

*Protecting Our Water Environment*



*Metropolitan Water Reclamation District of Greater Chicago*

***RESEARCH AND DEVELOPMENT  
DEPARTMENT***

**REPORT NO. 06-52**

**CALUMET EAST SOLIDS MANAGEMENT AREA**

**MONITORING DATA FOR**

**SECOND QUARTER 2006**

**August 2006**

August 31, 2006

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: Calumet East Solids Management Area - Stickney WRP, Contract No. 85-273-2P, L170401, IEPA Permit No. 2005-AO-4281-1, Monitoring Data for April, May, and June 2006

The attached six tables contain the monitoring data for the Calumet East Solids Management Area for April, May, and June 2006 as required by IEPA Operating Permit No. 2005-AO-4281-1.

The data reported are as follows:

Table 1, Analysis of Water from Lysimeters L-1 through L-6 at the Calumet East Solids Management Area Sampled on April 5, 2006

Table 2, Analysis of Water from Lysimeters L-1 through L-6 at the Calumet East Solids Management Area Sampled on May 3, 2006

Table 3, Analysis of Water from Lysimeters L-1 through L-6 at the Calumet East Solids Management Area Sampled on June 28, 2006

Table 4, Analysis of Monthly Compositing Digested Biosolids Placed in the Calumet East Solids Management Drying Area During June 2006

Table 5, Analysis of Monthly Compositing Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During April 2006

Table 6, Analysis of Monthly Compositing Processed Digested Biosolids Removed from the Calumet East Solids Management Drying Area During June 2006

Subject: Calumet East Solids Management Area - Stickney WRP, Contract No. 85-273-2P, L170401, IEPA Permit No. 2005-AO-4281-1, Monitoring Data for April, May, and June 2006

Biosolids were placed in the drying site during the month of June only, but were removed from the site during April and June.

Very truly yours,

Louis Kollias  
Director  
Research and Development

LK:PL:spy

Enclosure

cc w/enc: Records Unit (IEPA)  
Sulski (IEPA)

cc via MWRDGC Web Site:  
Levy/Sharma  
Stuba/Granato  
O'Connor/Cox  
Lindo/Patel, M.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-6  
 AT THE CALUMET EAST SOLIDS MANAGEMENT AREA  
 SAMPLED ON APRIL 5, 2006

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-3	L-4
pH <sup>1</sup>			7.7	7.7	7.8	7.4
EC	mS/m		313	364	185	376
Total Dissolved Solids	mg/L		3,384	4,264	1,828	4,192
Total Dissolved Organic Carbon	"		9	3	7	3
Cl <sup>-</sup>	"		193	217	52	507
SO <sub>4</sub> <sup>=</sup>	"		1,720	2,161	711	1,812
TKN	"		13	0.68	0.37	1.4
NH <sub>3</sub> -N	"	L	3.7	< 0.04	< 0.02	0.64
NO <sub>2</sub> + NO <sub>3</sub> -N	"	Y	0.07	0.20	0.07	0.11
Total P	"	S	0.05	< 0.10	< 0.05	0.05
Alkalinity as CaCO <sub>3</sub>	"	I	629	542	523	366
		M				
Al	"	E	0.020	0.040	0.020	0.020
Ca	"	T	404	566	228	487
Cd	"	E	< 0.0004	< 0.0008	< 0.0004	< 0.0004
Cr	"	R	< 0.0005	< 0.0010	< 0.0005	< 0.0005
Cu	"		< 0.002	0.014	0.005	0.008
		D				
Fe	"	R	5.25	0.076	0.036	18.0
Hg	µg/L	Y	< 0.05	< 0.10	< 0.05	< 0.05
K	mg/L		12	6	2	6
Mg	"		234	275	140	264
Mn	"		0.4825	0.0066	0.0014	0.1241
Na	"		160	148	61	145
Ni	"		< 0.0004	0.0020	0.0030	< 0.0004
Pb	"		< 0.004	< 0.008	0.006	< 0.004
Zn	"		0.006	0.062	0.024	0.028

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 1 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-6  
AT THE CALUMET EAST SOLIDS MANAGEMENT AREA  
SAMPLED ON APRIL 5, 2006

Parameter	Unit	Lysimeter No.	
		L-5	L-6
pH <sup>1</sup>		7.8	7.9
EC	mS/m	188	140
Total Dissolved Solids	mg/L	1,652	1,398
Total Dissolved Organic Carbon	"	0.8	1
Cl <sup>-</sup>	"	222	16
SO <sub>4</sub> <sup>=</sup>	"	543	671
TKN	"	0.81	0.56
NH <sub>3</sub> -N	"	0.40	0.33
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.21	0.24
Total P	"	0.06	0.08
Alkalinity as CaCO <sub>3</sub>	"	251	282
Al	"	0.010	0.010
Ca	"	203	169
Cd	"	< 0.0004	< 0.0004
Cr	"	< 0.0005	< 0.0005
Cu	"	0.002	< 0.002
Fe	"	2.65	0.966
Hg	μg/L	< 0.05	< 0.05
K	mg/L	4	4
Mg	"	96.0	85.8
Mn	"	0.0482	0.0403
Na	"	87	72
Ni	"	< 0.0004	< 0.0004
Pb	"	< 0.004	< 0.004
Zn	"	0.008	0.005

<sup>1</sup>pH analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-6  
 AT THE CALUMET EAST SOLIDS MANAGEMENT AREA  
 SAMPLED ON MAY 3, 2006

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-3	L-4
pH <sup>1</sup>			7.4	7.6	7.5	7.1
EC	mS/m		336	393	181	383
Total Dissolved Solids	mg/L		3,628	4,336	1,810	4,382
Total Dissolved Organic Carbon	"		10	4	7	3
Cl <sup>-</sup>	"		160	169	43	444
SO <sub>4</sub> <sup>=</sup>	"		1,844	2,295	677	1,738
TKN	"		14	0.98	0.75	1.4
NH <sub>3</sub> -N	"	L	3.3	0.24	0.09	0.71
NO <sub>2</sub> + NO <sub>3</sub> -N	"	Y	0.05	0.23	0.18	0.18
Total P	"	S	0.06	0.10	0.18	0.07
Alkalinity as CaCO <sub>3</sub>	"	I	543	410	436	315
		M				
Al	"	E	< 0.007	< 0.014	< 0.007	< 0.007
Ca	"	T	432	567	217	504
Cd	"	E	0.0017	0.0030	0.0020	0.0020
Cr	"	R	0.0014	0.0024	0.0012	0.0005
Cu	"		< 0.002	< 0.004	< 0.002	< 0.002
		D				
Fe	"	R	6.25	0.036	0.013	19.2
Hg	μg/L	Y	< 0.05	< 0.10	< 0.05	0.07
K	mg/L		13	7	2	7
Mg	"		269	291	143	302
Mn	"		0.3311	0.0106	0.0034	0.1298
Na	"		188	159	62	170
Ni	"		< 0.0004	0.0062	0.0036	< 0.0004
Pb	"		0.011	0.030	0.012	0.012
Zn	"		0.013	0.068	0.032	0.038

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 2 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-6  
AT THE CALUMET EAST SOLIDS MANAGEMENT AREA  
SAMPLED ON MAY 3, 2006

Parameter	Unit	Lysimeter No.	
		L-5	L-6
pH <sup>1</sup>		7.5	7.7
EC	mS/m	182	143
Total Dissolved Solids	mg/L	1,848	1,402
Total Dissolved Organic Carbon	"	1	1
Cl <sup>-</sup>	"	208	13
SO <sub>4</sub> <sup>=</sup>	"	557	689
TKN	"	0.84	0.49
NH <sub>3</sub> -N	"	0.39	0.26
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.25	0.21
Total P	"	0.08	0.17
Alkalinity as CaCO <sub>3</sub>	"	228	238
Al	"	< 0.007	< 0.007
Ca	"	206	170
Cd	"	0.0015	0.0017
Cr	"	0.0013	0.0013
Cu	"	< 0.002	< 0.002
Fe	"	2.25	0.157
Hg	μg/L	< 0.05	< 0.05
K	mg/L	4	4
Mg	"	103	89.5
Mn	"	0.0488	0.0362
Na	"	94	75
Ni	"	< 0.0004	< 0.0004
Pb	"	0.011	0.010
Zn	"	0.018	0.018

<sup>1</sup>pH analyzed beyond recommended holding time of 15 minutes.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-6  
AT THE CALUMET EAST SOLIDS MANAGEMENT AREA  
SAMPLED ON JUNE 28, 2006

Parameter	Unit	Lysimeter No.				
		L-1	L-1N	L-2	L-3	L-4
pH <sup>1</sup>		7.3	7.4	7.3	7.5	7.2
EC	mS/m	449	343	366	184	388
Total Dissolved Solids	mg/L	NA	3,550	3,932	1,670	3,912
Total Dissolved Organic Carbon	"	NA	10	4	6	3
Cl <sup>-</sup>	"	NA	166	180	48	540
SO <sub>4</sub> <sup>=</sup>	"	NA	1,564	1,865	605	1,437
TKN	"	NA	9.0	0.90	0.47	1.3
NH <sub>3</sub> -N	"	NA	< 0.02	< 0.02	< 0.02	0.54
NO <sub>2</sub> + NO <sub>3</sub> -N	"	NA	0.09	0.16	0.19	0.13
Total P	"	NA	0.09	0.06	0.05	< 0.05
Alkalinity as CaCO <sub>3</sub>	"	NA	540	477	509	362
Al	"	NA	0.057	0.062	0.023	0.049
Ca	"	NA	420	542	214	478
Cd	"	NA	0.0006	< 0.0004	0.0005	0.0006
Cr	"	NA	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cu	"	NA	< 0.002	< 0.002	< 0.002	< 0.002
Fe	"	NA	10.4	0.088	0.022	19.5
Hg	μg/L	NA	< 0.05	< 0.05	< 0.05	< 0.05
K	mg/L	NA	11	6	2	6
Mg	"	NA	245	260	136	257
Mn	"	NA	0.3080	0.0065	0.0024	0.1352
Na	"	NA	159	141	60	143
Ni	"	NA	< 0.0004	0.0019	< 0.0004	< 0.0004
Pb	"	NA	< 0.004	< 0.004	0.005	< 0.004
Zn	"	NA	0.006	0.014	0.012	0.025



METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 3 (Continued)

ANALYSIS OF WATER FROM LYSIMETERS L-1 THROUGH L-6  
AT THE CALUMET EAST SOLIDS MANAGEMENT AREA  
SAMPLED ON JUNE 28, 2006

Parameter	Unit	Lysimeter No.	
		L-5	L-6
pH <sup>1</sup>		7.5	7.6
EC	mS/m	185	146
Total Dissolved Solids	mg/L	1,550	1,314
Total Dissolved Organic Carbon	"	0.8	1
Cl <sup>-</sup>	"	230	15
SO <sub>4</sub> <sup>=</sup>	"	503	550
TKN	"	0.30	0.27
NH <sub>3</sub> -N	"	< 0.02	< 0.02
NO <sub>2</sub> + NO <sub>3</sub> -N	"	0.32	0.41
Total P	"	0.06	0.05
Alkalinity as CaCO <sub>3</sub>	"	241	276
Al	"	0.025	0.019
Ca	"	208	169
Cd	"	< 0.0004	0.0004
Cr	"	< 0.0005	< 0.0005
Cu	"	< 0.002	< 0.002
Fe	"	0.162	0.066
Hg	μg/L	< 0.05	< 0.05
K	mg/L	4	3
Mg	"	96.9	84.4
Mn	"	0.0294	0.0245
Na	"	87	71
Ni	"	< 0.0004	< 0.0004
Pb	"	0.005	0.005
Zn	"	0.006	0.007

<sup>1</sup>pH analyzed beyond recommended holding time of 15 minutes.

NA = No analysis; insufficient sample.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 4

ANALYSIS OF MONTHLY COMPOSITED DIGESTED BIOSOLIDS  
PLACED IN THE CALUMET EAST  
SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2006

Parameter	Unit	Concentration*
pH		7.7
Total Solids	%	10.2
Total Volatile Solids	”	47.9
TKN	mg/kg	32,813
NH <sub>3</sub> -N	”	11,915

\*Values for one sample only.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 5

ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS  
 REMOVED FROM THE CALUMET EAST  
 SOLIDS MANAGEMENT DRYING AREA DURING APRIL 2006

Parameter	Unit	Concentration*
pH		8.2
Total Solids	%	18.9
Total Volatile Solids	"	53.6
TKN	mg/kg	33,309
NH <sub>3</sub> -N	"	17,509
Total P	"	17,400
Al	"	11,877
As	"	3
Ca	"	44,352
Cd	"	3.4
Cr	"	92
Cu	"	452
Fe	"	31,149
Hg	"	1.6
K	"	2,636
Mg	"	13,952
Mn	"	791
Mo	"	18
Na	"	1,537
Ni	"	43
Pb	"	91
Se	"	10
Zn	"	994

\*Values are the means of two samples.

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO

TABLE 6

ANALYSIS OF MONTHLY COMPOSITED PROCESSED DIGESTED BIOSOLIDS  
 REMOVED FROM THE CALUMET EAST  
 SOLIDS MANAGEMENT DRYING AREA DURING JUNE 2006

Parameter	Unit	Concentration*
pH		6.6
Total Solids	%	61.2
Total Volatile Solids	"	44
TKN	mg/kg	35,262
NH <sub>3</sub> -N	"	2,323
Total P	"	38,969
Al	"	16,143
As	"	10
Ca	"	53,121
Cd	"	7.5
Cr	"	133
Cu	"	481
Fe	"	33,818
Hg	"	1.4
K	"	3,341
Mg	"	15,609
Mn	"	859
Mo	"	17
Na	"	1,144
Ni	"	44
Pb	"	146
Se	"	17
Zn	"	1,464

\*Values are the means of four samples.