State of Illinois
ENVIRONMENTAL PROTECTION AGENCY

Mary A. Gade, Director

1701 First Avenue, Maywood, IL 60153

MEMORANDUM

US EPA RECORDS CENTER REGION 5
400208

DATE: February 15, 1995

TO: File

FROM: Chris Kallis CK

SUBJECT: **North Chicago Refiners and Smelters**

Attached is a copy of sediment data collected by DLPC during a CERCLA expanded site inspection of North Chicago Refiners and Smelters. At this time, NCRS is appealing the Title 35 effluent limits assigned to all four outfalls on the draft NPDES permit. They have submitted a report to the Agency that supports the notion that they do not adversely affect water quality of Pettibone Creek and Lake Michigan. It is recommended that the Bureau of Water review and take into consideration the attached sediment data of Pettibone Creek. Special attention should be given to points X209 and X208. Point X209 is about 20 ft. upstream of the outlet of the Sheridan Road storm sewer, while X208 is 15 ft. downstream. This storm sewer is the direct receiving stream of all of the NCRS outfalls.

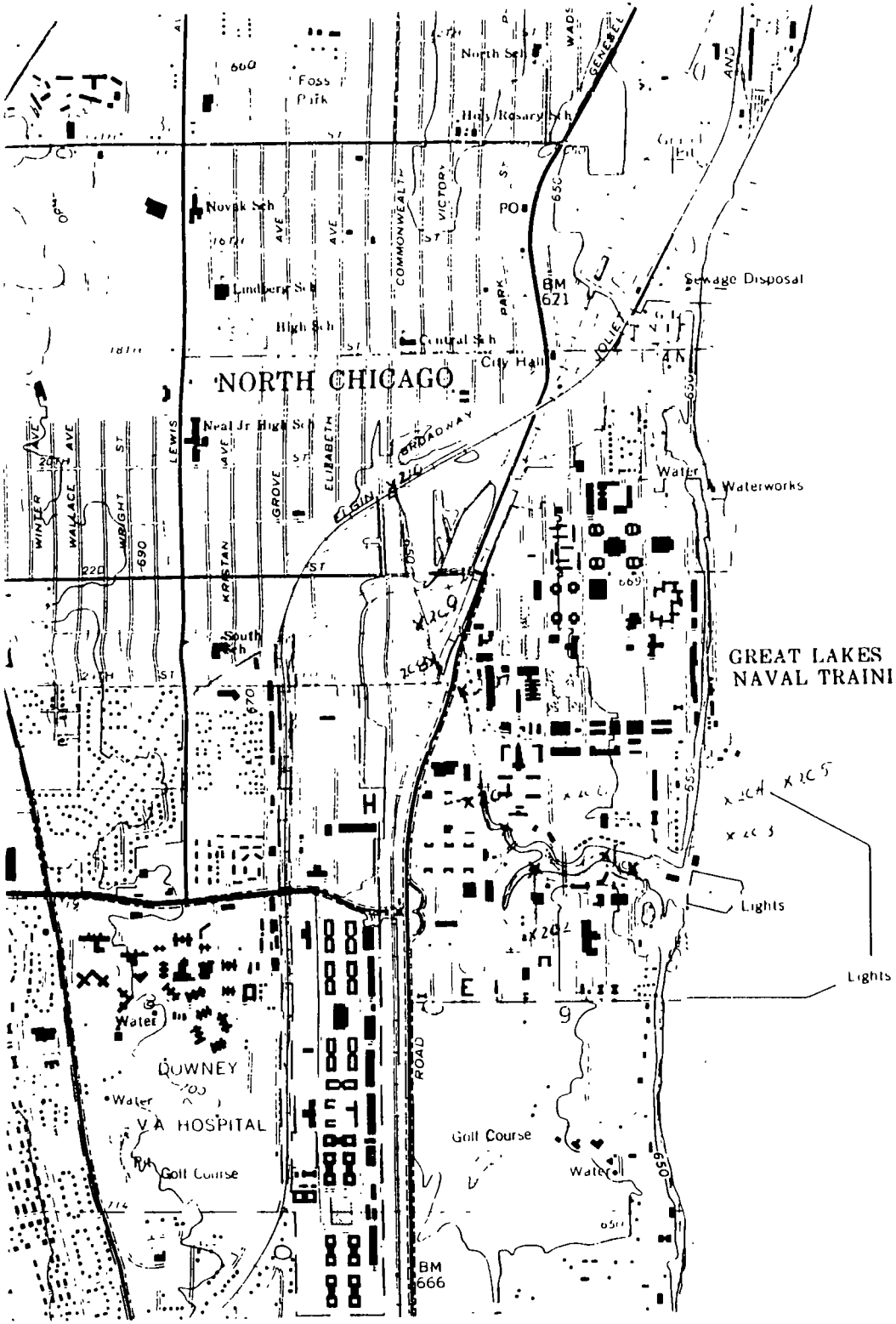
The LSI-CEI that was performed on December 13, 1995, showed that NCRS would not meet the prescribed effluent limits for Copper, Iron and Zinc. The attached data shows that concentrations of these three specific metals are at their highest in the creek at a point just downstream of the storm sewer outfall. This includes the area at the headwaters down to the harbor at Great Lakes Navel Training Center. The data showed that the upstream to downstream concentrations increased 2400% for Copper, 3900% for Lead and 2760% for Zinc. Also shown was a marked increase in concentrations of Beryllium, Barium, Chromium, Iron, Manganese and Nickel.

In reviewing the information, it is apparent that NCRS is not the only contributor of contaminants to Pettibone Creek. A high amount of organics and volatiles appear to be from the industrial park that is located west of the GLNTC. DWPC-FOS intends to investigate the source by storm water compliance inspections and a review of NOI non-submittals. Also noted is the high amounts of pesticides that appear to be coming from the GLNTC property. This will be investigated in the near future during the installations annual inspection. However, the introduction of heavy metals, especially those

associated with NCRS, go unmatched at any other location. The area located just east of the headwaters is a site known to be contaminated and under CERCLA investigation. The contamination is believed to have the same historical source as what has been found on NCRS. However, its affect on Pettibone Creek appears to be minimal in comparison to NCRS. This suggests that much of the contaminated storm water from NCRS is most likely associated with on- going present day industrial activity. This information coordinates strongly with field observations made during the December FOS inspection.

cc: DWPC/ FOS/ RU
DWPC/ Tom McSwiggin
DWPC/ Steve Nightingale
DWPC/ CAS
DLC/ Bruce Carlson
DLPC/ Judy Triller
DWPC/ Bob Schacht
DWPC/ Wally Matsunaga
CK
02/16/95

CK: ck



Approximate Sample Locations (Pettibone Creek) collected during CERCLA Expanded Site Inspect. of NCR+S

4-26-94

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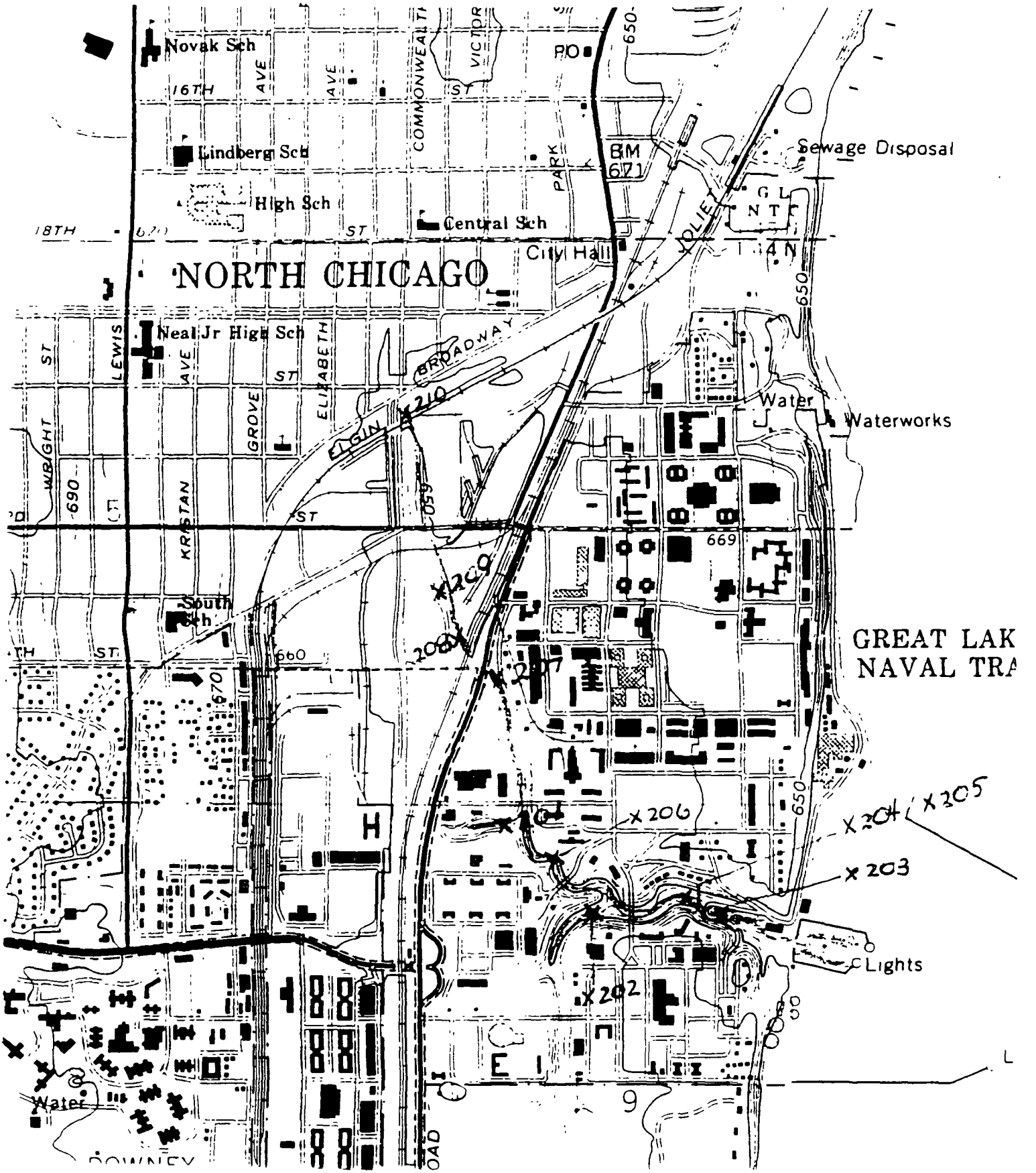
A K E M I C H I G A N

APPROXIMATE MEAN LAKE ELEVATION 560


Novak Sch
16TH
AVE
AVE
COMMONWEALTH
VICTOR
ST
PO
650
Lindberg Sch
BM
671
PARK
Sewage Disposal
High Sch
Central Sch
18TH
ST
City Hall
JOLIET
NORTH CHICAGO
Neal Jr High Sch
LEWIS
AVE
ST
ELIZABETH
BROADWAY
GROVE
ELGIN
210
Water
Waterworks
WRIGHT
690
KRISTAN
ST
669
209
South Sch
660
208
207
670
GREAT LAK
NAVAL TRA
206
204
205
203
Lights
202
Water
DOWNEY
OAD

NORTH CHICAGO REFINERS & SMELTERS

ILD097271563

SOIL SAMPLES

CK

SAMPLING POINT	X101 GLNTC 4-27-94	X102 GLNTC 4-27-94	X103 School 4-27-94	X104 Resid 4-27-94	X105 Resid 4-27-94	X106 Resid 4-27-94	X107 Resid 4-27-94	X108 Resid 4-27-94	X109 Resid 4-27-94	X110 Resid 4-27-94	X111 Resid 4-27-94
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Methylene Chloride	4 00 J	12 00 U	--	--	--	--	7 00 J	--	--	--	--
1,1,1-Trichloroethane	3 00 J	12 00 U	--	--	--	--	6 00 J	--	--	--	4 00 J
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
2-Methylnaphthalene	390 00 U	390 00 U	--	--	110 00 J	--	--	--	--	--	--
Acenaphthylene	390 00 U	390 00 U	--	--	170 00 J	170 00 J	--	--	--	--	--
2,6-Dinitrotoluene	390 00 U	390 00 U	--	--	--	--	--	--	--	--	--
Phenanthrene	420 00	250 00 J	--	--	--	480 00	510 00	170 00 J	190 00 J	890 00	190 00 J
Anthracene	390 00 U	390 00 U	89 00 J	--	90 00 J	--	--	--	--	150 00 J	--
Carbazole	390 00 U	390 00 U	89 00 J	--	--	--	--	--	--	94 00 J	--
Di-n-Butylphthalate	1100 00	390 00 U	--	400 00	--	830 00	1200 00 B	1500 00	--	830 00	1100 00
Fluoranthene	590 00	610 00	390 00	130 00 J	250 00 J	760 00	630 00	310 00 J	300 00 J	1300 00	380 00 J
Pyrene	520 00	490 00	250 00 J	130 00 J	350 00 J	940 00	710 00	240 00 J	260 00 J	1600 00	340 00 J
Butylbenzylphthalate	390 00 U	390 00 U	--	--	--	--	--	--	--	130 00 J	--
3,3'-Dichlorobenzidine	390 00 U	390 00 U	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	400 00	430 00	--	--	--	640 00	480 00	140 00 J	190 00 J	1100 00	220 00 J
Chrysene	470 00	480 00	850 00	500 00	1100 00	810 00	540 00	190 00 J	240 00 J	1200 00	270 00 J
bis(2-Ethylhexyl)phthalate	150 00 J	390 00 U	--	--	--	530 00	570 00	590 00	610 00	--	280 00 J
Di-n-Octylphthalate	390 00 U	390 00 U	--	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	460 00	390 00 U	--	--	--	--	520 00	--	--	1100 00	230 00 J
Benzo(k)fluoranthene	370 00 J	490 00	820 00	450 00	790 00	800 00	440 00	170 00 J	210 00 J	--	200 00 J
Benzo(a)pyrene	380 00 J	320 00 J	570 00	310 00 J	670 00	620 00	--	--	--	800 00	180 00 J
Indeno(1,2,3-cd)pyrene	200 00 J	390 00 U	--	--	--	--	--	--	--	--	--

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Field Operations Section - Reg 2

NORTH CHICAGO REFINERS & SMELTERS

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SOIL SAMPLES (continued)

SAMPLING POINT	X101 GLNTC 4-27-94	X102 GLNTC 4-27-94	X103 School 4-27-94	X104 Resid 4-27-94	X105 Resid 4-27-94	X106 Resid 4-27-94	X107 Resid 4-27-94	X108 Resid 4-27-94	X109 Resid 4-27-94	X110 Resid 4-27-94	X111 Resid 4-27-94
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
delta-BHC	20 00 U	2 00 U	--	--	--	3 90 P	--	280 00 PD	280 00 PD	--	--
gamma-BHC (Lindane)	20 00 U	2 00 U	--	0 79 JP	0 29 JP	1 40 JP	--	--	--	--	--
Heptachlor	20 00 U	2 00 U	--	--	--	--	--	150 00	150 00	3 30 P	--
Heptachlor epoxide	20 00 U	2 00 U	2 10 P	7 20 P	--	--	--	1000 00 PD	1000 00 PD	5 90 P	--
Dieldrin	20 00 U	0 76 JP	1 90 JP	5 40 P	--	25 00 P	2 90 JP	--	--	--	43 00 PD
4,4'-DDE	2600 00 BD	35 00	--	500 00 D	80 00	65 00 D	31 00	150 00	150 00	32 00	--
Endrin	4 10 JP	4 80 P	10 00 P	22 00 P	28 00 P	88 00 D	39 00	--	--	30 00	180 00 D
Endosulfan II	38 00 U	2 60 J	--	--	11 00 P	--	11 00	--	--	--	--
4,4'-DDD	28 00 JP	4 80 P	1 90 JP	54 00 D	11 00 P	41 00 PD	6 20 P	--	--	7 40 P	7 60 P
Endosulfan sulfate	38 00 U	3 90 U	--	--	--	--	--	20 00 JP	14 00 JP	--	--
4,4'-DDT	590 00 BD	22 00	22 00	430 00 D	89 00	120 00 PD	38 00 P	130 00 P	140 00 P	41 00 P	18 00 P
Methoxychlor (Marlate)	58 00 J	20 00 U	--	--	--	--	--	--	--	--	14 00 JP
Endrin Ketone	38 00 U	3 90 U	--	--	--	--	--	--	--	--	--
Endrin aldehyde	8 70 JP	3 90 U	--	--	--	--	7 70 P	14 00 JP	13 00 JP	--	--
alpha-Chlordane	4 40 JP	0 44 JP	8 60	23 00 P	8 00 P	55 00 D	4 60 P	4100 00 D	4100 00 D	40 00 P	50 00 D
gamma-Chlordane	20 00 U	1 50 JP	4 80 P	9.70 P	6 50 P	20 00 P	4 80 P	2000 00 PD	1900 00 PD	--	48 00 PD
Toxaphene	2000 00 U	200 00 U	--	--	--	--	--	--	--	--	--
Aroclor-1016	380 00 U	39 00 U	--	--	--	650 00 D	--	--	--	--	--
Aroclor-1254	--	--	--	--	--	--	--	--	--	--	2100 00 D
Aroclor-1260	380 00 U	39 00 U	91 00	200 00 P	220 00	640 00 D	260 00	320 00 JP	370 00 JP	230 00	1300 00 D
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	15400 00	13700 00	14900 00	12700 00	16700 00	15500 00	14700 00	16000 00	16800 00	13300 00	16000 00
Antimony	10 20 UJ	10 10 UJ	--	--	--	--	--	--	--	--	--
Arsenic	7 60	9 10	6 20	12 60	11 10	10 60	13 10	10 00	11 40	12 10 J	9 10 J
Barium	72 20	63 00	91 90	136 00	116 00	135 00	129 00	151 00	159 00	103 00	101 00
Beryllium	0 81 B	0 75 B	0 84 B	1 10	1 50	1 00 B	1 10	1 00 B	1 00 B	0 97 B	1 00 B
Cadmium	0 80 U	0 79 U	--	5 50	5 30	3 00	5 70	4 60	3 40	2 61	1 40
Calcium	16100 00	26200 00	18300 00	16300 00	25500 00	11000 00	12100 00	12300 00	12500 00	18100 00	12400 00
Chromium	23 40	21 60	23 00	36 10	34 70	216 00	75 80	45 90	45 00	62 40	33 30
Cobalt	8 10 B	9 00 B	7 20 B	7 40 B	9 50 B	10 60	8 50 B	9 80 B	10 40 B	12 70	9 00 B
Copper	24 40	22 70	60 20	506 00	606 00	200 00	370 00	300 00	287 00	281 00	271 00
Iron	22900 00	21700 00	20100 00	23300 00	25500 00	24400 00	22100 00	21700 00	22800 00	22300 00	22600 00
Lead	47 70	38 70	132 00	1180 00	586 00	297 00	467 00	251 00	233 00	318 00	200 00
Magnesium	10600 00	17500 00	10800 00	8900 00	11400 00	2740 00	6610 00	7240 00	7400 00	10400 00	7070 00
Manganese	700 00	689 00	539 00	404 00	542 00	470 00	553 00	782 00	814 00	709 00	412 00
Mercury	0 05 B	0 06 B	0 15	0 43	0 47	0 58	3 80	0 23	0 26	0 43	0 13
Nickel	23 80	26 70	22 60	34 80	44 60	32 20	30 70	27 70	24 30	31 70	28 60
Potassium	3250 00	2670 00	2630 00	1940 00	2280 00	2680 00	2080 00	2230 00	2150 00	2110 00	2600 00
Selenium	0 23 UJ	0 24 UJ	0 29 BJ	1 50 J	1 60 J	0 50 BJ	2 10 J	0 43 BJ	2 00 J	2 30 J	0 34 BJ
Silver	0 80 U	0 79 U	--	1 00 B	--	2 40	9 80	1 10 B	1 20 B	--	--
Sodium	89 40 B	115 00 B	119 00 B	121 00 B	252 00 B	114 00 B	120 00 B	98 80 B	108 00 B	110 00 B	87 40 B
Thallium	0 23 UJ	0 24 UJ	--	--	--	--	--	--	0 52 B	0 44 B	0 45 B
Vanadium	37 00	32 00	35 10	33 60	35 30	35 40	35 60	36 70	38 70	31 90	36 80
Zinc	91 80	86 30	329 00	2650 00	2690 00	761 00	1740 00	1210 00	1150 00	1100 00	845 00
Cyanide	0 98 U	0 98 U	--	--	1 40	2 10	--	1 40	--	--	--

NORTH CHICAGO REFINERS & SMELTERS
ILD097271563

SEDIMENT SAMPLES

SAMPLING POINT	X201 Trib to Pettibone	X202 Trib to Pettibone	X203 L Michigan Harbor	X204 Pettibone GLNTC	X205 Dup of X204	X206 Pettibone GLNTC	X207 Pettibone GLNTC	X208 Pettibone	X209 Pettibone	X210 Origin of Pettibone
Date	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94
VOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Vinyl Chloride	14 0 U	14 0 U	--	--	--	--	--	--	30 0	670 0 D
Methylene Chloride	14 00 U	14 0 U	35 0 B	--	--	--	--	--	--	--
Acetone	23 0	12 0 J	26 0	16 0	24 0 J	7 0 J	46 0 J	5 0 J	5 0 J	--
Carbon Disulfide	4 0 J	14 0 U			4 0 J	4 0 J	4 0 J	--	--	--
1,1-Dichloroethene	--	--	--	--	--	--	--	--	--	8 0 J
1,1-Dichloroethane	--	--	--	--	--	--	--	--	--	12 0 J
1,2-Dichloroethene (total)	14 0 U	14 0 U				--	34 0	25 0	25 0	700 0 D
2-Butanone	13 0 J	5 0 J	20 0	7 0 J	6 0 J	--	31 0 J	--	--	--
1,1,1-Trichloroethane	14 00 U	14 0 U	13 0	--	--	--	--	--	--	--
Trichloroethene	14 00 U	14 0 U	--	--	--	--	13 0 J	8 0 J	--	4 0 J
4-Methyl-2-Pentanone	14 00 U	14 0 U	--	--	--	--	3 0 J	--	--	--
Tetrachloroethene	14 00 U	14 0 U	--	--	--	--	21 0	--	--	--
1,1,2,2-Tetrachloroethane	14 00 U	14 0 U	--	--	--	--	4 0 J	--	--	--
Toluene	14 00 U	14 0 U	4 0 J	--	--	--	12 0 J	--	--	--
Ethylbenzene	14 00 U	14 0 U	--	--	--	--	6 0 J	--	--	--
Styrene	14 00 U	14 0 U	--	--	--	--	3 0 J	--	--	--
Xylene (total)	14 00 U	14 0 U	6 0 J	--	--	--	33 0	--	--	--
SEMIVOLATILES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
4-Methylphenol	450 00 U	440 0 U	--	--	--	--	820 0 J	--	--	--
Naphthalene	130 00 J	170 0 J	600 0	--	--	300 0 J	--	--	--	--
2-Methylnaphthalene	110 00 J	160 0 J	310 0 J	--	--	120 0 J	--	--	93 0 J	--
Acenaphthylene	450 00 U	120 0 J	--	--	--	--	--	--	--	--
Acenaphthene	730 00	440 0 U	850 0	--	--	530 0	--	--	--	--
Dibenzofuran	510 00	130 0 J	600 0	--	--	330 0 J	--	--	--	--
Fluorene	680 00	220 0 J	980 0	--	--	--	--	--	--	--
Phenanthrene	45000 00 U	1100 0	5700 0	3100 0	3100 0	4800 0	5000 0	--	130 0 J	420 0
Anthracene	840 00	220 0 J	1200 0	--	--	670 0	--	--	--	--
Carbazole	950 00	220 0 J	1500 0	--	--	1200 0	--	--	--	--
Di-n-Butylphthalate	740 00	960 0	980 0 B	1100 0 J	1300 0 J	--	1100 0 J	--	--	--
Fluoranthene	3100 00	1600 0	2000 0	3000 0	3100 0	7200 0	6700 0	--	--	750 0
Pyrene	45000 00 U	1400.0	1100 0	2400 0	2800 0	6100 0	4600 0	--	--	730 0
Butylbenzylphthalate	420 00 J	440 0 U	--	--	--	--	--	--	--	--
Benzo(a)anthracene	2200 00	880 0	--	1700 0 J	--	3400 0	2700 0	--	--	410 0
Chrysene	2300 00	870 0	3800 0	--	--	3500 0 J	3300.0	--	--	490 0
bis(2-Ethylhexyl)phthalate	300000 00	560 0	--	--	--	12000 0	22000 0	--	--	440 0
Di-n-Octylphthalate	23000 00 J	440 0 U	--	--	--	--	--	--	--	--
Benzo(b)fluoranthene	450 00 U	730 0	--	--	--	--	4300 0	--	--	--
Benzo(k)fluoranthene	2300 00	440 0 U	3500 0	--	--	--	2800 0	--	--	--
Benzo(a)pyrene	450 00 U	440 0 U	2500 0	--	--	2100 0	3200 0	--	--	--

NORTH CHICAGO REFINERS & SMELTERS
ILD097271563

SEDIMENT SAMPLES (cont)

SAMPLING POINT	X201 Trib to Pettibone	X202 Trib to Pettibone	X203 L Michigan Harbor	X204 Pettibone GLNTC	X205 Dup of X204	X206 Pettibone GLNTC	X207 Pettibone GLNTC	X208 Pettibone	X209 Pettibone	X210 Origin of Pettibone
Date	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94	4-26-94
PESTICIDES	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
alpha-BHC	2 30 U	1 2 J	5 5 P	--	--	6 0 P	--	--	--	--
delta-BHC	2 30 U	2 3 U	--	120 0 P	--	--	--	--	--	--
Heptachlor	1 30 J	2 3 U	--	--	--	--	--	--	--	--
Heptachlor epoxide	2 30 U	4 0 P	--	--	--	--	--	--	--	--
Endosulfan I	2 30 U	2 3 U	--	--	30 0	--	--	--	--	--
Dieldrin	4 80 P	9 8 P	12 0 P	36 0 JP	25 0 JP	64 0 PD	5 8 P	--	--	0 6 JP
4,4'-DDE	4 50 U	41 0	280 0 D	230 0 P	260 0 P	300 0 D	--	--	--	--
Endrin	33 00 P	9 7 P	82 0 PD	210 0 P	210 0 P	220 0 PD	53 0 P	0 4 JP	0 7 JP	6 0 P
Endosulfan II	12 00	4 4 U	--	--	--	--	17 0	--	--	--
4,4'-DDD	26 00 P	59 0	580 0 D	3300 0 D	3100 0 D	460 0 PD	53 0 P	--	--	5 7 P
4,4'-DDT	42 00	71 0	200 0 D	170 0	310 0	170 0 PD	69 0 P	0 5 JP	0 7 JP	--
Endrin aldehyde	4 50 U	4 4 U	--	96 0 P	--	--	--	0 2 JP	--	6 1 P
alpha-Chlordane	1 10 JP	29 0	19 0	84 0	--	16 0	12 0 P	--	--	2 4
gamma-Chlordane	2 30 U	16 0 P	21 0 P	36 0 P	30 0 P	--	8 5 P	--	--	1 7 JP
Aroclor-1016	45 00 U	44 0 U	--	1300 0	1600 0	680 0 P	--	--	12 0 J	--
Aroclor-1254	270 00	44 0 U	1200 0 PD	5200 0 PD	3300 0 P	1800 0 D	650 0	--	--	69 0
Aroclor-1260	310 00	160 0	--	1400 0	1700 0	2800 0 D	460 0	10 0 J	11 0 JP	--
INORGANICS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	4320 00	3740 0	4180 0	11600 0	12400 0	4830 0	4450 0	12800 0	16000 0	10100 0
Antimony	14 70 UJ	10 8 UJ	--	15 5 J	--	--	--	--	--	--
Arsenic	5 90 J	6 1 J	8 8 J	22 1	24 0	7 4	7 4 J	17 5 J	7 1 J	8 5 J
Barium	54 90 B	55 2	31 6 B	208 0	167 0	48 8	50 4 B	104 0	68 6	96 1
Beryllium	0 46 B	0 3 B	0 8 B	2 4	3 0	0 6 B	0 7 B	11 2	1 3	0 9 B
Cadmium	1 20 U	0 8 U	0 9 B	4 7	5 6	0 9 B	2 3	1 5	--	--
Calcium	47800 00	65000 0	39700 0	88700 0	102000 0	53700 0	31800 0	85700 0	76000 0	83800 0
Chromium	9 70	13 0	12 9	61 6	69 2	21 6	20 8	42 2	25 3	17 0
Cobalt	7 10 B	6 9 B	6 0 B	18 1	15 4	5 0 B	4.1 B	13 5	11 5	8 1 B
Copper	38 20	16 9	159 0	465 0	475 0	209 0	425 0	2530 0	106 0	69 8
Iron	11600 00	16000 0	12000 0	19000 0	17300 0	15000 0	12100 0	36700 0	23700 0	19300 0
Lead	146 00	48 0	149 0	392 0	435 0	278 0	167 0	1840 0	46 9	48.2
Magnesium	23700 00	36400 0	20500 0	24600 0	29800 0	28700 0	15700 0	38500.0	39500 0	44300.0
Manganese	345 00	472 0	342 0	2140 0	2470 0	378 0	291.0	1110 0	541 0	616.0
Mercury	0 04 B	0 1 B	0 2	1 4	1 6	0 3	0 1 B	0 2	1.1	--
Nickel	9 20 B	10 4	24 9	216 0	445 0	22 9	19.4	107.0	36.1	26.1
Potassium	836 00 B	1060 0	885 0 B	3350 0	3290 0	1190 0	636 0 B	1680 0	4700 0	2880.0
Selenium	0 27 UJ	0 2 UJ	--	3 5 J	5 0 J	0 7 BJ	--	2 2 J	--	--
Silver	1 20 U	0 8 U	1 5 B	42 1	50 8	1 8 B	--	--	--	--
Sodium	292 00 B	227 0 B	463 0 B	765 0 B	748 0 B	273 0 B	548 0 B	5540 0	700 0 B	658 0 B
Thallium	0 27 U	0 2 U	--	--	0 4 BJ	--	--	0 2 B	0 5 B	0 3 B
Vanadium	15 00	13 8	14 2	25 6	26 9	15 1	12 5 B	32 4	29 7	21 2
Zinc	159 00	83 3	664 0	1160 0	605 0	685 0	1230 0	17000 0	614 0	820 0
Cyanide	1 20 U	1 0 U	--	3 9	4 2	2 4	--	--	--	--

TENTATIVELY IDENTIFIED COMPOUNDS

North Chicago Refiners & Smelters
ILD097271563

SOIL SAMPLES

SAMPLE POINT	X102	X103	X104	X105	X108	X109
Benzenedicarboxylic acid	2000 BJN	2200 JN	1800 JN	2300 JN	N.D.	1600 J
Heptachlor Epoxide	N D	N D	N D	N D	490 JN	550 JN
Methyl Phenanthrene	N.D.	N D	N D.	840 JN	N D.	N.D.

SEDIMENT SAMPLES

SAMPLE POINT	X201	X203	X206	X207	X208	X209
Benzenedicarboxylic acid	290000 JN	N.D	N D	N D	1700 JN	2100 JN
Benzo(c)phenanthrene	N D	N D.	1400 JN	N D.	N.D.	N D.
Dimethyldisulfide	N D	N D	N D	220 JN	N D.	N.D.
Hydroxymethyl Pentanone	340000 JNBA	N D.	170000 JNBA	180000 JNBA	N.D.	N.D.
Methylanthracene	N D	2600 JN	N D	N D	N D	N.D.
Naphthacene	N D	7000 JN	N D.	N D.	N D.	N D.
Thiobis Methane	N D	N D	N D.	230 JN	N D.	N D.

SEDIMENT SAMPLE DESCRIPTIONS

SAMPLE	DEPTH	APPEARANCE	APPROXIMATE LOCATION
X201	4" – 8" under 2" water	Black/brown; sandy to med. size gravel; leaf decay	GLNTC, northern trib. to Pettibone 138' downstream of steam line
X202	4" – 6" under 4" – 6" water	Black; sandy with leaf decay	GLNTC, southern trib. to Pettibone 274' upstream of hospital bridge
X203	6" – 16" under 2.5' water	Dark silty gravel with some sand	GLNTC, inner harbor; 160' E of bridge marked "1938" 52' N of southern concrete bank
X204/X205	16" – 18" under 18" water	Very black; sandy, silty with gravel; petroleum–like odor	GLNTC, Pettibone Crk. between harbor and southern trib. 42' S of gravel rd. and 183' W of bridge
X206	4" – 8" under 3" water	Black; sandy to lrg. rock texture; tar–like smell	GLNTC, Pettibone Crk. between the tributaries; 140' downstream of bunker 24 E
X207	0" – 6" under 1" water	Dark grey; silt/sand with leaf matter	GLNTC, Pettibone Crk. 12' downstream from culvert where creek enters GLNTC
X208	0" – 6" under 6" water	Grayish brown clay	Pettibone Crk. NW of Sheridan Rd. 15' downstream of outfall from east/north.
X209	8" – 9" under 8" water	Hard gray clay	Pettibone Crk. NW of Sheridan Rd. 34' downstream from Federal Chicago fence.
X210	0" – 6" under 4" water	Dark gray/green; silty sandy clay	Origin of Pettibone Crk. 1' downstream of culvert from north 20' east of Commonwealth

NORTH CHICAGO REFINERS & SMELTERS
ILD097271563

SOIL SAMPLE DESCRIPTIONS

SAMPLE	DEPTH	APPEARANCE	APPROXIMATE LOCATION
X101	0" – 1"	Light brown silt loam	GLNTC, Lawn of housing unit 2845. 42' S of south side of housing unit 2845 and 93' W of ???some street
X102	0" – 1"	Light brown silty loam with some gravel and clay, black lumps	GLNTC; Baseball field, lawn area north of Wyoming St 114' N of Wyoming St and 50' W of utility pole B280
X103	0" – 1"	Light brown silty loam	M P Hart School; 1110 18th Street. East of building and south of playground 27' S of playground fence and 30 5' E of east side of school building
X104	0" – 1"	Dark brown silt loam with some sand	1923 Glenn, off SW corner of house; 18' S of southwest corner of house and 25' E of fence along Glenn
X105	0" – 1"	Dark brown humus with some clay	1924 Jackson Street; front lawn, east of house; 23' E of southeast corner of house and 15' S of home's walkway leading to front porch
X106	0" – 1"	Light brown silty loam	1018 Argonne Drive; front lawn; 12' S of southeast corner of home and 14'4" W of walk leading to front door
X107	0" – 1"	Dark brown silt loam with some sand	918 Argonne; front lawn; 16' S of home's southeast corner and 18 5' W of home's walk leading to front door
X108/X109	0" – 1"	Light brown silty loam	917 Argonne; back lawn; 15' W of residence's east wood fence and 19' S of south wall of house
X110	0" – 1"	Light brown silty loam	1830 Park Ave., back lawn; 20' W of west side of house and 11'10" S of hurricane fence

I am in the process of identifying this street name! ⇒ Bldg. 3400 off of Buckly Rd

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

IL 532-0357
ADM 39
054-002

Subject permit limits
Data Lavin + SDNS sediment
Reviewed by C Kullis Date 2-15-95

sediment data from upstream and downstream of NCRS combined discharge from storm sewer. All concentrations in mg/kg

parameter	upstream	downstream
Barium	68.6	104
Beryllium	1.3	11.2
Chromium	25.3	42.2
copper	106	2530
iron	23700	36700
Lead	46.9	1840
manganese	541	1110
Nickel	36.1	107
Zinc	614	17000