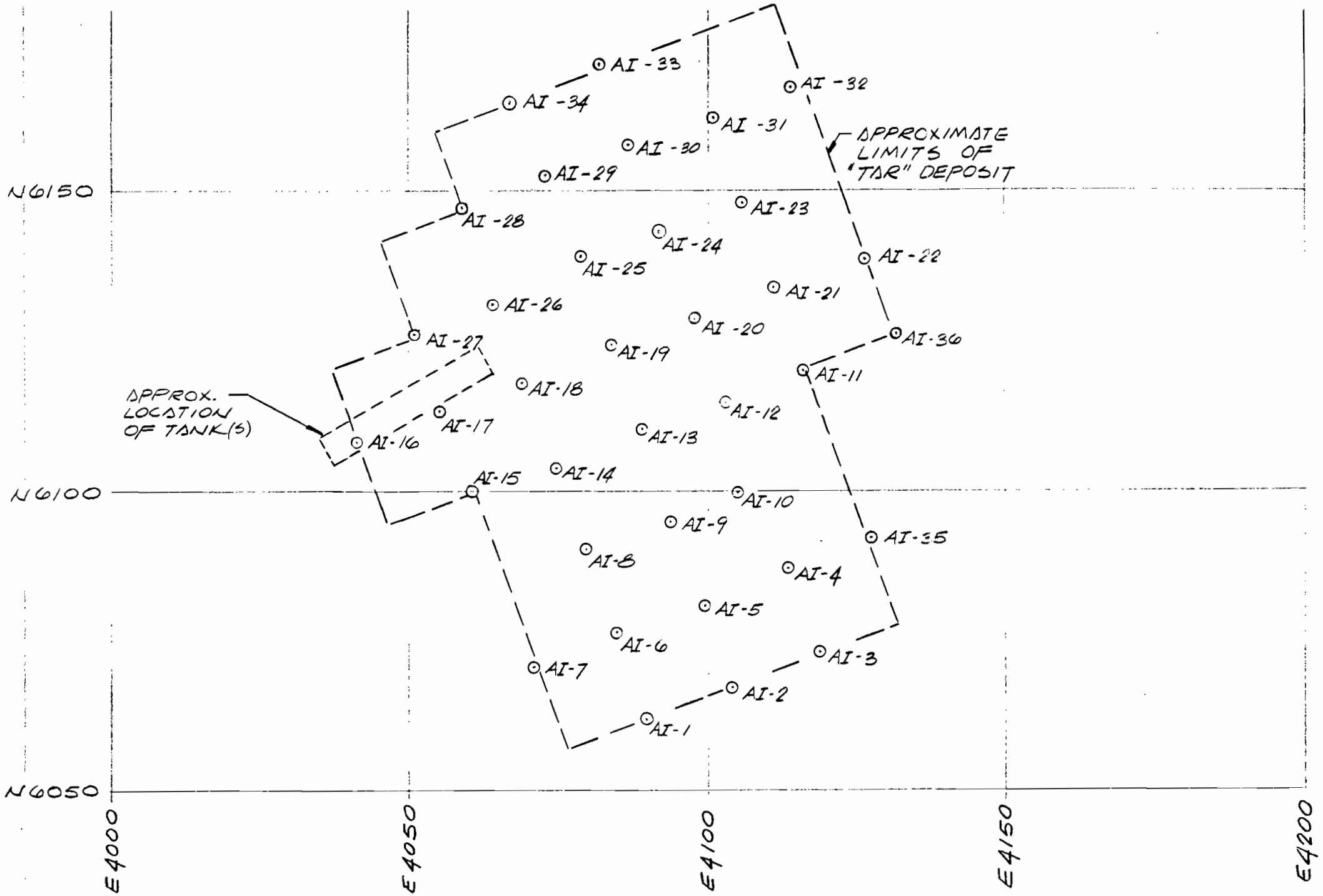

LEGEND

⊙AI-3 TEST PIT LOCATION & NUMBER MADE IN 1987

0 20 40

1" = 20'-0

NOTES:

1. TEST PITS WERE LOCATED IN THE FIELD USING OPTICAL SURVEY METHODS BY SODERHOLM ENGINEERING. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.

2. THE APPROXIMATE LIMITS OF THE "TAR" DEPOSIT SHOWN ARE BASED ON VISUAL OBSERVATIONS MADE DURING 1987 TEST PITS.

GZA

FILE No.

NEW BUFFALO INDUSTRIAL PARK
BUFFALO, NEW YORK

AREA I
EXPLORATIONS

MAY 1987 FIGURE 2

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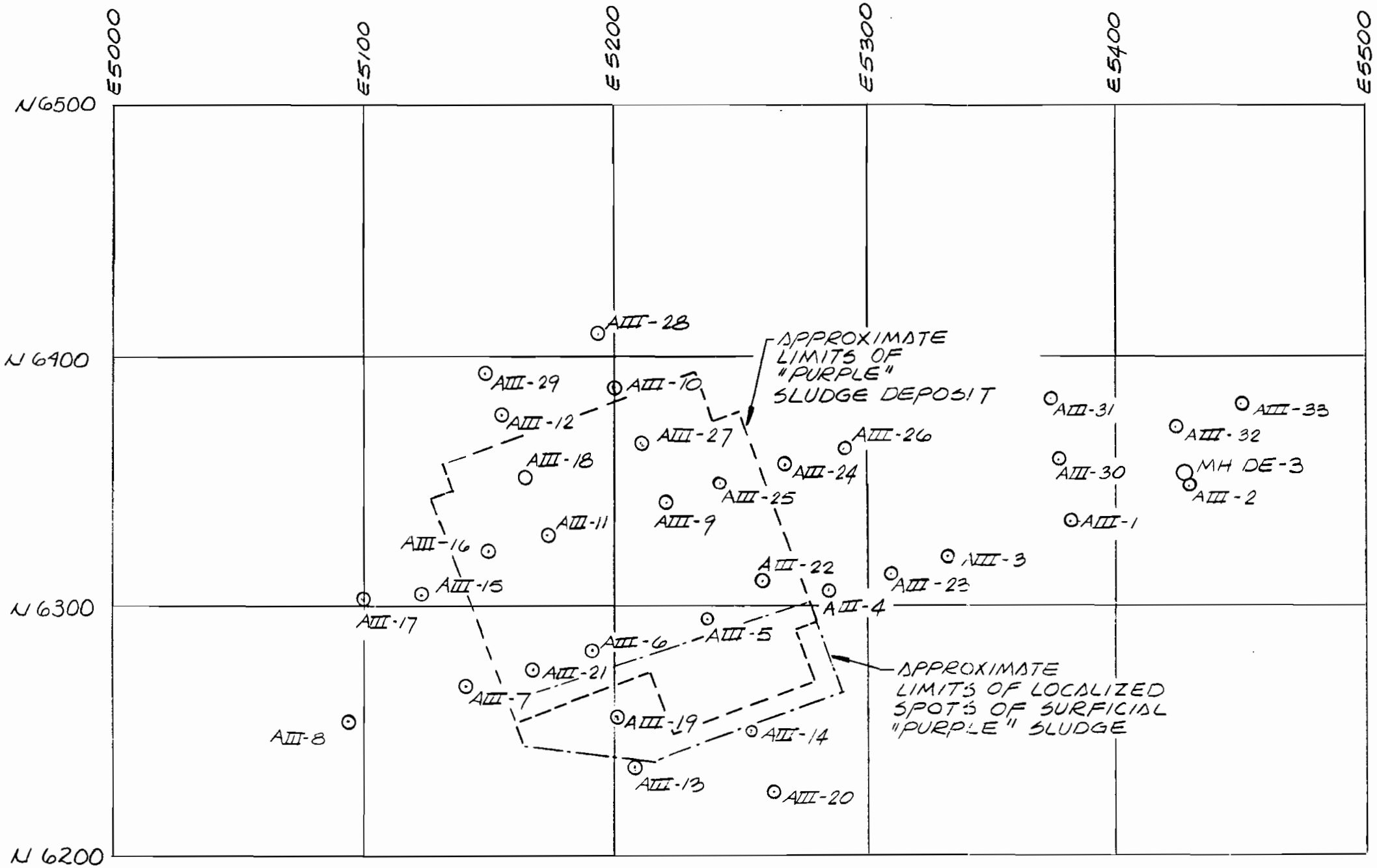
FILE No.



LEGEND

⊙ AIII-5 TEST PIT LOCATION & NUMBER MADE IN 1987

NOTES: 1. TEST PITS WERE LOCATED IN THE FIELD USING OPTICAL SURVEY METHODS BY SODERHOLM ENGINEERING. THE LOCATIONS SHOULD BE CONSIDERED ACCURATE TO THE DEGREE IMPLIED BY THE METHOD USED.

2. THE APPROXIMATE LIMITS OF THE "PURPLE" SLUDGE DEPOSIT SHOWN ARE BASED ON VISUAL OBSERVATIONS MADE DURING 1987 TEST PITS AND ANALYTICAL TEST RESULTS FROM TEST PIT SAMPLES AVAILABLE AT THIS TIME.

3. THE APPROXIMATE LIMIT OF LOCALIZED SPOTS OF SURFICIAL "PURPLE" SLUDGE IS BASED UPON VISUAL OBSERVATION.

0 50 100

1" = 50'-0

GZA

NEW BUFFALO INDUSTRIAL PARK
BUFFALO, NEW YORK

AREA III
EXPLORATIONS

APRIL 1987 FIGURE 3