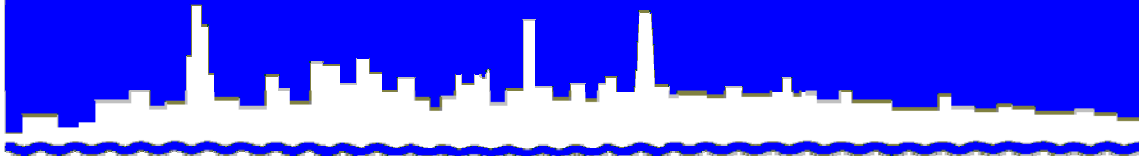


Protecting Our Water Environment



Metropolitan Water Reclamation District of Greater Chicago

***RESEARCH AND DEVELOPMENT
DEPARTMENT***

REPORT NO. 07-14

HARLEM AVENUE SOLIDS MANAGEMENT AREA

MONITORING DATA FOR

FOURTH QUARTER 2006

MARCH 2007

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

March 29, 2007

312-751-5190

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 October, November, and December 2006

The attached eight tables contain the monitoring data for the Harlem Avenue Solids Management Area for October, November, and December 2006 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-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on October 11, 2006

Table 2, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on October 25, 2006

Table 3, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on November 8, 2006

Table 4, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on November 21, 2006

Table 5, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on December 6, 2006

Subject: Harlem Avenue Solids Management Area - Stickney WRP, Contract No. 84-111-2P, IEPA Permit No. 2004-AO-2591, Monitoring Report for October, November, and December 2006

Table 6, Analysis of Water from Lysimeters L-1N through L-1N-1 at the Harlem Avenue Solids Management Area Sampled on December 20, 2006

Table 7, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Harlem Avenue Solids Management Drying Area During October 2006

Table 8, Analysis of Monthly Compositated Processed Digested Biosolids Removed from the Harlem Avenue Solids Management Drying Area During November 2006

No biosolids were placed in the solids drying area during October, November, and December 2006. Biosolids were removed from the solids drying area during October and November 2006.

Very truly yours,

Louis Kollias
Director
Research and Development

LK:PL:spy
Attachments

cc w/att: Mr. Sulski, IEPA
Records Unit, IEPA
Mr. W. Stuba
Dr. T. Granato
Dr. A. Cox
Dr. P. Lindo
Ms. M. Patel

cc wo/att: Ms. M. Sharma
Mr. S. Levy
Mr. O. Jamjun
Mr. A. Quintanilla
Mr. A. Ryzak

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 11, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH ¹			7.2	7.4	7.3	7.6
EC	mS/m		355	155	244	256
Total Dissolved Solids	mg/L		NA	1,108	1,760	1,976
Total Diss. Org. Carbon	"		NA	3	7	39
Cl ⁻	"		NA	181	100	98
SO ₄ ⁼	"		NA	238	265	84
TKN	"		NA	2.2	1.0	10
NH ₃ -N	"	L	NA	1.3	<0.02	5.2
NO ₂ + NO ₃ -N	"	Y	NA	3.0	0.29	5.1
Total P	"	S	NA	0.06	<0.05	<0.05
Alkalinity as CaCO ₃	"	I	NA	397	1,143	1,488
		M				
Al	"	E	NA	0.034	0.051	0.048
Ca	"	T	NA	196	321	293
Cd	"	E	NA	<0.0004	<0.0004	0.0041
Cr	"	R	NA	<0.0005	<0.0005	<0.0005
Cu	"		NA	<0.002	<0.002	0.031
		D				
Fe	"	R	NA	0.010	0.012	2.80
Hg	μg/L	Y	NA	0.06	0.07	0.07
K	mg/L		NA	0.9	1	4
Mg	"		NA	52.0	141	176
Mn	"		NA	0.0426	0.1176	0.3347
Na	"		NA	76	37	44
Ni	"		NA	0.0005	<0.0004	0.0048
Pb	"		NA	<0.004	<0.004	0.006
Zn	"		NA	0.011	0.019	NRR

¹pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

NRR = No reportable result.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON OCTOBER 25, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH ¹			7.1	7.4	7.3	7.5
EC	mS/m		323	141	212	240
Total Dissolved Solids	mg/L		3,524	1,136	1,770	1,932
Total Diss. Org. Carbon	"		52	2	7	39
Cl ⁻	"		94	185	100	107
SO ₄ ⁼	"		1,630	233	278	9
TKN	"		79	0.37	0.64	8.4
NH ₃ -N	"	L	77	<0.02	<0.02	4.5
NO ₂ + NO ₃ -N	"	Y	45	0.09	0.23	0.03
Total P	"	S	0.91	<0.05	<0.05	<0.05
Alkalinity as CaCO ₃	"	I	705	399	1,181	1,618
		M				
Al	"	E	0.069	0.035	0.044	0.045
Ca	"	T	451	182	312	296
Cd	"	E	<0.0004	<0.0004	<0.0004	<0.0004
Cr	"	R	<0.0005	<0.0005	<0.0005	<0.0005
Cu	"		0.013	<0.002	<0.002	<0.002
		D				
Fe	"	R	0.051	0.010	0.010	9.79
Hg	μg/L	Y	0.05	<0.05	<0.05	<0.05
K	mg/L		19	0.3	1	4
Mg	"		240	44.3	139	183
Mn	"		0.5879	0.0318	0.1635	0.3224
Na	"		73	73	37	46
Ni	"		0.0165	0.0006	<0.0004	0.0022
Pb	"		<0.004	<0.004	<0.004	<0.004
Zn	"		0.327	1.74	2.68	1.37

¹pH analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 8, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH ¹			7.2	7.3	7.3	7.5
EC	mS/m		361	156	215	242
Total Dissolved Solids	mg/L		3,430	1,204	1,696	1,646
Total Diss. Org. Carbon	"		52	3	7	37
Cl ⁻	"		97	194	92	108
SO ₄ ⁼	"		1,563	262	264	29
TKN	"		118	3.9	0.63	7.7
NH ₃ -N	"	L	109	3.2	<0.02	4.4
NO ₂ + NO ₃ -N	"	Y	27	0.90	0.27	0.04
Total P	"	S	0.08	0.06	0.06	0.08
Alkalinity as CaCO ₃	"	I	929	445	1,094	1,546
		M				
Al	"	E	0.073	0.038	0.061	0.055
Ca	"	T	437	192	320	296
Cd	"	E	0.0005	0.0004	0.0006	0.0004
Cr	"	R	0.0020	<0.0005	<0.0005	<0.0005
Cu	"		0.002	<0.002	<0.002	<0.002
		D				
Fe	"	R	0.040	0.016	0.017	7.53
Hg	μg/L	Y	<0.05	<0.05	<0.05	<0.05
K	mg/L		21	0.9	1	4
Mg	"		231	52.0	144	180
Mn	"		0.5692	0.0443	0.1089	0.3297
Na	"		67	73	35	45
Ni	"		0.0188	0.0016	<0.0004	0.0026
Pb	"		<0.004	<0.004	<0.004	<0.004
Zn	"		0.036	0.010	0.016	0.016

¹pH analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON NOVEMBER 21, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH ¹			7.3	7.4	7.2	7.3
EC	mS/m		388	178	220	240
Total Dissolved Solids	mg/L		3,516	1,076	1,616	1,564
Total Diss. Org. Carbon	"		55	3	8	40
Cl ⁻	"		94	182	86	102
SO ₄ ⁼	"		1,564	246	296	3
TKN	"		124	0.82	1.1	10
NH ₃ -N	"	L	117	<0.02	<0.02	4.5
NO ₂ + NO ₃ -N	"	Y	26	0.40	0.59	0.76
Total P	"	S	0.07	0.05	<0.05	<0.05
Alkalinity as CaCO ₃	"	I	923	394	1,177	1,546
		M				
Al	"	E	0.068	0.035	0.065	0.053
Ca	"	T	479	199	337	324
Cd	"	E	0.0004	0.0004	0.0004	0.0004
Cr	"	R	<0.0005	<0.0005	<0.0005	<0.0005
Cu	"		0.002	<0.002	<0.002	<0.002
		D				
Fe	"	R	0.054	0.015	0.013	12.3
Hg	μg/L	Y	<0.05	<0.05	<0.05	<0.05
K	mg/L		22	0.3	1	5
Mg	"		257	50.1	157	193
Mn	"		0.5865	0.0029	0.1120	0.3499
Na	"		75	80	35	50
Ni	"		0.0197	0.0008	<0.0004	0.0029
Pb	"		<0.004	<0.004	<0.004	<0.004
Zn	"		0.025	0.010	0.015	0.017

¹pH analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 6, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH ¹		7.7	7.2	7.3	7.2	7.3
EC	mS/m	173	374	147	224	253
Total Dissolved Solids	mg/L	1,304	3,040	1,166	1,496	1,420
Total Diss. Org. Carbon	"	20	54	2	8	39
Cl ⁻	"	44	95	180	86	102
SO ₄ ⁼	"	11	1,675	220	257	3
TKN	"	2.8	144	1.4	0.77	9.9
NH ₃ -N	"	0.76	115	0.64	<0.02	4.8
NO ₂ + NO ₃ -N	"	1.5	27	0.19	0.41	0.18
Total P	"	0.20	0.08	0.05	0.09	0.11
Alkalinity as CaCO ₃	"	1,076	954	403	1,059	1,303
Al	"	0.056	0.077	0.040	0.061	0.066
Ca	"	190	470	196	323	302
Cd	"	<0.0008	0.0005	0.0005	0.0007	0.0009
Cr	"	<0.0010	0.0005	<0.0005	<0.0005	<0.0005
Cu	"	0.044	<0.002	<0.002	<0.002	<0.002
Fe	"	1.43	0.045	0.007	0.010	1.64
Hg	μg/L	<0.10	<0.05	<0.05	<0.05	<0.05
K	mg/L	3	22	0.4	1	4
Mg	"	142	260	50.2	156	188
Mn	"	0.2114	0.5950	0.0064	0.0876	0.3370
Na	"	46	76	77	34	48
Ni	"	0.0020	0.0181	0.0006	<0.0004	0.0018
Pb	"	<0.008	<0.004	<0.004	<0.004	<0.004
Zn	"	0.080	0.021	0.006	0.010	0.157

¹pH analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

ANALYSIS OF WATER FROM LYSIMETERS
L-1N THROUGH L-1N-1 AT THE HARLEM AVENUE
SOLIDS MANAGEMENT AREA SAMPLED ON DECEMBER 20, 2006

Parameter	Unit	Lysimeter No.				
		L-1N	L-1	L-2	L-3	L-1N-1
pH ¹		7.9	7.1	7.3	7.2	7.4
EC	mS/m	201	226	154	216	245
Total Dissolved Solids	mg/L	1,412	3,530	1,146	1,720	1,518
Total Diss. Org. Carbon	"	NA	54	2	8	40
Cl ⁻	"	61	97	195	107	105
SO ₄ ⁼	"	NA	1,696	218	264	2
TKN	"	10	128	0.96	0.74	8.7
NH ₃ -N	"	6.6	125	0.32	<0.02	4.6
NO ₂ + NO ₃ -N	"	3.3	23	0.58	0.63	0.90
Total P	"	0.12	0.23	<0.05	<0.05	0.05
Alkalinity as CaCO ₃	"	1,340	994	421	1,123	1,479
Al	"	0.060	0.081	0.047	0.064	0.060
Ca	"	253	469	195	317	308
Cd	"	<0.0008	<0.0004	<0.0004	<0.0004	<0.0004
Cr	"	0.0018	0.0017	0.0007	<0.0005	0.0008
Cu	"	<0.004	<0.002	<0.002	<0.002	<0.002
Fe	"	3.02	0.044	0.033	0.021	9.44
Hg	μg/L	<0.10	<0.05	<0.05	<0.05	<0.05
K	mg/L	4	21	0.3	1	4
Mg	"	153	251	48.9	139	189
Mn	"	0.3460	0.5961	0.0041	0.1519	0.3557
Na	"	44	74	75	40	47
Ni	"	0.0024	0.0177	<0.0004	<0.0004	0.0014
Pb	"	0.016	<0.004	0.007	0.004	<0.004
Zn	"	0.040	0.010	0.004	0.004	0.012

¹pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 7

ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE HARLEM AVENUE
SOLIDS MANAGEMENT DRYING AREA DURING OCTOBER 2006

Parameter	Unit	Concentration*
pH		7.5
Total Solids	%	24.7
Total Volatile Solids	%	57.1
TKN	mg/kg	49,012
NH ₃ -N	"	8,361
Total P	"	30,979
Al	"	13,489
As	"	<0.9
Ca	"	34,773
Cd	"	3
Cr	"	158
Cu	"	742
Fe	"	28,881
Hg	"	1.8
K	"	2,867
Mg	"	9,930
Mn	"	626
Mo	"	20
Na	"	948
Ni	"	81
Pb	"	70
Se	"	<0.7
Zn	"	870

*Values for one sample only.

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

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 8

ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED
BIOSOLIDS REMOVED FROM THE HARLEM AVENUE
SOLIDS MANAGEMENT DRYING AREA DURING NOVEMBER 2006

Parameter	Unit	Concentration*
pH		7.8
Total Solids	%	36.2
Total Volatile Solids	%	40.0
TKN	mg/kg	30,382
NH ₃ -N	"	6,875
Total P	"	22,673
Al	"	23,126
As	"	5
Ca	"	41,236
Cd	"	5
Cr	"	269
Cu	"	423
Fe	"	19,580
Hg	"	1.5
K	"	4,415
Mg	"	18,222
Mn	"	565
Mo	"	19
Na	"	980
Ni	"	54
Pb	"	153
Se	"	<0.7
Zn	"	953

*Values are the means of four samples.

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