RESEARCH AND DEVELOPMENT DEPARTMENT

REPORT NO. 07-56

HARLEM AVENUE SOLIDS MANAGEMENT AREA

MONITORING REPORT FOR

SECOND QUARTER 2007

AUGUST 2007

Protecting Our Water Environment

Metropolitan Water Reclamation District of Greater Chicago

100 EAST ERIE STREET CHICAGO, ILLINOIS 60611-3154 312-751-5600

Louis Kollias, P.E., BCEE
Director of Research and Development
312-751-5190

August 30, 2007

Mr. S. Alan Keller, P.E.
Manager, Permit Section
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794 -9276

Dear Mr. Keller:

Subject: Harlem Avenue Solids Management Area - Stickney WRP, Contract No. 84-111-2P, IEPA Permit No. 2004-AO-2591, Monitoring Report for April, May, and June 2007

The attached ten tables contain the monitoring data for the Harlem Avenue Solids Management Area for April, May, and June 2007 as required by IEPA Operating Permit No. 2004-AO-2591. In a letter dated January 19, 2007, the IEPA granted permission to terminate the monitoring of lysimeters L-1 and L-1N. Therefore, monitoring data for these lysimeters will not be included in this and subsequent reports.

The data reported are as follows:

Table 1, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on April 11, 2007

Table 2, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on April 25, 2007

Table 3, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on May 9, 2007

Table 4, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on May 23, 2007

Table 5, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on June 6, 2007

Subject: Harlem Avenue Solids Management Area - Stickney WRP, Contract No. 84-111-2P, IEPA Permit No. 2004-AO-2591, Monitoring Report for April, May, and June 2007

Table 6, Analysis of Water from Lysimeters L-2 through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on June 20, 2007

Table 7, Analysis of Monthly Composited Digested Biosolids Placed in the Harlem Avenue Solids Management Drying Area During June 2007

Table 8, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Harlem Avenue Solids Management Drying Area During April 2007

Table 9, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Harlem Avenue Solids Management Drying Area During May 2007

Table 10, Analysis of Monthly Composited Processed Digested Biosolids Removed from the Harlem Avenue Solids Management Drying Area During June 2007

Biosolids were placed in the solids drying area during June 2007. Biosolids were removed from the solids drying area during April, May, and June 2007.

Very truly yours,

Louis Kollias
Director
Research and Development

LK:PL:spy
Attachments
cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA
Stuba/Granato/Cox/Lindo/M. Patel

cc wo/att: Sharma/S. Levy/Jamjun/Quintanilla

TABLE 1: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 11, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.2	7.3	7.6
EC	mS/m	198	210	258
Total Dissolved Solids	mg/L	1,570	1,650	1,796
Total Diss. Org. Carbon	”	3	6	38
Cl^-	”	256	118	111
$SO_4^=$	”	470	264	2
TKN	”	0.71	0.71	8.3
NH_3-N	”	<0.02	<0.02	5.5
$NO_2 + NO_3$-N	”	0.71	0.22	0.17
Total P	”	0.06	0.05	0.10
Alkalinity as $CaCO_3$	”	442	1,014	1,634
Al	”	0.056	0.062	0.078
Ca	”	294	309	299
Cd	”	<0.0004	0.0005	0.0010
Cr	”	0.0008	0.0008	0.0020
Cu	”	<0.002	<0.002	<0.004
Fe	”	0.013	0.009	1.27
Hg	μg/L	<0.05	<0.05	<0.10
K	mg/L	0.3	1	4
Mg	”	72.6	128	188
Mn	”	0.1091	0.1984	0.3620
Na	”	72	47	45
Ni	”	0.0030	<0.0004	0.0010
Pb	”	<0.004	<0.004	<0.008
Zn	”	0.022	0.013	0.022

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 2: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON APRIL 25, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.3	7.3	7.3
EC	mS/m	171	186	180
Total Dissolved Solids	mg/L	1,880	1,690	1,636
Total Diss. Org. Carbon	”	3	6	40
Cl^-	”	257	128	108
$SO_4^=$	”	482	269	3
TKN	”	0.72	0.81	8.2
NH_3-N	”	<0.02	<0.02	4.6
$NO_2 + NO_3$-N	”	1.1	0.46	0.03
Total P	”	<0.05	<0.05	0.05
Alkalinity as $CaCO_3$	”	421	968	1,449
Al	”	0.079	0.077	0.077
Ca	”	304	304	305
Cd	”	<0.0004	<0.0004	<0.0004
Cr	”	0.0015	0.0015	0.0023
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.026	0.024	6.00
Hg	μg/L	<0.05	<0.05	0.09
K	mg/L	0.2	1	4
Mg	”	75.1	127	184
Mn	”	0.6906	0.4507	0.3488
Na	”	71	50	46
Ni	”	0.0014	<0.0004	0.0022
Pb	”	<0.004	<0.004	<0.004
Zn	”	0.030	0.010	0.015

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 3: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 9, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		6.9	7.5	7.4
EC	mS/m	218	214	243
Total Dissolved Solids	mg/L	2,052	1,734	1,882
Total Diss. Org. Carbon	”	2	7	39
Cl^-	”	286	118	118
$SO_4^=$	”	627	285	0.6
TKN	”	0.53	1.1	8.5
NH_3-N	”	<0.02	<0.02	4.7
$NO_2 + NO_3$-N	”	0.51	0.26	0.51
Total P	”	0.05	<0.05	0.05
Alkalinity as $CaCO_3$	”	449	1,098	1,655
Al	”	0.059	0.062	0.065
Ca	”	326	312	294
Cd	”	0.0008	0.0005	0.0006
Cr	”	<0.0005	<0.0005	0.0006
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.021	0.053	7.13
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.3	1	4
Mg	”	81.9	136	189
Mn	”	0.6407	0.3677	0.3494
Na	”	70	44	47
Ni	”	0.0028	<0.0004	0.0024
Pb	”	<0.004	<0.004	<0.004
Zn	”	0.033	0.013	0.014

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 4: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON MAY 23, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.2	7.3	7.3
EC	mS/m	266	214	247
Total Dissolved Solids	mg/L	2,464	1,700	1,968
Total Diss. Org. Carbon	”	3	7	41
Cl^-	”	281	97	111
$SO_4^=$	”	724	237	10
TKN	”	0.81	0.76	9.5
NH_3-N	”	<0.02	<0.02	4.7
$NO_2 + NO_3$-N	”	0.15	0.12	0.11
Total P	”	<0.05	<0.05	<0.05
Alkalinity as $CaCO_3$	”	421	1,020	1,491
Al	”	0.074	0.064	0.069
Ca	”	372	280	296
Cd	”	<0.0004	<0.0004	<0.0004
Cr	”	0.0011	0.0011	0.0019
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.010	0.014	16.6
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.2	1	4
Mg	”	95.4	128	184
Mn	”	0.2142	0.3306	0.3441
Na	”	65	35	46
Ni	”	0.0018	0.0007	0.0024
Pb	”	<0.004	<0.004	<0.004
Zn	”	0.022	0.011	0.020

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 5: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 6, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.3	7.3	7.6
EC	mS/m	252	243	265
Total Dissolved Solids	mg/L	2,560	1,896	1,876
Total Diss. Org. Carbon	”	3	7	40
Cl^-	”	290	104	117
$SO_4^=$	”	873	273	16
TKN	”	0.82	0.98	8.9
NH_3-N	”	<0.02	<0.02	4.7
$NO_2 + NO_3$-N	”	0.44	0.19	0.10
Total P	”	0.06	<0.05	0.06
Alkalinity as $CaCO_3$	”	418	1,116	1,578
Al	”	0.065	0.058	0.054
Ca	”	413	322	303
Cd	”	0.0010	0.0009	0.0006
Cr	”	0.0015	0.0016	0.0026
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.041	0.010	5.74
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.3	1	4
Mg	”	109	144	187
Mn	”	0.3918	0.2823	0.3520
Na	”	69	37	50
Ni	”	<0.0004	<0.0004	0.0005
Pb	”	<0.004	0.005	0.006
Zn	”	0.026	0.010	0.008

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 6: ANALYSIS OF WATER FROM LYSIMETERS
L-2 THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON JUNE 20, 2007

Parameter	Unit	Lysimeter No.		
		L-2	L-3	L-1N-1
pH[1]		7.2	7.3	7.6
EC	mS/m	251	221	242
Total Dissolved Solids	mg/L	2,962	2,120	1,876
Total Diss. Org. Carbon	”	2	6	37
Cl^-	”	300	121	122
$SO_4^=$	”	724	264	10
TKN	”	0.57	0.61	8.2
NH_3-N	”	<0.02	<0.02	4.7
$NO_2 + NO_3$-N	”	1.2	0.62	0.62
Total P	”	0.06	0.05	0.06
Alkalinity as $CaCO_3$	”	453	1,134	1,534
Al	”	0.073	0.067	0.063
Ca	”	394	325	297
Cd	”	0.0010	0.0008	0.0009
Cr	”	0.0014	0.0019	0.0025
Cu	”	<0.002	<0.002	<0.002
Fe	”	0.011	0.027	5.98
Hg	μg/L	<0.05	<0.05	<0.05
K	mg/L	0.2	1	4
Mg	”	101	140	186
Mn	”	0.1830	0.4210	0.3454
Na	”	72	43	54
Ni	”	<0.0004	<0.0004	0.0007
Pb	”	<0.004	<0.004	<0.004
Zn	”	0.026	0.008	0.007

[1]pH analyzed beyond recommended holding time of 15 minutes.

TABLE 7: ANALYSIS OF MONTHLY COMPOSITED DIGESTED BIOSOLIDS PLACED IN THE HARLEM AVENUE SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2007

Parameter	Unit	Concentration*
pH		8.4
Total Solids	%	20.6
Total Volatile Solids**	%	44.7
TKN	mg/kg	39,605
NH_3-N	,,	10,292

*Values for one sample only.

**Total volatile solids as a percentage of total solids.

TABLE 8: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE HARLEM AVENUE SOLIDS MANAGEMENT DRYING AREA DURING APRIL 2007

Parameter	Unit	Concentration*
pH		8.1
Total Solids	%	22.9
Total Volatile Solids**	%	53.3
TKN	mg/kg	53,621
NH_3-N	,,	10,434
Total P	,,	21,941
Al	,,	17,000
As	,,	<5
Ca	,,	32,311
Cd	,,	4
Cr	,,	146
Cu	,,	364
Fe	,,	15,426
Hg	,,	0.49
K	,,	3,361
Mg	,,	16,140
Mn	,,	543
Mo	,,	13
Na	,,	1,655
Ni	,,	54
Pb	,,	107
Se	,,	7
Zn	,,	737

*Values for one sample only.

**Total volatile solids as a percentage of total solids.

TABLE 9: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE HARLEM AVENUE SOLIDS MANAGEMENT DRYING AREA DURING MAY 2007

Parameter	Unit	Concentration*
pH		7.3
Total Solids	%	45.5
Total Volatile Solids**	%	42.1
TKN	mg/kg	30,177
NH_3-N	,,	4,726
Total P	,,	25,835
Al	,,	21,503
As	,,	<5
Ca	,,	41,125
Cd	,,	4
Cr	,,	227
Cu	,,	425
Fe	,,	18,650
Hg	,,	0.98
K	,,	4,011
Mg	,,	19,390
Mn	,,	554
Mo	,,	19
Na	,,	963
Ni	,,	55
Pb	,,	138
Se	,,	<4
Zn	,,	861

*Values for one sample only.

**Total volatile solids as a percentage of total solids.

TABLE 10: ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS REMOVED FROM THE HARLEM AVENUE SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2007

Parameter	Unit	Concentration*
pH		6.5
Total Solids	%	66.7
Total Volatile Solids**	%	28.9
TKN	mg/kg	11,124
NH_3-N	,,	814
Total P	,,	14,570
Al	,,	18,815
As	,,	<5
Ca	,,	49,087
Cd	,,	7
Cr	,,	288
Cu	,,	405
Fe	,,	18,399
Hg	,,	0.96
K	,,	3,178
Mg	,,	24,067
Mn	,,	573
Mo	,,	15
Na	,,	<600
Ni	,,	52
Pb	,,	162
Se	,,	<4
Zn	,,	961

*Values for one sample only.

**Total volatile solids as a percentage of total solids.