NUS CORPORATION
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PRIORITY POLLUTANT ANALYTICAL RESULTS
FROM
80 LISTER AVENUE STUDY AREA
NEWARK, NEW JERSEY

PROJECT FOR PERFORMANCE OF REMEDIAL RESPONSE ACTIVITIES AT UNCONTROLLED HAZARDOUS SUBSTANCE FACILITIES—ZONE 1

NUS CORPORATION
SUPERFUND DIVISION

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PRIORITY POLLUTANT ANALYTICAL RESULTS
FROM
80 LISTER AVENUE STUDY AREA
NEWARK, NEW JERSEY

3/30/84

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1.0 EXECUTIVE SUMMARY

On December 7 and 8, 1983, thirty-five (35) representative soil samples were collected in the 80 Lister Avenue study area located in Newark, New Jersey. The samples were analyzed to determine the presence or non-presence of priority pollutants. 2,3,7,8 Tetrachloro-dibenzo-p-dioxin (TCDD) was detected at all thirty-five (35) sample locations during prior TCDD sampling activities. Forty (40) other organic priority pollutants were also detected. They include: acenaphthene, 1,2,4-trichlorobenzene, hexachlorobenzene, 1,3-dichlorobenzene, fluoranthene, isophorone, naphthalene, n-nitrosodiphenylamine, phthalate esters, polynuclear aromatic hydrocarbons, pentachlorophenol, phenol, benzene, carbon tetrachloride, ethylbenzene, methylene chloride, trichlorofluoromethane, toluene, aldrin, dieldrin, chlordane, 4,4-DDT,4,4-DDE, 4.4-DDD and endrin. Eighteen (18) inorganic priority pollutants were detected. They include: aluminum, chromium, barium, beryllium, cadmium, cobalt, copper, iron, lead, nickel, manganese, zinc, vanadium, arsenic, antimony, mercury, tin and silver.

2.0 OBJECTIVE

The objective of this investigation is to determine the presence or non-presence of priority pollutants in the 80 Lister Avenue study area. Soil samples representative of the study area were taken and analyzed for priority pollutants. Sample locations were chosen to correspond with previous positive TCDD sampling points.

3.0 BACKGROUND

Figure 3-1 provides a study area location map. The study area is located in Essex County within the city of Newark.

3.1 Study Area

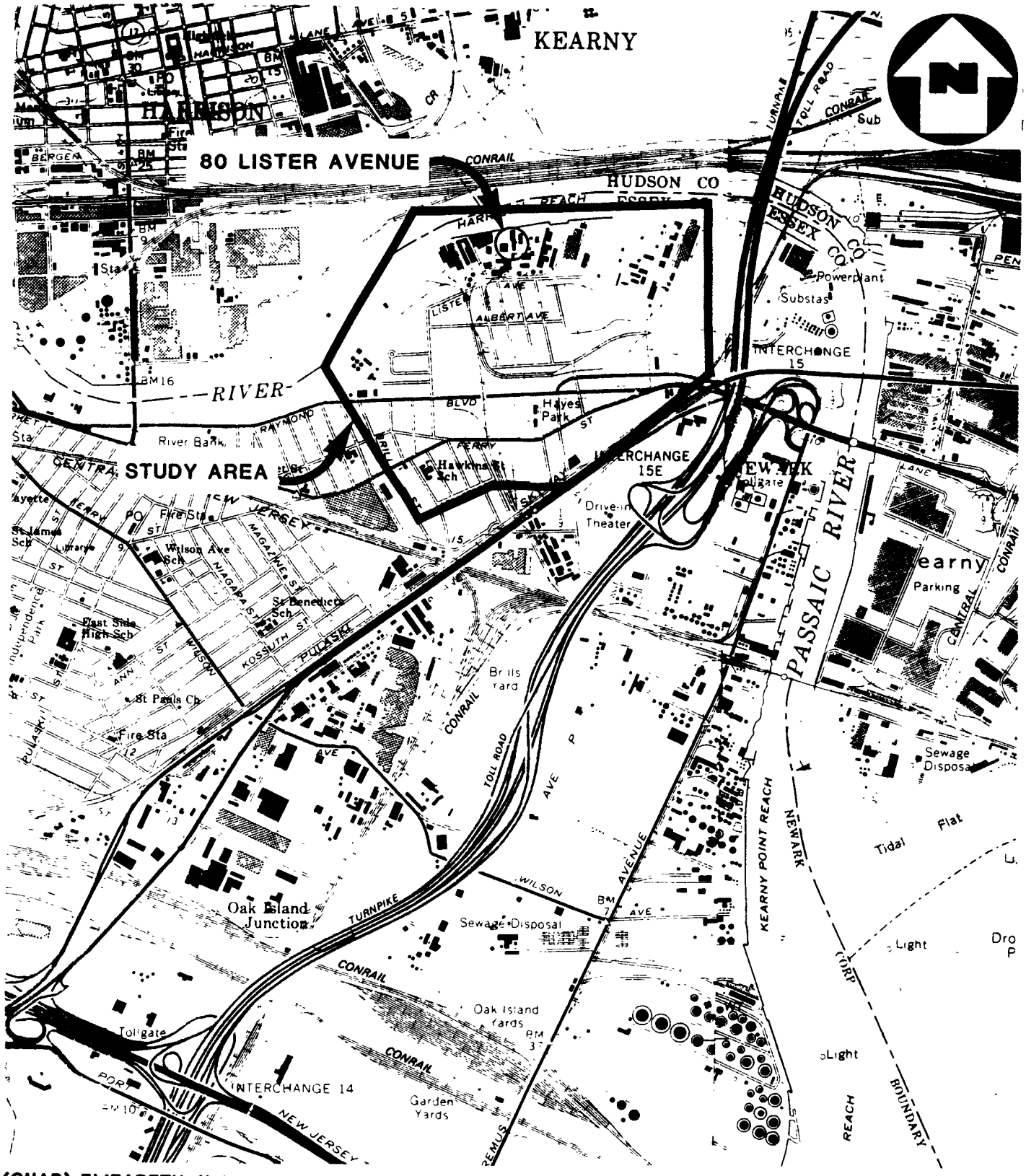
The study area is defined as that part of the Ironbound section of Newark that is bordered on the north and northwest by the Passaic River, on the east by the New Jersey Turnpike, and on the south by the Pulaski Skyway. It includes the former Diamond Shamrock Company facility on Lister Avenue, and the heavily industrialized area surrounding this facility. There are also a number of residences and a major food distribution center located within the area.

3.2 Geological Setting

The study area is situated upon stratified glacial drift of the Pleistocene Epoch, within close proximity of the Passaic River. Beneath the sand, gravel, silt, and clay layers of the drift lies Triassic Age sandstone and shale of the Brunswick Formation which contains the Brunswick Aquifer. The depth to bedrock is between 50 and 110 feet below the drift surface. The unconsolidated sediments of the stratified drift layer in this region have good water-bearing properties. However, use of the Brunswick Aquifer as a potable water source has dwindled during the past forty years due to contamination by saline encroachment.

3.3 Investigative History

80 Lister Avenue is a former herbicide manufacturing plant which produced 2,4,5-Trichlorophenoxy acetic acid (2,4,5-T). One of the ingredients used in the manufacture of 2,4,5-T is 2,4,5-Trichlorophenol (TCP). The 2,3,7,8-TCDD isomer is known to be a contaminant of 2,4,5-TCP.



(QUAD) ELIZABETH, N.J.

FIGURE 3-1

STUDY AREA LOCATION MAP
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

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In April 1983, the New Jersey Department of Environmental Protection (NJDEP) took two (2) soil samples on the 80 Lister Avenue property. One NJDEP sample contained 1220 ppb of 2,3,7,8-TCDD. Datum is not available for the other sample.

On May 27, 1983, FIT sampled soil at nine (9) on-site locations and verified 2,3,7,8-TCDD contamination. Concentrations ranged from 60 ppb to greater than 50,000 ppb. On June 2, 1983 the NJDEP collected nine (9) off-site soil samples. The results showed that contamination existed off-site. Concentrations ranged from not detected to 15 ppb.

To determine the habitability of the surrounding area, the EPA Region II Field Investigation Team (FIT) collected thirty-three (33) samples in the vicinity of the 80 Lister Avenue from June 3 to June 8, 1983. These samples included vacuum bags, air conditioner filters, good soil and sweep samples.

A more comprehensive sampling plan began on June 11, 1983 to further define the extent of 2,3,7,8-TCDD contamination in the study area. Table 3-1 provides a summary of the twenty-five (25) 80 Lister Avenue study area TCDD sampling activities which took place between May 27, 1983 and November 15,1983. The sampling dates, types, and numbers of samples are provided for each sampling activity.

Sampling between June 22 and October 10, 1983, led EPA to suspect the Brady Iron and Metals property to be a second source of TCDD contamination. The analytical results for one hundred and thirty-eight (138) TCDD and eight (8) priority pollutant samples collected on and around this property are presented in a separate report entitled, "Analytical Results from Brady Iron and Metals".

On December 7 and 8, 1983, thirty-five (35) soil samples were collected from the 80 Lister Avenue study area for priority pollutant analysis.

TABLE 3-1
SAMPLING ACTIVITIES
80 LISTER AVENUE, NEWARK, NEW JERSEY

Sampling Date	Sampling Phase	Sampling Type and Number
5/27/83	On-Site	9 Soil
6/3/83	Habitability	2 Soil (Sweep) 4 Air Conditioner Filter 18 Vacuum Bag
6/7/83	Joseph Street and SCA Chemical Services	2 Soil 1 Air Conditioner Filter
6/8/83	Thomasset Colors, Inc.	2 Air Conditioner Filter
6/11/ - 6/17/83	Public Contact Areas Phase I	5 Vacuum Bag 10 Air Conditioner Filter 17 Sweeps 40 Soil
6/22/83 - 7/1/83	Transportation Routes Phase I	4 Sweep 1 Soil 83 Composite (Soil-Soil) 45 Composite (Sweep-Sweep) 43 Composite (Sweep-Soil)
6/28/83 - 6/29/83	Passaic River Sediment	35 Sediment
7/11/83 - 8/9/83	Selected Grid Phase I	157 Soil
7/14/83 - 7/15/83	Passaic River Crab and Fish	12 Fish (Collected by NJDEP) 4 Crab
7/26/83	Public Contact Areas Phase II	10 Soil 5 Vacuum Bag 3 Air Conditioner Filter
8/11/83 - 8/18/83	Transportation Routes Phase II	5 Sweep 37 Soil 2 Composite (Soil-Soil)
8/16/83	17 Foundry Street	4 Soil
8/17/83	Hayes Park East After TAT Clean-up	4 Sweep

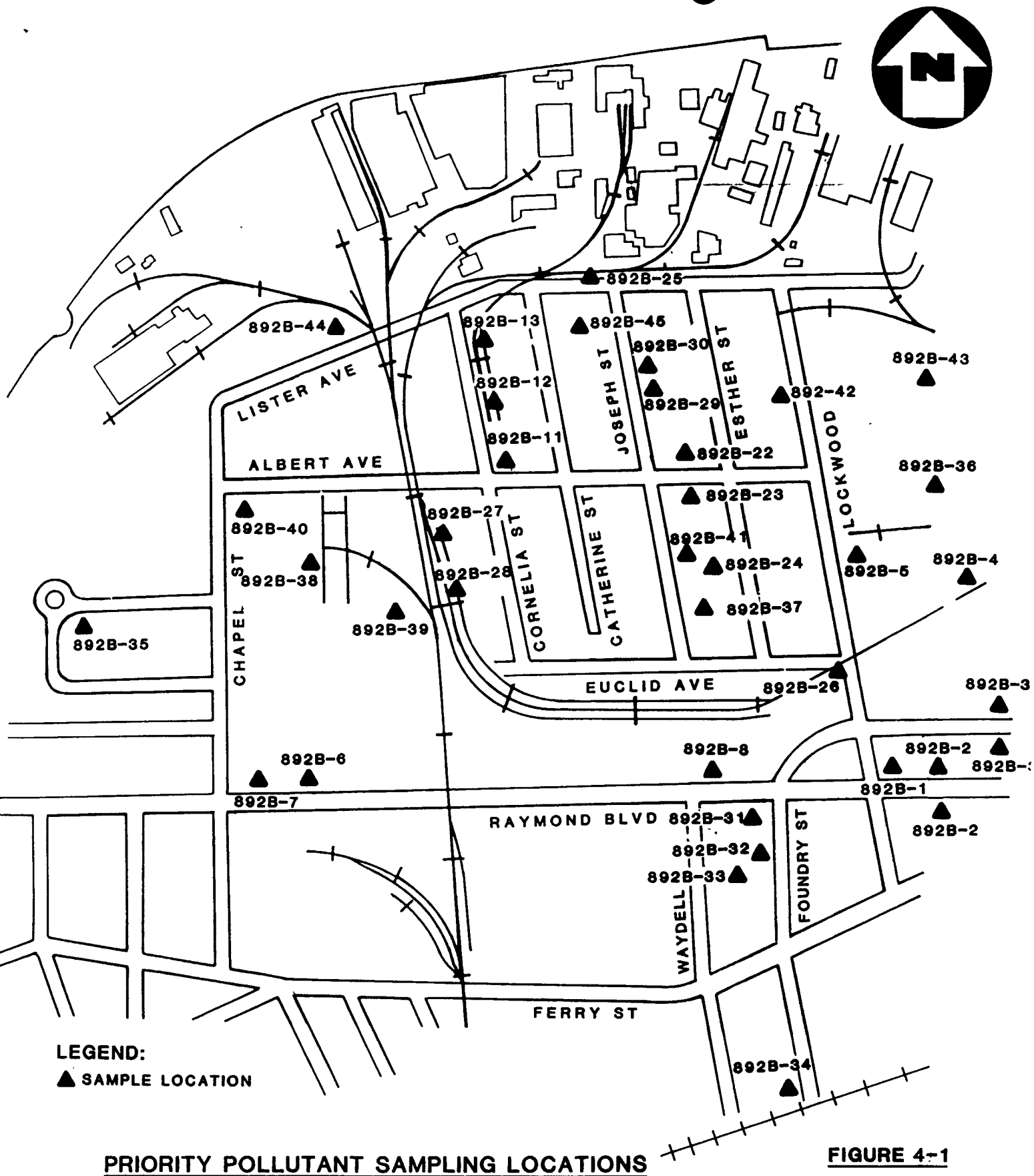
TABLE 3-1 (cont'd)
SAMPLING ACTIVITIES
80 LISTER AVENUE, NEWARK, NEW JERSEY

Sampling Date	Sampling Phase	Sampling Type and Number
9/1/83	Transportation Routes Post-Remedial Action	35 Composite (Sweep-Sweep)
9/15/83	Transportation Routes Phase III	12 Soil 1 Sweep 1 Composite (Soil-Soil) 16 Composite (Sweep-Sweep)
9/16/83 - 9/26/83	Industrial Areas	10 Sweep 1 Soil
9/20/83	Selected Grid Phase II	13 Sweep
10/18/83	Parkway Soil	41 Soil
10/20/83 - 10/28/83	Ferry Street	18 Composite (Sweep-Sweep)
10/26/83	Hildemann Property	18 Soil
10/27/83	New Jersey Transit	18 Air Conditioner Filter
	TOTAL:	778 Samples

4.0 METHODOLOGY

On December 7 and 8, 1983, the FIT collected thirty-five (35) priority pollutant soil samples in the study area. Figure 4-1 provides a priority pollutant sample location map. Table 4-1 provides sample numbers, corresponding TCDD sample numbers, concentrations and sample types for these samples.

All samples were collected from within five feet of previously sampled positive TCDD sampling locations. Sample locations were selected to ensure representation of the study area. Soil samples for priority pollutant analysis were collected with clean stainless steel implements. All samples were grab soil taken from the surface. The samples were collected in 40 milliliter volatile organic sample (VOA) bottles. There were two (2) (VOA) bottles for each sampling location. Soil samples collected for priority pollutant analysis were not homogenized in order to avoid loss of volatile organic compounds.



PRIORITY POLLUTANT SAMPLING LOCATIONS
80 LISTER AVENUE VICINITY, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 4-1

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TABLE 4-1

PRIORITY POLLUTANT TCDD SAMPLE NUMBER AND TYPE

80 LISTER AVENUE

SAMPLE NUMBER	TCDD NUMBER (a)	TCDD CONCENTRATION ppb	SAMPLE TYPE
892B-1	897	1.4	Soil
892B-2	734	0.13	Soil (b)
892B-3	723	0.09	Soil (b)
892B-4	608	0.78	Soil
892B-5	890	1.0	Soil
892B-6	636	0.56	Soil
892B-7	933	3.4	Soil
892B-8	886	1.2	Soil
892B-11	544	0.20	Soil
892B-12	551	0.65	Soil
892B-13	548	0.89	Soil
892B-22	922	1.9	Soil
892B-23	923	0.14	Soil
892B-24	916	1.0	Soil
892B-25	931	0.96	Soil
892B-26	744	2.9	Soil
892B-27	739	0.13	Soil
892B-28	611	0.33	Soil
892B-29	112	0.83	Soil

(a) Priority pollutant sample location is within 5 feet of corresponding TCDD sample.

(b) Composite soil taken from both sides of the street.

TABLE 4-1 (cont'd)

PRIORITY POLLUTANT TCDD SAMPLE NUMBER AND TYPE

80 LISTER AVENUE

SAMPLE NUMBER	TCDD NUMBER (a)	TCDD CONCENTRATION ppb	SAMPLE TYPE
892B-30	117	4.1	Soil
892B-31	524	0.92	Soil
892B-32	627	0.10	Soil
892B-33	776	0.07	Soil
892B-34	772	0.14	Soil
892B-35	95	0.16	Soil
892B-36	572	0.46	Soil
892B-37	570	0.99	Soil
892B-38	540	0.26	Soil
892B-39	538	0.05	Soil
892B-40	584	0.71	Soil
892B-41	600	1.1	Soil
892B-42	412	0.09	Soil
892B-43	436	0.44	Soil
892B-44	581	1.3	Soil
892B-45	451	0.14	Soil

(a) Priority pollutant sample location is within 5 feet of corresponding TCDD sample.

5.0 FINDINGS

Table 5-1 provides the analytical results for thirty-five (35) Priority Pollutant soil samples collected on December 7 and 8, 1983, in the study area. Significant results are summarized below. Also provided are the corresponding TCDD values.

TCDD was detected at all thirty-five (35) sample locations. Values ranged from 0.07 ppb to 4.1 ppb.

The following organic priority pollutants were detected:

- Acenaphthene was detected in sample numbers 892B-4, 892B-28, 892B-29, 892B-35, 892B-36, and 892B-40. Concentrations ranged from 0.15 mg/kg to 1.9 mg/kg. Figure 5-1 shows the locations of these samples.

- 1,2,4-trichlorobenzene was detected in sample 892B-28 at 0.45 mg/kg. Figure 5-2 shows the location of this sample.

- Hexachlorobenzene was detected in sample numbers 892B-12, 892B-13, 892B-22, 892B-40, 892B-43, and 892B-45. Concentrations ranged from 0.13 mg/kg to 1.1 mg/kg. Figure 5-3 shows the locations of these samples.

- 1,3-Dichlorobenzene was detected in sample 892B-28 at 0.21 mg/kg. Figure 5-4 shows the location of this sample.

- Fluoranthene was detected in all samples except 892B-24 and 892B-37. Concentrations ranged from 0.18 mg/kg to 32 mg/kg. Figure 5-5 shows the locations of these samples.

- Isophorone was detected in sample 892B-44 at 3.7 mg/kg. Figure 5-6 shows the location of this sample.

- Naphthalene was detected in sixteen (16) samples. Concentrations ranged from less than 0.1 mg/kg to 1.4 mg/kg. Figure 5-7 shows the locations of these samples.

- o N-nitrosodiphenylamine was detected in sample numbers 892B-8, 892B-22, and 892B-31. Concentrations ranged from 0.38 mg/kg to 3.1 mg/kg. Figure 5-8 shows the locations of these samples.

- o Several phthalate esters were detected in all samples except 892B-26 and 892B-39. Concentrations ranged from not detected to 110 mg/kg. Figure 5-9 shows the locations of these samples.

- o Polynuclear Aromatic Hydrocarbons (PAH's) were detected in all thirty-five (35) samples taken. Concentrations ranged from not detected to 87 mg/kg. Figure 5-10 shows the locations of these samples.

- o Pentachlorophenol was detected in 892B-13 at 0.13 mg/kg. Figure 5-11 shows the location of this sample.

- o Phenol was detected in sample numbers 892B-8, 892B-31, and 892B-40. Concentrations ranged from 0.17 mg/kg to 0.69 mg/kg. Figure 5-12 shows the locations of these samples.

- o Benzene was detected in sample 892B-26 at 0.18 mg/kg. Figure 5-13 shows the location of this sample.

- o Carbon tetrachloride was detected in sample 892B-43 at less than 0.10 mg/kg. Figure 5-14 shows the location of this sample.

- o Ethylbenzene was detected in sample 892B-44 at 0.13 mg/kg. Figure 5-15 shows the location of this sample.

- o Methylene Chloride was detected in samples 892B-44 and 892B-45 at 5.7 mg/kg and 15 mg/kg respectively. Figure 5-16 shows the locations of these samples.

- o Trichlorofluoromethane was detected in sample numbers 892B-1, 892B-2, and 892B-25. Concentrations ranged from 0.11 mg/kg to 1.7 mg/kg. Figure 5-17 shows the locations of these samples.

- Toluene was detected in samples 892B-1, 892B-25, 892B-26, 892B-43, 892B-44 and 892B-45. Concentrations ranged from 0.11 mg/kg to 1.7 mg/kg. Figure 5-18 shows the locations of these samples.

- Aldrin was detected in sample 892B-27 at 0.01 mg/kg. Figure 5-19 shows the location of this sample.

- Dieldrin was detected in sample numbers 892B-4, 892B-23, 892B-32, 892B-40, and 892B-43. Concentrations ranged from 0.02 mg/kg to 0.09 mg/kg. Figure 5-20 shows the locations of these samples.

- Chlordane was detected in sample numbers 892B-24, 892B-32, 892B-37, and 892B-42. Concentrations ranged from 0.64 mg/kg to 2.7 mg/kg. Figure 5-21 shows the locations of these samples.

- 4,4-DDT, 4,4-DDE and 4,4-DDD were detected in twenty-three (23) samples. Concentrations ranged from 0.01 mg/kg to 7.7 mg/kg. Figure 5-22 shows the locations of these samples.

- Endrin was detected in sample 892B-4 at 0.04 mg/kg. Figure 5-23 shows the location of this sample.

The following inorganic priority pollutants were detected:

- Aluminum was detected in all thirty-five (35) samples. Concentrations ranged from 360 mg/kg to 3,600 mg/kg. Figure 5-24 shows the locations of these samples.

- Chromium was detected in all thirty-five (35) samples. Concentrations ranged from 4.7 gm/kg to 51 mg/kg. Figure 5-25 shows the locations of these samples.

- Barium was detected in all thirty-five (35) samples. Concentrations ranged from 6.9 mg/kg to 250 mg/kg. Figure 5-26 shows the locations of these samples.

- Beryllium was detected in fifteen (15) samples. Concentrations ranged from 0.25 mg/kg to 0.55 mg/kg. Figure 5-27 shows the locations of these samples.

- Cadmium was detected in thirty-one (31) samples. Concentrations ranged from 0.23 mg/kg to 7.1 mg/kg. Figure 5-28 shows the locations of these samples.

- Cobalt was detected in eleven (11) samples. Concentrations ranged from 2.7 mg/kg to 5.1 mg/kg. Figure 5-29 shows the locations of these samples.

- Copper was detected in all thirty-five (35) samples. Concentrations ranged from 12 mg/kg to 1,200 mg/kg. Figure 5-30 shows the locations of these samples.

- Iron was detected in all thirty-five (35) samples. Concentrations ranged from 1,800 mg/kg to 24,000 mg/kg. Figure 5-31 shows the locations of these samples.

- Lead was detected in all thirty-five (35) samples. Concentrations ranged from 71 mg/kg to 1,600 mg/kg. Figure 5-32 shows the locations of these samples.

- Nickel was detected in all thirty-five (35) samples. Concentrations ranged from 2.1 mg/kg to 48 mg/kg. Figure 5-33 shows the locations of these samples.

- Manganese was detected in all thirty-five (35) samples. Concentrations ranged from 71 mg/kg to 2,100 mg/kg. Figure 5-34 shows the locations of these samples.

- Zinc was detected in all thirty-five (35) samples. Concentrations ranged from 60 mg/kg to 960 mg/kg. Figure 5-35 shows the locations of these samples.

- Vanadium was detected in twenty-eight (28) samples. Concentrations ranged from 9.0 mg/kg to 54 mg/kg. Figure 5-36 shows the locations of these samples.

- Arsenic was detected in sample numbers 892B-26, 892B-28, and 892B-44. Concentrations ranged from 6.2 mg/kg to 43 mg/kg. Figure 5-37 shows the locations of these samples.

- Antimony was detected in seven (7) samples. Concentrations ranged from 1.5 mg/kg to 4.3 mg/kg. Figure 5-38 shows the locations of these samples.

- Mercury was detected in thirty-two (32) samples. Concentrations ranged from 0.054 mg/kg to 1.7 mg/kg. Figure 5-39 shows the locations of these samples.

- Tin was detected in eight (8) samples. Concentrations ranged from 1.4 mg/kg to 11 mg/kg. Figure 5-40 shows the locations of these samples.

- Silver was detected in seventeen (17) samples. Concentrations ranged from 0.5 mg/kg to 2.0 mg/kg. Figure 5-41 shows the locations of these samples.

TABLE 5-1
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS

SAMPLE NUMBER

BASE NEUTRAL EXTRACTABLES	8928-1d	8928-2d	8928-3d	8928-4d	8928-5d	8928-6d	8928-7d	8928-8d	Field Blank[a]	Field Blank	8928-11d	8928-12d	8928-13d
Acenaphthene	e			<1.0									
Benzidine	e												
1,2,4 - Trichlorobenzene	e												
Hexachlorobenzene	e											1.1	0.14
Hexachloroethane	e												
Bis(2-chloroethyl)ether	e												
2-Chloronaphthalene	e												
1,2 - Dichlorobenzene	e												
1,3 - Dichlorobenzene	e												
1,4 - Dichlorobenzene	e												
3,3 - Dichlorobenzidine	e												
2,4 - Dinitrotoluene	e												
2,6 - Dinitrotoluene	e												
1,2 - Diphenylhydrazine	e												
Fluoranthene	e	1.1	0.81	32	2.5	1.3	1.1	0.69			0.64	8.7	0.55
4 - Chlorophenyl phenyl ether	e												
4 - Bromophenyl phenyl ether	e												
Bis(2-chloroisopropyl)ether	e												
Bis(2-chloroethoxy)methane	e												
Hexachlorobutadiene	e												
Hexachlorocyclopentadiene	e												
Isophorone	e												
Naphthalene	e			<1.0	0.5								
Nitrobenzene	e												
N-nitrosodimethylamine	e												
N-nitrosodiphenylamine	e							3.1					
N-nitrosodi-n-propylamine	e												
Bis(2-ethylhexyl) phthalate	e	16	1.2	2.2	1.5	5.5	17	8.8			0.93	1.0	0.73
Butyl benzyl phthalate	e					1.1	2.9	0.88			0.16		0.13
Di-n-butyl phthalate	e			1.9	1.2		<1.0	2.3		0.75		0.53	2.5
Di-n-octyl phthalate	e												
Diethyl phthalate	e												
Dimethyl phthalate	e												
Benzo(a)anthracene (1,2-benzanthracene)	e		0.68	19	1.8	1.7	<1.0	0.74			0.45	22	0.38
Benzo(a) pyrene	e		0.5	19	1.2	1.6		<0.5			0.37	20	0.38
3,4 Benzo fluoranthene	e	2.2	1.9	44	3.8	5.1	3.1	1.9				87	1.4
Benzo(k) fluoranthene	e	2.2	1.9	44	3.8	5.1	3.1	1.9				87	1.4
Chrysene	e	1.2	0.81	16	1.8	1.8	1.2	0.83			0.47	21	0.52
Acenaphthylene	e							0.83	0.28	0.21		6.8	0.17

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS

SAMPLE NUMBER

BASE NEUTRAL EXTRACTABLES	8928-22[d]	8928-23[d]	8928-24[d]	8928-25[d]	8928-26[d]	8928-27[d]	8928-28[d]	8928-29[d]	8928-30[d]	8928-31[d]	8928-32[d]	8928-33[d]	8928-34[d]
Acenaphthene							0.15	.59					e
Benzidine													e
1,2,4 - Trichlorobenzene							0.45						e
Hexachlorobenzene	0.97												e
Hexachloroethane													e
Bis(2-chloroethyl)ether													e
2-Chloronaphthalene													e
1,2 - Dichlorobenzene													e
1,3 - Dichlorobenzene							0.21						e
1,4 - Dichlorobenzene													e
3,3 - Dichlorobenzidine													e
2,4 - Dinitrotoluene													e
2,6 - Dinitrotoluene													e
1,2 - Diphenylhydrazine													e
Fluoranthene	0.97	0.96		0.95	1.1	0.56	3.0	6.1	1.5	1.0	2.1	.83	e
4 - Chlorophenyl phenyl ether													e
4 - Bromophenyl phenyl ether													e
Bis(2-chloroisopropyl)ether													e
Bis(2-chloroethoxy)methane													e
Hexachlorobutadiene													e
Hexachlorocyclopentadiene													e
Isophorone													e
Naphthalene	0.13	<0.1			0.15	0.14	1.1	.51		.27			e
Nitrobenzene													e
N-nitrosodimethylamine													e
N-nitrosodiphenylamine	0.75									.38			e
N-nitrosodi-n-propylamine													e
Bis(2-ethylhexyl) phthalate	2.9	3.3	54	6.5		0.46	2.6	2.6	4.3	4.6	.71	2.5	e
Butyl benzyl phthalate	0.23	0.37	<5	0.59			0.23	.25	.33	.56	.15	.59	e
Di-n-butyl phthalate	0.41	0.24		<0.5		0.12	0.19	.31	.14	.52	1.4	.60	e
Di-n-octyl phthalate		<0.1					0.16	.15	.16	.17			e
Diethyl phthalate													e
Dimethyl phthalate													e
Benzo(a)anthracene (1,2-benzanthracene)	0.78	0.75		0.75	0.81	0.43	1.6	3.1	.78	.59	1.4	.47	e
Benzo(a) pyrene	0.68	0.60		1.0	0.61	0.43	1.1	3.4	.79	1.3	1.5	.54	e
3,4 Benzo fluoranthene	2.8	2.3		3.3	0.94	1.5	6.3	4.4	1.4	2.3	2.5	.74	e
Benzo(k) fluoranthene	2.8	2.3		3.3	0.94	1.5	6.3	4.4	1.4	2.3	2.5	.74	e
Chrysene	0.81	0.74		1.0	0.93	0.43	2.1	3.1	.81	.73	1.5	.47	e
Acenaphthylene				<0.5	0.23								e

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

BASE NEUTRAL EXTRACTABLES	8928-35[d]	8928-36[d]	8928-37[d]	8928-38[d]	8928-39[d]	8928-40[d]	8928-41[d]	8928-42[d]	8928-43[d]	8928-44[d]	8928-45[d]	Field Blank[d]	Field Blank[d]
Acenaphthene	1.9	1.4				0.37							
Benzidine													
1,2,4 - Trichlorobenzene													
Hexachlorobenzene						0.13			0.18		0.14		
Hexachloroethane													
Bis(2-chloroethyl)ether													
2-Chloronaphthalene													
1,2 - Dichlorobenzene													
1,3 - Dichlorobenzene													
1,4 - Dichlorobenzene													
3,3 - Dichlorobenzidine													
2,4 - Dinitrotoluene													
2,6 - Dinitrotoluene													
1,2 - Diphenylhydrazine													
Fluoranthene	20	28		0.65	0.18	5.6	0.89	0.48	0.52	<1.0	2.1		
4 - Chlorophenyl phenyl ether													
4 - Bromophenyl phenyl ether													
Bis(2-chloroisopropyl)ether													
Bis(2-chloroethoxy)methane													
Hexachlorobutadiene													
Hexachlorocyclopentadiene													
Isophorone										3.7			
Naphthalene	.53	2.2		0.11	0.14	0.24				1.4	0.12		
Nitrobenzene													
N-nitrosodimethylamine													
N-nitrosodiphenylamine													
N-nitrosodi-n-propylamine													
Bis(2-ethylhexyl) phthalate	1.4	1.1	12			2.6		1.5	0.41	3.6	0.32		
Butyl benzyl phthalate				0.12		0.69	0.32		0.18		0.12		
Di-n-butyl phthalate		0.44								110		1.6	
Di-n-octyl phthalate													
Diethyl phthalate													
Dimethyl phthalate													
Benzo(a)anthracene (1,2-benzanthracene)	8.7	23		0.46	0.13	3.5	0.62	0.32	0.31	<1.0	1.6		
Benzo(a) pyrene	9.4	8.9		0.53	0.14	2.7	0.75	0.44	0.38		2.2		
3,4 Benzo fluoranthene	23	29		0.90	0.14	3.9	0.97	1.1	1.4	3.0	3.5		
Benzo(k) fluoranthene	23	29		0.90	0.14	3.9	0.97	1.1	1.4	3.0	3.5		
Chrysene	9.1	15		0.53	0.15	2.6	0.61	0.33	0.41	<1.0	1.7		
Acenaphthylene		2.5											

NOTES: Blank spaces indicate that the chemical was not detected
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- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed

TABLE 5-1(Cont'd)

RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

BASE NEUTRAL EXTRACTABLES (cont'd.)	892B-1d	892B-2d	892B-3d	892B-4d	892B-5d	892B-6d	892B-7d	892B-8d	Field Blank c	Field Blank d	892B-11d	892B-12d	892B-13d
Anthracene	e			4.4							0.11	4.5	0.18
Benzo(ghi) perylene (1,12-Benzoperylene)	e		<0.5	9.2	0.5	<1.0	<1.0	0.78			0.37	9.2	0.3
Fluorene	e												
Phenanthrene	e		0.68	18	1.5	1.0		<0.5	0.2		0.42	1.4	0.5
Dibenzo(a,h) anthracene (1,2,5,6-dibenzanthracene)	e			2.6							0.12	3.5	
Indeno (1,2,3-cd) pyrene	e		<0.5	11	1.2	1.3		0.54			0.38	13	0.33
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (b)	1.4	0.13	0.09	0.78	1.0	0.56	3.4	1.2			0.2	0.65	0.89
Pyrene	e	1.5	0.72	28	2.0	1.6	1.6	0.69			0.55	22	0.51
2-Methyl naphthalene (g)	e			<1.0									
Undecane (g)	10.1										0.7		
Dodecane (g)	14.1												
Tridecane (g)	16.8												
Tetradecane (g)	22.6												
Heptadecane (g)	42.3												
Nonadecane (g)	43.5												
Heneicosane (g)	23.6												
5-Propyl-Tridecane (g)	20.7	1.1											
2,3,5-Trimethyl-Decane (g)	39.8												
2,6,10,14-Tetramethyl Heptadecane (g)	36.6												
2-Pentanone, 4-Hydroxy-4-Methyl (g)		e	e	e	e	e	e	e	e	44.9	e	e	e
Pentacosane (g)			e					2.8					
Hexadecanoicacid (g)			e	11.8				4.7			1.6		
Eicosane (g)			e										
Benzoic Acid (g)				<1.0									
2 Methyl, 1-Heptene (g)								6.9			2.6	6.2	
3,4-Dimethyl, 2-Pentene (g)								5.4					
4-Methyl-3-Penten-2-one (g)											3.1		
Propanoicacid, Ethenylester (g)											0.9		
3-Methyl-2-Hexene-1-01 (g)											1.3		
Octadecanoicacid (g)											1.5		
2,3 Dimethyl-2-Pentene (g)												3.4	
Benzo (J) Fluoranthene (g)												5.9	

NOTES: Blank spaces indicate that the chemical was not detected
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- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
- g - Not priority pollutant

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

BASE NEUTRAL EXTRACTABLES (cont'd.)	8928-22[d]	8928-23[d]	8928-24[d]	8928-25[d]	8928-26[d]	8928-27[d]	8928-28[d]	8928-29[d]	8928-30[d]	8928-31[d]	8928-32[d]	8928-33[d]	8928-34[d]
Anthracene	0.23	0.20			0.26	0.12	0.90	1.3	0.24	0.28	0.42	0.20	e
Benzo(ghi) perylene (1,12-Benzoperylene)	0.56	0.46		0.52	0.51	0.26	0.70	1.5	0.50	0.77	0.84	0.23	e
Fluorene													e
Phenanthrene	0.61	0.69	<5	0.88	0.75	0.33	1.4	6.0	0.95	0.79	1.7	1.0	e
Dibenzo(a,h) anthracene (1,2,5,6-dibenzanthracene)	0.25	0.14			0.19		0.29	0.60		0.13	0.31		e
Indeno (1,2,3-cd) pyrene	0.53	0.48		<0.5	0.61	0.30	0.91	1.7	0.56	0.61	0.90	0.26	e
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (d)	1.9	0.14	1.0	0.96	2.9	0.13	0.33	0.83	4.1	0.92	0.1	0.07	0.14
Pyrene	0.96	0.86		0.85	1.0	0.56	2.6	5.5	1.4	0.93	1.9	0.72	e
2-Methyl-1-Heptene (g)	2.7	1.9			1.0				2.0	1.6	2.6	1.9	
Hexadecanoic Acid (g)	1.4	1.3							2.5	2.1		2.6	
Pentacosane (g)	0.7								3.9				
Pentatriacontane (g)	0.7	1.1							1.7				
2,3-Dimethyl-2-Pentene (g)		0.6											
BromoPentaFluorobenzene (g)		1.3											
Octadecanol (g)		1.8							1.3				
Hexadecanol (g)		0.4											
2-Methyl-2-Hexanol (g)							11.7						
2,6-BIS (1,1-Dimethylethyl)-2,5-Cyclohexadiene-1,4-Dione (g)				2.4									
Benzene,1,1[1]Thoibis-,Tetrachloroderiv. (g)				1.8									
1,3,5-Triazine-2,4-Diamine, 6-C (g)					1.1								
DiBenzofuran (g)							0.46						
2-Methylnaphthalene (g)							0.74						
Urea, N, N[1]-BIS(2,4-Dichlorophen) (g)							2.8						
Propanoic Acid, 2-Methyl-,2-Meth (g)								3.2	1.7	1.2			
Henetcosane (g)									1.1				
Bicyclo/3.1.0/Hexane,4-Methyle (g)										1.1			
DiBenzoFuran (g)													
2,4-DiMethyl-2-Pentanol (g)													
2-Pentene, 4,4-Dimethyl- (Z)- (g)													
2,6,10,14,18,22-Tetracosahexae (g)													
7-Hexyleicosane (g)													
Cyclohexene, 4-Methylene-1-(1-M (g)													
2,2-DimethylDecane (g)													
6-Ethyl-2-Methyl Octane (g)													
2,2,3-Trimethylnonane (g)													
2,5,5-TrimethylHeptane (g)													
2,2,4-TrimethylHeptane (g)													
1,2-BenzeneDicarboxylic Acid, DI (g)													
6-Methyl-3-Heptanol (g)													
2-Pentanone, 4-Hydroxy-4-Methyl (g)	e		e	e	e	e		e	e	e	e	e	

NOTES: Blank spaces indicate that the chemical was not detected
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- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
- q - Not a priority pollutant

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

BASE NEUTRAL EXTRACTABLES (cont'd.)	8928-35[d]	8928-36[d]	8928-37[d]	8928-38[d]	8928-39[d]	8928-40[d]	8928-41[d]	8928-42[d]	8928-43[d]	8928-44[d]	8928-45[d]	Field Blank[d]	Field Blank[d]
Anthracene	2.9	2.5		0.13	0.19	0.82	0.15	0.13	0.12		0.41	0.12	
Benzo(ghi) perylene (1,12-Benzoperylene)	3.4	4.1		0.31		1.2	0.40						
Fluorene	1.4	1.4											
Phenanthrene	19	21	0.5			4.4		0.39	0.44	1.5	0.13		
Dibenzo(a,h) anthracene (1,2,5,6-dibenzanthracene)	.94	1.2				0.39							
Indeno (1,2,3-cd) pyrene	3.8	4.4		0.32		1.4	0.34		0.20		0.67		
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD) (b)	0.16	0.46	0.99	0.26	0.05	0.71	1.1	0.09	0.44	1.3	0.14		
Pyrene	16	23		0.69	0.15	5.2	0.84	0.44	0.48	<1.0	1.9		
2-Methyl-1-Heptene (g)						2.2							
Hexadecanoic Acid (g)													
Pentacosane (g)				2.9					1.9	17.6			
Pentatriacontane (g)				2.2		3.9			6.4	15.5			
2,3-Dimethyl-2-Pentene (g)													
BromoPentaFluorobenzene (g)													
Octadecanol (g)													
Hexadecanol (g)													
2-Methyl-2-Hexanol (g)													
2,6-BIS (1,1-Dimethylethyl)-2,5-Cyclohexadiene-1,4-Dione (g)													
Benzene, 1,1[1]-Thoibis-,Terrachloroderiv. (g)													
1,3,5-Triazine-2,4-Diamine, 6-C (g)													
2-Methylnaphthalene (g)		0.60				0.12				<1.0			
Urea, N, N[1]-BIS (2,4-Dichlorophen) (g)													
Propanoic Acid, 2-Methyl-,2-Meth (g)				1.1				3.4	2.6				
Heneicosane (g)													
Bicyclo/3.1.0/Hexane,4-Methyle (g)													
DiBenzoFuran (g)	1.0	1.2				0.21							
2,4-DiMethyl-2-Pentanol (g)					e								
2-Pentene, 4,4-Dimethyl- (Z)- (g)						2.3							
2,6,10,14,18,22-Tetracosahexae (g)						3.8							
7-Hexyleicosane (g)							3.7						
Cyclohexene, 4-Methylene-1-(1-M (g)										61.1			
2,2-DimethylDecane (g)										42.7			
6-Ethyl-2-Methyl Octane (g)										63.7			
2,2,3-Trimethylnonane (g)										60.9			
2,5,5-TrimethylHeptane (g)										33.7			
2,2,4-TrimethylHeptane (g)										29.8			
1,2-BenzeneDicarboxylic Acid, DI (g)										71.8			
6-Methyl-3-Heptanol (g)												e	
2-Pentanone, 4-Hydroxy-4-Methyl (g)	e	e	e	e				e	e	e	e		

NOTES: Blank spaces indicate that the chemical was not detected

a - Concentrations in ug/l
b - Concentrations in ug/kg
c - Concentrations in mg/l
d - Concentrations in mg/kg
e - Analysis did not pass QA/QC requirements
f - Analysis was not performed
g - Not priority pollutant

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

ACID COMPOUNDS	8928-1[d]	8928-2[d]	8928-3[d]	8928-4[d]	8928-5[d]	8928-6[d]	8928-7[d]	8928-8[d]	Field Blank[d]	Field Blank[d]	8928-11[d]	8928-12[d]	8928-13[d]
2,4,6-Trichlore[illegible]	e												
p-Chloro-m-cres[illegible]	e												
2-Chlorophenol	e												
2,4-Dichlorophenol	e												
2,4-Dimethylphenol	e												
2-Nitrophenol	e												
4-Nitrophenol	e												
2,4-Dinitrophenol	e												
4,6-Dinitro-o-cresol	e												
Pentachlorophenol	e												0.13
Phenol	e							0.69					
Benzonic Acid (g)													

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
- g - Not priority pollutant

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS

SAMPLE NUMBER

ACID COMPOUNDS	8928-22[d]	8928-23[d]	8928-24[d]	8928-25[d]	8928-26[d]	8928-27[d]	8928-28[d]	8928-29[d]	8928-30[d]	8928-31[d]	8928-32[d]	8928-33[d]	8928-34[d]
2,4,6-Trichlorophenol													e
p-Chloro-m-cresol													e
2-Chlorophenol													e
2,4-Dichlorophenol													e
2,4-Dimethylphenol													e
2-Nitrophenol													e
4-Nitrophenol													e
2,4-Dinitrophenol													e
4,6-Dinitro-o-cresol													e
Pentachlorophenol													e
Phenol										.17			e
Benzoic Acid (g)	0.49	0.48					0.63	.54		.61		.12	e

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
- g - Not priority pollutant

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

ACID COMPOUNDS	892B-35[d]	892B-36[d]	892B-37[d]	892B-38[d]	892B-39[d]	892B-40[d]	892B-41[d]	892B-42[d]	892B-43[d]	892B-44[d]	892B-45[d]	Field Blank[d]	Field Blank[d]
2,4,6-Trichlorophenol													
p-Chloro-m-cresol													
2-Chlorophenol													
2,4-Dichlorophenol													
2,4-Dimethylphenol													
2-Nitrophenol													
4-Nitrophenol													
2,4-Dinitrophenol													
4,6-Dinitro-o-cresol													
Pentachlorophenol													
Phenol						0.24							
Benzoic Acid (g)						0.67	0.38						

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
- g - Not priority pollutant

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

VOLATILES	892B-1[d]	892B-2[d]	892B-3[d]	892B-4[d]	892B-5[d]	892B-6[d]	892B-7[d]	892B-8[d]	Field Blank	Field Blank	892B-11[d]	892B-12[d]	892B-13[d]
Acrolein													
Acrylonitrile													
Benzene													
Carbon tetrachloride													
Chlorobenzene													
1,2-Dichloroethane													
1,1,1-Trichloroethane													
1,1-Dichloroethane													
1,1,2-Trichloroethane													
1,1,2,2-Tetrachloroethane													
Chloroethane													
2-Chloroethyl vinyl ether (mixed)													
Chloroform													
1,1-Dichloroethylene													
1,2-trans-Dichloroethylene													
1,2-Dichloropropane													
1,3-Dichloropropylene (1,3-Dichloropropene)													
Ethylbenzene													
Methylene chloride (Dichloromethane)													
Methyl chloride (Chloromethane)													
Methyl bromide (Bromomethane)													
Bromoform (Tribromomethane)													
Bromodichloromethane													
Trichlorofluoromethane	0.12	1.0											
Dichlorodifluoromethane													
Chlorodibromomethane													
Tetrachloroethene (Tetrachloroethylene)													
Toluene	0.24												
Trichloroethene (Trichloroethylene)													
Vinyl chloride													
Xylenes (Total) (g)		0.9						0.22					

NOTES: Blank spaces indicate that the chemical was not detected
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- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
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TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

VOLATILES	8928-22[d]	8928-23[d]	8928-24[d]	8928-25[d]	8928-26[d]	8928-27[d]	8928-28[d]	8928-29[d]	8928-30[d]	8928-31[d]	8928-32[d]	8928-33[d]	8928-34[d]
Acrolein													
Acrylonitrile													
Benzene					0.18								
Carbon tetrachloride													
Chlorobenzene													
1,2-Dichloroethane													
1,1,1-Trichloroethane													
1,1-Dichloroethane													
1,1,2-Trichloroethane													
1,1,2,2-Tetrachloroethane													
Chloroethane													
2-Chloroethyl vinyl ether (mixed)													
Chloroform													
1,1-Dichloroethylene													
1,2-trans-Dichloroethylene													
1,2-Dichloropropane													
1,3-Dichloropropylene (1,3-Dichloropropene)													
Ethylbenzene													
Methylene chloride (Dichloromethane)													
Methyl chloride (Chloromethane)													
Methyl bromide (Bromomethane)													
Bromoform (Tribromomethane)													
Bromodichloromethane													
Trichlorofluoromethane				0.20									
Dichlorodifluoromethane													
Chlorodibromomethane													
Tetrachloroethene (Tetrachloroethylene)													
Toluene				0.13	0.11								
Trichloroethene (Trichloroethylene)													
Vinyl chloride													
Xylenes (Total) (g)	0.29												

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
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TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

VOLATILES	8928-35[d]	8928-36[d]	8928-37[d]	8928-38[d]	8928-39[d]	8928-40[d]	8928-41[d]	8928-42[d]	8928-43[d]	8928-44[d]	8928-45[d]	Field Blank[d]	Field Blank[d]
Acrolein													
Acrylonitrile													
Benzene													
Carbon tetrachloride									<0.10				
Chlorobenzene													
1,2-Dichloroethane													
1,1,1-Trichloroethane													
1,1-Dichloroethane													
1,1,2-Trichloroethane													
1,1,2,2-Tetrachloroethane													
Chloroethane													
2-Chloroethyl vinyl ether (mixed)													
Chloroform													
1,1-Dichloroethylene													
1,2-trans-Dichloroethylene													
1,2-Dichloropropane													
1,3-Dichloropropylene (1,3-Dichloropropene)													
Ethylbenzene										0.13			
Methylene chloride (Dichloromethane)										5.7	15		
Methyl chloride (Chloromethane)													
Methyl bromide (Bromomethane)													
Bromoform (Tribromomethane)													
Bromodichloromethane													
Trichlorofluoromethane													
Dichlorodifluoromethane													
Chlorodibromomethane													
Tetrachloroethene (Tetrachloroethylene)													
Toluene									0.36	1.7	0.22		
Trichloroethene (Trichloroethylene)													
Vinyl chloride													
Xylenes (Total) (g)										0.48			

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
- g - Not a priority pollutant

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

PESTICIDES	8928-1[d]	8928-2[d]	8928-3[d]	8928-4[d]	8928-5[d]	8928-6[d]	8928-7[d]	8928-8[d]	Field Blank[d]	Field Blank[d]	8928-11[d]	8928-12[d]	8928-13[d]
Aldrin	e												
Dieldrin	e			0.06[h]									
Chlordane	e												
4,4'-DDT	e		0.23[h]		0.74[h]						0.46[h]	5.6[h]	0.55[h]
4,4'-DDE	e		0.05[h]		0.11[h]						0.05[h]	1.5[h]	0.08[h]
4,4'-DDD	e		0.03[h]		0.26[h]						0.07[h]	2.0[h]	0.04[h]
∠-Endosulfan	e												
β -Endosulfan	e												
Endosulfan sulfate	e												
Endrin	e			0.04[h]									
Endrin aldehyde	e												
Heptachlor	e												
Heptachlor epoxide	e												
∠-BHC	e												
β -BHC	e												
σ -BHC	e												
Δ -BHC	e												
PCB-1242	e												
PCB-1254	e					e							
PCB-1221	e												
PCB-1232	e												
PCB-1248	e												
PCB-1260	e						e	e				e	
PCB-1016	e												
Toxaphene	e												

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed
- g - Not Priority Pollutants
- h- This flag applies to pesticides parameters where the identification has been performed using two column confirmation (as specified in Method 608), but the level is too low for verification of the compound by mass spectrometry.

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

PESTICIDES	8928-22[d]	8928-23[d]	8928-24[d]	8928-25[d]	8928-26[d]	8928-27[d]	8928-28[d]	8928-29[d]	8928-30[d]	8928-31[d]	8928-32[d]	8928-33[d]	8928-34[d]
Aldrin						0.01[h]							
Dieldrin		0.06[h]									.09[h]		e
Chlordane			0.64[h]								2.7[h]		e
4,4'-DDT	7.7[h]	0.82[h]	0.26[h]		<0.10[h]	<0.10[h]	1.4[h]	3.2[h]		.91[h]	.45[h]	e	e
4,4'-DDE	1.2[h]	0.06[h]	0.11[h]		0.01[h]	0.01[h]	0.11[h]	.26[h]		.18[h]	.10[h]		e
4,4'-DDD	0.91[h]	<0.10[h]	0.16[h]		<0.10[h]	<0.10[h]	0.22[h]	.53[h]		.09[h]	.11[h]		e
∝-Endosulfan													
β -Endosulfan													
Endosulfan sulfate													
Endrin													
Endrin aldehyde													
Heptachlor													
Heptachlor epoxide													
∝-BHC													
β -BHC													
σ -BHC (Lindane)													
Δ -BHC													
PCB-1242													
PCB-1254													
PCB-1221													
PCB-1232													
PCB-1248													
PCB-1260				e					e				
PCB-1016													
Toxaphene													

NOTES: Blank spaces indicate that the chemical was not detected

a - Concentrations in ug/l
b - Concentrations in ug/kg
c - Concentrations in mg/l
d - Concentrations in mg/kg
e - Analysis did not pass QA/QC requirements
f - Analysis was not performed
g - Not priority Pollutants

h - This flag applies to pesticides parameters where the identification has been performed using two column confirmation (as specified in Method 608), but the level is too low for verification of the compound by mass spectrometry.

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

ORGANICS — SAMPLE NUMBER

PESTICIDES	8928-35[d]	8928-36[d]	8928-37[d]	8928-38[d]	8928-39[d]	8928-40[d]	8928-41[d]	8928-42[d]	8928-43[d]	8928-44[d]	8928-45[d]	Field Blank[d]	Field Blank[d]
Aldrin													
Dieldrin						0.05[h]			0.02[h]				
Chlordane			1.3[h]					0.87					
4,4'-DDT		2.1[h]	0.56[h]	0.19[h]	<0.10[h]	1.1[h]	0.28[h]	0.35[h]	0.33[h]	0.68[h]	0.98[h]		
4,4'-DDE		.15[h]	0.11[h]	0.04[h]		0.11[h]	0.04[h]	0.45[h]	0.05[h]	0.17[h]	0.16[h]		
4,4'-DDD		.22[h]	<0.10[h]	0.04[h]		0.27[h]	0.03[h]	0.04[h]	0.04[h]	0.12[h]	0.12[h]		
∠-Endosulfan													
β -Endosulfan													
Endosulfan sulfate													
Endrin													
Endrin aldehyde													
Heptachlor													
Heptachlor epoxide													
∠-BHC													
β -BHC													
σ -BHC													
Δ -BHC													
PCB-1242													
PCB-1254													
PCB-1221													
PCB-1232													
PCB-1248													
PCB-1260	e												
PCB-1016													
Toxaphene													

NOTES: Blank spaces indicate that the chemical was not detected

a - Concentrations in ug/l
b - Concentrations in ug/kg
c - Concentrations in mg/l
d - Concentrations in mg/kg
e - Analysis did not pass QA/QC requirements
f - Analysis was not performed
g - Not priority Pollutants

h - This flag applies to pesticides parameters where the identification has been performed using two column confirmation (as specified in Method 608), but the level is too low for verification of the compound by mass spectrometry.

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

INORGANICS — SAMPLE NUMBER

	892B-1[d]	892B-2[d]	892B-3[d]	892B-4[d]	892B-5[d]	892B-6[d]	892B-7[d]	892B-8[d]	Sample Blank	Sample Blank	892B-11[d]	892B-12[d]	892B-13[d]
Aluminum	2500	1500	2500	2100	3000	3000	2500	2200			1800	1900	2500
Chromium	29	22	6.7	32	51	38	22	24			18	25	16
Barium	120	41	34	54	190	120	77	53			64	140	58
Beryllium				0.3			0.33				0.41	0.38	0.3
Cadmium	4.9	1.4		0.3	2.3	4.4	2.6	0.42			0.41	5.1	0.23
Cobalt												3.8	4.3
Copper	130	63	45	95	84	190	1200	92			87	120	110
Iron	19000	15000	5100	12000	10000	13000	13000	9000	15		6200	10,000	12000
Lead	1100	510	140	210	630	660	840	580		0.3	210	290	260
Nickel	26	27	9.8	26	18	26	48	18			33	17	16
Manganese	140	110	110	330	200	390	150	140			560	470	580
Zinc	530	300	200	320	620	930	730	580			750	860	480
Boron													
Vanadium	15	<10	9.0	27	30	18	12	9.3			<10	38	25
Arsenic	e	e	e	e	e	e	e	e			e	e	e
Antimony	3.0	1.5					2.8	2.5				3.0	
Selenium													e
Thallium													
Mercury	0.054	0.081	0.076		0.42	0.27	0.20	0.33			0.26	0.41	0.27
Tin		11		1.4	4.1	4.3		10			4.5	4.6	4.6
Silver	0.91					0.55	0.76	0.70				1.1	0.70

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

INORGANICS — **SAMPLE NUMBER**

	8928-22[d]	8928-23[d]	8928-24[d]	8928-25[d]	8928-26[d]	8928-27[d]	8928-28[d]	8928-29[d]	8928-30[d]	8928-31[d]	8928-32[d]	8928-33[d]	8928-34[d]
Aluminum	1900	2200	2500	2500	910	1800	940	1900	2300	1200	2900	1400	1200
Chromium	50	21	35	40	4.7	4.8	16	21	17	20	18	6.8	18
Barium	170	57	100	74	33	51	44	140	61	40	110	33	87
Beryllium	0.55	0.28	0.35	0.27		0.42					0.25		
Cadmium	2.2	1.2	7.1	2.1	0.3	0.46	1.1	2.9	1.5	1.5	1.3	0.46	8.3
Cobalt	5.1		4.4	4.0						2.7	2.7		
Copper	180	65	230	110	25	27	150	74	92	110	70	12	39
Iron	9500	6900	13000	12000	2600	3300	7900	24000	6300	5900	5600	1800	4200
Lead	700	320	480	460	86	71	190	380	290	750	480	1600	230
Nickel	22	12	33	19	3.8	3.9	8.9	17	14	25	8.8	2.1	5.7
Manganese	330	150	160	240	690	2100	170	240	260	99	430	96	71
Zinc	470	180	490	330	320	300	310	320	280	470	540	410	260
Boron													
Vanadium	54	15	17	24			27	22	21		23		
Arsenic	6.0	2.1	2.8	4.4	27	3.4	43	2.2	3.1	0.96	3.8	1.3	1.2
Antimony													
Selenium													
Thallium													
Mercury	0.54	0.31	0.39	0.68	0.24	0.09	0.39	0.43	0.37	0.68	0.64	1.7	0.45
Tin	e		e	e	e			e					
Silver	1.0			2.0			0.67			0.81	0.5	0.62	0.5

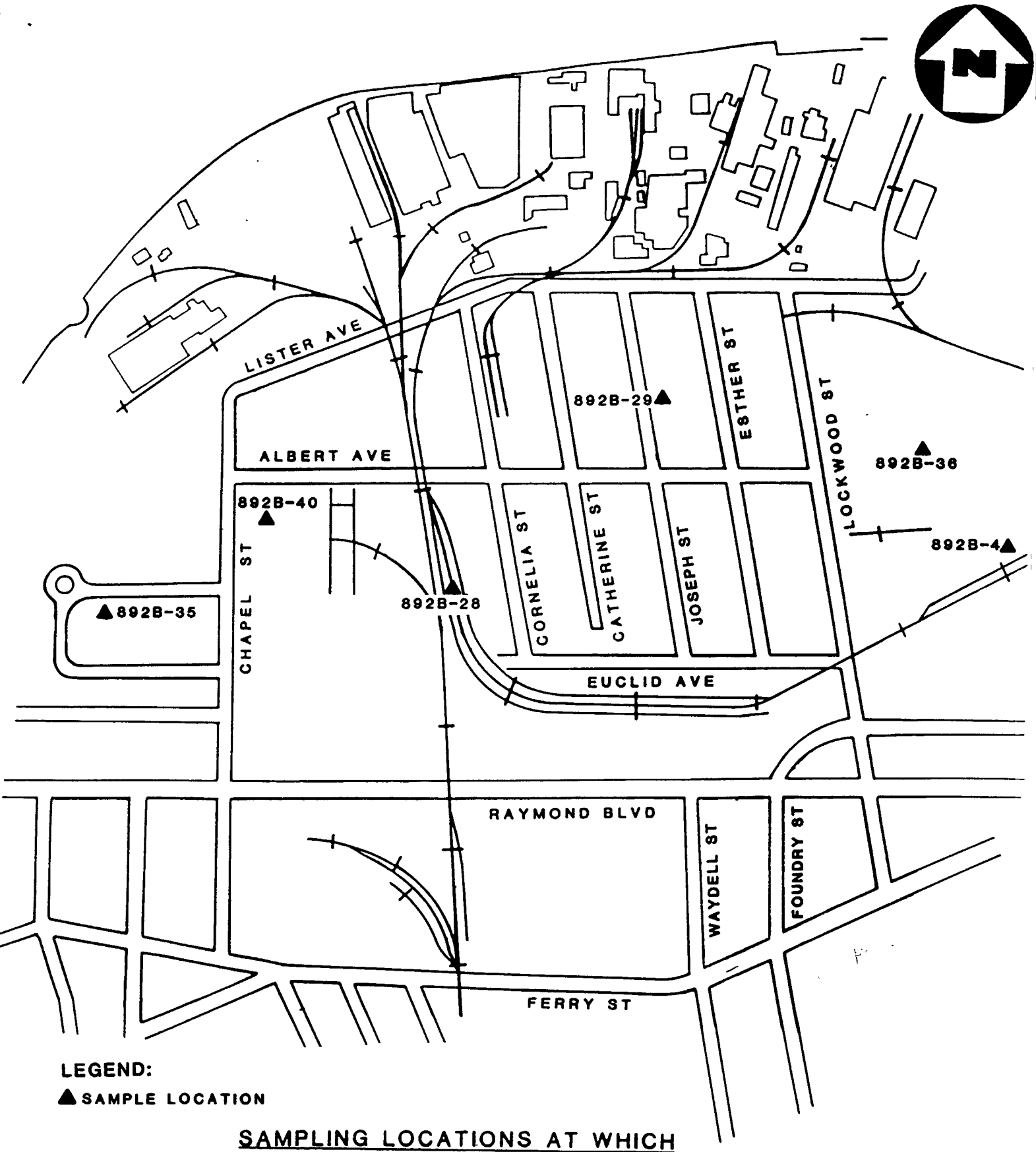
NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed

TABLE 5-1(Cont'd)
RESULTS OF PRIORITY POLLUTANT ANALYSIS

INORGANICS — **SAMPLE NUMBER**

	8928-35[d]	8928-36[d]	8928-37[d]	8928-38[d]	8928-39[d]	8928-40[d]	8928-41[d]	8928-42[d]	8928-43[d]	8928-44[d]	8928-45[d]	[d] Sample Blank	[d] Sample Blank
Aluminum	2600	910	2100	360	1400	570	2800	3690	2780	2400	2000		
Chromium	7.0	14	24	15	9.7	6.1	8.2	12	15	24	17		
Barium	28	24	160	10	170	6.9	70	43	43	97	250		
Beryllium		0.38	0.25						0.29	0.33			
Cadmium	1.2	0.52	1.7	0.32	1.7		0.87			2.6	1.9		
Cobalt		3.4	3.1		2.9						3.1		
Copper	160	82	90	49	120	63	44	41	30	240	120		
Iron	5100	8800	8800	3900	7000	2400	4700	4300	4800	11000	15000	30	2.7
Lead	160	190	1200	76	240	160	310	200	140	310	720		
Nickel	6.5	11	12	11	13	2.0	7.3	5.6	7.5	16	11		
Manganese	960	75	190	75	290	320	180	150	82	300	240		
Zinc	990	600	290	250	680	70	270	120	60	960	520	1.3	1.3
Boron													
Vanadium	14	20	31		12	13		12	26	19	17		
Arsenic	2.4	2.9	1.8		1.5					6.2	0.65		
Antimony		4.3	2.8										
Selenium													
Thallium													
Mercury	0.38	0.47	0.59			0.53	0.16	0.4	0.61	0.41	0.64		
Tin				e						e			
Silver		0.87	1.4		1.1					0.71			

NOTES: Blank spaces indicate that the chemical was not detected
- a - Concentrations in ug/l
- b - Concentrations in ug/kg
- c - Concentrations in mg/l
- d - Concentrations in mg/kg
- e - Analysis did not pass QA/QC requirements
- f - Analysis was not performed



LEGEND:

▲ SAMPLE LOCATION

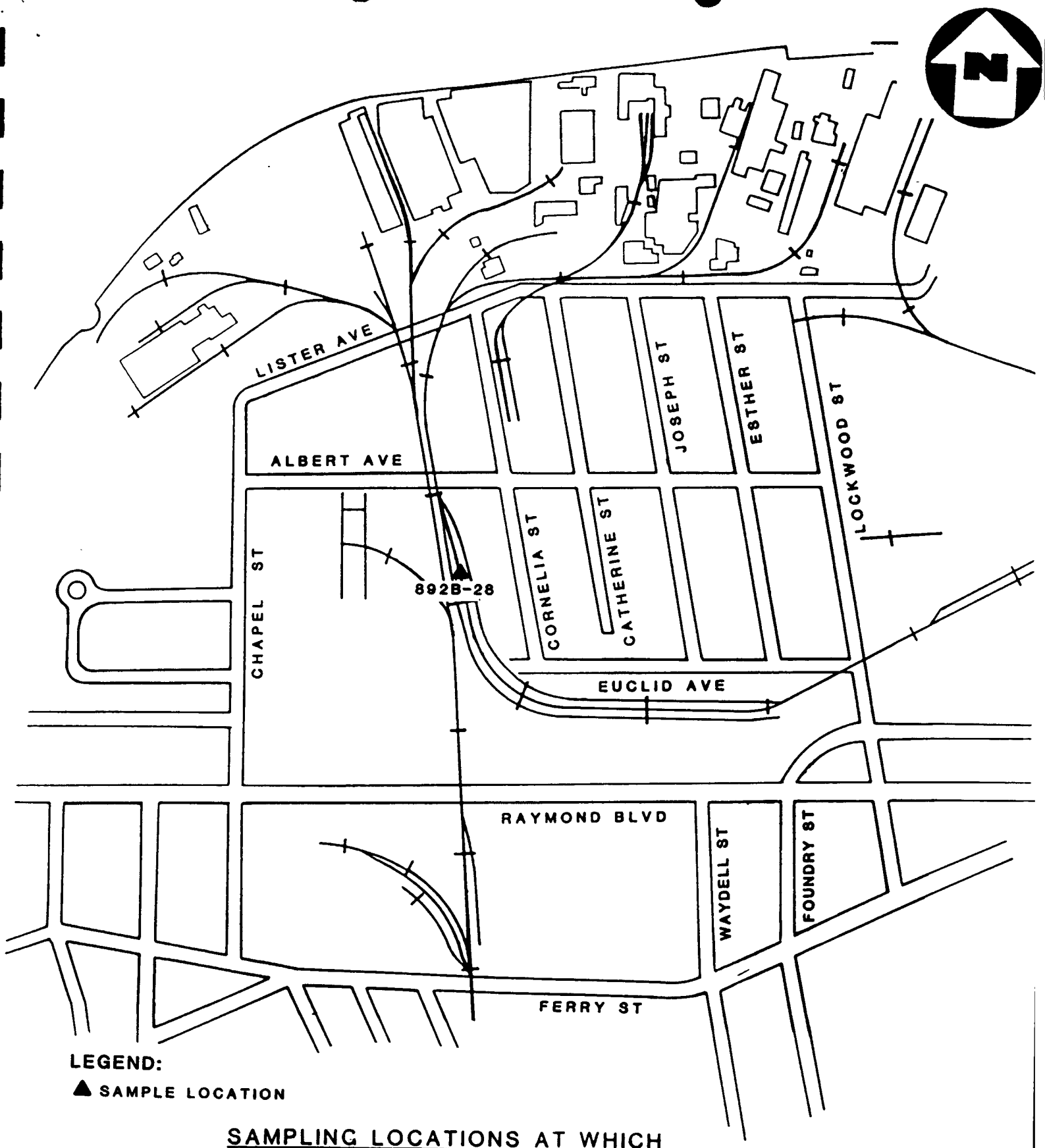
SAMPLING LOCATIONS AT WHICH ACENAPHTHENE WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-1

NUS CORPORATION

A Halliburton Company

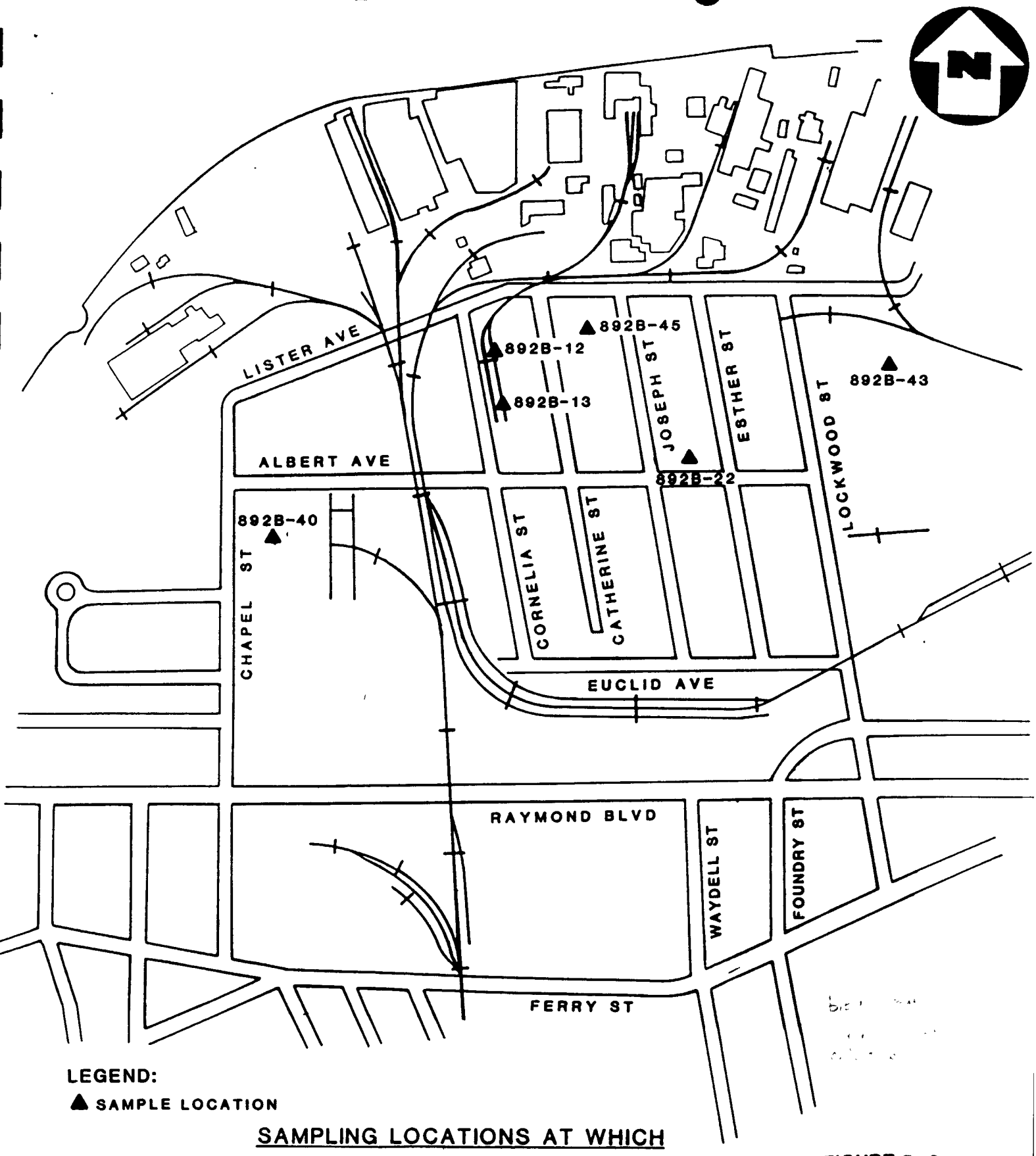


SAMPLING LOCATIONS AT WHICH
1, 2, 4-TRICHLOROBENZENE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-2

NUS CORPORATION
A Halliburton Company



LEGEND:

▲ SAMPLE LOCATION

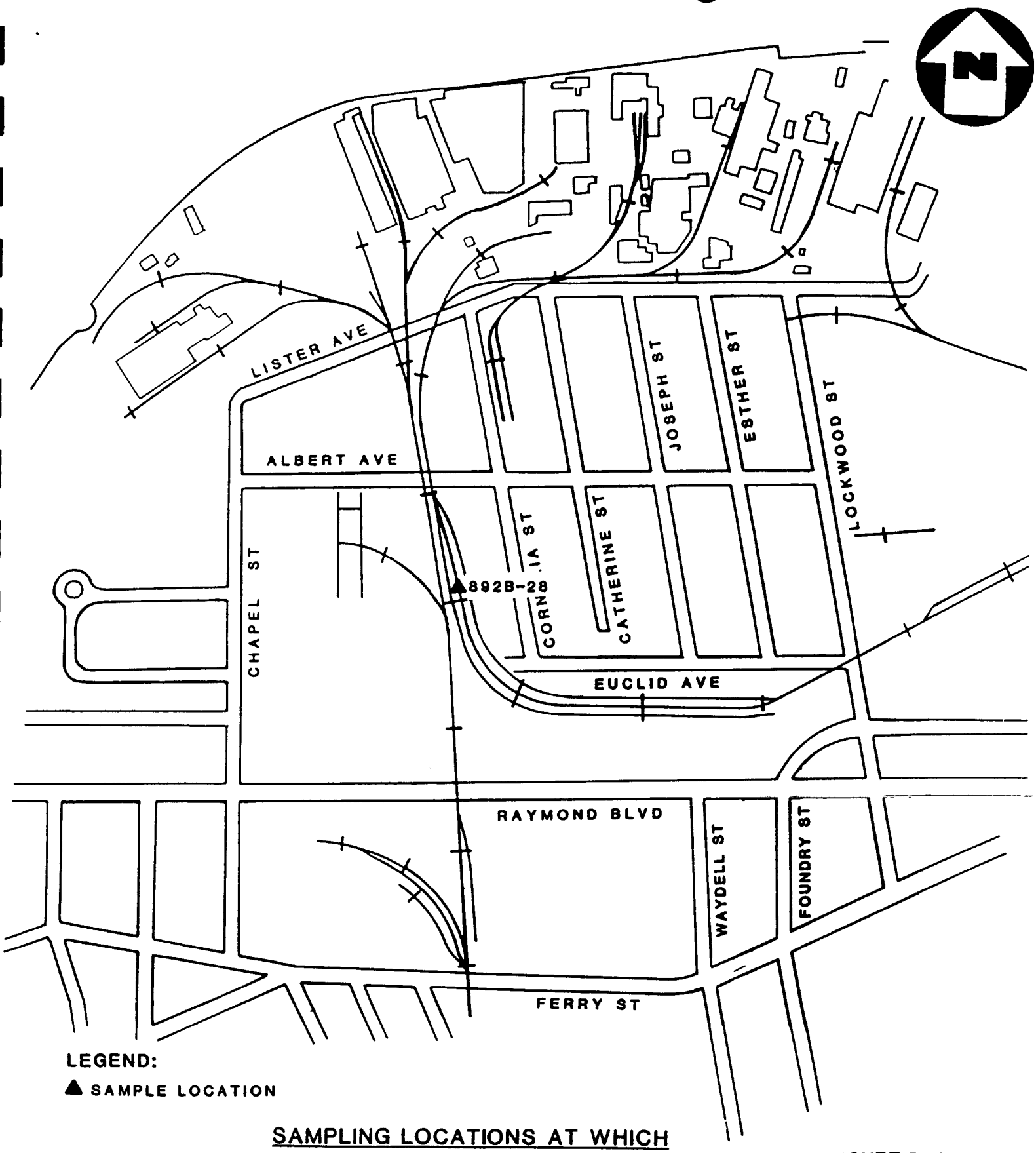
SAMPLING LOCATIONS AT WHICH HEXACHLOROBENZENE WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-3

NUS CORPORATION

A Halliburton Company

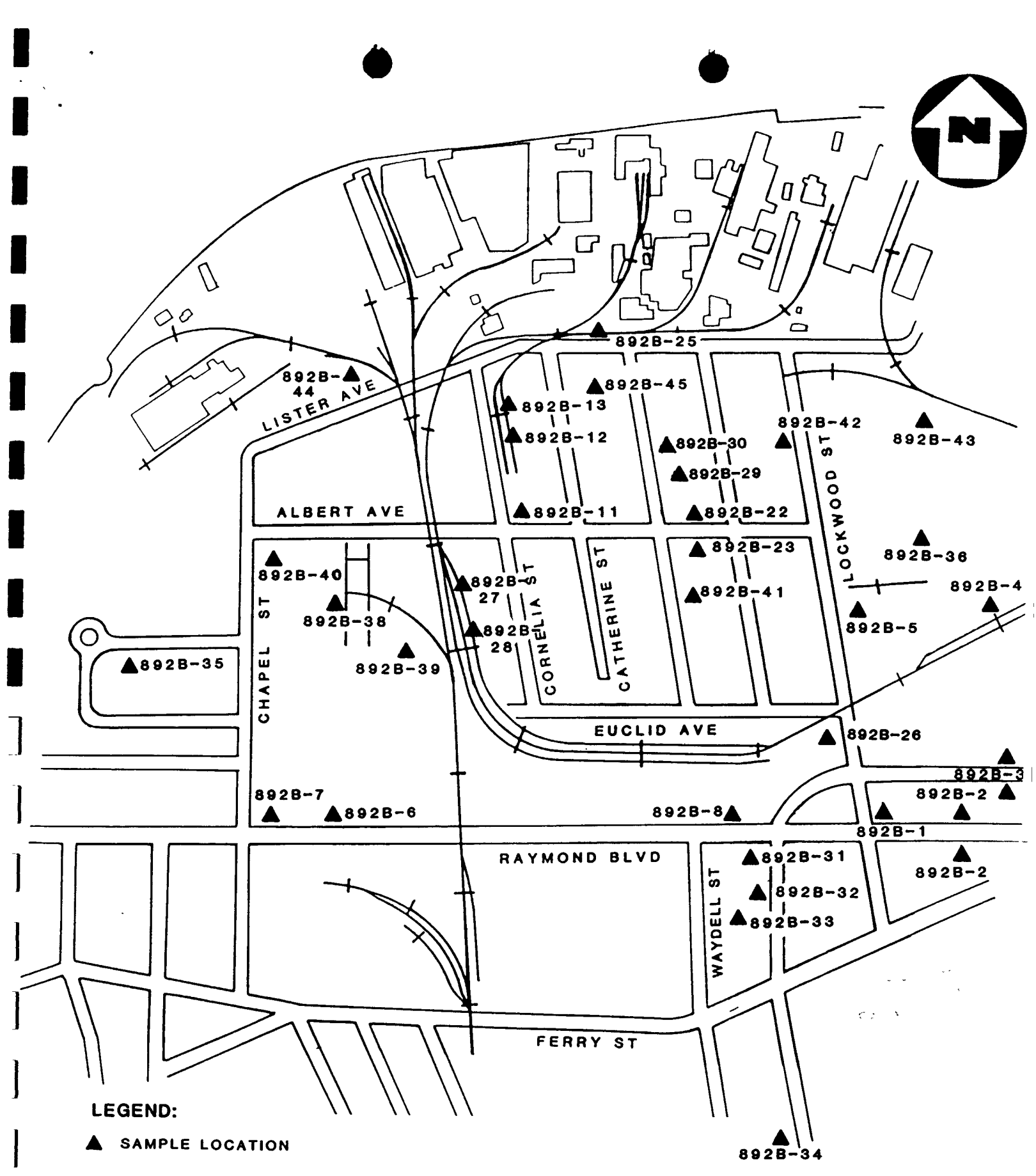


SAMPLING LOCATIONS AT WHICH
1, 3-DICHLOROBENZENE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-4

NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH FLUORANTHENE WAS DETECTED

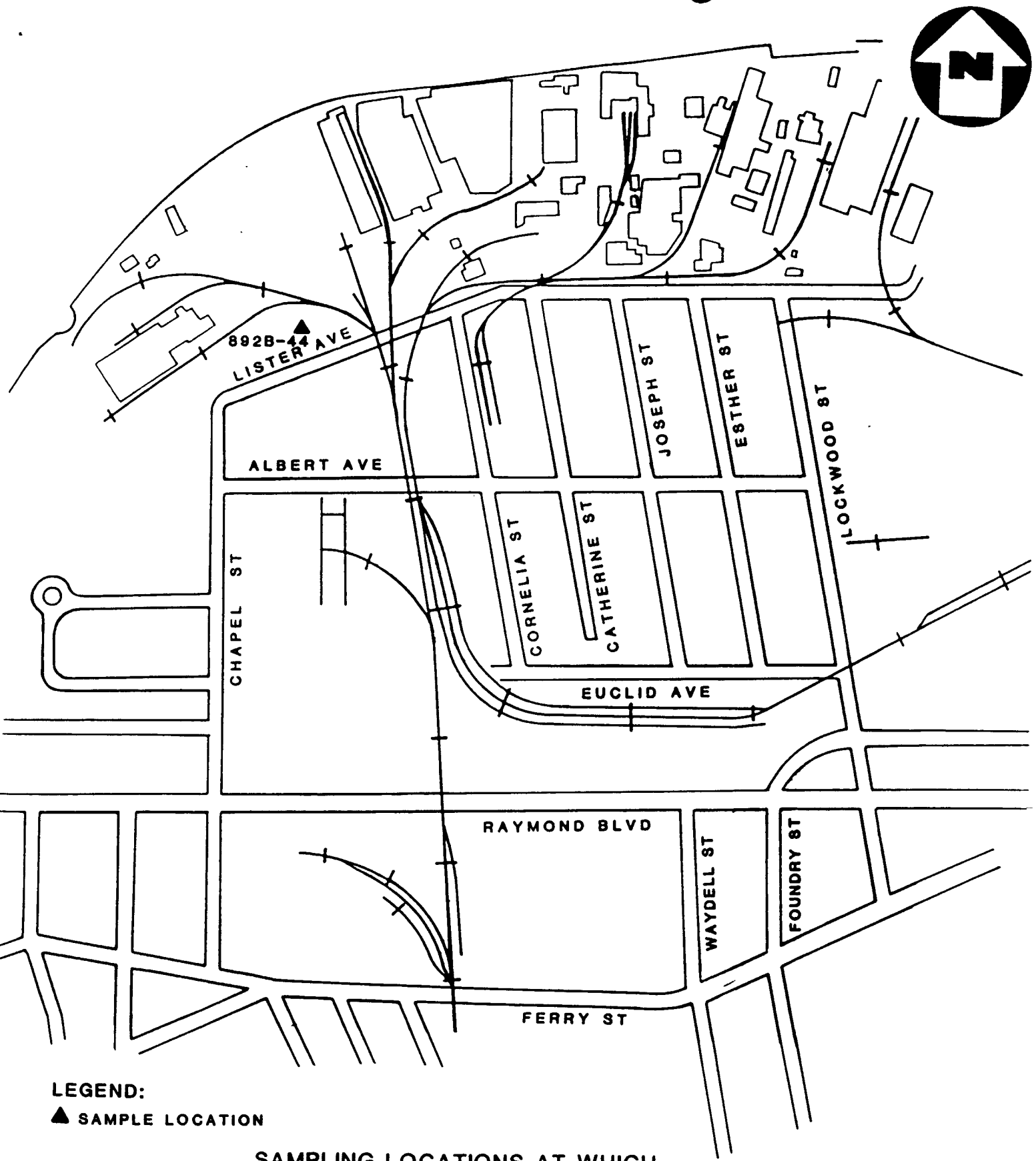
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-5

NUS CORPORATION

A Halliburton Company

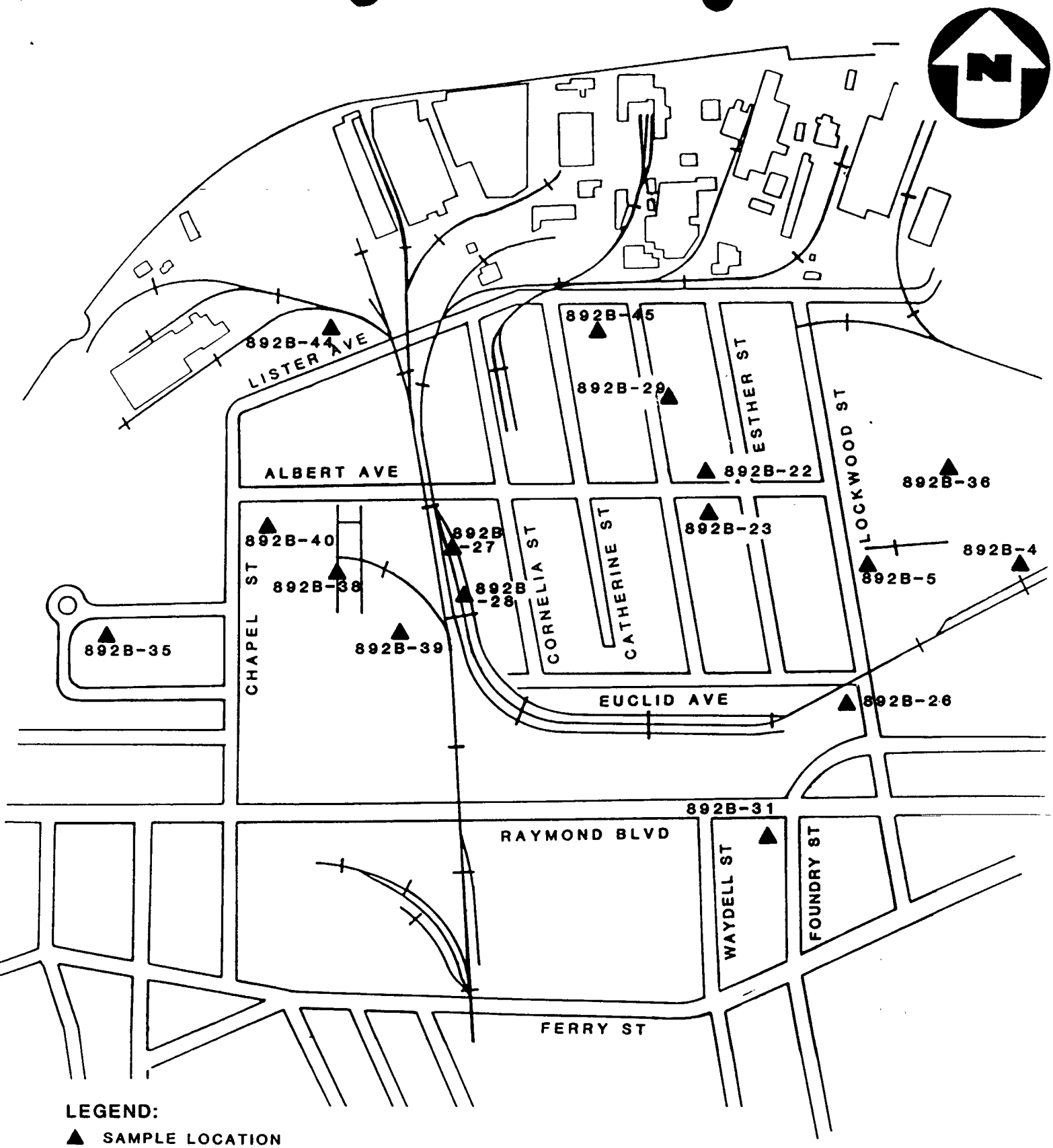


SAMPLING LOCATIONS AT WHICH ISOPHORONE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-6

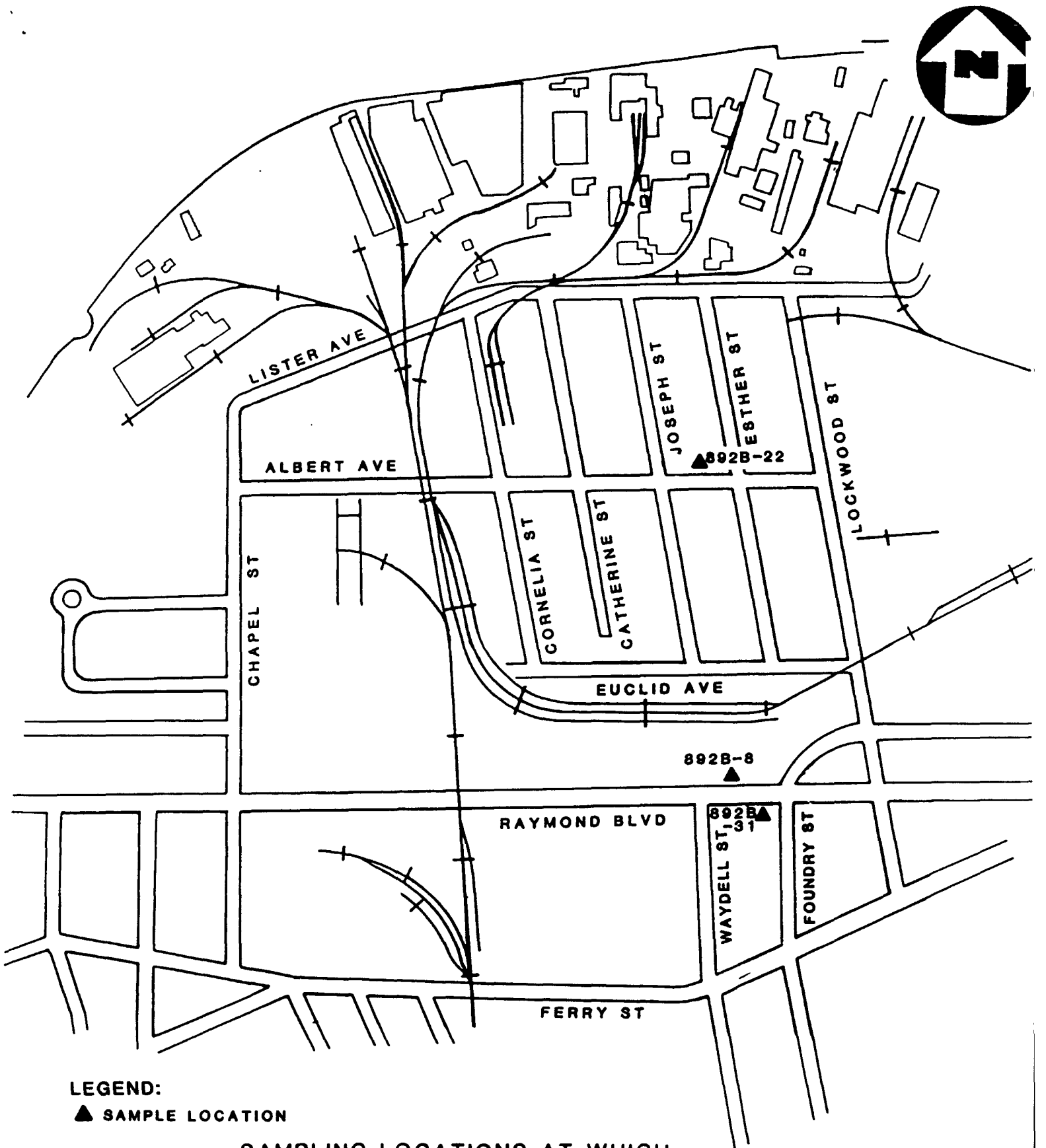
NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH NAPHTHALENE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-7

NUS CORPORATION
A Halliburton Company



LEGEND:

▲ SAMPLE LOCATION

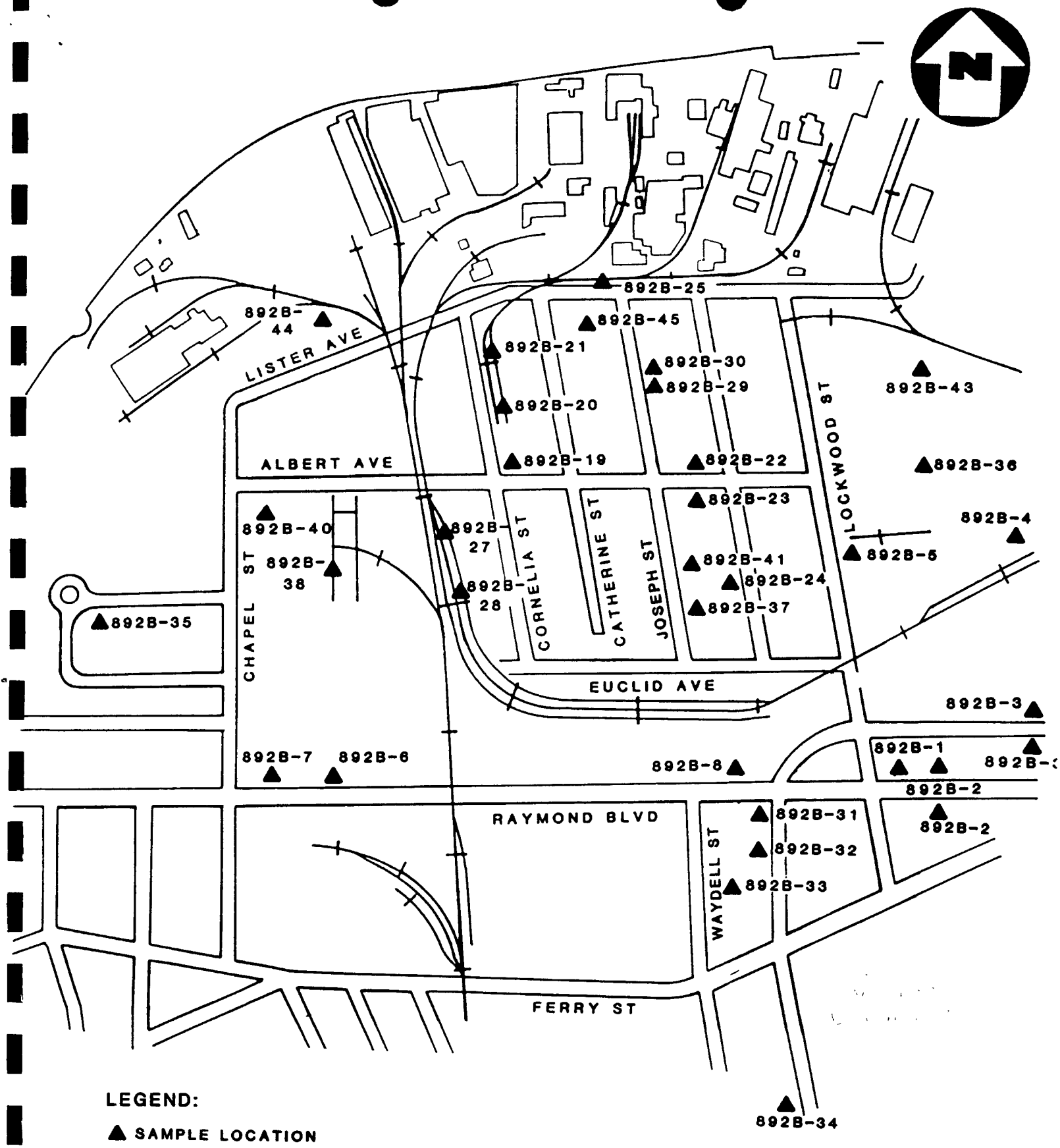
SAMPLING LOCATIONS AT WHICH N-NITROSODIPHENYLAMINE WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-8

NUS CORPORATION

A Halliburton Company



LEGEND:

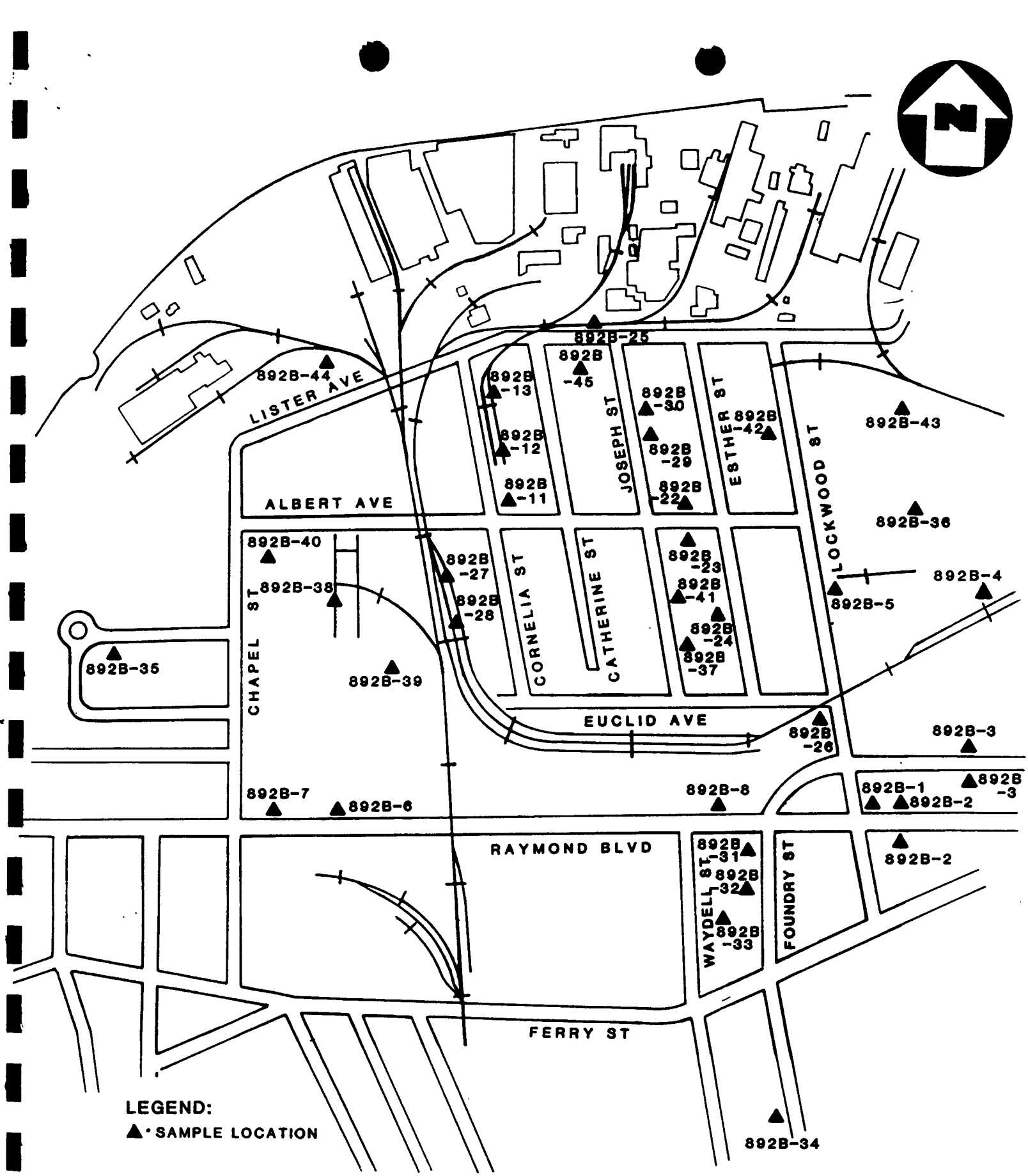
▲ SAMPLE LOCATION

SAMPLING LOCATIONS AT WHICH PHTHALATE ESTERS WERE DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-9

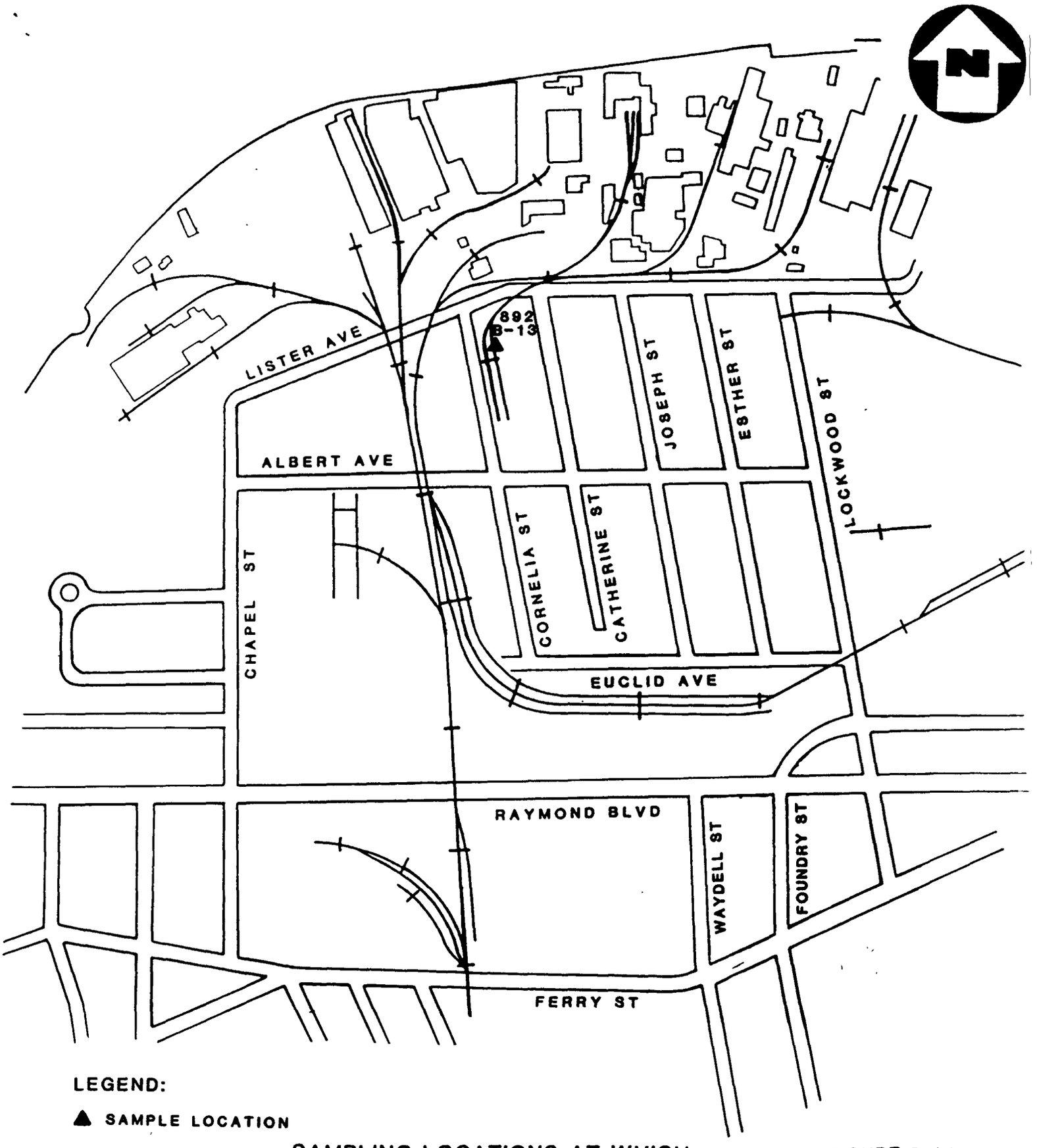
NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH POLYNUCLEAR AROMATIC HYDROCARBONS (PAH'S) WERE DETECTED
80 LISTER AVENUE NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-10

NUS CORPORATION
A Halliburton Company



LEGEND:

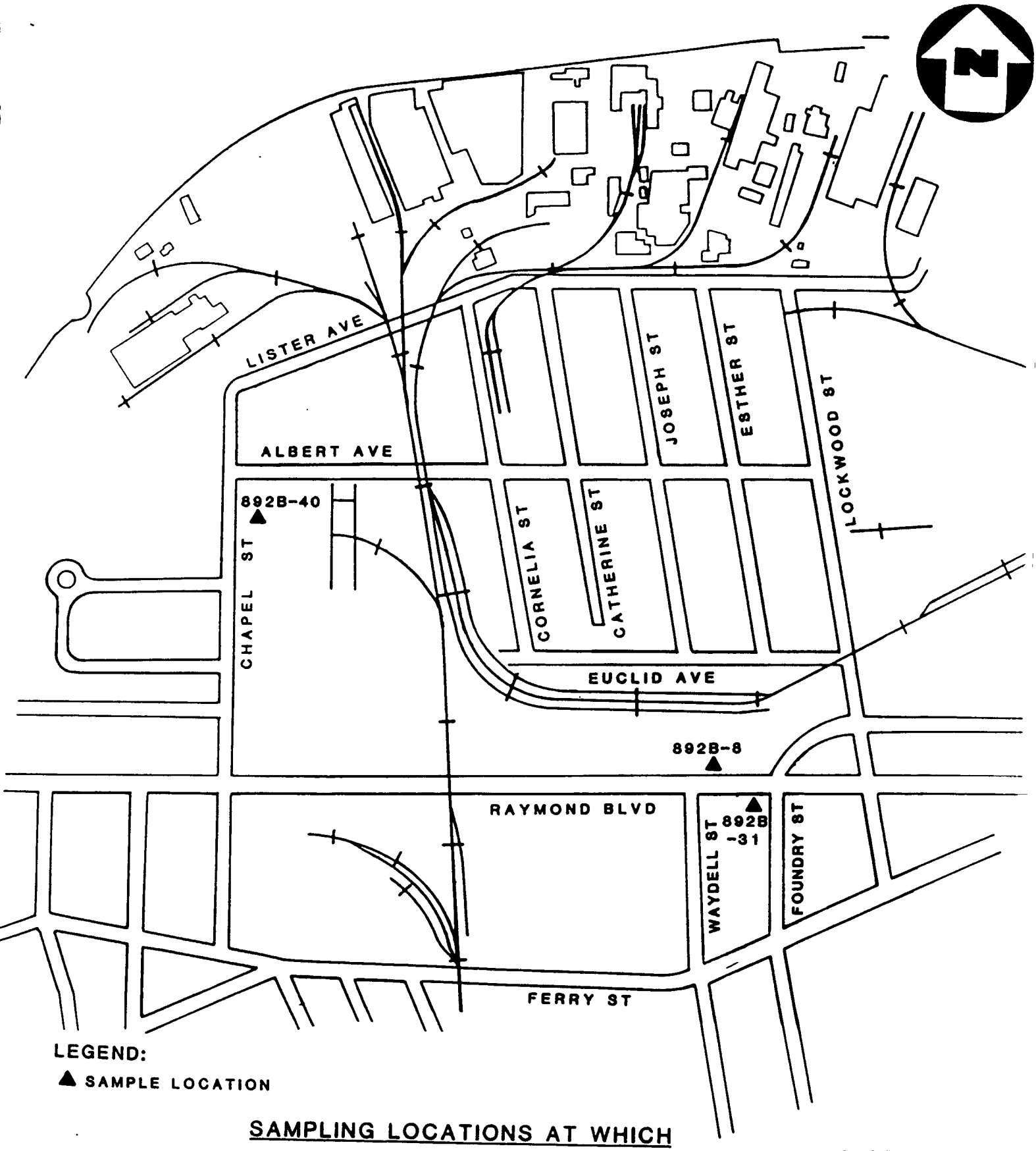
▲ SAMPLE LOCATION

SAMPLING LOCATIONS AT WHICH PENTACHLOROPHENOL WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-11

NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH PHENOL WAS DETECTED

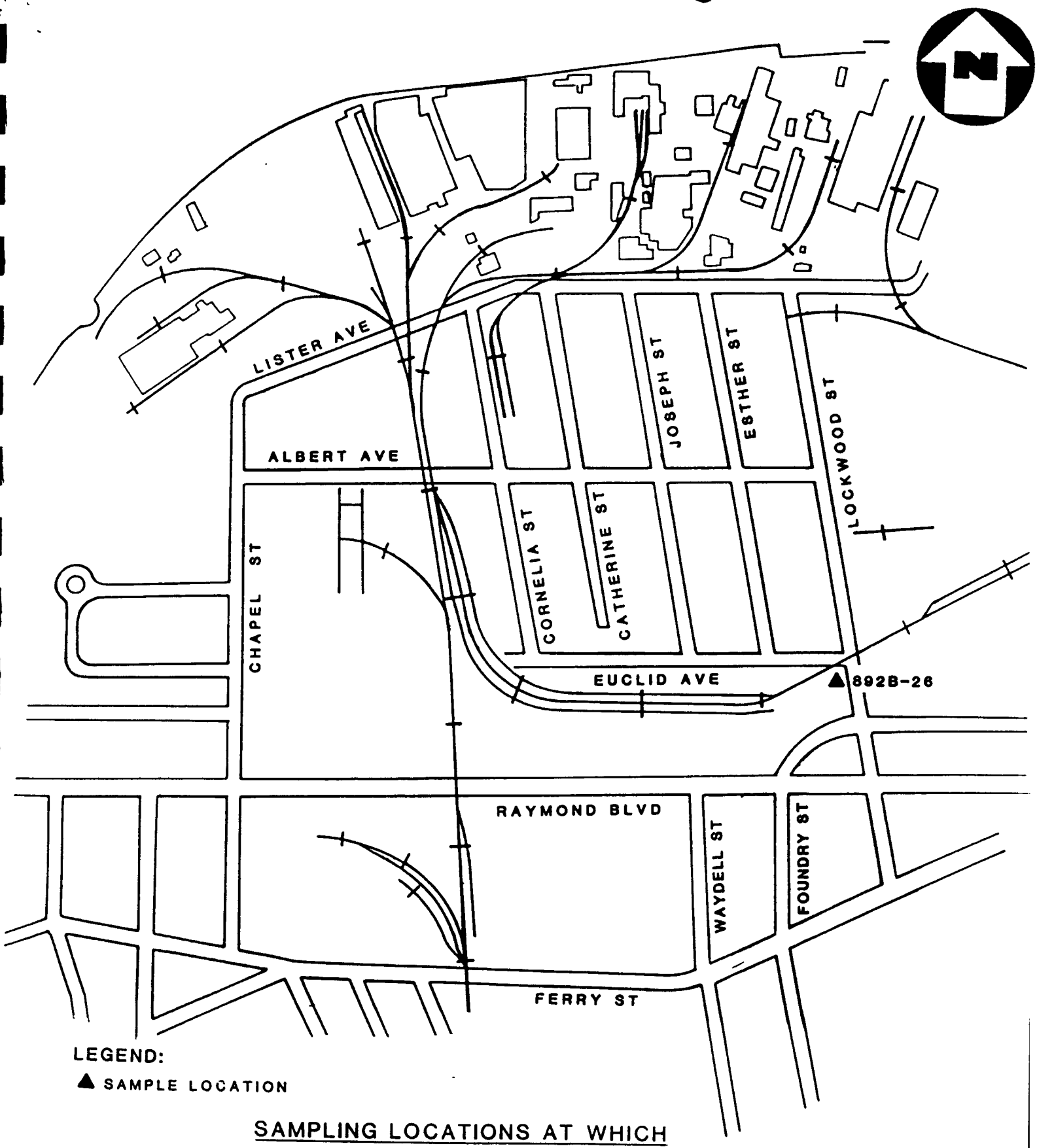
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-12

NUS CORPORATION

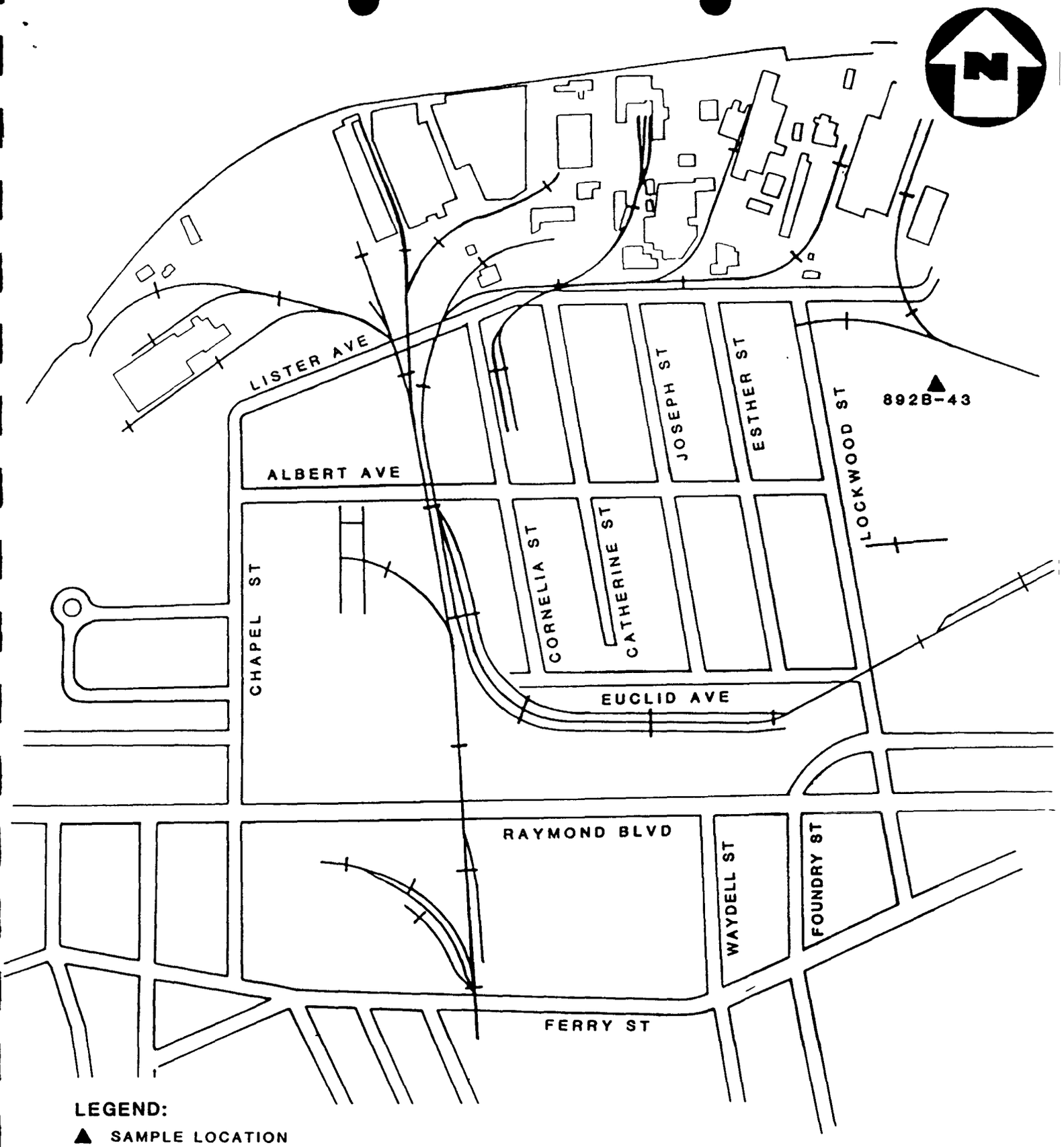
A Halliburton Company



SAMPLING LOCATIONS AT WHICH
BENZENE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-13

NUS CORPORATION
A Halliburton Company



SAMPLING LOCATION AT WHICH CARBON TETRACHLORIDE WAS DETECTED

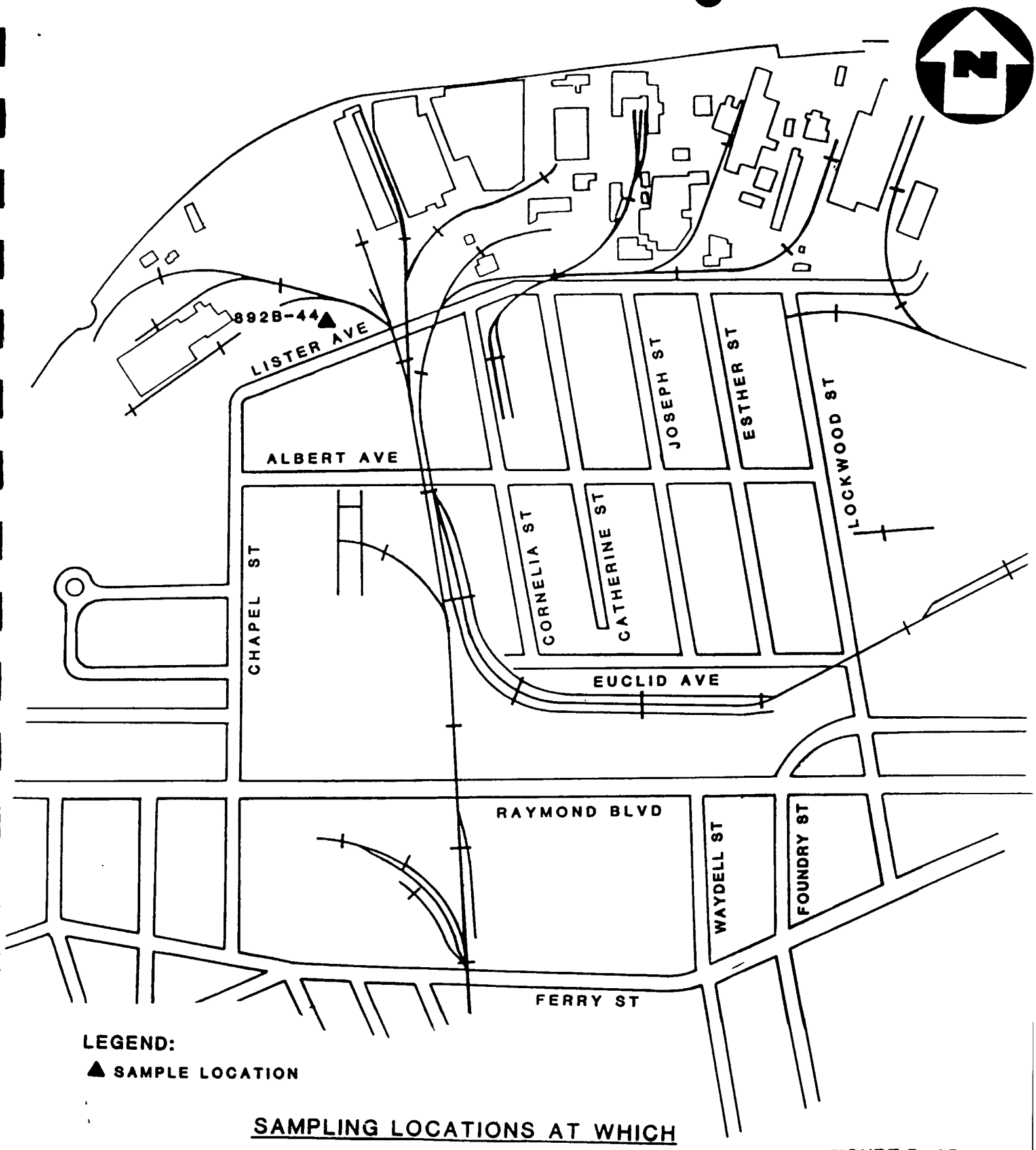
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-14

NUS CORPORATION

A Halliburton Company



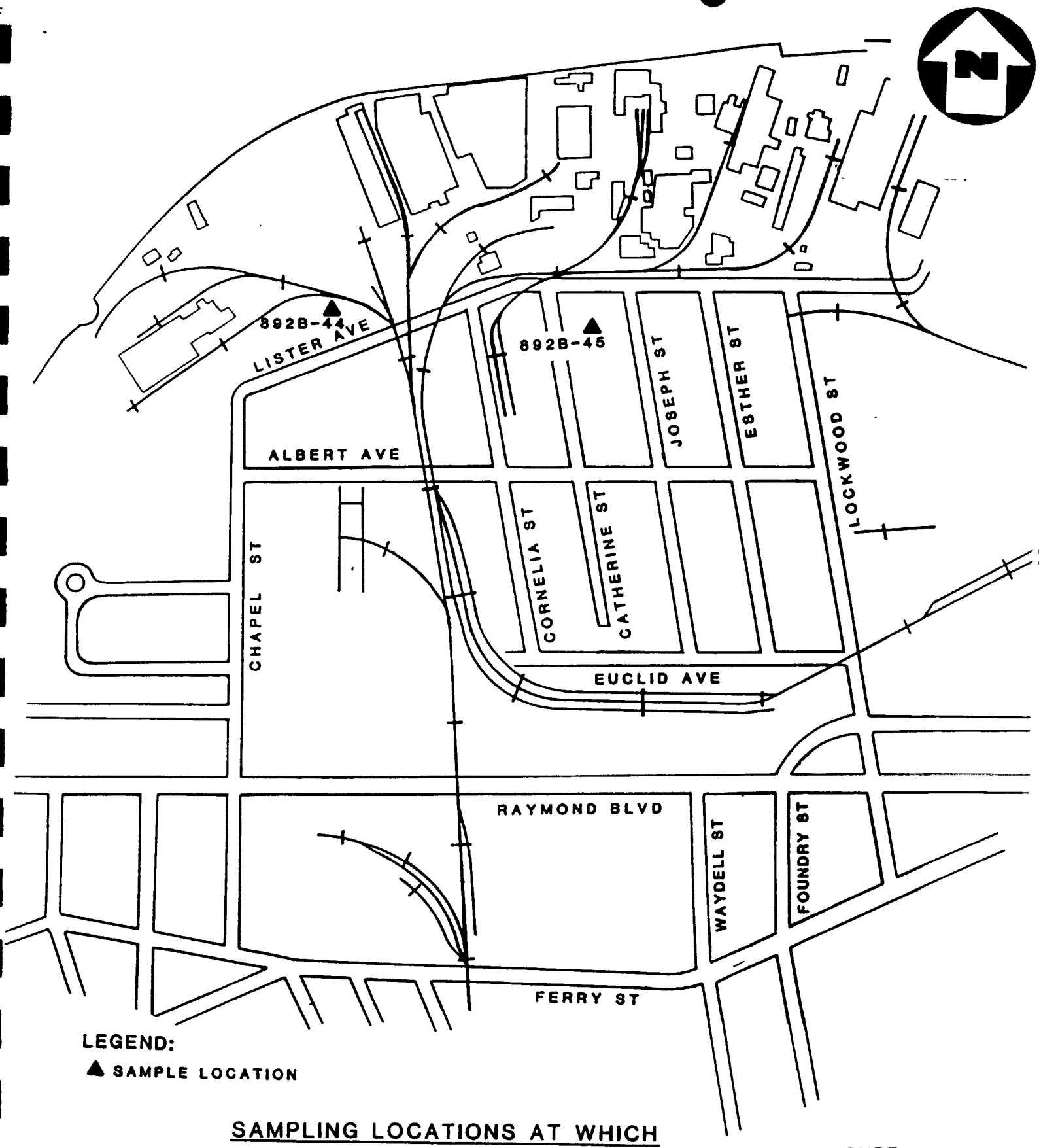
SAMPLING LOCATIONS AT WHICH ETHYLBENZENE WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-15

NUS CORPORATION

A Halliburton Company

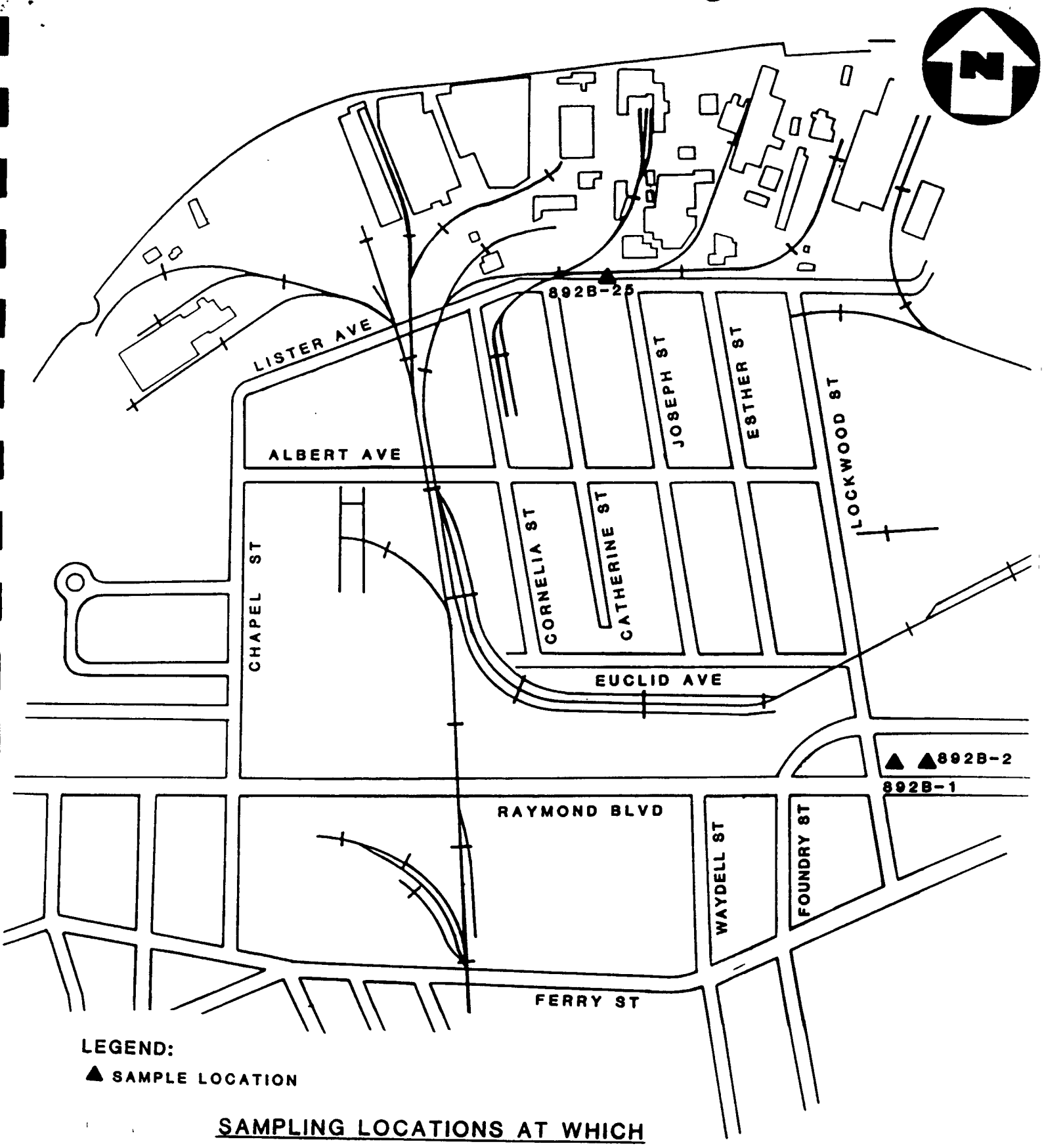


SAMPLING LOCATIONS AT WHICH METHYLENE CHLORIDE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-16

NUS CORPORATION
A Halliburton Company

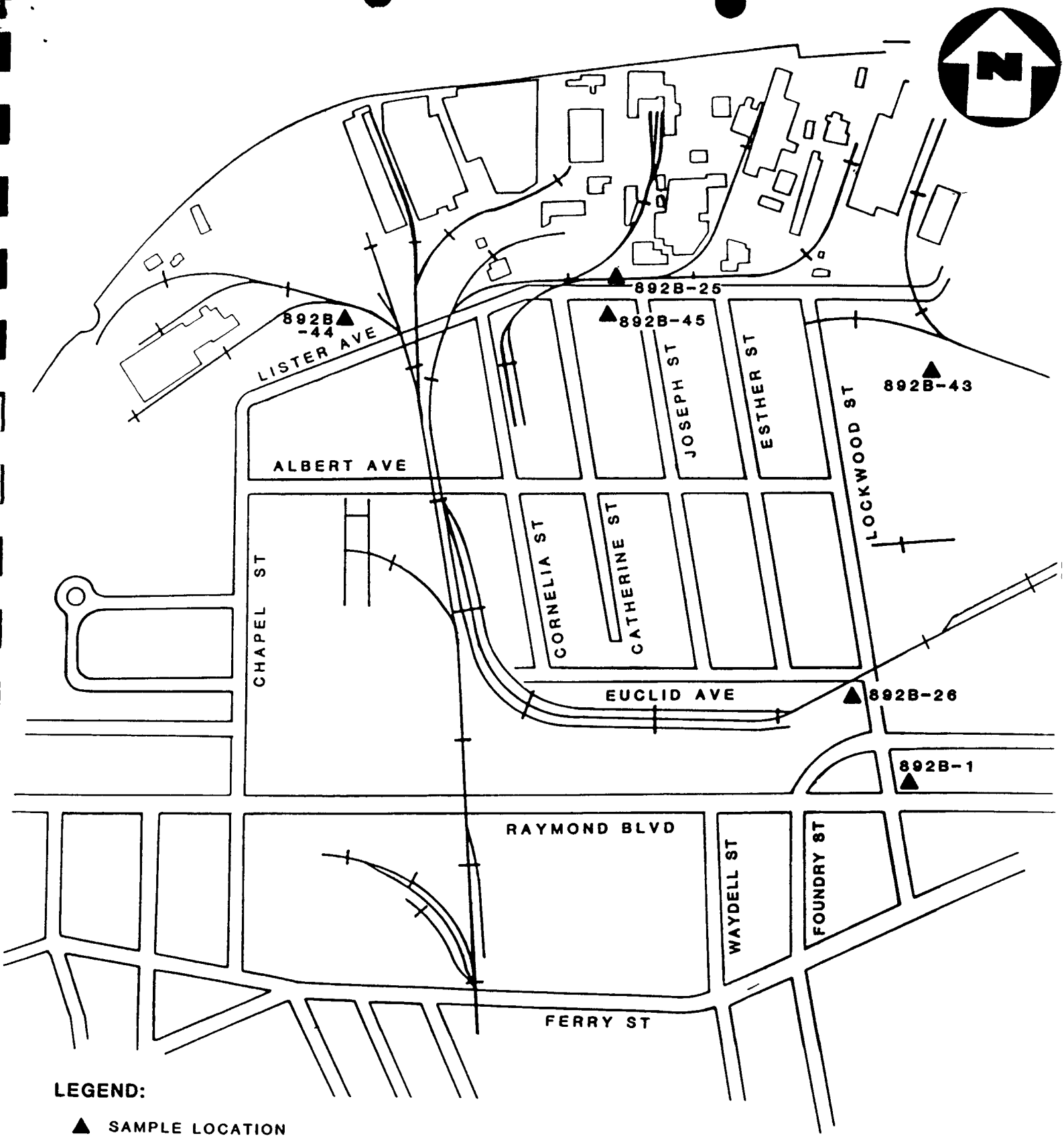


SAMPLING LOCATIONS AT WHICH
TRICHLOROFLUOROMETHANE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-17

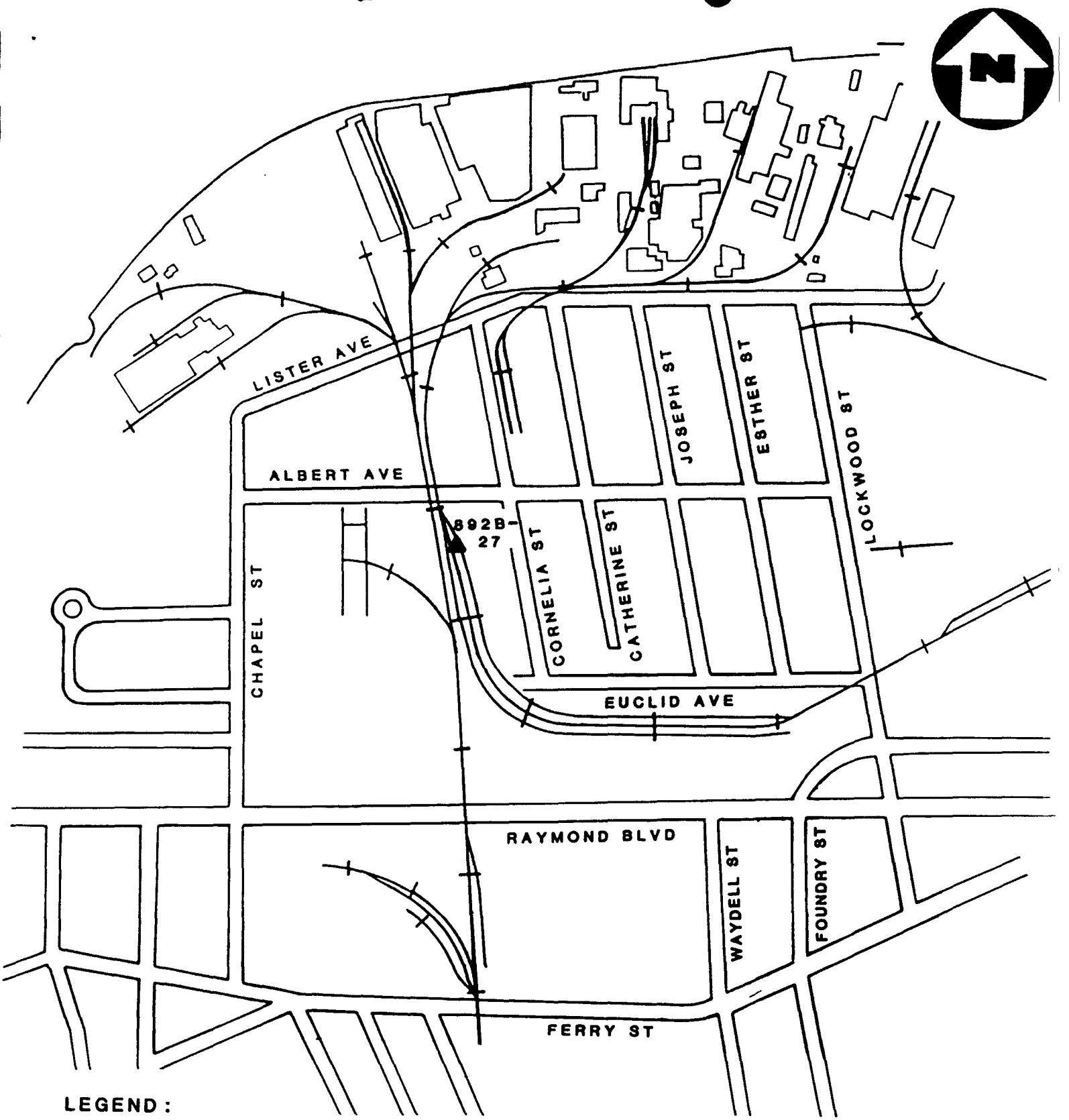
NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH TOLUENE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-18

NUS CORPORATION
A Halliburton Company

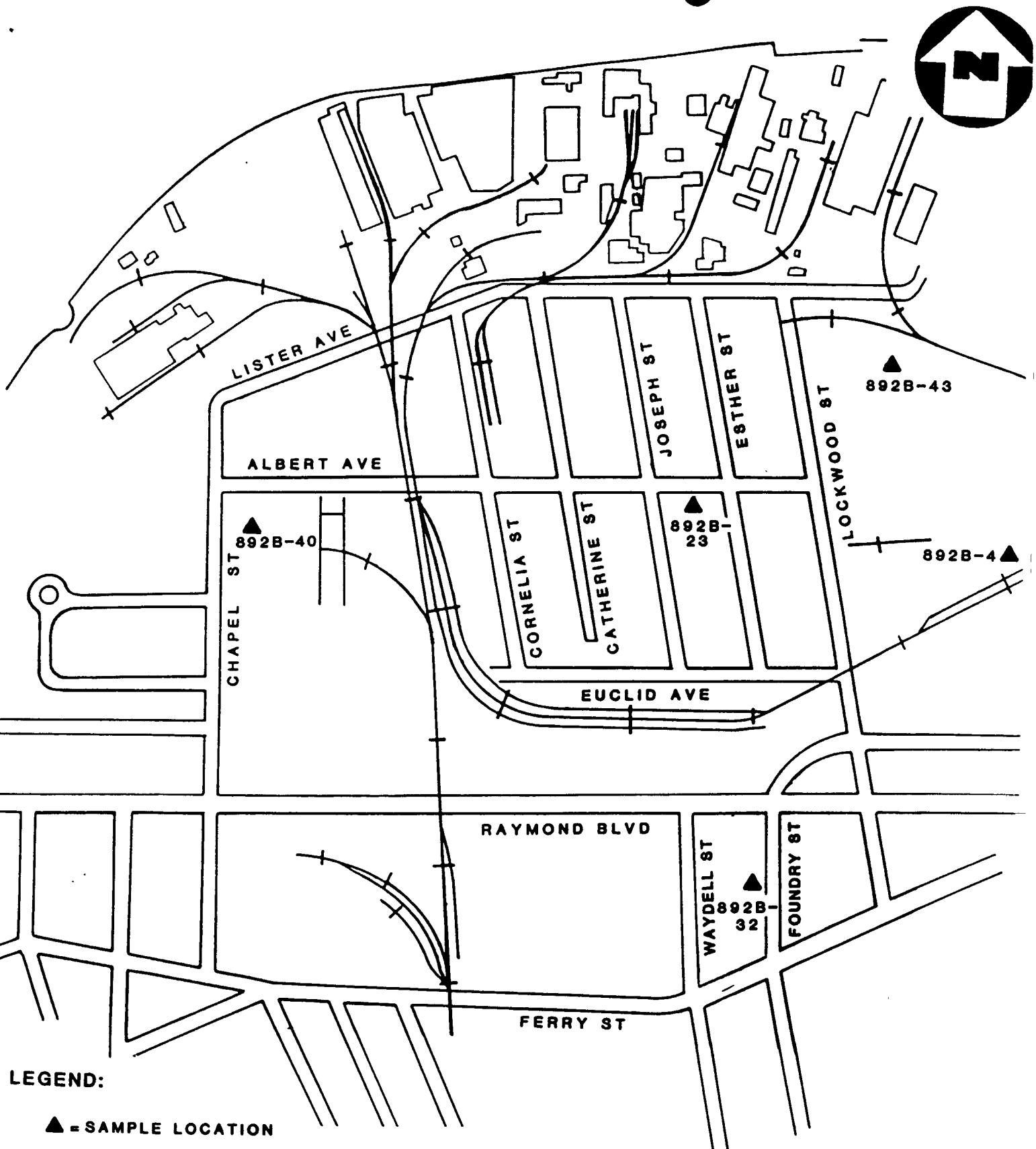


SAMPLING LOCATIONS AT WHICH
ALDRIN WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-19

NUS CORPORATION
A Halliburton Company

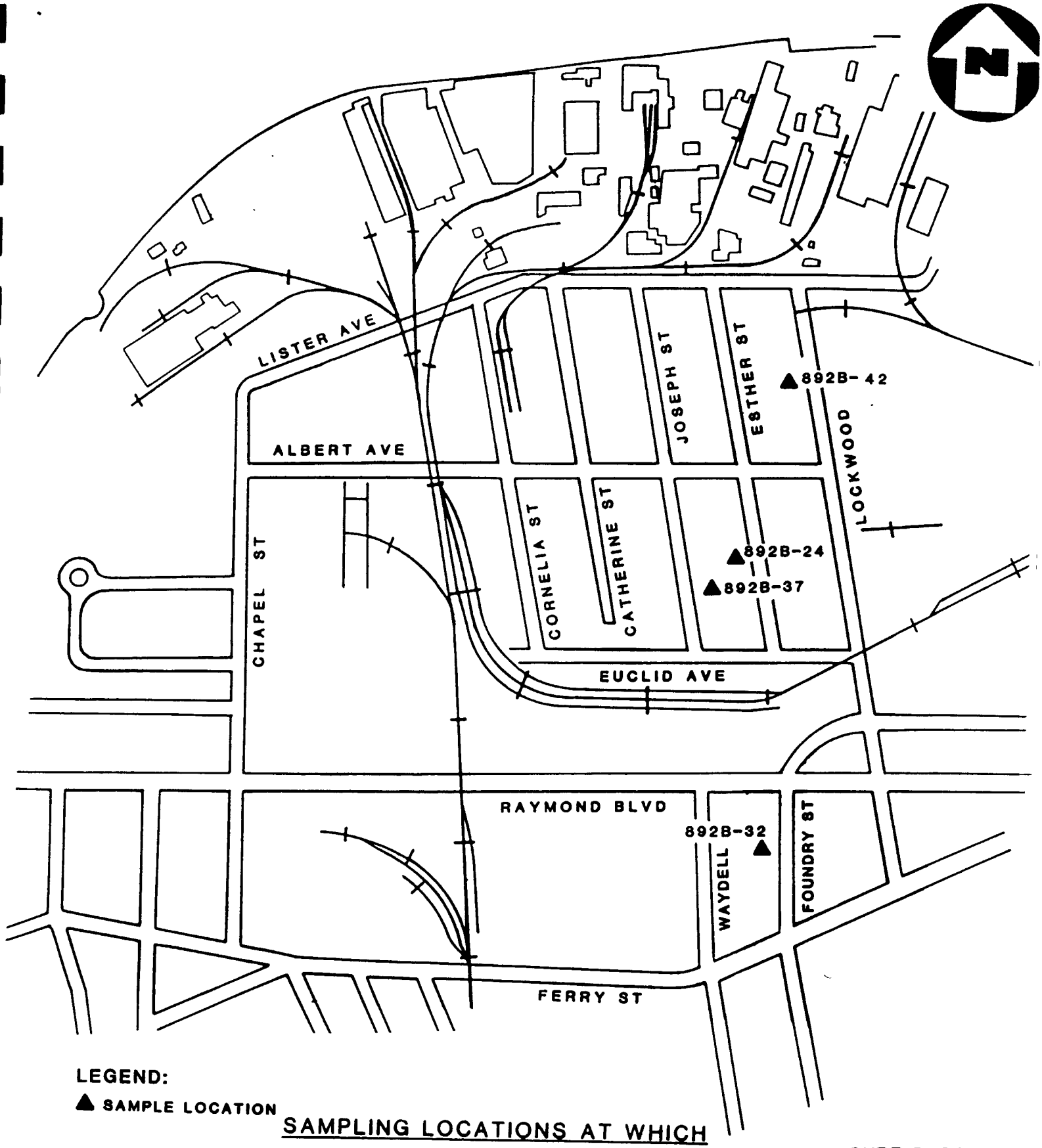


SAMPLING LOCATIONS AT WHICH
DIELDRIN WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-20

NUS CORPORATION
A Halliburton Company



LEGEND:

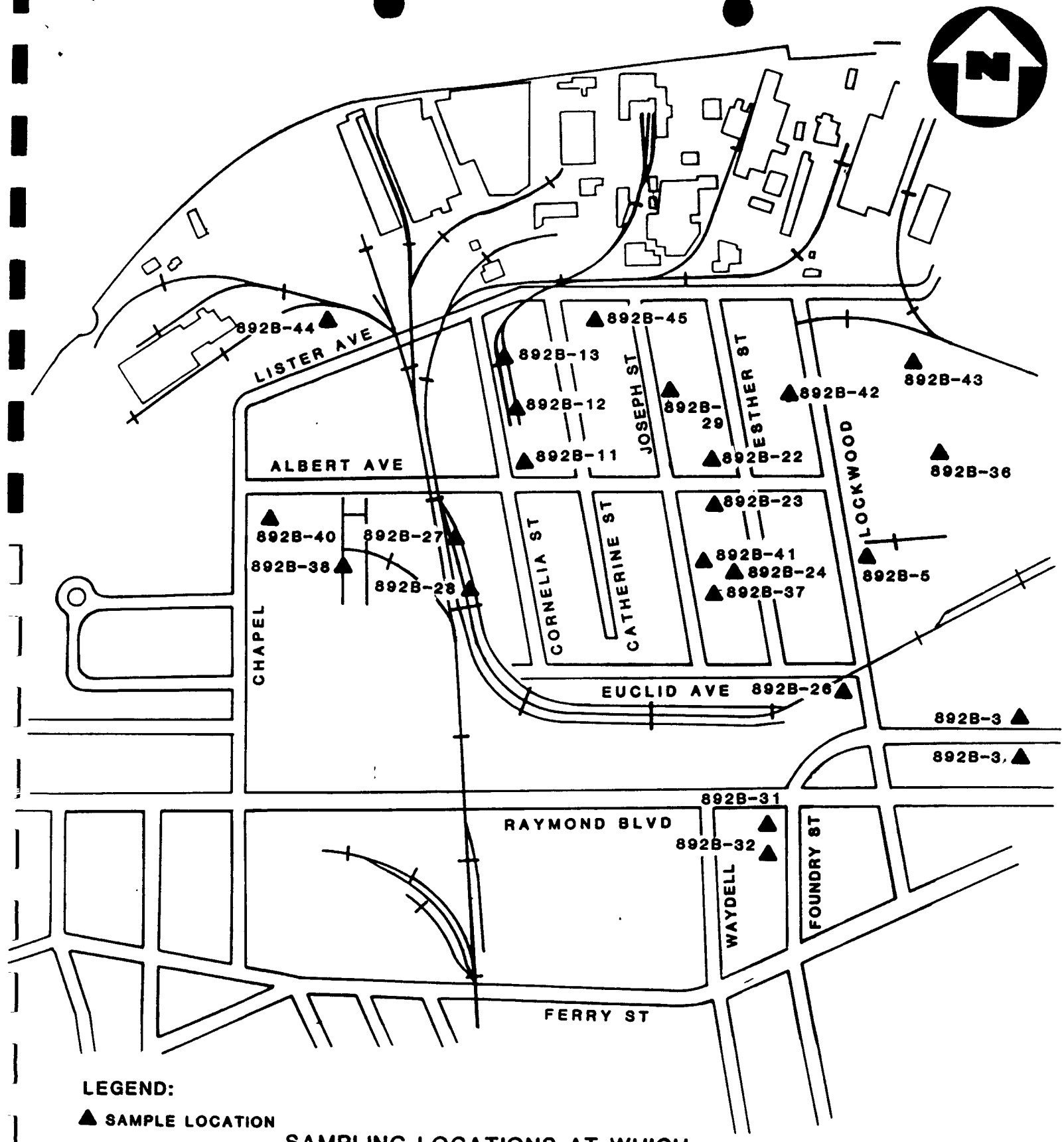
▲ SAMPLE LOCATION

SAMPLING LOCATIONS AT WHICH CHLORODANE WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-21

NUS CORPORATION
A Halliburton Company



LEGEND:

▲ SAMPLE LOCATION

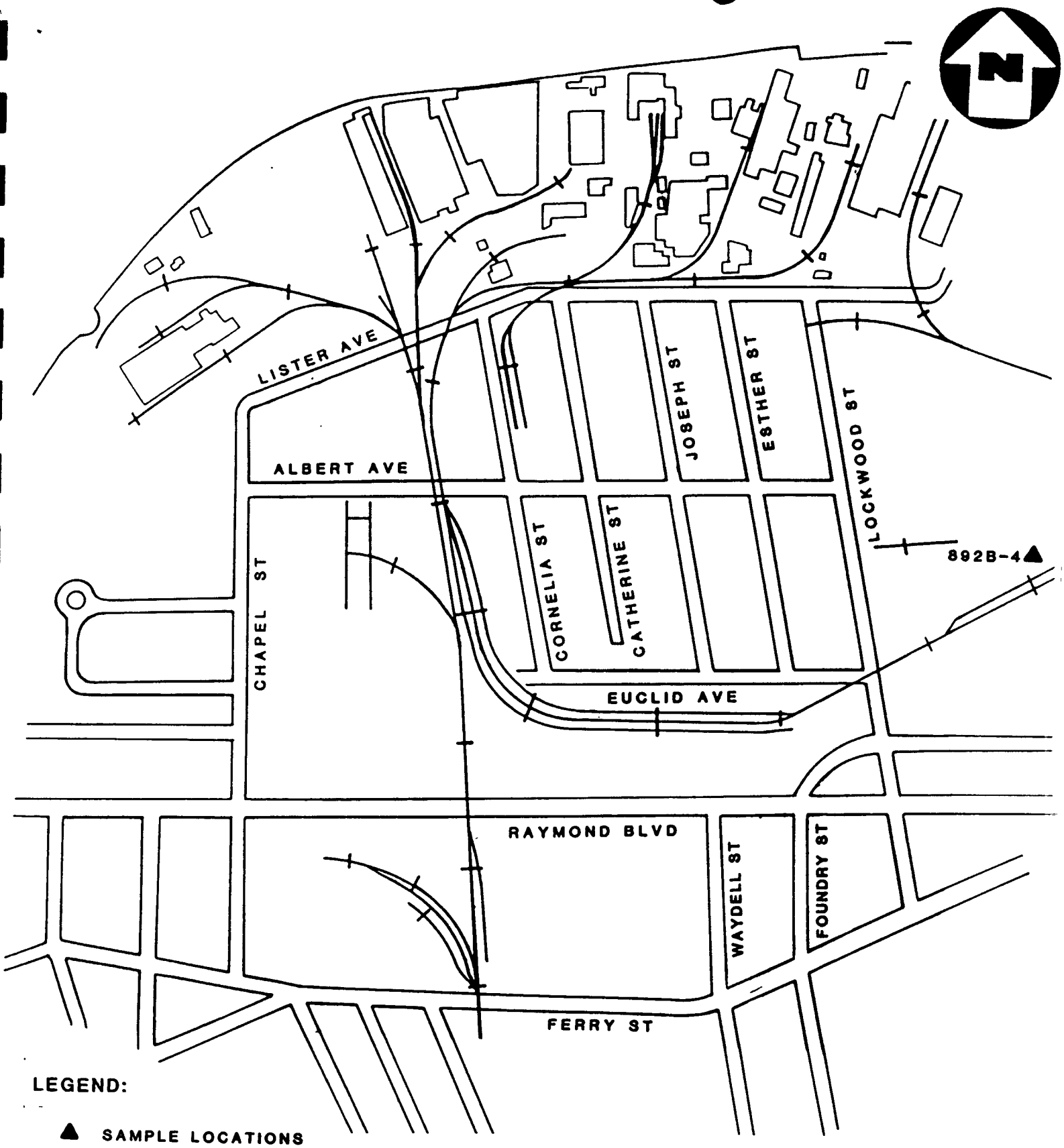
SAMPLING LOCATIONS AT WHICH 4,4'-DDT, 4,4'-DDE AND 4,4'-DDD WERE DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-22

NUS CORPORATION

A Halliburton Company

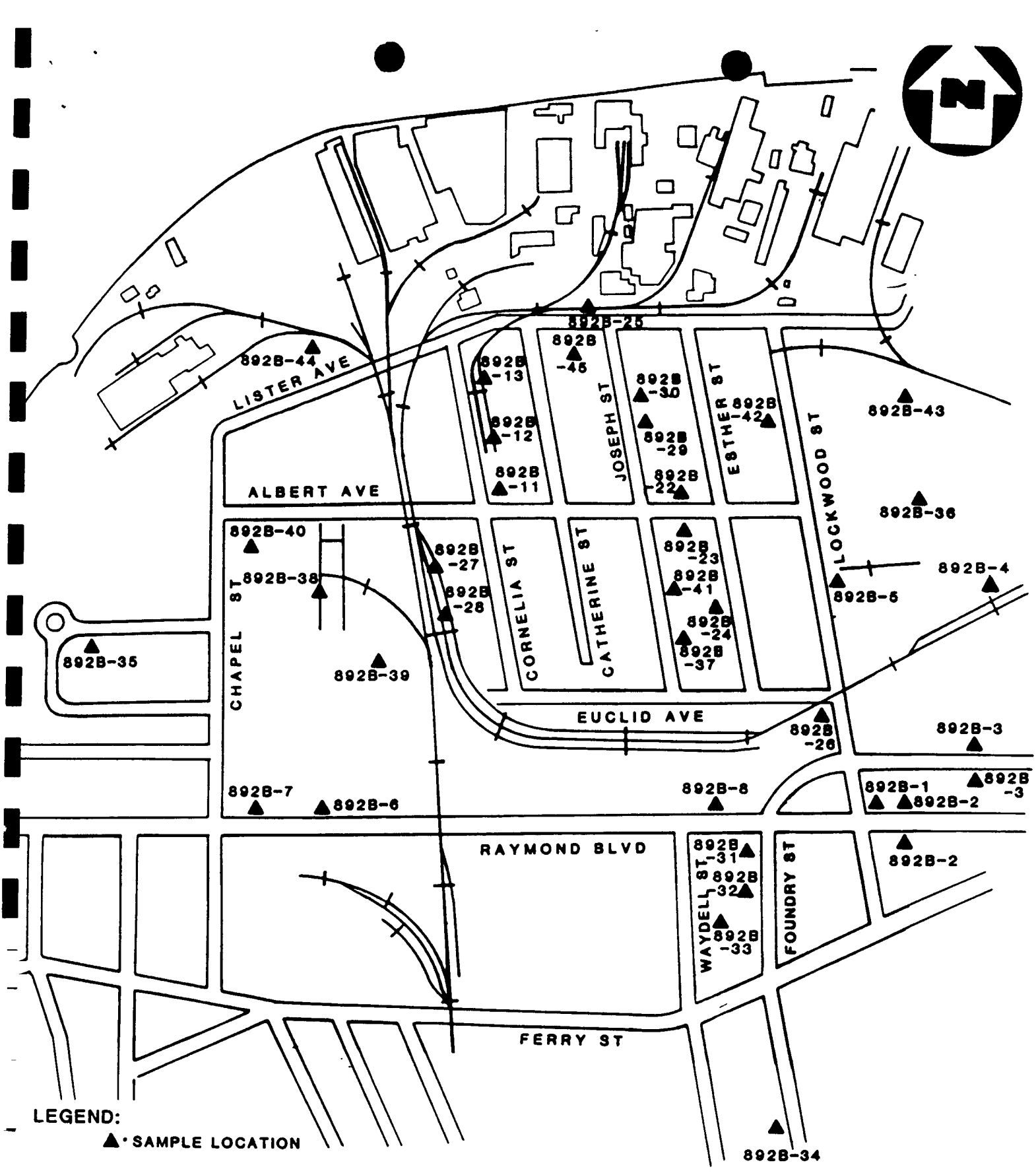


SAMPLING LOCATIONS AT WHICH
ENDRIN WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-23

NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH ALUMINUM WAS DETECTED

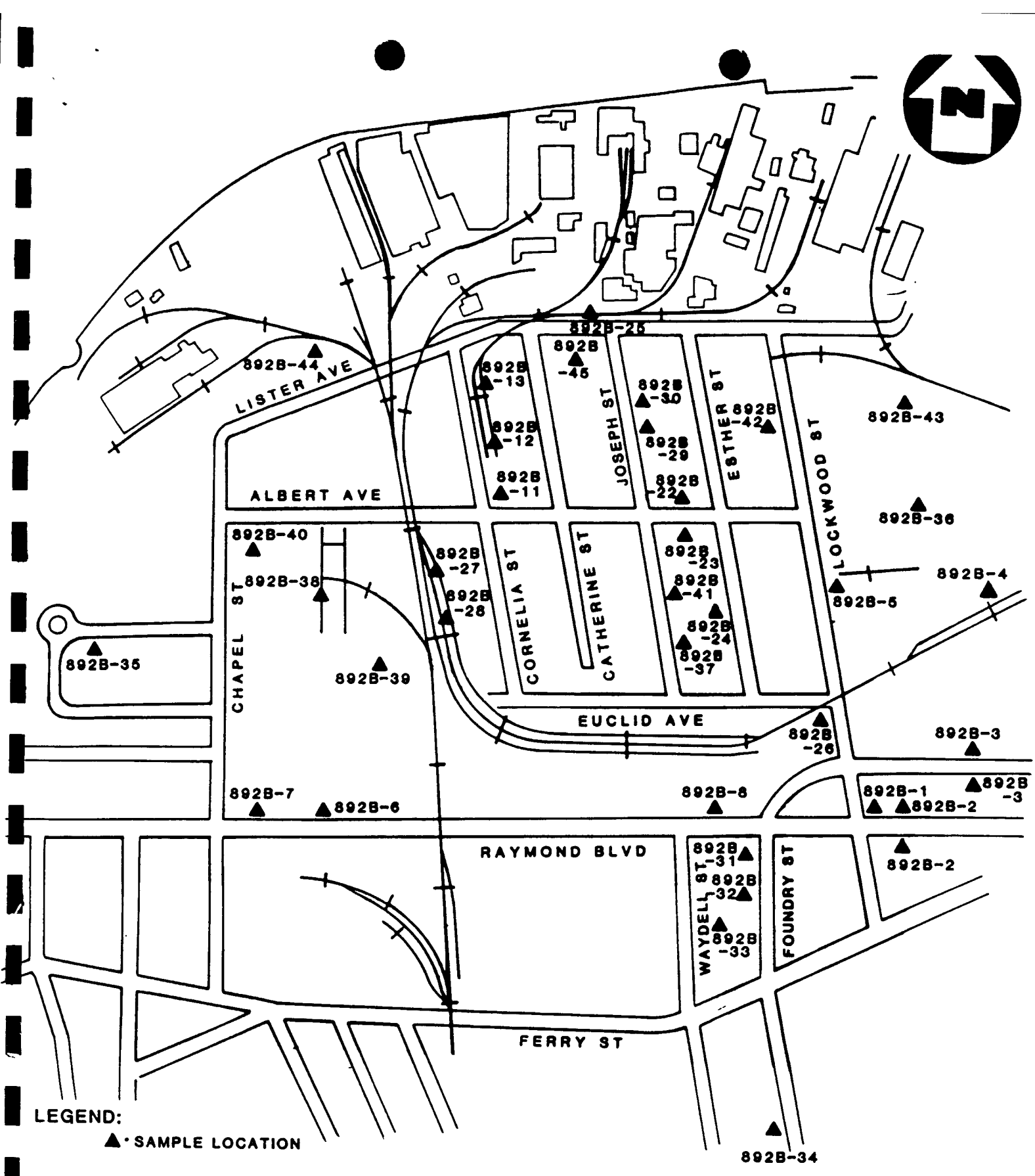
80 LISTER AVENUE NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-24

NUS CORPORATION

A Halliburton Company



SAMPLING LOCATIONS AT WHICH CHROMIUM WAS DETECTED

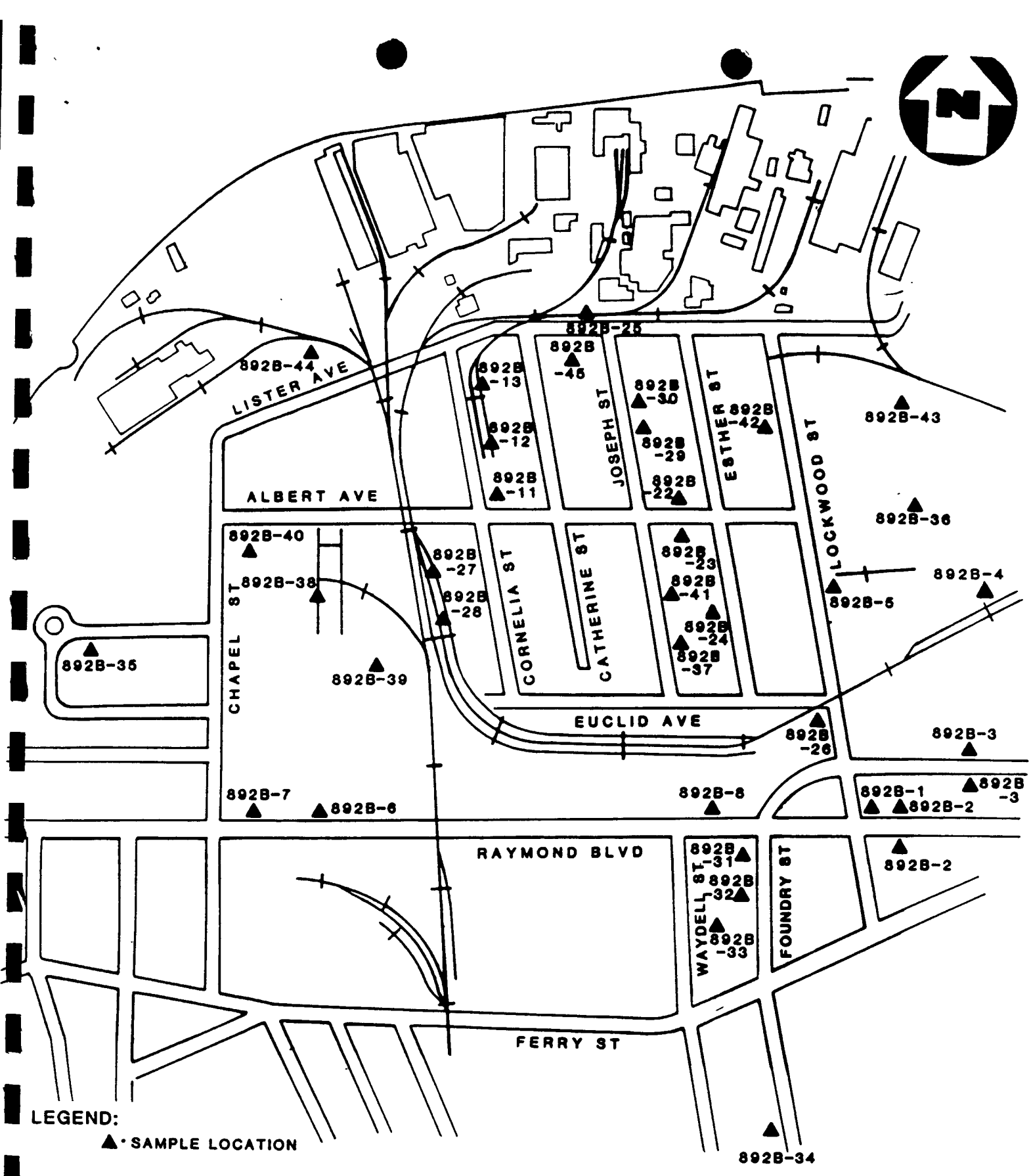
80 LISTER AVENUE NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-25

NUS CORPORATION

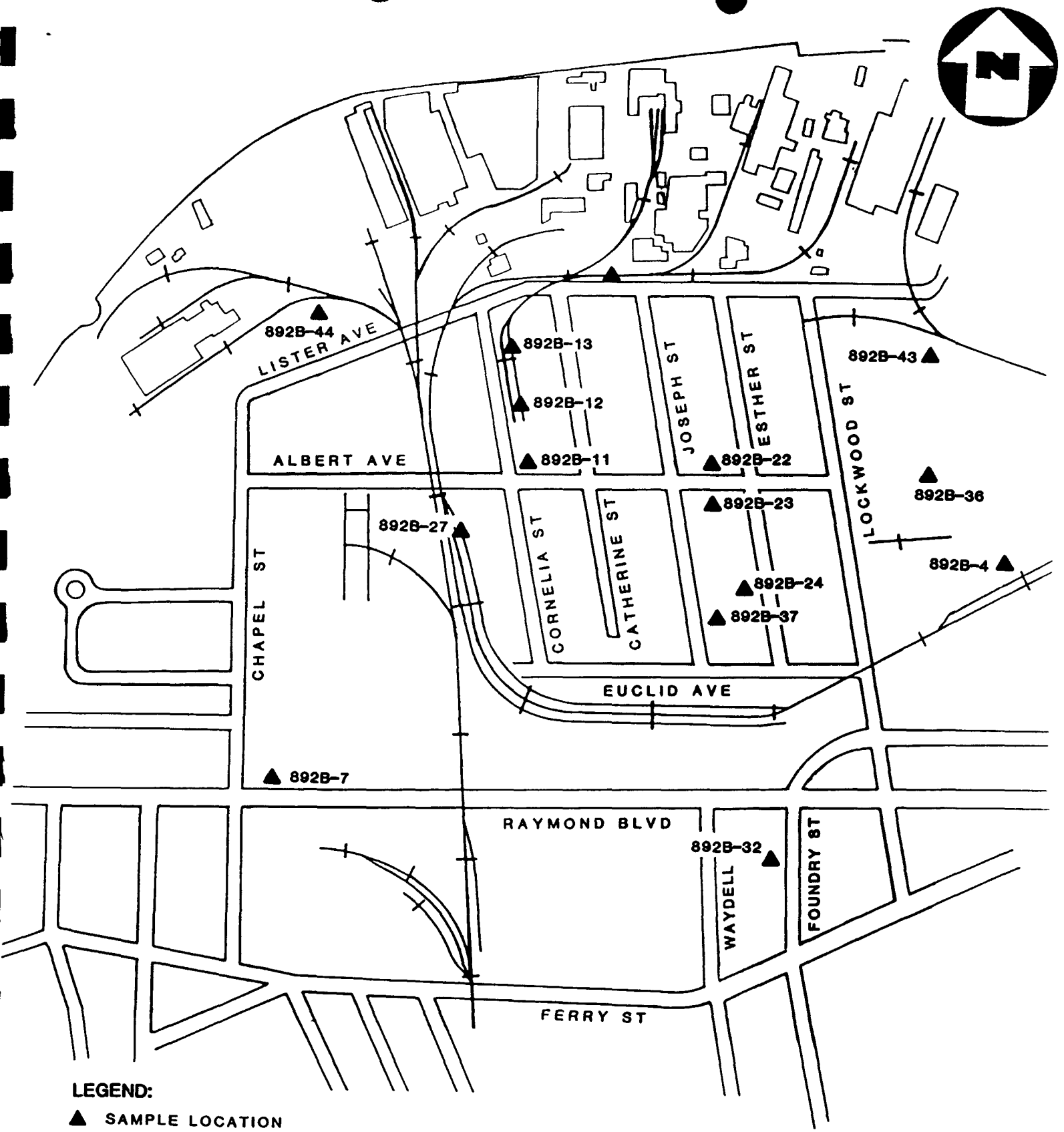
A Halliburton Company



SAMPLING LOCATIONS AT WHICH BARIUM WAS DETECTED
80 LISTER AVENUE NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-26

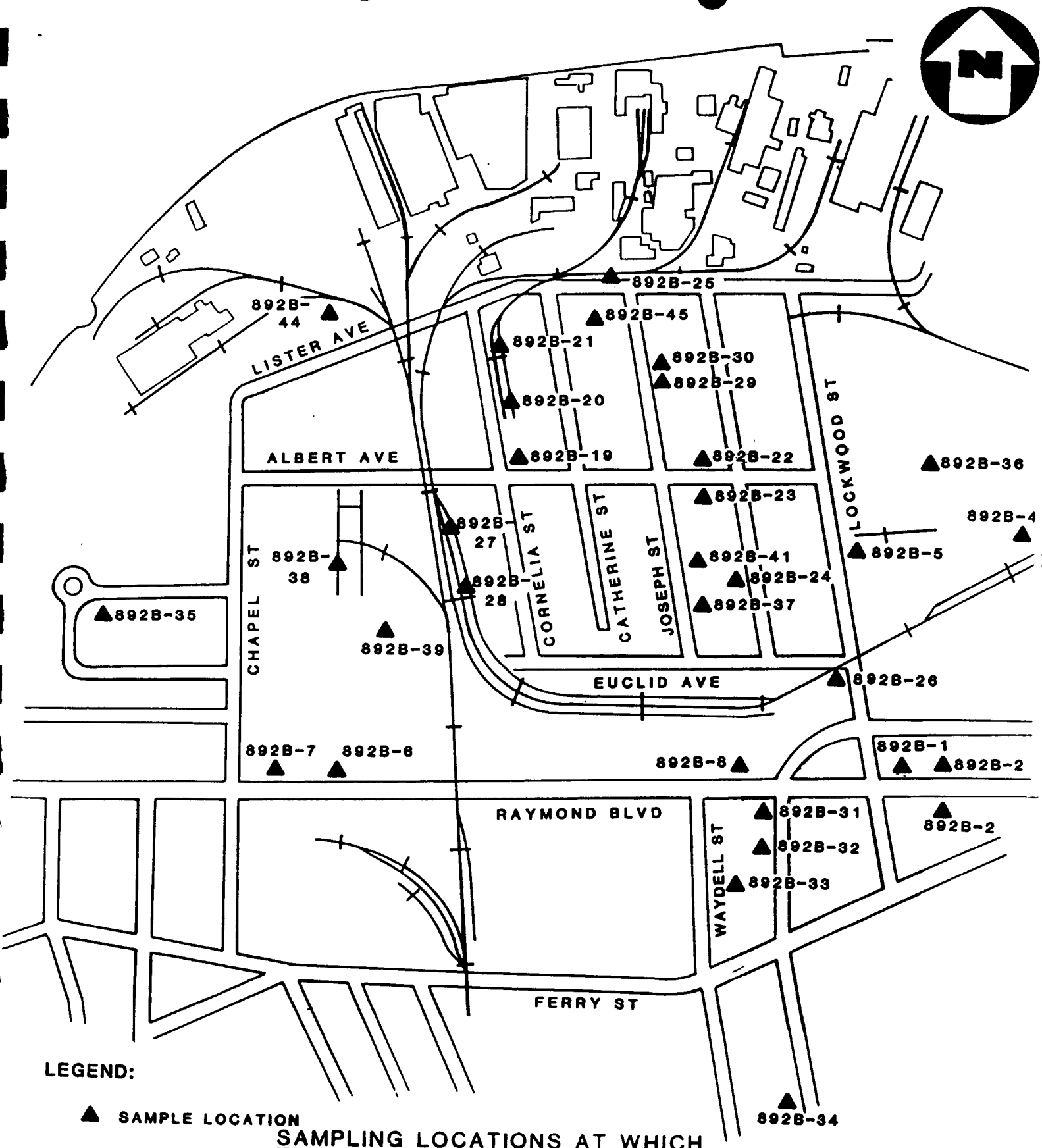
NUS CORPORATION
A Halliburton Company



LOCATIONS AT WHICH BERYLLIUM WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-27

NUS CORPORATION
A Halliburton Company

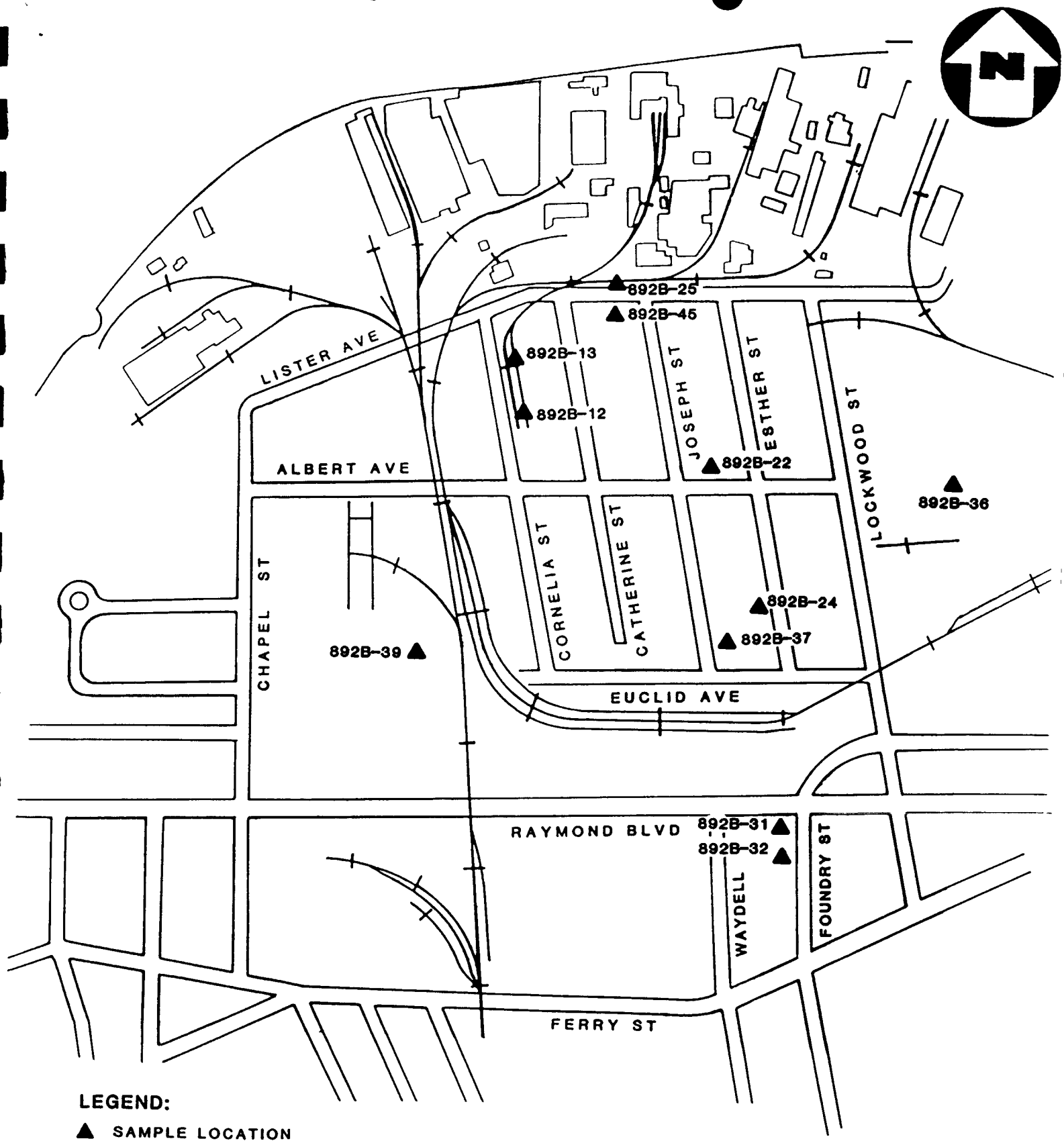


SAMPLING LOCATIONS AT WHICH CADMIUM WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-28

NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH COBALT WAS DETECTED

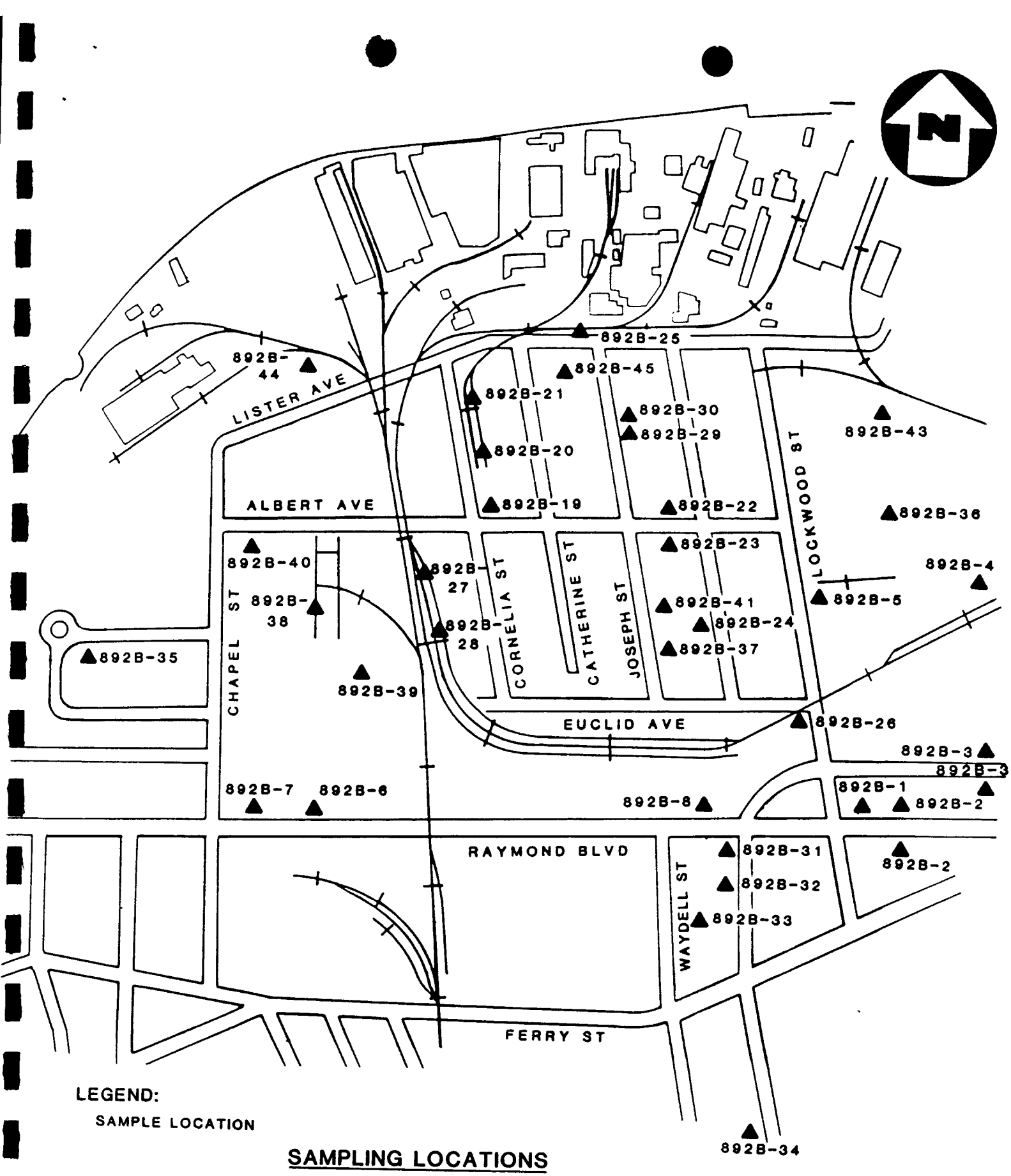
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-29

NUS CORPORATION

A Halliburton Company



LEGEND:

SAMPLE LOCATION

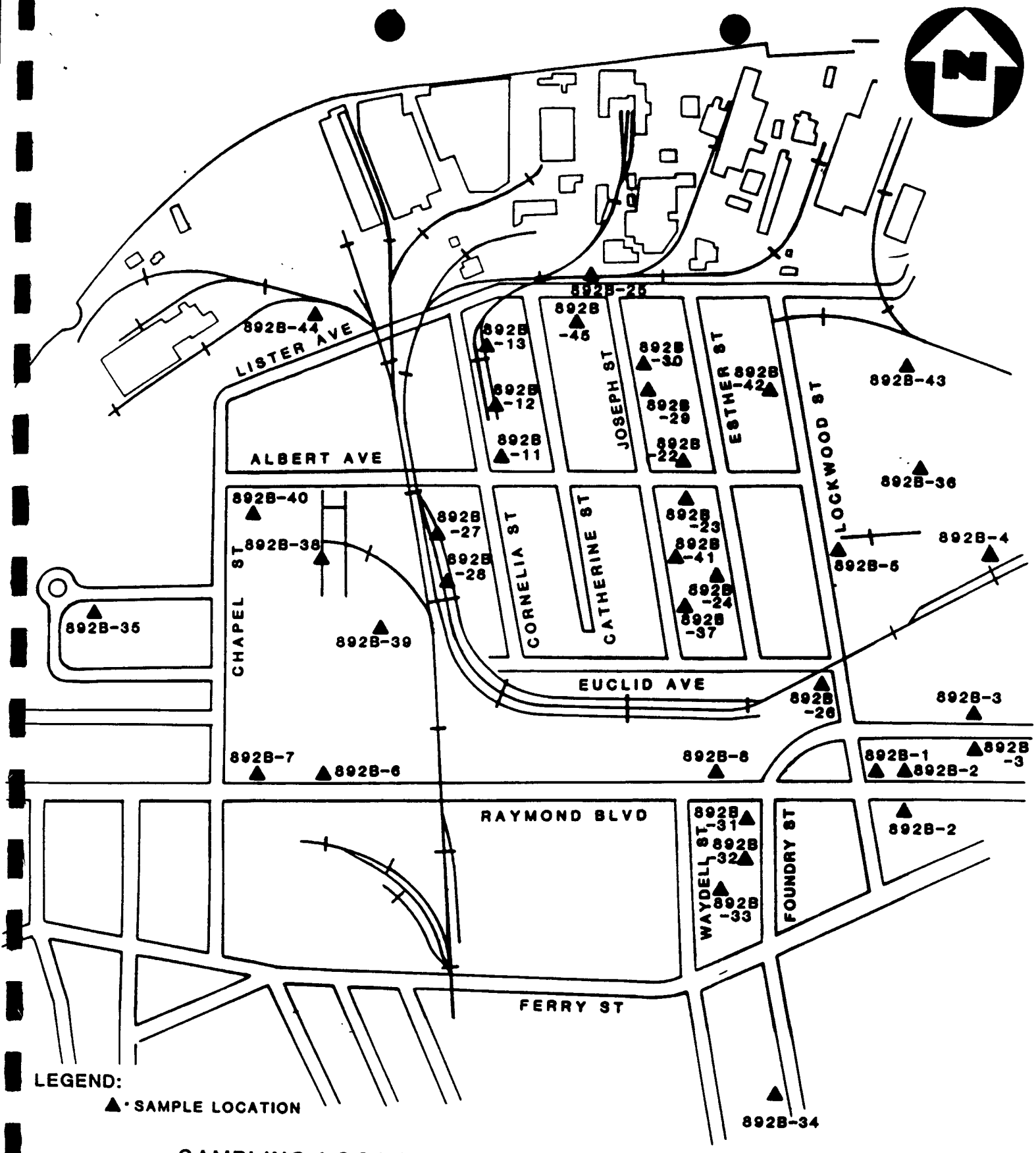
SAMPLING LOCATIONS AT WHICH COPPER WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-30

NUS CORPORATION

A Halliburton Company



SAMPLING LOCATIONS AT WHICH IRON WAS DETECTED

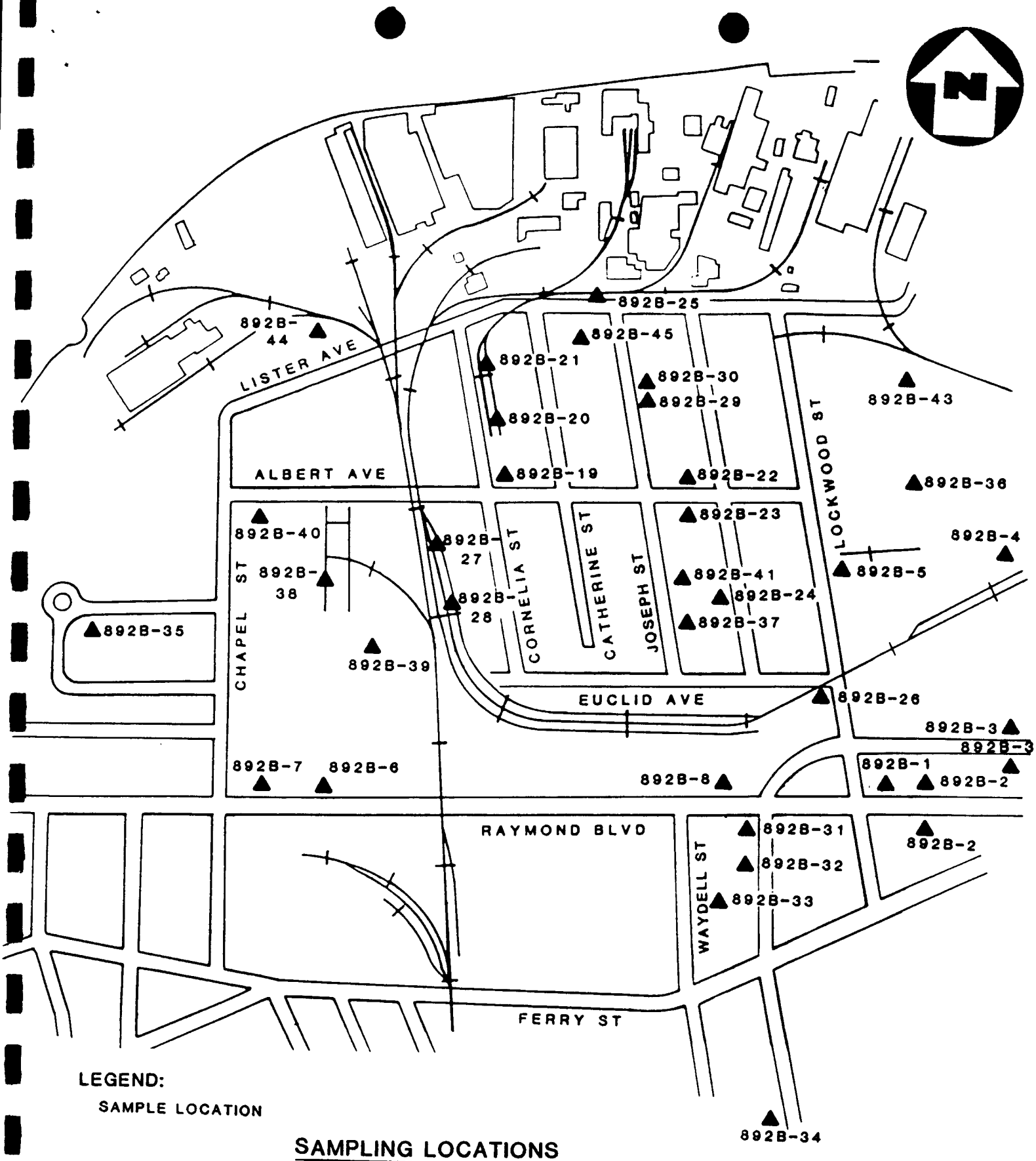
80 LISTER AVENUE NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-31

NUS CORPORATION

A Halliburton Company



LEGEND:

SAMPLE LOCATION

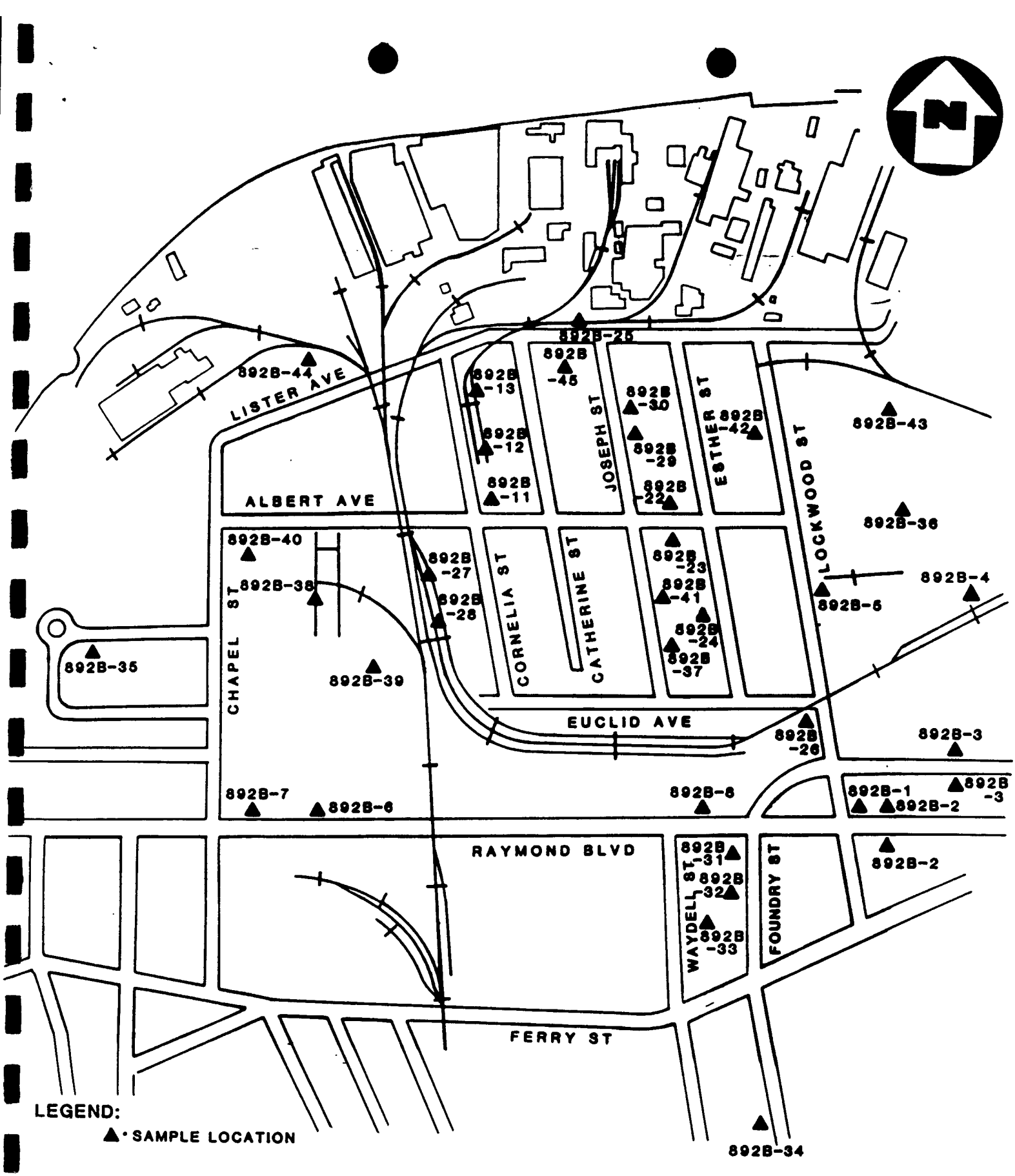
SAMPLING LOCATIONS AT WHICH LEAD WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-32

NUS CORPORATION

A Halliburton Company



SAMPLING LOCATIONS AT WHICH NICKEL WAS DETECTED

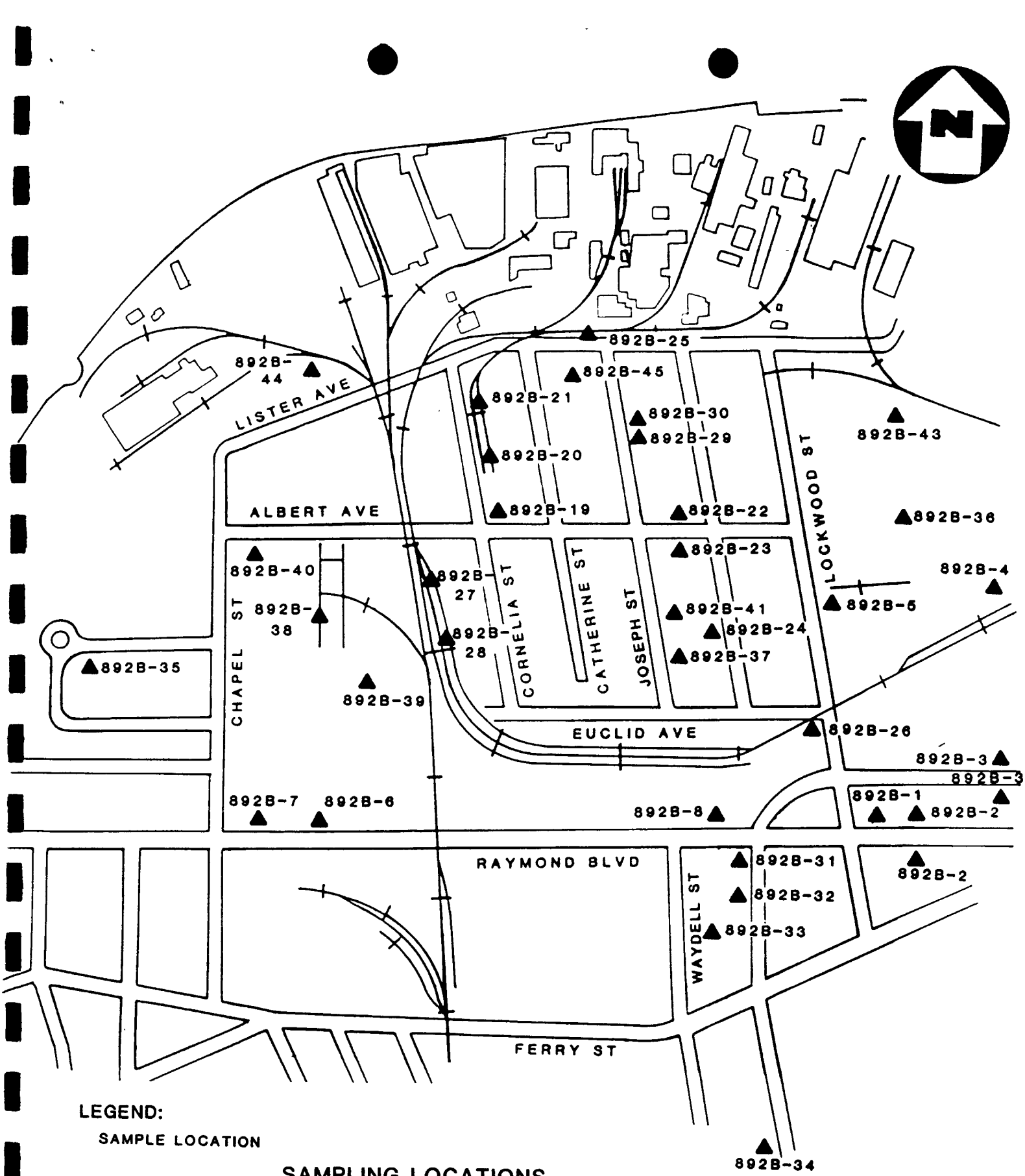
80 LISTER AVENUE NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-33

NUS CORPORATION

A Halliburton Company



LEGEND:

SAMPLE LOCATION

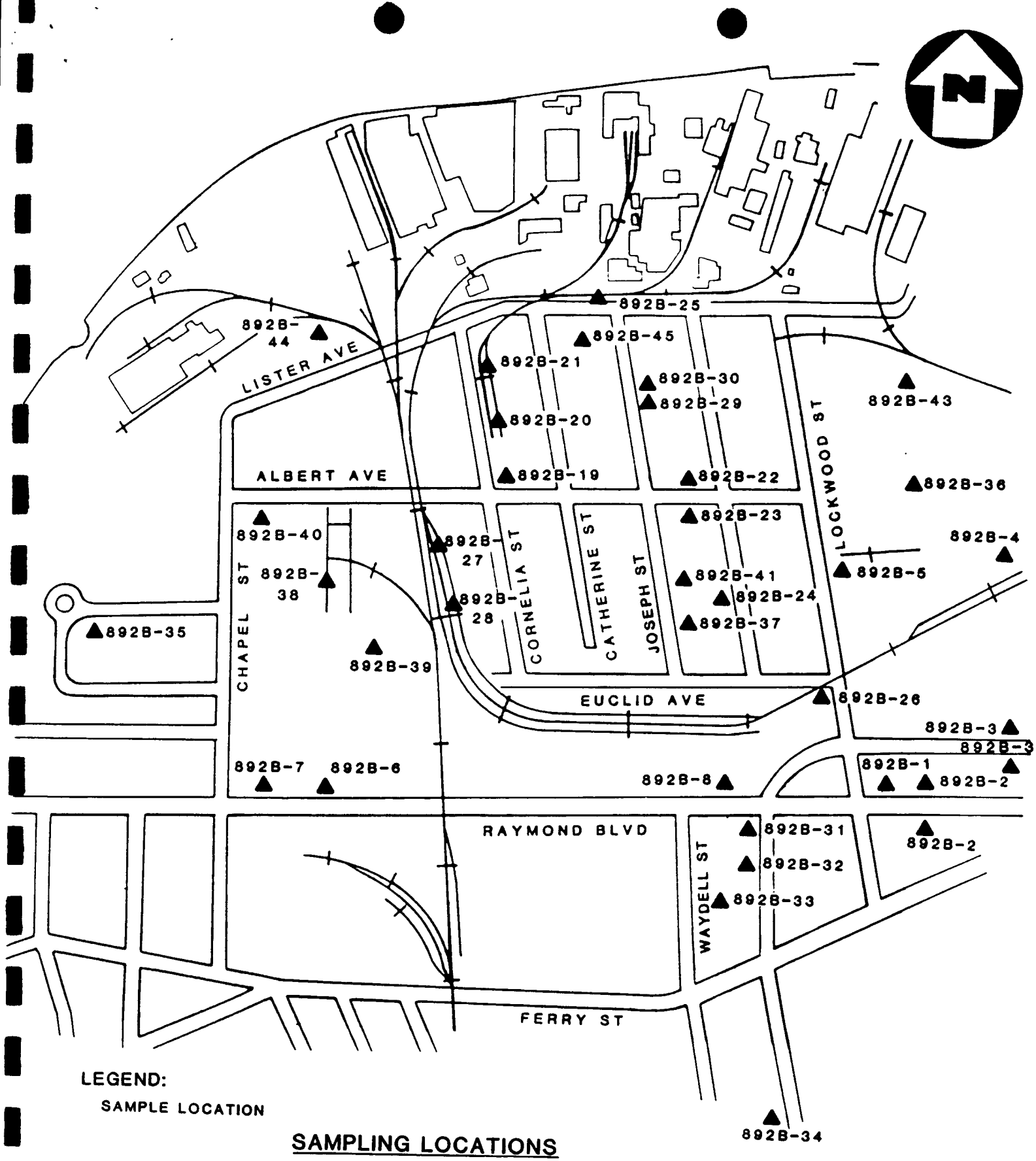
SAMPLING LOCATIONS AT WHICH MANGANESE WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-34

NUS CORPORATION

A Halliburton Company



LEGEND:

SAMPLE LOCATION

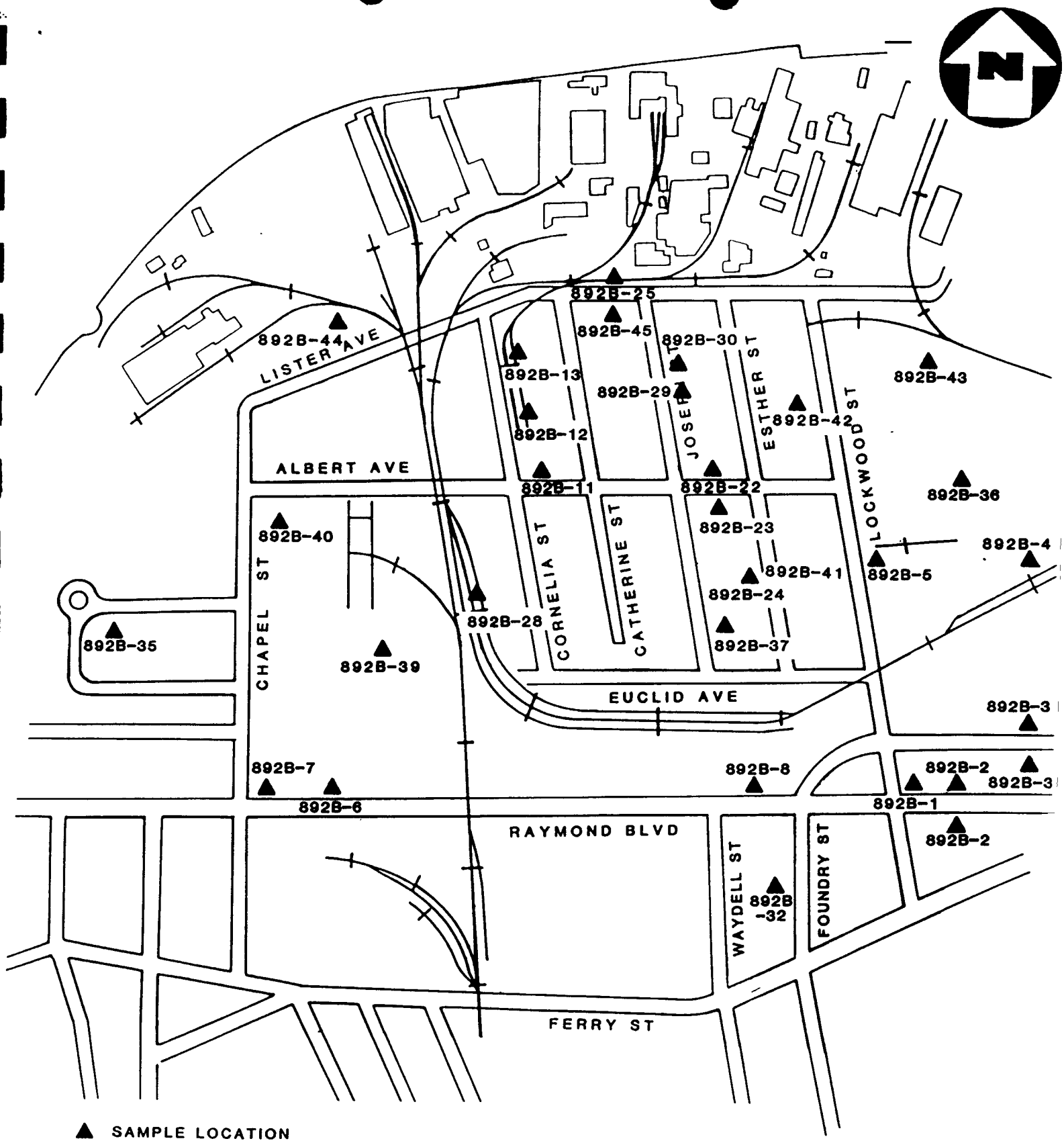
SAMPLING LOCATIONS AT WHICH ZINC WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-35

NUS CORPORATION

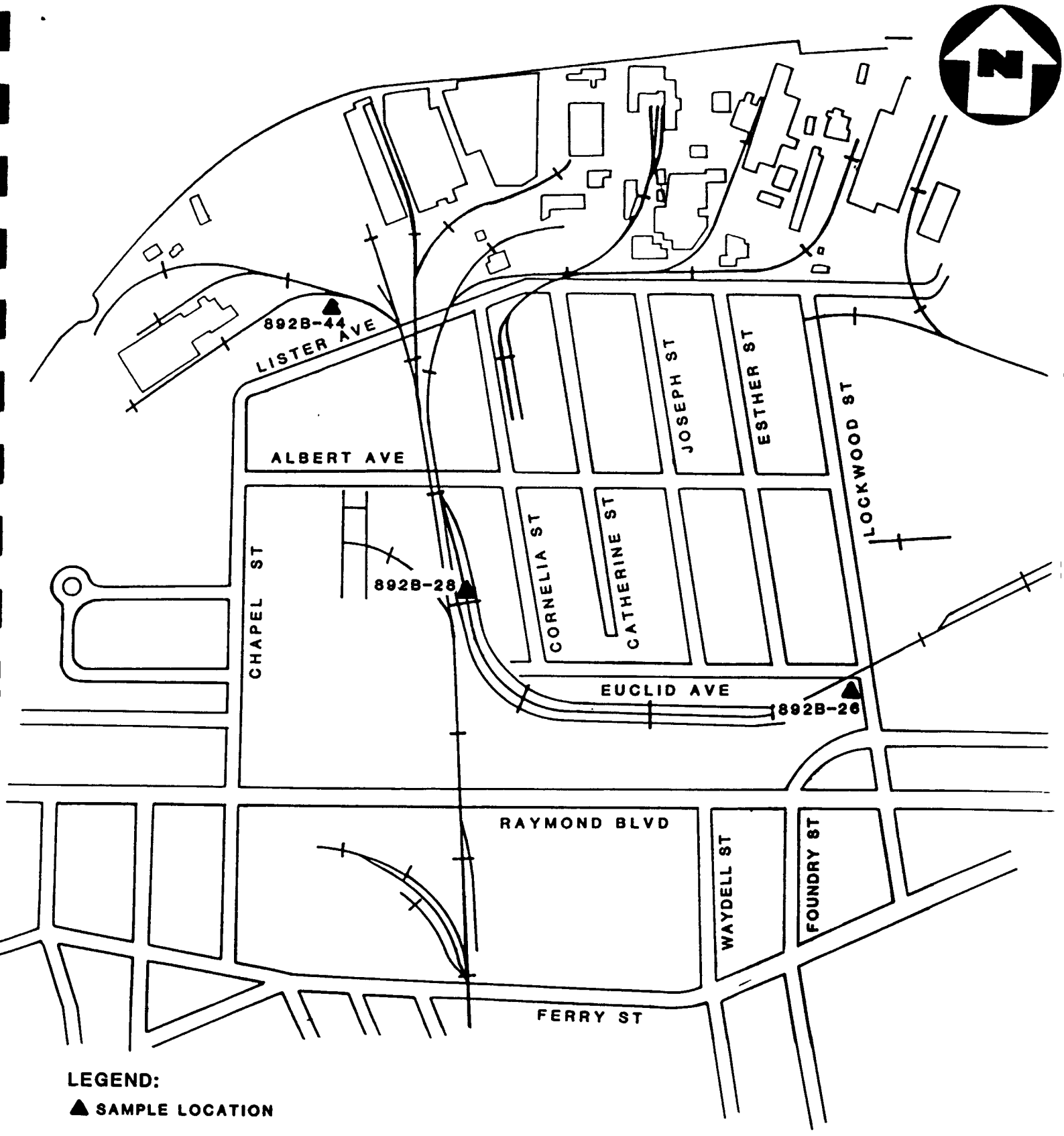
A Halliburton Company



SAMPLE LOCATIONS AT WHICH VANADIUM WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-36

NUS CORPORATION
A Halliburton Company



LEGEND:

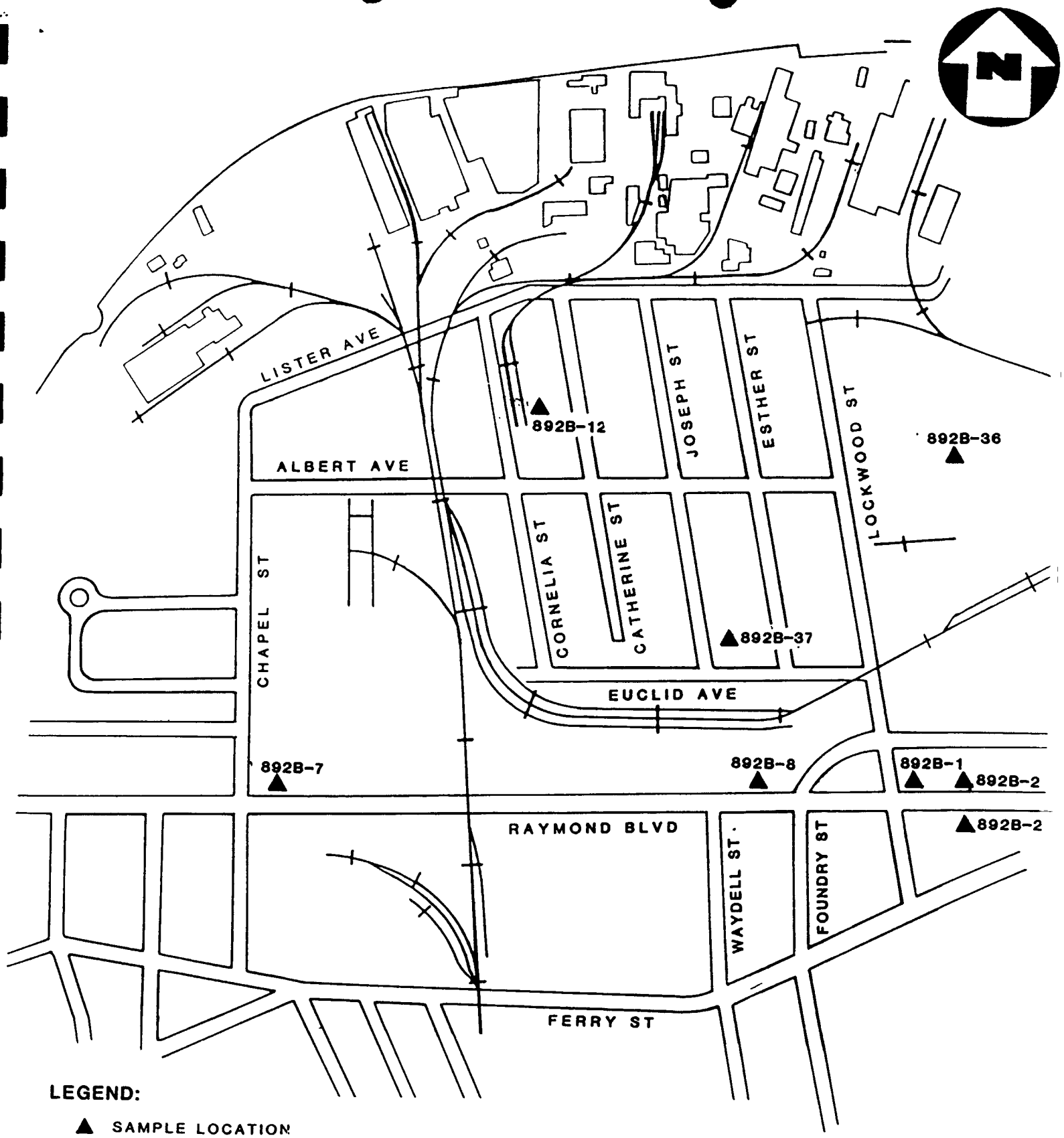
▲ SAMPLE LOCATION

SAMPLING LOCATIONS AT WHICH ARSENIC WAS DETECTED 80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-37

NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH ANTIMONY WAS DETECTED

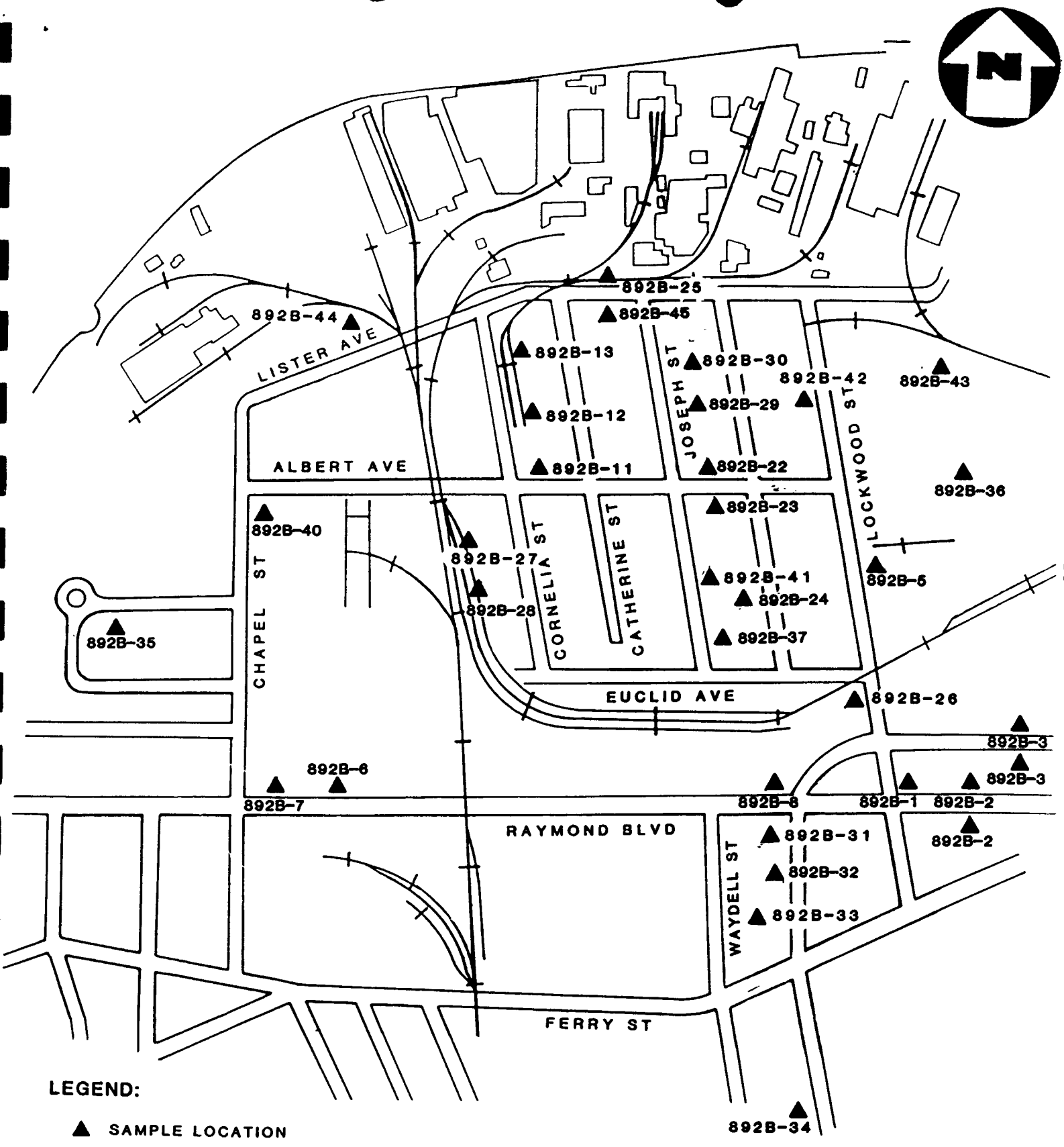
80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-38

NUS CORPORATION

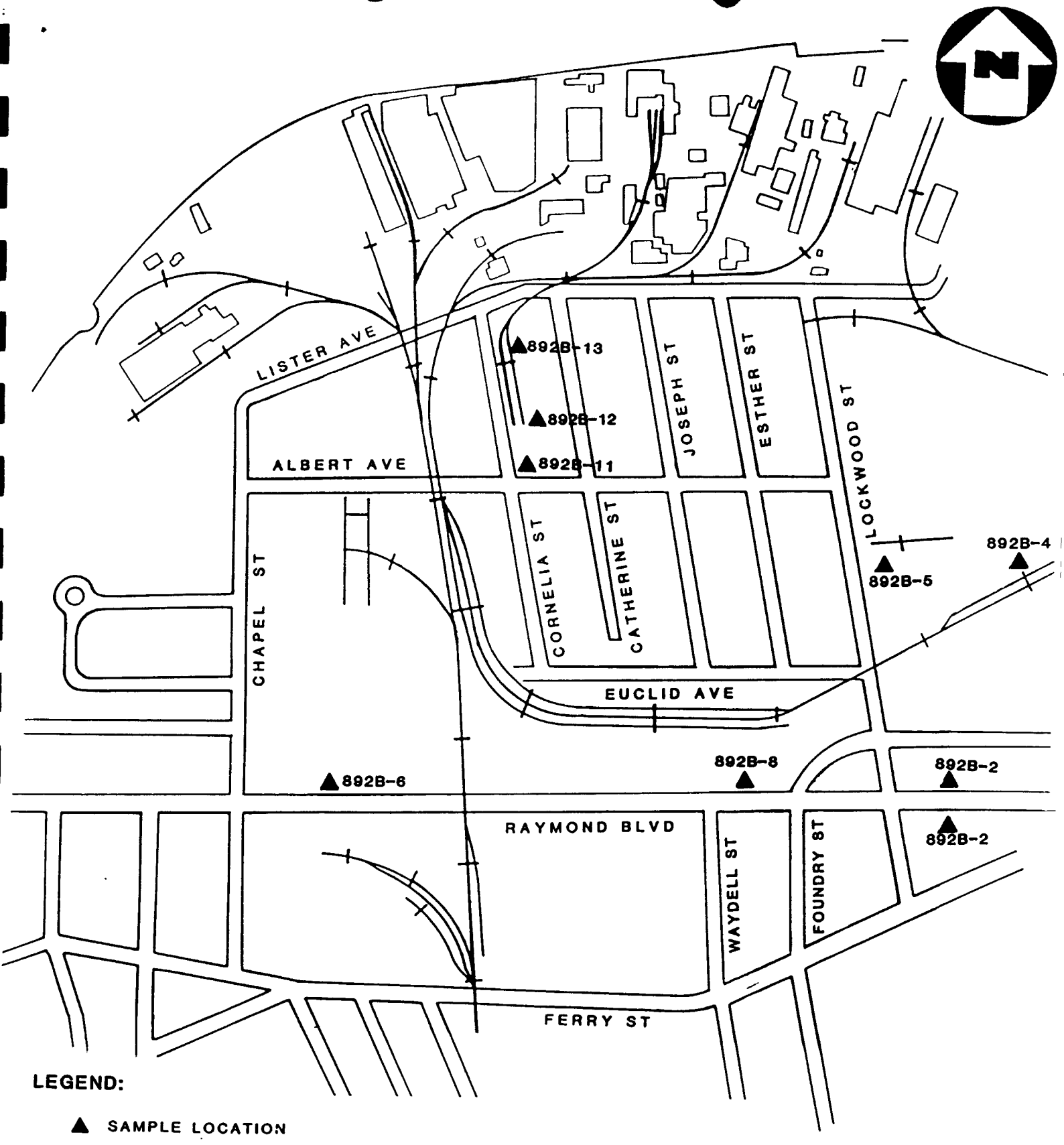
A Halliburton Company



SAMPLING LOCATIONS AT WHICH MERCURY WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-39

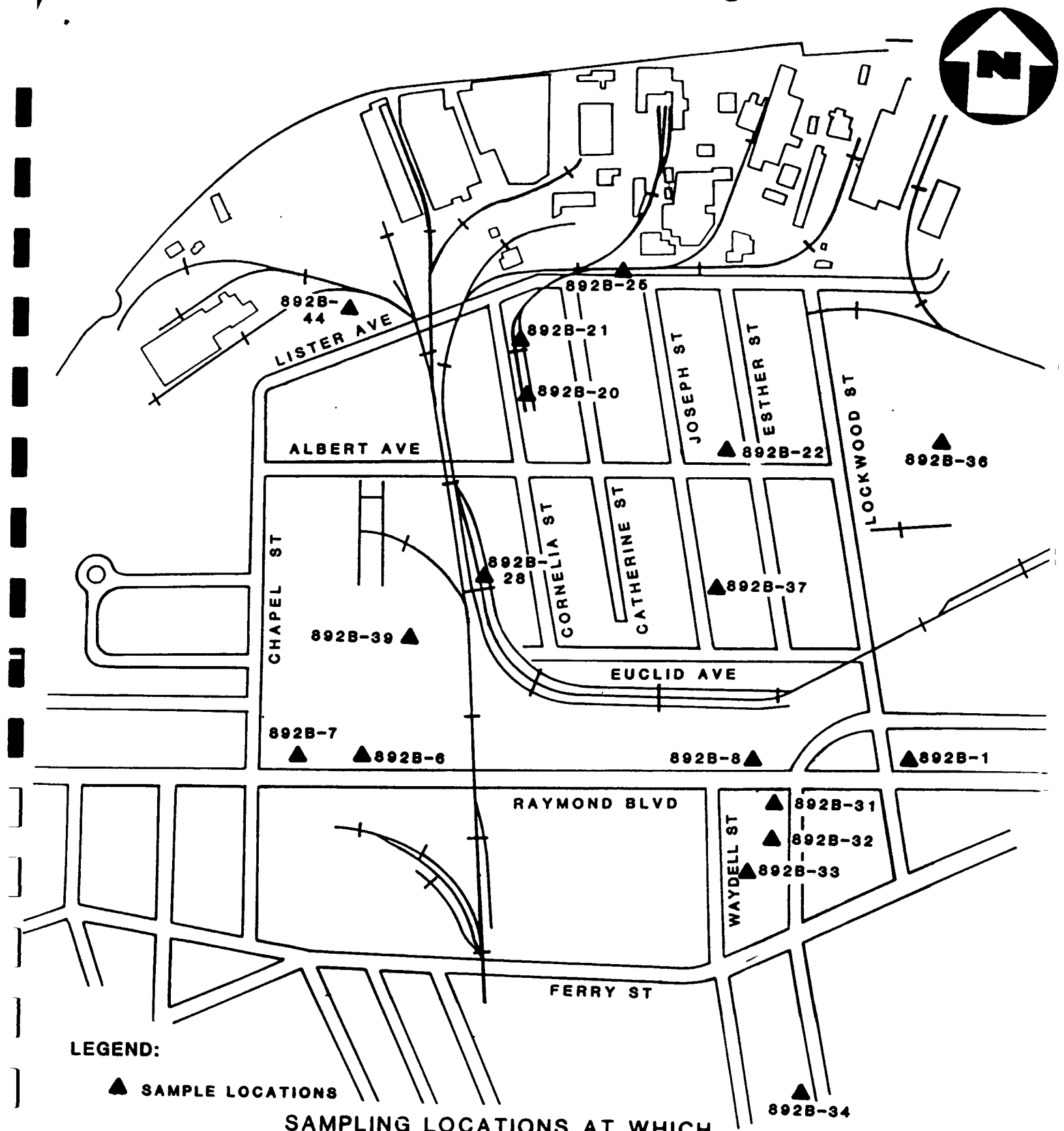
NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH TIN WAS DETECTED
80 LISTER AVENUE, NEWARK, N.J.
(NOT TO SCALE)

FIGURE 5-40

NUS CORPORATION
A Halliburton Company



SAMPLING LOCATIONS AT WHICH SILVER WAS DETECTED

80 LISTER AVENUE, NEWARK, N.J.

(NOT TO SCALE)

FIGURE 5-41

NUS CORPORATION

A Halliburton Company

6.0 CONCLUSIONS

Analytical results from thirty-five (35) soil samples collected from the study area indicates the presence of priority pollutants. TCDD was detected at all thirty-five (35) sample locations during prior TCDD sampling activities. Forty (40) other organic priority pollutants were also detected. They include: acenaphthene, 1,2,4-trichlorobenzene, hexachlorobenzene, 1,3-dichlorobenzene, fluoranthene, isophorone, naphthalene, n-nitrosodiphenylamine, phthalate esters, polynuclear aromatic hydrocarbons, pentachlorophenol, phenol, benzene, carbon tetrachloride, ethylbenzene, methylene chloride, trichlorofluoromethane, toluene, aldrin, dieldrin, chlordane, 4,4-DDT, 4,4-DDE, 4,4-DDD and endrin. Eighteen (18) inorganic priority pollutants were detected. They include: aluminum, chromium, barium, beryllium, cadmium, cobalt, copper, iron, lead, nickel, manganese, zinc, vanadium, arsenic, antimony, mercury, tin and silver.